

Maryland Envirothon: Class Mammalia



WILDLIFE AND HERITAGE
SERVICE



Mammalia Overview

- >100 species in Maryland
- Extirpated species include:
 - American elk
 - American marten
 - Gray wolf
 - American bison

Note: This guide is an overview of select species found in Maryland. The taxonomy and descriptions are based on Peterson Field Guide to Mammals of North America, 4th Ed



American Elk

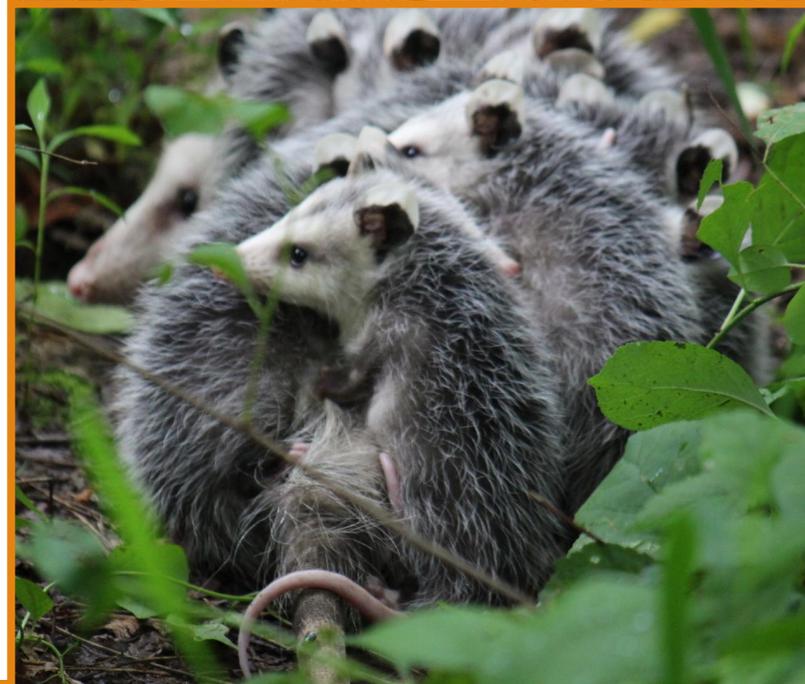


Gray Wolf

Virginia Opossum (*Didelphis virginiana*)



- Omnivore
- Marsupial
 - Prehensile tail
 - Pouch for young
- Low body temperature
- Resistant to many viper venoms, including Maryland's native venomous snakes



Order: Rodentia

- Largest group of mammals
- 25 species in Maryland
 - Castoridae (beaver)
 - Erethizontidae (porcupine)
 - Muridae (mice and rats)
 - includes native mice and rats, jumping mice, introduced mice and rats, lemmings, voles, muskrats
 - Sciuridae (squirrels, chipmunks, woodchucks)
- Teeth never stop growing
- Until recently: Myocastoridae (nutria) - eradicated in 2022

Beaver teeth



White-footed Mouse



Porcupine

Semi-aquatic Rodents



Castoridae: American Beaver
(*Castor canadensis*)

Head & body = 2-3', tail = 1'
Scaly, paddle-shaped tail; 1 hump visible when swimming (usual)

Arvicolinae: Common Muskrat
(*Ondatra zibethicus*)

Head & body = 12", tail = 9"
Flattened tail; 3 humps visible when swimming (usual)

Myocastoridae: Coypu (Nutria)
(*Myocastor coypus*)

Head & body = 22", tail = 13"
Squared-off head w/white whiskers; rounded tail; **invasive**

Family: Sciuridae

Woodchucks have grizzled brownish- black fur. Underfur is black

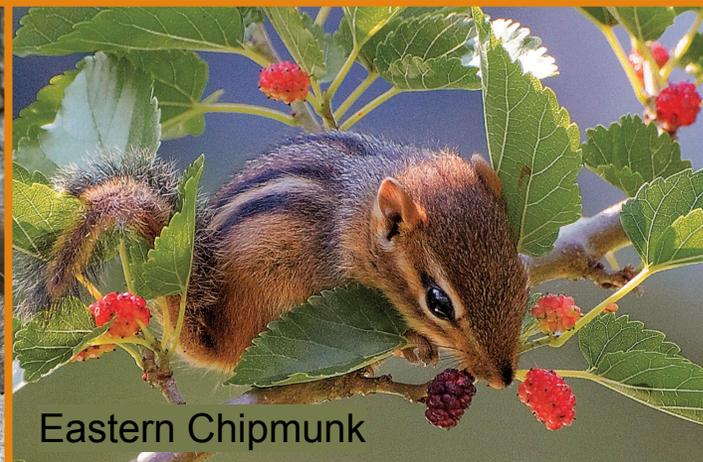
- 7 species in Maryland
- Includes chipmunks, tree squirrels, flying squirrels, woodchucks
- Largest: woodchuck/groundhog (*Marmota monax*)



Woodchucks



Southern Flying Squirrels



Eastern Chipmunk

Order: Rodentia; Family: Sciuridae

Above: Barbara Saffir
Bottom left to right: Nancy McAllister, Debbie MacArthur, Krystina Spencer

Red Squirrel (*Tamiasciurus hudsonicus*)

- Head & body = 7", tail = 5"
- Belly and eye ring white
- Ears tufted in winter
- Tail tipped in orange
- Prefers conifer forests



Sciurus- tree squirrels with diurnal habits



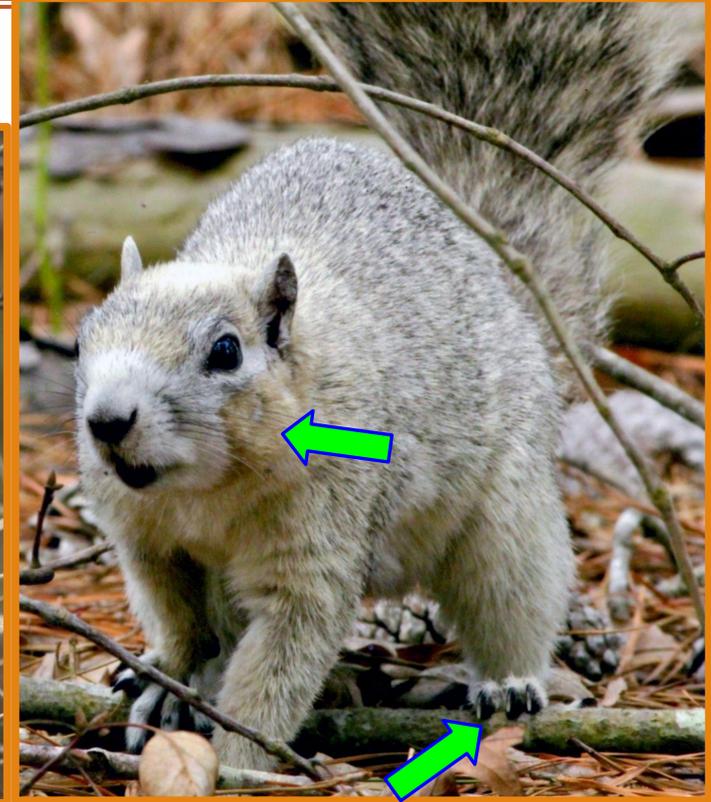
Eastern Gray Squirrel
(*Sciurus carolinensis*)

Head & body = 9-11.2", tail = 6-10"
Upper parts gray with yellow-brown
on back and head; eye ring white or
pale orange; belly white



Eastern Fox Squirrel
(*Sciurus niger niger*)

Head & body = 10-14.5"
tail = 8-13"
Belly, cheeks, eye-ring, and feet orange
to rusty brown



Delmarva Fox Squirrel
(*Sciurus niger cinereus*)

Head & body = 10-14.5"
tail = 8-13"
Gray above; belly white; cheeks
and eye-ring cream; lower legs
and feet white; rare.

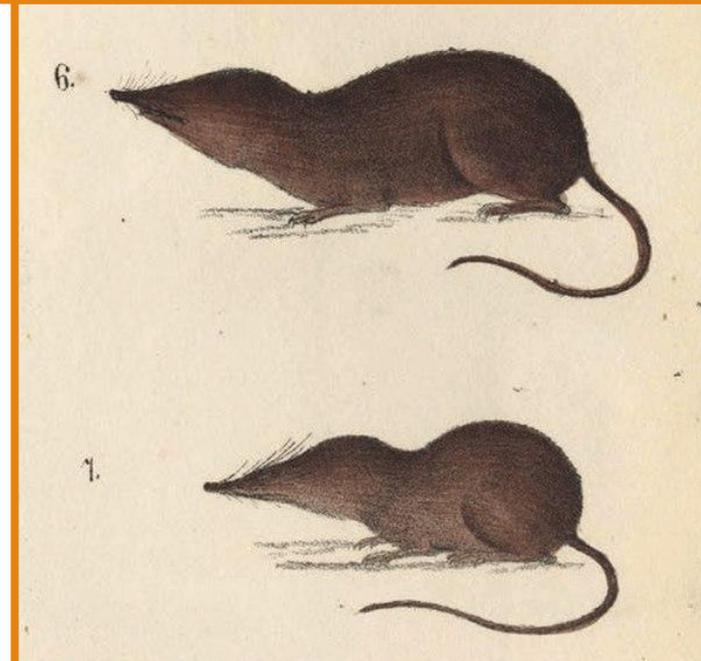
Order: Soricimorpha*

- Previously called Insectivora
- 11 species
 - Soricidae (shrews)
 - Talpidae (moles)
- Small w/ long, narrow snouts
- Have 5 toes on front and hind feet

*Current taxonomy is **Order: Eulipotyphla**.

Families have not changed.

However, Soricimorpha is the order as listed in the guide, so this is what we will be using for Envirothon



Masked shrew,
historic depictions

Northern Short-tailed Shrew (*Blarina brevicauda*)

- Head & body = 4", tail = 1"
- Small eyes, tiny ears, short tail
- Must eat 3x its weight/day
- Toxic saliva, which can paralyze or kill insects
- Echolocation



Order: Soricimorpha, Family: Soricidae

Top: Barbara Thurrow
Bottom, from left: Clayton Koonce (CC BY-NC),
Jaroslav Holly and Jaroslav Holly (CC BY-NC)

Talpidae: Moles

- 3 species
 - Eastern mole
 - Hairy-tailed mole
 - Star-nosed mole
- Large front feet
- Worms = 💕

The eastern mole does not have a hairy tail and is the most common species in Maryland.

Eastern Mole scared by lawnmower



Star-nosed Mole



Hairy-tailed mole



Star-nosed mole (*Condylura cristata*) is uncommon in Maryland. It has 22 finger-like appendages on its nose.

Order: Soricimorpha, **Family: Talpidae**

Order: Chiroptera

- Bats
 - Only flying mammals
- Family: Vespertilionidae
 - 10 species in Maryland
 - Insectivores
 - Some hibernate, some migrate
- Many declining due to white-nose syndrome



Big Brown Bats

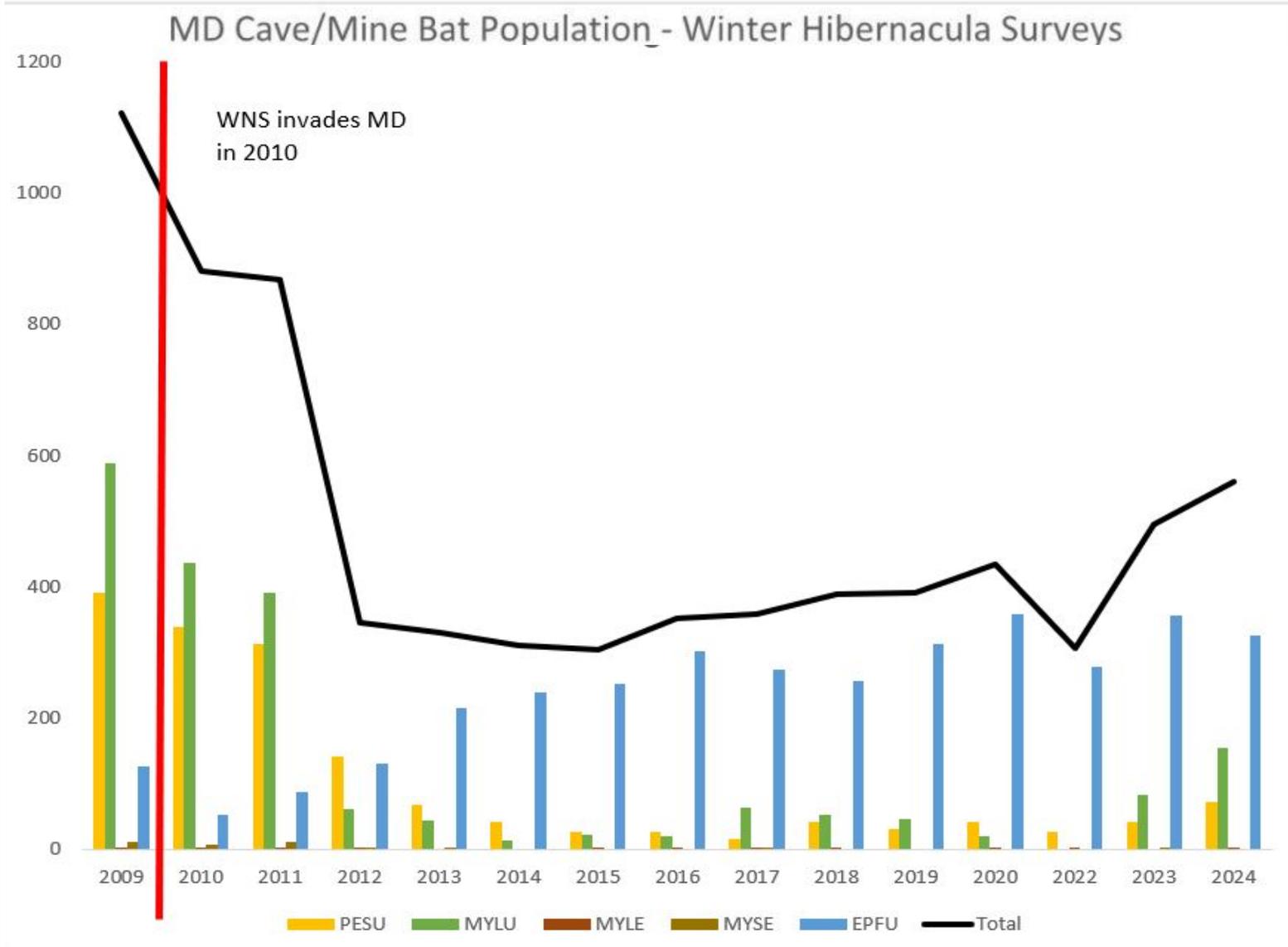


juvenile Evening Bat



Eastern Red Bat

White-Nose Syndrome



Order: Carnivora

22 species in Maryland

- Canidae (canines)
- Felidae (cats)
- Mephitidae (skunks)
- Mustelidae (weasels)
- Phocidae (seals)
- Procyonidae (raccoon)
- Ursidae (bears)

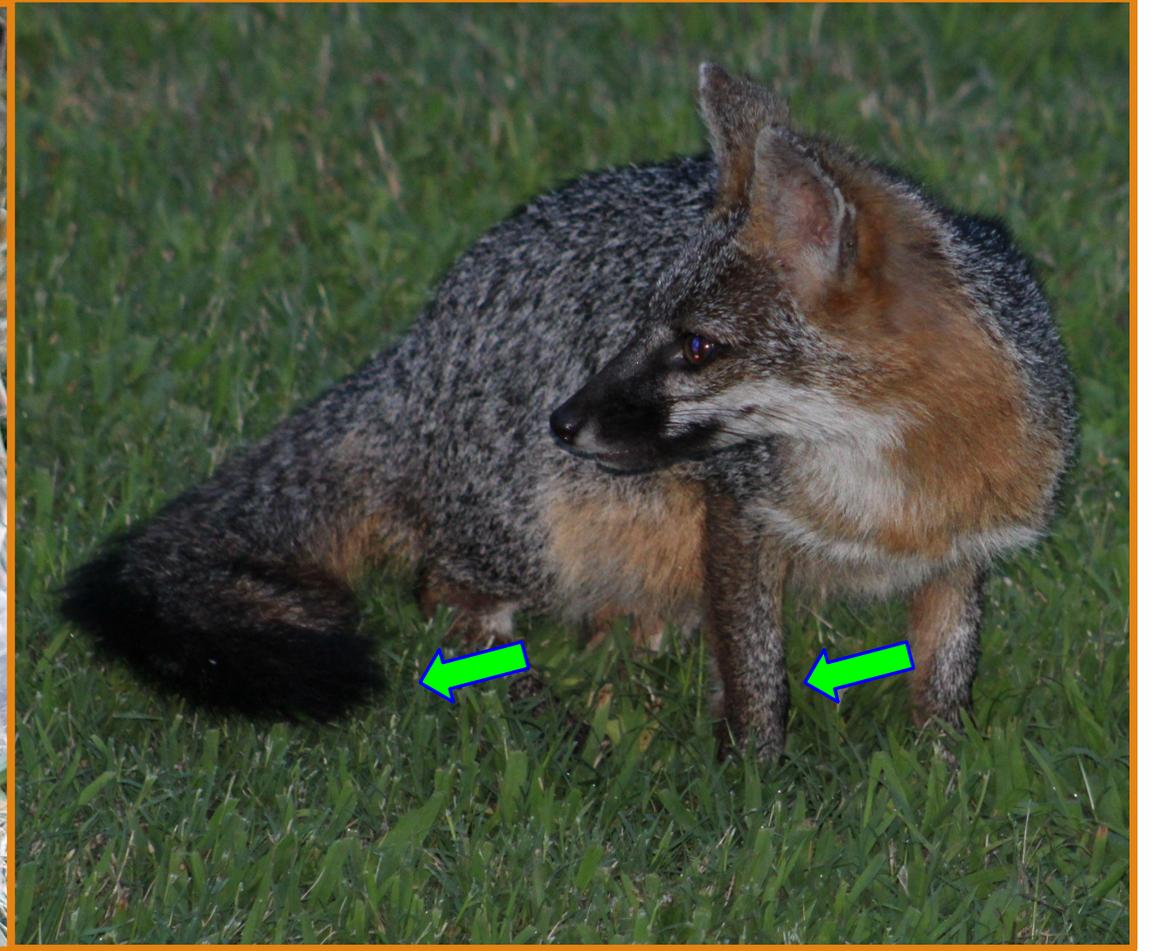


Canidae: Foxes



Red Fox (*Vulpes vulpes*)

White tip on end of tail; dark marks on legs and ear tips

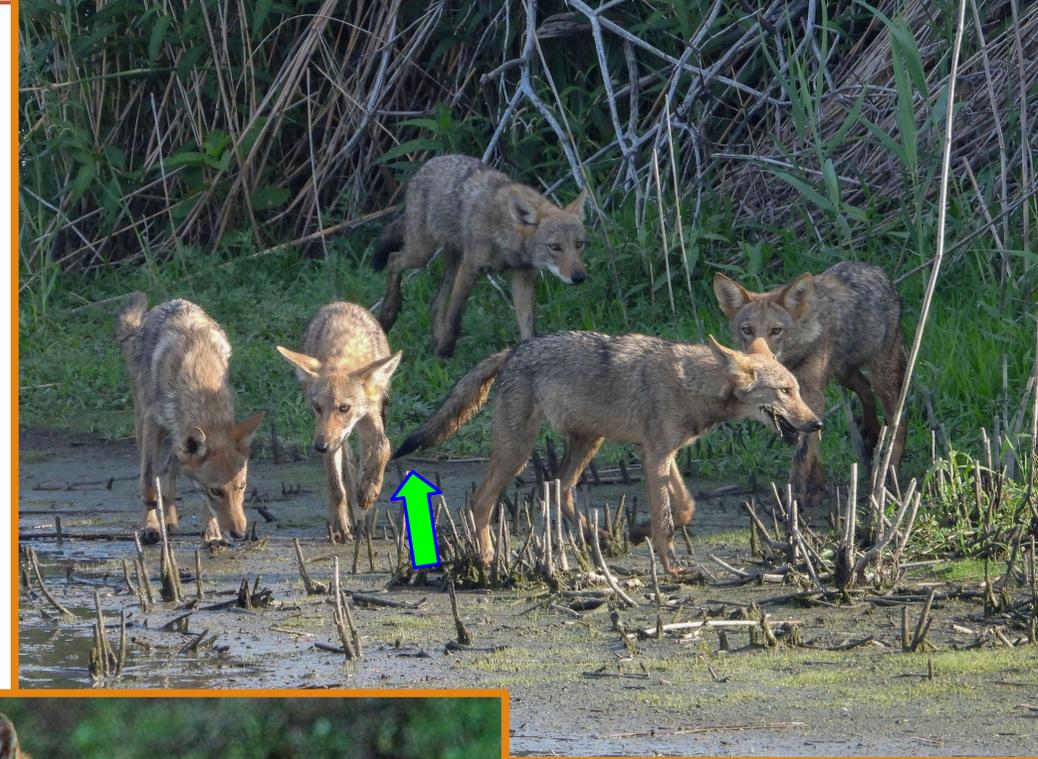


Gray Fox (*Urocyon cinereoargenteus*)

Black tip on end of tail

Eastern Coyote (*Canis latrans*)

- First documented in MD in 1972
- Omnivore
- Identification:
 - Large ears and narrow muzzle
 - Color can vary
 - Black tip on end of tail

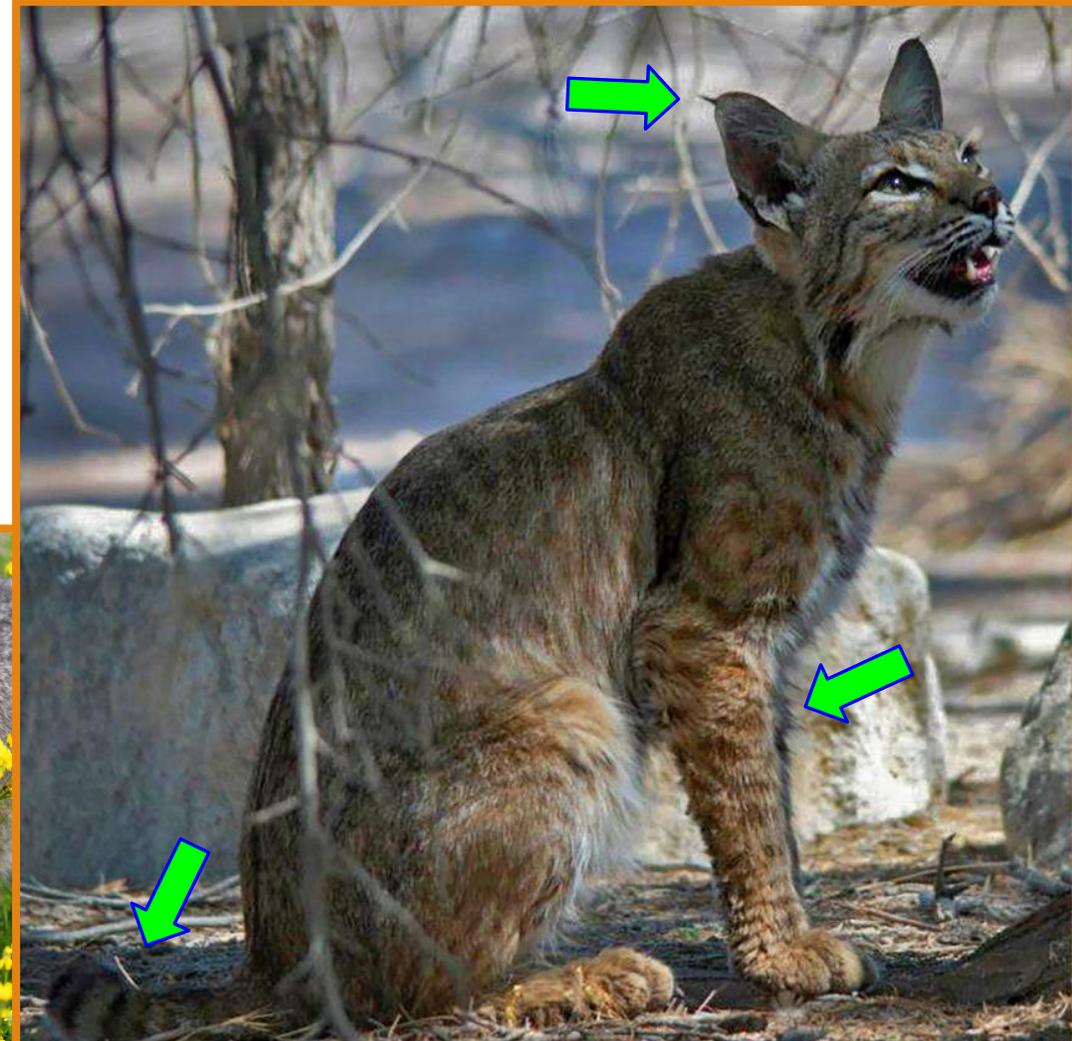


Order: Carnivora; Family: Canidae

Top, Bottom L two: Cory Byrne
Bottom Mid: Laura Hammett; Bill Blauvelt (CC BY-NC)

Felidae

- Bobcat (*Lynx rufus*) only extant species in Maryland
 - Head & body = 3'
 - Tail = 4-8" ("bobbed" tail)
 - Has ear tufts and striped legs
 - Mainly nocturnal
 - Relatively small: 9 - 40 lbs; avg 21 lbs male, 15 lbs female
- Eastern cougar (*Puma concolor cougar*) declared extinct in 2011



Mustelidae

- 5 extant species in Maryland
- Long, slender bodies with short legs
- Well-developed anal scent glands



Fisher released from trap during field research



Fisher stealing bait



Least Weasel



American Marten
(extirpated)

Mustelids



American Mink (*Mustela vison*)

Head & body = 12-16"

Tail = 5.5-8"

Dark brown with white on chin and chest;
usually near water



Fisher (*Martes pennanti*)

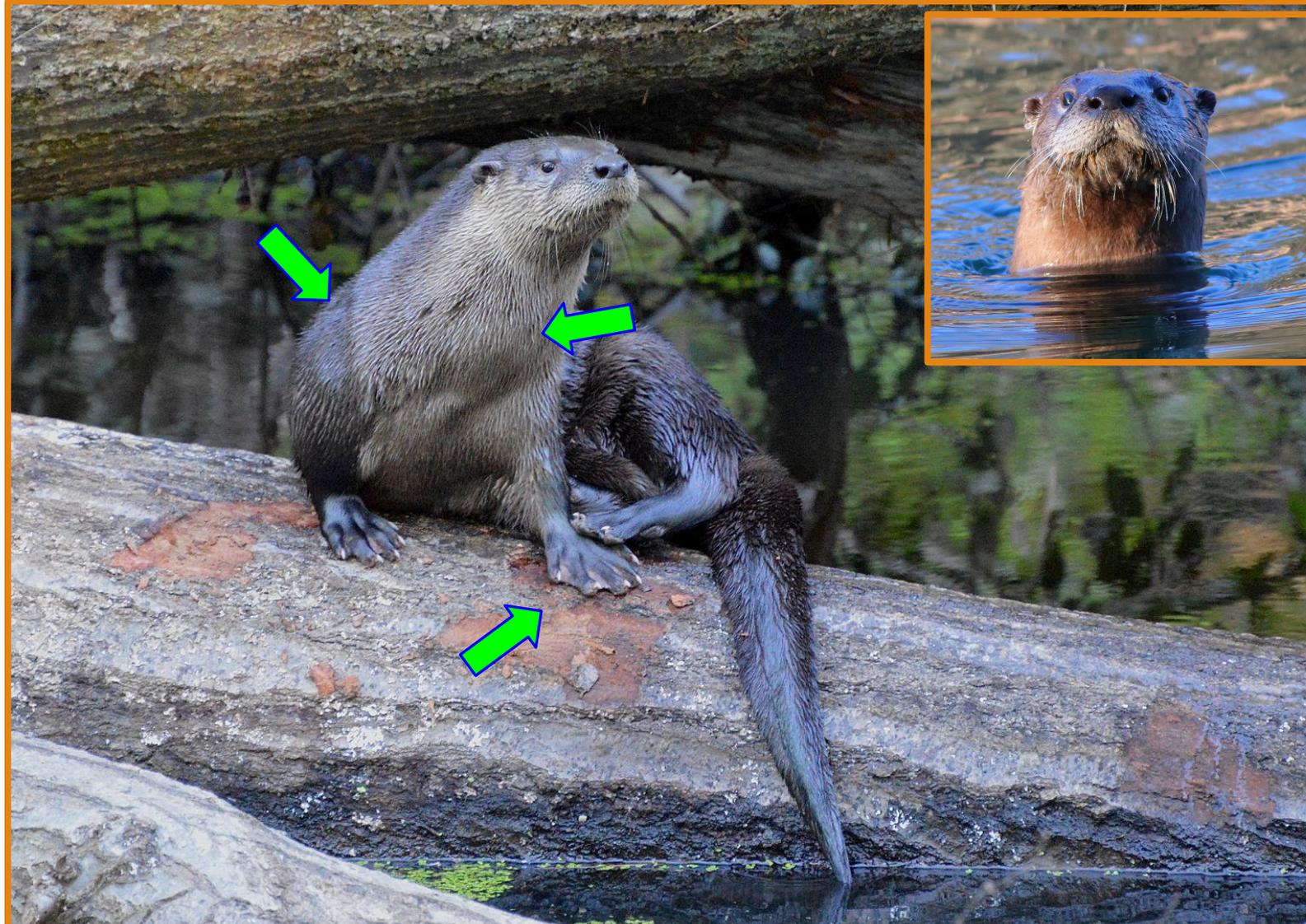
Head & body = 17-31"

Tail = 12-16"

Large and dark; head and shoulders grizzled;
prefers coniferous or deciduous-conifer forest

Northern River Otter (*Lontra canadensis*)

- Head & body = 26-31"
- Tail = 12-20"
- Feet broad and webbed
- Upperparts brown and belly silvery
- Strong swimmer
- Eats fish, crayfish, frogs, etc.



Phocidae - Seals

- 4 species in Maryland
- Lack external ears
- Hind flippers face back & front flippers are small
- Mostly found along Atlantic coast in Maryland, but can travel up the Bay
- Protected under the Marine Mammal Protection Act



Juvenile Harp Seal (*Pagophilus groenlandicus*)

Adult males have black face and black horseshoe-shaped patch on back. Adult females have similar markings though lighter.

Order: Artiodactyla

- Even-toed ungulates
- 2 species in Maryland
- Family Cervidae:
 - White-tailed deer
 - Sika deer



Cervids



Sika Deer (*Cervus nippon*)

Introduced. Coat usually reddish-brown and spotted in summer, dark brown in winter; midline of back black; white rump patch



White-tailed Deer (*Odocoileus virginianus*)

Coat usually grayish in winter and reddish-brown in summer; adults lack spots; tail long with white underside

Rabies

- Top 5 species: raccoons, skunks, foxes, bats, cats
- Passed through saliva
- Disorientation, uncoordinated movement and staggering, paralysis of hind legs
- Do not approach; secure people & pets; call animal control
- Contact Health Dept if exposure suspected

Data as of November 16, 2024

Laboratory Confirmed Rabies in Maryland by Species, 2023		
Species	Total	%
Bat	18	8%
Cat	22	10%
Cow	1	0%
Dog	0	0%
Fox	23	11%
Groundhog	2	1%
Raccoon	118	55%
Skunk	29	13%
Coyote	1	0%
Horse	1	0%
Otter	1	0%
Positive	216	100%

Laboratory Confirmed Rabies in Maryland by Species, 2024		
Species	Total	%
Bat	16	8%
Cat	13	6%
Cow	1	0%
Dog	0	0%
Fox	9	4%
Groundhog	7	3%
Raccoon	131	65%
Skunk	21	10%
Coyote	1	0%
Goat	2	1%
Other	2	1%

ANIMAL RABIES IN MARYLAND, 2000-2023
SPECIES BY YEAR

YEAR	BAT			CAT			DOG			FOX			SKUNK			RACCOON			GROUNDHOG			OTHER			TOTALS		
	POS	TESTED	%	POS	TESTED	%	POS	TESTED	%	POS	TESTED	%	POS	TESTED	%	POS	TESTED	%	POS	TESTED	%	POS	TESTED	%			
2000	17	398	4.3	18	1830	1.0	1	929	0.1	28	172	16.3	24	42	57.1	313	600	52.2	9	143	6.3	3	757	0.4	413	4871	8.5
2001	27	430	6.3	23	1730	1.3	1	930	0.1	38	168	22.6	42	71	59.2	366	672	54.5	5	196	2.6	3	754	0.4	505	4951	10.2
2002	35	586	6.0	11	1555	0.7	1	850	0.1	30	134	22.4	34	48	70.8	272	542	50.7	7	170	4.1	6	588	1.0	396	4473	8.8
2003	10	563	1.8	21	1868	1.1	2	844	0.2	37	144	25.7	16	37	43.2	269	589	45.7	11	154	7.1	5	629	0.8	371	4828	7.7
2004	23	737	3.1	13	1719	0.8	1	838	0.1	24	134	17.9	22	44	50.0	244	569	42.9	5	173	2.9	4	647	0.6	336	4861	6.9
2005	41	856	4.8	28	1875	1.5	1	872	0.1	39	136	28.7	27	52	51.9	245	551	44.5	2	146	1.4	3	521	0.6	386	5009	7.7
2006	44	889	4.9	15	1692	0.9	0	850	0.0	41	168	24.4	27	54	50.0	272	585	46.5	10	198	5.1	5	580	0.9	414	5016	8.3
2007	54	992	5.4	19	1562	1.2	3	794	0.4	49	192	25.5	41	71	57.7	253	585	43.2	6	167	3.6	6	427	1.4	431	4790	9.0
2008	33	767	4.3	21	1590	1.3	1	794	0.1	37	169	21.9	41	62	66.1	271	663	40.9	11	159	6.9	5	474	1.1	420	4678	9.5
2009	64	896	7.1	19	1522	1.2	0	773	0.0	35	137	25.5	20	46	43.5	239	554	43.1	3	149	2.0	4	424	0.9	384	4501	8.5
2010	44	945	4.7	17	1418	1.2	0	785	0.0	41	124	33.1	27	42	64.3	223	540	41.3	5	166	3.0	5	399	1.3	362	4419	8.2
2011	58	1043	5.6	17	1191	1.4	3	729	0.4	27	106	25.5	23	46	50.0	169	371	45.6	6	146	4.1	2	176	1.1	305	3808	8.0
2012	54	1091	4.9	13	1221	1.1	0	727	0.0	20	102	19.6	26	51	51.0	203	414	49.0	5	177	2.8	4	195	2.1	325	3978	8.2
2013	50	1198	4.2	24	1216	2.0	1	793	0.1	33	99	33.3	19	35	54.3	234	467	50.1	10	180	5.6	4	224	1.8	375	4212	8.5
2014	79	1337	5.9	18	1154	1.6	0	769	0.0	27	74	36.5	21	49	42.9	192	400	48.0	5	152	3.3	2	170	1.2	344	4105	8.4
2015	118	1210	9.8	19	1092	1.7	1	788	0.1	17	58	29.3	14	32	43.8	167	410	40.7	1	150	0.7	2	141	1.4	341	3881	8.8
2016	104	1026	10.1	27	1148	2.4	0	676	0.0	19	70	27.1	26	38	68.4	154	370	41.6	5	162	3.1	2	140	1.4	335	3630	9.2
2017	40	939	4.3	33	1108	3.0	0	701	0.0	10	77	13.0	9	15	60.0	139	314	44.3	8	144	5.6	3	157	1.9	242	3455	7.0
2018	26	977	2.7	24	1016	2.4	2	679	0.3	23	107	21.5	15	29	51.7	168	394	42.6	4	165	2.4	6	164	3.7	268	3531	7.6
2019	19	1056	1.8	15	947	1.6	0	644	0.0	33	92	35.9	11	26	42.3	184	450	40.9	3	154	1.9	4	137	2.9	269	3506	7.7
2020	20	941	2.1	35	762	4.6	1	593	0.2	22	87	25.3	9	16	56.3	160	437	36.5	4	140	2.9	4	107	3.7	255	3083	8.3
2021	14	1021	1.4	19	762	2.5	0	596	0.0	29	78	37.2	13	24	54.2	97	332	29.2	1	122	0.8	4	88	4.5	177	3068	6.8
2022	28	944	3.0	11	762	1.4	0	593	0.0	18	81	22.2	29	42	69.0	132	322	41.0	7	136	5.1	0	84	0.0	225	3135	7.2
2023	18	944	1.9	11	762	1.4	0	753	0.0	18	81	22.2	15	26	57.7	118	386	30.6	2	127	1.6	4	64	6.3	216	3207	6.7
Total	1002	20842	4.8	460	30740	1.5	19	17547	0.1	677	2709	25.0	536	972	55.1	4966	11131	44.6	133	3649	3.6	86	7983	1.1	7879	95789	8.2
Average	44	906	4.7	20	1337	1.6	1	763	0.1	29	118	25.7	23	42	54.7	216	484	44.1	6	159	3.6	4	347	1.5	343	4165	8.2

For Additional Information

For more information on Maryland's mammals, please visit our webpage at: dnr.maryland.gov/wildlife
Additional information can be found in the following resources.

Book Resources:

- Peterson Field Guide to Mammals of North America, 4th Ed

Online Resources:

- [Maryland Envirothon \(Wildlife and Heritage Service\)](#)
- [Mammals of Maryland \(MD DNR\)](#)
- [Maryland Biodiversity Project \(Mammals\)](#)



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