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Appendix 1a. Data Sources and Resources

This appendix lists the information sources that were researched, compiled, and reviewed in order to best determine and present the status of the full array of wildlife and its conservation in Maryland. A wide diversity of literature and programs was consulted and compiled through extensive research and coordination efforts. Some of these sources are included in the References section of this document, and the remaining sources are provided here as a resource for users and implementing parties of this document as well as for future revisions. Sources include published and unpublished data, reports, and correspondence from existing conservation programs and are listed in alphabetical order.

Table 1A.1. World Wide Web information resources utilized in the preparation of the WDCP.

Aberdeen Proving Ground, U.S. Army	http://www.apg.army.mil/apghome/sites/local/
Adkins Arboretum	http://www.adkinsarboretum.org
Alliance for the Chesapeake Bay	http://www.acb-online.org
America's Living Oceans: Charting a Course for Sea Change. A Report to the Nation, Recommendations for a New Ocean Policy, Pew Oceans Commission 2003	http://www.pewoceans.org/oceans/index.asp
American Bird Conservancy	http://www.abcbirds.org/
American Birding Association	http://www.americanbirding.org/
American Chestnut Land Trust	http://www.acltweb.org/
American Fisheries Society	http://www.fisheries.org/html/index.shtml
Anacostia Watershed Society	http://anacostiaws.org
Animal and Plant Health Inspection Service (APHIS), USDA	http://www.aphis.usda.gov/
Anne Arundel County Volunteer Water Quality Monitoring Program	http://yosemite.epa.gov/water/volmon.nsf/0/2943e 16f6b6f3b 9b8525671d006c4585?OpenDocument
Annual Chester River Watershed Snapshot, Chester Riverkeeper – Chester River Association	http://www.chesterriverassociation.org
Appalachian Clean Streams Initiative, USGS	http://mine-drainage.usgs.gov/archive/osm.html
Assateague Coastal Trust	http://www.actforbays.org/
Assateague Coastkeeper (Coastal Bays health), Assateague Coastal Trust	http://www.actforbays.org
Assateague Island geomorphology, National Park Service	http://www.nps.gov
Assateague Island National Seashore	http://www.nps.gov/asis/index.htm

Assessing The Relative Habitat Value Of Restored Versus Natural Coastal Marshes And Islands To Migratory Birds In Chesapeake Bay, USGS Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/staff/fieldstations/PWRCchar.cfm
Assessment of Spring Recreational Finfish Harvest in the Choptank River, Maryland DNR	http://www.dnr.state.md.us/fisheries
Association of Biodiversity Information	http://www.abi.org
Atlantic Seaduck Study: Movements, Habitat Use, and Feeding Ecology of Seaducks in Chesapeake Bay and Other Atlantic Coastal Areas (satellite tracking), USGS Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/resshow/perry/scoters/default.htm
Atlantic States Marine Fisheries Commission	http://www.asmfc.org/
Atmospheric deposition (rainfall and nitrogen) at Assateague Island NS, National Park Service	http://www2.nature.nps.gov/air/index.cfm
Audubon Maryland -- D.C.	http://www.audubonmddc.org/
Audubon Naturalist Society	http://www.audubonnaturalist.org/
Baltimore Ecosystem Study	http://www.beslter.org/
Baltimore Ecosystem Study – Long-term Ecological Research (LTER) project, Institute of Ecosystem Studies, National Science Foundation, U.S. Forest Service	http://www.fs.fed.us/ne/global/research/blter.html
Bat Conservation International	http://www.batcon.org/
Bay, Plain and Piedmont: A Landscape History of the Chesapeake Heartland …	http://www.chesapeakebay.net/pubs/gateways/plainandpiedmont/
Beach Water Quality Sampling Program, Worcester County	http://www.earth911.org/waterquality/default.asp?beach_id=2088&cluster=24
Biomonitoring of Environmental Status and Trends (BEST) Program (measure and assess ecological impacts of contaminants), USGS Patuxent Wildlife Research Center	http://water.usgs.gov/eap/env_data.html
Bird Banding Laboratory (banding and recovery monitoring, U.S. and Canada), USGS Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/bbl
Bird Counts, Chesapeake Bay Environmental Center	http://www.cbec-wtna.org
Bird Source, National Audubon Society & Cornell Lab of Ornithology	http://www.birds.cornell.edu

Bird-a-Thon, Irvine Nature Center	http://www.explorenature.org
Blackwater NWR	http://www.fws.gov/blackwater/
Breeding Bird Survey (U.S. and Canada), USGS Patuxent Wildlife Research Center	http://www.mbr-pwrc.usgs.gov/bbs/bbs.html
Breeding Bird Survey, Maryland Ornithological Society	http://www.mdbirds.org/sitemap.html
Bush River Watershed Management Plan, Harford County, Center for Watershed Protection (2003)	http://www.cwp.org/ws_services.htm
Butterfly Count (western Montgomery Co.), Audubon Naturalist Society	http://www.audubonnaturalist.org
Center for Watershed Protection	http://www.cwp.org/
Central Appalachian Forest Ecoregional Plan, The Nature Conservancy, Thorne et al. (2001)	http://nature.org
Chesapeake 2000: A Watershed Partnership Agreement, Chesapeake Bay Program (2000)	http://www.chesapeakebay.net
Chesapeake Bay Acid Rain Foundation	http://www.chesapeakebay.org
Chesapeake Bay Commission	http://www.chesbay.state.va.us
Chesapeake Bay Ecosystem Program, USGS	http://md.water.usgs.gov
Chesapeake Bay Environmental Center	http://www.wildfowltrust.org/about.htm
Chesapeake Bay Foundation	http://www.cbf.org
Chesapeake Bay Gateways Network	http://www.baygateways.net/
Chesapeake Bay Monitoring Program, Ecosystem Processes Component, Maryland DNR	http://www.dnr.state.md.us/bay/monitoring
Chesapeake Bay National Estuarine Research Reserve	http://www.nerrs.noaa.gov/ChesapeakeBayMD/welcome.html
Chesapeake Bay Program	http://www.chesapeakebay.net/
Chesapeake Bay Remote Sensing Program (chlorophyll), University of Maryland Center for Environmental Science, Maryland SeaGrant	http://www.mdsg.umd.edu/CB/remote_sensing.html
Chesapeake Bay Winter Dredge Survey (blue crab), Maryland DNR, Virginia Institute of Marine Sciences	http://www.vims.edu/research
Chesapeake Biological Laboratory	http://www.cbl.umces.edu/Research/ecologists/index.htm
Chesapeake Marshlands National Wildlife Refuge Complex – Draft Environmental Assessment and Comprehensive Conservation Plan	http://www.friendsofblackwater.org/ccp.html
Chester River Association	http://www.chesterriverassociation.org/

Choptank River Basin Overview, Choptank River Tributary Strategies Team, MD DNR (2003f)	http://www.dnr.state.md.us/bay/tribstrat/choptank/chop_whats_new.html
Christmas Bird Count, Audubon Society	http://www.audubon.org/bird/cbc/biblio.html
Christmas Bird Count, Audubon Society	http://www.audubon.org/bird/cbc/biblio.html
Coastal America	http://www.coastalamerica.gov
Coastal Bays Program	http://www.mdcoastalbays.org/
Coastal Bays Water Quality Monitoring Program, Maryland DNR	http://www.dnr.state.md.us/coastalbays/water_quality
Coastal LIDAR (high resolution elevation data), Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Coastal States Organization	http://www.coastalstates.org/
Coastal Zone Management Program	http://www.ocrm.nos.noaa.gov/czm/
Cooperative Agricultural Pest Survey (CAPS), USDA/APHIS	http://www.caes.state.ct.us/CAPS/CAPS.htm
Cornell Lab of Ornithology	http://www.birds.cornell.edu/
Corsica River Watershed Restoration Action Strategy, Town of Centreville 2004	http://www.dnr.state.md.us/watersheds/surf/proj/cr_char.html
Critical Area Commission for Chesapeake Bay and Atlantic Coastal Bays	http://www.dnr.state.md.us/criticalarea/abouttheccommission.html
Defenders of Wildlife	http://www.defenders.org/
Description of the Ecoregions of the United States, U.S. Forest Service, Bailey (1995)	http://www.fs.fed.us/institute/ecoregions/ecoreg1_home.html
Diamondback Terrapin Project (sightings, tag/release; Assateague Is.) Assateague Coastal Trust	http://www.actforbays.org/index.html
Ducks Unlimited	http://www.ducks.org/
Eastern Neck NWR	http://easternneck.fws.gov/
Eastern Shore Land Conservancy	http://www.eslc.org
Ecological Systems of the United States: A Working Classification of U.S. Terrestrial Systems, NatureServe, Comer et al. (2003)	http://www.natureserve.org/publications/usEcologicalsystems.jsp
Endangered Invertebrates: the case for greater attention to invertebrate conservation, Hoffman Black et al. (2004)	http://www.umich.edu/~esupdate/marapr2001/hoffman.htm
EPA	http://www.epa.gov/region03/index.htm
Eyes on the Bay Program	http://mddnr.chesapeakebay.net/eyesonthebay/index.cfm

Fish Health/Disease Program, Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Fish Monitoring Program (Otter Point Creek), Otter Point Creek – Anita C. Leight Estuary Center	http://www.dnr.state.md.us/baylinks/3.html
Fish population surveys, Trout Unlimited	http://www.tu.org/site/pp.asp?c=7dJEKTNuFmG&b=275410
FishBase	http://www.fishbase.org/search.cfm
Fisheries Statistics & Economics program, NOAA-NMFS	http://www.st.nmfs.gov/st1/fus/fus95
FISHMAP (Fishery Independent Sampling and Habitat Mapping), Maryland DNR	http://www.dnr.state.md.us/fisheries/education/flounder/flounder.html
Forest Inventory & Analysis Program, USFS	http://fia.fs.fed.us/
Forest Inventory Analysis, USDA/U.S. Forest Service	http://www.fs.fed.us
Freshwater Ecoregions of North America: A Conservation Assessment, World Wildlife Fund, Abell et al. (2000)	http://www.worldwildlife.org/science/ecoregions/delineation.cfm
Friends of Blackwater NWR	http://www.Friendsofblackwater.org
Friends of Sligo Creek	http://fosc.org/fosc.htm
Friends of the Potomac	http://wwww.potomacfriends.org
From the Mountains to the Sea: The State of Maryland's Freshwater Streams, MD DNR, EPA, Boward et al. (1999)	http://www.epa.gov/maia/html/md-streams.html
Georges Creek Watershed Restoration Action Strategies Plan, Georges Creek watershed partners, WRAS Steering Committee (2002)	http://dnrweb.dnr.state.md.us/download/bays/gcr_strategy.pdf
Governor's Office of Smart Growth	http://www.smartgrowth.state.md.us/
Grassland Birds of North America, Distribution and Trends of Breeding and Wintering Populations, USGS Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/biodiversity
Great Herring Bay Stream and Shore Survey, Maryland Save Our Streams	http://www.sidwell.edu/~env/sos.html
GreenPrint Program	http://www.dnr.state.md.us/education/growfromhere/LESSON4/ GREENPRINT/INDEX.HTM
Herpetology Monitoring Program (Otter Point Creek), Otter Point Creek – Anita C. Leight Estuary Center	http://www.dnr.state.md.us/baylinks/3.html
Herring Run Watershed Association	http://www.herringrun.org

Index of Watershed Indicators: An Overview, Environmental Protection Agency (2002)	http://www.epa.gov/iwi/iwi-overview.pdf
International Association of Fish and Wildlife Agencies (IAFWA)	http://www.iafwa.org/
Investigation of Anadromous Alosids in Chesapeake Bay, Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Investigation of Maryland's Atlantic Ocean and Coastal Bay Finfish Stocks, Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Investigation of Yellow Perch Stocks in Maryland, Maryland DNR	http://www.dnr.state.md.us/fisheries/recreational/articles/ypmgmnt.html
Irvine Nature Center	http://www.explorenature.org
Isle of Wight Bay Watershed Restoration Action Strategy, Worcester County 2002	http://dnrweb.dnr.state.md.us/download/bays/iow_strategy.pdf
Jones Falls Watershed Association	http://www.jonesfalls.org
LANDSAT Remote Sensing (land use/land cover), NASA, U.S. Geological Survey	http://www.usgs.gov
Liberty Reservoir Watershed Restoration Action Strategy with Carroll County, MD delete, Carroll County (2002)	http://www.dnr.state.md.us/watersheds/surf/proj/libres_sca.html
LIDAR Topographic Surveys, Assateague Island, USGS, National Park Service	http://www.usgs.gov
Little Patuxent River Watershed Restoration Action Strategy, Howard County, Howard County (2002)	http://www.dnr.state.md.us/watersheds/surf/proj/lpat_sca.html
Low Impact Development (LID) Center	http://www.lowimpactdevelopment.org/
Lower Eastern Shore Basin Overview, Lower Eastern Shore Tributary Strategies Team, MD DNR (2003g)	http://www.dnr.state.md.us/bay/tribstrat/low_east/low_east_shore.html
Lower Monocacy River Watershed Restoration Action Strategy, Frederick County (2004)	http://www.dnr.state.md.us/watersheds/surf/proj/lmon_char.html
Lower Patuxent River in Calvert County Watershed Restoration Action Strategy, Calvert County, Center for Watershed Protection (2004)	http://www.cwp.org
Lower Potomac River Basin Overview, Lower Potomac River Tributary Strategies Team, MD DNR (2003e)	http://www.dnr.state.md.us/bay/tribstrat/low_pot/low_pot.html

Lower Western Shore Basin Overview, Lower Western Tributary Strategies Team, MD DNR (2003h)	http://www.dnr.state.md.us/bay/tribstrat/low_west/lws_about.html
Magothy River Association	http://www.magothyriver.org/Who_We_Are.html
Manokin River Watershed Restoration Action Strategy, Somerset County 2002	http://dnrweb.dnr.state.md.us/download/bays/man_strategy.pdf
Marine Mammal and Sea Turtle Stranding Response program, Maryland DNR	http://www.dnr.state.md.us/fisheries/recreational/articles/marinemammal.html
Marine species strandings at Assateague Island NS, National Park Service	http://www.nps.gov
Maryland Anacostia River Basin Study (gamefish, stream barriers, benthos, water quality), Maryland DNR	http://www.dnr.state.md.us/streams/pubs/ea01-3_anacostia.pdf
Maryland Biological Stream Survey	http://www.dnr.state.md.us/streams/mbss/index.html
Maryland Biological Stream Survey (MBSS), Maryland DNR	http://www.dnr.state.md.us/streams/mbss/2002_pts.html
Maryland Bowhunter Survey, Maryland DNR	http://www.dnr.state.md.us/wildlife/gpar/index.asp
Maryland Breeding Bird Atlas 2002-2006, USGS Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/bba
Maryland Coastal Bays Ecosystem Health Assessment 2004	http://www.mdcoastalbays.org/publications2.php?subaction=showfull&id=1106242148&archive=&start_from=&ucat=24&
Maryland Coastal Program	http://www.dnr.state.md.us/bay/czm/
Maryland Coverts Project	http://www.naturalresources.umd.edu/Covert_Project.html
Maryland Dept. of Agriculture	http://www.mda.state.md.us/
Maryland Dept. of Environment	http://www.mde.state.md.us/
Maryland Dept. of Natural Resources	http://www.dnr.state.md.us/sw_index_flash.asp
Maryland Dept. of Planning	http://www.mdp.state.md.us/
Maryland Dept. of Transportation/State Highway Administration	http://www.mdot.state.md.us/
Maryland Farm Bureau	http://www.mdfarmbureau.com
Maryland Forests	http://mdforests.org
Maryland Geological Survey	http://www.mgs.md.gov/index.html
Maryland Ornithological Society	http://www.mdbirds.org/
Maryland Save Our Streams	http://www.towson.edu/gwc/gunpowder/Stream%20data%20and%20 monitoring%20sites.htm
Maryland SeaGrant	http://www.mdsg.umd.edu/
Maryland State Parks and Forests	http://www.dnr.state.md.us/mdmap.html

Maryland State Wetland Conservation Plan	http://www.mde.state.md.us/Programs/WaterPrograms/Wetlands_Waterways/wetland_conservation/index.asp
Maryland Stream Waders	http://www.dnr.state.md.us/streams/mbss/mbss_volun.html
Maryland Trawl Survey, Maryland DNR	http://www.dnr.state.md.us/fisheries/education/crab/bluecrabfacts.html
Maryland Water Monitoring Council	http://www.mgs.md.gov/mwmc/
Maryland's Coastal Bays Ecosystem Health Assessment 2004, MD DNR (2004e)	http://www.dnr.state.md.us/coastalbays/sob_2004.html
Mast survey, Maryland DNR	http://www.dnr.state.md.us/wildlife/bbtfappendc.html
MD DNR Environmental Design Program	http://www.dnr.state.md.us/ed
MD DNR Natural Heritage Program	http://www.dnr.state.md.us/wildlife/nhpintro.asp
MD DNR Surf your Watershed	http://www.dnr.state.md.us/watersheds/surf/index.html
MD DNR Tributary Strategies	http://www.dnr.state.md.us/bay/tribstrat/wshd_orgs.html
MD DNR Wildlife and Heritage Service	http://www.dnr.state.md.us/wildlife/index.asp
MERLIN	http://www.mdmerlin.net/index.html
Mid-Atlantic / New England / Maritimes (MANEM) Waterbird Conservation Plan	http://www.fws.gov/birds/waterbirds/manem/habitat%20profiles.htm
Mid-Atlantic Fishery Management Council	http://www.mafmc.org/mid-atlantic/mafmc.htm
Middle Potomac River Basin Overview, Middle Potomac River Tributary Strategies Team, MD DNR (2003b)	http://www.dnr.state.md.us/bay/tribstrat/mid_pot/mid_pot.html
Midwinter Waterfowl Survey (Chesapeake Bay area), Maryland DNR, USFWS	http://www.dnr.state.md.us/dnrnews/pressrelease2005/030205.html
Montgomery County Stream Team	http://www.montgomerycountymd.gov/mc/services/dep/ education/streamteam.htm
Multi-Resolution Land Characteristics (land cover), EPA	http://www.epa.gov/mrlc
Mute Swan Aerial Surveys, Maryland DNR	http://www.dnr.state.md.us/wildlife/msfinalstrat.html
Nanticoke Watershed Alliance	http://www.nanticokeriver.org
National Aquarium in Baltimore	http://aqua.org/teachandlearn.html
National Audubon Society	http://www.audubon.org/
National Biological Information Infrastructure (NBII)	http://www.nbii.gov/

National Coastal Assessment (aka Coastal 2000) Maryland DNR, EPA	http://www.dnr.state.md.us/coastalbays/water_quality/coastal_2000.html
National Fish Habitat Initiative	http://www.fishhabitat.org
National Marine Fisheries Service	http://www.nmfs.noaa.gov/
National Ocean Service Cooperative Oxford Laboratory	http://www.chbr.noaa.gov/CooperativeOxfordLaboratory2.html
National Resources Inventory (NRI), USDA/Natural Resources Conservation Service	http://www.nrcs.usda.gov/technical/NRI
National Water Quality Assessment (NAWQA) Program USGS	http://water.usgs.gov/nawqa
National Wetlands Mitigation Action Plan	http://www.mitigationactionplan.gov/
National Wetlands Inventory Program, USFWS	http://www.personal.psu.edu/users/k/x/kxr246/5221/Project%203/project3.htm
National Wild Turkey Federation	http://www.nwtf.org/
National Wildlife Federation	http://www.nwf.org/
Native American Fish & Wildlife Society	http://www.nafws.org/
Natural Heritage Program Database (monitors non-game, endangered and rare species, habitats), Maryland DNR	http://www.dnr.state.md.us/wildlife/nhpdo.asp
Natural Resources Conservation Service	http://www.md.nrcs.usda.gov/
NatureServe	http://www.natureserve.org/
NOAA Restoration Center Programs, (oil spill and contaminant release response and restoration), NOAA	http://www.dnr.state.md.us/wildlife/mcc.asp
North American Butterfly Association	http://www.naba.org/
North Atlantic Right Whale Consortium	www.rightwhaleweb.org/
Northeast Midwest Institute	http://www.nemw.org/
Operation Clearwater (microbial water quality monitoring, Severn River), Severn River Association	http://www.severnriver.org/clear.htm
Otter Point Creek – Anita C. Leight Estuary Center	http://www.otterpointcreek.org/
Oyster population status and trends, Maryland DNR	http://www.dnr.state.md.us/coastalbays/publications/Chapter8.4.pdf
Partners in Flight	http://www.partnersinflight.org/
Patapsco / Back River Basin Overview, Patapsco-Back River Tributary Strategies Team, MD DNR (2003d)	http://www.dnr.state.md.us/bay/tribstrat/patapsco/pat_back.html
Patuxent Research Refuge, USFWS	http://www.fws.gov/patuxent/

Patuxent River Basin Overview, Patuxent River Tributary Strategies Team, MD DNR (2003c)	http://www.dnr.state.md.us/bay/tribstrat/patuxent/patuxent.html
Patuxent River Policy Plan, Patuxent River Commission 1997	http://www.mdp.state.md.us/info/patxattach/PPP-update-Q&A.pdf
Pickering Creek Audubon Center	http://www.pickeringcreek.org
Poplar Island Restoration project monitoring (water quality, fish, wildlife, SAV, ichthyoplankton, etc.), U.S. Army Corps of Engineers	http://www.nab.usace.army.mil/projects/Maryland/PoplarIsland
Potomac River Association	http://www.p-r-a.org
Potomac Riverkeeper	http://potomacriverkeeper.org
Potomac Watershed Partnership	http://potomacwatershed.net
Prince Georges County Stream Team	http://www.co.pg.md.us/government/agencyindex/der/ppd/ community/stream_teams.asp
Proceedings of the Marsh Bird Monitoring Workshop, USFWS, Ribic et al. (1999)	http://www.fws.gov
Project Owlnet, Adkins Arboretum	http://www.projectowlnet.org
Resident and Migratory Juvenile Finfish Recruitment Survey, Maryland DNR	http://www.fws.gov
Rivers of Life: Critical Watersheds for Protecting Freshwater Biodiversity, The Nature Conservancy, Master et al. (1998)	http://conserveonline.org/2000/11/a/en/ws2ks2.pdf
Ruffed Grouse Society	http://www.ruffedgrousesociety.org/
Scenic Rivers Land Trust	http://www.srlt.org/
Severn River Association	http://www.severnriver.org
South River Federation	http://www.southriverfederation.org
South Riverkeeper (monitoring river condition), South River Federation	http://www.geocities.com/RainForest/Wetlands/2002
Spatial Distribution and Dynamics of Breeding Bird Species and Communities in an Urban/Suburban Landscape (bird monitoring in Washington D.C. and suburban MD), USGS Patuxent Wildlife Research Center	http://www.usgs.gov
State of the Birds: USA 2004, Audubon, Butcher (2004)	http://www.audubon.org/bird/pdf/StateOfTheBirds.pdf
State of the Maryland Coastal Bays 2004	http://www.mdcoastalbays.org/
State of the Maryland Coastal Bays 2004, MD DNR (2004d)	http://www.dnr.state.md.us/coastalbays

Statewide Fisheries Survey And Management: Investigations of Largemouth Bass Populations Inhabiting Maryland's Tidal Waters, Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Status of the Bald Eagle in Maryland, Maryland DNR	http://www.dnr.state.md.us/wildlife/baldeagle.html
Stock Assessment of Selected Adult Resident and Migratory Finfish in Maryland's Chesapeake Bay, Maryland DNR	http://www.dnr.state.md.us/irc/lr.html
Stream water quality monitoring, Trout Unlimited	http://www.tu.org/site/pp.asp?c=7dJEKTNuFmG&b=275410
Striped Bass Monitoring and Research, Maryland DNR	http://www.dnr.state.md.us/fisheries/commercial/fmp.html
Submerged Aquatic Vegetation (SAV) Surveys, Virginia Institute of Marine Sciences	http://www.vims.edu/bio/sav/clamdredge
Surfrider Foundation	http://www.surfrider.org/
Survey, Inventory, and Management of Maryland's Coldwater Fishery Resource, Maryland DNR	http://www.dnr.state.md.us/streams/pubs/ea01-10_qaqc.pdf
Susquehanna River Fishery Investigations: Investigation of the Smallmouth Bass in the Susquehanna River Below Conowingo Dam, Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Tagging Studies and Stock Characterization of Summer Flounder in Maryland's Coastal Waters Near Ocean City, MD, Maryland DNR	http://www.dnr.state.md.us/sw_index_flash.asp
Teaming With Wildlife	http://www.teaming.com/
Terrestrial Ecoregions of North America: A Conservation Assessment, World Wildlife Fund, Ricketts et al. (1999)	http://www.worldwildlife.org/science/ecoregions/delineation.cfm
The American Bird Conservancy Guide to the 500 Most Important Bird Areas in the United States, American Bird Conservancy, Chipley et al. (2003)	http://www.findarticles.com/p/articles/mi_qa3793/is_200407/ai_n9456728
The Breton Bay Watershed Restoration Action Strategy, St. Mary's County and the Town of Leonardtown, Center for Watershed Protection and MD DNR (2003)	http://dnrweb.dnr.state.md.us/download/bays/brbay_char.pdf

The Global 200: Priority ecoregions for global conservation, World Wildlife Fund, Olson and Dinerstein 2002	http://www.worldwildlife.org/science/pubs/annals_of_missouri.pdf
The Magothy River Index (water quality, vital habitats), Magothy River Association	http://www.magothyriver.org
The Nature Conservancy	http://nature.org/wherewework/northamerica/states/maryland/
The State of the Chesapeake Bay and its Watershed	http://www.chesapeakebay.net/SOTB04/index.cfm
The State of the Chesapeake Bay and Its Watershed: A Report to the Citizens of the Bay Region, Chesapeake Bay Program (2004a)	http://www.dartmouth.edu/~kfv/waterqualitytradingdatabase.pdf
The State of the Streams: 1995-1997 Maryland Biological Stream Survey (MBSS) Results, MD DNR, Roth et al. (1999)	http://www.dnr.state.md.us/streams/pubs/ea-03-7_changes2002.pdf
The Western Branch Watershed Restoration Action Strategy – Prince George's County and the City of Bowie, MD, Prince George's County 2004	http://www.dnr.state.md.us/watersheds/surf/proj/wras.html
The Western Branch Watershed Restoration Action Strategy Plan – City of Bowie (2004)	http://dnrweb.dnr.state.md.us/download/bays/westbr_strategy_text.pdf
The Wildlife Society	http://www.wildlife.org/
Town of Ocean City	http://www.town.ocean-city.md.us/
Trout Unlimited	http://www.tu.org/index.asp
Trust for Public Land	http://www.tpl.org/
U.S. Army Corps of Engineers, Baltimore District	http://www.nab.usace.army.mil/
U.S. Army Environmental Center	http://aec.army.mil/usaec/
U.S. Dept. of Agriculture	http://www.usda.gov/wps/portal/usdahome
U.S. Fish & Wildlife Service (USFWS)	http://www.fws.gov
U.S. Forest Service	http://www.fs.fed.us/
U.S. Geological Survey	http://www.usgs.gov
University of Maryland Center for Environmental Science	http://www.umces.edu/
Upper Choptank River Strategic Watershed Restoration Action Plan delete, Caroline and Talbot County Departments of Planning et al. (2003)	http://www.dnr.state.md.us/watersheds/wras/docs/ucr/strat/ucr_strategy.pdf
Upper Eastern Shore Basin Overview, Upper Eastern Shore Tributary Strategies Team, MD DNR (2003i)	http://www.dnr.state.md.us/bay/tribstrat/upper_east/up_east_shore.html

Upper Patuxent River Watershed Restoration Action Strategy for Anne Arundel and Prince George's Counties, MD Anne Arundel and Prince George's Counties, Anne Arundel County (2004), Prince George's County (2003)	http://www.dnr.state.md.us/watersheds/surf/proj/upat_strategy.html
Upper Potomac River Basin Overview, Upper Potomac River Tributary Strategies Team, MD DNR (2003k)	http://www.dnr.state.md.us/bay/tribstrat/upper_pot/upper_pot.html
Upper Western Shore Basin Overview, Upper Western Shore Tributary Strategies Team, MD DNR (2003j)	http://www.dnr.state.md.us/bay/tribstrat/upper_west/up_west_shore.html
USGS Patuxent Wildlife Research Center	http://www.pwrc.usgs.gov/
USGS-NPS Vegetation Mapping Program (at Assateague Island National Seashore), USGS, National Park Service	http://biology.usgs.gov/npsveg/index.html
Virginia Dept. of Game and Inland Fisheries	http://www.dgif.state.va.us/
Virginia Institute of Marine Sciences	http://www.vims.edu/
Water Quality Monitoring (Potomac River), Potomac Riverkeeper	http://www.potomacriverkeeper.org
Watershed Restoration Action Strategies Program	http://www.dnr.state.md.us/watersheds/wras/
West Nile Virus Surveillance, USGS, MD Dept. of Health and Mental Hygiene	http://westnilevirus.nbii.gov/states/maryland.html
Wild Turkey and Upland Game Bird Program (turkey, ruffed grouse, bobwhite quail, ring-necked pheasants populations), Maryland DNR	http://www.dnr.state.md.us/wildlife/gpar/gpupland.asp
Worcester County	http://www.co.worcester.md.us/
World Wildlife Fund	http://www.worldwildlife.org/index.cfm

Table 1A.2. Numerous species-focused conservation/management plans and articles in the technical literature were compiled, analyzed and hereby incorporated by reference into this WDCP plan. Each of these plans addresses the full array of wildlife found in Maryland, providing information on life history, abundance and status, distribution, threats and problems, conservation actions, monitoring, and research needs. Full citations are listed in the references.

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Interstate Fishery Management Plan for American Lobster	ASMFC (1997)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Atlantic Sturgeon	ASMFC (1998a)	X	X	X	X	X	X	X
Fishery Management Plan for Inshore Stocks of Winter Flounder	ASMFC (1998b)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Horseshoe Crab	ASMFC (1998b)	X	X	X	X	X	X	X
Atlantic Herring Fishery Management Plan	ASMFC (1999a)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Shad and River Herring	ASMFC (1999b)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for American Eel	ASMFC (2000)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Atlantic Menhaden	ASMFC (2001)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Spiny Dogfish	ASMFC (2002a)	X	X	X	X	X	X	X
Fishery Management Plan for Tautog	ASMFC (2002b)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Weakfish	ASMFC (2002c)	X	X	X	X	X	X	X
Interstate Fishery Management Plan for Red Drum	ASMFC (2002d)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Interstate Fishery Management Plan for Atlantic Striped Bass	ASMFC (2003)	X	X	X	X	X	X	X
Diamondback Terrapin Project (sightings, tag/release; Assateague Is.)	Assateague Coastal Trust		X	X	X	X	X	X
Atlantic Coast Joint Venture Strategic Plan	Atlantic Coast Joint Venture, ACJV (2004)		X	X	X	X	X	X
North American Waterfowl Management Plan 2004. Strategic Guidance: Strengthening the Biological Foundation	U.S. Fish and Wildlife Service, North American Waterfowl Management Plan, Plan Committee (ACJV 2004)	X	X	X	X	X	X	X
Chesapeake Bay Alosid (Shad and Herring) Management Plan	Chesapeake Bay Program (1989a)	X	X	X	X	X	X	X
Chesapeake Bay Striped Bass Management Plan	Chesapeake Bay Program (1989b)	X	X	X	X	X	X	X
Chesapeake Bay Weakfish and Spotted Seatrout Management Plan	Chesapeake Bay Program (1990a)	X	X	X	X	X	X	X
Chesapeake Bay Waterfowl Policy and Management Plan	Chesapeake Bay Program (1990b)	X	X	X	X	X	X	X
Chesapeake Bay Atlantic Croaker and Spot Management Plan	Chesapeake Bay Program (1991a)	X	X	X	X	X	X	X
Chesapeake Bay Summer Flounder Fishery Management Plan	Chesapeake Bay Program (1991b)	X	X	X	X	X	X	X
Chesapeake Bay Red Drum Management Plan	Chesapeake Bay Program (1993a)	X	X	X	X	X	X	X
Chesapeake Bay Black Drum Management Plan	Chesapeake Bay Program (1993b)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Chesapeake Bay and Atlantic Coast King and Spanish Mackerel Fishery Management Plan	Chesapeake Bay Program (1994a)	X	X	X	X	X	X	X
Aquatic Reef Habitat Management Plan	Chesapeake Bay Program (1994b)		X	X	X	X	X	X
Chesapeake Bay and Atlantic Coast Black Sea Bass Management Plan	Chesapeake Bay Program (1996a)	X	X	X	X	X	X	X
Chesapeake Bay Blue Crab Fishery Management Plan	Chesapeake Bay Program (1997)	X	X	X	X	X	X	X
Tautog Fishery Management Plan	Chesapeake Bay Program (1998)	X	X	X	X	X	X	X
Chesapeake Bay Oyster Management Plan	Chesapeake Bay Program (2004b)	X	X	X	X	X	X	X
American Eel Fishery Management Plan	Chesapeake Bay Program, (1987)	X	X	X	X	X	X	X
Chesapeake Bay and Atlantic Coast Horseshoe Crab Fishery Management Plan	Chesapeake Bay Program, Butowski (1994)	X	X	X	X	X	X	X
Ducks Unlimited's conservation plan: Meeting the annual life cycle needs of North America's waterfowl	Ducks Unlimited (2001)	X	X	X	X	X	X	X
Reptiles in Decline: The Global Decline of Reptiles, Déjà Vu Amphibians	Gibbons et al. (2000)	X	X	X	X	X	X	X
Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan	MAFMC (1983)	X	X	X	X	X	X	X
Bluefish Fishery Management Plan	MAFMC (1984)	X	X	X	X	X	X	X
Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan	MAFMC (1988)	X	X	X	X	X	X	X
Monkfish Fishery Management Plan	MAFMC (1999)	X	X	X	X	X	X	X
Tilefish Fishery Management Plan	MAFMC (2000)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Spiny Dogfish Fishery Management Plan	MAFMC and NEFMC (1999)	X	X	X	X	X	X	X
United States Shorebird Conservation Plan	Manomet Center for Conservation Sciences, Brown et al. (2001)	X	X	X	X	X	X	X
Mosquito Control Program (wildlife disease monitoring)	Maryland Dept. of Agriculture	X	X	X	X	X	X	X
Forest Pest Management program (Asian longhorned beetle, gypsy moth, et al.)	Maryland Dept. of Agriculture	X	X	X	X	X	X	X
Plant Protection and Weed Management program (noxious weeds, plant pests, ginseng, sudden oak death)	Maryland Dept. of Agriculture	X	X	X	X	X	X	X
American and Hickory Shad Restoration in Three MD Rivers	Maryland DNR (CBP 1989a)	X	X	X	X	X	X	X
Fall and Winter (Fish) Stock Assessment	Maryland DNR (unpubl. rep.)	X	X	X	X	X	X	X
Striped Bass Monitoring and Research (fishing mortality, spawning stocks, juveniles, hatchery introductions, tag recovery, abundance and distribution, contaminants)	Maryland DNR (CBP 1989b)	X	X	X	X	X	X	X
Survey, Inventory, and Management of Maryland's Coldwater Fishery Resource (for 11 streams, 10 river basins)	Maryland DNR (unpubl. rep.)	X	X	X	X	X	X	X
Upper Chesapeake Bay Largemouth Bass Management Program	Maryland DNR (unpubl. rep.)	X	X	X	X	X	X	X
Deer Management Program (population status and trends, white-tailed and sika deer)	Maryland DNR (1998)	X	X	X	X	X	X	X
Black Bear Management Program (population	Maryland DNR (2004a)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
status and trends, mortality, radio telemetry, public opinion)								
Furbearer Management Program (furbearer species)	Maryland DNR (unpubl. rep.)	X	X	X	X	X	X	X
Marine Mammal and Sea Turtle Stranding Response program	Maryland DNR, Litwiler (2001)	X	X	X	X	X	X	X
The Distribution and Status of the Hellbender in Maryland [FWRS 1979, 1983]	Maryland DNR (unpubl. rep.)	X	X	X	X	X	X	X
Eastern Tiger Salamander Study (distribution, population status) [FWRS 1979]	Maryland DNR (unpubl. rep.)	X	X	X	X	X	X	X
Charting the course for deer management in Maryland: A management plan for white-tailed deer in Maryland	MD DNR (1998)	X	X	X	X	X	X	X
Black bear management plan 2004 - 2013	MD DNR (2004a)	X	X	X	X	X	X	X
Maryland Coastal and Estuarine Land Conservation Plan (DRAFT)	MD DNR, Burke et al. (2004)				X	X	X	X
Conservation Plan for Sea Turtles, Marine Mammals, and the Shortnose Sturgeon in Maryland	MD DNR, Litwiler (2001)	X	X	X	X	X	X	X
Maryland's Green Infrastructure Assessment: A Comprehensive Strategy for Land Conservation and Restoration	MD DNR, Weber (2003)		X	X	X	X	X	X
Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States	Metropolitan Conservation Alliance, Calhoun and Klemens (2002)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Atlantic Surfclam and Ocean Quahog Fishery Management Plan	Mid-Atlantic Fishery Management Council (MAFMC 1977)	X	X	X	X	X	X	X
Recovery Plan for the Humpback Whale *(Megaptera novaeangliae)*	National Marine Fisheries Service (NMFS 1991a)	X	X	X	X	X	X	X
Piping Plover Breeding Biology, Foraging Ecology and Behavior on Assateague Island NS	National Park Service (Kumer 2004)	X	X	X	X	X	X	X
Recovery Plan for the Northern Right Whale *(Eubalaena glacialis)*	NMFS (1991b)	X	X	X	X	X	X	X
Recovery plan for the blue whale *(Balaenoptera musculus)*	NMFS (1998a)	X	X	X	X	X	X	X
Recovery Plan for the Shortnose Sturgeon *(Acipenser brevirostrum)*	NMFS (1998b)	X	X	X	X	X	X	X
Draft Recovery Plan for the Fin Whale *(Balaenoptera Physalus)* and Sei Whale *(Balaenoptera Borealis)*	NMFS (1998c)	X	X	X	X	X	X	X
Final Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks	NMFS (2003a)	X	X	X	X	X	X	X
Recovery Plan for the North Atlantic Right Whale *(Eubalaena glacialis)* - DRAFT Revision	NMFS (2003b)	X	X	X	X	X	X	X
Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks	NMFS (2003c)	X	X	X	X	X	X	X
Recovery Plan for U.S. Population of Atlantic	NMFS and USFWS (1991a)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Green Turtle								
Recovery Plan for U.S. Population of Loggerhead Turtle	NMFS and USFWS (1991b)	X	X	X	X	X	X	X
Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico	NMFS and USFWS (1992a)	X	X	X	X	X	X	X
Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico	NMFS and USFWS (1993)	X	X	X	X	X	X	X
Guidelines for the Conservation and Restoration of Seagrasses in the United States and Adjacent Water	NOAA, Fonseca et al. (1998)	X	X	X	X	X	X	X
North American Bird Conservation Initiative Strategic Plan	North American Bird Conservation Initiative (1999)	X	X	X	X	X	X	X
North American grouse management plan – DRAFT	North American Grouse Partnership (2004)	X	X	X	X	X	X	X
Northern Atlantic Regional Shorebird Plan	Northern Atlantic Shorebird Habitat Working Group, Clark and Niles (2000)	X	X	X	X	X	X	X
PARC Habitat Management Guidelines: a National Update and Regional Status Report	PARC (2004)	X	X	X	X	X	X	X
Conserving Amphibians and Reptiles in the New Millennium	PARC, Gibbons and Stangel (1999)	X	X	X	X	X	X	X
Partners in Flight Landbird Conservation Plan: Physiographic Area 10: Mid-Atlantic Piedmont	Partners in Flight, Kearney (2003)	X	X	X	X	X	X	X
Partners in Flight North American Landbird	Partners in Flight, Rich et al.	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Conservation Plan	(2004)							
Partners In Flight Landbird Conservation Plan, Physiographic Area 12: Mid-Atlantic Ridge and Valley	Partners in Flight, Rosenberg (2003)	X	X	X	X	X	X	X
Partners In Flight Continental Priorities and Objectives Defined at the State and Bird Conservation Region Levels: Maryland	Partners in Flight, Rosenberg (2004)	X	X	X	X	X	X	X
Partners In Flight Landbird Conservation Plan, Physiographic Area 44: Mid-Atlantic Coastal Plain	Partners in Flight, Watts (1999)	X	X	X	X	X	X	X
The South Atlantic Migratory Bird Initiative Implementation Plan: An Integrated Approach to Conservation of "All Birds Across All Habitats" DRAFT	SAMBI, Watson and McWilliams (2004)	X	X	X	X	X	X	X
The Northern Bobwhite Conservation Initiative	Southeastern Association of Fish and Wildlife Agencies, Dimmick et al. (2002)	X	X	X	X	X	X	X
Priorities for Conservation: 1996 Annual Report Card for U.S. Plant and Animal Species	The Nature Conservancy (1996)	X	X	X	X	X	X	X
Lower New England – Northern Piedmont Ecoregional Conservation Plan	The Nature Conservancy, Barbour et al. (2003)		X	X	X	X	X	X
Chesapeake Bay Lowlands Ecoregional Conservation Plan	The Nature Conservancy, Samson et al. (2003)	X	X	X	X	X	X	X
The North American Bird Conservation Initiative in the United States: A Vision of	U.S. North American Bird Conservation Initiative	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
American Bird Conservation	Committee (2000)							
Bog Turtle *(Clemmys muhlenbergii),* Northern Population, Recovery Plan	USFWS (2001	X	X	X	X	X	X	X
Eastern Cougar *(Puma concolor)* Recovery Plan	USFWS (1982a)	X	X	X	X	X	X	X
Revised Maryland Darter *(Etheostoma sellare)* Recovery Plan	USFWS (1985)	X	X	X	X	X	X	X
Dwarf Wedge Mussel *(Alasmidonta heterodon)* Recovery Plan	USFWS (1993a)	X	X	X	X	X	X	X
Puritan Tiger Beetle *(Cicindela puritana G. Horn)* Recovery Plan	USFWS (1993b)	X	X	X	X	X	X	X
Delmarva Fox Squirrel *(Sciurus niger cinereus)* Recovery Plan	USFWS (1993c)	X	X	X	X	X	X	X
Northeastern Beach Tiger Beetle *(Cicindela Dorsalis Dorsalis Say)* Recovery Plan	USFWS (1994)	X	X	X	X	X	X	X
American Woodcock Management Plan	USFWS (1996a)	X	X	X	X	X	X	X
Piping Plover *(Charadrius melodus),* Atlantic Coast Population, Revised Recovery Plan	USFWS (1996b)	X	X	X	X	X	X	X
Agency Draft Indiana Bat *(Myotis sodalis)* Revised Recovery Plan	USFWS (1999b)	X	X	X	X	X	X	X
A Blueprint for the Future of Migratory Birds - Draft Strategic Plan	USFWS (2003a)	X	X	X	X	X	X	X
Recovery plan for the red-cockaded woodpecker *(Picoides borealis)*	USFWS (2003b)	X	X	X	X	X	X	X
Recovery Plan for the Kemp's Ridley Sea Turtle *(Lepidochelys kempii)*	NMFS and USFWS (1992b)	X	X	X	X	X	X	X

Title	Author/Source	Life History	Abundance and Status	Distribution	Threats	Conservation Actions	Monitoring	Research Needs
Southeastern Coastal Plains and Caribbean Regional Shorebird Plan	USFWS, Hunter (2003)	X	X	X	X	X	X	X
Expanding the Vision: 1998 Update, North American Waterfowl Management Plan	USFWS, SEMARNAP Mexico, and Canadian Wildlife Service, USFWS (1999a)	X	X	X	X	X	X	X
Canvasback population, mortality and life history in Chesapeake Bay	USGS Patuxent Wildlife Research Center (unpubl. rep.)	X	X	X	X			
Waterbird Conservation for the Americas: The North America Waterbird Conservation Plan	Waterbird Conservation for the Americas, Kushlan et al. (2002)	X	X	X	X	X	X	X
Shorebird Management Manual	Western Hemisphere Shorebird Reserve Network, Helmers (1992)	X	X	X	X	X	X	X

Appendix 1b. Compilation of Threats

This appendix lists the threats identified from a review of existing, relevant local, state, regional, national and international conservation plans (Appendix 1a) compiled for this WDCP effort. The table identifies detailed threats to Maryland's watersheds (listed in alphabetical order), and the matrices represent the final condensation of a compilation that was then used as a foundation from which the MD DNR and its partners began the development of conservation actions to address these threats. The matrices lists the existing threats and the categories of key wildlife habitats to which they apply for each broad habitat groupings – Forested, Non-Forested, Wetland, and Marine.

Threats to Maryland Watersheds

Watershed: **Aberdeen Proving Ground** 02130705

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	4	2	5	5	1	4	3

Habitat Alteration	Channelization	2	2	3	3	2	1	1
Habitat Alteration	Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration	Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration	Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration	Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration	Sedimentation	1	3	3	4	3	1	1
Habitat Alteration	Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration	Wetland Loss	1	3	3	4	2	1	1
Non-natives	Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives	Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Anacostia River** 02140205

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	5	3	3	4	3	2	4
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	4	3	3	4	2	2	3
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Antietam Creek** 02140502

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Assawoman Bay** 02130102

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Atkisson Reservoir** 02130703

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Back Creek** 02130604

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Back River** 02130901

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	5	3	3	4	2	2	4
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Baltimore Harbor** 02130903

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	5	3	3	4	3	2	4
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	5	3	3	4	2	2	4
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Big Annemessex River** 02130207

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Big Elk Creek** 02130606

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Bird River** 02130803

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Bodkin Creek** 02130902

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Bohemia River** 02130602

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Breton Bay** 02140104

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Brighton Dam** 02131108

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Broad Creek** 02120205

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Bush River** 02130701

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Bynum Run** 02130704

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Cabin John Creek** 02140207

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	4	3	3	4	2	2	3
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Casselman River** 05020204

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	4	1	5	5	1	4	3
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Catoctin Creek** 02140305

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	5	3	3	4	3	2	4
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Chincoteague Bay** 02130106

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	1	2	2	3	2	1	1

Watershed: **Christina River** 02130607

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	0	3	3	4	2	0	0
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Conewago Creek** 02050301

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Conococheague Creek** 02140504

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Conowingo Dam Susq R** 02120204

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Corsica River** 02130507

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Deep Creek Lake** 05020203

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	4	1	5	5	1	4	3
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Deer Creek** 02120202

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Dividing Creek** 02130204

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Double Pipe Creek** 02140304

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Eastern Bay** 02130501

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Evitts Creek** 02141002

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Fifteen Mile Creek** 02140511

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	5	3	3	4	3	2	4
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Fishing Bay** 02130307

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Furnace Bay** 02130609

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Georges Creek** 02141004

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	4	1	5	5	1	4	3
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Gilbert Swamp** 02140107

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Gunpowder River** 02130801

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Gwynns Falls** 02130905

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	5	3	3	4	2	2	4
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Honga River** 02130401

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Isle of Wight Bay** 02130103

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	1	2	2	3	2	1	1

Watershed: **Jones Falls** 02130904

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	5	3	3	4	2	2	4
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Kent Island Bay** 02130511

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Kent Narrows** 02130504

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **L Susquehanna River** 02120201

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Langford Creek** 02130506

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Liberty Reservoir** 02130907

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	5	3	3	4	3	2	4
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Licking Creek** 02140506

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Little Choptank** 02130402

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	5	3	3	4	2	2	4
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Little Conococheague** 02140505

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Little Elk Creek** 02130605

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Little Gunpowder Falls** 02130804

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Little Patuxent River** 02131105

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	3	2	2	3	3	1	2
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Little Tonoloway Creek** 02140509

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Little Youghiogheny R** 05020202

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Loch Raven Reservoir** 02130805

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Lower Chester River** 02130505

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	3	2	2	3	3	1	2
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	5	3	2	3	2	2	3
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Lower Choptank** 02130403

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Lower Elk River** 02130601

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Lower Gunpowder Falls** 02130802

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Lower Monocacy River** 02140302

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Lower Pocomoke River** 02130202

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	4	2	5	5	1	4	3
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Lower Wicomico River** 02130301

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	3	2	2	3	3	1	2
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Lower Winters Run** 02130702

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	3	2	2	3	3	1	2
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Magothy River** 02131001

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Manokin River** 02130208

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	1	2	2	3	2	1	1

Watershed: **Marsh Run** 02140503

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Marshyhope Creek** 02130306

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Mattawoman Creek** 02140111

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Middle Chester River** 02130509

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Middle Patuxent River** 02131106

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Middle River - Browns** 02130807

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	4	3	3	4	2	2	3
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Miles River** 02130502

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	5	3	3	4	2	2	4
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	1	2	2	3	2	1	1

Watershed: **Monie Bay** 02130302

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Nanjemoy Creek** 02140110

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Nanticoke River** 02130305

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Nassawango Creek** 02130205

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Newport Bay** 02130105

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Northeast River** 02130608

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Octoraro Creek** 02120203

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Oxon Creek** 02140204

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	5	3	3	4	2	2	4
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	1	2	2	3	2	1	1

Watershed: **Patapsco River L N Br** 02130906

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Patuxent River lower** 02131101

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Patuxent River middle** 02131102

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Patuxent River upper** 02131104

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Piscataway Creek** 02140203

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Pocomoke Sound** 02130201

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Port Tobacco River** 02140109

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Potomac River AL Cnty** 02140508

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Potomac River FR Cnty** 02140301

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Potomac River L N Branch** 02141001

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	1	1	5	5	1	2	1
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Potomac River L tidal** 02140101

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	4	2	5	5	1	4	3
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Potomac River M tidal** 02140102

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	4	2	5	5	1	4	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Potomac River MO Cnty** 02140202

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Potomac River U N Branch** 02141005

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	4	1	5	5	1	4	3
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Potomac River U tidal** 02140201

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Potomac River WA Cnty** 02140501

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Prettyboy Reservoir** 02130806

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Rock Creek** 02140206

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	4	3	3	4	2	2	3
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Rocky Gorge Dam** 02131107

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **S Branch Patapsco** 02130908

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Sassafras River** 02130610

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Savage River** 02141006

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	1	1	5	5	1	2	1
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	5	3	3	4	3	2	4
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Seneca Creek** 02140208

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Severn River** 02131002

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Sideling Hill Creek** 02140510

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	5	2	2	3	2	2	3

Watershed: **Sinepuxent Bay** 02130104

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	5	3	3	4	2	2	4
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **South River** 02131003

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	3	2	2	3	3	1	2
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Southeast Creek** 02130508

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **St. Clements Bay** 02140105

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **St. Mary's River** 02140103

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	4	3	4	2	3	1	4
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Stillpond-Fairlee** 02130611

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Swan Creek** 02130706

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	2	3	2	3	3	1	1
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	3	2	2	3	3	1	2
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Tangier Sound** 02130206

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	2	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Tonoloway Creek** 02140507

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	3	4	4	5	1	4	2
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	0	2	2	3	2	0	0

Watershed: **Town Creek** 02140512

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	2	3	2	3	4	1	2
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	4	3	4	2	3	1	4
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Transquaking River** 02130308

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Tuckahoe Creek** 02130405

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Upper Chester River** 02130510

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	3	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	3	2	3	3	2	1	2
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Upper Choptank** 02130404

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	4	2	2	2	3	1	3
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Upper Elk River** 02130603

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	3	3	3	4	3	1	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Upper Monocacy River** 02140303

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	3	3	2	3	3	1	2
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	4	3	3	4	3	2	3
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Upper Pocomoke River** 02130203

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	5	3	2	3	3	2	4
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	5	2	2	3	3	2	4
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	5	2	3	3	2	2	4
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	4	3	3	4	2	2	3
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	5	3	3	4	2	2	4
Non-natives		Invasive plants (riparian)	2	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **West Chesapeake Bay** 02131005

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	4	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	2	3	3	4	3	1	2
Habitat Alteration		Surface water withdrawal	5	2	2	2	3	1	4
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **West River** 02131004

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	3	3	4	2	3	1	3
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	0	2	3	3	2	0	0
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	4	2	3	3	2	2	3
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Western Branch** 02131103

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	1	2	4	4	2	1	1
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	4	3	2	3	2	2	2
Habitat Alteration		Ground Water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Migration Barriers	5	2	3	3	2	2	4
Habitat Alteration		Runoff/ baseflow/ down cutting	3	3	3	4	2	2	2
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Wicomico Creek** 02130303

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	0	3	2	3	3	0	0
Chemical	Non-point Source	Excess Phosphorus	0	3	2	3	4	0	0
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	5	2	5	5	1	5	4
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	0	3	2	3	2	0	0
Non-natives		Non-native species (aquatic)	1	2	2	3	2	1	1

Watershed: **Wicomico River** 02140106

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	4	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	0	2	3	3	3	0	0
Chemical	Point Source	Pathogens/ Endocrine disruptors	1	3	4	2	3	1	1
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	2	2	5	5	1	3	2
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	5	3	3	4	3	2	4
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	3	3	3	4	2	2	2
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Wicomico River Head** 02130304

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	3	2	4	4	2	2	3
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	1	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	5	2	3	3	3	2	4
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	4	4	4	5	1	4	3
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	3	3	2	3	2	1	2
Habitat Alteration		Ground Water withdrawal	3	2	2	2	3	1	2
Habitat Alteration		Migration Barriers	3	2	3	3	2	1	2
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	4	3	2	3	2	2	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Wills Creek** 02141003

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	2	2	4	4	2	1	2
Chemical	Non-point Source	Acid Mine Drainage	2	1	5	5	1	2	2
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	3	3	3	4	3	1	3
Chemical	Point Source	Agricultural Pesticides	0	2	2	3	3	0	0
Chemical	Point Source	Dissolved Oxygen	0	3	4	2	3	0	0
Chemical	Point Source	Industrial (NPDES)	3	2	3	3	3	1	3
Chemical	Point Source	Pathogens/ Endocrine disruptors	3	3	4	2	3	1	3
Future Changes		Land Conversion	1	4	4	5	1	2	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	4	2	3	3	2	2	3
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	4	2	2	3	2	2	2

Watershed: **Wye River** 02130503

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	0	2	4	4	2	0	0
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	4	3	2	3	3	1	3
Chemical	Non-point Source	Excess Phosphorus	5	3	2	3	4	1	4
Chemical	Non-point Source	Mercury Deposition	2	3	2	4	2	1	1
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	4	2	2	3	3	1	3
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	3	2	5	5	1	3	3
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	5	3	2	3	2	2	3
Habitat Alteration		Ground Water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	4	3	3	4	3	2	3
Habitat Alteration		Surface water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Wetland Loss	4	3	3	4	2	2	3
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	2	2	2	3	2	1	1

Watershed: **Youghiogheny River** 05020201

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	1	1	5	5	1	2	1
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	1	3	2	3	4	0	1
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	2	3	3	4	3	1	2
Chemical	Point Source	Agricultural Pesticides	2	2	2	3	3	1	1
Chemical	Point Source	Dissolved Oxygen	1	3	4	2	3	1	1
Chemical	Point Source	Industrial (NPDES)	2	2	3	3	3	1	2
Chemical	Point Source	Pathogens/ Endocrine disruptors	2	3	4	2	3	1	2
Future Changes		Land Conversion	2	4	4	5	1	3	1
Future Changes		Sea Level Rise	0	2	5	5	1	1	0
Habitat Alteration		Channelization	1	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	1	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	2	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	1	3	3	4	3	1	1
Habitat Alteration		Surface water withdrawal	2	2	2	2	3	1	1
Habitat Alteration		Wetland Loss	1	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	1	3	2	3	2	1	1
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Watershed: **Zekiah Swamp** 02140108

Category	Subcategory	Name	Extent	Trend	Severity	Persistence	Reversibility	Prevention	Restoration
Chemical	Non-point Source	Acid deposition/ Low pH	5	2	4	4	2	2	4
Chemical	Non-point Source	Acid Mine Drainage	0	1	5	5	1	1	0
Chemical	Non-point Source	Excess Nitrates	1	3	2	3	3	0	1
Chemical	Non-point Source	Excess Phosphorus	4	3	2	3	4	1	3
Chemical	Non-point Source	Mercury Deposition	4	3	2	4	2	2	2
Chemical	Non-point Source	Organic Matter Retention	1	3	3	4	3	1	1
Chemical	Point Source	Agricultural Pesticides	1	2	2	3	3	0	1
Chemical	Point Source	Dissolved Oxygen	2	3	4	2	3	1	2
Chemical	Point Source	Industrial (NPDES)	1	2	3	3	3	0	1
Chemical	Point Source	Pathogens/ Endocrine disruptors	5	3	4	2	3	1	5
Future Changes		Land Conversion	5	4	4	5	1	5	4
Future Changes		Sea Level Rise	1	2	5	5	1	2	1
Habitat Alteration		Channelization	2	2	3	3	2	1	1
Habitat Alteration		Forest Fragmentation	2	3	2	3	2	1	1
Habitat Alteration		Ground Water withdrawal	1	2	2	2	3	0	1
Habitat Alteration		Migration Barriers	1	2	3	3	2	1	1
Habitat Alteration		Runoff/ baseflow/ down cutting	1	3	3	4	2	1	1
Habitat Alteration		Sedimentation	0	3	3	4	3	0	0
Habitat Alteration		Surface water withdrawal	0	2	2	2	3	0	0
Habitat Alteration		Wetland Loss	2	3	3	4	2	1	1
Non-natives		Invasive plants (riparian)	3	3	2	3	2	1	2
Non-natives		Non-native species (aquatic)	3	2	2	3	2	1	2

Legend for previous table

EXTENT (0-5) Based on the estimated percentage of stream miles or, in some cases, area in the watershed that are affected
0 = None or negligible
1 = 1-10%
2 = 11-20%
3 = 21-30%
4 = 31- 60%
5 = 61-100%

TREND (1-5) Based on the projected rate of change and immediacy of the impact
0 = Threat extent deceasing over time, either due to human intervention or natural rejuvenation
1 = Threat extent unchanging
2 = Threat slowly getting worse; up to 0.25% change per year
3 = Threat extent is getting worse; up to 0.5% change per year
4 = Threat extent is steadily growing, up to 2% change per year
5 = Threat extent is rapidly growing, 2 or more percent per year

SEVERITY (0-5) Based on the estimated or known impact to aquatic ecosystems.
0 = No impact likely
1 = Mild
2 = Moderate; degradation of some forms of biological function; detectable shift in community structure & species loss
3 = Serious; significant loss of biological function, communities often dominated by tolerant generalists &/or richness declines
4 = Very serious; heavy loss of biological function; only tolerant species remain
5 = Catastrophic; near-total loss of biological function in affected areas

PERSISTANCE (1-5) Based on duration of impact
0 = Recovery nearly immediate
1 = Short duration, substantial recovery possible in less than 1 year
2 = Moderate duration, substantial recovery possible within 5 years
3 = Long duration, substantial recovery possible within 5-50 years with human remediation
4 = Extreme duration, substantial recovery not likely for 50 to 100s of years, even with intensive human intervention
5 = Essentially permanent environmental feature lasting hundreds of years, even with intensive human intervention

PREVENTION RANK

((TREND + SEVERITY + PERSISTENCE) X EXTENT / REVERSABILITY) + EXTENT = PREVENTION RANK

Critical (5). Will almost certainly result in widespread, complete loss of GCN habitat and/or populations within the watershed. Action is imperative.

Serious (4). Will result in widespread and severe degradation of GCN habitat and/or reduction in populations within the watershed. Action is highly important.

Moderate (3). Will contribute to degradation of GCN habitat and/or decline in GCN population levels. Action should be taken.

Low (2). Evidence indicates that without action, a long-term decline in GCN habitat and/or population levels is probable due to the cumulative effect of this and other threats. A plan for long-term action to eliminate or reduce this threat should be considered to ensure sustainability of GCN habitat/populations.

Slight (1). Evidence indicates that some long-term decline in GCN habitat/populations is possible. Better monitoring of this threat should be considered.

None (0). Available information in this watershed indicates little or no need for action.

RESTORATION RANK

(REVERSABILITY + SEVERITY) = RESTORATION RANK

Critical (5). Will almost certainly result in widespread, complete loss of GCN habitat and/or populations within the watershed. Action is imperative.

Serious (4). Will result in widespread and severe degradation of GCN habitat and/or reduction in populations within the watershed. Action is highly important.

Moderate (3). Will contribute to degradation of GCN habitat and/or decline in GCN population levels. Action should be taken.

Low (2). Evidence indicates that without action, a long-term decline in GCN habitat and/or population levels is probable due to the cumulative effect of this and other threats. A plan for long-term action to eliminate or reduce this threat should be considered to ensure sustainability of GCN habitat/populations.

Slight (1). Evidence indicates that some long-term decline in GCN habitat/populations is possible. Better monitoring of this threat should be considered.

None (0). Available information in this watershed indicates little or no need for action.

Threat Descriptions for **Forested Habitats**	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forest	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood Forests	Floodplain forests
Development, including roads, impoundments and conversion to other land uses, that results in habitat loss and/or fragmentation and isolation of local populations	X		X	X	X	X	X	X
Pesticide use and contamination that directly or indirectly affects GCN species, such as non-target impacts of gypsy moth and mosquito control on GCN	X		X	X	X	X	X	X
Lack of scientific understanding of appropriate habitat requirements and management for all GCN species	X	X	X	X	X	X	X	X
Inappropriate forestry practices that result in habitat degradation, imbalanced vegetation structure and species composition, or conversion to less diverse pine plantations or other habitat types	X		X	X	X	X	X	X
Deer overbrowsing that results in loss of forest structural diversity	X			X	X	X	X	X
Invasive species that result in habitat loss or degradation	X	X		X		X		X
Windpower development on ridgetops that results in habitat loss						X	X	
Exclusion or alteration of natural fire regimes that results in habitat loss or conversion	X					X		
Human use and/or disturbance, including ATV use, that results in habitat degradation	X		X					
Sudden oak death causing loss of oak component in forest structure					X	X		
Hemlock wooly adelgid causing loss of spruce and hemlock forest components							X	

Threat Descriptions for **Forested Habitats**	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forest	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood Forests	Floodplain forests
Pest species invasion, such as southern pine bark beetle and gypsy moth, that may have landscape level effects				X				
Inappropriate agricultural practices such as ditching and channelization, livestock grazing, inadequate buffers, and pond construction that result in habitat degradation								X
Reduced water quality and hydrological changes resulting from development and roads								X
Encroachment by woody vegetation or buffer planting on riverine prairies and rare herbaceous species								X
Acid mine drainage								X
Groundwater withdrawal for residential, commercial, and agricultural use								X
Removal of beaver populations								X
Disturbance of sensitive species, especially during the breeding season						X		
Disturbance of sensitive barrens habitat				X				
Lack of disturbance of natural processes that results in loss or conversion of early successional conditions		X						
Non-native species, including feral horses on Assateague Island, that cause habitat degredation			X					
Acid precipitation	X				X		X	
Sea-level rise			X					

Threat Descriptions for **Non-Forested Terrestrial Habitats**	Grasslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Development, including housing and commercial, road construction and salt application, and conversion to other land uses that results in habitat loss, degradation, and/or fragmentation	X	X	X	X	X
Inappropriate agricultural practices, including overgrazing, that result in habitat loss or degradation	X			X	
Inappropriate forestry practices, including reforestation or timber harvest, that result in habitat loss, fragmentation or degradation	X		X	X	
Human disturbance, including boating and ORV, that results in habitat degradation	X	X	X		X
Pesticide use and contamination that directly or indirectly affects GCN species, such as gypsy moth suppression	X	X			
Altered natural fire regimes that results in habitat loss or conversion	X	X			
Lack of disturbance of natural processes that results in loss or conversion of early successional conditions	X	X			
Invasive and non-native species that results in habitat loss or degradation	X	X	X		X
Lack of scientific understanding of appropriate habitat requirements and management for all GCN species	X	X	X	X	X
Inappropriate resource utilization from mining and wind farms that results in habitat degradation		X	X	X	
Deer overbrowsing that results in loss of forest structural diversity		X			
Inappropriate shore erosion control			X		X
Pollution of groundwater from pesticides, such as dimlin, toxins, and nutrient overload				X	
Hydrologic disturbances, siltation, groundwater flow alternation, and disturbances of recharge areas affecting water flow or quality				X	
Vegetation removal at upwellings resulting in loss of allochthonous input				X	

Threat Descriptions for **Non-Forested Terrestrial Habitats**	Grasslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Spelunker disturbances to caves and mines resulting in compaction of littoral zone				X	
Sea-level rise, climate change and shoreline erosion resulting in modification of natural processes					X
Sedimentation that results in habitat degradation					X
Oil spills that result in habitat degradation and direct GCN species impact					X

Threat Descriptions for **Wetland Habitats**	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Development, including residential development, roads, impervious surfaces, urbanization, conversion to other land uses, surface mining, coal mining (deep mines and strip mines), peat mining, that results in habitat loss and/or fragmentation	X	X	X	X		X	X	X	

Threat Descriptions for **Wetland Habitats**	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Inappropriate management practices, including draining, filling, burning, impounding, artifical control of water levels, lack of beaver impoundments, inadequate buffers, that results in habitat loss, degradation and/or fragmentation	X	X	X	X	X	X	X	X	X
Inappropriate timber harvesting, including logging that results in habitat degradation	X		X	X		X	X		
Inappropriate agricultural practices, including livestock overgrazing, ditching, channelization, pond construction, inadequate buffers and conversion to agricultural use, that result in habitat loss, degradation and/or fragmentation	X	X		X		X	X	X	
Hydrologic distubances, changes in surface and groundwater features, including, ditches, central pivitot irrigation, water withdrawl, diversions, that result in reduced water quality and changes in qantity	X	X	X	X		X	X	X	
Eutrophication, excess nutrient loading and siltation due to agriculture runoff and chemical lawn treatments, that result in reduced water quality		X	X		X			X	
Pesticide use, chemical contamination, and acidification of habitat that directly or indirectly affects GCN species		X	X		X			X	X
Non-target impacts of gypsy moth control	X			X			X		

Threat Descriptions for **Wetland Habitats**	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Non-target impacts of mosquito control practices such as adulticide use and introduction of larvicides or biological control agents such as mosquitofish or mudminnows to control mosquito larvae	X		X	X		X			X
Invasive species that result in habitat loss and/or degradation, especially phragmites, purple loosestrife, nutria, and cormorants	X	X		X	X	X	X	X	X
Human use and/or distubrance, including recreational off-road vehicles, that results in habitat degradation	X		X				X		
Lack of scientific understanding of appropriate habitat requirements and management for all GCN species		X	X	X	X	X	X	X	X
Fire exclusion		X							
Succession and woody vegetation encroachment (buttonbush, red mapel, sweetgum, and other species succeeding into forest open-canopy herbaceous-dominated seasonal wetlands)		X	X					X	
Groundwater contamination from development and agriculture			X						
Altered natural disturbance patterns resulting in inadequate habitat conditions for some GCN species				X		X	X		
Increased flooding events due to sea-level rise, subduction, and increased erosion rates that results in habitat loss					X				X
Acid mine drainage						X	X		

Threat Descriptions for **Wetland Habitats**	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Acid precipitation							X		X
High deer densities resulting in overbrowsing							X		
In Allegheny Plateau, loss of northern conifers (red spruce, eastern white pine, blasam fir, eastern hemlock) due to timber harvesting							X		
In Coastal Plain, decline of Atlantic white cedar							X		
Loss of eastern hemlock due to hemlock wooly adelgid							X		
Water quality degradation of wetlands, streams and rivers feeding wetlands								X	
Channelization and damming of streams feeding wetlands								X	
Sedimentation and siltation within wetlands								X	
Conversion to impoundments								X	
Habitat degradation due to the impact of piers, docks and boat wakes									X
Shoreline stabilization through rip-rap placement and bulkhead construction									X
Contaminatioin from oil spills, boat fuels, and other sources of harmful chemicals									X

Threat Descriptions for **Estuarine and Marine Habitats**	Oligohaline, Mesohaline and Polyhaline Estuarines	Ocean
Inappropriate agricultural practices, including erosion, sedimentation, and nutrient enrichment, that result in habitat loss, degradation and/or fragmentation	X	
Development/urban sprawl that results in erosion, sedimentation and nutrient enrichment, habitat loss and/or fragmentation	X	X
Lack of scientific understanding of appropriate habitat requirements and management for all GCN species	X	X
Pollution, including metaloids, changes in pH, and thermal and toxic discharges, nutrients (especially nitrogen and phosphorus) and sedimentation, that result in water quality degradation	X	X
Non-native species	X	
Oil and chemical spills	X	X
Dredge spoil dumping	X	
Channel dredging	X	X
Loss of submerged aquatic vegetation	X	
Loss of oxygen	X	
Habitat loss due to oyster reef extraction	X	
Dredges and scrapes (commercial uses) that result in habitat degradation	X	
Hydologic and ground water alteration that results in changes in salinty	X	
Release of sediment from impoundments	X	
Acoustic disturbance		X
Excessive human recreationl use that results in habitat degradation		X

Appendix 2. Crosswalk of Maryland's Terrestrial Key Wildlife Habitats to Ecological Systems

This appendix provides a crosswalk linkage between the WDCP Key Wildlife Habitats and the 38 Terrestrial Ecological Systems found in Maryland. Terrestrial Ecological Systems were developed by NatureServe to classify mid-scale ecological units nationally and as part of the effort to develop an International Terrestrial Ecological Systems Classification. More information can be found at http://www.natureserve.org/publications/usEcologicalsystems.jsp. IAFWA guidance (2002) and subsequent Steering Committee correspondence recommended that the crosswalk linkages to regional and national standardized classification systems for use in large landscape level analysis and monitoring be included.

KWH #	Key Wildlife Habitat	Terrestrial Ecological Systems
1	Old Growth Forests	N/A
2	Early Successional Forests	N/A
3	Maritime Forests and Shrublands	Atlantic Coastal Plain Northern Maritime Forest
4	Loblolly Pine - Oak Forests	Atlantic Coastal Plain Northern Mixed Oak-Heath Forest
5	Mesic Deciduous Forests	Atlantic Coastal Plain Mesic Hardwood and Mixed Forest Southern and Central Appalachian Cove Forest
6	Dry Oak - Pine Forests	Appalachian Serpentine Woodland Appalachian Shale Barrens Allegheny-Cumberland Dry Oak Forest and Woodland Atlantic Coastal Plain Northern Mixed Oak-Heath Forest Central Appalachian Oak and Pine Forest

KWH #	Key Wildlife Habitat	Terrestrial Ecological Systems
		Central Appalachian Pine-Oak Rocky Woodland
		Central Appalachian Montane Rocky Bald
		Southern Piedmont Northern Triassic Basin Dry Forest
		Northeastern Interior Dry Oak Forest
		Southern Piedmont Dry Oak-Heath Forest
		Atlantic Coastal Plain Northern Dry Hardwood Forest
7	Northern Conifer - Hardwood Forests	Appalachian Hemlock-Hardwood Forest
8	Floodlplain Forests	Atlantic Coastal Plain Northern Tidal Wooded Swamp
		Atlantic Coastal Plain Small Brownwater River Floodplain Forest
		Atlantic Coastal Plain Blackwater Stream Floodplain Forest
		Atlantic Coastal Plain Brownwater Stream Floodplain Forest
		Atlantic Coastal Plain Northern Basin Peat Swamp
		Central Appalachian Floodplain
		Central Appalachian Riparian
9	Upland Depressional Swamps	Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest
		Atlantic Coastal Plain Northern Pondshore
		North-Central Appalachian Acidic Swamp
		Atlantic Coastal Plain Northern Basin Peat Swamp
10	Carolina Bays	Atlantic Coastal Plain Northern Pondshore
11	Vernal Pools	Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest
12	Forested Seepage Wetlands	North-Central Appalachian Acidic Swamp
		Atlantic Coastal Plain Northern Basin Peat Swamp

KWH #	Key Wildlife Habitat	Terrestrial Ecological Systems
13	Tidal Shrub Wetlands	Atlantic Coastal Plain Northern Tidal Wooded Swamp Atlantic Coastal Plain Northern Tidal Salt Marsh Atlantic Coastal Plain Northern Fresh and Oligohaline Tidal Marsh
14	Nontidal Shrub Wetlands	Southern and Central Appalachian Bog and Fen
15	Bog and Fen Wetland Complexes	Atlantic Coastal Plain Northern Basin Peat Swamp Southern and Central Appalachian Bog and Fen North-Central Appalachian Seepage Fen
16	Nontidal Emergent Wetlands	Atlantic Coastal Plain Northern Pondshore North-Central Appalachian Seepage Fen
17	Tidal Marshes	Atlantic Coastal Plain Northern Fresh and Oligohaline Tidal Marsh Atlantic Coastal Plain Northern Tidal Salt Marsh Atlantic Coastal Plain Northern Brackish Tidal Marsh
18	Grasslands	Atlantic Coastal Plain Northern Dune and Maritime Grassland
19	Barrens and Dry Glades	Appalachian Serpentine Woodland Appalachian Shale Barrens Central Appalachian Alkaline Glade and Woodland Southern Piedmont Glade and Barrens Southern and Central Appalachian Mafic Glade and Barrens
20	Cliffs and Rock Outcrops	Central Appalachian Pine-Oak Rocky Woodland North-Central Appalachian Acidic Cliff and Talus

KWH #	Key Wildlife Habitat	Terrestrial Ecological Systems
		North-Central Appalachian Circumneutral Cliff and Talus
21	Caves, Mines, and Springs	N/A
22	Coastal Beaches, Dunes, and Mudflats	Atlantic Coastal Plain Northern Dune and Maritime Grassland Atlantic Coastal Plain Northern Sandy Beach

Appendix 3a. Maryland's Full Array of Wildlife

This appendix lists all the vertebrate species known to occur or having occurred or likely to occur in Maryland along with their state, regional and national status categories if known. Many invertebrates are also included, which primarily represent those being tracked by NHP. However, this list greatly underrepresents the thousands, if not tens of thousands, of invertebrates that are likely to occur in Maryland. It represents the best available information from the most current MD DNR and partner datasets. The faunal list was reviewed and refined by taxonomic scientific experts for accuracy and supplemental information relevant to the WDCP. Multiple datasets were consulted to compile data and current ranks including the NHP database, NatureServe, Fishbase, and numerous regional and national programs. Key status categories include:
G-Rank = TNC / NatureServe global conservation status rank
S-Rank = TNC / NatureServe state conservation status rank (assigned by NHP)

An explanation of these rank codes is located at the end of the species list.

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
	VERTEBRATES		
MAMMALS			
Allegheny woodrat	Neotoma magister	G3G4	S1
American beaver	Castor canadensis	G5	S5
American bison	Bos bison	G4	SX
American elk	Cervus elaphus	G5	SX
American marten	Martes americana	G5	SX
Atlantic spotted dolphin	Stenella frontalis	G5	SZN
Atlantic white-sided dolphin	Leucopleurus acutus	G4	SZN
Big brown bat	Eptesicus fuscus	G5	S5B,S5N
Black bear	Ursus americanus	G5	S3S4
Black rat	Rattus rattus	G5	SE
Black right whale	Eubalaena glacialis	G1	SZN
Blue whale	Balaenoptera musculus	G3G4	SZN
Bobcat	Lynx rufus	G5	S3
Bottle-nosed dolphin	Tursiops truncatus	G5	SZN
Common gray fox	Urocyon cinereoargenteus	G5	S5
Common raccoon	Procyon lotor	G5	S5
Coyote	Canis latrans	G5	S4
Deer mouse	Peromyscus maniculatus	G5	S5
Delmarva fox squirrel	Sciurus niger cinereus	G5T3	S1
Dwarf sperm whale	Kogia simus	G4	SZN
Eastern chipmunk	Tamias striatus	G5	S5
Eastern cottontail	Sylvilagus floridanus	G5	S5
Eastern cougar	Puma concolor couguar	G5TH	SH
Eastern fox squirrel	Sciurus niger	G5	S4

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Eastern gray squirrel	Sciurus carolinensis	G5	S5
Eastern harvest mouse	Reithrodontomys humulis	G5	SH
Eastern mole	Scalopus aquaticus	G5	S5
Eastern pipistrelle	Pipistrellus subflavus	G5	S5B,S5N
Eastern red bat	Lasiurus borealis	G5	S5B,S5N
Eastern small-footed bat	Myotis leibii	G3	S1B,S2N
Eastern spotted skunk	Spilogale putorius	G5	S1
Ermine	Mustela erminea	G5	SR
Evening bat	Nycticeius humeralis	G5	S5B
False killer whale	Pseudorca crassidens	G4	SR
Feral horse (assateague pony)	Equus caballus	G5	SE
Fin whale	Balaenoptera physalus	G3G4	SZN
Fisher	Martes pennanti	G5	S3S4
Goose-beaked whale	Ziphius cavirostris	G4	SZN
Gray seal	Halichoerus grypus	G4G5	SA
Gray wolf	Canis lupus	G4	SX
Hairy-tailed mole	Parascalops breweri	G5	S4
Harbor porpoise	Phocoena phocoena	G4G5	SZN
Harbor seal	Phoca vitulina	G5	SA
Harp seal	Pagophilus groenlandica	G5	SA
Hoary bat	Lasiurus cinereus	G5	SPB,S5N
Hooded seal	Cystophora cristata	G4G5	SA
House mouse	Mus musculus	G5	SE
Humpback whale	Megaptera novaeangliae	G3	SZN
Indiana bat	Myotis sodalis	G2	S1
Killer whale	Orcinus orca	G4G5	SZN
Least shrew	Cryptotis parva	G5	S3S5
Least weasel	Mustela nivalis	G5	S2S3
Little brown myotis	Myotis lucifugus	G5	S5B,S5N
Long-finned pilot whale	Globicephala melas	G5	SZN
Long-tailed shrew	Sorex dispar	G4	S2
Long-tailed weasel	Mustela frenata	G5	S5
Manatee	Trichechus manatus	G2	SA
Marsh rice rat	Oryzomys palustris	G5	S4
Maryland shrew	Sorex fontinalis	G4Q	S?
Masked shrew	Sorex cinereus	G5	S5
Meadow jumping mouse	Zapus hudsonius	G5	S5
Meadow vole	Microtus pennsylvanicus	G5	S5
Melon-headed whale	Peponocephala electra	G4	SZN
Mink	Mustela vison	G5	S4
Minke whale	Balaenoptera acutorostrata	G5	SZN
Muskrat	Ondatra zibethicus	G5	S5
New england cottontail	Sylvilagus transitionalis	G4	S1
Northern myotis	Myotis septentrionalis	G4	S4B,S4N
Northern river otter	Lontra canadensis	G5	S5
Northern short-tailed shrew	Blarina brevicauda	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Norway rat	Rattus norvegicus	G5	SE
Nutria	Myocastor coypus	G5	SE
Porcupine	Erethizon dorsatum	G5	S1S2
Pygmy sperm whale	Kogia breviceps	G4	SZN
Rafinesque's big-eared bat	Corynorhinus rafinesquii	G3G4	SP
Red fox	Vulpes vulpes	G5	S5
Red squirrel	Tamiasciurus hudsonicus	G5	S5
Risso's dolphin	Grampus griseus	G5	SZN
Sei whale	Balaenoptera borealis	G3	SZN
Short-beaked common dolphin	Delphinus delphis	G5	SZN
Short-finned pilot whale	Globicephala macrorhynchus	G5	SZN
Sika deer	Cervus nippon	G4	SE
Silver-haired bat	Lasionycteris noctivagans	G5	SPB,S5N
Smoky shrew	Sorex fumeus	G5	S2S3
Snowshoe hare	Lepus americanus	G5	SH
Southeastern shrew	Sorex longirostris	G5	S3S4
Southeastern star-nosed mole	Condylura cristata parva	G5T4	SU
Southern bog lemming	Synaptomys cooperi	G5	S3
Southern flying squirrel	Glaucomys volans	G5	S5
Southern pygmy shrew	Sorex hoyi winnemana	G5T4	S2
Southern red-backed vole	Clethrionomys gapperi	G5	S5
Southern rock vole	Microtus chrotorrhinus carolinensis	G4T3	S1
Southern water shrew	Sorex palustris punctulatus	G5T3	S1
Sperm whale	Physeter catodon	G3G4	SZN
Striped dolphin	Stenella coeruleoalba	G5	SZN
Striped skunk	Mephitis mephitis	G5	S5
True's beaked whale	Mesoplodon mirus	G3	SZN
Virginia northern flying squirrel	Glaucomys sabrinus fuscus	G5T2	SP
Virginia oppossum	Didelphis virginiana	G5	S5
White-footed mouse	Peromyscus leucopus	G5	S5
White-tailed deer	Odocoileus virginianus	G5	S5
Woodchuck	Marmota monax	G5	S5
Woodland jumping mouse	Napaeozapus insignis	G5	S4
Woodland vole	Microtus pinetorum	G5	S5
BIRDS			
Acadian flycatcher	Empidonax virescens	G5	S5B
Alder flycatcher	Empidonax alnorum	G5	S2B
American avocet	Recurvirostra americana	G5	SZN
American bittern	Botaurus lentiginosus	G4	S1S2B,S1N
American black duck	Anas rubripes	G5	S4B,S5N
American coot	Fulica americana	G5	SAB,S3N
American crow	Corvus brachyrhynchos	G5	S5
American golden-plover	Pluvialis dominica	G5	SZN
American goldfinch	Carduelis tristis	G5	S5
American kestrel	Falco sparverius	G5	S5B,S4N

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
American oystercatcher	Haematopus palliatus	G5	S3B,SAN
American peregrine falcon	Falco peregrinus anatum	G4T3	S2
American pipit	Anthus rubescens	G5	S3N
American redstart	Setophaga ruticilla	G5	S4B
American robin	Turdus migratorius	G5	S5B,S5N
American tree sparrow	Spizella arborea	G5	S3N
American white pelican	Pelecanus erythrorhynchos	G3	SAN
American wigeon	Anas americana	G5	S4N
American woodcock	Scolopax minor	G5	S4B,S4N
Anhinga	Anhinga anhinga	G5	SAN
Arctic peregrine falcon	Falco peregrinus tundrius	G4T3T4	S3N
Arctic tern	Sterna paradisaea	G5	SAN
Ash-throated flycatcher	Myiarchus cinerascens	G5	SAN
Atlantic puffin	Fratercula arctica	G5	SZN
Audubon's shearwater	Puffinus lherminieri	G4G5	SZN
Bachman's sparrow	Aimophila aestivalis	G3	SHB
Baird's sandpiper	Calidris bairdii	G5	SZN
Baird's sparrow	Ammodramus bairdii	G4	SAN
Bald eagle	Haliaeetus leucocephalus	G4	S2S3B,S3N
Baltimore oriole	Icterus galbula	G5	S5B
Bank swallow	Riparia riparia	G5	S3S4B
Barn owl	Tyto alba	G5	S3
Barn swallow	Hirundo rustica	G5	S5B
Barred owl	Strix varia	G5	S5
Barrow's goldeneye	Bucephala islandica	G5	SAN
Bay-breasted warbler	Dendroica castanea	G5	SZN
Belted kingfisher	Ceryle alcyon	G5	S5B,S4N
Bewick's wren	Thryomanes bewickii altus	G5T2Q	S1B
Bicknell's thrush	Catharus bicknelli	G4	SZN
Black rail	Laterallus jamaicensis	G4	S2S3B
Black scoter	Melanitta nigra	G5	S3N
Black skimmer	Rynchops niger	G5	S1B
Black tern	Chlidonias niger	G4	SZN
Black vulture	Coragyps atratus	G5	S4B,S4N
Black-and-white warbler	Mniotilta varia	G5	S4B
Black-bellied plover	Pluvialis squatarola	G5	S3N
Black-bellied whistling-duck	Dendrocygna autumnalis	G5	SAN
Black-billed cuckoo	Coccyzus erythropthalmus	G5	S4B
Blackburnian warbler	Dendroica fusca	G5	S1S2B
Black-capped chickadee	Poecile atricapilla	G5	S4
Black-capped petrel	Pterodroma hasitata	G1	SAN
Black-crowned night-heron	Nycticorax nycticorax	G5	S3B,S2N
Black-headed grosbeak	Pheucticus melanocephalus	G5	SAN
Black-headed gull	Larus ridibundus	G5	SZN
Black-legged kittiwake	Rissa tridactyla	G5	SZN
Black-necked stilt	Himantopus mexicanus	G5	SNA

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Blackpoll warbler	Dendroica striata	G5	SZN
Black-throated blue warbler	Dendroica caerulescens	G5	S3S4B
Black-throated gray warbler	Dendroica nigrescens	G5	SAN
Black-throated green warbler	Dendroica virens	G5	S4B
Blue grosbeak	Guiraca caerulea	G5	S5B
Blue jay	Cyanocitta cristata	G5	S5B,S5N
Blue-gray gnatcatcher	Polioptila caerulea	G5	S5B
Blue-headed vireo	Vireo solitarius	G5	S3S4B
Blue-winged teal	Anas discors	G5	S2B,S3S4N
Blue-winged warbler	Vermivora pinus	G5	S4B
Boat-tailed grackle	Quiscalus major	G5	S3S4
Bobolink	Dolichonyx oryzivorus	G5	S3S4B
Bohemian waxwing	Bombycilla garrulus	G5	SAN
Bonaparte's gull	Larus philadelphia	G5	S2N
Boreal chickadee	Poecile hudsonica	G5	SAN
Brant	Branta bernicla	G5	S3N
Brewer's blackbird	Euphagus cyanocephalus	G5	SAN
Bridled tern	Sterna anaethetus	G5	SAN
Broad-winged hawk	Buteo platypterus	G5	S4B
Brown creeper	Certhia americana	G5	S4
Brown pelican	Pelecanus occidentalis	G4	S1B
Brown thrasher	Toxostoma rufum	G5	S5B,S2N
Brown-headed cowbird	Molothrus ater	G5	S5
Brown-headed nuthatch	Sitta pusilla	G5	S3S4
Buff-breasted sandpiper	Tryngites subruficollis	G4	SZN
Bufflehead	Bucephala albeola	G5	S5N
Bullock's oriole	Icterus bullockii	G5	SAN
Burrowing owl	Athene cunicularia	G4	SAN
California gull	Larus californicus	G5	SAN
Canada goose	Branta canadensis	G5	S4B,S5N
Canada warbler	Wilsonia canadensis	G5	S3B
Canvasback	Aythya valisineria	G5	S3S4N
Cape may warbler	Dendroica tigrina	G5	SZN
Carolina chickadee	Poecile carolinensis	G5	S5
Carolina parakeet	Conuropsis carolinensis	GX	SX
Carolina wren	Thryothorus ludovicianus	G5	S5
Caspian tern	Sterna caspia	G5	SZN
Cattle egret	Bubulcus ibis	G5	S3S4B
Cedar waxwing	Bombycilla cedrorum	G5	S5B,S5N
Cerulean warbler	Dendroica cerulea	G4	S3S4B
Chestnut-collared longspur	Calcarius ornatus	G5	SAN
Chestnut-sided warbler	Dendroica pensylvanica	G5	S4B
Chimney swift	Chaetura pelagica	G5	S5B
Chipping sparrow	Spizella passerina	G5	S5B,S1N
Chuck-will's-widow	Caprimulgus carolinensis	G5	S4B
Cinnamon teal	Anas cyanoptera	G5	SAN

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Clapper rail	Rallus longirostris	G5	S3S4B,S3N
Clay-colored sparrow	Spizella pallida	G5	SAN
Cliff swallow	Petrochelidon pyrrhonota	G5	S3S4B
Coastal plain swamp sparrow	Melospiza georgiana nigrescens	G5T3	S2B,SZN
Common eider	Somateria mollissima	G5	S1N
Common goldeneye	Bucephala clangula	G5	S5N
Common grackle	Quiscalus quiscula	G5	S5
Common ground-dove	Columbina passerina	G5	SAN
Common loon	Gavia immer	G5	S4N
Common merganser	Mergus merganser	G5	S3N
Common moorhen	Gallinula chloropus	G5	S2B,SAN
Common murre	Uria aalge	G5	SAN
Common nighthawk	Chordeiles minor	G5	S3S4B
Common raven	Corvus corax	G5	S2
Common redpoll	Carduelis flammea	G5	S1N
Common tern	Sterna hirundo	G5	S4B
Common yellowthroat	Geothlypis trichas	G5	S5B
Connecticut warbler	Oporornis agilis	G4	SZN
Cooper's hawk	Accipiter cooperii	G5	S4B,S4N
Corn crake	Crex crex	G5	SAN
Cory's shearwater	Calonectris diomedea	G5	SZN
Curlew sandpiper	Calidris ferruginea	G5?	SAN
Dark-eyed junco	Junco hyemalis	G5	S2B,S5N
Dickcissel	Spiza americana	G5	S2B
Double-crested cormorant	Phalacrocorax auritus	G5	S1B,S3S4N
Dovekie	Alle alle	G5	SZN
Downy woodpecker	Picoides pubescens	G5	S5
Dunlin	Calidris alpina	G5	S3N
Eared grebe	Podiceps nigricollis	G5	SAN
Eastern bluebird	Sialia sialis	G5	S5B,S4N
Eastern kingbird	Tyrannus tyrannus	G5	S5B
Eastern meadowlark	Sturnella magna	G5	S5B,S3N
Eastern phoebe	Sayornis phoebe	G5	S5B
Eastern screech-owl	Otus asio	G5	S5
Eastern towhee	Pipilo erythrophthalmus	G5	S5B,S4N
Eastern wood-pewee	Contopus virens	G5	S5B
Eskimo curlew	Numenius borealis	GH	SXN
Eurasian wigeon	Anas penelope	G5	S1N
European starling	Sturnus vulgaris	G5	SE
Evening grosbeak	Coccothraustes vespertinus	G5	S2N
Field sparrow	Spizella pusilla	G5	S5
Fish crow	Corvus ossifragus	G5	S5
Fork-tailed flycatcher	Tyrannus savana	G5	SAN
Forster's tern	Sterna forsteri	G5	S4B
Fox sparrow	Passerella iliaca	G5	S2N
Franklin's gull	Larus pipixcan	G4G5	SAN

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Fulvous whistling-duck	Dendrocygna bicolor	G5	SAN
Gadwall	Anas strepera	G5	S2B,S4N
Glaucous gull	Larus hyperboreus	G5	SZN
Glossy ibis	Plegadis falcinellus	G5	S4B
Golden eagle	Aquila chrysaetos	G5	S1N
Golden-crowned kinglet	Regulus satrapa	G5	S2B,S4N
Golden-winged warbler	Vermivora chrysoptera	G4	S3B
Grasshopper sparrow	Ammodramus savannarum	G5	S4B
Gray catbird	Dumetella carolinensis	G5	S5B,S1N
Gray kingbird	Tyrannus dominicensis	G5	SAN
Gray-cheeked thrush	Catharus minimus	G5	SZN
Great black-backed gull	Larus marinus	G5	S4B,S4N
Great blue heron	Ardea herodias	G5	S4B,S3S4N
Great cormorant	Phalacrocorax carbo	G5	S2N
Great crested flycatcher	Myiarchus crinitus	G5	S5B
Great egret	Ardea alba	G5	S4B
Great horned owl	Bubo virginianus	G5	S5
Great skua	Stercorarius skua	G4G5	SZN
Greater flamingo	Phoenicopterus ruber	G3	SAN
Greater scaup	Aythya marila	G5	S4N
Greater shearwater	Puffinus gravis	G5	SZN
Greater white-fronted goose	Anser albifrons	G5	SZN
Greater yellowlegs	Tringa melanoleuca	G5	S1N
Green heron	Butorides virescens	G5	S5B
Green-winged teal	Anas crecca	G5	SAB,S4N
Groove-billed ani	Crotophaga sulcirostris	G5	SAN
Gull-billed tern	Sterna nilotica	G5	S1B
Gyrfalcon	Falco rusticolus	G5	SAN
Hairy woodpecker	Picoides villosus	G5	S5
Hammond's flycatcher	Empidonax hammondii	G5	SAN
Harlequin duck	Histrionicus histrionicus	G4	S1N
Harris' sparrow	Zonotrichia querula	G5	SAN
Heath hen	Tympanuchus cupido cupido	G4TX	SX
Henslow's sparrow	Ammodramus henslowii	G4	S1S2B
Hermit thrush	Catharus guttatus	G5	S3S4B,S4N
Herring gull	Larus argentatus	G5	S5B,S5N
Hoary redpoll	Carduelis hornemanni	G5	SAN
Hooded merganser	Lophodytes cucullatus	G5	S1B,S2N
Hooded warbler	Wilsonia citrina	G5	S4S5B
Horned grebe	Podiceps auritus	G5	S4N
Horned lark	Eremophila alpestris	G5	S4B,S4N
House finch	Carpodacus mexicanus	G5	SE
House sparrow	Passer domesticus	G5	SE
House wren	Troglodytes aedon	G5	S5B
Hudsonian godwit	Limosa haemastica	G4	SZN
Iceland gull	Larus glaucoides	G5	SZN

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Indigo bunting	Passerina cyanea	G5	S5B
Ivory-billed woodpecker	Campephilus principalis	GH	SX
Kentucky warbler	Oporornis formosus	G5	S4B
Killdeer	Charadrius vociferus	G5	S5B,S4N
King eider	Somateria spectabilis	G5	S1N
King rail	Rallus elegans	G4G5	S3S4B,S2N
Labrador duck	Camptorhynchus labradorius	GX	SX
Lapland longspur	Calcarius lapponicus	G5	S1N
Lark bunting	Calamospiza melanocorys	G5	SAN
Lark sparrow	Chondestes grammacus	G5	SXB,SAN
Laughing gull	Larus atricilla	G5	S1B,S4N
Lazuli bunting	Passerina amoena	G5	SAN
Le conte's sparrow	Ammodramus leconteii	G4	SAN
Leach's storm-petrel	Oceanodroma leucorhoa	G5	SZN
Least bittern	Ixobrychus exilis	G5	S2S3B
Least flycatcher	Empidonax minimus	G5	S3S4B
Least sandpiper	Calidris minutilla	G5	SZN
Least tern	Sterna antillarum	G4	S2B
Lesser black-backed gull	Larus fuscus	G5	SZN
Lesser scaup	Aythya affinis	G5	S4N
Lesser yellowlegs	Tringa flavipes	G5	S1N
Limpkin	Aramus guarauna	G5	SAN
Lincoln's sparrow	Melospiza lincolnii	G5	SZN
Little blue heron	Egretta caerulea	G5	S3B
Little gull	Larus minutus	G5	SZN
Little stint	Calidris minuta	G5	SAN
Loggerhead shrike	Lanius ludovicianus	G4	S1B,S1N
Long-billed curlew	Numenius americanus	G5	SAN
Long-billed dowitcher	Limnodromus scolopaceus	G5	SZN
Long-eared owl	Asio otus	G5	SHB,S1N
Long-tailed duck	Clangula hyemalis	G5	S4N
Long-tailed jaeger	Stercorarius longicaudus	G5	SZN
Louisiana waterthrush	Seiurus motacilla	G5	S5B
Magnificent frigatebird	Fregata magnificens	G5	SAN
Magnolia warbler	Dendroica magnolia	G5	S3S4B
Mallard	Anas platyrhynchos	G5	SE
Manx shearwater	Puffinus puffinus	G5	SZN
Marbled godwit	Limosa fedoa	G5	SZN
Marsh wren	Cistothorus palustris	G5	S4B,S2N
Masked duck	Nomonyx dominicus	G5	SAN
Merlin	Falco columbarius	G5	S1N
Mew gull	Larus canus	G5	SAN
Mississippi kite	Ictinia mississippiensis	G5	SAN
Mountain bluebird	Sialia currucoides	G5	SAN
Mourning dove	Zenaida macroura	G5	S5
Mourning warbler	Oporornis philadelphia	G5	S1B

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Mute swan	Cygnus olor	G5	SE
Nashville warbler	Vermivora ruficapilla	G5	S1S2B
Nelson's sharp-tailed sparrow	Ammodramus nelsoni	G5	SAN
Northern bobwhite	Colinus virginianus	G5	S5
Northern cardinal	Cardinalis cardinalis	G5	S5
Northern flicker	Colaptes auratus	G5	S5B,S5N
Northern fulmar	Fulmarus glacialis	G5	SZN
Northern gannet	Morus bassanus	G5	SZN
Northern goshawk	Accipiter gentilis	G5	S1B,SZN
Northern harrier	Circus cyaneus	G5	S2B,S4N
Northern mockingbird	Mimus polyglottos	G5	S5
Northern parula	Parula americana	G5	S4S5B
Northern pintail	Anas acuta	G5	S4N
Northern rough-winged swallow	Stelgidopteryx serripennis	G5	S4B
Northern saw-whet owl	Aegolius acadicus	G5	S1B,S1N
Northern shoveler	Anas clypeata	G5	SAB,S2N
Northern shrike	Lanius excubitor	G5	SAN
Northern waterthrush	Seiurus noveboracensis	G5	S2S3B
Northern wheatear	Oenanthe oenanthe	G5	SAN
Olive-sided flycatcher	Contopus cooperi	G4	SHB,SZN
Orange-crowned warbler	Vermivora celata	G5	SZN
Orchard oriole	Icterus spurius	G5	S5B
Osprey	Pandion haliaetus	G5	S4B
Ovenbird	Seiurus aurocapillus	G5	S5B
Painted bunting	Passerina ciris	G5	SAN
Palm warbler	Dendroica palmarum	G5	S2N
Parasitic jaeger	Stercorarius parasiticus	G5	SZN
Passenger pigeon	Ectopistes migratorius	GX	SX
Pectoral sandpiper	Calidris melanotos	G5	SZN
Philadelphia vireo	Vireo philadelphicus	G5	SZN
Pied-billed grebe	Podilymbus podiceps	G5	S2B,S3N
Pileated woodpecker	Dryocopus pileatus	G5	S5
Pine grosbeak	Pinicola enucleator	G5	SAN
Pine siskin	Carduelis pinus	G5	SAB,S1S2N
Pine warbler	Dendroica pinus	G5	S4B,S2N
Piping plover	Charadrius melodus	G3	S1B,SAN
Pomarine jaeger	Stercorarius pomarinus	G5	SZN
Prairie warbler	Dendroica discolor	G5	S4B
Prothonotary warbler	Protonotaria citrea	G5	S4B
Purple finch	Carpodacus purpureus	G5	S3B,S3N
Purple gallinule	Porphyrula martinica	G5	SAB
Purple martin	Progne subis	G5	S5B
Purple sandpiper	Calidris maritima	G5	S2N
Razorbill	Alca torda	G5	SZN
Red crossbill	Loxia curvirostra	G5	SNA
Red knot	Calidris canutus	G5	SZN

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Red phalarope	Phalaropus fulicaria	G5	SZN
Red-bellied woodpecker	Melanerpes carolinus	G5	S5
Red-breasted merganser	Mergus serrator	G5	S3N
Red-breasted nuthatch	Sitta canadensis	G5	S1B,S3N
Red-cockaded woodpecker	Picoides borealis	G3	SHB,SAN
Red-eyed vireo	Vireo olivaceus	G5	S5B
Redhead	Aythya americana	G5	S2N
Red-headed woodpecker	Melanerpes erythrocephalus	G5	S4
Red-necked grebe	Podiceps grisegena	G5	SZN
Red-necked phalarope	Phalaropus lobatus	G4G5	SZN
Red-necked stint	Calidris ruficollis	G5	SAN
Red-shouldered hawk	Buteo lineatus	G5	S4S5B,S4N
Red-tailed hawk	Buteo jamaicensis	G5	S5B,S5N
Red-throated loon	Gavia stellata	G5	S3S4N
Red-winged blackbird	Agelaius phoeniceus	G5	S5
Ring-billed gull	Larus delawarensis	G5	S5N
Ring-necked duck	Aythya collaris	G5	S2N
Ring-necked pheasant	Phasianus colchicus	G5	SE
Rock dove	Columba livia	G5	SE
Rock wren	Salpinctes obsoletus	G5	SAN
Roseate spoonbill	Ajaia ajaja	G5	SAN
Roseate tern	Sterna dougallii dougallii	G4T3	SHB,SAN
Rose-breasted grosbeak	Pheucticus ludovicianus	G5	S3S4B
Ross' goose	Chen rossii	G4	SAN
Ross's gull	Rhodostethia rosea	G3G4	SAN
Rough-legged hawk	Buteo lagopus	G5	S2N
Royal tern	Sterna maxima	G5	S1B
Ruby-crowned kinglet	Regulus calendula	G5	S3N
Ruby-throated hummingbird	Archilochus colubris	G5	S5B
Ruddy duck	Oxyura jamaicensis	G5	S3N
Ruddy turnstone	Arenaria interpres	G5	S1N
Ruff	Philomachus pugnax	G5	SAN
Ruffed grouse	Bonasa umbellus	G5	S4
Rufous hummingbird	Selasphorus rufus	G5	SAN
Rusty blackbird	Euphagus carolinus	G5	S2S3N
Sabine's gull	Xema sabini	G5	SAN
Sage thrasher	Oreoscoptes montanus	G5	SAN
Saltmarsh sharp-tailed sparrow	Ammodramus caudacutus	G4	S3B,S1N
Sanderling	Calidris alba	G5	S3N
Sandhill crane	Grus canadensis	G5	SAN
Sandwich tern	Sterna sandvicensis	G5	S1B
Savannah sparrow	Passerculus sandwichensis	G5	S3S4B,S4N
Scarlet tanager	Piranga olivacea	G5	S5B
Scissor-tailed flycatcher	Tyrannus forficatus	G5	SAN
Seaside sparrow	Ammodramus maritimus	G4	S4B,S2N
Sedge wren	Cistothorus platensis	G5	S1B

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Semipalmated plover	Charadrius semipalmatus	G5	SZN
Semipalmated sandpiper	Calidris pusilla	G5	SZN
Sharp-shinned hawk	Accipiter striatus	G5	S1S2B,S4N
Short-billed dowitcher	Limnodromus griseus	G5	SZN
Short-eared owl	Asio flammeus	G5	S1B,S2N
Smith's longspur	Calcarius pictus	G5	SAN
Snow bunting	Plectrophenax nivalis	G5	S1N
Snow goose	Chen caerulescens	G5	S4N
Snowy egret	Egretta thula	G5	S3S4B
Snowy owl	Nyctea scandiaca	G5	SAN
Solitary sandpiper	Tringa solitaria	G5	SZN
Song sparrow	Melospiza melodia	G5	S5
Sooty shearwater	Puffinus griseus	G5	SZN
Sooty tern	Sterna fuscata	G5	SAN
Sora	Porzana carolina	G5	S1B,SZN
South polar skua	Stercorarius maccormicki	G5	SZN
Spotted sandpiper	Actitis macularia	G5	S3S4B
Spotted towhee	Pipilo maculatus	G5	SAN
Stilt sandpiper	Calidris himantopus	G5	SZN
Summer tanager	Piranga rubra	G5	S4B
Surf scoter	Melanitta perspicillata	G5	S4N
Swainson's hawk	Buteo swainsoni	G5	SAN
Swainson's thrush	Catharus ustulatus	G5	SXB
Swainson's warbler	Limnothlypis swainsonii	G4	S1B
Swallow-tailed kite	Elanoides forficatus	G5	SAN
Swamp sparrow	Melospiza georgiana	G5	S4B,S5N
Tennessee warbler	Vermivora peregrina	G5	SZN
Thick-billed murre	Uria lomvia	G5	SAN
Townsend's solitaire	Myadestes townsendi	G5	SAN
Tree swallow	Tachycineta bicolor	G5	S4B
Tricolored heron	Egretta tricolor	G5	S3B
Trumpeter swan	Cygnus buccinator	G4	SXN
Tufted duck	Aythya fuligula	G5	SAN
Tufted titmouse	Baeolophus bicolor	G5	S5
Tundra swan	Cygnus columbianus	G5	S4N
Turkey vulture	Cathartes aura	G5	S5B,S5N
Upland sandpiper	Bartramia longicauda	G5	S1B
Varied thrush	Ixoreus naevius	G5	SAN
Veery	Catharus fuscescens	G5	S4B
Vermilion flycatcher	Pyrocephalus rubinus	G5	SAN
Vesper sparrow	Pooecetes gramineus	G5	S3S4B,S2N
Virginia rail	Rallus limicola	G5	S4B,S4N
Warbling vireo	Vireo gilvus	G5	S4B
Wayne's black-throated green warbler	Dendroica virens waynei	G5TU	SU
Western grebe	Aechmophorus occidentalis	G5	SAN
Western kingbird	Tyrannus verticalis	G5	SAN

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Western sandpiper	Calidris mauri	G5	SZN
Western tanager	Piranga ludoviciana	G5	SAN
Whimbrel	Numenius phaeopus	G5	SZN
Whip-poor-will	Caprimulgus vociferus	G5	S3S4B
White ibis	Eudocimus albus	G5	SAN
White-breasted nuthatch	Sitta carolinensis	G5	S5
White-crowned sparrow	Zonotrichia leucophrys	G5	S3S4N
White-eyed vireo	Vireo griseus	G5	S5B
White-faced storm-petrel	Pelagodroma marina	G5	SAN
White-rumped sandpiper	Calidris fuscicollis	G5	SZN
White-throated sparrow	Zonotrichia albicollis	G5	SAB,S5N
White-winged crossbill	Loxia leucoptera	G5	SAN
White-winged dove	Zenaida asiatica	G5	SAN
White-winged scoter	Melanitta fusca	G5	S3N
Wild turkey	Meleagris gallopavo	G5	S4
Willet	Catoptrophorus semipalmatus	G5	S3S4B
Willow flycatcher	Empidonax traillii	G5	S4B
Wilson's phalarope	Phalaropus tricolor	G5	SZN
Wilson's plover	Charadrius wilsonia	G5	S1B
Wilson's snipe	Gallinago delicata	G5	S2N
Wilson's storm-petrel	Oceanites oceanicus	G5	SZN
Wilson's warbler	Wilsonia pusilla	G5	SZN
Winter wren	Troglodytes troglodytes	G5	S2B,S3N
Wood duck	Aix sponsa	G5	S5B,S3N
Wood stork	Mycteria americana	G4	SAN
Wood thrush	Hylocichla mustelina	G5	S5B
Worm-eating warbler	Helmitheros vermivorus	G5	S4B
Yellow rail	Coturnicops noveboracensis	G4	SAN
Yellow warbler	Dendroica petechia	G5	S5B
Yellow-bellied flycatcher	Empidonax flaviventris	G5	SZN
Yellow-bellied sapsucker	Sphyrapicus varius	G5	SHB,S3N
Yellow-billed cuckoo	Coccyzus americanus	G5	S5B
Yellow-breasted chat	Icteria virens	G5	S5B
Yellow-crowned night-heron	Nyctanassa violacea	G5	S2B
Yellow-headed blackbird	Xanthocephalus xanthocephalus	G5	SAN
Yellow-legged gull	Larus cachinnans	G5	SAN
Yellow-nosed albatross	Thalassarche chlororhynchos	G3	SAN
Yellow-rumped warbler	Dendroica coronata	G5	SAB,S4N
Yellow-throated vireo	Vireo flavifrons	G5	S4S5B
Yellow-throated warbler	Dendroica dominica	G5	S4B
REPTILES			
Atlantic hawksbill seaturtle	Eretmochelys imbricata	G3	SRN
Black ratsnake	Elaphe obsoleta	G5	S5
Bog turtle	Clemmys muhlenbergii	G3	S2
Broad-headed skink	Eumeces laticeps	G5	S4

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Common five-lined skink	Eumeces fasciatus	G5	S5
Common ribbonsnake	Thamnophis sauritus	G5	S5
Cornsnake	Elaphe guttata	G5	S4
Eastern box turtle	Terrapene carolina	G5	S5
Eastern gartersnake	Thamnophis sirtalis	G5	S5
Eastern hog-nosed snake	Heterodon platirhinos	G5	S5
Eastern kingsnake	Lampropeltis getula	G5	S5
Eastern mud turtle	Kinosternon subrubrum	G5	S5
Eastern six-lined racerunner	Cnemidophorus sexlineatus	G5	S4
Eastern smooth earthsnake	Virginia valeriae valeriae	G5	S4S5
Eastern snapping turtle	Chelydra serpentina	G5	S5
Eastern spiny softshell	Apalone spinifera	G5	S1
Eastern wormsnake	Carphophis amoenus	G5	S5
Green seaturtle	Chelonia mydas	G3	S1N
Kemp's ridley seaturtle	Lepidochelys kempii	G1	S1N
Leatherback seaturtle	Dermochelys coriacea	G2	S1
Little brown skink	Scincella lateralis	G5	S5
Loggerhead seaturtle	Caretta caretta	G3	S1B,S1N
Mediterranean gecko	Hemidactylus turcicus	G5	SE
Milksnake	Lampropeltis triangulum	G5	S5
Mole kingsnake	Lampropeltis calligaster	G5	S4
Mountain earthsnake	Virginia valeriae pulchra	G5T3T4	S2
Northern black racer	Coluber constrictor	G5	S5
Northern brownsnake	Storeria dekayi	G5	S5
Northern coal skink	Eumeces anthracinus	G5	SU
Northern copperhead	Agkistrodon contortrix	G5	S5
Northern diamond-backed terrapin	Malaclemys terrapin terrapin	G4T4	S4
Northern fence lizard	Sceloporus undulatus	G5	S5
Northern map turtle	Graptemys geographica	G5	S1
Northern pinesnake	Pituophis melanoleucus	G4	SH
Northern red-bellied snake	Storeria occipitomaculata	G5	S5
Northern red-bellied turtle	Pseudemys rubriventris	G5	S5
Northern rough greensnake	Opheodrys aestivus	G5	S5
Northern scarletsnake	Cemophora coccinea	G5	S3
Northern watersnake	Nerodia sipedon	G5	S5
Painted turtle	Chrysemys picta	G5	S5
Queen snake	Regina septemvittata	G5	S5
Rainbow snake	Farancia erytrogramma	G5	S1
Red-bellied watersnake	Nerodia erythrogaster erythrogaster	G5T5	S2S3
Red-eared slider	Trachemys scripta	G5	S5
Ring-necked snake	Diadophis punctatus	G5	S5
Smooth greensnake	Liochlorophis vernalis	G5	S5
Southeastern five-lined skink	Eumeces inexpectatus	G5	S4
Spotted turtle	Clemmys guttata	G5	S5
Stinkpot	Sternotherus odoratus	G5	S5
Timber rattlesnake	Crotalus horridus	G4	S3

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Wood turtle	Glyptemys insculpta	G4	S4
AMPHIBIANS			
Allegheny Mountain dusky salamander	Desmognathus ochrophaeus	G5	S5
American bullfrog	Rana catesbeiana	G5	S5
American toad	Bufo americanus	G5	S5
Barking treefrog	Hyla gratiosa	G5	S1
Carpenter frog	Rana virgatipes	G5	S2
Common mudpuppy	Necturus maculosus	G5	S1
Cope's gray treefrog	Hyla chrysoscelis	G5	S5
Eastern cricket frog	Acris crepitans	G5	S5
Eastern hellbender	Cryptobranchus alleganiensis	G3G4	S1
Eastern mud salamander	Pseudotriton montanus	G5	S2?
Eastern narrow-mouthed toad	Gastrophryne carolinensis	G5	S1S2
Eastern red-backed salamander	Plethodon cinereus	G5	S5
Eastern spadefoot	Scaphiopus holbrookii	G5	S4
Eastern tiger salamander	Ambystoma tigrinum	G5	S2
Four-toed salamander	Hemidactylium scutatum	G5	S5
Fowler's toad	Bufo fowleri	G5	S5
Gray treefrog	Hyla versicolor	G5	S5
Green salamander	Aneides aeneus	G3G4	S2
Green treefrog	Hyla cinerea	G5	S5
Jefferson salamander	Ambystoma jeffersonianum	G4	S3
Long-tailed salamander	Eurycea longicauda	G5	S5
Marbled salamander	Ambystoma opacum	G5	S5
Mountain chorus frog	Pseudacris brachyphona	G5	S2
New Jersey chorus frog	Pseudacris feriarum kalmi	G5T4	S4
Northern dusky salamander	Desmognathus fuscus	G5	S5
Northern green frog	Rana clamitans	G5	S5
Northern leopard frog	Rana pipiens	G5	S4
Northern red salamander	Pseudotriton ruber	G5	S5
Northern slimy salamander	Plethodon glutinosus	G5	S5
Northern spring peeper	Pseudacris crucifer	G5	S5
Northern spring salamander	Gyrinophilus porphyriticus	G5	S4
Northern two-lined salamander	Eurycea bislineata	G5	S5
Pickerel frog	Rana palustris	G5	S5
Pine woods treefrog	Hyla femoralis	G5	SP
Red-spotted newt	Notophthalmus viridescens	G5	S5
Seal salamander	Desmognathus monticola	G5	S5
Southern leopard frog	Rana sphenocephala	G5	S4S5
Spotted salamander	Ambystoma maculatum	G5	S5
Upland chorus frog	Pseudacris feriarum feriarum	G5	S5
Valley and ridge salamander	Plethodon hoffmani	G5	S5
Wehrle's salamander	Plethodon wehrlei	G5	S2
Wood frog	Rana sylvatica	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
FISHES			
Alewife	Alosa pseudoharengus	G5	S5
American brook lamprey	Lampetra appendix	G4	S1S2
American eel	Anguilla rostrata	G5	S4
American shad	Alosa sapidissima	G5	S3
Atlantic angel shark	Squatina dumeril	G?	S?
Atlantic sturgeon	Acipenser oxyrinchus	G3	S1
Banded darter	Etheostoma zonale	G5	SE
Banded killifish	Fundulus diaphanus	G5	S5
Banded sunfish	Enneacanthus obesus	G5	S2
Black bullhead	Ameiurus melas	G5	S?
Black crappie	Pomoxis nigromaculatus	G5	SE
Black dogfish	Centroscyllium fabricii	G?	S?
Blackbanded sunfish	Enneacanthus chaetodon	G4	S1
Blacknose dace	Rhinichthys atratulus	G5	S5
Blue catfish	Ictalurus furcatus	G5	SE
Blue ridge sculpin	Cottus caeruleomentum	G4	S4
Blueback herring	Alosa aestivalis	G5	S5
Bluegill	Lepomis macrochirus	G5	SE?
Bluespotted sunfish	Enneacanthus gloriosus	G5	S3S4
Bluntnose minnow	Pimephales notatus	G5	S5
Bowfin	Amia calva	G5	S1?
Bramble shark	Echinorhinus brucus	G?	S?
Bridle shiner	Notropis bifrenatus	G5	SH
Brook trout	Salvelinus fontinalis	G5	S3S4
Broudband shark	Etmopterus gracilispinis	G?	S?
Brown bullhead	Ameiurus nebulosus	G5	S5
Brown trout	Salmo trutta	G5	SE
Central stoneroller	Campostoma anomalum	G5	S5
Chain pickerel	Esox niger	G5	S5
Channel catfish	Ictalurus punctatus	G5	SE
Cheat minnow	Pararhinichthys bowersi	G1G2Q	SX
Checkered sculpin	Cottus sp 7	G4Q	S1S2
Comely shiner	Notropis amoenus	G5	S2
Common carp	Cyprinus carpio	G5	SE
Common shiner	Luxilus cornutus	G5	S5
Creek chub	Semotilus atromaculatus	G5	S5
Creek chubsucker	Erimyzon oblongus	G5	S5
Cuban dogfish	Squalus cubensis	G?	S?
Cutlips minnow	Exoglossum maxillingua	G5	S5
Cutthroat trout	Oncorhynchus clarki	G4	SE
Eastern mosquitofish	Gambusia holbrooki	G5	S4S5
Eastern mudminnow	Umbra pygmaea	G5	S5
Eastern silvery minnow	Hybognathus regius	G5	S4
Emerald shiner	Notropis atherinoides	G5	SE
Fallfish	Semotilus corporalis	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Fantail darter	Etheostoma flabellare	G5	S4
Fathead minnow	Pimephales promelas	G5	SE
Flathead catfish	Pylodictis olivaris	G5	SE?
Flier	Centrarchus macropterus	G5	S1S2
Gizzard shad	Dorosoma cepedianum	G5	S5
Glassy darter	Etheostoma vitreum	G4G5	S1S2
Golden redhorse	Moxostoma erythrurum	G5	S4
Golden shiner	Notemigonus crysoleucas	G5	S5
Goldfish	Carassius auratus	G5	SE
Grass carp	Ctenopharyngodon idella	G5	SE
Green sunfish	Lepomis cyanellus	G5	SE?
Greenland shark	Somniosus microcephalus	G?	S?
Greenside darter	Etheostoma blennioides	G5	S5
Hickory shad	Alosa mediocris	G5	S3
Ironcolor shiner	Notropis chalybaeus	G4	S1
Johnny darter	Etheostoma nigrum	G5	S3
Kitefin shark	Dalatias licha	G?	S?
Lake trout	Salvelinus namaycush	G5	SE
Largemouth bass	Micropterus salmoides	G5	SE
Least brook lamprey	Lampetra aepyptera	G5	S4
Logperch	Percina caprodes	G5	S1S2
Longear sunfish	Lepomis megalotis	G5	S4
Longnose dace	Rhinichthys cataractae	G5	S5
Longnose gar	Lepisosteus osseus	G5	S2?
Longnose sucker	Catostomus catostomus	G5	SH
Margined madtom	Noturus insignis	G5	S5
Maryland darter	Etheostoma sellare	GH	SH
Mottled sculpin	Cottus bairdi	G5	S3S4
Mud sunfish	Acantharchus pomotis	G5	S2
Mummichog	Fundulus heteroclitus	G5	S5
Muskellunge	Esox masquinongy	G5	SE
Northern hogsucker	Hypentelium nigricans	G5	S5
Northern pike	Esox lucius	G5	SE
Pacific angel shark	Squatina californica	G?	S?
Pacific sleeper shark	Somniosus pacificus	G?	S?
Pearl dace	Margariscus margarita	G5	S1S2
Pirate perch	Aphredoderus sayanus	G5	S5
Portuguese shark	Centroscymnus coelolepis	G?	S?
Potomac sculpin	Cottus girardi	G4	S4
Prickly shark	Echinorhinus cookei	G?	S?
Pumpkinseed	Lepomis gibbosus	G5	S5
Quillback	Carpiodes cyprinus	G5	S4?
Rainbow darter	Etheostoma caeruleum	G5	SE
Rainbow trout	Oncorhynchus mykiss	G5	SE
Redbreast sunfish	Lepomis auritus	G5	S5
Redfin pickerel	Esox americanus	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Redside dace	Clinostomus elongatus	G4	SX
River chub	Nocomis micropogon	G5	S5
Rock bass	Ambloplites rupestris	G5	S5
Rosyface shiner	Notropis rubellus	G5	S4S5
Rosyside dace	Clinostomus funduloides	G5	S5
Roughskin dogfish	Squalus asper	G?	S?
Satinfin shiner	Cyprinella analostana	G5	S4S5
Scup	Stenotomus chrysops	G?	S?
Sea lamprey	Petromyzon marinus	G5	S4
Shield darter	Percina peltata	G5	S3
Shorthead redhorse	Moxostoma macrolepidotum	G5	S4
Shortnose sturgeon	Acipenser brevirostrum	G3	S1
Silver shiner	Notropis photogenis	G5	SE
Silverjaw minnow	Ericymba buccata	G5	S4
Smallmouth bass	Micropterus dolomieu	G5	S5
Spanish mackerel	Scomberomorus maculatus	G5	S?
Spiny dogfish	Squalus acanthias	G?	S?
Spotfin killifish	Fundulus luciae	G4	S2?
Spotfin shiner	Cyprinella spiloptera	G5	S4
Spottail shiner	Notropis hudsonius	G5	S5
Stonecat	Noturus flavus	G5	S1
Stripeback darter	Percina notogramma	G4	S1
Striped bass	Morone saxatilis	G5	S5
Striped shiner	Luxilus chrysocephalus	G5	S1S2
Swallowtail shiner	Notropis procne	G5	S5
Swamp darter	Etheostoma fusiforme	G5	S2
Tadpole madtom	Noturus gyrinus	G5	S4
Tautog	Tautoga onitis	G?	S?
Tessellated darter	Etheostoma olmstedi	G5	S5
Threadfin shad	Dorosoma petenense	G5	SE?
Threespine stickleback	Gasterosteus aculeatus	G5	S?
Trout-perch	Percopsis omiscomaycus	G5	SX
Walleye	Stizostedion vitreum	G5	SE?
Warmouth	Lepomis gulosus	G5	S3?
White bass	Morone chrysops	G5	SE
White catfish	Ameiurus catus	G5	SU
White crappie	Pomoxis annularis	G5	SE
White perch	Morone americana	G5	S5
White sucker	Catostomus commersoni	G5	S5
Yellow bullhead	Ameiurus natalis	G5	S5
Yellow perch	Perca flavescens	G5	S5

INVERTEBRATES

DRAGONFLIES & DAMSELFLIES			
Allegheny river cruiser	Macromia alleghaniensis	G4	S2
Allegheny snaketail	Ophiogomphus incurvatus	G3	S2

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Amber-winged spreadwing	Lestes eurinus	G4	S3
American emerald	Cordulia shurtleffi	G5	S3
American rubyspot	Hetaerina americana	G5	S3S4
Appalachian jewelwing	Calopteryx angustipennis	G4	SP
Arrow clubtail	Stylurus spiniceps	G5	S3
Arrowhead spiketail	Cordulegaster obliqua	G4	S2
Ashy clubtail	Gomphus lividus	G5	S5
Atlantic bluet	Enallagma doubledayi	G5	SH
Attenuated bluet	Enallagma daeckii	G4	S3
Aurora damsel	Chromagrion conditum	G5	S3S4
Azure bluet	Enallagma aspersum	G5	S3S4
Banded pennant	Celithemis fasciata	G5	S3
Band-winged meadowhawk	Sympetrum semicinctum	G5	S3
Bar-winged skimmer	Libellula axilena	G5	S3
Beaverpond baskettail	Epitheca canis	G5	S3
Beaverpond clubtail	Gomphus borealis	G4	SP
Big bluet	Enallagma durum	G5	S3
Black saddlebags	Tramea lacerata	G5	S5
Black-shouldered spinyleg	Dromogomphus spinosus	G5	S4
Black-tipped darner	Aeshna tuberculifera	G4	S2
Blackwater bluet	Enallagma weewa	G5	S1
Blue corporal	Libellula deplanata	G5	S4S5
Blue dasher	Pachydiplax longipennis	G5	S5
Blue-faced meadowhawk	Sympetrum ambiguum	G5	S3S4
Blue-fronted dancer	Argia apicalis	G5	S4
Blue-ringed dancer	Argia sedula	G5	S3
Blue-tipped dancer	Argia tibialis	G5	S4
Brown spiketail	Cordulegaster bilineata	G5	S2
Burgundy bluet	Enallagma dubium	G5	S1
Calico pennant	Celithemis elisa	G5	S5
Canada darner	Aeshna canadensis	G5	S2
Carolina saddlebags	Tramea carolina	G5	S4S5
Chalk-fronted skimmer	Libellula julia	G5	S2
Cherry-faced meadowhawk	Sympetrum internum	G5	SR
Cinnamon shadowdragon	Neurocordulia virginiensis	G4	S1
Citrine forktail	Ischnura hastata	G5	S4S5
Clamp-tipped emerald	Somatochlora tenebrosa	G5	S3S4
Cobra clubtail	Gomphus vastus	G5	S3
Comet darner	Anax longipes	G5	S3
Common baskettail	Epitheca cynosura	G5	S5
Common green darner	Anax junius	G5	S5
Common sanddragon	Progomphus obscurus	G5	S3
Common spreadwing	Lestes disjunctus	G5	S5
Common whitetail	Libellula lydia	G5	S5
Crimson-ringed whiteface	Leucorrhinia glacialis	G5	S1
Cyrano darner	Nasiaeschna pentacantha	G5	S3

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Delta-spotted spiketail	Cordulegaster diastatops	G5	S3
Dot-tailed whiteface	Leucorrhinia intacta	G5	S3
Double-ringed pennant	Celithemis verna	G5	S2
Double-striped bluet	Enallagma basidens	G5	S4
Dragonhunter	Hagenius brevistylus	G5	S4
Dusky clubtail	Gomphus spicatus	G5	SP
Dusky dancer	Argia translata	G5	S4
Eastern amberwing	Perithemis tenera	G5	S5
Eastern forktail	Ischnura verticalis	G5	S5
Eastern pondhawk	Erythemis simplicicollis	G5	S5
Eastern red damsel	Amphiagrion saucium	G5	S3
Eastern ringtail	Erpetogomphus designatus	G5	S2
Ebony jewelwing	Calopteryx maculata	G5	S5
Elegant spreadwing	Lestes inaequalis	G5	S4
Elfin skimmer	Nannothemis bella	G4	S1
Elusive clubtail	Stylurus notatus	G3	SU
Emerald spreadwing	Lestes dryas	G5	SH
Faded pennant	Celithemis ornata	G5	S1
Familiar bluet	Enallagma civile	G5	S5
Fawn darner	Boyeria vinosa	G5	S4S5
Fine-lined emerald	Somatochlora filosa	G5	S2
Flag-tailed spinyleg	Dromogomphus spoliatus	G4G5	SR
Four-spotted pennant	Brachymesia gravida	G5	S3S4
Four-spotted skimmer	Libellula quadrimaculata	G5	SA?
Fragile forktail	Ischnura posita	G5	S5
Frosted whiteface	Leucorrhinia frigida	G5	SP
Furtive forktail	Ischnura prognata	G4	SP
Georgia river cruiser	Macromia illinoiensis georgina	G5T5	S3S4
Golden bluet	Enallagma sulcatum	G4	SU
Golden-winged skimmer	Libellula auripennis	G5	S3
Gray petaltail	Tachopteryx thoreyi	G4	S2
Great blue skimmer	Libellula vibrans	G5	S4S5
Great spreadwing	Archilestes grandis	G5	S3
Greater hyacinth glider	Miathyria marcella	G5	SA
Green-faced clubtail	Gomphus viridifrons	G3	S1
Green-striped darner	Aeshna verticalis	G5	S2
Hagen's bluet	Enallagma hageni	G5	S3S4
Halloween pennant	Celithemis eponina	G5	S4S5
Harlequin darner	Gomphaeschna furcillata	G5	S3
Harpoon clubtail	Gomphus descriptus	G4	S1
Hudsonian whiteface	Leucorrhinia hudsonica	G5	S1
Illinois river cruiser	Macromia illinoiensis	G5	S4
Jane's meadowhawk	Sympetrum janeae	G5	SU
Lake darner	Aeshna eremita	G5	SR
Lancet clubtail	Gomphus exilis	G5	S5
Lance-tipped darner	Aeshna constricta	G5	SH

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Laura's clubtail	Stylurus laurae	G4	S2
Least clubtail	Stylogomphus albistylus	G5	S3S4
Lilypad clubtail	Arigomphus furcifer	G5	SP
Lilypad forktail	Ischnura kellicotti	G5	S3S4
Little blue dragonlet	Erythrodiplax minuscula	G5	S1
Lyre-tipped spreadwing	Lestes unguiculatus	G5	SH
Maine snaketail	Ophiogomphus mainensis	G4	SP
Mantled baskettail	Epitheca semiaquea	G4	SH
Marsh bluet	Enallagma ebrium	G5	SH
Martha's pennant	Celithemis martha	G4	S2
Midland clubtail	Gomphus fraternus	G5	S2
Mocha emerald	Somatochlora linearis	G5	S3S4
Needham's skimmer	Libellula needhami	G5	S4S5
Northern pygmy clubtail	Lanthus parvulus	G4	S1
Ocellated darner	Boyeria grafiana	G5	S1
Orange bluet	Enallagma signatum	G5	S4
Painted skimmer	Libellula semifasciata	G5	S4S5
Pale bluet	Enallagma pallidum	G4	SH
Petite emerald	Dorocordulia lepida	G5	SH
Piedmont clubtail	Gomphus parvidens	G4	SH
Powdered dancer	Argia moesta	G5	S4
Prince baskettail	Epitheca princeps	G5	S4
Pronghorn clubtail	Gomphus graslinellus	G5	SR
Rainbow bluet	Enallagma antennatum	G5	S1
Rambur's forktail	Ischnura ramburii	G5	S4
Rapids clubtail	Gomphus quadricolor	G3G4	S1
Red-mantled saddlebags	Tramea onusta	G5	SA
Riffle snaketail	Ophiogomphus carolus	G5	SP
River jewelwing	Calopteryx aequabilis	G5	S1
Riverine clubtail	Stylurus amnicola	G4	SH
Robust baskettail	Epitheca spinosa	G4	S1S2
Roseate skimmer	Orthemis ferruginea	G5	SA
Royal river cruiser	Macromia taeniolata	G5	S3
Ruby meadowhawk	Sympetrum rubicundulum	G5	S4
Russet-tipped clubtail	Stylurus plagiatus	G5	S3
Rusty snaketail	Ophiogomphus rupinsulensis	G5	S2
Sable clubtail	Gomphus rogersi	G4	S1
Seaside dragonlet	Erythrodiplax berenice	G5	S4
Sedge sprite	Nehalennia irene	G5	S3
Seepage dancer	Argia bipunctulata	G4	S3
Selys' sunfly	Helocordulia selysii	G4	S2
Shadow darner	Aeshna umbrosa	G5	S4
Skillet clubtail	Gomphus ventricosus	G3	SH
Skimming bluet	Enallagma geminatum	G5	S4S5
Ski-tailed emerald	Somatochlora elongata	G5	S1
Slaty skimmer	Libellula incesta	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Slender bluet	Enallagma traviatum	G5	S3
Slender spreadwing	Lestes rectangularis	G5	S4S5
Smoky rubyspot	Hetaerina titia	G5	SH
Southern pygmy clubtail	Lanthus vernalis	G4	S1
Southern sprite	Nehalennia integricollis	G5	S1S2
Sparkling jewelwing	Calopteryx dimidiata	G5	SH
Sphagnum sprite	Nehalennia gracilis	G5	S2
Spine-crowned clubtail	Gomphus abbreviatus	G3G4	SH
Spiny baskettail	Epitheca spinigera	G5	SP
Splendid clubtail	Gomphus lineatifrons	G4	SH
Spotted spreadwing	Lestes congener	G5	S3
Spot-winged glider	Pantala hymenaea	G5	S5
Spring blue darner	Aeshna mutata	G3G4	S1
Springtime darner	Basiaeschna janata	G5	S4
Stream bluet	Enallagma exsulans	G5	S5
Stream cruiser	Didymops transversa	G5	S4S5
Striped saddlebags	Tramea calverti	G5	SA
Stripe-winged baskettail	Epitheca costalis	G4	S1
Stygian shadowdragon	Neurocordulia yamaskanensis	G5	S2
Superb jewelwing	Calopteryx amata	G4	S2
Swamp darner	Epiaeschna heros	G5	S5
Swamp spreadwing	Lestes vigilax	G5	S4
Sweetflag spreadwing	Lestes forcipatus	G5	S3
Taper-tailed darner	Gomphaeschna antilope	G4	S2
Tiger spiketail	Cordulegaster erronea	G4	S2
Treetop emerald	Somatochlora provocans	G4	S1
Tule bluet	Enallagma carunculatum	G5	SH
Turquoise bluet	Enallagma divagans	G5	S3S4
Twelve-spotted skimmer	Libellula pulchella	G5	S4S5
Twin-spotted spiketail	Cordulegaster maculata	G5	S4
Uhler's sundragon	Helocordulia uhleri	G5	S3
Umber shadowdragon	Neurocordulia obsoleta	G4	S3
Unicorn clubtail	Arigomphus villosipes	G5	S4
Variable dancer	Argia fumipennis	G5	S4S5
Vesper bluet	Enallagma vesperum	G5	S3
Wandering glider	Pantala flavescens	G5	S5
White corporal	Libellula exusta	G4	S1
White-faced meadowhawk	Sympetrum obtrusum	G5	S3
White-spangled skimmer	Libellula cyanea	G5	S5
Widow skimmer	Libellula luctuosa	G5	S5
Yellow-legged meadowhawk	Sympetrum vicinum	G5	S5
Yellow-sided skimmer	Libellula flavida	G5	S2
Zebra clubtail	Stylurus scudderi	G4	S1
BUTTERFLIES & MOTHS			
A borer moth	Papaipema arctivorens	G5	S?

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
A borer moth	Papaipema baptisiae	G4	S?
A borer moth	Papaipema cataphracta	G5	S?
A borer moth	Papaipema cerussata	G5	S?
A borer moth	Papaipema marginidens	G4	S4
A borer moth	Papaipema nebris	G5	S?
A borer moth	Papaipema rutila	G4	S?
A borer moth	Papaipema stenocelis	G4	S?
A geometer moth	Apodrepanulatrix liberaria	G4	SU
A geometrid moth	Cyclophora nanaria	G5	S1?
A geometrid moth	Idaea eremiata	G4	S1?
A geometrid moth	Semiothisa aequiferaria	G5	S?
A lasiocampid moth	Artace cribraria	G5	S5
A lasiocampid moth	Tolype notialis	G?	S4
A lymantriid moth	Dasychira atrivenosa	G4	SU
A moth	Caripeta aretaria	G4	S4
A noctuid moth	Apamea apamiformis	G4	S2S3
A noctuid moth	Apamea mixta	GU	S1
A noctuid moth	Apamea plutonia	G4	SU
A noctuid moth	Capis curvata	G4	S1S2
A noctuid moth	Catocala praeclara	G5	S?
A noctuid moth	Elaphria georgei	G4	SU
A noctuid moth	Euxoa immixta	G4	S?
A noctuid moth	Hadena ectypa	G3G4	SU
A noctuid moth	Macrochilo hypocritalis	G4	S4?
A noctuid moth	Meropleon diversicolor	G4	S?
A noctuid moth	Meropleon titan	G2G4	SU
A noctuid moth	Renia nemoralis	G4	S1S3
A noctuid moth	Schinia parmeliana	GU	SH
A noctuid moth	Xestia bollii	G4?	SU
A noctuid moth	Zale curema	G3G4	S1?
A noctuid moth	Zale obliqua	G5	S4S5
A noctuid moth	Zale squamularis	G4	SU
A noctuid moth	Zale submediana	G4	S1S3
Aaron's skipper	Poanes aaroni	G4	S4
Acadian hairstreak	Satyrium acadicum	G5	SA
American chestnut nepticulid moth	Ectoedemia castaneae	GH	SH
American copper	Lycaena phlaeas	G5	S5
American holly azure	Celastrina idella	G4G5	S?
American lady	Vanessa virginiensis	G5	S5B,SZN
American snout	Libytheana carinenta	G5	SZB,SZN
An underwing moth	Catocala amica	G5	S?
An underwing moth	Catocala andromedae	G5	S?
An underwing moth	Catocala carissima	G5	S?
An underwing moth	Catocala cerogama	G5	S?
An underwing moth	Catocala coccinata	G5	S?
An underwing moth	Catocala dejecta	G4	S?

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
An underwing moth	Catocala flebilis	G5	S?
An underwing moth	Catocala grynea	G5	S?
An underwing moth	Catocala habilis	G5	S?
An underwing moth	Catocala innubens	G5	S?
An underwing moth	Catocala judith	G5	S?
An underwing moth	Catocala lineella	G5	S?
An underwing moth	Catocala maestosa	G5	S?
An underwing moth	Catocala micronympha	G5	S?
An underwing moth	Catocala muliercula	G5	S?
An underwing moth	Catocala palaeogama	G5	S?
An underwing moth	Catocala parta	G5	S?
An underwing moth	Catocala relicta	G5	S?
An underwing moth	Catocala residua	G5	S?
An underwing moth	Catocala similis	G5	S?
An underwing moth	Catocala sordida	G5	S?
An underwing moth	Catocala subnata	G5	S?
An underwing moth	Catocala ultronia	G5	S?
An underwing moth	Catocala vidua	G5	S?
Aphrodite fritillary	Speyeria aphrodite	G5	S4
Appalachian blue	Celastrina neglectamajor	G4	S3S4
Appalachian eyed brown	Satyrodes appalachia	G4	S4
Aralia shoot borer moth	Papaipema araliae	G3G4	S?
Ash borer moth	Papaipema furcata	G4	S?
Atlantis fritillary	Speyeria atlantis	G5	S1
Aureolaria seed borer	Rhodoecia aurantiago	G4	S?
Baltimore checkerspot	Euphydryas phaeton	G4	S3
Banded hairstreak	Satyrium calanus	G5	S5
Barred yellow	Eurema daira	G5	SAN
Barrens xylotype	Xylotype capax	G4	SU
Black dash	Euphyes conspicuus	G4	S4
Black swallowtail	Papilio polyxenes	G5	S5
Black-waved flannel moth	Lagoa crispata	G5	SU
Bog copper	Lycaena epixanthe	G4G5	S1
Brazilian skipper	Calpodes ethlius	G5	SAN
Broad-lined catopyrrha	Erastria coloraria	G4	SH
Broad-winged skipper	Poanes viator	G5	S4
Bronze copper	Lycaena hyllus	G5	S4
Brown elfin	Incisalia augustinus	G5	S4
Cannubial underwing	Catocala connubialis	G5	S?
Carolina satyr	Hermeuptychia sosybius	G5	S1S3
Checkered white	Pontia protodice	G4	S4
Chermock's mulberry wing	Poanes massasoit chermocki	G4T1	S1
Chestnut clearwing moth	Synanthedon castaneae	G3G5	SX
Clouded skipper	Lerema accius	G5	SZN
Clouded sulphur	Colias philodice	G5	S5
Clouded underwing	Catocala nebulosa	G5	S?

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Cloudless sulphur	Phoebis sennae	G5	SZB,SZN
Cobweb skipper	Hesperia metea	G4G5	S3
Common buckeye	Junonia coenia	G5	S5B,SZN
Common checkered-skipper	Pyrgus communis	G5	S5
Common ptichodis	Ptichodis herbarum	G4	S?
Common roadside-skipper	Amblyscirtes vialis	G5	S4
Common sootywing	Pholisora catullus	G5	S5
Common wood-nymph	Cercyonis pegala	G5	S5
Compton tortoiseshell	Nymphalis vaualbum	G5	S1B,SZN
Confused cloudywing	Thorybes confusis	G4	SU
Coral hairstreak	Harkenclenus titus	G5	S4
Crossline skipper	Polites origenes	G5	S5
Cypress sphinx moth	Isoparce cupressi	G4	SU
Darling underwing	Catocala cara	G5	S?
Delaware skipper	Atrytone logan	G5	S4
Diana fritillary	Speyeria diana	G3	SAH
Dion skipper	Euphyes dion	G4	S3
Dog face	Colias cesonia	G5	SAN
Dotted skipper	Hesperia attalus slossonae	G3G4T3	SH
Dreamy duskywing	Erynnis icelus	G5	S5
Dun skipper	Euphyes vestris	G5	S5
Dusky azure	Celastrina ebenina	G4	SH
Dusted skipper	Atrytonopsis hianna	G4G5	S4
Early hairstreak	Erora laeta	G3G4	S1
Eastern comma	Polygonia comma	G5	S5
Eastern pine elfin	Incisalia niphon	G5	S4
Eastern tailed-blue	Everes comyntas	G5	S5
Eastern tiger swallowtail	Papilio glaucus	G5	S5
Edwards' hairstreak	Satyrium edwardsii	G4	S1
Epione underwing	Catocala epione	G5	S?
Esther moth	Hypagyrtis esther	G5	S5
Eufala skipper	Lerodea eufala	G5	SAN
European cabbage white	Pieris rapae	G5	SE
European skipper	Thymelicus lineola	G5	SE
Falcate orange tip	Anthocharis midea	G4G5	S5
Fiery skipper	Hylephila phyleus	G5	SZB,SZN
Footpath sallow moth	Metaxaglaea semitaria	G5	S4
Four-lined chocolate moth	Argyrostrotis quadrifilaris	G4	S?
Franck's sphinx	Sphinx franckii	G4	S1S2
Frosted elfin	Incisalia irus	G3	S1
Gemmed satyr	Cyllopsis gemma	G5	SR
Giant swallowtail	Papilio cresphontes	G5	S2
Golden-banded skipper	Autochton cellus	G4	SH
Graceful underwing	Catocala gracilis	G5	S?
Gray comma	Polygonia progne	G5	S1S3
Gray hairstreak	Strymon melinus	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Great purple hairstreak	Atlides halesus	G5	S1S2
Great southern white	Ascia monuste	G5	SAN
Great spangled fritillary	Speyeria cybele	G5	S5
Gulf fritillary	Agraulis vanillae	G5	SAN
Gypsy moth	Lymantria dispar	G5	SE
Hackberry emperor	Asterocampa celtis	G5	S5
Harris's checkerspot	Chlosyne harrisii	G4	S2
Harvester	Feniseca tarquinius	G4	S4
Hayhurst's scallopwing	Staphylus hayhurstii	G5	S4
Henry's elfin	Incisalia henrici	G5	S4
Hessel's hairstreak	Mitoura hesseli	G3G4	SH
Hickory hairstreak	Satyrium caryaevorum	G4	S1
Hoary edge	Achalarus lyciades	G5	S5
Hoary elfin	Callophrys polios	G5	S1
Hobomok skipper	Poanes hobomok	G5	S5
Horace's duskywing	Erynnis horatius	G5	S5
Ilia underwing	Catocala ilia	G5	S?
Indian skipper	Hesperia sassacus	G5	S3
Joyful holomelina moth	Holomelina laeta	G5	S1?
Juniper hairstreak	Mitoura grynea	G5	S4
Juvenal's duskywing	Erynnis juvenalis	G5	S5
King's hairstreak	Satyrium kingi	G3G4	S1
Large orange sulphur	Phoebis agarithe	G5	SA
Least skipper	Ancyloxypha numitor	G5	S5
Lemmer's noctuid moth	Lithophane lemmeri	G3G4	S?
Leonard's skipper	Hesperia leonardus	G4	S4
Little glassywing	Pompeius verna	G5	S5
Little metalmark	Calephelis virginiensis	G4	SR
Little sulphur	Eurema lisa	G5	SZB,SZN
Little wood satyr	Megisto cymela	G5	S5
Long dash	Polites mystic	G5	S3
Long-tailed skipper	Urbanus proteus	G5	SZN
Marbled underwing	Catocala marmorata	G3G4	SH
Meadow fritillary	Boloria bellona	G5	S4
Milbert's tortoiseshell	Nymphalis milberti	G5	SAN
Mitchell's satyr	Neonympha mitchellii	G1G2	SR
Monarch	Danaus plexippus	G4	SZB
Mottled duskywing	Erynnis martialis	G3G4	S1
Mourning cloak	Nymphalis antiopa	G5	S5B,SZN
Mulberry wing	Poanes massasoit	G4	S4
Northern broken-dash	Wallengrenia egeremet	G5	S5
Northern cloudywing	Thorybes pylades	G5	S5
Northern crescent	Phyciodes cocyta	G5	SP
Northern hairstreak	Fixsenia ontario	G4T4	S1S2
Northern metalmark	Calephelis borealis	G3G4	S2
Northern pearly-eye	Enodia anthedon	G5	S4

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Ocola skipper	Panoquina ocola	G5	SZN
Olympia marble	Euchloe olympia	G4G5	S2
Orange sulphur	Colias eurytheme	G5	S5
Packard's lichen moth	Cisthene packardii	G5	S5
Painted lady	Vanessa cardui	G5	S5B,SZN
Palamedes swallowtail	Papilio palamedes	G5	S1
Palatka skipper	Euphyes pilatka	G3G4	SA
Pearl crescent	Phyciodes tharos	G5	S5
Peck's skipper	Polites coras	G5	S5
Pepper and salt skipper	Amblyscirtes hegon	G5	S2
Persius duskywing	Erynnis persius persius	G5T2T3	SH
Phleophagan chestnut nepticulid moth	Ectoedemia phleophaga	GH	SH
Pine barrens zanclognatha	Zanclognatha martha	G4	S1S3
Pine devil	Citheronia sepulcralis	G5	S4
Pink-edged sulphur	Colias interior	G5	S1
Pipevine swallowtail	Battus philenor	G5	S4
Polymnia stalk borer	Papaipema polymniae	G4	SH
Precious underwing	Catocala pretiosa pretiosa	G4T2T3	SH
Question mark	Polygonia interrogationis	G5	S5
Rare skipper	Problema bulenta	G2G3	S1
Red admiral	Vanessa atalanta	G5	S5B,SZN
Red-banded hairstreak	Calycopis cecrops	G5	S4
Red-spotted purple	Limenitis arthemis	G5	S5
Regal fritillary	Speyeria idalia	G3	SH
Regal moth	Citheronia regalis	G5	S4
Sachem	Atalopedes campestris	G5	SZB,SZN
Salt marsh skipper	Panoquina panoquin	G5	S4
Seaside goldenrod stem borer	Papaipema duovata	G4	SU
Silver-bordered fritillary	Boloria selene	G5	S3
Silver-spotted skipper	Epargyreus clarus	G5	S5
Silvery blue	Glaucopsyche lygdamus	G5	S2
Silvery checkerspot	Chlosyne nycteis	G5	S4
Sinuous lytrosis	Lytrosis sinuosa	G4	S1S3
Sleepy duskywing	Erynnis brizo	G5	S5
Sleepy orange	Eurema nicippe	G5	SZB,SZN
Southern broken-dash	Wallengrenia otho	G5	S3S4
Southern cloudywing	Thorybes bathyllus	G5	S4
Southern grizzled skipper	Pyrgus wyandot	G2	S1
Southern hairstreak	Fixsenia favonius	G4	S?
Southern ptichodis	Ptichodis bistrigata	G3	S?
Southern variable dart moth	Anomogyna elimata	G5	S5
Spicebush swallowtail	Papilio troilus	G5	S5
Spiny oakworm	Anisota stigma	G5	S4
Spring azure	Celastrina argiolus	G5	S5
Striped hairstreak	Satyrium liparops	G5	S4
Summer azure	Celastrina neglecta	G5	S?

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Swarthy skipper	Nastra lherminier	G5	S5
Tawny crescent	Phyciodes batesii batesii	G4T1	SH
Tawny emperor	Asterocampa clyton	G5	S4
Tawny-edged skipper	Polites themistocles	G5	S5
Tearful underwing	Catocala lacrymosa	G5	S?
The bride	Catocala neogama	G5	S?
The buckmoth	Hemileuca maia maia	G5T5	SU
The penitent	Catocala piatrix	G5	S?
The sweetheart underwing	Catocala amatrix	G5	S?
Three-horned moth	Pachypolia atricornis	G3G4	SH
Twin-spot skipper	Oligoria maculata	G5	SAN
Two-spotted skipper	Euphyes bimacula	G4	S1
Variable tropic moth	Hemeroplanis scopulepes	G5	S?
Variegated fritillary	Euptoieta claudia	G5	SZB,SZN
Viceroy	Limenitis archippus	G5	S5
West virginia white	Pieris virginiensis	G3G4	S3
Whirlabout	Polites vibex	G5	SAN
White-m hairstreak	Parrhasius m-album	G5	S4
Wild indigo duskywing	Erynnis baptisiae	G5	S4
Yellow-gray underwing	Catocala retecta	G5	S?
Zabulon skipper	Poanes zabulon	G5	S5
Zarucco duskywing	Erynnis zarucco	G5	SAN
Zebra swallowtail	Eurytides marcellus	G5	S4
BEETLES			
A beetle	Hydrocolus deflatus	G?	S?
A cave beetle	Pseudanophthalmus sp 15	G1	S1
A chrysomelid beetle	Diabrotica cristata	G?	S?
A coccinellid beetle	Nephus gordoni	G?	SU
A dytiscid beetle	Agabetes acuductus	G?	S?
A dytiscid beetle	Hoperius planatus	G?	S2
A hydrophilid beetle	Hydrochara occultus	G?	SU
A hydrophilid beetle	Sperchopsis tessellatus	G?	S2
A hydrophylid beetle	Helocombus bifidus	G?	S?
A lampyrid firefly	Photuris bethaniensis	G1?	SP
A tenebrionid beetle	Schoenicus puberulus	G?	S?
A tiger beetle	Cicindela abdominalis	G5	S1
A tiger beetle	Cicindela ancocisconensis	G3	S1
A tiger beetle	Cicindela duodecimguttata	G5	S5
A tiger beetle	Cicindela marginata	G5	S5
A tiger beetle	Cicindela punctulata	G5	S5
A tiger beetle	Cicindela purpurea	G5	S3
A tiger beetle	Cicindela repanda	G5	S5
A tiger beetle	Cicindela rufiventris	G5	S4
A tiger beetle	Cicindela scutellaris	G5	S3
A tiger beetle	Cicindela sexguttata	G5	S5

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
A tiger beetle	Cicindela splendida	G5	S3
A tiger beetle	Cicindela tranquebarica	G5	S5
A tiger beetle	Cicindela unipunctata	G4	S3
A tiger beetle	Megacephala virginica	G5	S5
A water beetle	Cyphon sp 1	G?	S?
American burying beetle	Nicrophorus americanus	G2G3	SX
Beach-dune tiger beetle	Cicindela hirticollis	G5	S5
Big sand tiger beetle	Cicindela formosa	G5	SU
Black lordithon rove beetle	Lordithon niger	GU	SP
Cobblestone tiger beetle	Cicindela marginipennis	G2G3	SP
Giant stag beetle	Lucanus elephas	G3G5	S1
Green-patterned tiger beetle	Cicindela patruela	G3	S1
Little white tiger beetle	Cicindela lepida	G4	S1
Northeastern beach tiger beetle	Cicindela dorsalis dorsalis	G4T2	S1
Puritan tiger beetle	Cicindela puritana	G1G2	S1
Schwarz' diving beetle	Laccophilus schwarzi	G?	SX
Seth forest water scavenger beetle	Hydrochus spangleri	G1	S1
Six-banded longhorn beetle	Dryobius sexnotatus	G?	S1
White tiger beetle	Cicindela dorsalis media	G4T4	S1
OTHER INSECTS			
A scalaris trichopteran	Hydropsyche brunneipennis	G?	S3
A plecopteran	Allocapnia wrayi	G5	S?
A formicid ant	Proceratium croceum	G?	S?
A cicadellid leafhopper	Chlorotettix sp 1	G?	SU
Eastern sedge barrens planthopper	Limotettix minuendus	G1	S1
A microphysid bug	Chinaola quercicola	G?	S?
A mirid bug	Lygocoris nyssae	G?	S?
A plant bug	Hesperophylum heidemanni	G?	S?
A mayfly	Paraleptophlebia assimilis	G3	S?
A mayfly	Tricorythodes robacki	G3	S?
Walker's tusked sprawler	Potamanthus walkeri	G5	SU
A mosquito	Wyeomyia haynei	G4	S?
Pitcher-plant mosquito	Wyeomyia smithii	G5	S2
A springtail	Sinella cavernarum	G4G5	S?
A springtail	Sinella hoffmani	G4G5	S?
Crabtree cave springtail	Arrhopalites sp 1	G?	SU
SPIDERS			
Appalachian cave spider	Porhomma cavernicola	G4G5	S2
Red-legged purse-web spider	Sphodros rufipes	G4	S1S2
Snivelys cave spider	Oreonetides sp 1	G?	SU
CRUSTACEANS			
A branchiopod	Cyzicus mexicanus	G5	S?
A branchiopod	Eubranchipus holmanii	G5	S?

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
A branchiopod	Eubranchipus serratus	G5	S?
A branchiopod	Eubranchipus vernalis	G4	S?
A branchiopod	Streptocephalus sealii	G5	S?
A clam shrimp	Eulimnadia diversa	G5	SU
A crayfish	Cambarus acuminatus	G4	S3
A crayfish	Cambarus carolinus	G4	S?
A crayfish	Cambarus dubius	G5	S3S4
A crayfish	Fallicambarus uhleri	G5	S4
A crayfish	Orconectes obscurus	G5	S3
A cyclopoid copepod	Diacyclops palustris	G?	SU
A harpacticoid copepod	Attheyella spinipes	G?	SU
Allegheny cave amphipod	Stygobromus allegheniensis	G4	S2S3
American lobster	Homarus americanus	G?	S?
An amphipod	Stygobromus sp 6	G?	S1
An entocytherid ostracod	Ankylocythere tridentata	G?	SX
An entocytherid ostracod	Dactylocythere scotos	G?	S1
An isopod	Caecidotea sp 1	G1	S1
An isopod	Caecidotea sp 2	G?	S1
An isopod	Caecidotea sp 3	G3	S1
An isopod	Caecidotea sp 4	G?	S1
An isopod	Caecidotea sp 5	G?	S1
An isopod	Caecidotea sp 6	G?	S2
Appalachian brook crayfish	Cambarus bartonii	G5	S5
Barrelville amphipod	Stygobromus sp 5	G?	S1
Biggers' cave amphipod	Stygobromus biggersi	G2G4	S1
Blue crab	Callinectes sapidus	G?	S?
Dearolf's cave amphipod	Crangonyx dearolfi	G2G3	S1
Devil crawfish	Cambarus diogenes	G5	S4
Franz's cave amphipod	Stygobromus franzi	G2G3	S2S3
Franz's cave isopod	Caecidotea franzi	G2G3	S1
Greenbrier cave amphipod	Stygobromus emarginatus	G3	S1
Pizzini's amphipod	Stygobromus pizzinii	G2G4	S1
Potomac amphipod	Stygobromus tenuis potomacus	G4T3T4Q	S3
Price's cave isopod	Caecidotea pricei	G3G4	S3
Roundtop amphipod	Stygobromus sp 14	G?	S1
Shenandoah cave amphipod	Stygobromus gracilipes	G2G4	S1
Spinycheek crayfish	Orconectes limosus	G4G5	S4
Tenuis amphipod	Stygobromus tenuis tenuis	G4G5T2T3Q	SU
Tidewater amphipod	Stygobromus indentatus	G3	S1
Virile crayfish	Orconectes virilis	G5	SE
White river crawfish	Procambarus acutus	G5	S4
MEROSTOMATAN			
Horseshoe crab	Limulus polyphemus	G?	S?
MOLLUSCS			

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
A snail	Amnicola limosus	G5	SP
A snail	Aplexa elongata	G5	S?
A snail	Campeloma decisum	G5	SP
A snail	Elimia virginica	G4G5	SP
A snail	Ferrissia fragilis	G5	SP
A snail	Ferrissia parallelus	G5	SP
A snail	Ferrissia rivularis	G5	S?
A snail	Fossaria humilis	G5	SP
A snail	Fossaria obrussa	G5	S?
A snail	Fossaria parva	G5	S?
A snail	Gillia altilis	G5	SP
A snail	Gyraulus deflectus	G5	SP
A snail	Gyraulus parvus	G5	S?
A snail	Helisoma anceps	G5	S?
A snail	Leptoxis carinata	G5	SP
A snail	Lioplax subcarinata	G5	SP
A snail	Littoridinops tenuipes	G5	S?
A snail	Lyogyrus granum	G5	SP
A snail	Micromenetus dilatatus	G5	SP
A snail	Physella gyrina	G5	S?
A snail	Physella heterostropha	G5	SP
A snail	Planorbella trivolvis	G5	SP
A snail	Planorbula armigera	G5	SP
A snail	Pseudosuccinea columella	G5	SP
A snail	Stagnicola caperata	G5	S?
A snail	Stagnicola catascopium	G5	S?
A snail	Valvata tricarinata	G5	SP
A snail	Viviparus georgianus	G5	S?
Aldrich's spring snail	Fontigens aldrichi	G3G4	S?
Alewife floater	Anodonta implicata	G5	S3
American oyster	Crassostrea virginica	G5	S?
Angular disc	Discus catskillensis	G3G5	S1
Appalachian spring snail	Fontigens bottimeri	G2	S2
Asiatic clam	Corbicula fluminea	G5	SE
Atlantic spike	Elliptio producta	G4Q	S2S3
Bark snaggletooth	Gastrocopta corticaria	G4G5	SU
Bay scallop	Argopecten irradians	G?	S?
Bear creek slitmouth	Stenotrema simile	G?	SU
Blue ridge spring snail	Fontigens orolibas	G2G3	S1
Broad-banded forestsnail	Allogona profunda	G5	SU
Brook floater	Alasmidonta varicosa	G3	S1
Channel whelk	Busycotypus canaliculatus	G?	S?
Cherrydrop snail (cherrystone drop)	Hendersonia occulta	G4	S2
Common razor clam	Ensis directus	G?	S?
Creeper	Strophitus undulatus	G5	S2
Cylindrically-ornate wood snail	Vertigo ventricosa	G3G4	SU

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK
Dentate supercoil	Paravitrea multidentata	G4G5	SU
Dwarf wedge mussel	Alasmidonta heterodon	G1G2	S1
Eastern elliptio	Elliptio complanata	G5	S5
Eastern floater	Pyganodon cataracta	G5	S5
Eastern glass-snail	Vitrina angelicae	G?	SU
Eastern lampmussel	Lampsilis radiata	G5	SU
Eastern pondmussel	Ligumia nasuta	G4G5	SU
Flamed disc	Anguispira alternata	G5	S5
Green floater	Lasmigona subviridis	G3	S1
Hard-shell clam (northern quahog)	Mercenaria mercenaria	G?	S?
Inland slitmouth	Stenotrema stenotrema	G5	SU
Knobbed whelk	Busycon carica	G?	S?
Lightning whelk	Busycon sinistrum	G?	S?
Northern lance	Elliptio fisheriana	G4	S3
Paper pondshell	Utterbackia imbecillis	G5	S3
Plain pocketbook	Lampsilis cardium	G5	SE
Pocketbook	Lampsilis ovata	G5	SE
Rader's snail (maryland glyph)	Glyphyalinia raderi	G2	SH
Rust glyph	Glyphyalinia picea	G3	SU
Soft-shell clam	Mya arenaria	G?	S?
Spike-lip crater	Appalachina sayana	G4G5	SU
Spruce knob threetooth	Triodopsis picea	G3	S1
Striped whitelip	Webbhelix multilineata	G?	S1
Tidewater mucket	Leptodea ochracea	G4	SU
Triangle floater	Alasmidonta undulata	G4	S1
Variable vertigo	Vertigo gouldi	G4G5	SU
Watercress snail	Fontigens nickliniana	G5	SP
Yellow lampmussel	Lampsilis cariosa	G3G4	S1
Yellow lance	Elliptio lanceolata	G2G3	SU
FLATWORMS			
A planarian	Phagocata virilis	G?	S1
A planarian	Planaria dactyligera	G?	S2
A planarian	Procotyla typhlops	G1G2	S1
A planarian	Sphalloplana sp 1	G?	S1S2
Hoffmaster's cave planarian	Sphalloplana hoffmasteri	G2G3	S1

EXPLANATION OF CONSERVATION RANK CODES

Originally designed by The Nature Conservancy, the global and state ranking system is used by all 50 state Natural Heritage Programs and numerous Conservation Data Centers in other countries in this hemisphere, as well as by the coordinating organization, NatureServe. Because they are assigned based upon standard criteria, the ranks can be used to assess the range-wide status of a species as well as the status within portions of the species' range. The primary criterion used to define these ranks are the number of known distinct occurrences with consideration given to the total number of individuals at each locality. Additional factors considered include the current level of protection, the types and degree of threats, ecological vulnerability, and population trends. Global and state ranks are used in combination to set inventory, protection, and management priorities for species both at the state as well as regional level.

GLOBAL RANK

G1 Highly globally rare. Critically imperiled globally because of extreme rarity (typically 5 or fewer estimated occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 Globally rare. Imperiled globally because of rarity (typically 6 to 20 estimated occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 Either very rare and local throughout its range or distributed locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range; typically with 21 to 100 estimated occurrences.

G4 Apparently secure globally, although it may be quite rare in parts of its range, especially at the periphery.

G5 Demonstrably secure globally, although it may be quite rare in parts of its range, especially at the periphery.

GH No known extant occurrences (i.e., formerly part of the established biota, with the expectation that it may be rediscovered).

GU Possibly in peril range-wide, but its status is uncertain; more information is needed.

GX Believed to be extinct throughout its range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? The species has not yet been ranked.

_Q Species containing a "Q" in the rank indicates that the taxon is of questionable or uncertain taxonomic standing (i.e., some taxonomists regard it as a full species, while others treat it at an infraspecific level).

_T Ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species.

STATE RANK

S1 Highly State rare. Critically imperiled in Maryland because of extreme rarity (typically 5 or fewer estimated occurrences or very few remaining individuals or acres in the State) or because of some factor(s) making it especially vulnerable to extirpation. Species with this rank are actively tracked by the Natural Heritage Program.

S2 State rare. Imperiled in Maryland because of rarity (typically 6 to 20 estimated occurrences or few remaining individuals or acres in the State) or because of some factor(s) making it vulnerable to becoming extirpated. Species with this rank are actively tracked by the Natural Heritage Program.

S3 Rare to uncommon with the number of occurrences typically in the range of 21 to 100 in Maryland. It may have fewer occurrences but with a large number of individuals in some populations, and it may be susceptible to large-scale disturbances. Species with this rank are not actively tracked by the Natural Heritage Program.

S3.1 A species that is actively tracked by the Natural Heritage Program because of the global significance of Maryland occurrences. For instance, a G3 S3 species is globally rare to

uncommon, and although it may not be currently threatened with extirpation in Maryland, its occurrences in Maryland may be critical to the long term security of the species. Therefore, its status in the State is being monitored.

S4 Apparently secure in Maryland with typically more than 100 occurrences in the State or may have fewer occurrences if they contain large numbers of individuals. It is apparently secure under present conditions, although it may be restricted to only a portion of the State.

S5 Demonstrably secure in Maryland under present conditions.

SA Accidental or considered to be a vagrant in Maryland.

SE Established, but not native to Maryland; it may be native elsewhere in North America.

SH Historically known from Maryland, but not verified for an extended period (usually 20 or more years), with the expectation that it may be rediscovered.

SP Potentially occurring in Maryland or likely to have occurred in Maryland (but without persuasive documentation).

SR Reported from Maryland, but without persuasive documentation that would provide a basis for either accepting or rejecting the report (e.g., no voucher specimen exists).

SU Possibly rare in Maryland, but of uncertain status for reasons including lack of historical records, low search effort, cryptic nature of the species, or concerns that the species may not be native to the State. Uncertainty spans a range of 4 or 5 ranks as defined above.

SX Believed to be extirpated in Maryland with virtually no chance of rediscovery.

SZ A migratory species which does not inhabit specific locations for long periods of time.

S? The species has not yet been ranked.

_B This species is migratory and the rank refers only to the breeding status of the species. Such a migrant may have a different rarity rank for non-breeding populations.

_N This species is migratory and the rank refers only to the non-breeding status of the species. Such a migrant may have a different rarity rank for breeding populations.

This table lists the statewide population estimates and relative rarity as determined by the MBSS for fish species collected by the MBSS during 2000-2004. Many of the following species occur primarily in estuaries, tidal streams, reservoirs, ponds, or larger rivers; these population estimates are for 1st to 4th order freshwater streams.

Family	Common Name	Scientific Name	Population Estimate	Standard Error	Relative Standard Error	Rarity Weighted Index
Petromyzontidae						
	Least Brook Lamprey	*Lampetra aepyptera*	1,218,006	444,019	0.36	50.0
	American Brook Lamprey	*Lampetra appendix*	16,085	8,853	0.55	8.3
	Sea Lamprey	*Petromyzon marinus*	312,474	144,423	0.46	31.0
Lepisosteidae						
	Longnose Gar	*Lepisosteus osseus*	- -	- -	- -	2.4
Anguillidae						
	American Eel	*Anguilla rostrata*	1,885,854	237,320	0.13	85.7
Clupeidae						
	Blueback Herring	*Alosa aestivalis*	- -	- -	- -	1.2
	Alewife	*Alosa pseudoharengus*	939	939	1.00	2.4
	American Shad	*Alosa sapidissima*	34,106	33,966	1.00	1.2
	Gizzard Shad	*Dorosoma cepedianum*	17,342	7,319	0.42	11.9
Cyprinidae						
	Central Stoneroller	*Campostoma anomalum*	1,275,817	285,890	0.22	39.3
	Goldfish	*Carassius auratus*	2,984	1,024	0.34	20.2

Family	Common Name	Scientific Name	Population Estimate	Standard Error	Relative Standard Error	Rarity Weighted Index
	Rosyside Dace	*Clinostomus funduloides*	2,768,643	252,152	0.09	66.7
	Satinfin Shiner	*Cyprinella analostana*	366,824	97,017	0.26	54.8
	Spotfin Shiner	*Cyprinella spiloptera*	444,668	198,406	0.45	50.0
	Common Carp	*Cyprinus carpio*	2,777	1,073	0.39	36.9
	Cutlip Minnow	*Exoglossum maxillingua*	513,129	67,232	0.13	45.2
	Eastern Silvery Minnow	*Hybognathus regius*	65,493	55,693	0.85	32.1
	Striped Shiner	*Luxilus chrysocephalus*	190	190	1.00	3.6
	Common Shiner	*Luxilus cornutus*	982,909	177,389	0.18	54.8
	Pearl Dace	*Margariscus margarita*	134,983	110,418	0.82	6.0
	River Chub	*Nocomis micropogon*	1,208,206	780,994	0.65	47.6
	Golden Shiner	*Notemigonus crysoleucas*	748,061	151,793	0.20	79.8
	Comely Shiner	*Notropis amoenus*	13,053	7,129	0.55	17.9
	Silverjaw Minnow	*Notropis buccatus*	515,093	313,406	0.61	14.3
	Ironcolor Shiner	*Notropis chalybaeus*	4,800	4,800	1.00	4.8
	Spottail Shiner	*Notropis hudsonius*	2,454,881	1,771,155	0.72	66.7
	Swallowtail Shiner	*Notropis procne*	897,541	199,182	0.22	53.6
	Rosyface Shiner	*Notropis rubellus*	183,922	82,316	0.45	34.5
	Bluntnose Minnow	*Pimephales notatus*	6,522,897	2,652,632	0.41	41.7
	Fathead Minnow	*Pimephales promelas*	87,984	32,852	0.37	36.9
	Eastern Blacknose Dace	*Rhinichthys atratulus*	14,343,129	798,493	0.06	81.0
	Longnose Dace	*Rhinichthys cataractae*	2,524,940	313,648	0.12	56.0
	Creek Chub	*Semotilus atromaculatus*	3,524,739	289,317	0.08	69.0
	Fallfish	*Semotilus corporalis*	1,178,279	294,751	0.25	65.5
Catostomidae						
	White Sucker	*Catostomus commersonii*	2,967,035	281,078	0.09	79.8
	Creek Chubsucker	*Erimyzon oblongus*	687,579	115,343	0.17	70.2
	Northern Hog Sucker	*Hypentelium nigricans*	265,115	62,861	0.24	51.2
	Golden Redhorse	*Moxostoma erythrurum*	12,539	7,714	0.62	19.0
	Shorthead Redhorse	*Moxostoma macrolepidotum*	118	118	1.00	7.1
Ictaluridae						
	White Catfish	*Ameiurus catus*	301	301	1.00	11.9
	Yellow Bullhead	*Ameiurus natalis*	258,624	91,832	0.36	67.9
	Brown Bullhead	*Ameiurus nebulosus*	460,987	488,224	1.06	77.4
	Channel Catfish	*Ictalurus punctatus*	3,724	2,270	0.61	20.2
	Stonecat	*Noturus flavus*	660	- -	- -	1.2
	Tadpole Madtom	*Noturus gyrinus*	202,218	133,798	0.66	33.3
	Margined Madtom	*Noturus insignis*	733,458	408,676	0.56	69.0
Esocidae						
	Redfin Pickerel	*Esox americanus*	570,126	129,532	0.23	47.6
	Chain Pickerel	*Esox niger*	68,680	11,043	0.16	40.5
Umbridae						
	Eastern Mudminnow	*Umbra pygmaea*	12,498,604	2,140,057	0.17	54.8
Salmonidae						

Family	Common Name	Scientific Name	Population Estimate	Standard Error	Relative Standard Error	Rarity Weighted Index
	Cutthroat Trout	*Oncorhynchus clarki*	117	117	1.00	3.6
	Rainbow Trout	*Oncorhynchus mykiss*	14,514	4,793	0.33	38.1
	Brown Trout	*Salmo trutta*	247,316	93,617	0.38	38.1
	Brook Trout	*Salvelinus fontinalis*	407,262	69,942	0.17	21.4
Aphredoderidae						
	Pirate Perch	*Aphredoderus sayanus*	1,549,770	905,638	0.58	31.0
Atherinidae						
	Inland Silverside	*Menidia beryllina*	1,108	1,108	1.00	1.2
Fundulidae						
	Banded Killifish	*Fundulus diaphanus*	109,101	47,412	0.43	34.5
	Mummichog	*Fundulus heteroclitus*	197,474	96,245	0.49	29.8
	Striped Killifish	*Fundulus majalis*	- -	- -	- -	1.2
Poeciliidae						
	Mosquitofish	*Gambusia holbrooki*	376,892	164,792	0.44	52.4
Cottidae						
	Blue Ridge Sculpin	*Cottus caeruleomentum*	7,341,496	830,343	0.11	41.7
	Mottled Sculpin	*Cottus bairdii*	687,961	186,349	0.27	3.6
	Checkered Sculpin	*Cottus sp.*	60,251	41,524	0.69	2.4
	Potomac Sculpin	*Cottus girardi*	1,504,276	394,846	0.26	26.2
Percichthyidae						
	White Perch	*Morone americana*	1,791	862	0.48	31.0
	Striped Bass	*Morone saxatilis*	1,857	952	0.51	16.7
Centrarchidae						
	Mud Sunfish	*Acantharchus pomotis*	9,128	3,377	0.37	10.7
	Rock Bass	*Ambloplites rupestris*	190,134	43,192	0.23	38.1
	Flier	*Centrarchus macropterus*	6,588	5,197	0.79	6.0
	Bluespotted Sunfish	*Enneacanthus gloriosus*	494,446	108,404	0.22	34.5
	Banded Sunfish	*Enneacanthus obesus*	83,702	43,633	0.52	14.3
	Redbreast Sunfish	*Lepomis auritus*	771,869	104,004	0.13	78.6
	Green Sunfish	*Lepomis cyanellus*	1,000,153	255,245	0.26	69.0
	Pumpkinseed	*Lepomis gibbosus*	893,175	164,911	0.18	96.4
	Warmouth	*Lepomis gulosus*	34,429	18,597	0.54	17.9
	Bluegill	*Lepomis macrochirus*	1,630,342	240,248	0.15	96.4
	Longear Sunfish	*Lepomis megalotis*	16,114	6,551	0.41	14.3
	Smallmouth Bass	*Micropterus dolomieu*	275,775	49,812	0.18	54.8
	Largemouth Bass	*Micropterus salmoides*	236,345	31,312	0.13	96.4
	Black Crappie	*Pomoxis nigromaculatus*	15,048	8,031	0.53	35.7
	White Crappie	*Pomoxis annularis*				1.2
Percidae						
	Greenside Darter	*Etheostoma blennioides*	2,658,390	4,767,241	1.79	22.6
	Rainbow Darter	*Etheostoma caeruleum*	249,336	82,811	0.33	14.3
	Fantail Darter	*Etheostoma flabellare*	2,137,230	424,363	0.20	29.8
	Swamp Darter	*Etheostoma fusiforme*	9,734	3,742	0.38	14.3
	Johnny Darter	*Etheostoma nigrum*	31,958	16,142	0.51	3.6

Family	Common Name	Scientific Name	Population Estimate	Standard Error	Relative Standard Error	Rarity Weighted Index
	Tessellated Darter	*Etheostoma olmstedi*	4,907,866	612,645	0.12	86.9
	Glassy Darter	*Etheostoma vitreum*	27,602	23,244	0.84	7.1
	Banded Darter	*Etheostoma zonale*	- -	- -	- -	2.4
	Yellow Perch	*Perca flavescens*	13,321	5,210	0.39	42.9
	Logperch	*Percina caprodes*	1,342	1,342	1.00	4.8
	Stripeback Darter	*Percina notogramma*	- -	- -	- -	1.2
	Shield Darter	*Percina peltata*	60,567	23,125	0.38	16.7
Sciaenidae						
	Spot	*Leiostomus xanthurus*				1.2

The following table is a provisional list of an additional 516 species of estuarine and marine fishes that are known to occur or that may occur in Maryland. This list was compiled primarily from the online database **www.fishbase.org**.

COMMON NAME	SCIENTIFIC NAME
A barracudina	Sudis hyalina
A bigscale	Melamphaes pumilus
A conger	Acromycter atlanticus
A cusk-eel	Bassogigas gillii
A cusk-eel	Bassozetus normalis
A cusk-eel	Holcomycteronus squamosus
A cusk-eel	Ophidion robinsi
A greeneye	Chlorophthalmus chalybeius
A grenadier	Coryphaenoides alateralis
A halosaur	Halosaurus guentheri
A lanternfish	Bolinichthys photothorax
A lanternfish	Diaphus dumerilii
A lanternfish	Diaphus mollis
A lanternfish	Hygophum hygomii
A lanternfish	Hygophum taaningi
A lanternfish	Lampadena urophaos atlantica
A lanternfish	Lampanyctus alatus
A lanternfish	Lampanyctus pusillus
A lanternfish	Lepidophanes guentheri
A lanternfish	Myctophum obtusirostre
A lanternfish	Nannobrachium atrum
A lanternfish	Nannobrachium lineatum
A loosejaw	Photostomias guernei
A morid cod	Laemonema melanurum
A scaleless dragonfish	Bathophilus brevis
A scaleless dragonfish	Bathophilus vaillanti
A scaleless dragonfish	Chirostomias pliopterus

COMMON NAME	SCIENTIFIC NAME
A scaleless dragonfish	Echiostoma barbatum
A scaleless dragonfish	Eustomias enbarbatus
A scaleless dragonfish	Eustomias filifer
A scaleless dragonfish	Eustomias obscurus
A scaleless dragonfish	Flagellostomias boureei
A scaleless dragonfish	Leptostomias gladiator
A scaleless dragonfish	Photonectes braueri
A scaleless dragonfish	Photonectes dinema
A scaly dragonfish	Stomias longibarbatus
A snaggletooth	Astronesthes niger
A snaggletooth	Neonesthes capensis
A snipe eel	Labichthys carinatus
A spiderfish	Bathypterois viridensis
A spiny eel	Polyacanthonotus africanus
A stingray	Dasyatis hastata
A waryfish	Scopelosaurus smithii
Abyssal halosaur	Halosauropsis macrochir
African pompano	Alectis ciliaris
Agujon needlefish	Tylosurus acus acus
Albacore (longfin) tuna	Thunnus alalunga
Almaco jack	Seriola rivoliana
Monkfish	Lophius americanus
Butterfish	Peprilus triacanthus
American conger eel	Conger oceanicus
Fourspot flounder	Hippoglossina oblonga
American halfbeak	Hyporhamphus meeki
American harvestfish	Peprilus paru
American sand lance	Ammodytes americanus
American stardrum	Stellifer lanceolata
Angler	Lophius piscatorius
Antenna codlet	Bregmaceros atlanticus
Armored searobin	Peristedion miniatum
Arrowhead dogfish	Deania profundorum
Arrowtail	Melanonus zugmayeri
Atlantic angel shark	Squatina dumeril
Atlantic bigeye tuna	Thunnus obesus
Atlantic blue marlin	Makaira nigricans
Atlantic bonito	Sarda sarda
Atlantic bumper	Chloroscombrus chrysurus
Atlantic chub mackerel	Scomber colias
Atlantic cod	Gadus morhua
Atlantic croaker	Micropogonias undulatus
Atlantic eelpout	Lycodes terraenovae
Atlantic fanfish	Pterycombus brama
Atlantic flyingfish	Cheilopogon melanurus
Atlantic halibut	Hippoglossus hippoglossus

COMMON NAME	SCIENTIFIC NAME
Atlantic herring	Clupea harengus harengus
Atlantic mackerel	Scomber scombrus
Atlantic menhaden	Brevoortia tyrannus
Atlantic moonfish	Selene setapinnus
Atlantic needlefish	Strongylura marina
Atlantic pomfret	Brama brama
Atlantic rainbow smelt	Osmerus mordax mordax
Atlantic roughy	Hoplostethus occidentalis
Atlantic sailfish	Istiophorus albicans
Atlantic saury	Scomberesox saurus saurus
Atlantic sharpnose shark	Rhizoprionodon terraenovae
Atlantic silverside	Menidia menidia
Atlantic soft pout	Melanostigma atlanticum
Atlantic spadefish	Chaetodipterus faber
Atlantic stingray	Dasyatis sabina
Atlantic thornyhead	Trachyscorpia cristulata cristulata
Atlantic thread	Herring opisthonema oglinum
Atlantic thread herring	Opisthonema oglinum
Atlantic threadfin	Polydactylus octonemus
Atlantic tomcod	Microgadus tomcod
Atlantic torpedo	Torpedo nobiliana
Tripletail	Lobotes surinamensis
Avocet snipe-eel	Avocettina infans
Balao halfbeak	Hemiramphus balao
Ballyhoo	Hemiramphus brasiliensis
Banded butterflyfish	Chaetodon striatus
Banded drum	Larimus fasciatus
Banded rudderfish	Seriola zonata
Bandtail puffer	Sphoeroides spengleri
Bandwing flyingfish	Cypselurus exsiliens
Bar jack	Carangoides ruber
Barndoor skate	Dipturus laevis
Barrelfish	Hyperoglyphe perciformis
Basking shark	Cetorhinus maximus
Bay anchovy	Anchoa mitchilli
Bay whiff	Citharichthys spilopterus
Beardfish	Polymixia lowei
Beardless codling	Gadella imberbis
Benoit's lanternfish	Hygophum benoiti
Bermuda sea chub	Kyphosus sectator
Bigelow's ray	Rajella bigelowi
Bigeye	Epigonus pandionis
Bigeye scad	Selar crumenophthalmus
Bigeye smooth-head	Bajacalifornia megalops
Bigeye soldierfish	Ostichthys trachypoma
Bigeye squaretail	Tetragonurus atlanticus

COMMON NAME	SCIENTIFIC NAME
Bigeye thresher shark	Alopias superciliosus
Black dogfish	Centroscyllium fabricii
Black drum	Pogonias cromis
Black gemfish	Nesiarchus nasutus
Black grouper	Mycteroperca bonaci
Black sawtoothed eel	Serrivomer brevidentatus
Black seabass	Centropristis striata
Black snake mackerel	Nealotus tripes
Blackbelly rosefish	Helicolenus dactylopterus dactylopterus
Blackcheek tonguefish	Symphurus plagiusa
Blackfin goby	Gobionellus atripinnis
Blackfin spiderfish	Bathypterois phenax
Blackfin tuna	Thunnus atlanticus
Blackfin waryfish	Scopelosaurus lepidus
Blackhead salmon	Narcetes stomias
Blackmouth bass	Synagrops bellus
Blackrim cusk-eel	Lepophidium profundorum
Blacktail pike-conger	Hoplunnis diomedianus
Blacktip shark	Carcharhinus limbatus
Blackwing flyingfish	Hirundichthys rondeletii
Bladefin bass	Jeboehlkia gladifer
Blue antimora	Antimora rostrata
Blue parrotfish	Scarus coeruleus
Blue runner	Caranx crysos
Blue shark	Prionace glauca
Blue tang surgeonfish	Acanthurus coeruleus
Blue whiting	Micromesistius poutassou
Bluefin driftfish	Psenes pellucidus
Bluefin tuna	Thunnus thynnus
Bluefish	Pomatomus saltatrix
Blunthead puffer	Sphoeroides pachygaster
Bluntnose stingray	Dasyatis say
Boxer snipe eel	Nemichthys curvirostris
Bramble shark	Echinorhinus brucus
Bristly grenadier	Trachonurus sulcatus
Broadbanded lanternshark	Etmopterus gracilispinis
Brown driftfish	Ariomma melanum
Common trunk fish	Lactophrys trigonus
Bull shark	Carcharhinus leucas
Bullet tuna	Auxis rochei rochei
Bullnose ray	Myliobatis freminvillii
Caribbean lanternshark	Etmopterus hillianus
Cero mackerel	Scomberomorus regalis
Chain dogfish	Scyliorhinus retifer
Chain pipefish	Syngnathus louisianae
Checkered puffer	Sphoeroides testudineus

COMMON NAME	SCIENTIFIC NAME
Chevron scutepout	Lycodonus mirabilis
Chub mackerel	Scomber japonicus
Clearnose skate	Raja eglanteria
Clown goby	Microgobius gulosus
Cobia	Rachycentron canadum
Cocco's lanternfish	Lobianchia gemellarii
Common Atlantic grenadier	Nezumia aequalis
Common fangtooth	Anoplogaster cornuta
Halfbeak	Hyporhamphus unifasciatus
Common remora	Remora remora
Red porgy	Pagrus pagrus
Common wolf eel	Lycenchelys paxillus
Bluespotted cornetfish	Fistularia tabacaria
Cornish blackfish	Schedophilus medusophagus
Cottonmouth Jack	Uraspis secunda
Cownose ray	Rhinoptera bonasus
Crested bigscale	Poromitra crassiceps
Crevalle jack	Caranx hippos
Cubera snapper	Lutjanus cyanopterus
Cunner	Tautogolabrus adspersus
Darwin's slimehead	Gephyroberyx darwinii
Deal fish	Trachipterus arcticus
Deepbody boarfish	Antigonia capros
Deepsea lizardfish	Bathysaurus ferox
Deepwater arrowtooth eel	Histiobranchus bathybius
Deepwater catshark	Apristurus profundorum
Deepwater flounder	Monolene sessilicauda
Diminutive worm eel	Pseudomyrophis fugesae
Doctorfish	Acanthurus chirurgus
Doflein's false headlightfish	Lobianchia dofleini
Dog snapper	Lutjanus jocu
Dolphinfish	Coryphaena hippurus
Dotterel filefish	Aluterus heudelotii
Duckbill barracudina	Magnisudis atlantica
Dusky pipefish	Syngnathus floridae
Dusky shark	Carcharhinus obscurus
Dwarf goatfish	Upeneus parvus
Emerald parrotfish	Nicholsina usta usta
Escolar	Lepidocybium flavobrunneum
Eyed flounder	Bothus ocellatus
False catshark	Pseudotriakis microdon
Feather blenny	Hypsoblennius hentzi
Flamefish	Apogon maculatus
Flat needlefish	Ablennes hians
Striped mullet	Mugil cephalus
Florida pompano	Trachinotus carolinus

COMMON NAME	SCIENTIFIC NAME
Flying gurnard	Dactylopterus volitans
Flying halfbeak	Euleptorhamphus velox
Fourbeard rockling	Enchelyopus cimbrius
Foureye butterflyfish	Chaetodon capistratus
Fourspine stickleback	Apeltes quadracus
Fourwing flyingfish	Hirundichthys affinis
Freckled driftfish	Psenes cyanophrys
Freckled skate	Leucoraja garmani
Freckled tonguefish	Symphurus nebulosus
Frigate mackerel	Auxis thazard thazard
Fringed filefish	Monacanthus ciliatus
Fringed flounder	Etropus crossotus
Gag	Mycteroperca microlepis
Garrick	Cyclothone braueri
Ghostly grenadier	Coryphaenoides leptolepis
Glacier lanternfish	Benthosema glaciale
Goby flathead	Bembrops gobioides
Goosehead scorpionfish	Scorpaena bergii
Gray angelfish	Pomacanthus arcuatus
Gray triggerfish	Balistes capriscus
Great barracuda	Sphyraena barracuda
Great northern tilefish	Lopholatilus chamaeleonticeps
Great white shark	Carcharodon carcharias
Greater amberjack	Seriola dumerili
Green goby	Microgobius thalassinus
Green moray	Gymnothorax funebris
Grey snapper	Lutjanus griseus
Grideye fish	Ipnops murrayi
Grunt	Haemulon plumierii
Guachanche barracuda	Sphyraena guachancho
Gulf Stream flounder	Citharichthys arctifrons
Hakeling	Physiculus fulvus
Half-naked hatchetfish	Argyropelecus hemigymnus
Hardhead sea catfish	Ariopsis felis
Harvestfish	Peprilus alepidotus
Hatchetfish	Argyropelecus gigas
Hawaiian halosaurid fish	Aldrovandia phalacra
Highfin lizardfish	Bathysaurus mollis
Hogchoker	Trinectes maculatus
Hogfish	Lachnolaimus maximus
Honeycomb cowfish	Acanthostracion polygonius
Horned lanternfish	Ceratoscopelus maderensis
Horse-eye jack	Caranx latus
Hound needlefish	Tylosurus crocodilus crocodilus
Iceland catshark	Apristurus laurussonii
Inquiline snailfish	Liparis inquilinus

COMMON NAME	SCIENTIFIC NAME
Inshore lizardfish	Synodus foetens
Jenny mojarra	Eucinostomus gula
Jewel lanternfish	Lampanyctus crocodilus
Jolthead porgy	Calamus bajonado
Kaup's arrowtooth eel	Synaphobranchus kaupii
King mackerel	Scomberomorus cavalla
King of herrings	Regalecus glesne
Kitefin shark	Dalatias licha
Kriete's tonguefish	Symphurus billykrietei
Ladyfish	Elops saurus
Lanternfish	Bolinichthys indicus
Largescale lantern fish	Symbolophorus veranyi
Largescale tonguefish	Symphurus minor
Laura's lanternfish	Loweina rara
Leatherjack	Oligoplites saurus
Lemon shark	Negaprion brevirostris
Lesser amberjack	Seriola fasciata
Lesser devil ray	Mobula hypostoma
Lightfish	Ichthyococcus ovatus
Lined seahorse	Hippocampus erectus
Little skate	Leucoraja erinacea
False albacore	Euthynnus alletteratus
Live sharksucker	Echeneis naucrates
Lobisomem	Notoscopelus caudispinosus
Longbill spearfish	Tetrapturus pfluegeri
Longfin hake	Phycis chesteri
Longfin lanternfish	Diogenichthys atlanticus
Longfinned bullseye	Cookeolus japonicus
Longhorn sculpin	Myoxocephalus octodecemspinosus
Longnose greeneye	Parasudis truculenta
Longnose lancetfish	Alepisaurus ferox
Longspine snipefish	Macroramphosus scolopax
Lookdown	Selene vomer
Loosejaw	Aristostomias tittmanni
Lovely hatchetfish	Argyropelecus aculeatus
Lowfin snailfish	Paraliparis calidus
Lumpsucker	Cyclopterus lumpus
Luvar	Luvarus imperialis
Lyre goby	Evorthodus lyricus
Mackerel scad	Decapterus macarellus
Man-of-war fish	Nomeus gronovii
Margined flyingfish	Cheilopogon cyanopterus
Margined snake eel	Ophichthus cruentifer
Margined tonguefish	Symphurus marginatus
Marlin sucker	Remora osteochir
Metallic lanternfish	Metallic lantern fish

COMMON NAME	SCIENTIFIC NAME
Michael Sars smooth-head	Bathytroctes michaelsarsi
Mosquitofish	Gambusia affinis
Muddy arrowtooth eel	Ilyophis brunneus
Mutton snapper	Lutjanus analis
Naked goby	Gobiosoma bosc
Narrownose chimaera	Harriotta raleighana
Night shark	Carcharhinus signatus
North American naked sole	Gymnachirus melas
Northern kingfish	Menticirrhus saxatilis
Northern pipefish	Syngnathus fuscus
Northern puffer	Sphoeroides maculatus
Northern red snapper	Lutjanus campechanus
Northern sand lance	Ammodytes dubius
Northern searobin	Prionotus carolinus
Northern sennet	Sphyraena borealis
Northern stargazer	Astroscopus guttatus
Northern tonguefish	Symphurus pusillus
Nurse shark	Ginglymostoma cirratum
Ocean pout	Zoarces americanus
Ocean sunfish	Mola mola
Ocean surgeon	Acanthurus bahianus
Ocean triggerfish	Canthidermis sufflamen
Oceanic puffer	Lagocephalus lagocephalus lagocephalus
Oceanic two-wing flyingfish	Exocoetus obtusirostris
Oceanic whitetip shark	Carcharhinus longimanus
Ocellated moray	Gymnothorax saxicola
Offshore hake	Merluccius albidus
Opah	Lampris guttatus
Opossum pipefish	Microphis brachyurus lineatus
Orange filefish	Aluteras schoepfii
Orangespotted filefish	Cantherhines pullus
Oyster toadfish	Opsanus tau
Palefin dragonet	Foetorepus goodenbeani
Pallid sculpin	Cottunculus thomsonii
Palometa	Trachinotus goodei
Pearlsides	Maurolicus muelleri
Pearly lanternfish	Myctophum nitidulum
Pelagic stingray	Pteroplatytrygon violacea
Permit	Trachinotus falcatus
Pigfish	Orthopristis chrysoptera
Pilotfish	Naucrates ductor
Pinfish	Lagodon rhomboides
Pink flabby whalefish	Cetostoma regani
Pipehorse	Acentronura dendritica
Planehead filefish	Stephanolepis hispidus
Atlantic Pollock	Pollachius virens

COMMON NAME	SCIENTIFIC NAME
Pompano dolphinfish	Coryphaena equiselis
Porbeagle	Lamna nasus
Pouty seasnail	Paraliparis garmani
Pricklefish	Stephanoberyx monae
Pudgy cuskeel	Spectrunculus grandis
Queen triggerfish	Balistes vetula
Rainbow runner	Elagatis bipinnulata
Rainwater killifish	Lucania parva
Red drum	Sciaenops ocellatus
Red goatfish	Mullus auratus
Red hake	Urophycis chuss
Red lionfish	Pterois volitans
Redear sunfish	Lepomis microlophus
Redeye gaper	Chaunax stigmaeus
Redfin parrotfish	Sparisoma rubripinne
Redmouth whalefish	Rondeletia loricata
Reinhardt's lanternfish	Hygophum reinhardtii
Reticulate moray	Muraena retifera
Ribbon barracudina	Arctozenus risso
Rock hind	Epinephelus adscensionis
Roudi escolar	Promethichthys prometheus
Rough pomfret	Taractes asper
Rough scad	Trachurus lathami
Rough silverside	Membras martinica
Roughtail stingray	Dasyatis centroura
Roughtip grenadier	Nezumia sclerorhynchus
Round herring	Etrumeus teres
Round sardinella	Sardinella aurita
Round scad	Decapterus punctatus
Roundnose lanternfish	Centrobranchus nigroocellatus
Sand drum	Umbrina coroides
Sand tiger shark	Carcharias taurus
Sandbar shark	Carcharhinus plumbeus
Scaled herring	Harengula jaguana
Scalloped hammerhead	Sphyrna lewini
Scamp	Mycteroperca phenax
Schoolmaster snapper	Lutjanus apodus
Scotian snailfish	Careproctus ranula
Scrawled cowfish	Acanthostracion quadricornis
Scrawled filefish	Aluterus scriptus
Scup	Stenotomus chrysops
Sea raven	Hemitripterus americanus
Seaboard goby	Gobiosoma ginsburgi
Seaweed blenny	Parablennius marmoreus
Sergeant major	Abudefduf saxatilis
Sheepshead	Archosargus probatocephalus

COMMON NAME	SCIENTIFIC NAME
Sheepshead minnow	Cyprinodon variegatus variegatus
Short bigeye	Pristigenys alta
Shortfin mako	Isurus oxyrinchus
Shortfinger anchovy	Anchoa lyolepis
Short-headed lantern fish	Diaphus brachycephalus
Shortnose greeneye	Chlorophthalmus agassizi
Shortnose lancetfish	Alepisaurus brevirostris
Shortspine boarfish	Antigonia combatia
Shrimp eel	Ophichthus gomesii
Silky shark	Carcharhinus falciformis
Silver anchovy	Engraulis eurystole
Silver perch	Bairdiella chrysoura
Silver driftfish	Psenes maculatus
Silver hake	Merluccius bilinearis
Silver mojarra	Eucinostomus argenteus
Silver seatrout	Cynoscion nothus
Silver-rag driftfish	Ariomma bondi
Silvery John dory	Zenopsis conchifera
Simony's frostfish	Benthodesmus simonyi
Singlespot frogfish	Antennarius radiosus
Skilletfish	Gobiesox strumosus
Skipjack tuna	Katsuwonus pelamis
Slender cuskeel	Porogadus miles
Slender searobin	Peristedion gracile
Slender snipe eel	Nemichthys scolopaceus
Slenderhead searobin	Peristedion imberbe
Slim flounder	Monolene antillarum
Slope hatchetfish	Polyipnus clarus
Smallfin lanternfish	Benthosema suborbitale
Smallmouth flounder	Etropus microstomus
Smallmouth spiny eel	Polyacanthonotus rissoanus
Smallscale smooth-head	Bathytroctes microlepis
Smallspine spookfish	Harriotta haeckeli
Smalltooth sawfish	Pristis pectinata
Smooth butterfly ray	Gymnura micrura
Smooth dogfish	Mustelus canis
Smooth hammerhead	Sphyrna zygaena
Smooth puffer	Lagocephalus laevigatus
Smooth trunkfish	Lactophrys triqueter
Snaggletooth	Astronesthes gemmifer
Snake mackerel	Gempylus serpens
Snakefish	Trachinocephalus myops
Snakehead	Channa argus argus
Snowy grouper	Epinephelus niveatus
Snubnosed eel	Simenchelys parasitica
Southern kingfish	Menticirrhus americanus

COMMON NAME	SCIENTIFIC NAME
Southern stingray	Dasyatis americana
Spanish mackerel	Scomberomorus maculatus
Spearfish remora	Remora brachyptera
Spiny butterfly ray	Gymnura altavela
Spiny dogfish	Squalus acanthias
Spiny eel	Notacanthus chemnitzii
Spinycheek scorpionfish	Neomerinthe hemingwayi
Spinyhead blenny	Acanthemblemaria spinosa
Spotfin butterflyfish	Chaetodon ocellatus
Spotfin dragonet	Foetorepus agassizii
Spotfin flyingfish	Cheilopogon furcatus
Spotfin killifish	Fundulus luciae
Porcupine fish	Diodon hystrix
Spottail pinfish	Diplodus holbrooki
Spotted burrfish	Chilomycterus atringa
Spotted driftfish	Ariomma regulus
Spotted eagle ray	Aetobatus narinari
Spotted goatfish	Pseudupeneus maculatus
Spotted hake	Urophycia regius
Spotted lanternfish	Myctophum punctatum
Spotted scorpionfish	Scorpaena plumieri
Spotted seatrout	Cynoscion nebulosus
Spotted tinselfish	Xenolepidichthys dalgleishi
Striated argentine	Argentina striata
Striated frogfish	Antennarius striatus
Striped anchovy	Anchoa hepsetus
Striped blenny	Chasmodes bosquianus
Striped burrfish	Chilomycterus schoepfii
Striped cusk-eel	Ophidion marginatum
Striped searobin	Prionotus evolans
Summer flounder	Paralichthys dentatus
Swordfish	Xiphias gladius
Synagrops spinosus	Synagrops spinosus
Tan bristlemouth	Cyclothone pallida
Thickbeard grenadier	Coryphaenoides zaniophorus
Thorny skate	Amblyraja radiata
Thorny tinselfish	Grammicolepis brachiusculus
Threadfin blenny	Nemaclinus atelestos
Threadfin rockling	Gaidropsarus ensis
Thresher shark	Alopias vulpinus
Tiger muskellunge	Esox lucius x Esox masquinongy
Tiger shark	Galeocerdo cuvier
Tomtate grunt	Haemulon aurolineatum
Tripodfish	Bathypterois grallator
Twospot cardinalfish	Apogon pseudomaculatus
Twospot flounder	Bothus robinsi

COMMON NAME	SCIENTIFIC NAME
Unicorn leatherjacket	Aluterus monoceros
Veiled anglemouth	Cyclothone microdon
Wahoo	Acanthocybium solandri
Warsaw grouper	Epinephelus nigritus
Waryfish	Scopelosaurus argenteus
Weakfish	Cynoscion regalis
Weitzman's pearlside	Maurolicus weitzmani
Western Atlantic seabream	Archosargus rhomboidalis
Western softhead grenadier	Malacocephalus occidentalis
Whale shark	Rhincodon typus
White baggar	Galeichthys feliceps
White hake	Urophycis tenuis
White marlin	Tetrapturus albidus
White mullet	Mugil curema
Whitefin sharksucker	Echeneis neucratoides
White-spoted lantern fish	Diaphus rafinesquii
Whitetip reef shark	Triaenodon obesus
Windowpane flounder	Scophthalmus aquosus
Winter flounder	Pseudopleuronectes americanus
Winter skate	Leucoraja ocellata
Witch	Glyptocephalus cynoglossus
Wolf eelpout	Lycenchelys verrillii
Wreckfish	Polyprion americanus
Yellow jack	Carangoides bartholomaei
Yellow sea chub	Kyphosus incisor
Yellowfin bass	Anthias nicholsi
Yellowfin tuna	Thunnus albacares
Yellowtail flounder	Limanda ferruginea
Yellowtail snapper	Ocyurus chrysurus

Appendix 3b. GCN Species

This appendix lists Maryland's wildlife species determined to be of Greatest Conservation Need (GCN). For each species, the best available status information is listed according to the guidance categories provided by the IAFWA steering committee (2002) and discussed in Chapter 3. These categories indicate reasons for conservation concern, including low and declining populations, endemism, etc. (see Table 3.2). These compiled rankings represent the best available information on status of these GCN species, as determined by MD DNR NHP staff and other leading experts. An explanation of the G-Rank and S-Rank codes is found in Appendix 3a. An explanation of the remaining acronyms is found at the end of this appendix.

VERTEBRATES

GCN Mammals – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
Allegheny woodrat	Neotoma magister	G3G4	S1	E	
American marten	Martes americana	G5	SX	X	
Blue whale	Balaenoptera musculus	G3G4	SZN	E	E
Bobcat	Lynx rufus	G5	S3	I	
Delmarva fox squirrel	Sciurus niger cinereus	G5T3	S1	E	E
Eastern harvest mouse	Reithrodontomys humulis	G5	SH	X	
Eastern red bat	Lasiurus borealis	G5	S5B,S5N		
Eastern small-footed myotis	Myotis leibii	G3	S1B,S2N	I	
Eastern spotted skunk	Spilogale putorius	G5	S1		
Fin whale	Balaenoptera physalus	G3G4	SZN	E	E
Harbor porpoise	Phocoena phocoena	G4G5	SZN		
Hoary bat	Lasiurus cinereus	G5	SPB,S5N		
Humpback whale	Megaptera novaeangliae	G3	SZN	E	E
Indiana bat	Myotis sodalis	G2	S1	E	E
Least shrew	Cryptotis parva	G5	S3S5		
Least weasel	Mustela nivalis	G5	S2S3	I	
Long-tailed shrew	Sorex dispar	G4	S2	I	
New england cottontail	Sylvilagus transitionalis	G4	S1	I	
North American Porcupine	Erethizon dorsatum	G5	S1S2	I	
Northern flying squirrel	Glaucomys sabrinus	G5	SP		
Northern right whale	Eubalaena glacialis	G1	SZN	E	E
Rafinesque's big-eared bat	Corynorhinus rafinesquii	G3G4	SP		
Sei whale	Balaenoptera borealis	G3	SZN	E	E
Silver-haired bat	Lasionycteris noctivagans	G5	SPB,S5N		
Smoky shrew	Sorex fumeus	G5	S2S3	I	
Snowshoe hare	Lepus americanus	G5	SH	X	
Southeastern myotis	Myotis austroiparius	G3G4	SP		
Southeastern shrew	Sorex longirostris	G5	S3S4		

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
Southeastern star-nosed mole	Condylura cristata parva	G5T4	SU		
Southern bog lemming	Synaptomys cooperi	G5	S3		
Southern pygmy shrew	Sorex hoyi winnemana	G5T4	S2		
Southern rock vole	Microtus chrotorrhinus carolinensis	G4T3	S1	E	
Southern water shrew	Sorex palustris punctulatus	G5T3	S1	E	
Sperm whale	Physeter catodon	G3G4	SZN	E	E

GCN Mammals – Part 2

COMMON NAME	CITES	IUCN	NE_Reg	TNC Ecoregion	BCI	Endemic	Responsibility
Allegheny woodrat		LR	NE_Reg	PRIMARY			
American marten							
Blue whale	1	EN					
Bobcat	2	LR					
Delmarva fox squirrel		LR		PRIMARY			
Eastern harvest mouse							
Eastern red bat		LR	NE_Reg				
Eastern small-footed myotis		LR	NE_Reg	PRIMARY	BCI		
Eastern spotted skunk							
Fin whale	1	EN					
Harbor porpoise	2	VU	NE_Reg				
Hoary bat		LR	NE_Reg				
Humpback whale	1	VU					
Indiana bat		EN		PRIMARY			
Least shrew			NE_Reg				
Least weasel		LR					
Long-tailed shrew							
New england cottontail		VU	NE_Reg	SECONDARY			
North American Porcupine		LR					
Northern flying squirrel		LR		PRIMARY			
Northern right whale	1	EN					
Rafinesque's big-eared bat		VU	NE_Reg	PRIMARY	BCI		
Sei whale	1	EN					
Silver-haired bat		LR	NE_Reg				
Smoky shrew							
Snowshoe hare							
Southeastern myotis					BCI		
Southeastern shrew							
Southeastern star-nosed mole							
Southern bog lemming							
Southern pygmy shrew							
Southern rock vole		LR	NE_Reg	PRIMARY			
Southern water shrew			NE_Reg	PRIMARY			
Sperm whale	1	VU					

GCN Birds – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
Acadian flycatcher	Empidonax virescens	G5	S5B				
Alder flycatcher	Empidonax alnorum	G5	S2B	I			
American bittern	Botaurus lentiginosus	G4	S1S2B,S1N	I			
American black duck	Anas rubripes	G5	S4B,S5N				
American oystercatcher	Haematopus palliatus	G5	S3B,SAN				
American peregrine falcon	Falco peregrinus anatum	G4T3	S2	I		1	
American redstart	Setophaga ruticilla	G5	S4B				
American woodcock	Scolopax minor	G5	S4B,S4N				
Bachman's sparrow	Aimophila aestivalis	G3	SHB	X			LR
Bald eagle	Haliaeetus leucocephalus	G4	S2S3B,S3N	T	T	1	
Bank swallow	Riparia riparia	G5	S3S4B				
Barn owl	Tyto alba	G5	S3			2	
Barred owl	Strix varia	G5	S5			2	
Bewick's wren	Thryomanes bewickii altus	G5T2Q	S1B	E			
Bicknell's thrush	Catharus bicknellii	G4	SZN				VU
Black rail	Laterallus jamaicensis	G4	S2S3B	I			LR
Black skimmer	Rynchops niger	G5	S1B	E			
Black tern	Chlidonias niger	G4	SZN				
Black-and-white warbler	Mniotilta varia	G5	S4B				
Black-bellied plover	Pluvialis squatarola	G5	S3N				
Black-billed cuckoo	Coccyzus erythropthalmus	G5	S4B				
Blackburnian warbler	Dendroica fusca	G5	S1S2B	T			
Black-crowned night-heron	Nycticorax nycticorax	G5	S3B,S2N				
Black-throated blue warbler	Dendroica caerulescens	G5	S3S4B				
Black-throated green warbler	Dendroica virens	G5	S4B				
Blue-headed vireo	Vireo solitarius	G5	S3S4B				
Blue-winged warbler	Vermivora pinus	G5	S4B				
Boat-tailed grackle	Quiscalus major	G5	S3S4				
Bobolink	Dolichonyx oryzivorus	G5	S3S4B				
Brant	Branta bernicla	G5	S3N				
Broad-winged hawk	Buteo platypterus	G5	S4B			2	
Brown creeper	Certhia americana	G5	S4				
Brown pelican	Pelecanus occidentalis	G4	S1B				
Brown thrasher	Toxostoma rufum	G5	S5B,S2N				
Brown-headed nuthatch	Sitta pusilla	G5	S3S4				
Canada warbler	Wilsonia canadensis	G5	S3B				
Canvasback	Aythya valisineria	G5	S3S4N				
Cerulean warbler	Dendroica cerulea	G4	S3S4B				
Chestnut-sided warbler	Dendroica pensylvanica	G5	S4B				
Chuck-will's-widow	Caprimulgus carolinensis	G5	S4B				
Coastal plain swamp sparrow	Melospiza georgiana nigrescens	G5T3	S2B,SZN	I			
Common loon	Gavia immer	G5	S4N				
Common moorhen	Gallinula chloropus	G5	S2B,SAN	I			
Common nighthawk	Chordeiles minor	G5	S3S4B				

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
Common raven	Corvus corax	G5	S2				
Common tern	Sterna hirundo	G5	S4B				
Dark-eyed junco	Junco hyemalis	G5	S2B,S5N				
Dickcissel	Spiza americana	G5	S2B				LR
Dunlin	Calidris alpina	G5	S3N				
Eastern meadowlark	Sturnella magna	G5	S5B,S3N				
Eastern towhee	Pipilo erythrophthalmus	G5	S5B,S4N				
Field sparrow	Spizella pusilla	G5	S5				
Forster's tern	Sterna forsteri	G5	S4B				
Glossy ibis	Plegadis falcinellus	G5	S4B				
Golden eagle	Aquila chrysaetos	G5	S1N			2	
Golden-crowned kinglet	Regulus satrapa	G5	S2B,S4N				
Golden-winged warbler	Vermivora chrysoptera	G4	S3B				
Grasshopper sparrow	Ammodramus savannarum	G5	S4B				
Great blue heron	Ardea herodias	G5	S4B,S3S4N				
Great egret	Ardea alba	G5	S4B				
Greater yellowlegs	Tringa melanoleuca	G5	S1N				
Gull-billed tern	Sterna nilotica	G5	S1B	E			
Hairy woodpecker	Picoides villosus	G5	S5				
Harlequin duck	Histrionicus histrionicus	G4	S1N				
Henslow's sparrow	Ammodramus henslowii	G4	S1S2B	T			LR
Hermit thrush	Catharus guttatus	G5	S3S4B,S4N				
Hooded warbler	Wilsonia citrina	G5	S4S5B				
Horned grebe	Podiceps auritus	G5	S4N				
Kentucky warbler	Oporornis formosus	G5	S4B				
King rail	Rallus elegans	G4G5	S3S4B,S2N				
Laughing gull	Larus atricilla	G5	S1B,S4N				
Least bittern	Ixobrychus exilis	G5	S2S3B	I			
Least flycatcher	Empidonax minimus	G5	S3S4B				
Least tern	Sterna antillarum	G4	S2B	T			
Little blue heron	Egretta caerulea	G5	S3B				
Loggerhead shrike	Lanius ludovicianus	G4	S1B,S1N	E			
Long-eared owl	Asio otus	G5	SHB,S1N			2	
Louisiana waterthrush	Seiurus motacilla	G5	S5B				
Magnolia warbler	Dendroica magnolia	G5	S3S4B				
Marsh wren	Cistothorus palustris	G5	S4B,S2N				
Mourning warbler	Oporornis philadelphia	G5	S1B	E			
Nashville warbler	Vermivora ruficapilla	G5	S1S2B	I			
Northern bobwhite	Colinus virginianus	G5	S5				
Northern gannet	Morus bassanus	G5	SZN				
Northern goshawk	Accipiter gentilis	G5	S1B,SZN	E*		2	
Northern harrier	Circus cyaneus	G5	S2B,S4N			2	
Northern parula	Parula americana	G5	S4S5B				
Northern saw-whet owl	Aegolius acadicus	G5	S1B,S1N			2	
Northern waterthrush	Seiurus noveboracensis	G5	S2S3B				
Olive-sided flycatcher	Contopus cooperi	G4	SHB,SZN	E			
Ovenbird	Seiurus aurocapillus	G5	S5B				

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
Pied-billed grebe	Podilymbus podiceps	G5	S2B,S3N				
Pileated woodpecker	Dryocopus pileatus	G5	S5				
Piping plover	Charadrius melodus	G3	S1B,SAN	E	T		VU
Prairie warbler	Dendroica discolor	G5	S4B				
Prothonotary warbler	Protonotaria citrea	G5	S4B				
Purple sandpiper	Calidris maritima	G5	S2N				
Red knot	Calidris canutus	G5	SZN				
Red-breasted nuthatch	Sitta canadensis	G5	S1B,S3N				
Red-cockaded woodpecker	Picoides borealis	G3	SHB,SAN	X	E		VU
Red-eyed vireo	Vireo olivaceus	G5	S5B				
Red-headed woodpecker	Melanerpes erythrocephalus	G5	S4				
Red-shouldered hawk	Buteo lineatus	G5	S4S5B,S4N			2	
Red-throated loon	Gavia stellata	G5	S3S4N				
Roseate tern	Sterna dougallii	G4	SHB,SAN	X	E		
Royal tern	Sterna maxima	G5	S1B	E			
Ruddy duck	Oxyura jamaicensis	G5	S3N				
Ruddy turnstone	Arenaria interpres	G5	S1N				
Saltmarsh sharp-tailed sparrow	Ammodramus caudacutus	G4	S3B,S1N				LR
Sanderling	Calidris alba	G5	S3N				
Sandwich tern	Sterna sandvicensis	G5	S1B				
Savannah sparrow	Passerculus sandwichensis	G5	S3S4B,S4N				
Scarlet tanager	Piranga olivacea	G5	S5B				
Seaside sparrow	Ammodramus maritimus	G4	S4B,S2N				
Sedge wren	Cistothorus platensis	G5	S1B	E			
Semipalmated sandpiper	Calidris pusilla	G5	SZN				
Sharp-shinned hawk	Accipiter striatus	G5	S1S2B,S4N			2	
Short-billed Dowitcher	Limnodromus griseus	G5	SZN				
Short-eared owl	Asio flammeus	G5	S1B,S2N	E		2	
Snowy egret	Egretta thula	G5	S3S4B				
Solitary sandpiper	Tringa solitaria	G5	SZN				
Summer tanager	Piranga rubra	G5	S4B				
Swainson's thrush	Catharus ustulatus	G5	SXB				
Swainson's warbler	Limnothlypis swainsonii	G4	S1B	E			
Tricolored heron	Egretta tricolor	G5	S3B				
Upland sandpiper	Bartramia longicauda	G5	S1B	E			
Veery	Catharus fuscescens	G5	S4B				
Vesper sparrow	Pooecetes gramineus	G5	S3S4B,S2N				
Wayne's black-throated green warbler	Dendroica virens waynei	G5TU	SU				
Whimbrel	Numenius phaeopus	G5	SZN				
Whip-poor-will	Caprimulgus vociferus	G5	S3S4B				
Willet	Catoptrophorus semipalmatus	G5	S3S4B				
Willow flycatcher	Empidonax traillii	G5	S4B				
Wilson's plover	Charadrius wilsonia	G5	S1B	E			
Wilson's snipe	Gallinago delicata	G5	S2N				
Winter wren	Troglodytes troglodytes	G5	S2B,S3N				

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
Wood thrush	Hylocichla mustelina	G5	S5B				
Worm-eating warbler	Helmitheros vermivorus	G5	S4B				
Yellow-bellied sapsucker	Sphyrapicus varius	G5	SHB,S3N				
Yellow-crowned night-heron	Nyctanassa violacea	G5	S2B				
Yellow-throated vireo	Vireo flavifrons	G5	S4S5B				

GCN Birds – Part 2

COMMON NAME	NE_Reg	PIFRank-B	PIFRank-W	MNBMCN	NAWMP	MANEM
Acadian flycatcher		PIF-I				
Alder flycatcher						
American bittern	NE_Reg			MNBMCN		Focal
American black duck	NE_Reg	PIF-I	PIF-I		Highest	
American oystercatcher		PIF-I	PIF-I			
American peregrine falcon				MNBMCN		
American redstart						
American woodcock	NE_Reg	PIF-I	PIF-I			
Bachman's sparrow		PIF-I	PIF-I	MNBMCN		
Bald eagle						
Bank swallow						
Barn owl						
Barred owl						
Bewick's wren	NE_Reg	PIF-I		MNBMCN		
Bicknell's thrush	NE_Reg			MNBMCN		
Black rail		PIF-I	PIF-I	MNBMCN		Focal
Black skimmer		PIF-I				Focal
Black tern	NE_Reg			MNBMCN		
Black-and-white warbler		PIF-II				
Black-bellied plover						
Black-billed cuckoo						
Blackburnian warbler						
Black-crowned night-heron						Focal
Black-throated blue warbler		PIF-I				
Black-throated green warbler						
Blue-headed vireo						
Blue-winged warbler		PIF-I		MNBMCN		
Boat-tailed grackle						
Bobolink						
Brant	NE_Reg				High	
Broad-winged hawk						
Brown creeper						
Brown pelican						
Brown thrasher		PIF-II				
Brown-headed nuthatch		PIF-I	PIF-I			

COMMON NAME	NE_Reg	PIFRank-B	PIFRank-W	MNBMCN	NAWMP	MANEM
Canada warbler	NE_Reg	PIF-I				
Canvasback			PIF-I		High	
Cerulean warbler	NE_Reg	PIF-I		MNBMCN		
Chestnut-sided warbler				MNBMCN		
Chuck-will's-widow						
Coastal plain swamp sparrow						
Common loon				MNBMCN		
Common moorhen						
Common nighthawk						
Common raven						
Common tern	NE_Reg			MNBMCN		Focal
Dark-eyed junco						
Dickcissel		PIF-I				
Dunlin			PIF-I			
Eastern meadowlark				MNBMCN		
Eastern towhee		PIF-II				
Field sparrow		PIF-I	PIF-I	MNBMCN		
Forster's tern						Focal
Glossy ibis						Focal
Golden eagle	NE_Reg					
Golden-crowned kinglet						
Golden-winged warbler	NE_Reg	PIF-I		MNBMCN		
Grasshopper sparrow		PIF-II		MNBMCN		
Great blue heron						
Great egret						Focal
Greater yellowlegs						
Gull-billed tern						Focal
Hairy woodpecker						
Harlequin duck	NE_Reg				High	
Henslow's sparrow	NE_Reg	PIF-I		MNBMCN		
Hermit thrush						
Hooded warbler		PIF-I				
Horned grebe						Focal
Kentucky warbler		PIF-I				
King rail						Focal
Laughing gull						Focal
Least bittern				MNBMCN		
Least flycatcher						
Least tern	NE_Reg					Focal
Little blue heron						Focal
Loggerhead shrike	NE_Reg			MNBMCN		
Long-eared owl	NE_Reg					
Louisiana waterthrush	NE_Reg	PIF-I		MNBMCN		
Magnolia warbler						
Marsh wren		PIF-II				
Mourning warbler						

COMMON NAME	NE_Reg	PIFRank-B	PIFRank-W	MNBMCN	NAWMP	MANEM
Nashville warbler						
Northern bobwhite	NE_Reg	PIF-II				
Northern gannet						Focal
Northern goshawk				MNBMCN		
Northern harrier	NE_Reg			MNBMCN		
Northern parula		PIF-I				
Northern saw-whet owl						
Northern waterthrush						
Olive-sided flycatcher				MNBMCN		
Ovenbird						
Pied-billed grebe	NE_Reg					
Pileated woodpecker						
Piping plover		PIF-I	PIF-I			
Prairie warbler		PIF-I				
Prothonotary warbler		PIF-I				
Purple sandpiper			PIF-I			
Red knot	NE_Reg					
Red-breasted nuthatch						
Red-cockaded woodpecker		PIF-I	PIF-I			
Red-eyed vireo						
Red-headed woodpecker		PIF-I	PIF-I	MNBMCN		
Red-shouldered hawk				MNBMCN		
Red-throated loon						Focal
Roseate tern						
Royal tern						Focal
Ruddy duck					Moderate	
Ruddy turnstone						
Saltmarsh sharp-tailed sparrow	NE_Reg	PIF-I	PIF-I			
Sanderling						
Sandwich tern						
Savannah sparrow						
Scarlet tanager		PIF-I				
Seaside sparrow		PIF-I	PIF-I			
Sedge wren	NE_Reg			MNBMCN		
Semipalmated sandpiper						
Sharp-shinned hawk						
Short-billed Dowitcher						
Short-eared owl	NE_Reg	PIF-I	PIF-I	MNBMCN		
Snowy egret						Focal
Solitary sandpiper						
Summer tanager						
Swainson's thrush						
Swainson's warbler		PIF-I		MNBMCN		
Tricolored heron						Focal
Upland sandpiper	NE_Reg			MNBMCN		
Veery				MNBMCN		

COMMON NAME	NE_Reg	PIFRank-B	PIFRank-W	MNBMCN	NAWMP	MANEM
Vesper sparrow						
Wayne's black-throated green warbler						
Whimbrel						
Whip-poor-will	NE_Reg	PIF-I				
Willet						
Willow flycatcher		PIF-I				
Wilson's plover		PIF-I				
Wilson's snipe						
Winter wren						
Wood thrush		PIF-I		MNBMCN		
Worm-eating warbler		PIF-I		MNBMCN		
Yellow-bellied sapsucker						
Yellow-crowned night-heron						Focal
Yellow-throated vireo		PIF-I				

GCN Birds – Part 3

COMMON NAME	NASWG	NAWCP	BCC-BCR	BCC-NE	NALCP-1	NALCP-2
Acadian flycatcher			BCC-BCR		RESP	STEW
Alder flycatcher						
American bittern		High				
American black duck						
American oystercatcher	High		BCC-BCR	BCC-NE		
American peregrine falcon			BCC-BCR	BCC-NE		
American redstart						
American woodcock	Imperiled					
Bachman's sparrow			BCC-BCR		IM ACT	WATCH
Bald eagle						
Bank swallow						
Barn owl						
Barred owl						
Bewick's wren			BCC-BCR	BCC-NE		
Bicknell's thrush				BCC-NE		
Black rail		High	BCC-BCR	BCC-NE		
Black skimmer		High	BCC-BCR	BCC-NE		
Black tern		Moderate				
Black-and-white warbler						
Black-bellied plover	Moderate					
Black-billed cuckoo						
Blackburnian warbler						
Black-crowned night-heron		Moderate				
Black-throated blue warbler						
Black-throated green warbler						

COMMON NAME	NASWG	NAWCP	BCC-BCR	BCC-NE	NALCP-1	NALCP-2
Blue-headed vireo						
Blue-winged warbler			BCC-BCR		MGMT	WATCH
Boat-tailed grackle						
Bobolink						
Brant						
Broad-winged hawk						
Brown creeper						
Brown pelican		Moderate				
Brown thrasher					MGMT	STEW
Brown-headed nuthatch					MGMT	WATCH
Canada warbler			BCC-BCR	BCC-NE		
Canvasback						
Cerulean warbler			BCC-BCR	BCC-NE	MGMT	WATCH
Chestnut-sided warbler						
Chuck-will's-widow			BCC_BCR		MGMT	STEW
Coastal plain swamp sparrow						
Common loon		Moderate				
Common moorhen		Not at risk				
Common nighthawk						
Common raven						
Common tern		Low	BCC-BCR	BCC-NE		
Dark-eyed junco						
Dickcissel					MGMT	WATCH
Dunlin	Moderate					
Eastern meadowlark						
Eastern towhee					MGMT	STEW
Field sparrow						
Forster's tern		Moderate				
Glossy ibis		Low				
Golden eagle						
Golden-crowned kinglet						
Golden-winged warbler			BCC-BCR	BCC-NE	IM ACT	WATCH
Grasshopper sparrow						
Great blue heron		Not at risk				
Great egret		Not at risk				
Greater yellowlegs	High					
Gull-billed tern		High				
Hairy woodpecker						
Harlequin duck						
Henslow's sparrow			BCC-BCR	BCC-NE	IM ACT	WATCH
Hermit thrush						
Hooded warbler					RESP	STEW
Horned grebe		High				
Kentucky warbler			BCC-BCR	BCC-NE	MGMT	WATCH
King rail		Moderate				
Laughing gull		Not at risk				

COMMON NAME	NASWG	NAWCP	BCC-BCR	BCC-NE	NALCP-1	NALCP-2
Least bittern		Moderate				
Least flycatcher						
Least tern		High	BCC-BCR	BCC-NE		
Little blue heron		High				
Loggerhead shrike				BCC-NE		
Long-eared owl						
Louisiana waterthrush			BCC-BCR		RESP	STEW
Magnolia warbler						
Marsh wren			BCC-BCR			
Mourning warbler						
Nashville warbler						
Northern bobwhite						
Northern gannet		Not at risk				
Northern goshawk						
Northern harrier						
Northern parula						
Northern saw-whet owl			BCC-BCR			
Northern waterthrush						
Olive-sided flycatcher			BCC-BCR	BCC-NE		
Ovenbird						
Pied-billed grebe		Not at risk				
Pileated woodpecker						
Piping plover	Imperiled					
Prairie warbler			BCC-BCR	BCC-NE	MGMT	WATCH
Prothonotary warbler			BCC-BCR		MGMT	WATCH
Purple sandpiper	Moderate		BCC-BCR	BCC-NE		
Red knot	Imperiled		BCC-BCR	BCC-NE		
Red-breasted nuthatch						
Red-cockaded woodpecker					IM ACT	WATCH
Red-eyed vireo						
Red-headed woodpecker			BCC-BCR	BCC-NE	MGMT	WATCH
Red-shouldered hawk					RESP	STEW
Red-throated loon		High				
Roseate tern		High				
Royal tern		Moderate				
Ruddy duck						
Ruddy turnstone	High					
Saltmarsh sharp-tailed sparrow			BCC-BCR	BCC-NE	IM ACT	WATCH
Sanderling	High					
Sandwich tern		Not at risk				
Savannah sparrow						
Scarlet tanager						
Seaside sparrow			BCC-BCR	BCC-NE	RESP	WATCH
Sedge wren			BCC-BCR	BCC-NE		
Semipalmated sandpiper	High					
Sharp-shinned hawk						

COMMON NAME	NASWG	NAWCP	BCC-BCR	BCC-NE	NALCP-1	NALCP-2
Short-billed Dowitcher	High					
Short-eared owl			BCC-BCR	BCC-NE		
Snowy egret		High				
Solitary sandpiper	High					
Summer tanager						
Swainson's thrush						
Swainson's warbler			BCC-BCR	BCC-NE	RESP	WATCH
Tricolored heron		High				
Upland sandpiper	High		BCC-BCR	BCC-NE		
Veery						
Vesper sparrow						
Wayne's black-throated green warbler						
Whimbrel	Imperiled		BCC-BCR	BCC-NE		
Whip-poor-will			BCC-BCR	BCC-NE		
Willet	High					
Willow flycatcher					MGMT	WATCH
Wilson's plover	High		BCC-BCR			
Wilson's snipe	Moderate					
Winter wren						
Wood thrush			BCC-BCR	BCC-NE	MGMT	WATCH
Worm-eating warbler			BCC-BCR	BCC-NE	MGMT	WATCH
Yellow-bellied sapsucker			BCC-BCR			
Yellow-crowned night-heron		Moderate				
Yellow-throated vireo					RESP	STEW

GCN Birds – Part 4

COMMON NAME	TNC Ecoregion	Audubon	Endemic	Responsibility
Acadian flycatcher				
Alder flycatcher				
American bittern	SECONDARY			
American black duck	SECONDARY	YELLOW		
American oystercatcher	SECONDARY	YELLOW		
American peregrine falcon				
American redstart				
American woodcock		YELLOW		
Bachman's sparrow	PRIMARY	RED		
Bald eagle				
Bank swallow				
Barn owl				
Barred owl				
Bewick's wren	PRIMARY			
Bicknell's thrush	SECONDARY	RED		

COMMON NAME	TNC Ecoregion	Audubon	Endemic	Responsibility
Black rail	SECONDARY	RED		
Black skimmer	SECONDARY			
Black tern				
Black-and-white warbler				
Black-bellied plover				
Black-billed cuckoo				
Blackburnian warbler				
Black-crowned night-heron				
Black-throated blue warbler	SECONDARY			
Black-throated green warbler				
Blue-headed vireo				
Blue-winged warbler	SECONDARY	YELLOW		
Boat-tailed grackle				
Bobolink	SECONDARY			
Brant		YELLOW		
Broad-winged hawk				
Brown creeper	SECONDARY			
Brown pelican				
Brown thrasher				
Brown-headed nuthatch	SECONDARY	YELLOW		
Canada warbler		YELLOW		
Canvasback				Responsibility
Cerulean warbler	SECONDARY	RED		
Chestnut-sided warbler				
Chuck-will's-widow				
Coastal plain swamp sparrow	PRIMARY			
Common loon				
Common moorhen				
Common nighthawk				
Common raven				
Common tern				
Dark-eyed junco				
Dickcissel		YELLOW		
Dunlin				
Eastern meadowlark				
Eastern towhee				
Field sparrow				
Forster's tern				
Glossy ibis				
Golden eagle				
Golden-crowned kinglet				
Golden-winged warbler	SECONDARY	RED		
Grasshopper sparrow				Responsibility
Great blue heron				
Great egret				
Greater yellowlegs				

COMMON NAME	TNC Ecoregion	Audubon	Endemic	Responsibility
Gull-billed tern				
Hairy woodpecker				
Harlequin duck				
Henslow's sparrow	SECONDARY	RED		
Hermit thrush				
Hooded warbler	SECONDARY			
Horned grebe				
Kentucky warbler	SECONDARY	YELLOW		
King rail				
Laughing gull				
Least bittern				
Least flycatcher				
Least tern				
Little blue heron				
Loggerhead shrike				
Long-eared owl				
Louisiana waterthrush	SECONDARY			
Magnolia warbler				
Marsh wren				
Mourning warbler				
Nashville warbler				
Northern bobwhite				
Northern gannet				
Northern goshawk				
Northern harrier	SECONDARY			
Northern parula				
Northern saw-whet owl	SECONDARY			
Northern waterthrush				
Olive-sided flycatcher		YELLOW		
Ovenbird				
Pied-billed grebe				
Pileated woodpecker				
Piping plover	PRIMARY	RED		
Prairie warbler	SECONDARY	YELLOW		
Prothonotary warbler	SECONDARY	YELLOW		
Purple sandpiper		YELLOW		
Red knot		YELLOW		
Red-breasted nuthatch				
Red-cockaded woodpecker	PRIMARY	RED		
Red-eyed vireo				
Red-headed woodpecker		YELLOW		
Red-shouldered hawk				
Red-throated loon				
Roseate tern				
Royal tern				
Ruddy duck				Responsibility

COMMON NAME	TNC Ecoregion	Audubon	Endemic	Responsibility
Ruddy turnstone				
Saltmarsh sharp-tailed sparrow		RED		
Sanderling				
Sandwich tern				
Savannah sparrow				
Scarlet tanager				
Seaside sparrow		YELLOW		
Sedge wren				
Semipalmated sandpiper				
Sharp-shinned hawk				
Short-billed Dowitcher				
Short-eared owl		YELLOW		
Snowy egret				
Solitary sandpiper				
Summer tanager				
Swainson's thrush				
Swainson's warbler	SECONDARY	RED		
Tricolored heron				
Upland sandpiper				
Veery				
Vesper sparrow				
Wayne's black-throated green warbler				
Whimbrel		YELLOW		
Whip-poor-will				
Willet				
Willow flycatcher		YELLOW		
Wilson's plover		YELLOW		
Wilson's snipe				
Winter wren				
Wood thrush	SECONDARY	YELLOW		
Worm-eating warbler	SECONDARY	YELLOW		
Yellow-bellied sapsucker				
Yellow-crowned night-heron				
Yellow-throated vireo				

GCN Reptiles – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
Atlantic hawksbill seaturtle	Eretmochelys imbricata	G3	SRN	E	E
Bog turtle	Clemmys muhlenbergii	G3	S2	T	T
Broad-headed skink	Eumeces laticeps	G5	S4		
Cornsnake	Elaphe guttata	G5	S4		
Eastern box turtle	Terrapene carolina	G5	S5		

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
Eastern hog-nosed snake	Heterodon platirhinos	G5	S5		
Eastern ribbonsnake	Thamnophis sauritus	G5	S5		
Eastern spiny softshell	Apalone spinifera	G5	S1	I	
Green seaturtle	Chelonia mydas	G3	S1N	T	T
Kemp's ridley seaturtle	Lepidochelys kempii	G1	S1N	E	E
Leatherback seaturtle	Dermochelys coriacea	G2	S1	E	E
Loggerhead seaturtle	Caretta caretta	G3	S1B,S1N	T	T
Mountain earthsnake	Virginia valeriae pulchra	G5T3T4	S2	E	
Northern coal skink	Eumeces anthracinus	G5	SU	E	
Northern diamond-backed terrapin	Malaclemys terrapin terrapin	G4T4	S4		
Northern map turtle	Graptemys geographica	G5	S1	E*	
Northern pinesnake	Pituophis melanoleucus	G4	SH		
Northern red-bellied turtle	Pseudemys rubriventris	G5	S5		
Northern scarletsnake	Cemophora coccinea	G5	S3		
Queen snake	Regina septemvittata	G5	S5		
Rainbow snake	Farancia erytrogramma	G5	S1	E	
Red-bellied watersnake	Nerodia erythrogaster erythrogaster	G5T5	S2S3		
Spotted turtle	Clemmys guttata	G5	S5		
Timber rattlesnake	Crotalus horridus	G4	S3		
Wood turtle	Glyptemys insculpta	G4	S4		

GCN Reptiles – Part 2

COMMON NAME	CITES	IUCN	NE_Reg	TNC Ecoregion	Endemic	Responsibility
Atlantic hawksbill seaturtle	1	CR				
Bog turtle	1	EN		PRIMARY		
Broad-headed skink			NE_Reg			
Cornsnake						
Eastern box turtle	2	LR	NE_Reg			
Eastern hog-nosed snake			NE_Reg			
Eastern ribbonsnake			NE_Reg			
Eastern spiny softshell						
Green seaturtle	1	EN				
Kemp's ridley seaturtle	1	CR				
Leatherback seaturtle	1	CR				
Loggerhead seaturtle	1	EN		PRIMARY		
Mountain earthsnake			NE_Reg			
Northern coal skink			NE_Reg			
Northern diamond-backed terrapin			NE_Reg			
Northern map turtle						
Northern pinesnake			NE_Reg			
Northern red-bellied turtle		LR	NE_Reg			
Northern scarletsnake						

COMMON NAME	CITES	IUCN	NE_Reg	TNC Ecoregion	Endemic	Responsibility
Queen snake			NE_Reg			
Rainbow snake						
Red-bellied watersnake						
Spotted turtle		VU	NE_Reg			
Timber rattlesnake			NE_Reg	PRIMARY		
Wood turtle	2	VU	NE_Reg	SECONDARY		

GCN Amphibians – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES
Allegheny Mountain dusky salamander	Desmognathus ochrophaeus	G5	S5			
Barking treefrog	Hyla gratiosa	G5	S1	E		
Carpenter frog	Rana virgatipes	G5	S2	I		
Common mudpuppy	Necturus maculosus	G5	S1	X		
Eastern hellbender	Cryptobranchus alleganiensis	G3G4	S1	E		
Eastern mud salamander	Pseudotriton montanus	G5	S2?			
Eastern narrow-mouthed toad	Gastrophryne carolinensis	G5	S1S2	E		
Eastern spadefoot	Scaphiopus holbrookii	G5	S4			
Eastern tiger salamander	Ambystoma tigrinum	G5	S2	E		
Green salamander	Aneides aeneus	G3G4	S2	E		
Jefferson salamander	Ambystoma jeffersonianum	G4	S3			
Long-tailed salamander	Eurycea longicauda	G5	S5			
Mountain chorus frog	Pseudacris brachyphona	G5	S2	T		
New Jersey chorus frog	Pseudacris triseriata kalmi	G5T4	S4			
Northern red salamander	Pseudotriton ruber	G5	S5			
Seal salamander	Desmognathus monticola	G5	S5			
Wehrle's salamander	Plethodon wehrlei	G5	S2	I		

GCN Amphibians – Part 2

COMMON NAME	IUCN	NE_Reg	MBSS	TNC Ecoregion	Endemic	Responsibility
Allegheny Mountain dusky salamander			MBSS			
Barking treefrog				SECONDARY		
Carpenter frog		NE_Reg		SECONDARY		
Common mudpuppy						
Eastern hellbender		NE_Reg				
Eastern mud salamander		NE_Reg				
Eastern narrow-mouthed toad						
Eastern spadefoot		NE_Reg				
Eastern tiger salamander		NE_Reg		SECONDARY		

COMMON NAME	IUCN	NE_Reg	MBSS	TNC Ecoregion	Endemic	Responsibility
Green salamander	LR	NE_Reg		PRIMARY		
Jefferson salamander		NE_Reg				
Long-tailed salamander			MBSS			
Mountain chorus frog		NE_Reg				
New Jersey chorus frog		NE_Reg				Responsibility
Northern red salamander			MBSS			
Seal salamander			MBSS			
Wehrle's salamander						

GCN Fishes – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
American brook lamprey	Lampetra appendix	G4	S1S2	T			
American shad	Alosa sapidissima	G5	S3	I			
Atlantic sturgeon	Acipenser oxyrinchus	G3	S1		C	2	LR
Banded sunfish	Enneacanthus obesus	G5	S2				
Blackbanded sunfish	Enneacanthus chaetodon	G4	S1	T			
Bluespotted sunfish	Enneacanthus gloriosus	G5	S3S4				
Bowfin	Amia calva	G5	S1?				
Bridle shiner	Notropis bifrenatus	G5	SH	E			
Brook trout	Salvelinus fontinalis	G5	S3S4				
Cheat minnow	Pararhinichthys bowersi	G1G2Q	SX	X			
Checkered sculpin	Cottus sp 7	G4Q	S1S2				
Comely shiner	Notropis amoenus	G5	S2	T			
Flier	Centrarchus macropterus	G5	S1S2	T			
Glassy darter	Etheostoma vitreum	G4G5	S1S2	T			
Greenside darter	Etheostoma blennioides	G5	S5				
Hickory shad	Alosa mediocris	G5	S3	I			
Ironcolor shiner	Notropis chalybaeus	G4	S1	E			
Johnny darter	Etheostoma nigrum	G5	S3				
Least brook lamprey	Lampetra aepyptera	G5	S4				
Logperch	Percina caprodes	G5	S1S2	T			
Longnose gar	Lepisosteus osseus	G5	S2?				
Longnose sucker	Catostomus catostomus	G5	SH	X			
Maryland darter	Etheostoma sellare	GH	SH	E	E		EX
Mottled sculpin	Cottus bairdi	G5	S3S4				
Mud sunfish	Acantharchus pomotis	G5	S2	I			
Northern hogsucker	Hypentelium nigricans	G5	S5				
Pearl dace	Margariscus margarita	G5	S1S2	T			
Redside dace	Clinostomus elongatus	G4	SX				
Rosyside dace	Clinostomus funduloides	G5	S5				
Shield darter	Percina peltata	G5	S3				
Shortnose sturgeon	Acipenser brevirostrum	G3	S1	E	E	1	VU
Silverjaw minnow	Ericymba buccata	G5	S4				

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
Spotfin killifish	Fundulus luciae	G4	S2?				
Stonecat	Noturus flavus	G5	S1	E			
Stripeback darter	Percina notogramma	G4	S1	E			
Striped shiner	Luxilus chrysocephalus	G5	S1S2	I			
Swamp darter	Etheostoma fusiforme	G5	S2	I			
Trout-perch	Percopsis omiscomaycus	G5	SX	X			
Warmouth	Lepomis gulosus	G5	S3?				
White catfish	Ameiurus catus	G5	SU				

GCN Fishes – Part 2

COMMON NAME	NE_Reg	MBSS	AFS	DNR Fisheries	TNC Ecoregion	Endemic	Responsibility
American brook lamprey	NE_Reg	SAS-I					
American shad				DAF			
Atlantic sturgeon	NE_Reg		AFS-E		PRIMARY		
Banded sunfish	NE_Reg						
Blackbanded sunfish	NE_Reg	SAS					
Bluespotted sunfish							
Bowfin							
Bridle shiner	NE_Reg	SAS					
Brook trout		MBSS					
Cheat minnow							
Checkered sculpin		SAS-M					
Comely shiner		SAS					
Flier		SAS-M					
Glassy darter		SAS-I					
Greenside darter		SAS-M					
Hickory shad				DAF			
Ironcolor shiner		SAS-I					
Johnny darter		SAS-M					
Least brook lamprey		SAS-I					
Logperch		SAS-M					
Longnose gar							
Longnose sucker		SAS					
Maryland darter			AFS-E			Endemic	Responsibility
Mottled sculpin							
Mud sunfish	NE_Reg	SAS-M					
Northern hogsucker		SAS-I					
Pearl dace		SAS-M					
Redside dace							
Rosyside dace		SAS-I					
Shield darter		SAS-I					
Shortnose sturgeon			AFS-E		PRIMARY		

COMMON NAME	NE_Reg	MBSS	AFS	DNR Fisheries	TNC Ecoregion	Endemic	Responsibility
Silverjaw minnow		SAS-M					
Spotfin killifish							
Stonecat		SAS-I					
Stripeback darter							
Striped shiner		SAS-M					
Swamp darter		SAS-I					
Trout-perch							
Warmouth							
White catfish							

INVERTEBRATES

GCN Insects: Dragonflies and Damselflies (Odonata) – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES
A snaketail	Ophiogomphus sp 1	G?	S1			
Allegheny river cruiser	Macromia alleghaniensis	G4	S2			
Allegheny snaketail	Ophiogomphus incurvatus	G3	S2			
Amber-winged spreadwing	Lestes eurinus	G4	S3			
American emerald	Cordulia shurtleffi	G5	S3			
Arrowhead spiketail	Cordulegaster obliqua	G4	S2			
Atlantic bluet	Enallagma doubledayi	G5	SH			
Attenuated bluet	Enallagma daeckii	G4	S3			
Aurora damsel	Chromagrion conditum	G5	S3S4			
Azure bluet	Enallagma aspersum	G5	S3S4			
Band-winged meadowhawk	Sympetrum semicinctum	G5	S3			
Bar-winged skimmer	Libellula axilena	G5	S3			
Beaverpond baskettail	Epitheca canis	G5	S3			
Big bluet	Enallagma durum	G5	S3			
Black-tipped darner	Aeshna tuberculifera	G4	S2			
Blackwater bluet	Enallagma weewa	G5	S1			
Blue-faced meadowhawk	Sympetrum ambiguum	G5	S3S4			
Brown spiketail	Cordulegaster bilineata	G5	S2			
Burgundy bluet	Enallagma dubium	G5	S1			
Canada darner	Aeshna canadensis	G5	S2			
Chalk-fronted skimmer	Libellula julia	G5	S2			
Cherry-faced meadowhawk	Sympetrum internum	G5	S2			
Cobra clubtail	Gomphus vastus	G5	S3			
Comet darner	Anax longipes	G5	S3			
Common sanddragon	Progomphus obscurus	G5	S3			
Crimson-ringed whiteface	Leucorrhinia glacialis	G5	S1			
Cyrano darner	Nasiaeschna pentacantha	G5	S3			
Delta-spotted spiketail	Cordulegaster diastatops	G5	S3			

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES
Dot-tailed whiteface	Leucorrhinia intacta	G5	S3			
Eastern red damsel	Amphiagrion saucium	G5	S3			
Eastern ringtail	Erpetogomphus designatus	G5	S2			
Elfin skimmer	Nannothemis bella	G4	S1			
Elusive clubtail	Stylurus notatus	G3	SU			
Emerald spreadwing	Lestes dryas	G5	SH			
Faded pennant	Celithemis ornata	G5	S1			
Fine-lined emerald	Somatochlora filosa	G5	S2			
Four-spotted pennant	Brachymesia gravida	G5	S3S4			
Golden-winged skimmer	Libellula auripennis	G5	S3			
Gray petaltail	Tachopteryx thoreyi	G4	S2			
Great spreadwing	Archilestes grandis	G5	S3			
Green-faced clubtail	Gomphus viridifrons	G3	S1			
Green-striped darner	Aeshna verticalis	G5	S2			
Hagen's bluet	Enallagma hageni	G5	S3S4			
Harlequin darner	Gomphaeschna furcillata	G5	S3			
Harpoon clubtail	Gomphus descriptus	G4	S1			
Hudsonian whiteface	Leucorrhinia hudsonica	G5	S1			
Lance-tipped darner	Aeshna constricta	G5	SH			
Laura's clubtail	Stylurus laurae	G4	S2			
Least clubtail	Stylogomphus albistylus	G5	S3S4			
Little blue dragonlet	Erythrodiplax minuscula	G5	S1			
Lyre-tipped spreadwing	Lestes unguiculatus	G5	SH			
Mantled baskettail	Epitheca semiaquea	G4	SH			
Marsh bluet	Enallagma ebrium	G5	SH			
Martha's pennant	Celithemis martha	G4	S2			
Midland clubtail	Gomphus fraternus	G5	S2			
Mocha emerald	Somatochlora linearis	G5	S3S4			
Northern pygmy clubtail	Lanthus parvulus	G4	S1			
Ocellated darner	Boyeria grafiana	G5	S1			
Pale bluet	Enallagma pallidum	G4	SH			
Petite emerald	Dorocordulia lepida	G5	SH			
Piedmont clubtail	Gomphus parvidens	G4	SH			
Rainbow bluet	Enallagma antennatum	G5	S1			
Rapids clubtail	Gomphus quadricolor	G3G4	S1			
River jewelwing	Calopteryx aequabilis	G5	S1			
Riverine clubtail	Stylurus amnicola	G4	SH			
Robust baskettail	Epitheca spinosa	G4	S1S2			
Royal river cruiser	Macromia taeniolata	G5	S3			
Russet-tipped clubtail	Stylurus plagiatus	G5	S3			
Rusty snaketail	Ophiogomphus rupinsulensis	G5	S2			
Sable clubtail	Gomphus rogersi	G4	S1	E		
Sedge sprite	Nehalennia irene	G5	S3			
Seepage dancer	Argia bipunctulata	G4	S3			
Selys' sunfly	Helocordulia selysii	G4	S2			
Skillet clubtail	Gomphus ventricosus	G3	SH			

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES
Ski-tailed emerald	Somatochlora elongata	G5	S1			
Slender bluet	Enallagma traviatum	G5	S3			
Smoky rubyspot	Hetaerina titia	G5	SH			
Southern pygmy clubtail	Lanthus vernalis	G4	S1			
Southern sprite	Nehalennia integricollis	G5	S1S2			
Sparkling jewelwing	Calopteryx dimidiata	G5	SH			
Sphagnum sprite	Nehalennia gracilis	G5	S2			
Spine-crowned clubtail	Gomphus abbreviatus	G3G4	SH			
Splendid clubtail	Gomphus lineatifrons	G4	SH			
Spotted spreadwing	Lestes congener	G5	S3			
Spring blue darner	Aeshna mutata	G3G4	S1	E		
Stripe-winged baskettail	Epitheca costalis	G4	S1			
Stygian shadowdragon	Neurocordulia yamaskanensis	G5	S2			
Superb jewelwing	Calopteryx amata	G4	S2			
Sweetflag spreadwing	Lestes forcipatus	G5	S3			
Taper-tailed darner	Gomphaeschna antilope	G4	S2			
Tiger spiketail	Cordulegaster erronea	G4	S2			
Treetop emerald	Somatochlora provocans	G4	S1			
Tule bluet	Enallagma carunculatum	G5	SH			
Turquoise bluet	Enallagma divagans	G5	S3S4			
Uhler's sundragon	Helocordulia uhleri	G5	S3			
Vesper bluet	Enallagma vesperum	G5	S3			
White corporal	Libellula exusta	G4	S1			
White-faced meadowhawk	Sympetrum obtrusum	G5	S3			
Yellow-sided skimmer	Libellula flavida	G5	S2			
Zebra clubtail	Stylurus scudderi	G4	S1			

GCN Insects: Dragonflies and Damselflies (Odonata) – Part 2

COMMON NAME	IUCN	TNC Ecoregion	Endemic	Responsibility
A snaketail			?	?
Allegheny river cruiser				
Allegheny snaketail	LR	SECONDARY		
Amber-winged spreadwing				
American emerald				
Arrowhead spiketail				
Atlantic bluet				
Attenuated bluet				
Aurora damsel				
Azure bluet				
Band-winged meadowhawk				
Bar-winged skimmer				
Beaverpond baskettail				
Big bluet				

COMMON NAME	IUCN	TNC Ecoregion	Endemic	Responsibility
Black-tipped darner				
Blackwater bluet		SECONDARY		
Blue-faced meadowhawk				
Brown spiketail				
Burgundy bluet		SECONDARY		
Canada darner				
Chalk-fronted skimmer				
Cherry-faced meadowhawk				
Cobra clubtail				
Comet darner		SECONDARY		
Common sanddragon				
Crimson-ringed whiteface				
Cyrano darner				
Delta-spotted spiketail				
Dot-tailed whiteface				
Eastern red damsel				
Eastern ringtail				
Elfin skimmer		SECONDARY		
Elusive clubtail				
Emerald spreadwing				
Faded pennant				
Fine-lined emerald				
Four-spotted pennant				
Golden-winged skimmer				
Gray petaltail		SECONDARY		
Great spreadwing				
Green-faced clubtail		PRIMARY		
Green-striped darner				
Hagen's bluet				
Harlequin darner				
Harpoon clubtail				
Hudsonian whiteface				
Lance-tipped darner				
Laura's clubtail		SECONDARY		
Least clubtail				
Little blue dragonlet				
Lyre-tipped spreadwing				
Mantled baskettail				
Marsh bluet				
Martha's pennant				
Midland clubtail				
Mocha emerald				
Northern pygmy clubtail		PRIMARY		
Ocellated darner				
Pale bluet		SECONDARY		
Petite emerald				

COMMON NAME	IUCN	TNC Ecoregion	Endemic	Responsibility
Piedmont clubtail	LR			
Rainbow bluet				
Rapids clubtail		PRIMARY		
River jewelwing				
Riverine clubtail		PRIMARY		
Robust baskettail		PRIMARY		
Royal river cruiser				
Russet-tipped clubtail				
Rusty snaketail				
Sable clubtail		SECONDARY		
Sedge sprite		SECONDARY		
Seepage dancer		SECONDARY		
Selys' sunfly				
Skillet clubtail		PRIMARY		
Ski-tailed emerald				
Slender bluet				
Smoky rubyspot				
Southern pygmy clubtail				
Southern sprite				
Sparkling jewelwing				
Sphagnum sprite				
Spine-crowned clubtail		PRIMARY		
Splendid clubtail				
Spotted spreadwing				
Spring blue darner		PRIMARY		
Stripe-winged baskettail				
Stygian shadowdragon				
Superb jewelwing		SECONDARY		
Sweetflag spreadwing				
Taper-tailed darner				
Tiger spiketail		SECONDARY		
Treetop emerald		PRIMARY		
Tule bluet				
Turquoise bluet				
Uhler's sundragon				
Vesper bluet				
White corporal				
White-faced meadowhawk				
Yellow-sided skimmer		SECONDARY		
Zebra clubtail		PRIMARY		

GCN Insects: Butterflies and Moths (Lepidoptera) – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
A noctuid moth	Zale curema	G3G4	S1?		
A noctuid moth	Apamea mixta	GU	S1		
A noctuid moth	Meropleon titan	G2G4	SU		
A noctuid moth	Hadena ectypa	G3G4	SU		
American chestnut nepticulid moth	Ectoedemia castaneae	GH	SH		
Appalachian blue	Celastrina neglectamajor	G4	S3S4		
Atlantis fritillary	Speyeria atlantis	G5	S1	T	
Baltimore checkerspot	Euphydryas phaeton	G4	S3		
Bog copper	Lycaena epixanthe	G4G5	S1	E	
Carolina satyr	Hermeuptychia sosybius	G5	S1S3		
Chermock's mulberry wing	Poanes massasoit chermocki	G4T1	S1	E	
Chestnut clearwing moth	Synanthedon castaneae	G3G5	SX		
Cobweb skipper	Hesperia metea	G4G5	S3		
Compton tortoiseshell	Nymphalis vaualbum	G5	S1B,SZN	E	
Cypress sphinx moth	Isoparce cupressi	G4	SU		
Dion skipper	Euphyes dion	G4	S3		
Dotted skipper	Hesperia attalus slossonae	G3G4T3	SH		
Dusky azure	Celastrina ebenina	G4	SH	E	
Early hairstreak	Erora laeta	G3G4	S1	E	
Edwards' hairstreak	Satyrium edwardsii	G4	S1	E	
Frosted elfin	Incisalia irus	G3	S1	E	
Giant swallowtail	Papilio cresphontes	G5	S2	I	
Golden-banded skipper	Autochton cellus	G4	SH	X	
Gray comma	Polygonia progne	G5	S1S3		
Great purple hairstreak	Atlides halesus	G5	S1S2	T	
Harris's checkerspot	Chlosyne harrisii	G4	S2	T	
Hessel's hairstreak	Mitoura hesseli	G3G4	SH	X	
Hickory hairstreak	Satyrium caryaevorum	G4	S1	E	
Hoary elfin	Callophrys polios	G5	S1		
Indian skipper	Hesperia sassacus	G5	S3		
King's hairstreak	Satyrium kingi	G3G4	S1	E	
Long dash	Polites mystic	G5	S3		
Marbled underwing	Catocala marmorata	G3G4	SH		
Mitchell's satyr	Neonympha mitchellii	G1G2	SR		E
Mottled duskywing	Erynnis martialis	G3G4	S1	E	
Northern crescent	Phyciodes cocyta	G5	SP		
Northern hairstreak	Fixsenia ontario	G4T4	S1S2	E	
Northern metalmark	Calephelis borealis	G3G4	S2	T	
Olympia marble	Euchloe olympia	G4G5	S2	I	
Palamedes swallowtail	Papilio palamedes	G5	S1	E	
Pepper and salt skipper	Amblyscirtes hegon	G5	S2	I	
Persius duskywing	Erynnis persius persius	G5T2T3	SH		
Phleophagan chestnut nepticulid moth	Ectoedemia phleophaga	GH	SH		

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
Pine barrens zanclognatha	Zanclognatha martha	G4	S1S3		
Pink-edged sulphur	Colias interior	G5	S1		
Precious underwing	Catocala pretiosa pretiosa	G4T2T3	SH		
Rare skipper	Problema bulenta	G2G3	S1	T	
Regal fritillary	Speyeria idalia	G3	SH	X	
Seaside goldenrod stem borer	Papaipema duovata	G4	SU		
Silver-bordered fritillary	Boloria selene	G5	S3		
Silvery blue	Glaucopsyche lygdamus	G5	S2	I	
Southern grizzled skipper	Pyrgus wyandot	G2	S1	E	
Tawny crescent	Phyciodes batesii batesii	G4T1	SH	X	
The buckmoth	Hemileuca maia maia	G5T5	SU		
Three-horned moth	Pachypolia atricornis	G3G4	SH		
Two-spotted skipper	Euphyes bimacula	G4	S1	E	
West virginia white	Pieris virginiensis	G3G4	S3		

GCN Insects: Butterflies and Moths (Lepidoptera) – Part 2

COMMON NAME	CITES	IUCN	TNC Ecoregion	Endemic	Responsibility
A noctuid moth			PRIMARY		
A noctuid moth					
A noctuid moth					
A noctuid moth					
American chestnut nepticulid moth					
Appalachian blue					
Atlantis fritillary					
Baltimore checkerspot					
Bog copper			PRIMARY		
Carolina satyr					
Chermock's mulberry wing			PRIMARY		
Chestnut clearwing moth		NE			
Cobweb skipper					
Compton tortoiseshell					
Cypress sphinx moth			SECONDARY		
Dion skipper					
Dotted skipper					
Dusky azure					
Early hairstreak					
Edwards' hairstreak					
Frosted elfin			PRIMARY		
Giant swallowtail					
Golden-banded skipper					
Gray comma					
Great purple hairstreak			SECONDARY		
Harris's checkerspot					

COMMON NAME	CITES	IUCN	TNC Ecoregion	Endemic	Responsibility
Hessel's hairstreak			PRIMARY		
Hickory hairstreak					
Hoary elfin					
Indian skipper					
King's hairstreak			PRIMARY		
Long dash					
Marbled underwing					
Mitchell's satyr					
Mottled duskywing			SECONDARY		
Northern crescent					
Northern hairstreak					
Northern metalmark			PRIMARY		
Olympia marble					
Palamedes swallowtail					
Pepper and salt skipper					
Persius duskywing			PRIMARY		
Phleophagan chestnut nepticulid moth					
Pine barrens zanclognatha					
Pink-edged sulphur					
Precious underwing					
Rare skipper			PRIMARY		
Regal fritillary			PRIMARY		
Seaside goldenrod stem borer			SECONDARY		
Silver-bordered fritillary					
Silvery blue					
Southern grizzled skipper			PRIMARY		
Tawny crescent					
The buckmoth			PRIMARY		
Three-horned moth					
Two-spotted skipper					
West virginia white					

GCN Insects: Beetles (Coleoptera) – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
A cave beetle	Pseudanophthalmus sp 15	G1	S1		
A coccinellid beetle	Nephus gordoni	G?	SU		
A dytiscid beetle	Hoperius planatus	G?	S2		
A hydrophilid beetle	Hydrochara occultus	G?	SU		
A hydrophilid beetle	Sperchopsis tessellatus	G?	S2		
A lampyrid firefly	Photuris bethaniensis	G1?	SP		
A tiger beetle	Cicindela ancocisconensis	G3	S1	E	
A tiger beetle	Cicindela purpurea	G5	S3		
A tiger beetle	Cicindela scutellaris	G5	S3		
A tiger beetle	Cicindela unipunctata	G4	S3		

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
A tiger beetle	Cicindela splendida	G5	S3		
A tiger beetle	Cicindela abdominalis	G5	S1	E	
American burying beetle	Nicrophorus americanus	G2G3	SX	X	E
Big sand tiger beetle	Cicindela formosa	G5	SU		
Giant stag beetle	Lucanus elephas	G3G5	S1		
Green-patterned tiger beetle	Cicindela patruela	G3	S1	E	
Little white tiger beetle	Cicindela lepida	G4	S1	E	
Northeastern beach tiger beetle	Cicindela dorsalis dorsalis	G4T2	S1	E	T
Puritan tiger beetle	Cicindela puritana	G1G2	S1	E	T
Schwarz' diving beetle	Laccophilus schwarzi	G?	SX		
Seth forest water scavenger beetle	Hydrochus spangleri	G1	S1	E	
Six-banded longhorn beetle	Dryobius sexnotatus	G?	S1	E	
White tiger beetle	Cicindela dorsalis media	G4T4	S1	E	
Crabtree cave springtail	Arrhopalites sp 1	G?	SU		

GCN Insects: Beetles (Coleoptera) – Part 2

COMMON NAME	CITES	IUCN	TNC Ecoregion	Endemic	Responsibility
A cave beetle			PRIMARY		
A coccinellid beetle					
A dytiscid beetle					
A hydrophilid beetle					
A hydrophilid beetle					
A lampyrid firefly			PRIMARY		
A tiger beetle			PRIMARY		
A tiger beetle			SECONDARY		
A tiger beetle					
A tiger beetle					
A tiger beetle					
A tiger beetle			SECONDARY		
American burying beetle		CR			
Big sand tiger beetle					
Giant stag beetle					
Green-patterned tiger beetle			PRIMARY		
Little white tiger beetle			SECONDARY		
Northeastern beach tiger beetle			PRIMARY		
Puritan tiger beetle		EN	PRIMARY		
Schwarz' diving beetle					
Seth forest water scavenger beetle			PRIMARY		
Six-banded longhorn beetle					
White tiger beetle			SECONDARY		
Crabtree cave springtail					

GCN Insects: Other Orders – Part 1

ORDER	COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
HOMOPTERA						
	A cicadellid leafhopper	Chlorotettix sp 1	G?	SU		
	Eastern sedge barrens planthopper	Limotettix minuendus	G1	S1		
EPHEMEROPTERA						
	Walker's tusked sprawler	Potamanthus walkeri	G5	SU		
DIPTERA						
	Pitcher-plant mosquito	Wyeomyia smithii	G5	S2		
COLLEMBOLA						
	Crabtree cave springtail	Arrhopalites sp 1	G?	SU		

GCN Insects: Other Orders – Part 2

ORDER	COMMON NAME	CITES	IUCN	TNC Ecoregion	Endemic	Responsibility
HOMOPTERA						
	A cicadellid leafhopper					
	Eastern sedge barrens planthopper					
EPHEMEROPTERA						
	Walker's tusked sprawler					
DIPTERA						
	Pitcher-plant mosquito					
COLLEMBOLA						
	Crabtree cave springtail					

GCN Other Arthropods – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
A crayfish	Cambarus acuminatus	G4	S3		
A crayfish	Orconectes obscurus	G5	S3		
A cyclopoid copepod	Diacyclops palustris	G?	SU		
A harpacticoid copepod	Attheyella spinipes	G?	SU		
Allegheny cave amphipod	Stygobromus allegheniensis	G4	S2S3	I	
An amphipod	Stygobromus sp 6	G?	S1		
An entocytherid ostracod	Dactylocythere scotos	G?	S1		
An entocytherid ostracod	Ankylocythere tridentata	G?	SU		
An isopod	Caecidotea sp 4	G?	S1		
An isopod	Caecidotea sp 5	G?	S1		
An isopod	Caecidotea sp 6	G?	S2		
An isopod	Caecidotea sp 1	G1	S1		

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US
An isopod	Caecidotea sp 2	G?	S1		
An isopod	Caecidotea sp 3	G3	S1		
Appalachian cave spider	Porhomma cavernicola	G4G5	S2		
Barrelville amphipod	Stygobromus sp 5	G?	S1		
Biggers' cave amphipod	Stygobromus biggersi	G2G4	S1	E	
Dearolf's cave amphipod	Crangonyx dearolfi	G2G3	S1	E	
Franz's cave amphipod	Stygobromus franzi	G2G3	S2S3	I	
Franz's cave isopod	Caecidotea franzi	G2G3	S1	E	
Greenbrier cave amphipod	Stygobromus emarginatus	G3	S1	E	
Horseshoe crab	Limulus polyphemus	G?	S?		
Pizzini's amphipod	Stygobromus pizzinii	G2G4	S1		
Potomac amphipod	Stygobromus tenuis potomacus	G4T3T4Q	S3		
Price's cave isopod	Caecidotea pricei	G3G4	S3		
Red-legged purse-web spider	Sphodros rufipes	G4	S1S2		
Roundtop amphipod	Stygobromus sp 14	G?	S1		
Shenandoah cave amphipod	Stygobromus gracilipes	G2G4	S1	E	
Snivelys cave spider	Oreonetides sp 1	G?	SU		
Tenuis amphipod	Stygobromus tenuis tenuis	G4G5T2T3Q	SU		
Tidewater amphipod	Stygobromus indentatus	G3	S1		

GCN Other Arthropods – Part 2

COMMON NAME	CITES	IUCN	DNR Fisheries	TNC Ecoregion	Endemic	Responsibility
A crayfish						
A crayfish						
A cyclopoid copepod						
A harpacticoid copepod						
Allegheny cave amphipod						
An amphipod						
An entocytherid ostracod						
An entocytherid ostracod						
An isopod						
An isopod						
An isopod						
An isopod				PRIMARY		
An isopod						
An isopod				PRIMARY		
Appalachian cave spider						
Barrelville amphipod						
Biggers' cave amphipod				PRIMARY		
Dearolf's cave amphipod		EN		PRIMARY		
Franz's cave amphipod				PRIMARY		
Franz's cave isopod				PRIMARY		

COMMON NAME	CITES	IUCN	DNR Fisheries	TNC Ecoregion	Endemic	Responsibility
Greenbrier cave amphipod		VU		PRIMARY		
Horseshoe crab		LR	DMI			
Pizzini's amphipod		VU		PRIMARY		
Potomac amphipod						
Price's cave isopod				PRIMARY		
Red-legged purse-web spider						
Roundtop amphipod						
Shenandoah cave amphipod				PRIMARY		
Snivelys cave spider						
Tenuis amphipod				PRIMARY		
Tidewater amphipod		VU		PRIMARY		

GCN Molluscs – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES	IUCN
Alewife floater	Anodonta implicata	G5	S3				
Angular disc	Discus catskillensis	G3G5	S1				
Appalachian spring snail	Fontigens bottimeri	G2	S2				
Atlantic spike	Elliptio producta	G4Q	S2S3				LR
Bear creek slitmouth	Stenotrema simile	G?	SU				
Blue ridge spring snail	Fontigens orolibas	G2G3	S1	E			
Brook floater	Alasmidonta varicosa	G3	S1	E			DD
Cherrydrop snail	Hendersonia occulta	G4	S2	I			
Creeper	Strophitus undulatus	G5	S2	I			
Cylindrically-ornate wood snail	Vertigo ventricosa	G3G4	SU				
Dwarf wedge mussel	Alasmidonta heterodon	G1G2	S1	E	E		EN
Eastern lampmussel	Lampsilis radiata	G5	SU				
Eastern pondmussel	Ligumia nasuta	G4G5	SU				LR
Green floater	Lasmigona subviridis	G3	S1	E			LR
Northern lance	Elliptio fisheriana	G4	S3				
Paper pondshell	Utterbackia imbecillis	G5	S3				
Rader's snail	Glyphyalinia raderi	G2	SH	X			
Spruce knob threetooth	Triodopsis picea	G3	S1				
Striped whitelip	Webbhelix multilineata	G?	S1				
Tidewater mucket	Leptodea ochracea	G4	SU				LR
Triangle floater	Alasmidonta undulata	G4	S1	E			
Yellow lampmussel	Lampsilis cariosa	G3G4	S1	X			EN
Yellow lance	Elliptio lanceolata	G2G3	SU				LR

GCN Molluscs – Part 2

COMMON NAME	NE_Reg	MBSS	AFS	TNC Ecoregion	Endemic	Responsibility
Alewife floater			CS			
Angular disc						
Appalachian spring snail				PRIMARY		
Atlantic spike			SC			
Bear creek slitmouth						
Blue ridge spring snail				PRIMARY		
Brook floater	NE_Reg		T	PRIMARY		
Cherrydrop snail						
Creeper			CS			
Cylindrically-ornate wood snail						
Dwarf wedge mussel			E	PRIMARY		
Eastern lampmussel			CS	SECONDARY		
Eastern pondmussel	NE_Reg		SC	SECONDARY		
Green floater	NE_Reg		T	PRIMARY		
Northern lance			SC			
Paper pondshell			CS			
Rader's snail						
Spruce knob threetooth				PRIMARY		
Striped whitelip						
Tidewater mucket	NE_Reg		SC	SECONDARY		
Triangle floater			SC	SECONDARY		
Yellow lampmussel	NE_Reg		T	PRIMARY		
Yellow lance				PRIMARY		

GCN Planaria – Part 1

COMMON NAME	SCIENTIFIC NAME	G-RANK	S-RANK	MD	US	CITES
A planarian	Phagocata virilis	G?	S1			
A planarian	Planaria dactyligera	G?	S2			
A planarian	Procotyla typhlops	G1G2	S1	E		
A planarian	Sphalloplana sp 1	G?	S1S2			
Hoffmaster's cave planarian	Sphalloplana hoffmasteri	G2G3	S1	E		

GCN Planaria – Part 2

COMMON NAME	IUCN	TNC Ecoregion	Endemic	Responsibility
A planarian				
A planarian				

COMMON NAME	IUCN	TNC Ecoregion	Endemic	Responsibility
A planarian		PRIMARY		
A planarian				
Hoffmaster's cave planarian		PRIMARY		

RARE OR UNIQUE NATURAL COMMUNITIES OF MARYLAND	S-RANK
TERRESTRIAL	
HIGH ELEVATION MOUNTAIN COMMUNITIES	
Central Appalachian Northern Hardwood Forests	S3
Central Appalachian Red Spruce Forests	S1
LOW ELEVATION MESIC FORESTS	
Acidic Cove Forests	S3
Basic Mesic Forests	(S4)
Acer saccharum - Fraxinus americana - Tilia americana / Cimicifuga racemosa Forest	S3
Fagus grandifolia - Liriodendron tulipifera Forest	S3?
Eastern Hemlock Forests	S2
Rich Cove and Slope Forests	S3
LOW ELEVATION DRY AND DRY-MESIC FORESTS AND WOODLANDS	
Basic Oak-Hickory Forests	S3
Chestnut Oak Forests	(S5)
Quercus prinus / Deschampsia flexuosa - Solidago bicolor Coastal Plain Terrace Forest	S2
Coastal Plain Dry Calcareous Forests and Woodlands	S1
Dry-Mesic Calcareous Forests	S3
Eastern White Pine-Hardwood Forests	S3
Low Elevation Boulderfield Forests and Woodlands	S2
Montane Acidic Woodlands	S3
Montane Dry Calcareous Forests and Woodlands	S2
Piedmont/Mountain Basic Woodlands	S1
Pine-Oak/Heath Forests and Woodlands	S3
Sand Ridge/Dune Woodlands	S3
BARRENS AND ROCK OUTCROPS	
Central Appalachian Shale Barrens	S2
Piedmont/Mountain Cliffs	S1
Riverside Outcrop Barrens	S1
Sandstone Glades	S2
Serpentine Barrens	S1
MARITIME ZONE COMMUNITIES	
Maritime Dune Grasslands	S3
Maritime Dune Woodlands	S2
Maritime Loblolly Pine Forests	S3
Maritime Scrub	S2
PALUSTRINE	
ALLUVIAL FLOODPLAINS	

RARE OR UNIQUE NATURAL COMMUNITIES OF MARYLAND	S-RANK
Coastal Plain Semipermanent Impoundments	(S5)
Chamaecyparis thyoides / Alnus maritima Woodland	S?
Coastal Plain/Piedmont Bottomland Forests	(S4)
Acer rubrum - Fraxinus pensylvanica / Saururus cernuus Forest	S2?
Acer rubrum - Nyssa sylvatica - Betula nigra Forest	S2?
Liriodendron tulipifera - Acer rubrum - Liquidambar styraciflua / Medeola virginiana Forest	S3
Platanus occidentalis - (Liquidambar styraciflua, Liriodendron tulipifera) / Asimina triloba Forest	S3?
Quercus (palustris, phellos) - Acer rubrum / Cinna arundinacea Forest	S2?
Floodplain Ponds and Pools	S2
Piedmont/Mountain Swamp Forests	S3
River-Scour Woodlands	S3
Riverside Prairies	S1
Rocky Bars and Shores	(S4)
Carex torta Herbaceous Vegetation	S3
NON-ALLUVIAL WETLANDS	
Appalachian Bogs/Fens	S1
Atlantic White Cedar Wetlands	S1
Coastal Plain Ponds	S2S3
Coastal Plain Seepage Bogs/Fens	S1
Coastal Plain/Piedmont Acidic Seepage Swamps	S3
High Elevation Seepage Swamps	S2
Interdunal Swales	S1
Mountain/Piedmont Acidic Seepage Swamps	S3
Mountain/Piedmont Basic Seepage Swamps	S3
Upland Depression Swamps	(S4)
Liquidambar styraciflua - Acer rubrum - Nyssa biflora / Carex joorii Forest	S1
Quercus palustris - Quercus bicolor / Carex spp. Forest	S?
Quercus phellos / Smilax rotundifolia / Carex (albolutescens, festucacea) Woodland	S?
NON-TIDAL MARITIME WETLANDS	
Estuarine Fringe Loblolly Pine Forests	S1
Maritime Shrub Swamps	S3
Sea-Level Fens	S1
ESTUARINE	
TIDAL WETLANDS	
Intertidal Mud/Sand/Gravel Flats	S3
Tidal Bald Cypress Woodlands/Forests	S1S2
Tidal Freshwater and Oligohaline Aquatic Beds	(S5)
Nelumbo lutea Herbaceous Vegetation	S3
Tidal Freshwater Marshes	(S5)
Zizania aquatica Tidal Herbaceous Vegetation	S3
Tidal Freshwater Shrublands	(S4)
Alnus maritima / Acorus calamus Tidal Shrubland	S3.1
Tidal Hardwood Swamps	(S4)
Fraxinus pennsylvanica - Acer rubrum / Polygonum spp. Tidal Woodland	S2
Tidal Oligohaline Marshes	(S4)

RARE OR UNIQUE NATURAL COMMUNITIES OF MARYLAND	S-RANK
Carex hyalinolepis Tidal Herbaceous Vegetation	S2
Elecoharis (fallax, rostellata) Tidal Herbaceous Vegetation	SR
Tidal Oligohaline Shrublands	(S4)
Morella cerifera - Baccharis halimifolia / Eleocharis fallax Tidal Shrublands	S3
Morella cerifera – Rosa palustris / Thelypteris palustris var. pubescens Tidal Shrubland	S3S4
RIVERINE	
RIVERINE COMMUNITIES	
Riverine Aquatic Beds	(S5)
Vallisneria americana Riverine Herbaceous Vegetation	S?
MARINE	
COASTAL BEACHES	
Coastal Beaches and Overwash Flats	S3

EXPLANATION OF THE ACRONYMS USED IN APPENDIX 3b

AFS — American Fisheries Society priority species

BCI — Bat Conservation International species of concern, with USFWS

BCC-NE — Birds of Conservation Concern, 2002, USFWS, for Region 5

BCC-BCR — Birds of Conservation Concern, 2002, USFWS, for BCR #28, 29, or 30

BCR — Bird Conservation Regions developed by the North American Bird Conservation Initiative coalition

CITES — Convention on International Trade in Endangered Species of Flora and Fauna

DAF — Depleted Anadromous Fish of concern to the Fisheries Service, DNR

DMI — Depleted Marine Invertebrates of concern to the Fisheries Service, DNR

IUCN — Red List of Threatened Species, World Conservation Union

MANEM — Mid-Atlantic/New England/Maritimes Regional Working Group; MANEM list or draft focal species for the Mid-Atlantic

MBSS — Species of concern to the Maryland Biological Stream Survey, DNR

MNBMCN	Migratory Nongame Birds of Management Concern in the Northeast, 1995, USFWS Region 5
NABCI	North American Bird Conservation Initiative: A coalition of government agencies, private organizations and industries, and academic institutions; begun in 1999.
NALCP-1	North American Landbird Conservation Plan, Eastern Avifaunal Biome Action Category: Immediate Action, Management, or Responsibility, 2004, Partners in Flight
NALCP-2	North American Landbird Conservation Plan, Eastern Avifaunal Biome: Watchlist or Stewardship, 2004, Partners in Flight
NASWG	North Atlantic Shorebird Working Group; includes US Shorebird Conservation Plan, NABCI
NAWCP	North American Waterbird Conservation Plan conservation status, 2002, NABCI
NAWMP	North American Waterfowl Management Plan, 2003 update, breeding or nonbreeding, USFWS, for BCR #28, 29, or 30
NE_Reg	Wildlife of Regional Conservation Concern in the Northeast, 1999, NE Association of Fish and Wildlife Agencies
PIF	Partners in Flight – Breeding (B) and wintering (W) status
SAS	Sensitive Aquatic Species of concern to the Maryland Biological Stream Survey, DNR

Appendix 3c. Plants Species (Scientific Names) mentioned in this WDCP

Vascular Plants

COMMON NAME	SCIENTIFIC NAME
American basswood	*Tilia americana*
American beachgrass	*Ammophila breviligulata*
American beech	*Fagus grandifolia*
American bladdernut	*Staphylea trifolia*
American chestnut	*Castanea dentata*
American elm	*Ulmus americana*
American holly	*Ilex opaca var. opaca*
American mountain-ash	*Sorbus americana*
American waterwort	*Elatine americana*
annual saltmarsh aster	*Aster subulatus var. subulatus*
arrow-arum	*Peltandra virginica*
Atlantic white-cedar	*Chamaecyparis thyoides*
awl-leaf arrowhead	*Sagittaria subulata*
bald cypress	*Taxodium distichum*
barren bromegrass	*Bromus sterilis*
bayberry	*Morella pensylvanica*
beach heather	*Hudsonia tomentosa*
beach panic grass	*Panicum amarum var. amarulum*
beaked spikerush	*Eleocharis rostellata*
bear oak	*Quercus ilicifolia*
bird's-foot violet	*Viola pedata*
bitter seabeach grass	*Panicum amarum*
bitternut hickory	*Carya cordiformis*
black chokeberry	*Aronia melanocarpa*
black gum	*Nyssa sylvatica*
black huckleberry	*Gaylussacia baccata*
black locust	*Robinia pseudoacacia*
black needlerush	*Juncus roemerianus*
black oak	*Quercus velutina*
black willow	*Salix nigra*
blackjack oak	*Quercus marilandica*
bog goldenrod	*Solidago uliginosa var. uliginosa*
Bosc's panic grass	*Dichanthelium boscii*
bottlebrush grass	*Elymus hystrix var. hystrix*
boxelder	*Acer negundo*
bracken fern	*Pteridium aquilinum*
broad-leaved meadowsweet	*Spiraea alba var. latifolia*

COMMON NAME	SCIENTIFIC NAME
brown bog sedge	*Carex buxbaumii*
brownfruited rush	*Juncus pelocarpus*
brownish beaksedge	*Rhynchospora capitellata*
Canada burnet	*Sanguisorba canadensis*
Carolina rose	*Rosa carolina*
cheat grass	*Bromus tectorum*
cherrybark oak	*Quercus pagoda*
chestnut oak	*Quercus montana*
chinkapin oak	*Quercus muhlenbergii*
christmas fern	*Polystichum acrostichoides*
cinnamon fern	*Osmunda cinnamomea*
coastal carrionflower	*Smilax pseudochina*
coinleaf	*Centella erecta*
common buttonbush	*Cephalanthus occidentalis*
common dittany	*Cunila origanoides*
common elderberry	*Sambucus canadensis*
common greenbrier	*Smilax rotundifolia*
common hackberry	*Celtis occidentalis*
common prickly-ash	*Zanthoxylum americanum*
common reed	*Phragmites australis*
common St. John's-wort	*Hypericum punctatum*
common threesquare	*Schoenoplectus pungens var. pungens*
common water-willow	*Justicia americana*
common wild yam	*Dioscorea villosa*
cypress panicgrass	*Dichanthelium dichotomum var. ensifolium*
dangleberry	*Gaylussacia frondosa*
deerberry	*Vaccinium stamineum*
dotted smartweed	*Polygonum punctatum*
downy woodmint	*Blephilia ciliata*
dwarf sumac	*Rhus copallina*
early lowbush blueberry	*Vaccinium pallidum*
eastern hemlock	*Tsuga canadensis*
eastern hop-hornbeam	*Ostrya virginiana*
eastern larch	*Larix laricina*
eastern lilaeopsis	*Lilaeopsis chinensis*
eastern redbud	*Cercis canadensis var. canadensis*
eastern redcedar	*Juniperus virginiana var. virginiana*
eastern rose-mallow	*Hibiscus moscheutos ssp. moscheutos*
eastern white pine	*Pinus strobus*
Eaton's witchgrass	*Dichanthelium spretum*
false nettle	*Boehmeria cylindrica*
fetterbush	*Leucothoe racemosa*
flowering dogwood	*Cornus florida*

COMMON NAME	SCIENTIFIC NAME
fragrant sumac	*Rhus aromatica*
garlic-mustard	*Alliaria petiolata*
giant beardgrass	*Saccharum giganteum*
giant cane	*Arundinaria gigantea*
giant cordgrass	*Spartina cynosuroides*
great-laurel	*Rhododendron maximum*
green ash	*Fraxinus pennsylvanica*
greenfruit clearweed	*Pilea pumila*
halberd-leaf tearthumb	*Polygonum arifolium*
high-tide bush	*Baccharis halimifolia*
hoary mountain-mint	*Pycnanthemum incanum*
hoary puccoon	*Lithospermum canescens*
Indian cucumber-root	*Medeola virginiana*
Indian grass	*Sorghastrum nutans*
Japanese bromegrass	*Bromus japonicus*
Japanese honeysuckle	*Lonicera japonica*
Japanese stiltgrass	*Microstegium vimineum*
Kate's-mountain clover	*Trifolium virginicum*
kidneyleaf mudplantain	*Heteranthera reniformis*
large cranberry	*Vaccinium macrocarpon*
leatherleaf	*Chamaedaphne calyculata*
little bluestem	*Schizachyrium scoparium*
lizard's-tail	*Saururus cernuus*
loblolly pine	*Pinus taeda*
Long's rush	*Juncus longii*
low false bindweed	*Calystegia spithamaea ssp. purshiana*
maidencane	*Panicum hemitomon*
maple-leaf viburnum	*Viburnum acerifolium*
marsh blue violet	*Viola cucullata*
marsh dewflower	*Murdannia keisak*
marsh fern	*Thelypteris palustris var. pubescens*
marsh-elder	*Iva frutescens*
mountain holly	*Ilex montana*
mountain-laurel	*Kalmia latifolia*
mudwort	*Limosella australis*
multiflora rose	*Rosa multiflora*
narrow-leaved cattail	*Typha angustifolia*
narrow-leaved loosestrife	*Lythrum lineare*
narrow-leaved meadowsweet	*Spiraea alba var. alba*
northern arrow-wood	*Viburnum recognitum*
northern lowbush blueberry	*Vaccinium angustifolium*
northern moss phlox	*Phlox subulata*
northern red oak	*Quercus rubra*

COMMON NAME	SCIENTIFIC NAME
old-field broomstraw/broom-sedge	*Andropogon virginicus*
overcup oak	*Quercus lyrata*
Parker's pipewort	*Eriocaulon parkeri*
partridge-berry	*Mitchella repens*
pawpaw	*Asimina triloba*
Pennsylvania sedge	*Carex pensylvanica*
perennial saltmarsh aster	*Symphyotrichum tenuifolium*
persimmon	*Diospyros virginiana*
pickerel weed	*Pontederia cordata*
pignut hickory	*Carya glabra*
pin oak	*Quercus palustris*
pink lady's-slipper	*Cypripedium acaule*
pitch pine	*Pinus rigida*
poison ivy	*Toxicodendron radicans*
poison sumac	*Toxicodendron vernix*
pond pine	*Pinus serotina*
possum-haw	*Viburnum nudum*
post oak	*Quercus stellata*
poverty oat-grass	*Danthonia spicata*
primrose-leaved violet	*Viola primulifolia*
purple three-awn grass	*Aristida purpurascens*
purple-stem cliff-brake	*Pellaea atropurpurea*
rattlesnake-weed	*Hieracium venosum*
red chokeberry	*Aronia arbutifolia*
red maple	*Acer rubrum*
red milkweed	*Asclepias rubra*
red spruce	*Picea rubens*
rice cutgrass	*Leersia oryzoides*
river birch	*Betula nigra*
Robin's plantain	*Erigeron pulchellus var. pulchellus*
rose pogonia	*Pogonia ophioglossoides*
roundleaf fameflower	*Talinum teretifolium*
roundleaf sundew	*Drosera rotundifolia var. rotundifolia*
royal fern	*Osmunda regalis var. spectabilis*
sallow sedge	*Carex lurida*
saltgrass	*Distichlis spicata*
saltmarsh bulrush	*Schoenoplectus robustus*
saltmarsh cordgrass	*Spartina alterniflora*
salt-marsh false foxglove	*Agalinis maritima var. maritima*
saltwort	*Salsola kali*
sand blackberry	*Rubus cuneifolius*
sand hickory	*Carya pallida*
sanddune sandbur	*Cenchrus tribuloides*

COMMON NAME	SCIENTIFIC NAME
sassafras	*Sassafras albidum*
sea oats	*Uniola paniculata*
sea rose-pink	*Sabatia stellaris*
sea-lavender	*Limonium carolinianum*
sea-oxeye	*Borrichia frutescens*
seashore mallow	*Kosteletzkya virginica*
seaside goldenrod	*Solidago sempervirens var. sempervirens*
seaside spurge	*Chamaesyce polygonifolia*
serpentine aster	*Symphyotrichum depauperatum*
shagbark hickory	*Carya ovata*
shale-barren evening-primrose	*Oenothera argillicola*
shale-barren pussytoes	*Antennaria virginica*
shale-barren ragwort	*Packera antennariifolia*
sheep-laurel	*Kalmia angustifolia*
shortleaf pine	*Pinus echinata*
shrubby St. John's-wort	*Hypericum prolificum*
side-oats grama	*Bouteloua curtipendula var. curtipendula*
silky dogwood	*Cornus amomum ssp. amomum*
silver maple	*Acer saccharinum*
single-vein sweetflag	*Acorus calamus*
skunk-cabbage	*Symplocarpus foetidus*
slender fimbry	*Fimbristylis autumnalis*
slender spikegrass	*Chasmanthium laxum*
slender wild rye	*Elymus villosus*
small saltmeadow cordgrass	*Spartina patens*
smooth alder	*Alnus serrulata*
smooth winterberry	*Ilex laevigata*
soft rush	*Juncus effusus*
southern arrow-wood	*Viburnum dentatum*
southern bayberry	*Morella cerifera*
southern red oak	*Quercus falcata*
spatterdock	*Nuphar advena*
spatulate-leaved sundew	*Drosera intermedia*
speckled alder	*Alnus incana ssp. rugosa*
spicebush	*Lindera benzoin*
spotted jewelweed	*Impatiens capensis*
spotted knapweed	*Centaurea biebersteinii*
spotted wintergreen	*Chimaphila maculata*
striped maple	*Acer pensylvanicum*
sugar maple	*Acer saccharum var. saccharum*
swamp azalea	*Rhododendron viscosum*
swamp chestnut oak	*Quercus michauxii*
swamp loosestrife	*Decodon verticillatus*

COMMON NAME	SCIENTIFIC NAME
swamp rose	*Rosa palustris*
swamp tupelo	*Nyssa biflora*
swamp white oak	*Quercus bicolor*
sweet fern	*Comptonia peregrina*
sweet pepper-bush	*Clethra alnifolia*
sweetbay magnolia	*Magnolia virginiana*
sweetgum	*Liquidambar styraciflua*
switchgrass	*Panicum virgatum var. virgatum*
sycamore	*Platanus occidentalis*
table-mountain pine	*Pinus pungens*
tawny cotton-grass	*Eriophorum virginicum*
ten-angled pipewort	*Eriocaulon decangulare*
tree-of-heaven	*Ailanthus altissima*
tulip-tree	*Liriodendron tulipifera*
tussock sedge	*Carex stricta*
twig rush	*Cladium mariscoides*
Virginia chain fern	*Woodwardia virginica*
Virginia creeper	*Parthenocissus quinquefolia*
Virginia meadow-beauty	*Rhexia virginica*
Virginia pine	*Pinus virginiana*
Walter's sedge	*Carex striata var. brevis*
warty panicgrass	*Panicum verrucosum*
water-hemlock	*Cicuta maculata var. maculata*
wavy hairgrass	*Deschampsia flexuosa var. flexuosa*
white ash, American ash	*Fraxinus americana*
white beak-rush	*Rhynchospora alba*
white oak	*Quercus alba*
whiteleaf greenbrier	*Smilax glauca*
wild black cherry	*Prunus serotina var. serotina*
wild rice	*Zizania aquatica var. aquatica*
willow oak	*Quercus phellos*
winterberry	*Ilex verticillata*
wintergreen	*Gaultheria procumbens*
witch-hazel	*Hamamelis virginiana*
woolgrass bulrush	*Scirpus cyperinus*
yellow birch	*Betula alleghaniensis*

Non-vascular Plants

COMMON NAME	SCIENTIFIC NAME
cladonia	*Cladonia spp.*
haircap mosses	*Polytrichum spp.*
sphagnum mosses	*Sphagnum spp.*

Submerged Aquatic Vegetation

COMMON NAME	SCIENTIFIC NAME
curly pondweed	*Potamogeton crispus*
Eurasian watermilfoil	*Myriophyllum spicatum*
horned pondweed	*Zannichellia palustris*
hydrilla	*Hydrilla verticillata*
muskgrass	*Chara spp.*
naiads	*Najas spp.*
redhead grass	*Potamogeton perfoliatus*
sago pondweed	*Stuckenia pectinatus*
sea lettuce	*Ulva lactuca*
slender pondweed	*Potamogeton pusillus*
spiny naiad	*Najas minor*
water stargrass	*Heteranthera dubia*
widgeon grass	*Ruppia maritima*
wild celery	*Vallisneria americana*

Appendix 4a. Compilation of Conservation Actions from Existing Plans

This appendix lists the conservation actions compiled after a review of existing relevant local, state, regional, national, and international conservation plans for this WDCP effort. These matrices present an initial list of actions developed to address the threats identified by MD DNR and its partners (Appendix 1b). This compilation was then used to develop the more refined list of actions presented in Chapter 4. There are three sets of actions and needs associated with each of the four broad habitat grouping – Forests, Non-forests, Wetlands, and Estuarine/Marine. The first set of actions are conservation actions that apply to key wildlife habitats, the next set of needs list the existing inventory, monitoring and research needs that apply to each key habitat, and the last set identifies taxa or species specific conservation actions AND inventory, monitoring, and research needs for GCN species found in those broad habitat groupings.

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Conservation Actions for Forested Habitats								
Develop forest habitat management guidelines for use by foresters, land managers, and private landowners	X	X	X	X	X	X	X	
Work with partners to incorporate forest management guidelines into existing management plans of state forest service, MFA, TNC, state parks, state forests, USDA, USDI, NPS, etc.	X					X	X	
Work with foresters and land managers to promote best management practices and manage this habitat conducively for GCN species		X		X	X	X	X	

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Work with local, state, and federal agencies to incoporate forest management guidelines into land use and land planning efforts, especially to reduce/remove road impacts and fragmentation	X		X	X	X	X		X
Incorporate appropriate forest management practices into forest stewardship plans					X			
Develop and work with partners to implement invasive species control protocols to reduce impacts to GCN species	X				X	X	X	X
Develop and work with partners to implement deer population control protocols to reduce effects of deer overbrowsing	X	X			X	X	X	X
Develop and work with partners to implement beaver management protocols to maintain openings		X						X
Develop and work with partners to implement non-native herbivore population control protcols to reduce impacts			X					
Utilize existing (e.g. Farm bill programs) and develop new incentives for private landowners to conserve forest habitat on their properties	X	X						
Collaborate with private and public landowners to maintain and restore a mosaic of suitable habitat		X	X					
Limit access to and educate public about value of this forest habitat and its conservation	X		X					
Work with regulatory agencies and Public Service Commission for proper placement of wind turbines to reduce impact of wind farms on GCN species	X					X	X	

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Limit use of pesticides, such as gypsy moth management, such that GCN species are not adversely affected, especially on state lands	X		X	X	X	X	X	X
Work with farming community to conserve, manage, restore and protect this habitat on marginal croplands		X						X
Work with sportsman organizations, such as Quail Unlimited, to promote and manage this forest habitat		X						
Work with National Park Service to conserve this habitat on Assateague Island			X					
Work with utilities to manage rights-of-ways compatibility with shrubland GCN species		X						
Implement appropriate IPM practices to minimize effects of serious forest pests and pathogens, such as gypsy moth and sudden oak death			X		X	X		
Collaborate with TNC to implement Nanticoke River bioreserve strategy in conjunction with their ecoregional plan						X		X
Work with partners to re-establish natural fire regimes						X		
Collaborate withWatershed based Initiatives to restore and protect watersheds								X
Work with watershed groups to encourage forest conservation as a strategy for water conservation								X
Work with foresters and land managers to avoid/minimize timber harvesting impacts								X

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Work with land managers to to improve storm water management practices and sediment erosion control measures to avoid/minimize development impacts								X
Enforce and modify, as needed, nontidal wetland protection regulations especially as they relate to Wetlands of special state concern								X
Inventory, Monitoring, and Research Needs for Forested Habitats								
Initiate long-term monitoring studies of GCN species, including forest interior birds, invertebrate	X		X	X	X	X	X	
Conduct research on basic ecology, breeding parameters, and life histories of GCN species, especially reptiles, amphibians, invertebrates, and boreal mammals	X		X	X	X	X	X	X
Conduct research on habitat use and requirements of GCN species, especially reptiles, amphibians, invertebrates, and boreal mammals	X		X	X	X	X	X	X
Conduct species surveys and determine distribution and abundance of GCN species	X		X	X	X	X	X	X
Conduct research to determine movement patterns and dispersal of GCN species	X		X	X	X	X	X	X
Conduct research to determine forest matrix requirements	X							
Monitor forest health and pests	X							

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Continue old growth forest inventory on public and private lands throughout the state	X							
Conduct a thorough inventory of existing shurb habitat to determine the most important sites for breeding		X						
Conduct research to determine precise habitat characterizations and needs, including area sensitivity, habitat quality, and habitat availability		X						
Conduct studies on the factors limiting species abundance, such as predation rates, reproductive success, parasitism rates, and causes of mortality		X						
Conduct research to determine management needs and best management practices for populations, especially effects of various habitat management practices on species productivity and on long-term habitat suitability		X						
Establish monitoring programs that accompany management activities to assess long-term effects on GCN species		X						
Conduct research to determine the frequency of natural disturbance regeimes and their locations in Maryland's landscape		X						
Conduct research to assess the effects of develoment activities on GCN species, including Delmarva fox squirrel			X	X		X		
Conduct research to assess the effects of timber harvest practices on GCN species, including forest interior birds, reptiles, amphibians, and Delmarva fox squirrel			X	X	X			

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Conduct research to determine historical range of this key habitat and target priority sites for monitoring and research				X				
Conduct research to assess effects of gypsy moth spraying on GCN species					X		X	
Conduct research to assess effects of invasive species and deer overbrowsing on GCN species							X	
Conduct research to assess impacts of wooly adelgid							X	
Conduct surveys to determine population strongholds and status of GCN species, especially odonates, southern water shrew, bats, reptiles, amphibians, butterflies, and forest interior birds								X
Conduct research to determine effective buffer widths as it relates to development, timber harvesting and farming practices; include upland life zone requirements of reptiles and amphibians, foraging areas for bats, and area-sensitive species like forest interior birds and bobcat								X
Monitor habitat conditions and GCN species, especially those that serve as effective indicator, umbrella or keystone species, and species for which population trend data are most urgently needed								X
Taxa or Species Specific Conservation Actions and Inventory, Monitoring, and Research Needs for GCN Species found in Forested Habitats								
Promote woodcock management in moist soil areas and riparian areas		X						

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Implement regional and national bobwhite and woodcock management plans		X						
Implement PIF BCR and physiographic area plans for this habitat type		X		X	X	X	X	
Enforce existing state regulations on possession and trade of amphibians and reptiles and promote changes to increase protection for these GCN species			X	X	X	X	X	X
Protect breeding colonies of waterbirds from disturbance				X				
Develop a range wide Habitat Conservation Plan (HCP) for Delmarva fox squirrels and timber management				X				
Implement federal recovery plan for Delmarva fox squirrel, including reintroduction to unoccupied sites								X
Implement aspects of the federal recovery plan for red-cockaded woodpecker				X				
Evaluate feasibility of reintroduction of snowshoe hare, American marten, and norther flying squirrel							X	
Modify federal recovery plan for Indiana Bat so that protection and research needs in Maryland are adequately addressed								X
Implement well targeted education campaign to reduce illegal collecting and killing of reptiles and amphibians								X
Conduct research to determine effects of American woodcock and bobwhite habitat management techniques on other GCN early-successional bird species		X						

Forested Habitats	Old Growth Forests	Early successional Forests	Maritime Forests and Shrublands	Loblolly Pine – Oak Forests	Mesic Deciduous Forests	Dry Oak - Pine Forests	Northern Conifer- Hardwood	Floodplain Forests
Develop appropriate survey method for assessing populations of nightjars and other nocturnal birds			X	X				
Conduct surveys of roost locations and identify specific habitat requirements of the bats to produce specific management guidelines for the species				X				
Conduct research to assess population trends of GCN birds					X			
Coordinate monitoring of GCN birds at the regional level					X			
Conduct research to determine the requirements of wooly adelgid in an effort to establish appropriate control measures							X	
Conduct research to determine competition/displacement effects of Meadow vole on Souther Bog Lemming populations and factors that contribute to these effects								X
Conduct research to determine larval host plant requirements of certain GCN lepidoptera								X

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Conservation Actions for Non-Forested Terrestrial Habitats					
Develop habitat management guidelines for use by foresters and land managers		X	X		
Work with partners to incoporate management guidelines into existing management plans		X	X	X	X
Work with foresters and land managers to promote best management practices and manage this habitat conducively for GCN species		X			X
Work with local, city, county and state agencies to incorporate habitat management guidelines into land use and land planning efforts			X		X
Work with farming community to encourage beneficial agricultrual practices such as late mowing, involvement in Conservation Researve programs, including grass forb buffers in agricultural settings, etc.	X				
Limit access on state lands to minimize human caused disturbance and mortality and direct mortality from off-road vehicles, pets, recreational activities and farming practices	X	X	X		X
Work with partners to convert exotic pasture/hayland to native warm-season grasses on private and public lands	X				
Work with partners to restore savannah conditions on private and public lands	X				
Work with partners to implement effective best management practices for GCN grassland species	X				
Focus land preservation efforts on protecting large tracts of open grassland and minimize edge effects for area dependent grassland species	X				

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Encourage management for grassland species, including upland sandpipers, on airport lands and reclaimed mine lands	X				
Conduct prescribed burns using appropriate best managemetn practices and restore natural fire regimes	X	X			
Develop and work with partners to implement invasive species control protocols to reduce impacts to GCN species	X	X			
Develop and work with partners to implement deer population control protocols to reduce effects of deer overbrowsing		X			
Utilize existing (e.g. Farm Bill programs) and develop new incentives for private landowners to develop and maintain this habitat type, especially greater than 50 to 100 ha grassland habitat	X				
Collaborate with private and public landowners to maintain suitable habitat, including use of a private lands registry program		X			X
Work with conservation funding partners and programs		X			
Work with sportsman organizations, such as Quail Unlimited, to promote and manage this habitat	X				
Work with farming community to conserve and manage this habitat on marginal croplands	X				
Limit use of pesticides such that GCN species are not adversely affected	X	X	X	X	
Encourage the use of native seed stock for warm season grass plantings	X				
Create and distribute educational materials to general public, land owners and managers			X		X
Develop and implement shore erosion control practices that are compatible with cliff maintenance			X		
Work with regulatory agencies and Public Service Commission for proper placement of wind turbines to reduce impact of wind farms on GCN species			X		

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Add sites to Maryland Natural Areas Registry				X	
Uses registry or acquisition to restore and protect groundwater acquifers				X	
Install and maintain appropriate gates at entrances to caves and mines that support GCN species				X	
Minimize or eliminate soil disturbance in estimated catchment basin				X	
Determine recharge areas to calculate how large an area is neede to protect GCN species				X	
Work with Bureau of Mines to protect mines supporting GCN species				X	
Protect known sites from future strip mining or development of surrounding forests through acquisition or easement				X	
Initiate measures to prevent pollution of first and second order streams by surrounding habitat with adequate buffers through acquisition or easement				X	
Educate spelunkers about impacts of disturbance to caves and mines supporting GCN species				X	
Develop and work with partners to implement non-native herbivore population control protocols to reduce impacts (e.g. feral horses on Assateague Island)					X
Minimize risk of oil spills and respond immediately to contain spills when they occur					X
Utilize Coastal Bays Program to influence land use decisions and educate the public					X
Develop and work with partners to implement shore erosion control practices that are compatible with beach and dune maintenance					X
Inventory, Monitoring and Research Needs for Non-Forested Terrestrial Habitats					

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Initiate long-term monitoring studies of GCN species, including grassland birds, woodrats, Puritan tiger beetles, bats, invertebrates, piping plover, least tern, and shorebirds	X	X	X	X	X
Conduct research on basic ecology, breeding paramaeters, and life histories of GCN species, especially insects, bats and invertebrates	X		X	X	
Conduct research on habitat use and requirments of GCN species, including bobwhite, grassland birds, and insects, bats and invertebrates	X		X	X	
Conduct species surveys and determine distribution and abundance of GCN species, especially invertebrates	X	X	X	X	
Conduct research to determine movement patterns and dispersal of GCN species, including woodrats, bats, reptiles and Puritan tiger beetles	X	X	X	X	X
Develop standardized regional monitoring protocols for GCN species	X				
Identify agricultural practices beneficial to GCN species, especially grassland species, including mowing regimes	X				
Implement accurate and standardized survey methods to determine regional population trends	X				
Monitor success of populations in different habitat types, incuding restoration efforts	X				
Conduct studies on the limiting factors and management needs of GCN populations	X				
Conduct a comprehensive survey of appropriate habitat	X				
Determine historical extent, range, and condition of native grassland communities	X				
Assess extent of regional grassland habitats and determine how they can be preserved	X				
Conduct research on effects of pesticide use on GCN species, especially invertebrates		X			
Conduct research to determin natural fire regime		X			

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Determine forest matrix requirements to sustain functionality of habitats			X		
Conduct research to determine best management practices for GCN species			X		
Establish a habitat monitoring program				X	
Assess and monitor water quality				X	
Conduct targeted inventories of certain GCN species, especially invertebrates		X			X
Conduct research on habitat requirements to gain a better understanding of threats in general and area sensitivity needs of certain GCN species					X
Taxa or Species Specific Conservation Actions and Inventory, Monitoring, and Research Needs for GCN Species found in Non-Forested Terrestrial Habitats					
Implement PIF physiographic area plans for this habitat	X				
Discourage birds from nesting in population sinks	X				
Protect and manage both breeding and wintering habitats for GCN grassland birds	X				
Mow roadsides in early spring or late summer to protect nesting habitat for vesper sparrows and retain roadside fence lines	X				
Study nest timing of savannah sparrows and bobolinks	X				
Monitor trends in bobwhite populations	X				
Determine effects of agricultural practices on bobwhite reproduction	X				
Identify native insect species that are obligates of grasslands	X				
Research habitat needs for area sensitive species	X				
Enforce existing state regulations on possession and trade of amphibian and reptiles			X	X	

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Coordinate conservation efforts for woodrats at a regional level			X	X	
Control raccoon populations near woodrat sites			X	X	
Protect and maintain food source trees for woodrats from mast tree harvesting operations and further gypsy moth defoliation			X	X	
Coordinate conservation efforts for timber rattlesnake at a regional level			X		
Educate public to reduce killing of timer rattlesnakes and disturbance of den sites			X		
Implement Puritan tiger beetle federal recovery plan			X		
Restore degraded cliff sites for Puritan tiger beetles by removing encroaching vegetation			X		
Determine metapopulation requirements of GCN species, especially Alleghany woodrats, green salamander, timber rattlesnake, long-tailed shrew			X		
Research the link with raccoons and baylisascaris in hopes of preventing infection			X	X	
Monitor select woodrat populations rangewide			X	X	
Conduct research on the life history, movement patterns, habitat requirements, mortality factors and basic ecology of woodrats			X	X	
Implement the Indiana bat recovery plan if populations are found and provide technical assistance and outreach				X	
Manage habitat around hibernacula and foraging sites to protect GCN bat species				X	
Determine distribution, status, trends and locations of winter and summer roosts of GCN bat species				X	
Officially name and describe the numerous undescribed subterranean inverebrate species				X	
Monitor and survey for rare aquatic subterranian invertebrates				X	

Non-Forested Terrestrial Habitats	Graslands	Barrens and Dry Glades	Cliffs and Rock Outcrops	Caves, Mines and Springs	Coastal Beaches, Dunes, and Mudflats
Inventory terrestrial subterranian invertebrate fauna in caves				X	
Implement piping plover federal recovery plan					X
Prohibit boat access to mudflats on the north end of Assateague Island to minimize distrubance to piping plovers					X
Minimize distrubance to colonial waterbird colonies by restricting access during the nesting season					X
Assess predation of piping plovers and least terns by gulls					X

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Conservation Actions for Wetland Habitats									
Work with partners through acquitsition and easements to protect and restore best remaining examples of these wetland types and adjacent watersheds and provide sufficient	X	X		X		X	X	X	X

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
landscape connectivity and movement corridors within an extensive forest matrix									
Enforce and modify, as needed, wetland protection regulations especially as it relates to Nontidal Wetlands of Special Concern	X			X		X	X		
Work with partners to establish and maintain effective buffers along wetlands by restoring natural communities where possible	X			X				X	
Work with farming community to restore and protect wetlands through NRCS, FSA, USFWS, and MDA programs and farm bill and conservation reserve incentives	X			X		X	X	X	
Work with local, city, county and state agencies to incorporate conservation actions into land use and land planning efforts	X		X	X		X	X	X	
Work with partners to incorporate conservation actions into public land management plans	X		X	X	X	X	X	X	X
Regulate mosquito control and gypsy moth control in upland depressional wetlands and surrounding landscape, ensuring adequatae buffer in spraying	X						X	X	X

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Develop and work with partners to implement native and non-native invasive species control protocols, especially phragmites, purple loosestrife, woody vegetation and nutria	X	X		X	X	X	X	X	
Develop and disseminate public education materials to address human disturbance and conservation value issues	X		X				X		
Identify forest management practices that would improve habitat suitability		X							
Implement prescribed burn programs to control woody vegetation		X						X	
Restore hydrology through ditch plugging and other appropriate practices		X							
Delineate habitat boundaries and sensitive management areas for all populations and metapopulations of GCn species			X						
Amend state wetlands laws to protect all GCN vernal pool habitats			X						
Promote BMP's to appropriate public and private land managers, agencies and industries that have the greatest potential to influence protection of vernal pool habitat and buffers			X						
Eliminate human disturbance and off-road vehicles in and around vernal pools and other wetlands			X				X		

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Maintain or restor forest connectivity between vernal pool habitats			X						
Create or restore vernal pools			X						
Work with private property owners to protect known sites			X						
Coordinate conservation with farm bill programs, DNR, SHA, MDA, and local jurisdiction			X						
Coordinate conservation with NE PARC			X						
Implement BMPs for nutrients on agricultural lands to reduce sources of groundwater contamination			X						
Restore and protect forested theses wetland type and establish and maintain effective buffers along these wetlands, by restoring natural communities where possible				X	X				
Work with DOT and local roads departments to construct roads in such a way that minimizes effects on movement patterns of GCN species, especially for amphibians and reptiles that use upland depressional wetlands year-round or seasonally as breeding habitat; construct safe crossings to minimize road mortality	X			X			X	X	
Work with partners to minimize runoff from roads, including silt, salt, nutrients and contaminants by improving stormwater management practices and emergent control measures							X	X	

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Work with state agencies to minimize mosquito control and gypsy moth control in forested seepage wetland sites and surrounding landscape				X		X			
Develop forest habitat management guidelines for use by foresters, land managers, and private landowners				X					
Work with foresters and land managers to promote best management practices and manage this habitat conducively for GCN species				X			X		X
Conduct prescribed burns using appropriate best managemetn practices and restore natural fire regimes on certain wetlands that require such				X		X	X		
Actively participate in review of burning plans and “open marsh water management” activities					X				X
Initiate coordinated efforts to conerv habitat and maintain the integrity of wetland systems across wide geographic areas, including targeting the highest quality areas					X				
Work with partners to protect wetlands from drainage, ditching, filling and other damaging practices by implementing best management practices and adaptive management methods					X				X
Restore and enhance breeding and nonbreeding habitats of high priority GCN species					X				X

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Utilize U.S. Army Corps of Engineers and MDE regulatory processes to protect habitat					X				X
Restore wetlands affected by acid mine drainage							X		
Restore northern conifer component of bog-fen wetland complexes on Allegheny Plateau and Atlantic white-cedar component on Coastal Plain including working with TNC to accomplish this task							X		
Develop and work with partners to implement deer population control protocols to reduce effects of deer overbrowsing							X		
Work with watershed groups, federal programs, regulatory agencies, and wateshed based initiative to protect wetland habitats							X	X	
Mange or control livestock grazing within wetlands							X		
Conduct watershed-level stream restoration and protection efforts (e.g. water source)								X	
Consider making minor alterations of existing management schemes on wetlands managed for waterfowl by state and federal agencies to improve habitat for GCN species								X	
Promote the establishment and growth of floating-leaved and submergent vegetation								X	

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Restore-semi-permanent and permanent open water habitats and flats within weltands where appropriate								X	
Restore prior converted and other degraded wetlands								X	
Work with landowners to encourage retention of emergent wetlands (e.g. DO NOT impound)								X	
Limit the use of non-native fish as BMPs for mosquito control and vegetation management								X	
Acquire habitat through the North American Wetland Conervation Act (NAWCA)									X
Collaborate with the implementation of North American Waterfowl Plan									X
Work with partners to reduce impacts of water pollution from boats and other sources									X
Develop and implement methods to restore hydrology to wetlands degraded by ditching									X
Develop new technologies to accelerate tidal marsh accretion									X
Inventory, Monitoring, and Research Needs for Wetland Habitats									
Conduct surveys to better determine the distribution, characteristics and condition of these wetlands	X	X	X	X					

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Conduct surveys to better determine the distribution, abundance, population strongholds and status of GCN species, especially odonates, reptiles, amphibians, butterflies, subterranean/groundwater invertebrates, bats and other small mammasl (e.g. southern water shrew, southern bog lemming), birds	X	X	X	X		X	X		
Conduct research on life history, habitat requirements, metapopulation dynamics and movement/dispersal patterns of GCN species	X			X		X	X		
Determine effective buffer widths as it relates to development, timber harvesting, and farming practices; include upland life zone requirements of reptiles, amphibians, foraging areas for bats and American woodcock, and area-sensitive species like forest-nesting birds and bobcat	X			X		X	X		
Monitor habitat conditions and GCN species, especially those that serve as effective indicator, umbrella or keystone species, and species for which population trend data are most urgently needed	X			X		X	X		
Conduct studies on the factors limiting species abundance, such as predation rates, reproductive success, contamination and prey availability		X			X				X

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Determine landscape atributes and preserve designs that will allow the persistence of populations		X							
Determine management needs and best management practices for GCN species, especially effects of various habitat management practices on species' productivity and long-term habitat suitability		X			X				X
Design and implement monitoring programs to accompany management activities to assess effects of techniques on GCN species and long-term habitat suitability		X			X				X
Determine and monitor hydrologic conditions, including impacts of irrigation		X	X						
Initiate long-term monitoring studies of GCN species, including reptiles, amphibians and invertebrates			X				X	X	
Conduct research on basic ecology, breeding parameters, and life histories of GCN species, especially reptiles, amphibians and invertebrates			X				X		
Conduct research on habitat use and requirements of GCN species, especially reptiles, amphibians and invertebrates			X				X		
Determine beneficial long-term management needs and practices			X						
Research the impact of fire/burning					X				
Research the successional process					X				

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Monitor and assess the impact of phragmites control on GCN species					X				
Develop regional, standardized methodologies for effective assessment of population abundance, trends, distribution, and movement patterns and for improved monitoring of Maryland populations, especially for marshbirds					X			X	X
Determine precise habitat characterizations and needs, including area sensitivity, habitat quality, and habitat availability					X				X
Establish habitat monitoring on a periodic basis									X
Taxa or Species Specific Conservation Actions and Inventory, Monitoring, and Research Needs for GCN Species found in Wetland Habitats									
Implement bog turtle federal recovery plan	X			X		X	X	X	
Implement well targeted I&E campaign to reduce illegal herptile collecting and killing	X			X		X			
Enforce and modify to increase protection for certainspecies , as needed, regulations regarding possession and trade of herptiles, especially for painted turtle, especially painted turtle	X	X	X	X		X	X	X	

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Investigate competitioin/displacement effects of meadow vole on southern bog lemming populations and factors that contribute to these effects	X						X		
Implement planning efforts that examine core populations and linkag between them from a landscape perspective		X							
Establish buffers of 400-750 feet radius of quality upland habitat around GCN amphibian breeding habitat		X	X						
Estalbish buffers of 100-200 meters forest buffers around GCN invertebrate habitat that do not provide habitat for GCN amphibians		X	X						
Research the effects of bullfrogs and green frogs on abundance and viability of GCN amphibian populations		X							
Conduct research on the effects of acid deposition on egg and larval survival of GCN amphibian species			X						
Determine the landscape requirements for viable populations of GCN amphibian and invertebrate species			X						
Conduct inventory work on invertebrates			X						
Encourage neighboring states to conduct vernal pool inventories for GCN invertebrates			X						
Conduct studies on the effect of habiatat fragmentation and amphibian movement corridors			X						
Control erosion and restore islands with colonial waterbird colonies					X				X

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Prevent or minimize disturbance of colonial waterbird colonies					X				
Implement regional conservation startegy for American woodcock						X			
Determine larval host plant requirements of certain GCN lepidoptera						X	X		
Modify Federal Recovery Plans for Indiana bat and northern flying squirel so that recovery and reintroductioin in Maryland are given adequate attention							X		
Determine feasibility of reintroducing showshoe hare, American marten and northern flying squirrell							X		
Cooperate with a coordinated regional conservation plan for GCN species								X	
Research spotted turtle use of terrestrial habitats								X	
Study the effects of introduced non-native crayfish on queen snake populations and other GCN species								X	
Implement long-term monitoring studiest to track population trends of crayfish and queen snakes									
Develop standardized methodologies for effective monitoring of marshbird populations									
Identify major migration stop-over areas of marshbirds								X	
Determine impact of marsh manipulation on breeding success of marshbirds								X	
Determine host plants for GCN insects								X	

Wetland Habitats	Upland Depressional Swamps	Carolina Bays	Vernal Pools	Forested Seepage Wetlands	Tidal Shrub Wetlands	Nontidal Shrub Wetlands	Bog and Fen Wetland Complexes	Nontidal Emergent Wetlands	Tidal Marshes
Implement regional black duck conservation strategies for habitat management									X
Determine effects of mosquito control practices on black rails and GNC lepidoptera									X
Determine the habitat requirements of black rails									X
Assess the impacts of nesting barn owls on black rail populations									X
Determine the effects of periodic marsh burning on black rails, marshbirds, coastal plain swamp sparrow, and GCN lepidoptera									X
Implement a long-term monitoring program for marshbirds (e.g. rails, bitterns, moorhen)									X
Assess the population status of breeding king rails in Maryland									X
Cooperate in regional conservation efforts for the northern harrier and short-eared owl									X

Estuarine and Marine Habitats	Oligohaline, Mesohaline and Polyhaline Estuarines	Ocean
Conservation Actions for Estuarine and Marine Habitats		
Coordinate efforts with various programs, especially the Chesapeake Bay Program, to initiate measures to protect, maintain and improve all species habitats and populations	X	
Develop watershed management plans that review the totality of inputs and outputs of aqutic systems to preserve ecosystem functions	X	
Work with partners to implement BMP's to reduce non-point source impacts and erosion control measures and promote the protection and presesrvation/restoration of aquatic/riparian communities	X	
Work with partners to increase the number of pumpout stations	X	
Work with partners to reduce deleterious contaminant concentrations and upgrade wastewater treatment plants to improve water quality	X	
Work with partners to maintian buffer zones to block siltation, pesticide and fertilizer runoff to wetlands	X	
Develop regional strategies to reduce and restrict the flow of pesticides and other toxic contaminants into aquatic systems	X	
Reestablish submerged aquatic vegetation beds in areas where they formerly occurred and where water quality has improved since their disappearance	X	
Develop and work with partners to implement invasive species control protocols	X	
Work with partners to implement compatible shore-erosion techniques	X	
Develop and disseminate public educational materials and improve public outreach efforts, especially about recreational impacts and ways to minimize them	X	X
Improve capacity to respond quickly and efficiently to toxic and oil spills; implement contingency planning	X	X
Seek policies that reduce likelihood of spills (e.g. vessel mandates)	X	X
Utilize the Chesapeake Bay Critical Area program	X	
Work with NGOs, including Chesapeake Bay Foundation and Alliance for the Chesapeake Bay	X	
Encourage citizens to donate to the Chesapeake Bay and Endangered Species Fund	X	
Utilize Coastal Zone Management programs	X	

Estuarine and Marine Habitats	Oligohaline, Mesohaline and Polyhaline Estuarines	Ocean
Utilize the Coastal Bays Program	X	
Develop land management plans which incorporate conservation measures into the local planning processes	X	X
Coordinate conservation efforts between various interest groups and across state boundaries, including state agencies	X	X
Work with partners to reduce the presence of aquatic contaminants	X	X
Develop a cooperative management protection plan for Assateague Island that addresses GCN species seasonal needs		X
Inventory, Monitoring, and Research Needs for Estuarine and Marine Habitats		
Conduct quantitative surveys identifying all populations, habitats and critical resources of GCN species	X	
Initiate long-term monitoring on population trends and assessment of mortality factors for GCN species	X	
Establish coordinated habitat and population monitoring programs on a regional level using standardized surveying techniques designed to have minimal impacts on populations	X	
Develop monitoring programs to accompany all management activities to assess effectiveness of techniques	X	
Monitor effects of environmental contaminants	X	
Identify sources of aquatic contaminants to reduce their impact	X	X
Conduct research on movements, mortality rates, causes of mortality, and feeding habitat of GCN species	X	
Determine the effects of dredging on GCN species	X	
Conduct quantitative surveys on distribution, demographics, recruitment, and reproductive ecology, thoroughly document known populations of GCN species	X	
Taxa or Species Specific Conservation Actions and Inventory, Monitoring, and Research Needs for GCN Species found in Estuarine and Marine Habitats		
Implement the seaturtle conservation plan and the recovery plan for each seaturtle species	X	X
Work with fishing industry to reduce fishing gear impacts to GCN species	X	X

Estuarine and Marine Habitats	Oligohaline, Mesohaline and Polyhaline Estuarines	Ocean
Implement federal recovery plan for shortnose sturgeon	X	
Implement regional conservation strategies for diamond-backed terrapin	X	
Implement regional conservation strategies for colonial nesting waterbirds	X	
Identify, document, and minimize impacts of commercial, recreational, and military activities on seaturtles	X	X
Conduct field research (mark-recapture, telemetry, survey, sampling, etc.) to document shortnose sturgeon seasonal distribution and map concentration areas to characterize essential habitat	X	
Determine abundance, age structure, recruitment and minimal population size below which restoration may be considered of shortnose sturgeon populations	X	
Assess the need for augmenting shortnose sturgeon populatioins with stocked fish	X	
Conduct quantitative studies of Atlantic sturgeon to assess life history and ecological characteristics, including migration, spawning stock status, bycatch fishing mortality, habitat suitability, and populations dynamics	X	
Conduct quantiative harvest studies for diamond-backed terrapin to determine harvest size and seasonal limits	X	
Promote, improve and increase cooperative interstate research, monitoring, law enforcement, and regulation efforts		X
Enhance commercial fisheries and fisheries/marine mmmal and seaturtle interactions data in Maryland waters		X
Enhance seaturtle stranding network efforts		X
Continue working with commercial pound netters to release and tag captured turtles		X
Reduce or eliminate human-caused injury and mortality of marine mammals, including detrimental effects of directed vessel interactions		X
Implement regional conservation strategies for horseshoe crab		X
Identify offshore movement corridors for loons and gannets		X
Work with National Park Service to conduct routine monitoring and stranding surveys of Assateaue Island beach for seaturtles and marine mammals		X
Moinitor parasite load, biotoxins and anthropogenic contaminant level in tissues of whales and their prey		X

Estuarine and Marine Habitats	Oligohaline, Mesohaline and Polyhaline Estuarines	Ocean
Conduct economic studies to determine the value of the commercial horseshoe crab fishery, biomedical, and ecotourism industries and the impact of regulatory management on these industries		X
Determine stock structure and population discreteness of marine mammals and assess relationship to other North Atlantic poupulations		X
Determine and minimize any determental effects of directed vessel interactions to marine mammals and maximize efforts to acquire scientific information from dead, stranded and entangled or entrapped whales		X

Appendix 4b: Compilation of Existing Governmental Programs in Maryland to Support Conservation Actions and Improve Data Acquisition and Sharing

The following is a compilation of some of the numerous governmental agencies and programs that have direct and indirect influences on the conservation of Maryland's wildlife species and the key wildlife habitats that support them. Many of the conservation actions provided in Chapter 4 of this document will rely on the cooperation and partnership of these governmental programs to be successful.

OVERVIEW

State Agencies and Programs

Department of Natural Resources
Department of the Environment
Department of Agriculture
Department of Planning
Department of Transportation
University of Maryland

Federal Agencies and Programs

U.S. Fish and Wildlife Service
National Park Service
U.S. Geological Survey
National Oceanic and Atmospheric Administration
U.S. Environmental Protection Agency
U.S. Department of Agriculture
U.S. Department of Defense

Local Agencies and Programs

Planning and Zoning
Maryland-National Capital Park and Planning Commission

Multi-Agency Programs

Chesapeake Bay Program
Coastal Bays Program
Multi-Resolution Land Characteristics Consortium
National Wetlands Mitigation Action Plan

STATE AGENCIES AND PROGRAMS

Maryland Department of Natural Resources (DNR)

The mission of the MD Department of Natural Resources (DNR) is to preserve, protect, enhance and restore Maryland's natural resources for the wise use and enjoyment of all citizens. This includes the management and wise use of the living and natural resources of the Maryland portion of the Chesapeake Bay and its tributaries. The resources of the Maryland portion of the watershed include its state forests and parks, fisheries, wildlife and the recreation of citizens engaged in boating, fishing, hunting and other outdoor enjoyment of our natural resources.

DNR-wide objectives include:

1. Sustainable Populations of Living Resources and Aquatic Habitat
2. Healthy Maryland Watershed Lands, Streams and Non-Tidal Rivers
3. Natural Resources Stewardship Opportunities for Maryland's Urban and Rural Citizens
4. Conserved and Managed Statewide Network of Ecologically Valuable Private and Public Lands
5. Diverse Outdoor Recreation Opportunities for Maryland Citizens and Visitors
6. Diverse Workforce and Efficient Operations

The numerous monitoring, research, planning, protection, and restoration programs are detailed on the MD DNR website at www.dnr.state.ms.us. Below is a compilation of some of these programs related to the conservation of wildlife and key wildlife habitats.

Wildlife and Heritage Service (WHS)

The mission of the Wildlife and Heritage Service (WHS) is to conserve Maryland's diverse native wildlife, plants, and the natural communities that support them, using scientific expertise and informed public input. The WHS oversees the management of 41 Wildlife Management Areas (WMAs) statewide, totaling 104,000 acres; sponsors several conservation education programs; manages game species and regulates hunting and trapping activities within Maryland's Game Program; and conserves habitat on private land, as well as managing invasive non-native species statewide, through the Habitat Conservation Program. The Natural Heritage Program is also housed within this unit.

The Maryland Natural Heritage Program (NHP) is the lead state agency responsible for the identification, ranking, protection, and management of nongame, rare and endangered species and their habitats in Maryland. Data collected by NHP ecologists, contractors and cooperators provide a majority of the scientific foundation for the Threatened and Endangered Species lists mandated by the Act.

Natural Heritage Program researchers conduct inventory and monitoring activities on nongame wildlife, rare species populations and natural communities, documenting trends in population and habitat health and viability. Information gathered through this research

guides land management decisions and regulations designed to protect and conserve our state biological diversity. One important tool for biodiversity conservation is a state statute modeled after the federal Endangered Species Act. The General Assembly, when creating Maryland's Nongame and Endangered Species Conservation Act*, recognized the importance of plants and animals to human existence. The Act reads:

> (1) It is the policy of the State to conserve species of wildlife for human enjoyment, for scientific purposes, and to insure their perpetuation as viable components of their ecosystems;
>
> (2) Species of wildlife and plants normally occurring within the State which may be found to be threatened or endangered within the State should be accorded the protection necessary to maintain and enhance their numbers.

The Act mandates the Department of Natural Resources to list species that are in danger of extinction within the State; requires that State agencies use their authority to maintain and enhance nongame wildlife and endangered species populations; and directs the Secretary of the Department to set up programs to conserve these species. Maryland's Act has led to the successful development of programs, policies, and partnerships that conserve rare and endangered species.

* For full text of the Act and guiding regulations please see the Nongame and Endangered Species Conservation Act, Natural Resources Article, Sections 4-2A-01 -- 10-2A-01 -- 4-2A-08, 10-2A-09, Annotated Code of Maryland at the following websites, and search through Maryland Statutes: **www.mlis.state.md.us** or **www.dsd.state.md.us** **.**

Maryland Biological Stream Survey

The Maryland Biological Stream Survey (MBSS) was designed to take periodic snapshots of our streams, identify our best and worst areas, find out what caused them to become bad or stay healthy, and help target streams and watersheds for protection, restoration, or both. The MBSS uses random sampling to determine the status of wadeable streams and rivers in Maryland. Since 1994, biologists have collected water samples, biological, and habitat data for over 1000 streams.

Fisheries Service

The Fisheries Service is responsible for managing commercial and recreational fishing in Maryland waters. Freshwater, estuarine, and migratory fish stocks are managed for sustainable fisheries, to enhance and restore fish or shellfish species in decline; to promote ethical fishing practices, and to ensure public involvement in the fishery management process. Their mission of the Fisheries Service in part is to develop a management framework for the conservation and equitable use of fishery resources. This is done with attempts to manage fisheries in balance with the ecosystem for the present and future generations. Monitoring and assessing status and trends of fisheries resources are activities taking place which directly impact wildlife diversity conservation.

Park Service

The Park Service manages over 100,000 acres of MD DNR properties and is committed to the preservation and protection of the lands we hold in trust for future generations. Land management activities and acquisitions, and stewardship and conservation goals, help MD DNR protect wetlands, forest corridors and habitat of threatened species; enhance biological diversity of native plants and animals; and preserve historical and cultural resources while supporting responsible growth.

Forest Service

The mission of the Forest Service is to restore, manage, and protect Maryland's trees, forests, and forested ecosystems to sustain our natural resources and connect people to the land. This is done in part by attempting to retain Maryland's existing forest land base by the promotion and establishment of new forests to support healthy populations of native plants and animals across diverse and ecologically functional landscapes. The programmatic goals and objective used to achieve this can be seen to aid in the conservation of wildlife diversity. The Forest Service also works toward minimizing negative impacts to the State's forest and tree resources from wildlife, insects and disease, land conversion, and other natural disturbance agents.

Program Open Space

Program Open Space (POS) is a nationally recognized program providing dedicated funds for Maryland's state and local parks and conservation areas. Established under the Department of Natural Resources in 1969, POS symbolizes Maryland's long-term commitment to conserving our natural resources while providing exceptional outdoor recreation opportunities for our citizens. Almost all of the land purchased by the MD DNR in the last 32 years was funded at least in part through POS. Today there are more than 4,000 individual county and municipal parks and conservation areas that exist because of the program.

Rural Legacy Program

Established in 1997, the Rural Legacy Program provides the focus and funding necessary to protect large, contiguous tracts of land and other strategic areas from sprawl development and to enhance natural resource, agricultural, forestry and environmental protection through cooperative efforts among state and local governments and land trusts. Protection is provided through the acquisition of easements and fee estates from willing landowners and the supporting activities of Rural Legacy Sponsors and local governments.The Program encourages local governments and private land trusts to identify Rural Legacy Areas and to competitively apply for funds to complement existing land preservation efforts or to develop new ones. Easements or fee estate purchases are sought from willing landowners in order to protect areas vulnerable to sprawl development that can weaken an area's natural resources, thereby jeopardizing the economic value of farming, forestry, recreation and tourism.

Resource Planning

Resource Planning ensures that public lands owned by DNR are used in ways that are economically and environmentally sustainable. The responsibilities of this program

include strategic planning for the public use and protection of statewide natural resources and recreational lands that total 446,103 acres in the State of Maryland owned by the Department of Natural Resources. Additional responsibilities include support to local jurisdictions for open space and recreational planning; survey and property control of over 3000 miles of boundary lines; assessment of the impacts of different human activities on the environments of DNR's lands; and development of recommendations and policies to acquire, develop and manage the resources on these public lands.

Critical Area Commission for Chesapeake Bay and Atlantic Coastal Bays

The Critical Area Act, passed in 1984, created a statewide Critical Area Commission to oversee the development and implementation of local land use programs directed towards the Critical Area. This Act marked the first time that the State and local governments jointly addressed the impacts of land development on habitat and aquatic resources. The Department of Natural Resources is the lead State agency for the Commission. The "Critical Area" was identified as all land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands and all waters of and lands under the Chesapeake Bay and its tributaries.

The Commission developed criteria that were used by local jurisdictions to develop individual Critical Area programs and amend local comprehensive plans, zoning ordinances, and subdivision regulations. The goals were to minimize adverse impacts on water quality that result from pollutants that are discharged from structures or conveyances or that have run off from surrounding lands; conserve fish, wildlife, and plant habitat in the Critical Area; and establish land use policies for development in the Critical Area which accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in the Critical Area can create adverse environmental impacts.

The programs that have subsequently been adopted by local governments are specific and comprehensive. They are designed to address the unique characteristics and needs of each county and municipality and together they represent a comprehensive land use strategy for preserving and protecting Maryland's most important natural resource, the Chesapeake Bay. Today the Commission's primary responsibilities are review and approve State projects on State-owned land in the Critical Area; review and approve State or local agency actions resulting in major development on private lands or lands owned by local jurisdictions; and review and approve all changes to a jurisdiction's Critical Area Program, including changes to ordinances, regulations, and maps.

Coastal Zone Management Program

The National Coastal Zone Management Program is a federal-state partnership dedicated to comprehensive management of the nation's coastal resources, ensuring their protection for future generations while balancing competing national economic, cultural and environmental interests. The Department of Natural Resources is the lead state agency for this program. The Coastal Zone Management Program (CZMP) is authorized by the Coastal Zone Management Act of 1972 and administered at the federal level by the Coastal Programs Division (CPD) within the National Oceanic and Atmospheric

Administration's Office of Ocean and Coastal Resource Management (OCRM). The CPD is responsible for advancing national coastal management objectives and maintaining and strengthening state and territorial coastal management capabilities. It supports states through financial assistance, mediation, technical services and information, and participation in priority state, regional, and local forums. State and federal coastal zone management efforts are guided by the CZMP's Strategic Framework, which is organized around three major themes: Sustain Coastal Communities, Sustain Coastal Ecosystems, and Improve Government Efficiency.

Maryland's Coastal Program, established by executive order and approved in 1978, is a network of state laws and policies designed to protect coastal and marine resources. The program strives to achieve a balance between development and protection in the coastal zone. Maryland's coastal zone includes the Chesapeake Bay, coastal bays, and Atlantic Ocean, as well as, the towns, cities and counties that contain and help govern the coastline. It encompasses two-thirds of the state's land area and is home to 67.83% of Maryland's residents. Through partnerships and funding to local governments, state agencies, non-profit organizations, and universities, the Coastal Program addresses a variety of coastal issues including provision of public access, nonpoint source pollution reduction, coastal hazards mitigation, habitat and living resources protection and growth management.

Nonpoint Source Management Program – This program helps provide financial, technical and outreach assistance to control nonpoint source pollution. To help build local capacity for watershed planning and implementation of nonpoint source pollution controls, the program provides grants to state and local governments, and institutions of higher learning to implement nonpoint source pollution control projects and programs. Maryland’s Nonpoint Source Management Plan, developed by the Maryland Department of Natural Resources (DNR) Nonpoint Source Program, combines the State’s NPS Program (CWA Section 319) and Coastal NPS Program (CZARA Section 6217). Maryland’s NPS Program is a multi-disciplinary program providing financial assistance, nonpoint source related policy, and technical and educational assistance. CZARA has focused on strengthening the links between federal and state coastal zone management and water quality programs.

Evolving since its original inception in 1987 and is operated in an integrated fashion with Maryland’s Coastal Zone Program. The Management Plan is a comprehensive guide to the State’s nonpoint source problems, pollution control programs, and future steps for nonpoint source pollution control and prevention. In 2000, EPA approved a revised Management Plan that identified a number of priorities as long-term, statewide nonpoint source goals, including watershed programs and initiatives, and educational and financial assistance programs.

The backbone of the Management Plan is the application of management measures, i.e., economically achievable activities to control the addition of NPS pollution to coastal waters. There are 56 management measures that the State is required to implement on all applicable land uses within the coastal boundary. Each management measure has

associated enforceable policies and mechanisms to insure implementation. The following programs provide specific requirements that the modal administrations must follow to ensure that management measures are conducted: Stormwater Management Program; Sediment and Erosion Control Program, Nontidal Wetlands and Waterways Programs, Tidal Wetlands Program, and Chesapeake Bay Critical Areas Program.

Funding for the development of individual watershed management plans and strategies was made available in 2001 under two mechanisms: CWA Section 319 – Nonpoint Source Program planning funds; and Coastal Zone Management Act (CZMA) Section 309 – Coastal Enhancement Strategy funds. In addition, the Coastal Nonpoint Source funds are currently being used within the coastal zone (comprising 66 percent of Maryland's area) to address septic systems, fund clean marina programs, and track progress.

Federal Consistency Process - "A Guide to Maryland's Coastal Zone Management Program Federal Consistency Process" provides assistance in understanding the federal consistency requirements established by the federal Coastal Zone Management Act and how those requirements are administered through the Maryland Coastal Program. All federal activities, licenses, permits, and assistance which may affect coastal resources or uses are subject to review for consistency with those enforceable policies pertaining to the Forest Conservation Act, Reforestation Act, oil pollution control, stormwater management, and marine sanitation devices.

Aquatic Sensitive Areas Initiative - Since 1999, the Maryland Coastal Program has been partnering with the Maryland Coastal Bays Program (MCBP) and other stakeholders on the Aquatic Sensitive Areas Initiative. The Maryland Coastal Bays Aquatic Sensitive Areas Initiative stems from the Comprehensive Conservation and Management Plan (CCMP) goal to "balance resource protection with recreational use." The initiative has three primary components: (1) identify sensitive estuarine resources, (2) evaluate the risks from specific water-use activities and (3) develop appropriate management and educational tools.

Clean Water Action Plan (CWAP) - As part of the federal Clean Water initiative, the State of Maryland, in cooperation with local governments, watershed organizations and other stakeholders, developed a Maryland Clean Water Action Plan (CWAP) to help guide the State's watershed management efforts. Fifty-eight watersheds in Maryland need restoration according to the 1998 Clean Water Action Plan. Maryland's CWAP includes a list of priority watersheds needing restoration. Restoration strategies are being developed for these priority watersheds that will include an action plan for restoration. The State's long-term objective is to have Watershed Restoration Action Strategies (WRAS) that are comprehensive, and address all aspects of watershed condition and water quality, including public health; aquatic living resources; physical habitat and the landscape.

The strategies may be drawn from existing assessment and targeting efforts such as a county's comprehensive plan, stormwater and sewer plans, capital budgets, greenways

and open space plans, watershed stewardship programs, site design standards/best management practices, erosion and sediment control plans, soil conservation district watershed work plans and other efforts. A comprehensive strategy includes the following: a watershed-wide assessment of existing and anticipated future conditions that significantly affect water quality and natural resources, identifying the principal sources and relative contributions of point and nonpoint source pollution; major sources of habitat loss; and threats to drinking water; aquatic life, and natural resources critical to maintaining the integrity of the watershed; measurable environmental and programmatic goals and a timeframe for achieving significant milestones/accomplishments.
A public involvement process that provides mechanisms for informing the public and incorporating their concerns and priorities; a process for targeting individual projects for preventive or remedial activities (e.g. identifying appropriate areas to implement best management practices and buffer strips that will maximize the achievement of clean water and other natural resource goals; a water quality and natural resources monitoring element that utilizes existing and supplemental data sources to document current and future changes occurring in the watershed, and a process to routinely evaluate the effectiveness of projects and/or systems and their progress toward achieving environmental and programmatic goals.

Watershed restoration strategies will be encouraged to: coordinate restoration strategies with total maximum daily loads (TMDLs); address locally defined geographic priorities at smaller scales than the 134 watersheds evaluated in the Assessment; address an issue of statewide concern, such as nutrient reduction; rely on a partnership approach, including work with Tributary Teams and the Coastal Bays Program; and use Coastal Zone Management Act Section 6217 management measures. Key Maryland Clean Water Action Plan Agencies are: MD Dept of Natural Resouces, MD Dept of Environment, MD Department of Agriculture, MD Office of Planning. Key Federal Clean Water Action Plan Agencies are: US Environmental Protection Agency, US Natural Resouces Conservation Service.

Unified Watershed Assessment (UWA) - Maryland developed a Unified Watershed Assessment to assess the conditions of its watersheds. The UWA identified smaller watersheds at scales that, for the most part, fall inside or nest within the large federal USGS basins. There are 138 of these State-defined "8-digit" watersheds in Maryland. Watershed Restoration Actoin Strategies are being developed in these 8-digit watersheds with priority waters identified under the UWA for both the Chesapeake and Coastal Bays watersheds.This program’s goals include: assessment of the condition of each State's watersheds, identification of watersheds in need of restoration, identification of watersheds that need preventive action to sustain water quality and aquatic resources, and identification pristine or sensitive watersheds that need extra protection.

Watershed Restoration Priorities – Based on the assessment, States establish watershed restoration priorities, selecting those watersheds not meeting clean water and other natural resource goals that are most in need of restoration actions.

Watershed Restoration Action Strategies – Identification of the most important causes of water pollution and resource degradation, detailing of the actions needed to address these problems, and setting milestones by which to measure progress.

Maryland Environmental Trust (MET)

MET is a statewide local land trust governed by a citizen Board of Trustees who's goal is the preservation of open land, such as farmland, forest land, and significant natural resources. The primary approach utilized by MET is to work towared securing conservation easements. This is used as a tool for landowners to protect natural resources and preserve scenic open space. The landowner who gives an easement limits the right to develop and subdivide the land, now and in the future, but still remains the owner. Properties eligible for easements, which must be considered to be in the public interest, typically involve woodlands, wetlands, farmland, scenic areas, historic areas, wild and scenic rivers, and undisturbed natural areas. Wildlife diversity interests in general are served when open space is protected in this manner.

Maryland Department of the Environment (MDE)

MDE has three media-specific administrations and two other major administrations that provide administrative and technical support to the air, water and waste management administrations. The Department's primary services include permitting/licensing and inspections for 89 functions and different regulatory facilities, financial assistance, environmental clean-up oversight, technical assistance for compliance and pollution prevention, public education and outreach, and environmental emergency response.

Environmental Programs - MDE's mission is to protect and restore the quality of Maryland's air, water, and land resources, while fostering smart growth, economic development, safe communities, and quality environmental education, for the benefit of the environment, public health, and future generations. The Department accomplishes its mission by assessing, preventing, and controlling sources of pollution to foster an excellent quality of life for all Marylanders.

Water Programs - The Department of the Environment (MDE) implements a diversity of regulatory and planning programs to reduce the input of pollutants to surface and ground waters of the State. Reduction of nutrients from both point- and non-point sources is the focus of the permit requirements, along with control of bacterial pollution from sewage treatment plants and toxic materials from any source.

Dam Safety - This section provides an overview of how the State assures that all dams in Maryland are designed, constructed, operated and maintained safely to prevent dam failures and the consequences of failures.

Mining in Maryland - This section provides a information on mining in Maryland from regulatory permitting to abandoned mine reclamation. It provides data on water quality and historical perspectives on mining in Maryland.

Stormwater Management Program - The Sediment and Stormwater program concentrates on controlling runoff increases and mitigating water quality degredation associated with new development. This section provides detailed guidance on how to prevent sediment and stormwater runoff or nonpoint source pollution.

Total Maximum Daily Load Program - Total Maximum Daily Loads (TMDLs), a requirement of the Clean Water Act (CWA) Section 303(d), are a tool for implementing State water quality standards. They are based on the relationship between pollution sources and in-stream water quality conditions. A TMDL establishes the maximum amount of an impairing substance or stressor that a waterbody can assimilate and still meet Water Quality Standards (WQSs) and allocates that load among pollution contributors. A TMDL, that addresses a single pollutant or stressor for each waterbody, is the sum of the allowed pollutant loads for point sources, non-point sources, projected growth and a margin of safety, as follows: TMDL = Point Sources + Nonpoint Sources + Projected Growth + Margin of Safety. Load allocations are determined through the review of monitoring data and watershed modeling.

A TMDL represents an upper limit, or "cap", on pollutant loads to a waterbody, and, as a result there must be mechanisms to ensure that the cap is not exceeded. These mechanisms include state and local permitting and regulatory authority, and voluntary efforts under the Chesapeake Bay Agreement that are supported by technical and financial assistance. Maryland has one of the most comprehensive, multi-level, community-based estuary restoration programs in the country.

Many of Maryland's existing efforts to protect and restore water quality will help the State meet its TMDL goals. In particular, the waters identified for TMDLs are also at the core of Maryland's Clean Water Action Plan. In many ways, Maryland's ongoing effort to reduce nutrients entering the Chesapeake Bay has been very similar to a TMDL process. Stakeholders and researchers recognized water quality problems, set an achievable goal, and then identified specific controls for point and nonpoint pollution sources intended to achieve the goal. This is the essence of a TMDL.

Wastewater Permits - The Wastewater Permits program works to protect Maryland's waters by controlling wastewater discharges. The program regulates wastewater discharges to surface and to groundwater. Surface water discharges are regulated through a combined state and federal permits under the National Pollutant Discharge Elimination System (NPDES). Groundwater discharges are regulated through state issued groundwater permits.

Water Conservation - With an increasing demand for water and the lack of adequate water supply due to presistent drought conditions in the state, MDE is working to help meet water conservation goals by encouraging water utilities to take steps to reduce water consumption, and developing and implementing an outreach campaign to educate Maryland citizens about the importance of water conservation.

Water Supply - MDE protects drinking water by implementing various programs that protect groundwater and surface water supplies from contaiminants, establishes criteria for well construction, inspects facilities that treat and provide public drinking water, and assures compliance with all safe drinking water standards.

Water Quality Financing - The mission of the Water Quality Financing Administration (WQFA) is to assist in the financing of capital infrastructure costs for wastewater and drinking water projects.

Water Quality Infrastructure Program - This program manages federal capital funds consisting of federal EPA construction grants, special federal appropriations grants, and State revolving loan funds for water quality and drinking water projects.

Wetlands and Waterways - MDE's Wetlands and Waterways Program seeks to conserve valuable aquatic systems; providing for the environmental, economic and resource needs of Maryland.

Fish and Shellfish - MDE’s fish and shellfish programs put a strong emphasis on monitoring the quality of shellfish harvesting waters, and testing edible fish tissue to certify that fish are safe for human consumption.

Flood Hazard Mitigation - MDE’s flood mitigation program works with communities in finding ways to reduce or even eliminate risks to safety and property. Most importantly, MDE assists communities in establishing sustainable floodplain management programs to prevent flooding risks from occurring in the future.

Emergency Response - The Maryland Department of the Environment (MDE) has been heavily involved in response to the threat of terrorist attack, in the wake of the September 11, 2001 attacks. MDE's Emergency Response Team is called into action as frontline experts in dealing with hazardous materials spills, chemical fires and other environmental disasters.

Environmental Justice - Environmental justice seeks equal protection from environmental and public health hazards for all people regardless of race, income, culture and social class.

Noise Pollution Control - Noise has become an increasingly contentious "Quality of Life" issue as the State's population increases and urban sprawl progresses. The Noise Program operates on a complaint driven basis addressing specific requests from individual citizens as well as governmental entities.

Pollution Prevention - Pollution Prevention (P2) offers a proactive approach to environmental management. As defined by the Pollution Prevention Act of 1990, P2 is the reduction or elimination of pollution at the source rather than through control or treatment technologies at the end of the pipe or stack.

Maryland Department of Agriculture (MDA)

The mission of the MDA is to provide leadership and support to agriculture and the citizens of Maryland by conducting regulatory, service, and educational activities that assure consumer confidence, protect the environment, and promote agriculture. As shown below, two of the three current operating units within MDA are performing conservation work that augments wildlife diversity.

Office of Resource Conservation

The Maryland Department of Agriculture's Office of Resource Conservation (RC) works closely with Maryland farmers and soil conservation districts to plan and implement conservation practices and programs that balance crop and livestock production with the need to protect natural resources. RC provides a range of educational, financial, technical assistance and regulatory programs to support Maryland agriculture and protect natural resources for future generations. The Office works with a number of local, state, and federal agencies, while implementing policies established by the State Soil Conservation Committee. Four key areas-Program Planning and Development, Conservation Grants, the Nutrient Management Program, and Conservation Operations comprise the Office of Resource Conservation.

Office of Plant Industries and Pest Management

The goal of the forest pest management section is to serve the citizens of Maryland by protecting the rural and urban forest landscape tree resources from adverse effects of insects, diseases and other pests through environmentally sound pest management. This will be accomplished by protecting high value forest and landscape trees in urban and rural areas from losses due to insects and diseases.

The primary goal of the plant protection and weed management section is to conduct regulatory, inspection, and educational programs that protect the health of plants and honey bees in Maryland. Personnel in this section serve as the State's authorities on plant pests and agricultural quarantines, and provide liaison for the Department with other state and federal regulatory officials regarding these issues.

Maryland Department of Planning (MDP)

The Maryland Department of Planning (MDP) promotes growth that fosters vibrant, livable communities, preserves and protects the environment, and makes efficient use of State resources. MDP provides data, trend analysis, research assistance, and policy development and implementation support for local governments, communities, businesses, and organizations. The Department provides technical assistance, local program review and planning design services for Maryland's counties and municipalities. MDP also monitors and forecasts changes in development and land use throughout the state, as well as creating and producing research tools and resources to assist in planning

for Maryland's future. Information on demographic, socio-economic, political, cultural, geographic and land-use trends is collected, analyzed, and distributed in multiple formats. With computer mapping and geographic information systems, MDP supports map display and analysis of census data, satellite imagery, aerial photography, land-use and parcel data to enhance and assist growth management and land-use planning across the State.

Office of Smart Growth

The Office of Smart Growth works directly with local governments, businesses, and organizations to coordinate the implementation of proven planning strategies. The office helps developers and local officials produce well-planned projects and to educate and inform the public on land-use issues. Smart Growth has four straightforward goals: support existing communities by targeting resources to support development in areas where infrastructure exists;· save our most valuable natural resources before they are forever lost; save taxpayers from the high cost of building infrastructure to serve development that has spread far from our traditional population centers; and provide Marylanders with a high quality of life, whether they choose to live in a rural community, suburb, small town, or city. The State has over 80 programs that help to further Smart Growth, including the Rural Legacy Areas program.

Comprehensive Planning and Zoning

Comprehensive Planning and Zoning are some of the most basic tools of land use planning. Comprehensive Plans, also known as Master Plans, capture how people want their communities to function and grow. In Maryland, local jurisdictions are required to review and, if necessary, to update their Comprehensive Plans every six years, and the Maryland Department of Planning offers technical assistance for these updates. Zoning is the primary tool jurisdictions use to help implement the comprehensive plan. Zoning regulations, which are always accompanied by a map, typically govern the type of land uses permitted and how they can be configured on the land. Most jurisdictions also have subdivision or development regulations that provide further guidance for the development of land. MDP works with local jurisdictions to revise their zoning codes and subdivision regulations.

Maryland Department of Transportation (DOT)

As part of the Maryland Department of Transportation (MDOT), the State Highway Administration (SHA) is one of the most visible arms of state government. Today, SHA is responsible for more than 16,000 lane miles of interstate, primary and secondary roads and more than 2,500 bridges. During the preliminary planning process we ensure that proposed projects are compatible to local conditions and are environmentally friendly. SHA has updated its Guidelines to better address the preparation and review of Secondary Cumulative Effects Analysis (SCEAs).

MDOT will achieve its mission through responsible stewardship of the Chesapeake Bay and all Maryland waters and through the implementation of proactive water quality programs. MDOT will integrate water quality considerations into all applicable aspects

of its strategic planning and business decision-making. In addition to specific Water Quality Requirements, MDOT also must adhere to policies, programmatic initiatives, and directives that are not implemented by specific legislative or other requirements.

MDOT will actively seek resolutions of water quality issues by endeavoring to achieve the following goals: comply fully and promptly with all applicable laws, regulations, executive orders and MDOT policies, including the commitments of the Chesapeake 2000 Agreement; integrate costs, impacts, continuing maintenance and public concerns relating to water quality into operating decisions and facility development planning; minimize adverse impacts on natural resources while carrying out MDOT projects; minimize pollution and waste though source reduction, reuse and recycling; communicate this tool and its requirements to all levels of the Department and deliver the training, tools, and resources to implement this policy; promote cooperative working relationships with regulatory agencies and the Bay Program and promote development of sound legislation and regulations on water quality; provide community outreach and leadership on water quality issues, and respond in a timely fashion to inquiries or expressions of concern regarding water quality issues related to the activities of MDOT modals and their tenants; improve MDOT's performance by developing approaches to ensure the proper function and long-term effectiveness of the Department's water quality practices, and; continuously improve the effectiveness of MDOT's water quality programs through the MFR program.

Planning and Natural Resource Management Policy - MDOT will integrate water quality concerns into the facility development planning process. When developing projects, impacts a project might have on water quality, including erosion and siltation of streams, realignment or relocation of a waterway, filling or draining of wetlands, and changes in quality or quantity of runoff from increases in impervious surface or removal of forests will be considered. In planning redevelopment projects, MDOT will plan for the possibility that aforestation, reforestation, reduction in impervious surface, water quality treatment, water quantity control or some form of mitigation will be required.. As local governments develop watershed management plans, MDOT will participate in the planning process to ensure coordination with the plan when adopted.

Water Pollution Prevention and Stormwater Management Policy - MDOT will seek reductions from stormwater pollutant sources by promoting aggressive pollution prevention activities and innovative management technologies. Pollution prevention and stormwater management practices will be integrated into standard operating procedures with the goal of eliminating the discharge of nutrients, toxics and hazardous substances to surface or ground waters. MDOT will continue to investigate and share new technologies and products to improve the reduction and control of contaminants and to recycle waste products to the extent feasible. MDOT/SHA received an April 2003 award from FHWA for Excellence in Wetlands and Water Quality for their Stormwater Management Facilities and National Pollutant Discharge Elimination System Program. The award cites the example of the Stormwater Management Facilities Program as showing how to go beyond compliance as part of doing business. This comprehensive

maintenance program is used to locate, inspect, evaluate, remediate, and enhance all of SHA's stormwater management facilities.

Management Commitment Policy - MDOT will communicate water quality policies and their requirements to all levels of staff. Resources, staff and training necessary to implement these policies will be supported on a par with established programs for air quality, safety, system capacity and system preservation.

Community Relations Policy – MDOT will provide information and, when appropriate, actively solicit input regarding the impacts of their operations on water quality, and will consider public input in their planning and business decision-making.

University of Maryland Center for Environmental Science (UMCES)

The University of Maryland Center for Environmental Science is one of 13 constituent institutions of the University of Maryland. The Center's programs are carried out at three laboratories located across the state: the Appalachian Laboratory in western Maryland, the Chesapeake Biological Laboratory, in southern Maryland and the Horn Point Laboratory on the Delmarva Peninsula. UMCES is also responsible for the administration of the Maryland Sea Grant College program. The Center's research and science application activities emphasize the Chesapeake Bay and its watershed.

Appalachian Laboratory - AL was founded in 1962 and its faculty conduct research in aquatic ecology, landscape and watershed ecology, conservation biology and restoration ecology, behavioral and evolutionary ecology, and study both freshwater and terrestrial ecosystems of Maryland and other locations in the United States and the world. AL is a member of the **Association of Ecosystem Research Centers**. Appalachian Laboratory is the headquarters and administrative lead of the **Chesapeake Watershed Cooperative Ecosystem Studies Unit (CW CESU)**, a partnership among 11 university/research institutions and 6 federal agencies whose members strive to understand and protect the natural and cultural resources of the region. The CW CESU is part of the **CESU national network** of 17 similar partnerships. The primary objective of the network is to foster stewardship of the environment through collaborative research, technical assistance and education that support integrated ecosystem management. Environmental education is an important part of the mission of the Appalachian Laboratory, aimed at motivating future generations to be environmentally literate and to understand the importance of an ecologically healthy environment. Through this effort, the Lab educates teachers, students, and other members of our western Maryland community how to be wise stewards of our valuable natural resources.

Chesapeake Biological Laboratory - CBL is a marine research facility founded in 1925 at the mouth of the Patuxent River, within easy reach of the diverse aquatic and terrestrial habitats of one of the world's largest estuarine ecosystems. CBL is a charter member of the National Association of Marine Laboratories and it houses the UMCES research fleet.

Areas of research emphasis include aquatic environmental toxicology, environmental chemistry, ecosystem studies, and fisheries science.

Horn Point Laboratory - HPL is located on the banks of the Choptank River, a tributary of the Chesapeake Bay on Maryland's Eastern Shore. The Laboratory is interdisciplinary with faculty engaged in research on the biology, chemistry, physics, and ecology of organisms and ecosystems from wetlands and estuarine waters of the Chesapeake Bay to the continental shelf and open waters of the world's oceans. Areas of scientific expertise include oceanography, plankton dynamics, marine macrophyte and wetland ecology, systems ecology, nutrient dynamics and eutrophication, physiological ecology of benthic invertebrates, benthic-pelagic interactions, and aquaculture. HPL is a member of the **Southern Association of Marine Laboratories (SAML)** and the **National Association of Marine Laboratories (NAML)**.

Maryland Sea Grant College - supports innovative marine research and education, with a special focus on the Chesapeake Bay. With funding from the National Oceanic and Atmospheric Administration and the State of Maryland, Sea Grant-supported research targets practical problems, with the aim of promoting wise decision-making. By serving as a gateway to relevant and reliable scientific information, Sea Grant helps assure that individuals can make informed choices about their use and stewardship of marine resources.

First established in 1977, Maryland Sea Grant is part of a network of 30 university-based Sea Grant program around the country. Hosted by the University of Maryland's College Park campus, Maryland Sea Grant is administered by the University of Maryland Center for Environmental Science, on behalf of the thirteen campus University System of Maryland. We support scientific research using an interactive and innovative approach to program management.

To help return the Chesapeake Bay to a condition that more closely resembles its original productivity, where underwater grasses and oyster reefs lined the Bay's shallow edges, scientists and resource managers alike must explore new ways to improve water quality, to experiment with grass planting and oyster reef construction, to explore better ways of spawning and raising oysters and finfish in hatcheries and other facilities. The Maryland Sea Grant College helps to support activities in all these areas.

FEDERAL PROGRAMS

U.S. Fish and Wildlife Service (FWS)

The Fish and Wildlife Service, within the U.S. Department of the Interior, is the principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife, plants and their habitats for the continuing benefit of the American people. The Service

manages the 93-million acre National Wildlife Refuge System comprised of more than 540 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological services field stations. The agency enforces federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

Chesapeake Bay Field Office

The mission of the Chesapeake Bay Field Office is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Chesapeake Bay Field Office biologists work to protect endangered and threatened species, migratory birds, freshwater and anadromous fish, and wildlife habitats in the District of Columbia, Delaware, Maryland and Virginia. CBFO staff work with many other private and public partners to preserve and protect living resources of the Chesapeake Bay and Delaware Bay ecosystems.

Maryland Fishery Resources Office

Maryland Fishery Resources Office coordinates fish tagging programs in cooperation with federal and state agencies along the eastern seaboard. The Cooperative Tagging Program has provided critical information for striped bass restoration, and will likely be as important to sturgeon, shad, and horseshoe crab conservation. Information from these tagging programs can be used to monitor the status of stocks, restore fish populations, and set seasons on harvest. The Cooperative Tagging Program has provided essential information for striped bass restoration, and conservation. However, our understanding of migration, mortality, and spawning behavior is far from complete for these species.

National Wildlife Refuge System

The Chesapeake Marshlands National Wildlife Refuge Complex comprises the Blackwater National Wildlife Refuge (NWR), Eastern Neck NWR, and the Chesapeake Island Refuges, consisting of Martin NWR and Susquehanna NWR, which collectively includes the Barren Island, Watts Island, Bishops Head, and Spring Island Divisions. A planning team consisting of representatives from all divisions within the Fish and Wildlife Service initially developed a draft Comprehensive Conservation Plan (CCP) and Environmental Analysis (EA), with input and assistance from numerous partner agencies. A separate CCP/EA will be developed for Eastern Neck NWR. The purpose of the CCP is to provide management guidance for achieving the highest and best contribution to wildlife resources for which the Service is responsible for managing on the Refuge Complex. The CCP will identify the role that units of the Refuge Complex will play in fulfilling the mission of the Fish and Wildlife Service, the mission of the National Wildlife Refuge System, and the purposes for which the units of the Refuge Complex were established. The Environmental Assessment (EA) identifies three alternatives for managing the Refuge Complex, and discusses how each of those actions will affect the physical, biological, archaeological, historical, and socioeconomic environments.

Established in 1936 by executive order of President Franklin D. Roosevelt, the Patuxent Research Refuge is the Nation's only National Wildlife Refuge established to support wildlife research. This property houses the facilities for the USGS's Patuxent Wildlife Research Center (PWRC), as well as the National Wildlife Visitor Center. This Center is the largest science and environmental education center in the Department of the Interior. Designed to accommodate one million visitors per year, this unique facility seeks to impart to young and old alike an increased knowledge of and appreciation for the earth's vital resources. It highlights the work of professional scientists who strive to improve the condition of wildlife and their habitats.

National Park Service (NPS)

Within the U.S. Department of the Interior, the National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world. The NPS owns and manages a wide variety of properties across Maryland. Its 23 holdings within the state include National Scenic Trails, National Seashore, National Historic Sites, and National Battlefields.

U.S. Geological Survey (USGS)

Also housed within the U.S. Department of the Interior, the USGS serves the nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life. As the nation's largest water, earth, and biological science and civilian mapping agency, the USGS collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. The diversity of scientific expertise enables the implementation large-scale, multi-disciplinary investigations and the provision of impartial scientific information to resource managers, planners, and other customers.

Chesapeake Science Program

The USGS Chesapeake Science Program depends on the coordination of multiple USGS Programs that have a scientific interest in the Bay restoration. Over forty USGS scientists located in offices throughout the Bay watershed and at the CBP, are involved in scientific studies and information dissemination. Where possible, the USGS is planning and executing integrated efforts among USGS National Programs to enhance interdisciplinary approaches to technical issues. View some recent accomplishments of USGS Chesapeake Bay Science Studies.

Biology Program - area missions related to fisheries and aquatic resources, contaminants, wildlife, invasive species, and ecosystems are met through investigations carried out at

the Leetown Science Center and PWRC addressing submerged aquatic vegetation, wetlands, fisheries and water birds.

Coastal and Marine Geology Program - mission is met through research on sediment sources and dynamics affecting water clarity and submerged aquatic vegetation. Visit the home page for the Coastal and Marine Geology Program

Cooperative Geologic Mapping Program - mission is met through creation of maps of geologic and geomorphic characteristics of sediment transport and deposition history in watersheds and adjacent tidal. The National Cooperative Geologic Mapping Program site contains more information.

Cooperative Topographic Mapping Program - program mission is met through information management, access, and retrieval of GIS- based data through the WWW.

Earth Surface Dynamics Program - mission is met through research on effects of land-cover change and climate variability on sediment deposition and subsequent effects on water clarity and SAV.

Eastern Region Place-Based Studies - goal of coordinating and integrating science of the USGS National Programs and to meeting customer needs in the Mid-Atlantic Focus area is carried out through investigations in Chesapeake Bay and its watershed. Visit the Place-based Studies Program site or factsheet for more information.

Geographic Analysis and Monitoring Program (GAM) - mission is met through research and application to document the land-cover characterizations, land-cover and land-use changes, and relate to water quality and habitat changes through process models.

Hydrology National Research Program - mission is met through research of sediment sources, transport, and delivery in the selected watersheds and adjacent tidal systems and their relation to shallow-water habitats for SAV. Research on nutrient cycling in surface-water and ground-water systems. Research characterizing abundance and extent of SAV coverage in relation to sediment, seasonal water quality, and hydroclimatology. The National Research Program conducts basic and problem oriented hydrologic research.

Hydrology State-Federal Cooperative Program - mission is met through enhanced surface-water monitoring and modeling efforts to document sediment and nutrient loads, trend analysis, and factors affecting loads and trends.

National Water-Quality Assessment (NAWQA) Program - mission is met through work under Delmarva/Potomac study to understand nutrient and contaminant relation to land use and processes affecting geochemical cycling.

Toxic Substances Hydrology Program - the mission of this program is met through research on the influence of nutrients, sediments, and contaminants on the environmental health of the Chesapeake Bay and its watershed.

Support for Chesapeake Bay Program - Restoration of living resources and vital habitat is the highest priority of Chesapeake 2000. The CBP is developing plans to restore vital habitats and living resources including submerged aquatic vegetation and fisheries. Also, the Department of Interior is developing conservation measures to protect water birds in the Atlantic Flyway. To develop the strategies to conserve and restore the ecosystem, scientific information is needed to understand the complex relation of living resources and associated habitats to environmental factors in the Bay and its watershed. The USGS will focus on documenting the factors affecting the health of fish and water birds and their habitats: Submerged Aquatic Vegetation, Wetlands, Stream Corridors, Invasive Species, Fish Health, and Water Birds.

Land-use change is the primary factor causing water-quality and habitat degradation in the Bay and its watershed. There is a need for enhanced land-use and watershed data to explain changes in water quality, habitat, and living resources and improve associated CBP models and decision-support systems. The USGS is producing land-cover, land-use, and watershed data needed to understand changes in water quality and living resources. Efforts are focused on documenting the sediment, nutrient, and toxic sources associated with urban, suburban, and agricultural lands.

National Biological Information Infrastructure (NBII)

Part of the USGS, NBII is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. The NBII links diverse, high-quality biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry. NBII partners and collaborators also work on new standards, tools, and technologies that make it easier to find, integrate, and apply biological resources information. Resource managers, scientists, educators, and the general public use the NBII to answer a wide range of questions related to the management, use, or conservation of this nation's biological resources. One of Maryland's links to NBII is through the Mid-Atlantic Information Node (MAIN), the regional node encompassing Pennsylvania, Maryland, Delaware, Virginia, and West Virginia. The mission of the MAIN is to encourage accessibility and appropriate use of such biological resource information throughout the Mid-Atlantic Region. The MAIN philosophy for addressing the problem focuses heavily upon coordination, cooperation, and communication among the community of professionals that deal with data collection and management in the region.

National Oceanic and Atmospheric Administration (NOAA)

Situated within the U.S. Department of Commerce, NOAA's mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs.

Habitat Program - Works to improve the quality and increase the quantity of coastal habitat restoration. In addition to planning, funding, and implementing on-the-ground restoration projects, the Habitat Program advances the science underlying coastal habitat restoration and develops improved technology with which to achieve successful restoration. The Program also transfers restoration technology and the results of research and monitoring to the private and public sectors through extension, outreach, and education efforts.

Damage Assessment and Restoration Program -Conducts natural resource damage assessments and restoration of coastal and marine resources injured as a result of oil spills, releases of hazardous materials and ship groundings. Composed of NOAA Restoration Center, NOAA Damage Assessment Center, and NOAA Office of General Counsel.

Community-based Restoration Program - A financial and technical assistance program that promotes strong partnerships at the national, regional, and local level to restore fisheries habitat with the help of volunteer support, and other in-kind services. Administered by NOAA Restoration Center.
Coastal Wetlands Planning, Protection and Restoration Act Program - Funds and supports restoration, protection, conservation and enhancement of threatened wetlands on the Gulf of Mexico. Administered by NOAA Restoration Center.

Coastal Protection and Restoration Division - Implements the Secretary of Commerce's natural resource trusteeship by protecting and restoring coastal habitats and resources affected by hazardous materials releases. Office of Response and Restoration within the NOAA Ocean Service.

Estuary Restoration Act (ERA) - This Act formed a federal interagency council to make restoring our nation's estuaries a top priority. NOAA is assigned primary data coordination responsibilities under the ERA, including the establishment of monitoring protocols for restoration projects and the development and maintenance of a national inventory of restoration projects (National Estuary Restoration Inventory). NOAA is also working to assess habitat trends and fill gaps in restoration planning in key coastal areas.

Oyster Recovery Partnership - Provides a focus for NOAA’s multiple capabilities and activities in Chesapeake Bay along with the multi-state/Federal partnership that comprises the Chesapeake Bay Program. A component of the NOAA Chesapeake Bay Office.

NOAA Hydropower Program - Implements provisions of the Federal Power Act to prescribe fishways and other protection, mitigation, and enhancement measures at hydropower projects licensed by the Federal Energy Regulatory Commission.
A component of the NOAA Fisheries Service Office of Habitat Conservation.

NOAA Habitat Collaborating Programs - These programs are involved in NOAA restoration activities, but restoration is not their primary mission: NOAA Research

(OAR), National Sea Grant College Program (OAR), National Marine Sanctuary Program (NOS), Special Projects (NOS/MB), National Geodetic Survey (NOS), Landscape Characterization and Restoration Program (NOS/CSC), Center for Operational Oceanographic Products and Services (NOS), Center for Coastal Fisheries and Habitat Research (NOS/NCCOS), Center for Sponsored Coastal Ocean Research (NOS/NCCOS), Cooperative Institute for Coastal and Estuarine and Environmental Technologies CICEET (NOS/OCRM), National Estuarine Research Reserve System (NOS/OCRM), Coastal Zone Management Program (NOS/OCRM), Office of Protectd Resources (NMFS), NOAA Fisheries Labs (NMFS), National Fish and Wildlife Foundation (NOAA Partnership Program), Pribilof Islands Environmental Restoraton Project (NOAA Program), Southern Florida Ecosystem Restoration Program (NOAA Proram).

Coastal Services Center - supports the environmental, social and economic well being of the coast by linking people, information and technology.

NOAA CoastWatch Great Lakes Program - The NOAA Great Lakes Environmental Research Lab obtains, produces and delivers environmental data and products for near real-time monitoring of the Great Lakes to support environmental science, decision making and supporting research. This is achieved by providing access to near real-time and retrospective satellite observations.

The Marine Geology & Geophysics Division of the NOAA National Geophysical Data Center and the collocated World Data Center for Marine Geology & Geophysics, in Boulder, Colo., compiles and maintains extensive bathymetric, marine sediment and trackline geophysical databases in both coastal and open ocean areas.

Coast Survey - a component of the NOAA Ocean Service with a long history as the oldest scientific organization in the United States, having its foundation as far back as 1807. Today the Office of Coast Survey is known for the useful and necessary navigational products, which are required for the safe and efficient maritime commerce in and out of the nation's ports.

Coastal Zone Management - is a unique federal-state partnership that provides a proven basis for protecting, restoring and responsibly developing the nation's important and diverse coastal communities and resources.

Estuarine Reserve Research - The NOAA National Estuarine Research Reserve System protects and studies estuarine areas through a network of 25 reserves. We hope you will use this Web site to learn more about the importance of estuaries, national programs, reserves in your state and critical issues, such as polluted runoff, restoration science, invasive species and environmental stewardship.

Great Lakes Environmental Research Lab - The NOAA Great Lakes Environmental Research Laboratory (GLERL) conducts high-quality research and provides scientific

leadership on important issues in both Great Lakes and marine coastal environments leading to new knowledge, tools, approaches, awareness and services.

Integrated Coastal Management - a cooperative undertaking among the Intergovernmental Oceanographic Commission, UNESCO, the NOAA Ocean Service, National Oceanic and Atmospheric Administration, the Center for the Study of Marine Policy (University of Delaware), the World Bank, and the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities in conjunction with a number of other partners around the world.

National Centers for Coastal Ocean Science - The National Centers for Coastal Ocean Science (NCCOS) conducts and supports research, monitoring, assessment and technical assistance to people managing coastal ecosystems and society's use of them. Formed within the NOAA Ocean Service in March 1999, it puts all of NOAA's coastal research centers in one group. Each Center has specific capabilities and research expertise in important ocean and coastal issues: Center for Sponsored Coastal Ocean Research, Center for Coastal Monitoring and Assessment, Center for Coastal Fisheries and Habitat Research.

Ocean Prediction Center - issues marine warnings, forecasts and guidance in text and graphical format for maritime users. Also, the OPC quality controls marine observations globally from ship, buoy and automated marine observations for gross errors prior to being assimilated into computer model guidance. The Ocean Prediction Center also provides forecast points in coordination with the NOAA National Hurricane Center for Tropical Cyclones in the Atlantic Ocean E of 65W.

Ocean and Coastal Resource Management - administers the Coastal Zone Management Act and a leader on the Nation's coastal, estuarine and ocean management issues.

Sea Grant - network of Sea Grant Colleges and research institutions. Headquartered at many of the nation's premier universities, Sea Grant programs are located in coastal and Great Lake states, Hawaii and Puerto Rico. A national network of 30 Sea Grant Colleges and institutional programs shares research, outreach and education to solve old problems and explore new uses for the world's marine, Great Lakes and coastal resources.

Office of Habitat Conservation - The Office of Habitat Conservation is located in the National Oceanic and Atmospheric Administration (NOAA) Headquarters complex in Silver Spring, Maryland. It interacts with the NOAA Fisheries Regional Offices to manage, conserve and enhance habitats for fishery resources, protected species and other living marine resources.

National Marine Fisheries Service (NOAA Fisheries Service) is dedicated to protecting and preserving the nation's living marine resources through scientific research, fisheries management, enforcement and habitat conservation. NOAA Fisheries is a leading voice for commercial and recreational fisheries and continues to focus its efforts on sustaining marine resources. Marine fisheries (which extend from state waters to 200

miles from USA shores) provide an important source of food for the nation, as well as thousands of jobs and a traditional way of life for many coastal communities. From the Gulf of Maine, to the Gulf of Mexico and to the Gulf of Alaska, NOAA Fisheries scientists and managers work to ensure sustainable fish harvests; they are the stewards of marine resources and their habitats.

Marine Mammals — NOAA Fisheries works to protect marine mammals under its jurisdiction, including whales, dolphins, porpoises, seals and sea lions.

Sea Turtle Protection and Conservation - All six species of sea turtles in the U.S. are protected under the Endangered Species Act of 1973. One of the most important ways NOAA Fisheries acts to protect sea turtles is by requiring trawl fishermen to use Turtle Excluder Devices or TEDs while fishing.

Essential Fish Habitat — The conservation of essential fish habitat for federally managed fish species is an important component of building and maintaining sustainable fisheries.

U.S. Environmental Protection Agency

The mission of the Environmental Protection Agency is to protect human health and the environment. One of the numerous programs coordinated by EPA is the Environmental Monitoring and Assessment Program (EMAP), which is a research program to develop the tools necessary to monitor and assess the status and trends of national ecological resources. EMAP's goal is to develop the scientific understanding for translating environmental monitoring data from multiple spatial and temporal scales into assessments of current ecological condition and forecasts of future risks to our natural resources. EMAP aims to advance the science of ecological monitoring and ecological risk assessment, guide national monitoring with improved scientific understanding of ecosystem integrity and dynamics, and demonstrate multi-agency monitoring through large regional projects. EMAP develops indicators to monitor the condition of ecological resources. EMAP also investigates designs that address the acquisition, aggregation, and analysis of multiscale and multitier data.

U.S. Department of Agriculture

Among the varied responsibilities of USDA are the stewardship of our nation's 192 million acres of national forests and rangelands, as well as working with private landowners to encourage voluntary efforts to protect soil, water, and wildlife on the 70 percent of America's lands that are in private hands.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) coordinates numerous natural resources conservation programs help people reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters. Public benefits include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation, and scenic beauty. As an example, the Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP, USDA's Natural Resources Conservation Service provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed.

U.S. Department of Defense

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (Baltimore & Pittsburg Districts for Maryland) has many projects and programs that are helping to meet the Bay restoration goals. The Army Corps of Engineers carries out environmental and natural resource management programs at its projects, managing thousands of square miles as forest and wildlife habitat, monitoring water quality at its dams, operating fish hatcheries in cooperation with State wildlife agencies, and in some cases restoring the environment at projects built in earlier days.

Ecosystem Restoration Programs- Since passage of the National Environmental Policy Act of 1969, environmental protection has been an important component of the civil works planning process. Legislation passed in 1990 established environmental protection as one of the primary missions of water resources projects-- along with navigation and flood control. This new direction has allowed us to expand our traditional environmental activities and enhance or restore natural resources at our projects

Poplar Island Environmental Restoration Site - Poplar Island, in Talbot County, MD, is a national model for habitat restoration and the beneficial use of dredged material. The U.S. Army Corps of Engineers, Baltimore District has teamed with the Maryland Port Administration and other Federal and State agencies to restore Poplar Island. Six different habitat types are being created as part of the Poplar Island Environmental Restoration Project: upland habitat, salt marshes, tidal flats, nesting islands, rocky shorlines, and shallow water habitats. Not only will these habitats support a diverse assemblage of plants and animals, but some of the habitat types to be created include those that are most sorely needed in the Bay. The five restoration goals of Poplar Island Environmental Restoration Project are: create bare/sparsely vegetated islands to provide nesting habitat for birds; create/enhance vegetated islands to provide nesting habitat for birds; create/enhance tidal wetlands to provide fish and wildlife habitat; restore quiescent water habitat in Poplar Harbor to promote submerged aquatic vegetation recovery, and; create remote and diverse island habitat

Smith Island, Maryland Environmental Restoration and Protection Project -
The Baltimore District, in partnership with the Maryland DNR and Somerset County, has developed a plan for environmental restoration on Smith Island. The restoration efforts are focused on the northern half of the island that comprises the Martin National Wildlife Refuge. During the feasibility study, it was determined that the tremendous loss of submerged aquatic vegetation (SAV) around parts of Smith Island could be stopped and, to an extent, reversed by protecting and restoring lost wetlands in the Martin National Wildlife Refuge. Over a 50-year project life, these projects will restore or protect approximately 1,900 acres of SAV and restore or protect 240 acres of wetlands.

Environmental Stewardship Programs - includes compliance measures to ensure that our projects must meet Federal, state, and local environmental requirements. Prevention, meanwhile, focuses on eliminating pollution to the greatest extent possible. This includes reducing hazardous materials use and hazardous waste generation.

Civil Works Program - The civil works program enables the Corps, with support from non-federal sponsors, to plan, design, and construct projects related to ecosystem restoration, navigation and flood protection. Working toward a national goal of "no net loss of wetlands," the Civil Works program is undertaking projects to restore existing wetlands, or to create new ones.

International and Interagency Services Programs (IIS) - The Corps assists many non-Department of Defense federal, state and local government agencies to supplement their technical resources. We provide a full range of support services including engineering, construction, real estate acquisition, contracting and construction management functions.

Regulatory Program - The Corps' regulatory program is charged with protecting waterways and wetlands. We regulate the discharge of dredged or fill material into all waters of the Unites States, as well as construction activities and dredging within traditionally navigable waters.

Operations and Maintenance (O&M) - The Corps' Operations and Maintenance Program includes navigation actions, stewardship on Corps lands, and special initiatives such as the Baltimore Harbor Dredged Material Management Plan. The Corps continuously looks for ways to beneficially use material dredged from the federal navigation channels, such as wetland and island restoration. We also protect and restore the valuable environmental resources within our lakes and reservoirs.

Chesapeake Bay Model - The Chesapeake Bay Environmental Model Package (CBEMP), developed by the Engineer Research and Development Center (ERDC) of the Corps and supported by the Environmental Protection Agency (EPA), has been used for a variety of management purposes since its initial delivery in 1992. The most recent upgrade of the model is guiding management efforts to remove the bay from an EPA list of impaired water bodies. The model is being used to help determine nutrient and solids load reductions necessary to restore the bay. ERDC is initiating innovative model

developments to investigate the impact of a ten-fold increase in oyster population and is in the initial stages of adding a sediment transport component to the bay model.

U. S. Service Branches (Army, Navy, Air Force, Marine, Coast Guard) The Environmental Management System policy of our nation's Department of Defense (DoD) calls for systematic integration of environmental management into all missions, activities, and functions that are carried out by the various service branches. In taking this step, the DoD is emphasizing its commitment to the environment and its position that simply complying with environmental laws and regulations is not enough. Examples of this approach in practice would be the completion and implementation of Integrated Natural Resource Management Plans (INRMP's) for base facilities in Maryland, as well as commitiments by Maryland's National Guard to combat invasive species on training facilities leased from the state.

LOCAL AGENCIES AND PROGRAMS

Planning and Zoning

There are Planning and Zoning agencies within each of Maryland's 23 counties, as well as Baltimore City. Coordination at the local level also includes contact with county staff related to environmental protection and resource management. Maryland has more than 150 municipalities and coordination at this level is frequently accomplished through the county agencies or via the Department of Planning. Local agencies coordinate with various state agencies in the development of their Comprehensive Plans, Land Preservation and Recreation Plans, and other planning activities.

Maryland-National Capital Park and Planning Commission

The Maryland-National Capital Park and Planning Commission is a bi-county agency empowered by the State of Maryland in 1927 to acquire, develop, maintain and administer a regional system of parks within Montgomery and Prince George's Counties, and to prepare and administer a general plan for the physical development of the two counties. In addition, the Commission gained responsibility for the public recreation program in Prince George's County in 1970. The Commission administers a park system of more than 52,000 acres. It is composed of stream valley parks, large regional parks, neighborhood parks and park-school recreation areas.

MULTI-AGENCY PROGRAMS

Chesapeake Bay Program

The Chesapeake Bay Program is a unique regional partnership that has led and directed the restoration of the Chesapeake Bay since 1983. The Chesapeake Bay Program partners include the states of Maryland, Pennsylvania and Virginia; the District of Columbia, the

Chesapeake Bay Commission, a tri-state legislative body; the Environmental Protection Agency, representing the federal government; and participating citizen advisory groups. Since the signing of the Chesapeake 2000 agreement, Delaware, New York and West Virginia have joined the Bay Program partnership to improve the quality of the waters flowing into the Bay. As headwaters partners, each of those states will work with the Bay Program to reduce the amount of nutrients and sediments flowing into rivers from their jurisdictions. The Chesapeake Executive Council leads the Bay Program. The members of the Executive Council are the governors of Maryland, Virginia, and Pennsylvania; the Mayor of the District of Columbia; the Administrator of the US Environmental Protection Agency, and the Chair of the Chesapeake Bay Commission. The Executive Council meets annually to establish the policy direction for the Bay Program.

Since its inception in 1983, the Bay Program's highest priority has been the restoration of the Bay's living resources- its finfish, shellfish, Bay grasses and other aquatic life and wildlife. Improvements include fisheries and habitat restoration, recovery of Bay grasses, nutrient and toxic reductions, and significant advances in estuarine science.

Tributary Strategies Program - Maryland's Tributary Strategies' primary goal is to meet nutrient reduction goals in each of the ten major tributaries of the Chesapeake Bay. The Strategies recommend implementation targets for urban, agricultural, and resource protection best management practices that, along with implementation of biological nutrient removal at large wastewater treatment plants, are designed to meet nutrient reduction goals. Maryland's Tributary Teams—comprised of local citizens, farmers, business leaders, and government officials appointed by the Governor—work to formulate the Strategies. The Tributary Teams meet regularly to help implement pollution prevention measures to address local water quality problems.

Under the guidance of the Tributary Teams, major cleanup actions are underway in the ten key Chesapeake Bay tributaries. The Tributary Teams work to develop a pollution control plan unique to each watershed, its population and its land-use patterns. Examples of pollution control options being implemented in each tributary basin include: Upgrades to wastewater treatment plants, Planting of stream-side forests to absorb nutrient runoff, Best management practices to reduce agricultural runoff, and "Smart growth" plans.

Watershed Assistance Program - The Watershed Assistance workgroup is action-oriented with a mission to provide on-the-ground technical assistance to local watershed planning initiatives. In partnership with Maryland, Virginia, West Virginia, and Pennsylvania, the group: Provides assistance to local groups on watershed planning by facilitating the integration of watershed management and land use planning through meaningful dialogue and technical support; Plans, coordinates, and conducts, training for state and local government staff and interested organizations on local watershed planning; Provides outreach and education assistance through information, tools, and resources to enable and encourage local governments to do watershed planning in collaboration with community stakeholders.

The Chesapeake Bay Small Watershed Grants Program - Administered by the National Fish and Wildlife Foundation in partnership with the U.S. Environmental Protection Agency, Chesapeake Bay Program, the program is primarily funded by the Environmental Protection Agency'sChesapeake Bay Program Office. Additional funding partners include: National Oceanic and Atmospheric Administration, USDA Natural Resources Conservation Service, Chesapeake Bay Trust, Keith Campbell Foundation for the Environment, and Western Pennsylvania Watershed Program.

The program promotes community-based efforts to protect and restore the natural resources of the Chesapeake Bay and its watershed. The program provides grants to organizations working to improve the condition of their local watershed while building citizen-based resource stewardship. Many of the grants awarded are modest; however, they are often combined with the contributions of other partners, making possible projects that can make a measurable contribution to communities.

While the overall goal of the Program is to assist local communities with watershed protection, specific goals include: Supporting communities in developing and implementing watershed management plans; Encouraging innovative local programs or projects that improve water quality and restore important habitats within the Chesapeake Bay basin; Developing the capacity of local governments, citizen groups and other organizations to promote community-based stewardship and enhance local watershed management; Promoting a greater understanding of the Chesapeake Bay and the connection between the health of the Bay and condition of local watersheds, and; Strengthening the links between communities and the Chesapeake Bay Program.

Community Legacy Grants - The Community Legacy Grants initiative, begun in 2002, is intended to encourage the establishment of partnerships that will create a conservation legacy in communities throughout the Chesapeake Bay watershed. As envisioned under the Chesapeake 2000 Agreement, this legacy includes abundant, diverse populations of fish, wildlife and plants, fed by healthy streams and rivers, sustaining strong local and regional economies, and our unique quality of life. Through the Community Legacy Grants initiative grants will be awarded to truly innovative projects that either restore vital fish and wildlife habitats, develop locally-supported watershed management plans, or promote environmentally-sensitive development.

Community Wateshed Dialogue - The watershed assistance staff, in collaboration with Maryland, Pennsylvania, Virginia and West Virginia, organize and conduct Dialogues to engage community leaders and key stakeholders in managing watersheds. The Dialogues are a collaborative approach for community engagement, consensus building, and commitment to comprehensive resource management. Participants learn to integrate watershed management into sound land use decisions and practices.

The first Community Watershed Dialogue took place at the Wye Institute on Maryland's Eastern Shore. Community leaders and stakeholders from the Maryland DNR Watershed Restoration Action Strategy (WRAS) watersheds joined for two days to discuss watershed management and the "how to" of initiating local watershed planning. The

Maryland Dialogue contained sessions on visioning and goal setting, building stakeholder networks to support watershed preservation and restoration, implementing a locally developed watershed plan, and using resource data to make decisions. Participants from each watersheds met together to outline steps necessary for initiating planning efforts in their watershed. The watersheds included: Lower Patapsco, Upper Chester, Upper Monocacy, Chincoteague Bay, Anacostia, and the South Branch of the Potomac River, West Virginia

Builders for the Bay Roundtables - Many times, conservation of open space, forests and farms provide benefits to new developments. These cost saving benefits include natural infrastructure retention and the higher market value of homes adjacent to protected lands. At the Roundtables, representatives from the Center for Watershed Protection, The National Home Builders Association and the Alliance for the Chesapeake Bay lead a discussion between builders and environmentalist. They are working together to revise local codes and ordinances, so that new developments can conserve open space and protect water quality while meeting market demand and builders' needs.

The Resource Lands Assessment - The Resource Lands Assessment (RLA) provides a regional multi-state look at the most important remaining resource lands in the Chesapeake Bay Watershed. The RLA uses GIS models and expert knowledge to assess the value of resource lands within the watershed, providing guidance to state and local government in land protection strategy development, serving as an information resource for the land trust community, suggesting conservation focus areas to complement watershed restoration plans, and identifying areas important to maintain for the forest products industry. These models can inform growth management and land preservation planning at multiple spatial scales.

The Bay Program partners are conducting an assessment of the resource lands in the watershed. This assessment will be used to advise future land acquisition and analyze protected lands for habitat value, water quality/watershed integrity protection, cultural value, economic value (forest/farm production), and vulnerability to development.

The Chesapeake Bay Program developed analytical approaches for assessing the value of forests, farms and wetlands within the Chesapeake Bay Watershed using Geographic Information Systems (GIS) to manipulate and combine data from a variety of sources. The resulting assessment models can be utilized individually or in combination. The composite data sets can be reclassified and applied at different geographic scales based on the needs of the user. Each of the six assessment models uses a series of GIS data layers that were selected to represent ecological, cultural or socioeconomic phenomena. Data layers were selected based on their importance in assigning “value” to the landscape, and were weighted using input from resource experts within and outside of the Chesapeake Bay Program. Each assessment model contains different assumptions for appropriate data, the use of weights, and the limitations regarding display and interpretation of the composite results.

Maryland Coastal Bays Program

The Maryland Coastal Bays Program is one of 28 National Estuary Programs. The National Estuary Program was established in 1987 by amendments to the Clean Water Act (CWA Section 320) to identify, restore, and protect nationally significant estuaries of the US. The US Environmental Protection Agency administers the National Estuary Program, but program decisions and activities are carried out by committees of local government officials, private citizens, and representatives from other federal agencies, academic institutions, industry, and estuary user-groups.

The Maryland Coastal Bays include the Isle of Wight, Assawoman, Sinepuxent, Newport, and Chincoteaque bays as well as other smaller bays and estuaries within the watershed. Maryland's Coastal Bays Program began as a planning effort that assessed the coastal bays' conditions and trends. The Chesapeake Bay is protected under its own federally mandated program, separate but related to the National Estuary Program. In fact, the approach and methods of the National Estuary Program were developed from the foundation laid by earlier efforts to protect the Chesapeake Bay.

The Maryland Coastal Bays Program is a partnership among the towns of Ocean City and Berlin, National Park Service, Worcester County, U.S. Environmental Protection Agency, and the Maryland Departments of Natural Resources, Agriculture, Environment, and Planning, who have come together to produce the first ever management plan for the coastal bays. This led to the development of a Comprehensive Conservation and Management Plan (CCMP) that addresses environmental restoration and protection and has evolved into an integrated effort to implement restoration and protection efforts. The effort is a partnership of federal, state, and local governments, citizens, environmental organizations, businesses, agricultural interest, and scientists. The CCMP identifies major problems in the coastal bays and action plans to address the problems. A policy committee of high level EPA, state, and local officials and citizen representatives establishes policies and priorities for the protection of the coastal bays and serves as an advocate for the implementation of the CCMP.

Created by representatives from the development, farming, golf, tourism, and fishing industries, the plan represents a consensus of the best means needed to preserve the economic and ecological prosperity of the coastal bays in the next century. With help from local, state and federal planners and scientists, the strategies in this plan include reachable scientific goals and the most effective means for implementing them. An Implementation and Finance Plan shows how each strategy will be funded.

Grants of the Maryland Coastal Bays Program - Coastal Bays awards $130,000 for local projects School projects, boating safety, organic agriculture, breeding bird studies, wetland restoration highlight winners

Committees of the Maryland Coastal Bays Program - The Maryland Coastal Bays Program is extremely fortunate highly qualified and dedicated people serving on several committees working to help achieve the mission and goals of the foundation. These include committees on policy, implemantation, science and technology, and a citizen's advisory committee.

Maryland Coastal Bays Program Initiatives - The following is a list of the people we work with and provide various educational initiatives for the benefit of the coastal bay community: Homeowners; Farmers/Foresters; Developers; Fishermen/boaters; Businesses.

Multi-Resolution Land Characteristics (MRLC)

The Multi-Resolution Land Characteristics (MRLC) Consortium is a group of federal agencies who first joined together in 1993 (MRLC 1992) to purchase Landsat 5 imagery for the conterminous U.S. and to develop a land cover dataset called the National Land Cover Dataset (NLCD 1992). In 1999, a second-generation MRLC consortium of nine federal agencies, including EPA, NOAA, and USGS, was formed to purchase three dates of Landsat 7 imagery for the entire United States (MRLC 2001) and to coordinate the production of a comprehensive land cover database for the nation called the National Land Cover Database (NLCD 2001).

National Wetlands Mitigation Action Plan

In response to independent critiques of the effectiveness of wetlands compensatory mitigation for authorized losses of wetlands and other waters under Section 404 of the Clean Water Act (CWA), the Environmental Protection Agency, the Army Corps of Engineers, and the Departments of Agriculture, Commerce, Interior, and Transportation released the National Wetlands Mitigation Action Plan on December 26, 2002. The Plan includes 17 tasks that the agencies will complete by the end of 2005 to improve the ecological performance and results of compensatory mitigation.

Reports published in 2001 by the National Academy of Sciences (NAS) and the General Accounting Office (GAO) provided a critical evaluation of the effectiveness of wetlands compensatory mitigation for authorized losses of wetlands and other waters under Section 404 of the CWA. Section 404 regulates discharges of dredged and fill materials into waters of the United States and requires compensatory mitigation for unavoidable impacts. The independent analyses and other commentaries highlighted a number of shortfalls and identified a variety of technical, programmatic, and policy recommendations for the Federal agencies, States, and other involved parties.
An interagency team drafted the National Mitigation Action Plan endorsing the goal of no net loss of wetlands and outlining specific action items that address the concerns of the NAS, GAO, and other independent evaluations. The 17 actions, with various agency leads, address areas of concern, including data collection and availability, clarifying performance standards, improving accountability, and integrating mitigation into the watershed approach.

Completing the actions in the Plan will enable the agencies and the public to make better decisions regarding where and how to restore, enhance, and protect wetlands; improve their ability to measure and evaluate the success of mitigation efforts; and expand the public's access to information on these wetland mitigation activities.

Stakeholder Forums - In 1999, the Federal agencies began hosting a series of stakeholder forums to gather information and opinions on the concerns and challenges of compensatory mitigation. These forums have brought together a diverse group of individuals representing the regulated community, environmental organizations, academia, non-governmental organizations, and mitigation providers. The first forum was held in Washington, DC, in 1999, to discuss draft guidance on in-lieu-fee mitigation. The second forum was held in Baltimore, Maryland, in 2001. This meeting helped lead to the formulation of the Action Plan. Additional forums were held in Portland, Oregon, in 2003, and Tampa, Florida, in 2004, to discuss progress on Action Plan tasks and solicit input on future Action Plan tasks.

Components of the National Wetlands Mitigation Action Plan - Completion of the first task in the Plan, release of a revised Army Corps of Engineers Mitigation Regulatory Guidance Letter (RGL 02-2) occurred concurrent with the Plan. The remaining 16 actions, which will be completed by the end of 2005, will address areas of concern including integrating mitigation into the watershed approach, improving accountability, clarifying performance standards, and improving data collection and availability. These actions are: Develop guidance on the use of on-site vs. off-site and in-kind vs. out-of-kind compensatory mitigation; Develop guidance on the use of vegetated buffers as a potential component of compensatory mitigation; Develop guidance on the appropriate use of preservation for compensatory mitigation; Using the guidance developed above, conduct an analysis with Tribes and States on the use of compensatory mitigation within a watershed context and identify criteria for making mitigation decisions in this context; Develop guidance that clarifies implementation of TEA-21 preference for mitigation banking; Continue to provide financial assistance through EPA's wetlands grants program to encourage Tribes, States and others to increase the success of mitigation in their jurisdictions; Develop guidance for those wetlands for which mitigation, restoration, or creation is not feasible or scientifically viable; Clarify considerations for mitigation impacts to streams in the Section 404 program; Develop a model mitigation plan checklist for permit applicants; Develop guidance adapting the National Research Council's recommended guidelines for creating or restoring self-sustaining wetlands to the Section 404 program; Analyze existing research to determine the effectiveness of using biological indicators and functional assessments for evaluating mitigation performance; Building upon the biological indicators and functional assessments research, develop performance standards guidance on monitoring and adaptive management of mitigation sites; Clarify key concepts related to performance standards; Compile and disseminate information regarding existing mitigation-tracking database systems; Building upon the analysis of existing mitigation database systems, develop a shared mitigation database, and; Utilizing the shared database, provide an annual public report card on compensatory mitigation to complement reporting of other wetland programs.

Agency	Program	Description	Financial Assistance	Technical Assistance
Farm Service Agency (FSA), U.S. Dept. of Agriculture (USDA)	Conservation Reserve Program (CRP)	Voluntary program for farmers and ranchers to assist in compliance with environmental laws and regulations, establish vegetative cover on highly erodible cropland, improve water quality, establish wildlife habitat, and enhance wetlands and forests.	Yes	Yes
Natural Resources Conservation Service (NRCS), USDA	Agricultural Management Assistance (AMA)	Voluntary program that provides cost-share assistance to farms for watershed management or irrigation structures, tree planting for windbreaks or water quality improvement, soil erosion control measures, integrated pest management or conversion to organic farming.	Yes	
	Conservation Partnership Initiative (CPI)	Voluntary program that provides grants to states, communities, tribes, and NGOs for planning conservation projects in terrestrial and aquatic habitat, coastal resources, livestock nutrient management, and/or minor/specialty crop pest management.	Yes	Yes
	Conservation Security Program (CSP)	Voluntary conservation program that rewards farmers and ranchers in high priority watersheds (including the Scituate Reservoir and Pocasset watersheds) that maintain and enhance the highest standards of environmental stewardship on their lands.	Yes	Yes

Agency	Program	Description	Financial Assistance	Technical Assistance
	Environmental Quality Incentive Program (EQIP)	Voluntary program that provides cost sharing for agricultural improvements that will help meet water quality and other environmental objectives.	Yes	Yes
	Farm and Ranch Lands Protection Program (FRPP)	Voluntary program that provides matching funds to state, tribal or local governments, and non-governmental organizations to purchase development rights to maintain existing farms and/or ranches.	Yes	
	Farmland Protection Program	Voluntary program that provides matching funds to states, communities, tribes and nonprofit organizations for the purchase of conservation easements to protect productive farmland.	Yes	
	Grassland Reserve Program (GRP)	Voluntary program that allows landowners to protect, enhance or restore grasslands, pastures, shrublands, and ranges on their properties.	Yes	Yes
	Resource Conservation and Development (RC&D) Program	Localized program that assists state, tribal and local governments and NGOs in rural areas in conservation planning and management, sustainable development and quality of life improvements.	Yes	Yes

Agency	Program	Description	Financial Assistance	Technical Assistance
	Soil and Water Conservation Assistance (SWCA)	Voluntary program to provide cost-share incentives to farms and ranches for soil and water conservation measures, related natural resource conservation, and compliance with environmental laws and regulations.	Yes	
	Watershed Protection and Flood Prevention Program	Voluntary program that assists landowners and local organizations to develop and implement watershed plans, conduct river basin studies, flood hazard analyses, floodplain management practices, and water and land conservation measures.	Yes	Yes
	Watershed Surveys and Planning	Voluntary program that assists states, communities, tribes and others to survey and plan watershed protection, sediment and erosion control, water quality, flood prevention, fish and wildlife enhancement, wetland restoration and creation, and other water needs projects.	Yes	Yes
	Wetlands Reserve Program (WRP)	Voluntary conservation program that protects, enhances and restores wetlands and their wildlife resources on private lands.	Yes	Yes
	Wildlife Habitat Incentives Program (WHIP)	Voluntary program that assists landowners to create high quality aquatic, riparian, wetland and upland habitat areas that support wildlife populations of local, state, national or tribal significance.	Yes	Yes

Agency	Program	Description	Financial Assistance	Technical Assistance
U.S. Forest Service, USDA	Forest Inventory and Analysis Program	Tracks the status, distribution and health of forestland throughout the country.		Yes
	National Resources Inventory (NRI) Program	Monitors the status and trends of non-federal land use throughout the country.		Yes
	Stewardship Incentives Program (SIP)	Voluntary program that encourages private forest landowners to maintain productive and healthy forests.	Yes	Yes
	State and Private Forestry Programs	Assists private landowners, businesses, states, tribes and communities to sustain and manage forestlands, control invasive species, restore urban trees and greenspace, and manage the impacts of wildland fires on communities and the environment.	Yes	Yes

Appendix 5. Compilation of Existing Monitoring Plans and Programs

This appendix lists the relevant monitoring plans in Maryland that monitor GCN species, habitats or action parameters that may become part of Maryland's broad monitoring framework. This list represents many partner programs and an important implementation and coordination part of this WDCP effort to adaptively manage, incorporate and communicate goals and data as each plan is revised and updated. Since monitoring will occur at the state, local, regional, national and international levels, it will require the establishment of this broad framework for monitoring at all of these levels. This will also allow partners to incorporate select components of this WDCP into their plans, as appropriate.

Although this list is fairly comprehensive, additional monitoring programs may exist and will be incorporated into this list when discovered and as appropriate. Also, this list of 196 programs includes different aspects of related projects or separate parts of the same multi-agency projects that are being conducted by a different implementation lead, usually at a more local level.

Summary of Existing Monitoring Actions

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Project Owlnet (no. saw-whet owl migration, band/release)	Project Owlnet	X		
Alliance Citizen Monitoring Program (water quality, nutrients; 135 stations)	Alliance for the Chesapeake Bay			X
American Chestnut Land Trust Water Quality Monitoring Program (2 stations on Parkers Creek, Calvert County)	American Chestnut Land Trust			X
The Water Quality Flagging Project (fecal coliform, 4 stations on Anacostia River)	Anacostia Watershed Society			X
Anne Arundel County Volunteer Water Quality Monitoring Program (streams and rivers in Anne Arundel County)	Anne Arundel County			X
Diamondback Terrapin Project (sightings, tag/release; Assateague Is.)	Assateague Coastal Trust	X		X
Assateague Coastkeeper (Coastal Bays health)	Assateague Coastal Trust			X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Audubon Naturalist Society Water Quality Monitoring Program (water quality, benthic macroinvertebrates)	Audubon Naturalist Society	X		X
Butterfly Counts	Washington Area Butterfly Club, N.A. Butterfly Assoc.	X		X
Christmas Bird Count	MOS & National Audubon Society	X		X
Bird Counts (Winter, Spring Migration, Breeding, Fall Migration)	MD Ornithological Society	X		X
Chesapeake Bay Monitoring Program: • Nutrients • Sediment • Toxicants • Plankton • Benthos • Finfish and shellfish • Bay grasses (SAV) • Freshwater flows • Water temperature • Salinity • Circulation • Oxygen	Chesapeake Bay Program	X	X	X
Non-Indigenous Aquatic Species Monitoring	Chesapeake Bay Program	X		X
Annual Chester River Watershed Snapshot (conditions at 80+ streams)	Chester Riverkeeper – Chester River Association			X
Water Treatment and Western Boundary Study Area Monitoring (ground-water, water quality, contaminants)	Dept. of Defense -- U.S. Army Aberdeen Proving Ground			X
Michaelsville Landfill Monitoring (groundwater, water quality, contaminants)	Dept. of Defense -- U.S. Army Aberdeen Proving Ground			X
Installation Restoration Program monitoring (groundwater, water quality, streams, contaminants)	Dept. of Defense -- U.S. Army Aberdeen Proving Ground			X
Air quality monitoring (prescribed burns, range fire emissions)	Dept. of Defense -- U.S. Army Aberdeen Proving Ground			X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Honeybee Biomonitoring Program	Dept. of Defense -- U.S. Army Aberdeen Proving Ground			X
Post Construction Survey Monitoring Program for J- Field Shoreline Protection Project (shoreline erosion)	Dept. of Defense -- U.S. Army Aberdeen Proving Ground			X
Threatened and Endangered Species Monitoring (Aberdeen Proving Ground, Adelphi Army Research Laboratory)	Dept. of Defense -- U.S. Army	X		X
Fort Meade Environmental Monitoring (groundwater, contaminants)	Dept. of Defense -- U.S. Army Environmental Center			X
Estuarine Water Quality and SAV Monitoring (Aberdeen Proving Ground; 40 stations)	Dept. of Defense -- U.S. Army Environmental Center	X		X
Wetland Restoration Monitoring near Town Branch, Monacacy River watershed (vegetation, macroinvertebrates, birds)	Ducks Unlimited	X		X
Environmental Monitoring and Assessment Program (EMAP) (coastal ecosystem health)	EPA		X	X
Multi-Resolution Land Characteristics (land cover)	EPA			X
National Water Quality Monitoring Day (water quality, macroinvertebrates; 3 stations on Sligo Creek, Montgomery Co.)	Friends of Sligo Creek	X		X
Water Monitoring Stream Teams (41 sections of Herring Run stream system)	Herring Run Watershed Association			X
Baltimore Ecosystem Study – Long-term Ecological Research (LTER) project	Institute of Ecosystem Studies, National Science Foundation, U.S. Forest Service, etc.	X	X	X
Stream Watch Program (benthic macroinvertebrates, water quality at 25-30 sites in Jones Falls watershed)	Jones Falls Watershed Association	X		X
The Magothy River Index (water quality, vital habitats)	Magothy River Association	X		X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Volunteer Water Quality monitoring in Coastal Bays	Maryland Coastal Bays Program			X
SAV Citizens Monitoring program in Coastal Bays	Maryland Coastal Bays Program	X		X
Dredged material monitoring program in Coastal Bays (physical and biological; MD DNR 1999)	Maryland Coastal Bays Program			X
Coastal Bays Comprehensive Monitoring Program (MD DNR 1999a)	Maryland Coastal Bays Program	X	X	X
Eutrophication Monitoring in Coastal Bays (MD DNR 1999a)	Maryland Coastal Bays Program	X	X	X
Pfiesteria Surveillance in Support of Maryland's Response to Toxic Outbreaks of *Pfiesteria* and Similar Dinoflagellates (8 Lower Eastern Shore rivers)	Maryland Coastal Bays Program	X	X	
Forest Pest Management program (Asian longhorned beetle, gypsy moth, et al.)	Maryland Dept. of Agriculture	X		
Plant Protection and Weed Management program (noxious weeds, plant pests, ginseng, sudden oak death)	Maryland Dept. of Agriculture	X		
Air Quality Monitoring (ozone, pollutants)	Maryland Dept. of the Environment			X
Septic System Monitoring program in Coastal Bays watershed (MD DNR 1999a)	Maryland Dept. of the Environment			X
Shellfish Harvest monitoring (water quality, disease, contaminants)	Maryland Dept. of the Environment	X	X	X
Wetland status and trends (LaBranche et al. 2003)	Maryland Dept. of the Environment			X
Wetland Mitigation Monitoring	Maryland Dept. of the Environment			X
Acid Mine Drainage Restoration monitoring (water quality)	Maryland Dept. of the Environment			X
American and Hickory Shad Restoration in Three MD Rivers	Maryland DNR	X		
Commercial Fishery Harvest Monitoring	Maryland DNR	X		
Recreational Fishery Harvest Monitoring	Maryland DNR	X		

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Fall and Winter (Fish) Stock Assessment	Maryland DNR	X		
Finfish population monitoring in Coastal Bays	Maryland DNR	X	X	X
Maryland Biological Stream Survey (MBSS)	Maryland DNR	X	X	X
Stock Assessment of Selected Adult Resident and Migratory Finfish in Maryland's Chesapeake Bay	Maryland DNR	X		
Resident and Migratory Juvenile Finfish Recruitment Survey	Maryland DNR	X	X	
Assessment of Spring Recreational Finfish Harvest in the Choptank River	Maryland DNR	X	X	X
Investigation of Maryland's Atlantic Ocean and Coastal Bay Finfish Stocks	Maryland DNR	X	X	X
Investigation of Anadromous Alosids in Chesapeake Bay	Maryland DNR	X	X	
Fish Health/Disease Program (fishkills, bioassessments, immunological markers)	Maryland DNR	X		X
FISHMAP (Fishery Independent Sampling and Habitat MAPping)	Maryland DNR	X	X	X
Survey, Inventory, and Management of Maryland's Coldwater Fishery Resource (for 11 streams, 10 river basins)	Maryland DNR	X	X	X
Mattawomen Creek/Naval Ordnance Station Mercury Monitoring Study (bioaccumulation in bluegill, catfish, bass)	Maryland DNR	X		X
Maryland Anacostia River Basin Study (gamefish, stream barriers, benthos, water quality)	Maryland DNR	X	X	X
Fish Passage monitoring (fish)	Maryland DNR	X		X
Deer Management Program (population status and trends, white-tailed and sika deer)	Maryland DNR	X		
Mast survey (food supply for forest-dwelling fauna)	Maryland DNR			X
Maryland Bowhunter Survey (observations of 19 mammals, inc. Delmarva fox squirrel, in each county)	Maryland DNR	X		

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Rare species monitoring (over 300 rare animals and many rare natural communities)	Maryland DNR	X	X	X
Nongame/Guild monitoring (e.g., colonial waterbirds, marshbirds, freshwater mussels)	Maryland DNR	X	X	X
Furbearer Management Program (furbearer species)	Maryland DNR	X		
Maryland Marsh Restoration and Nutria Control Project (nutria abundance and distribution)	Maryland DNR	X		
Chronic Wasting Disease Monitoring (deer)	Maryland DNR	X		
Marine Mammal and Sea Turtle Stranding Response program	Maryland DNR	X		
The Distribution and Status of the Hellbender in Maryland	Maryland DNR	X		
Eastern Tiger Salamander Study (distribution, population status)	Maryland DNR	X		
Midwinter Waterfowl Survey (Chesapeake Bay area)	Maryland DNR, USFWS	X	X	
Mute Swan Aerial Surveys (population status and trends in Chesapeake Bay)	Maryland DNR	X		
Status of the Bald Eagle in Maryland (mid-winter surveys, nesting productivity)	Maryland DNR, U.S. Army Aberdeen Proving Ground, USFWS	X		
Wild Turkey and Upland Game Bird Program (northern bobwhite populations)	Maryland DNR	X		
Maryland Breeding Bird Atlas Project 2002 – 2006	MD Ornithological Society, Maryland DNR, USGS BRD	X	X	
Spawning Horseshoe Crab Voluntary Monitoring program (MD DNR 1999b)	Maryland DNR, Maryland Coastal Bay Program	X		X
Fish and wildlife health and disease monitoring (finfish and mollusks in Ches. Bay)	Maryland DNR, National Ocean Service (Cooperative Oxford Laboratory)	X	X	X
Macroinvertebrate Study on Coldwater Tailrace Areas	Maryland DNR	X	X	X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Eyes on the Bay monitoring program (water quality in Chesapeake and Coastal Bays)	Maryland DNR			X
Chesapeake Bay Monitoring Program, Atmospheric Deposition Component	Maryland DNR			X
Maryland River Input and Mainbay Monitoring program (nutrients, sediments, freshwater flow on 4 rivers)	Maryland DNR			X
Tidal Water and Habitat Quality Monitoring program (nutrients, DO, salinity, temperature, pH, algae abundance at 22 Ches. Bay and 55 tidal tributary stations)	Maryland DNR			X
Chesapeake Bay Monitoring Program, Zooplankton Component (12 Ches. Bay and tidal tributary stations)	Maryland DNR	X		X
Chesapeake Bay Monitoring Program, Nutrient Limitation Component (11 Ches. Bay and tidal tributary stations)	Maryland DNR			X
Chesapeake Bay Monitoring Program, Phytoplankton Component (12 Ches. Bay and tidal tributary stations)	Maryland DNR	X		X
Tidal Fish Community Indicators monitoring	Maryland DNR	X	X	X
Submerged Aquatic Vegetation Population Monitoring (Chesapeake and Coastal Bays)	Maryland DNR	X		X
Chesapeake Bay Monitoring Program, Ecosystem Processes Component (nutrient releases from sediments, water quality, chlorophyll, turbidity)	Maryland DNR			X
Chesapeake Bay Monitoring Program, Long-term Benthos Component (macroinvertebrate indicators at 27 fixed and 150 random Bay and tidal tributary stations)	Maryland DNR	X	X	X
Coastal Bays Water Quality Monitoring Program (physical and chemical properties, river inputs of sediments and nutrients, benthos, macroalgae)	Maryland DNR	X	X	X
Maryland Coastal Bays Volunteer Water Quality Monitoring Program	Maryland DNR	X		X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Continuous Monitoring (CONMON) Program (water quality at 34 estuarine stations)	Maryland DNR			X
National Coastal Assessment (aka Coastal 2000) (water quality, fish, benthos, sediment chemistry and toxicity)	Maryland DNR, EPA	X	X	X
Coastal LIDAR (high resolution elevation data)	Maryland DNR			X
Chesapeake Forest Project Monitoring (biodiversity, water quality, ecosystem health, Delmarva fox squirrel)	Maryland DNR	X		X
Invasive species monitoring (distribution and abundance of weeds, ballast water, non-native crabs, nutria, etc.)	Maryland DNR	X		
Special Rivers Project monitoring (riparian forest buffer success on 4 rivers)	Maryland DNR			X
Shoreline Change and Rate Monitoring	Maryland Geological Survey			X
Stream monitoring (Gunpowder, Gwynns Falls watersheds)	Maryland Save Our Streams	X	X	X
Great Herring Bay Stream and Shore Survey (sources of pollution)	Maryland Save Our Streams			X
Stream monitoring (aquatic invertebrates)	Maryland Stream Waders	X		X
Watershed water quality monitoring (14 citizen monitoring programs)	Maryland Water Monitoring Council			X
Stream Water Quality Monitoring (Montgomery and Prince Georges Counties)	Montgomery and Prince Georges County Stream Teams			X
Water quality monitoring (nutrients, chlorophyll, water clarity, fish, wildlife, habitat conditions; Nanticoke River)	Nanticoke Watershed Alliance	X		X
Bluebird Monitoring	Pickering Creek Audubon Center	X		X
Breton Bay Stream Sampling (macroinvertebrates, amphibians, crustaceans)	Potomac River Association	X		X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Maryland's Tributary Strategy Program (water quality for 10 watersheds in Ches. Bay watershed)	Tributary Teams (one for each of 10 watersheds)			X
LANDSAT Remote Sensing (land use/land cover)	NASA, U.S. Geological Survey			X
Chesapeake Bay Water Quality Monitoring	National Aquarium in Baltimore			X
Bird Source (national monitoring program)	National Audubon Society & Cornell Lab of Ornithology		X	
Piping Plover Breeding Biology, Foraging Ecology and Behavior on Assateague Island NS	National Park Service	X		X
Marine species strandings at Assateague Island NS	National Park Service	X		
Tiger beetle distribution and abundance surveys, Assateague Island NS	National Park Service	X		
Feral horse population monitoring, Assateague Island NS	National Park Service	X		
Feral horse grazing effects monitoring, Assateague Island NS	National Park Service	X		X
Sika deer grazing effects monitoring, Assateague Island NS	National Park Service	X		X
Sika and white-tailed deer population and harvest monitoring, Assateague Island NS	National Park Service	X		
Mosquitoes and wildlife disease (EEE, WNV) monitoring, Assateague Island NS	National Park Service	X		
Vegetation change monitoring, North End of Assateague Island NS	National Park Service			X
Water quality monitoring in Coastal Bays	National Park Service			X
Bathing beach water quality, Assateague Island NS	National Park Service			X
Estuarine tides and water levels, Assateague Island NS	National Park Service			X
Bassett Creek streamflow monitoring (Assateague Island NS)	National Park Service			X
Meteorology monitoring at Assateague Island NS	National Park Service			X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Atmospheric deposition (rainfall and nitrogen) at Assateague Island NS	National Park Service			X
Assateague Island geomorphology (22 beach profiles, shoreline position)	National Park Service			X
Sea-level rise monitoring (Chesapeake Bay)	NOAA – National Geodetic Survey			X
NOAA Restoration Center Programs (oil spill and contaminant release response and restoration)	NOAA	X	X	X
Fisheries Statistics & Economics program (stock assessments, landings)	NOAA-NMFS	X	X	
National Estuarine Research Reserve System Wide Monitoring Program (water quality, weather, sediment, chlorophyll, SAV, land use)	NOAA – Chesapeake Bay National Estuarine Research Reserve			X
National Estuarine Research Reserve System Wide Monitoring Program (emergent vegetation)	NOAA – Chesapeake Bay National Estuarine Research Reserve	X		X
Fish Monitoring Program (Otter Point Creek)	Otter Point Creek – Anita C. Leight Estuary Center	X		X
Herpetology Monitoring Program (Otter Point Creek)	Otter Point Creek – Anita C. Leight Estuary Center	X		X
Water Quality Monitoring (Potomac River)	Potomac Riverkeeper			X
Operation Clearwater (microbial water quality monitoring, Severn River)	Severn River Association			X
South Riverkeeper (monitoring river condition)	South River Federation			X
State of the Beach monitoring program (8 indicators of coastal environmental health)	Surfrider Foundation			X
Volunteer Co-op Monitor Program (habitat condition)	The Nature Conservancy			X
Rare species monitoring (on TNC preserves)	The Nature Conservancy	X		X
Fish population surveys (Gunpowder, Potomac and Patuxent River watersheds)	Trout Unlimited	X		X
Stream water quality monitoring	Trout Unlimited			X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Poplar Island Restoration project monitoring (water quality, fish, wildlife, SAV, ichthyoplankton, etc.)	U.S. Army Corps of Engineers	X		X
Disposal Area Monitoring System (water quality, faunal surveys at offshore disposal sites)	U.S. Army Corps of Engineers			X
National Resources Inventory (NRI) (land use, wetlands distribution and abundance)	USDA Natural Resources Conservation Service			X
Forest Inventory Analysis (forest distribution and abundance)	USDA U.S. Forest Service			X
Nutria population monitoring at Blackwater NWR	USFWS – Blackwater NWR	X		
Waterfowl population monitoring	USFWS Blackwater NWR	X	X	X
Tundra swan migration monitoring (satellite tracking)	USFWS Eastern Neck NWR	X		
Wildlife monitoring at Eastern Neck NWR (waterfowl, songbirds, deer)	USFWS Eastern Neck NWR	X	X	X
Wildlife monitoring at Patuxent Research Refuge (deer, waterbirds, reptiles, amphibians, harvested species)	USFWS Patuxent Research Refuge	X	X	X
Bird nesting productivity monitoring	USFWS Patuxent Research Refuge	X		
National Wetlands Inventory Program (wetland abundance and distribution)	USFWS			X
Biomonitoring of Environmental Status and Trends (BEST) Program (measure and assess ecological impacts of contaminants)	USGS Patuxent Wildlife Research Center	X	X	X
Bird Banding Laboratory (banding and recovery monitoring, U.S. and Canada)	USGS Patuxent Wildlife Research Center	X	X	
Breeding Bird Survey (U.S. and Canada)	USGS Patuxent Wildlife Research Center	X	X	
North American Amphibian Monitoring Program (vocal amphibian populations)	USGS Patuxent Wildlife Research Center	X	X	
Northeast Amphibian Research and Monitoring Initiative (on DOI lands in Northeast)	USGS Patuxent Wildlife Research Center	X	X	X

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Comprehensive Monitoring Program for Colonial Waterbirds	USGS Patuxent Wildlife Research Center	X	X	
Grassland Birds of North America, Distribution and Trends of Breeding and Wintering Populations	USGS Patuxent Wildlife Research Center	X	X	
Atlantic Seaduck Study: Movements, Habitat Use, and Feeding Ecology of Seaducks in Chesapeake Bay and Other Atlantic Coastal Areas (satellite tracking)	USGS Patuxent Wildlife Research Center	X	X	X
NPS Vital Signs Monitoring Program (water quality, nutrients, SAV at National Parks)	USGS Patuxent Wildlife Research Center	X		X
Impact Of (Tree) Harvest On Delmarva Fox Squirrels (monitor impacts of clearcut)	USGS Patuxent Wildlife Research Center	X		
Assessing The Relative Habitat Value Of Restored Versus Natural Coastal Marshes And Islands To Migratory Birds In Chesapeake Bay (nesting waterbirds)	USGS Patuxent Wildlife Research Center	X	X	X
Evaluation of Conservation Practices (Including Buffer Strips, Mowing, Fire Management, and Soil Amendments) in Agricultural Fields to Provide Optimum Habitat for Wildlife Diversity (wildlife use at 3 sites on Patuxent Research Refuge)	USGS Patuxent Wildlife Research Center	X		X
Assessing Nutria Impacts on Marsh Loss and the Impact of Control and Eradication Efforts on Marsh Conservation and Restoration (Blackwater NWR)	USGS Patuxent Wildlife Research Center	X		X
Canvasback population, mortality and life history in Chesapeake Bay	USGS Patuxent Wildlife Research Center	X		X
Predicting the Persistence of Coastal Wetlands to Global Change Effects (sea-level rise, wetland response at Blackwater NWR)	USGS Patuxent Wildlife Research Center			X
West Nile Virus Surveillance	USGS, MD Dept. of Health and Mental Hygiene	X		

Monitoring Plans/ Programs	Implementation Lead	Level of Monitoring		
		Species	Guild	Habitat
Pesticides in Surface Water of the Mid-Atlantic Region (water quality in 463 streams regionally)	USGS			X
Chesapeake Bay River Input Monitoring Program	USGS			X
Chesapeake Bay Ecosystem Program (water quality, DO, nutrients, sediment loads)	USGS			X
National Water Quality Assessment (NAWQA) Program (fish, water quality in 21 MD basins)	USGS			X
Appalachian Clean Streams Initiative (acid mine drainage)	USGS			X
LIDAR Topographic Surveys, Assateague Island	USGS, National Park Service			X
USGS-NPS Vegetation Mapping Program (at Assateague Island National Seashore)	USGS, National Park Service			X
Chesapeake Bay Remote Sensing Program (chlorophyll)	University of Maryland Center for Environmental Science, Maryland SeaGrant		X	X
Tundra Swan Trax Study (migration tracking, habitat use, survival rates)	Virginia Dept. of Game and Inland Fisheries, Maryland DNR	X		X
Submerged Aquatic Vegetation (SAV) Surveys (distribution and abundance in Ches. Bay)	Virginia Institute of Marine Sciences			X
Beach Water Quality Sampling Program	Worcester County			X
Golf Course Voluntary Water Quality Monitoring in Worcester County (groundwater, surface water; MD DNR 1999a)	Worcester County			X

Appendix 6a. WDCP Development Plan and Process Schedule

This appendix depicts the WDCP process and the project flow chart of major steps identified in this two-year effort. It provides, both in tabular and graphic format, the tasks and stages of Maryland's WDCP process and lists the timeframe for completion and the key parties leading and/ or involved with each stage. Timeframes are presented in quarterly intervals of the calendar year, and represent actual completion schedule of tasks.

TIMELINE	**2004 Quarters**				**2005 Quarters**			**Implementation**
TASKS	**1st**	**2nd**	**3rd**	**4th**	**1**	**2nd**	**3rd**	**2006-2015**
Planning (Project development and research)	X							
Project planning and scoping	X							
Planning Meetings- Agency and stakeholders	X							
Develop communication/outreach materials/ plan	X							
Research/ inventory programs, plans, data, maps	X	X	X					X
Contact staff, stakeholders, public	X	X	X	X	X	X	X	X
Plan Development (8 key elements)								
ID species / habitats of Greatest Conservation Need								X
Research and Compile data (kt compile existing) GCN list- GT sent categories, get staff input- LD draft list, send to staff for additions- Feb Raz draft/send habitat/sp assoc to staff-Feb Staff assign habitat associations- March Staff Refine April- prepare workshop-kt	X	X						Assess and update
Engage DNR staff, other public agencies and stakeholders, experts, TWW- workshop	X	GCN Habitat	X		X	Threats Actions	X	Review assessment
Review and refine lists (staff)		X	X	X	X			X Update
Engage broader public as appropriate		X	X	X	X			X Update
ID Conservation Actions for each species/habitat								
Research and Compile existing data (kt and staff)	X	X	X					X Update
Engage agency staff and stakeholders- workshops		begin	X	X	X			X Update
Review and refine lists (staff)		begin	X	X	X			X Update

TIMELINE	2004 Quarters				2005 Quarters			Implementation
Engage broader public as appropriate		begin	X	X	X			X Update
Develop monitoring/evaluation strategy		X	X	X	X			X Update
Develop maps and supporting materials				X	X	X		X Update
Write Plan								
Outline and Format (kt draft for staff approval)		X	X					
Draft Plan kt with staff assistance				X	X	X	X	2013-2015
Review					X	X	X	2014-2015
Final Plan Submitted							X	2015

Appendix 6b. List of Contacted Partner and Stakeholder Groups

This appendix lists Maryland's partner and stakeholder groups that were contacted in the development of this WDCP and that will continue to be contacted with updates during its implementation and revision. These groups received either email, mail, phone or meeting requests for information and input on the development and implementation of Maryland's WDCP. They were invited to attend the workshops held to incorporate their input on GCN species, key wildlife habitats, and threat and conservation action development. They were also notified of web page updates.

- 1000 Friends of Maryland
- Aberdeen Proving Ground Superfund Citizens Coalition, Inc.
- Aberdeen Proving Ground Volunteers for Improvement of Natural and Cultural Resources
- Accokeek Foundation
- Adkins Arboretum
- Adopt-a-Watershed
- Alice Ferguson Foundation
- Allegany College of Maryland
- Alliance for Community Education
- Alliance for Sustainable Communities
- Alliance for the Chesapeake Bay
- American Bat Conservation Society
- American Chestnut Land Trust
- American Fisheries Society
- American Forests
- American Rivers
- American Water Resources Association
- American Whitewater
- Anacostia Community Boathouse Association
- Anacostia Congress Heights Partnership
- Anacostia Floodplain Restoration Alliance
- Anacostia River Business Coalition
- Anacostia Riverkeeper
- Anacostia Watershed Restoration Committee (AWRC)
- Anacostia Watershed Society
- Annapolis Conservancy Board
- Anne Arundel County Volunteer Water Quality Monitoring Program
- Anne Arundel Waterway Restoration Alliance
- Appalachian Trail Conference Land Trust
- Assateague Coastal Trust
- Atkins Arboretum
- Audubon Naturalist Society
- Back River Neck Peninsula Community Association

- Baltimore Environmental Center
- Baltimore Walks - The Gwynns Falls Trail
- Beaver Creek Watershed Association
- Being in Place - Alliance for Sustainable Communities
- BioTrek Naturalist, Inc.
- Brandywine North Keys Citizens Association
- Broad Creek Conservancy
- C & O Canal Association
- Calvert Marine Museum Society
- Cambridge South Dorchester Middle School
- Canoe Cruisers Association
- Cape St. John Civic Association
- Carroll County Land Trust
- Carrollton Manor Land Trust
- Catoctin Land Trust
- Center for A New American Dream
- Center for Chesapeake Communities
- Center for Low Impact Development
- Center for the Environment, Commerce and Energy
- Center for Urban Ecology
- Center for Watershed Protection
- Central Maryland Heritage League
- Charles County Community College
- Chesapeake Appreciation, Inc.
- Chesapeake Association of Environmental Professionals
- Chesapeake Audubon Society
- Chesapeake Bay Acid Rain Foundation
- Chesapeake Bay Commission
- Chesapeake Bay Critical Area Commission
- Chesapeake Bay Environmental Center
- Chesapeake Bay Foundation
- Chesapeake Bay Foundation, Inc.
- Chesapeake Bay Program
- Chesapeake Bay String of Pearls Project
- Chesapeake Bay Trust
- Chesapeake Coastal Creeks Association
- Chesapeake Wetland Center at Horsehead
- Chesapeake Wildlife Heritage
- Chester River Association
- Chester Riverkeeper
- Chestertown Wildlife Exhibition and Sale
- Citizens Concerned for a Cleaner Prince George's County
- Citizens for the Preservation of Queenstown Creek
- Citizens for the Protection of Washington County

- Citizens to Conserve and Restore Indian Creek
- Citizens to Save South Valley Park and Whetstone Run
- Clean Water Action
- Clean Water Fund
- Coastal States Organization
- College Park Committee for a Better Environment (CBE)
- Committee on the Environment
- Community and Environmental Defense Services
- Community Commons
- Community Forestry Network
- CONCERN, Inc.
- Conservancy for Charles County
- Conservation Federation of Maryland
- Croom Citizens Association
- Deer Creek Scenic River Advisory Council
- Deer Creek Watershed Association
- Defenders of Wildlife
- Delta Waterfowl
- Dorchester County Resource Preservation & Development Corp.
- Dorchester County Soil Conservation District
- Dorchester MD Cooperative Extension
- Ducks Unlimited
- Eastern Neck Wildlife Refuge
- Eastern Shore Land Conservancy
- Echo Hill Outdoor School
- Environmental Advisory Committe (EAC)
- Environmental Concern
- Environmental Defense
- Evitts Creek Environmental Learning Center
- Eyes of Paint Branch
- Fair Hill Nature Center
- Fallston High School
- Farmers and Hunters Feeding the Hungry
- Fishing Creek Watershed Association (MD)
- Frederick County Trails
- Friends of Annapolis Creeks
- Friends of Blackwater National Wildlife Refuge
- Friends of Carroll County Streams
- Friends of Gwynns Falls/Leakin Park
- Friends of Jug Bay
- Friends of Kensington Hills Branch
- Friends of Mattawoman Creek
- Friends of Maydale
- Friends of Mount Aventine, Inc.

- Friends of Northwest Branch
- Friends of Saint Leonard Creek
- Friends of Sligo Creek
- Friends of the Annapolis' Creeks
- Friends of the Indian Creek Watershed
- Friends of the Lake
- Friends of the Nanticoke River
- Friends of the Potomac
- Friends of the Upper Choptank River
- Future Harvest - CASA, University of Maryland
- George's Creek Watershed Association
- Greater Baltimore Canoe Club
- Greater Bear Creek Watershed Association
- Greater Patapsco Community Association
- Gunpowder Valley Conservancy
- Gunpowder Watershed Coalition
- Gwynns Falls Watershed Association
- Harford Land Trust
- Herring Bay
- Herring Run Watershed Association
- Hood College
- Horn Point Environmental Lab Water Monitoring
- Horsehead Wetlands Center
- Howard County Conservancy
- Hunting Creek Watershed Management Task Force
- Hyattsville Organization for a Positive Environment
- Institute for Conservation Leadership
- Interstate Commission on the Potomac River Basin
- Interstate Commission on the Potomac River Basin (ICPRB)
- Irvine Natural Science Center
- Irvine Nature Center
- Issac Walton League
- Jones Falls Watershed Association
- Jug Bay Wetlands Sanctuary
- Kensington Land Trust
- Kent Conservation
- Lake Linganore Association
- Lake Linganore Conservation Society
- Land Trust International
- Little Elk Creek Agricultural Preserve
- Living Classrooms Foundation
- Long Green Valley Conservancy
- Low Impact Development Center
- Lower Eastern Shore Heritage Committee

- Lower Shore Land Trust
- Lower Susquehanna Heritage Greenway
- Magothy River Association
- Magothy River Land Trust
- Marine Fish Conservation Network
- Marshy Hope Creek Greenway
- Maryland Bowhunters Association
- Maryland Conservation Council
- Maryland Deer Hunters Association
- Maryland Division Isaak Walton League
- Maryland Environmental Trust
- Maryland Farm Bureau
- Maryland Fly Anglers, Inc.
- Maryland Forests Association
- Maryland Herpetological Society
- Maryland League of Conservation Voters
- Maryland Legislative Sportsmen Caucus
- Maryland Mountain Trust
- Maryland Native Plant Society
- Maryland Natural History Society
- Maryland Ornithological Society
- Maryland Public Broadcasting Foundation, Inc.
- Maryland Save Our Streams
- Maryland Sportsman’s Association
- Maryland Wetlands Restoration Steering Committee
- Mason-Dixon Canoe Cruisers, Inc.
- Mattaponi Basin Citizen's Association
- Mid-Maryland Land Trust Association
- Mid-Maryland Rural Legacy Association
- Monocacy Basin Stream Monitoring Project
- Monocacy Canoe Club
- Monocacy Scenic River Advisory Board
- Monocacy Watershed Conservancy
- Montgomery County Agricultural Center
- Montgomery County Stream Teams
- Montgomery Sycamore Island Club
- Mount Washington Preservation Trust
- Nanjemoy Creek Environmental Education Center
- Nanjemoy-Potomac Environmental Coalition, Inc.
- Nanticoke Watershed Alliance
- Nassawango Creek Preserve Stewardship Committee
- National Aquarium in Baltimore-Conservation Education
- National Audubon Society – MD/DC Office
- National Audubon Society - Chesapeake Chapter

- National Fish and Wildlife Foundation
- National Parks and Conservation Association
- National Wild Turkey Federation
- National Wildlife Federation
- Natural Resources Defense Council
- New Columbia Audubon Society
- New Forest Society
- Northeast Midwest Institute
- Otter Point Creek Alliance
- Owings Mills Green Action
- Oyster Recovery Partnership
- Parks and People Foundation
- Pasadena Sportfishing
- Patapsco River Conservation Association
- Patapsco Riverkeeper
- Patapsco/Back River Tributary Strategy Team
- Patuxent River Commission
- Patuxent Sierra Club
- Patuxent Tidewater Land Trust
- Pheasants Forever
- Pickering Creek Environmental Center
- Pocomoke River Alliance
- Port Tobacco River Conservancy
- Potomac Conservancy
- Potomac River Association
- Potomac River Greenways Coalition, Inc.
- Potomac River Paddlers
- Potomac River Waterfowlers Association
- Potomac Riverkeeper
- Potomac Trail Council
- Potomac Watershed Partnership
- Potomac-Patuxent Chapter Trout Unlimited
- Prince Georges Audubon Society
- Prince George's County Stream Teams
- Quail Unlimited
- Queen Anne's Conservation Association
- River Federation
- Ruffed Grouse Society
- Salisbury Zoological Park
- Save Our Streams
- Sawmill Creek Recovery Team
- Scenic Rivers Land Trust
- Severn River Association
- Severn River Land Trust, Inc.

- Severn Riverkeeper
- Sierra Club
- Sierra Club Montgomery County Group
- Sierra Club, Potomac Chapter
- Smallwood Village Association
- Smithsonian Environmental Research Center
- Society of Natural History of Delaware
- Somerset County MD Cooperative Extension Service
- Somerset County Soil Conservation District
- Somerset County Tourism
- South Cecil County Committee and Watershed Association
- South County Conservation Trust/Exchange
- South County Exchange
- South River Federation
- Southeast Watershed Forum
- Spa Creek Conservancy
- St. Mary's Friends of the Chesapeake
- St. Mary's River Watershed Project
- St. Mary's Scenic River Advisory Board
- Stream Watch
- Takoma Park Green Team
- Talbot River Protection Association
- Teaming with Wildlife Coalition
- The Conservation Fund
- The Nature Conservancy – MD/DC Field Office
- The Wilderness Society
- The Wildlife Society
- Thorpewood Foundation
- Town Creek Watershed Landowners' Association
- Trout Unlimited
- University of Maryland, Center for Environmental Science
- Upper Chesapeake Watershed Association
- USNPS National Chapter Region Conservation Data Center
- Washington Rowing Association
- Watershed Protection Coalition, Inc
- Weems Creek Conservancy
- Whitehall Bay Institute
- Wicomico County Department of Recreation, Parks and Tourism
- Wicomico County MD Cooperative Extension Service
- Wicomico Scenic River Commission
- Wildfowl Trust of North America
- Wildlife Conservation Society
- Wildlife Habitat Enhancement Council
- Women and Environmental Solution

- Worcester County Citizen's Coalition
- Worcester County MD Cooperative Extension Service
- Worcester County Soil Conservation District
- Worcester County Tourism
- Worcester Environmental Trust
- World Wildlife Fund

Appendix 6c. Coordination with Federal, State and Local Agencies and Indian Tribes during WDCP development

The Department of Natural Resources, Natural Heritage Program (NHP), took the lead in coordinating Maryland's WDCP, beginning its planning process in the summer of 2003 as information on the SWG and WCRP requirements and guidelines became available. Due to severe budget and personnel restrictions, NHP secured the services of a contractor, Terwilliger Consulting Inc. (TCI), involved in and familiar with the process at the state, regional and federal level.

Natural Heritage Program staff and TCI attended the IAFWA/USFWS Federal Aid Training Workshop at the National Conservation Training Center (NCTC) in West Virginia, and additional workshops for Region 5 states in Delaware in August 2003, for Region 4 states in GA in July 2004, the 50-state Coordination meeting in TX in January 2004 and the "One Year Out" meeting in Nebraska in August 2004. These meetings not only allowed states to share their progress and plan status, but also allowed for additional input and guidance from the National Advisory Acceptance Team and others. The consultant gave presentations about Maryland's process and plan status at each of these meetings.

A **WDCP Development Team** was formed with key DNR Natural Heritage Program and Maryland Biological Stream Survey staff. This committee met with TCI to compile existing resources and develop the initial timeline and framework for the development of the plan. A series of organizational and input solicitation meetings were held to involve first senior staff and then all division staff. The effort to obtain input was then expanded to the other divisions and units within the Department of Natural Resources through a series of emails, personal contacts, and meetings. Additional meetings with each division upon request were held to identify species of GCN, key habitats, threats and conservation actions.

A general scope of work was developed to guide the effort, identifying key tasks to be accomplished. The IAFWA and its committees, throughout the planning process, provided specific guidance. With this guidance in mind, and with the input of a broadening circle of stakeholders and conservation community, Maryland designed its WDCP development approach, providing for general and technical input throughout the process (Appendix 6a).

In addition, the effort quickly expanded with outreach to major research and conservation entities within the state. Stakeholders (See Appendix 6b), and more specifically the MD TWW Coalition was actively engaged in the WDCP process.

This WDCP process attempted to utilize and integrate existing Federal, State and local agency and Tribal programs that significantly affect wildlife conservation in Maryland. Representatives from each tribe and agency were identified and contacted for their input. These stakeholders and collaborators were invited to actively participate in the process. Federal partners include, but are not limited to, the U.S. Fish and Wildlife Service (Chesapeake Bay Field Office, National Wildlife Refuge Offices, Fishery Resources Office, and Federal Aid); U.S. Geological Survey; National Park Service; Natural Resources Conservation Service; U.S. Environmental Protection Agency; U.S. Department of

Agriculture; National Oceanic and Atmospheric Administration; and the Department of Defense. DNR's partner agencies at the state level include, but are not limited to, Department of the Environment, Department of Agriculture, Department of Planning, Department of Transportation (SHA), University of MD, and major state universities. Partners at the local government level include the planning and zoning agencies within each of Maryland's 23 counties, as well as Baltimore City.

There are no federally recognized Indian tribes in Maryland today. Non-recognized Indian tribes and communities include the Piscataway-Conoy Confederacy in La Plata, Maryland, and the American Indian Cultural Center of Cedarville Band in Waldorf, Maryland. They were contacted and invited to participate in the WDCP process.

Contact early in the process focused on informing and engaging these collaborators in the WDCP process, as well as inventorying their existing programs (See Appenices 4b & 5). An assortment of outreach techniques were used to maximize coordinated input, including surveys, personal contact and correspondence, meetings and presentations. Relevant target species, habitats and conservation actions from their existing programs were captured, compiled and integrated into the WDCP process. Follow-up correspondence kept them informed of WDCP progress and solicited their additional input and feedback at each major phase of the process. Further contact/ presentations solicited input as GCN species, key habitats, threats and potential conservation actions were identified during the process. Information on existing programs was discussed during the process to identify opportunities for collaboration/partnership in the implementation, evaluative review, and adaptive modification of the WDCP.

The DNR WHS will continue to take the lead in monitoring the progress as the WDCP is implemented (see Chapter 5) and in sharing this information with all the Agency and Tribal representatives involved in the development of the plan.

Appendix 6d. Public Participation Process

During the development phase of the WDCP, the WDCP Committee and contractor (TCI) worked to actively involve the public at different levels and during different stages of the process. Information on each major public and private (NGO) program was researched. This resulted in an inventory of all significant existing local, state, and regional/national programs, data sources, tools and information compiled from meetings, correspondence, and research from literature and the internet. This pool of knowledge was then used as the foundation for public outreach strategies. For the purposes of this WDCP effort, the "public" was categorized into 3 external tiers:

Tier 1- partners/collaborators with significant role/ program

- Key private (NGO) conservation groups, such as TNC, Audubon, PIF, etc.
- Leaders/staff/programs can contribute significant data/scientific knowledge base to be incorporated directly into WDCP
- Leaders/staff/programs can collaborate on implementation, monitoring and assessment/re-evaluation of Plan

Tier 2- interested groups and individuals with limited role/program

- Many smaller or localized NGO's, such as small private preserves, watershed groups, or local advocacy groups
- Staff/members have limited/no data/scientific knowledge base that is directly applicable to the WDCP but have a potential role in advocacy/outreach/general input into the development and future implementation of Plan

Tier 3- General Public

- Citizens not directly involved in a Tier 2 group project
- Able to benefit from the development and implementation of the plan as related to economic, recreational and quality of life benefits from effective state-wide Wildlife Conservation

Tier 1 and many Tier 2 individuals and groups were contacted for input throughout the WDCP process. Regular correspondence and sharing of technical information was critical to assist in the development of the WDCP. Workshops and individual feedback provided “peer review” and refinement during the processes of identifying GCN species and key habitats with their associated vegetative communities, of evaluating the most critical problems and threats to species and their habitats, and of selecting and prioritizing conservation actions that will be effective. Use of various programs’ existing target species/habitats and recommended conservation strategies was significant in providing input into WDCP development. Tier 3 individuals and groups were informed about the WDCP process and goals. They were kept informed of on-going progress through information posted on the web, articles, and press releases.

Further input was solicited from individuals and groups after DNR staff had sufficiently developed the document to a “Draft” product stage, ready for external review by those

interested. Drafts were posted on the web with comment response forms. For example, Maryland's draft GCN species and key wildlife habitats were posted in November, 2004 and its draft threats and conservation actions in May 2005 for pubic and stakeholder comment. Input was also solicited from over 300 Tier 1 and Tier 2 groups (Appendix 6b) at 2 workshops: June 26, 2004 at the national Wildlife Visitor Center in Laurel, Maryland focused on selection of GCN species and key habitats, and July 23, 2005 at Howard Community College in Columbia, Maryland focused on habitat threats and conservation actions. This outreach process included presentations to these groups and surveys to request feedback and review of the draft product. Participants completed survey/score sheets during the workshops and additional input was received via web responses. The results from these workshops were summarized and shared on the web, providing participants and general public with documentation about how their comments and input were incorporated into the document. This WDCP process was designed to include the continued input from public stakeholders at all 3 Tiers and will keep the public informed of SWG projects and results through annual reports, articles, and web site progress reports.

Citizen Participation by Objective (CPO) Worksheet Results identified the following specific actions/messages and techniques as most effective for SWG WDCP. Potentially Affected Interests (PAIs)

	CPO TECHNIQUES:
OBJECTIVE	**1B** = Open Meetings; **1C** = Forum
Bleiker #	**2B** = Content-type Advice-Giving Advisory Committee
	16A = Use Existing Clubs, Groups Organizations; **16B** Use their newsletters
	16C = Use Existing School Systems and Institutions
	38B = Create and Maintain Electronic Bulletin Board; **38C** = website
#1	**1** Create detailed Null Alternative that is simple and concise and convince *PAI's of its importance/seriousness
	8 Get PAI's consent that you and our organization are the right entity for the job
	9 Convince PAI's that it will increase quality of life for some/many PAI's
	12 Inform PAI's of history, mandate, legitimacy of agency/program
	21 Get PAI's to agree on legitimacy of your office
#3	**1** Clearly document/diagram PS/DM process
	17 Do this on a regular basis – keep them updated
	5 Get internal (agency) # of PAI's to buy into/agree to implement project
	6 Design process to include PS/DM to develop informed consent
	9 Get PAI's to feel that the process is fair and proper
#4	**3 C** Insure Plan gets implemented
	5 Address problems/issues of funding – who makes decisions, potential land-use impacts/protection up front (before they do)

	8 Make process more specific to deal with and counter and problems identified
#6	**1 B** Review, expand and update PAI's list, identify secondary and tertiary PAI's
	7 Convince PAI's you are listening, care and understand ; and are addressing their concerns
#9	**7** Create and maintain simple catalog of issues/problems and solutions
	4 Develop and communicate a grabbing, clear null alternative
#13	**1** Identify other PAI's with whom we need contact
	2 Keep PAI's informed and informed of other PAI's comments
	3 Develop plan to contact PAI's on regular basis
	5 Communicate other PAI's comments
	6 Seek out and follow up on PAI's who are silent when they have input you want
	6 Maintain contact list of PAI's who have dropped communication
	11 Create website that will address these concerns

*PAI= Potentially Affected Interest

Appendix 6e. Public Input Plan

This appendix summarizes the input plan that was designed for use in Maryland's WDCP process to contact Maryland's stakeholders and public. The input plan identified three different tiers of stakeholders and developed appropriate messages, methods, and objectives for each group. The Bleiker Citizen Participation by Objective (CPO) and Systematic Development of Informed Consent (SDIC) techniques and programs were used to develop this plan and they were consulted for follow up during this process in order to develop the most effective methods for outreach to the many "publics" or PAI's (Bleiker and Bleiker 2000, http://www.consentbuilding.com/).

MD's Public Input Plan **Bleiker CPO/SDIC worksheet results:** **Contact Method / Type of Promotion**	**Tier 1 Stakeholders** – TWW, DNR, Fed/State Partners, Collaborators **Goal: Consult and Collaborate**	**Tier 2 Stakeholders –** Interested but limited investment **Goal: Inform and Involve**	**Tier 3 - General Public** **Goal: Inform**	**Target Date – Regular Updates** **Development through implementation**
Direct mail / email (use Bleiker LP and messages for CPO) Fact sheets / program materials	Email, mail 4/04 Intro 12/04 - BLP and species / habitat list	Email, mail 4/04 Intro 12/04 – BLP and species / habitat list	X	Minimum every two months but each concrete step (Same as website – see below)
Follow up informal meeting	Follow up meetings (TWW, TNC, EPA 6) 10/04			
Direct mail / email Brochures / flyers	Email, mail 4/04	Email, mail 4/04	X	Initial mailing, then distribute at meetings and presentations throughout 04-05

MD's Public Input Plan **Bleiker CPO/SDIC worksheet results:** **Contact Method / Type of Promotion**	**Tier 1 Stakeholders** – TWW, DNR, Fed/State Partners, Collaborators **Goal: Consult and Collaborate**	**Tier 2 Stakeholders –** Interested but limited investment **Goal: Inform and Involve**	**Tier 3 - General Public** **Goal: Inform**	**Target Date – Regular Updates** **Development through implementation**
Website – Updated quarterly Phase 1 – Introductory material Phase 2 – GCN species and habitat info Phase 3 – Conservation Actions and Threats Phase 4 – Conservation Actions Draft Phase 5 – Draft Plan update Phase 6 – final plan announcement Implementation 2006-2015	Intro Draft species / habitats – 12/04	X	X	April – Intro materials July – GCN info and solicit – 7/04 draft Update 12/04 January – Conservation actions – solicit input Jan 05 – Conservation actions draft April – June 05 – Draft plan September 05 – Final Plan Updates and assessments yearly
Planning meetings DNR agency internal memos Inreach TWW meetings / correspondence	X			Meeting – every month Monthly updates Monthly emails & as needed
Newsletters – put in organization's newsletters	X 10/04 MOS 12/04 – 1/05	X	X	Quarterly to every 6 months
Attend NGO / partner meetings and provide updates / get input			X	As requested
Magazine articles – DNR or state conservation organizations	X	X	X	Quarterly to every 6 months
Public relations: press releases – as appropriate – and reader-friendly articles	Quarterly X	X	X	Quarterly with website updates

MD's Public Input Plan **Bleiker CPO/SDIC worksheet results:** **Contact Method / Type of Promotion**	**Tier 1 Stakeholders** – TWW, DNR, Fed/State Partners, Collaborators **Goal: Consult and Collaborate**	**Tier 2 Stakeholders –** Interested but limited investment **Goal: Inform and Involve**	**Tier 3 - General Public** **Goal: Inform**	**Target Date – Regular Updates** **Development through implementation**
Workshop / open space	June – GCN; July - Conservation Actions	X	X	2 for Tier 1, possible invited to Tier 2
DNR staff and TWW staff briefing / report at all meetings possible	Distribute brochures and updates	Distribute brochures and updates	Distribute brochures and updates	All meetings possible Develop schedule and list Minimum monthly
Presentations to Tier 2 and Tier 3 groups – go to their meetings / events				As requested

Appendix 7. Photo Credits

The photographs used to highlight the key wildlife habitats in Chapter 4 were supplied or authorized by the people listed in the table below. Other than the photographs that were offered by the Maryland Biological Stream Survey (MBSS), all were taken by staff of the MD DNR Natural Heritage Program.

KWH #	Key Wildlife Habitat	Photographer
1	Old Growth Forests	Ed Thompson
2	Early Successional Forests	Jim McCann
3	Maritime Forests and Shrublands	Paula Becker
4	Loblolly Pine - Oak Forests	Jim McCann
5	Mesic Deciduous Forests	R. Harrison Wiegand
6	Dry Oak - Pine Forests	R. Harrison Wiegand
7	Northern Conifer - Hardwood Forests	Jason Harrison
8	Floodplain Forests	Jason Harrison
9	Upland Depressional Swamps	Jason Harrison
10	Carolina Bays	Jason Harrison
11	Vernal Pools	Jim McCann
12	Forested Seepage Wetlands	Jason Harrison
13	Bog and Fen Wetland Complexes	Lynn Davidson
14	Nontidal Shrub Wetlands	Jim McCann
15	Tidal Shrub Wetlands	Jason Harrison
16	Nontidal Emergent Wetlands	Jim McCann
17	Tidal Marshes	Jason Harrison
18	Grasslands	Lynn Davidson
19	Barrens and Dry Glades	R. Harrison Wiegand
20	Cliffs and Rock Outcrops	Jim McCann
21	Caves, Mines, and Springs	Dan Feller
22	Coastal Beaches, Dunes, and Mudflats	Jim McCann
23	Coldwater Streams	R. Harrison Wiegand
24	Limestone Streams	Courtesy of MBSS
25	Highland Streams	Jim McCann
26	Piedmont Streams	Courtesy of MBSS
27	Coastal Plain Streams	Courtesy of MBSS
28	Blackwater Streams	Courtesy of MBSS
29	Highland Rivers	Jim McCann
30	Piedmont Rivers	R. Harrison Wiegand
31	Coastal Plain Rivers	Courtesy of MBSS

KWH #	Key Wildlife Habitat	Photographer
32	Oligohaline	Jason Harrison
33	Mesohaline	Paula Becker
34	Polyhaline	David Brinker
35	Ocean	David Brinker