DNR Response to Bloede Dam Removal Public Comments

The Maryland Department of Natural Resources (DNR), the National Oceanic and Atmospheric Administration (NOAA), and American Rivers, together with other project partners, have discussed the impacts and benefits associated with the removal of Bloede Dam. After careful consideration of the available information, a decision was reached to continue efforts to remove the dam. DNR and the Patapsco River Restoration Partners will pursue the next phase of work in restoring the Patapsco River.

The primary considerations for the decision to remove Bloede Dam included:

- Recommendations provided in the report entitled " Bloede Dam Alternatives Analysis" prepared by Interfluve, a consulting firm with broad national experience and expertise. The report evaluated the impacts and costs of a range of dam removal project alternatives.
- Thorough review and evaluation of 76 written comments received in response to public distribution of the Alternatives Analysis and a two-day "open house" public forum. The open house was sponsored by the project partners and held at the Catonsville Community Library in June of 2012. The majority of comments supported the removal of the dam.
- Internal discussions among project partners regarding the implications of the project on various aspects of DNR mission-related issues (e.g. fisheries resources, State Park operations, recreational impacts, cultural and historic resources). Several DNR units participated in the discussions, including Fisheries Service, Engineering & Construction, and Maryland Park Service.
- An evaluation of on-going impacts to the Patapsco River from the removal of the Simkins Dam in 2010. The benefits of any "lessons learned" that could be instructive to decisions regarding Bloede Dam were assessed.

These considerations determined the decision to pursue removal of the dam and sharpened our focus on four (4) main topics of public concern: 1) historical and cultural aspects of the dam; 2) potential sediment management issues; 3) fiscal concerns, and; 4) fish passage. Comments and recommendations received from the public will continue to be considered in ongoing discussions, analysis and evaluation by project partners to determine the best approach to dam removal while minimizing impact to historic resources, park visitors and the Patapsco River ecosystem. The following supplemental information is intended to capture the concerns expressed in the public comments received. It is the Department's response to those who took the time to offer thoughtful comments regarding this project over the past several months.

How will the history and cultural aspects of Bloede Dam be preserved?

The Patapsco River Restoration Project partners have conducted a preliminary determination of eligibility for the Bloede Dam (page 17, Bloede Dam Alternatives Analysis). This is a necessary first step when initiating the National Historic Preservation Act of 1966 (NHPA), Section 106 consultation. Section 106 of the NHPA requires federal agencies to take into account the effects of their actions on historic properties.

Given the need to examine alternative treatments for Bloede Dam and consider those in the context of project goals, only the data that directly relate to the alternatives under consideration were included in the report.

Maryland DNR and project partners recognize the historic value of the Bloede Dam structure and its role in the industrialization of the Patapsco River Valley. This was considered along with the long-term natural history of the site and the best methods for achieving the project goals. The important role the structure played in history will be respected.

The close structural relationship of the dam and the Baltimore County sewer line create the potential for retaining a portion of the dam. As the project engineers evaluate the factors related to how much of the dam structure can and should remain, DNR will undertake additional historical research to enhance the interpretation of the dam site.

In addition, a citizen's advisory group has been formed to engage community leaders and provide a forum for the exchange of ideas and other feedback pertaining to commemorating the historic and cultural aspects of the site. Recommendations from the group will be taken into consideration by the project management team when designing the restoration site.

Each of these components will be conducted in compliance with Section 106 of the NHPA and ongoing conversations with the Maryland Historic Trust. Historic mitigation at the Bloede site will be required.

What consideration has been given to the costs of the Bloede Dam project?

Fiscal considerations certainly play a role in an undertaking of this size. As cost containment continues to occur at the state and federal level, cost-effectiveness and long-term sustainability are important factors to consider in all state and federally funded projects. If the dam remained in place, the State would be responsible for the ongoing maintenance of the structure, and associated State Park operational costs (pages 19-20, 41, Bloede Dam Alternatives Analysis), as well as providing for a functioning fish ladder (pages 20-21, Bloede Dam Alternatives Analysis).

A dam is a built structure in a volatile environment. Ongoing maintenance and operational costs include meeting changing safety standards, repairing deteriorating concrete, keeping gates and other structures operational, maintaining and repairing the fish ladder, inspection costs, security, proper signage, and property maintenance. Eventually, the structure will need to be repaired or replaced. A study conducted by American Rivers examined 31 structures and found that, on average, repair costs were three (3) times the cost of removal. The repairs and associated studies, dam inspection and design costs for the 1992 Bloede Dam stabilization project were over $2.5 million. The costs associated with the feasibility studies, inspection and design of the current project are approaching $1 million (not including construction costs). Finding ways to reduce and/or eliminate long-term costs is fiscally prudent.

Removal of Bloede Dam has been the focal point of three previous studies: Century (1980), Synergics (1989) and Gannett Fleming (2012). When the Synergics report was released in 1989, cost estimates for removal of the dam and management of the sediment were significantly more than what is currently being presented in the Bloede Dam Alternatives Analysis. The most recent report presents best estimates for the cost of removing the dam. While these estimates are only preliminary, the figures are based on historic cost data for projects similar in scale and scope to the Bloede Dam.
At the time of the development of the Synergics report, very few structures had been removed (none in Maryland) and little was understood about this method of restoration. In the years since that report was released, dam removal has become more commonplace and designers and other contractors now have a much better understanding of how to efficiently remove these structures while taking care of the environment. There have also been advances in understanding and modeling of sediment transport and how rivers physically change. These advances, combined with site-specific knowledge of a clean sand and gravel system, provide the confidence to proceed with the recommendation of passive sediment management. This is far less expensive than the alternatives proposed in the Synergics report. As engineering design plans for Bloede Dam are developed, estimates for the removal of the dam will solidify. At this time, there is no expectation that there will be any significant deviation from the proposed estimates.

It is anticipated that funding for the Bloede Dam removal will be provided through a combination of federal and state funds, and the State has already requested capital funds for this project (funds that would have been allocated for the operation and maintenance of the structure). The project management team will also seek federal dollars that have traditionally been designated for use in providing fish passage and restoring diadromous fish populations. The overarching goals for the Patapsco River Restoration Project, including the passage and restoration of fish and aquatic organisms, as well as enhancements to public safety and recreational value, make this an attractive project to potential funders. Removal of Bloede Dam will: allow the reallocation of DNR staff currently required to patrol and secure the Bloede Dam site; ease management burdens at the site; provide additional recreational opportunities; enhance the park visitor's experience; and support DNR's overall vision for a free-flowing Patapsco River.

How will the sediment be managed?

Quite a few questions and comments were received regarding the management and eventual deposition of the sediment currently located behind the Bloede Dam. The Alternatives Analysis report contains a fair amount of information about sediment in the Patapsco (pages 26-29, 32-35, and 38-39). Managing sediment during the removal of Bloede Dam was evaluated from a variety of perspectives (e.g. ecological, fiscal, feasibility).

From an ecological perspective, allowing the sediment to transport naturally downstream is a responsible approach. Results from an evaluation of the sediment behind the Bloede Dam indicate the material consists of coarse sand and gravel and does not contain contaminants (pages 28-29, Bloede Dam Alternatives Analysis). Clean material of this grain size is not the type of sediment targeted as part of the Chesapeake Bay and Lower Patapsco sediment Total Maximum Daily Loads (TMDLs - for additional information see the following TMDL section). When considering natural sediment transport, this is the ideal sediment. In fact, it is the type of material that would characterize valuable aquatic habitat in an unimpacted stream. When released in larger volumes, there will be downstream impacts, as pools are filled in and current habitat buried. However, these impacts will be temporary as the sand and gravel moves through the system. This pattern was observed when the Simkins Dam was removed. Fishing holes downstream of the dam filled in immediately following the removal. The holes were back to their original depth in little more than a year after the removal. Even though sand continues to make its way through the river, fish and other aquatic life are still present. They migrate to new pools as they appear and disappear. This type of adaptive behavior will continue with the removal of the Bloede Dam.

The feasibility of removing the dam and associated fiscal considerations are inherently linked when considering whether or not to dredge sand from behind the dam. Dredging of material is a complex and costly undertaking. If mechanical dredging is employed, material will need to be pumped to a de-watering area and then mechanically placed in trucks or train cars for removal. The dewatering site would be larger than the area to be dredged. Ecologically, this often increases the amount of time invasive activities are underway. In-stream aquatic habitat is disturbed and the likelihood of losing additional trees increases significantly. It would negatively impact visitor’s access to the State Park. Trucks would be operating on a continual loop in and out of the park, hauling material for a full year or perhaps longer. If hydraulic dredging is utilized, sediment would be placed directly in water-tight trucks or freight cars. The volume of the sand plus the water (the material would be at most 20% sand and at least 80% water) would need to be hauled from the site.

Based on the following assumptions, the costs to dredge materials from the Bloede impoundment have been estimated:

- Suction dredging costs $35/ton, according to estimates received from local contacts (assuming pumping short distance to geotextile bags for dewatering and reasonable access to site for dredge). If mechanical removal of sediment is used, the cost is $60/cubic yard (~$4,800,000).
- Requires that the second CSX track is in good condition and permission is obtained for this purpose. If additional siding construction is required, add $1 for a mile of siding.
- Railroad hauling based on 1,053 rail cars can carry 76 cubic yards (98 tons) per car.
- The cost for loading railroad cars would be additional (includes road construction / path repair).
- Truck hauling cost of $0.15/mile/ton for 10 miles.

Suction Dredging	$2,800,000

Rail Shipping	$1,500,000
Truck Hauling	$156,000
Approximate Net Cost	$4,456,000

Upon consideration of the various factors (e.g. type of sediment present in the Bloede impoundment, ecological harm from dredging versus downstream impacts of releasing the sediment, cost associated with handling the material), allowing the natural transport of sediment throughout the Patapsco River is the preferred approach. A combination approach utilizing both passive and active sediment management could be utilized based on the analysis of additional data.

Is there an example of a similar dam removal project with actual outcomes that will give us an idea of what we can expect from the Bloede Dam removal?

Although no two dam removal projects with passive sediment management are alike, you can get a tangible idea of possible outcomes by looking at other dam removal projects. The Merrimack Village Dam (MVD), located in Merrimack, New Hampshire, is the first dam on the Souhegan River, a tributary to the Merrimack River. The MVD removal project was completed in 2008 and restored access to 14 miles of habitat.

The MVD project had similar goals to the Bloede Dam removal project. The goals included restoring diadromous fish, reconnecting river habitat, restoring natural sediment transport, eliminating operation and maintenance costs, and removing a potential safety hazard. The major issues addressed during the feasibility phase of the project were the quantity, quality, transport and management of impounded sediment; impacts of dam removal on wetlands and cultural/historical resources; and, access to private lands in order to remove the dam The dam was a 12-foot tall by 145-foot long structure constructed on bedrock in the early 1900s. The estimated volume of sediment behind the dam was 81,000 cubic-yards, consisting predominantly of sand. Removal of the dam and passive sediment transport resulted in a nearly instantaneous base level drop of 12 feet. Over the course of two months, sand within the impoundment was rapidly moved downstream, followed by channel widening (limited at the Merrimack site by root strength and large woody debris along the banks). Flow events (frequency and magnitude) controlled when the stored sediment in the impoundment was mobilized. Also, they partially controlled the remobilization of impounded material deposited downstream. The river response has been influenced by the establishment of bank vegetation within the former impoundment. An historic arch bridge located immediately downstream was not impacted by the sediment release.

How will the removal of Bloede Dam with passive sediment management impact the sediment and phosphorus allocations set forth in the Total Maximum Daily Loads (TMDLs)?

The Chesapeake Bay Total Maximum Daily Load (TMDL) highlights the importance of reducing nitrogen, phosphorus and sediment delivery to the estuary. When the Bloede Dam is removed, the sediment behind the dam will be released downstream. There is little risk of increasing nitrogen loads with passive sediment management. Ammonium nitrogen ions may be fixed in the interlayer of certain clay mixtures but clay minerals are not found in the impoundment behind the dam. Any impact to the Chesapeake Bay from removing Bloede Dam with passive sediment management should be offset by the restored river function provided through removal.

For this region, particulate phosphorus (that portion of the total amount of phosphate suspended in water that is attached to particles), on average, makes up 75% of the total phosphorus fraction. The remaining 25% is in the form of dissolved reactive phosphorus (the form of phosphorus that is directly taken up by algae). While the dominant form of total phosphorus is bound to sediment, the grain size of the sediment in the Bloede impoundment does not facilitate phosphorus assimilation. The grain size of sediment in the impoundment is 75% fine to medium sand, 20-25% gravel and 1-5% fine sediment. Sand particles and gravel, like those within the Bloede impoundment, have little capacity to bind phosphorus. As such, there is a low risk of increased phosphorus loading to the Chesapeake Bay with passive sediment management because of the type and composition of the sediment.

The impoundment area is likely functioning as a wet pond with a lake ecology. TMDL reduction estimates due to wet ponds are 20%, 45% and 60% for nitrogen, phosphorus and sediment, respectively. After removal of the dam the area will act more like a riverine system, with benefits similar to those of a riparian buffer with stream restoration. The revegetation and soil stabilization along the bank will increase nutrient and sediment reductions beyond those currently achieved with the existing wet pond system. This function should balance any increase in sediment and phosphorus load that may occur with the dam removal. The benefits to living resources from the creation of nearly two miles of improved spawning habitat, better conditions for other biota, and higher densities of invertebrates cannot be overlooked.

As discussed in the Bloede Dam Alternatives Analysis (pages 32-34), one of the short-term impacts of the dam removal is sand deposition in the channel and overbank sediment deposition. Modeling shows that without a large storm event, sediment will gradually transport through the Lower Patapsco River over the next 10-20 years. It is expected that some of the sand and gravel sediment will be deposited in the river system, functioning as downstream habitat and providing stream restoration benefits. It is unlikely the volume of particles transported to the Baltimore Harbor and Chesapeake Bay will have a measurable impact on submerged aquatic vegetation (SAV) and water clarity. The sediment that is evacuated from the impoundment area will be monitored to determine where it is deposited.

An adaptive management plan will be developed to address any issues that the sediment might cause. The plan will be similar to the one that was developed for the Simkins Dam removal project. For example, as part of the Simkins design report, potential areas where sediment deposition could pose temporary problems were identified. These included the

Grist Mill Trail and Grist Mill Trail Extension, Gunn Road Crossing, the School bus facility, and the Patapsco Valley State Park Bridge. For each site, criteria were developed that would trigger actions if they were needed. As part of the Bloede project design an adaptive management plan will include criteria for determining when and what actions may need to be taken if sediment deposition is a problem.

Can fish passage be improved without removing the dam?

Simply stated, the most effective way to allow migrating fish to move upstream of a dam is to remove the dam. It is the only means to ensure 100% effective passage of migratory fish. Removing the dam not only allows migratory fish access to upstream habitat, it also allows instream resident fish and other aquatic organisms to move freely within their habitat without hindrance to their natural rhythms.

Fish passage could be improved by partially removing the dam (e.g. notching or breaching). Notching would involve cutting a vertical indentation in the dam structure to allow water and fish to move. Breaching would involve removing an entire section of the dam but leaving a portion in place. Both of these techniques would necessitate careful engineering to alleviate any issues with excessive water velocity. These two types of modifications generally work for low head dams (<25 ft.) rather than tall dams. As Bloede Dam is 34 feet tall, neither notching nor breaching would be effective in providing adequate fish passage.

Another way to allow fish passage would be to create a natural bottom fishway built partially into the bedrock and valley side slopes (page 20, Bloede Dam Alternatives Analysis). This method would use a minimal amount of concrete, metal and lumber and rely on natural materials such as rock and earth. It would create a more natural stream-like appearance with natural landscaping. However, natural stream-like fishways are not 100% efficient at passing fish. It would require the complete removal of the fish ladder at Bloede Dam; a major deconstruction project estimated to cost approximately $2 million.

One method that has been used to pass fish at larger dams is a fish lift, which operates similarly to an elevator for people. Fish lifts are not 100% efficient at passing fish. They can move larger numbers of fish at one time and can move those species that are weak swimmers or those that avoid ladders because of behavioral characteristics. They are similar in cost to building fishways but more expensive to operate and maintain. Fish lifts are prone to mechanical failures which can be problematic during short migratory fish runs. Without a dedicated funding source, this option would not allow long-term reliable fish passage.

What is a fish ladder and how does it work?

Fish ladders or fishways are structures built to help fish go around barriers, most often dams. There are several different types of fishways and they operate on basically the same principle.

Fishways provide a series of intervals or steps that gradually increase in slope (insert photo). The velocity of water falling over the steps has to be large enough to attract the fish to the ladder, but not so large that it forces fish back downstream. Ladders that use baffles (a V or U-shaped structure to create each interval) generate a water flow that forms a small pool at each step. Fish are able to jump/swim up each interval and eventually pass the barrier.

Fish ladders have been used across the country and internationally to reopen habitat for migrating fish. During the 1990's, a large number of ladders were constructed along the East Coast of the United States. Biologists have been collecting data over the years and now realize that fish ladders are not as efficient as once hoped. Efficiency is defined as the number of fish successfully passed at a fishway divided by the number of fish below the fishway. Factors that influence the efficiency of fishways include slope, length and width, number of pools, baffle type, and entrance location. Results from fishway studies indicate that efficiency rates can rangefrom 0% to 97%. Denil fishways, such as the one currently in place at the Bloede Dam, had a mean rate of 51%. Vertical-slot ladders were on average 45% effective, pool-and-weir fishways were on average 40% efficient, and nature-like fishways were about 70% effective. The rate for natural fishways was influenced by passing more species. The available data on fishway efficiencies do not clearly justify recommending one type of fishway over another type.

How well does the Denil fish ladder work at Bloede Dam?

The Denil fish ladder at Bloede Dam is a sloped, concrete trough with U-shaped baffles placed at regular intervals. It is over 160 ft. long and has three turns and two resting areas. It has a narrow 3 ft. entranceway located downstream of the dam. It has been monitored to verify the passage of migratory fish a number of times since its construction in 1992.

In the spring of 1993, a modified Fyke net was set at the exit of the fish ladder but it did not cover the entire exitway. From April 14 through May 11, the net was set for time periods ranging from 2-8 hours but no fish were captured. On May 13, 294 adult herring were stocked below the ladder as an experiment to see if they would use the ladder. From May 13 through May 27, the net was continuously monitored and only 2 fish were captured: a redbreast sunfish and a rock bass.

The ladder was monitored again in 1994 with a new net design that covered the entire exit area of the ladder. The net was continuously monitored on weekdays from April 27 through June 10. Several species of fish were captured including: 1 American shad, 171 gizzard shad, 4 sea lamprey, 4 white suckers, 4 smallmouth bass, 37 common carp, 1 river chub, 1 channel catfish, 1 rainbow trout, and 4 brown trout. On eight separate occasions during May, approximately 2,000 adult blueback herring were stocked below the dam. However, none were captured at the exit of the fish ladder.

The ladder was not monitored again until 1998. A net covering the entire exit of the ladder was used from March 2 to May 28 and only removed during storm events when the water was too high to safely sample. Fish captured included: 177 gizzard shad, 2 sea lamprey, 8 white sucker, 11 rainbow trout, 6 brown trout, 7 rock bass, 1 channel catfish, 8 bluegill sunfish, 18 redbreast sunfish, 4 pumpkinseed sunfish, 4 green sunfish and 2 interspecific sunfish. During the sampling season, hickory shad, white perch, striped bass, and river herring were all observed in the Patapsco River downstream of Bloede Dam. A small school of blueback herring was first sighted on May 1, three miles below Bloede Dam. Over the next two weeks, heavy rainfall caused turbid water conditions in the Patapsco River and there were no sightings of any target species. By May 15, the water had cleared and approximately 1,000 blueback herring were seen spawning on a large gravel bar just below Bloede Dam. However, none of these target fish were captured at the exit of the fish ladder.

The ladder was again monitored by Fish Passage staff in 1999. Similar to the 1998 sampling technique, the net was left in place continuously from March 19 to May 28. During that time, a total of 4 blueback herring used the fish ladder. Other fish collected included: 1 American eel, 5 sea lamprey, 324 gizzard shad, 7 bluegill sunfish, 9 carp, 4 northern hogsucker, 27 rainbow trout, 36 rock bass, 5 smallmouth bass, 15 white sucker, and 157 redbreast sunfish. Numerous groups of herring and hickory shad were observed below the dam.

Following the removal of the Union and Simkins dams upstream, the Maryland Biological Stream Survey (MBSS) crew began sampling the Patapsco River to monitor biological changes in the river that might be associated with dam removals. In spring 2011, the crew installed a net at the exit of the fish ladder similar to DNR protocols in the past. Despite seeing a number of herring and hickory shad below the dam, no fish were captured at the exit of the ladder. This may have been due to several missing baffles in the ladder that were damaged by storms earlier that year. The missing baffles were replaced and the ladder was again monitored in the spring of 2012. MBSS captured 13 species of fish using the ladder including: 4 bluegill, 37 brown trout, 1 channel catfish, 19 common carp, 2 fallfish, 3 gizzard shad, 34 northern hogsucker, 11 rainbow trout, 26 redbreast sunfish, 5 rockbass, 16 smallmouth bass, 3 white catfish, and 142 white sucker.

Could the fish ladder be fixed to pass more migratory fish?

At 34 feet tall, Bloede Dam is the tallest dam in Maryland with a Denil-style ladder. Research has shown Denil ladders to be more effective for shorter dams. The height of Bloede Dam required a fish ladder that is over 160 feet long, which is significantly longer than any other ladder in Maryland. It required three turns and two resting areas for fish. Studies have shown that passage efficiency rates drop as the length of the ladder increases. Given the height of the dam and the need to maintain an appropriate slope, the length of the ladder is relatively fixed.

The Bloede Dam is over 160 feet long with adjacent concrete abutments that span a total distance of 220 feet across the river. There is a natural rock outcropping on the right side of the river which allows only a moderate amount of space to place a fish ladder. As a result of this limitation, the entrance of the ladder was placed near the spillway. The size of the dam creates an "attractive" water flow from the spillway which competes with the flow at the entrance of the ladder. This situation makes it difficult for migrating fish to find the 3-foot entrance. Adequate attraction flow is one of the major factors influencing efficiency rates. Some attempts have been made to improve attraction and efficiency by adjusting sections of fishways at other dams in other states. However, these attempts have been met with limited success. For the Bloede Dam fish ladder, it would require experimenting with different ladder configurations to find the appropriate water velocity to attract migratory fish. It would require several years of testing with associated costs and would still have limited efficiency because it is an artificial, man-made structure.

Field observations by DNR and United States Fish & Wildlife Service (USFWS) personnel indicate that migrating fish seem to get confused at the first turn on the Bloede fish ladder. A possible fix for this issue would be to modify the turn by reducing the angle. However, it is unknown if changing the fishway corner would improve passage. It would require funding to redesign the ladder, to make the necessary construction changes, and to monitor the effectiveness of the change (page 20, Bloede Dam Alternatives Analysis).

One of the major objectives of the Patapsco River Restoration Project is to provide passage for American eels. A traditional fish ladder like the one at Bloede Dam does not provide passage for eels. A new ladder, specifically designed to pass eels, would need to be constructed. Elvers (young eels) need a climbing substrate in order to move over a dam structure. Additional design and construction costs would be necessary to add an eel ladder.

Are there any other factors that inhibit the efficiency of the fish ladder?

Efficient fish passage not only depends on the physical characteristics of the fishway, but may be more dependent on the biological characteristics of the fish species. Fish behavior and swimming ability play an important role in successful fish passage. Since different species have different capabilities, body types and sizes, what works for one species may not be the best for another species. There are design limitations for all fishways which ultimately cannot address the needs of all fish species. In addition to a species' swimming characteristics and behavior, many environmental factors can impact efficiency rates, including air/water temperature, rainfall, and flow rates.

Any fish ladder on Bloede Dam would be affected by the natural functioning of the river and would incur annual maintenance costs and repairs. The current ladder is routinely subjected to high water events due to the flash-flood nature of the steep Patapsco River valley. Unlike other Denil ladders, the Bloede Dam fish ladder is located almost directly below the dam spillway. During high water events, debris from above the dam is sent over the spillway and into the lower sections of the ladder. Large rocks, trees, and even chunks of ice damage the grates, fencing, and wooden baffles. Each spring the fish ladder requires significant manual labor to remove the debris and repair the ladder. Additionally, high water events often clog the upstream exit with debris and must be cleaned out before the ladder can be opened. This type of maintenance requires staff to work in the water near the dam crest and is dangerous and labor-intensive.

In Conclusion

Comments received from various individuals and interest groups were instructive and useful as DNR works toward achieving the benefits associated with the removal of Bloede Dam. Many of the comments have been used to guide our next steps. Many ideas will be taken into consideration by the project management team to insure the final design and methods used to remove the dam will be based on what is technically and financially feasible and best meets the goals of the project while minimizing disruption to park activities. DNR, American Rivers, NOAA and our other partners thank all those who attended the public open house, reviewed the alternatives analysis and provided thoughtful comment on this project. DNR invites you to continue to provide comments on the Bloede Dam removal project.