**Fish Passage Workgroup Meeting**

Monday, December 19, 2016

10:30 am – 3:00 pm

Chesapeake Bay Field Office, Large Conference Room

**Participants**

|  |  |
| --- | --- |
| Mary Andrews, NOAA (Chair) | Sandy Davis, USFWS |
| Kyle Runion, CRC (Staff) | Jimmy Dick, EQR |
| Nancy Butowski, MD DNR | Ben Lorson, PA FBC |
| Jim Thompson, MD DNR | Jennifer Bountry, USBR\* |
| Gina Hunt, MD DNR | Tim Randle, USBR\* |
| Alan Weaver, VDGIF | Serena McClain, AR\* |
| Dave O’Brien, NOAA | Lisa Moss, USFWS\* |
| Julie Devers, USFWS | Adam Wright, DoD\* |
| Chris Reilly, USFWS | \* Remote |
| Jennifer Greiner, USFWS |  |

**Action Items:**

* ACTION: The Federal Dam Removal Analysis Guidelines for Sediment will be distributed to the workgroup for review. Any comments should be sent to [runion.kyle@epa.gov](mailto:runion.kyle@epa.gov) by noon on Friday, January 13th.
* ACTION: Mary will follow up with the American Society of Civil Engineers regarding infrastructure issues with dam removals and will keep the workgroup updated about this conversation.

**Minutes:**

**State Fish Passage Coordinator Updates**

**Virginia**, Alan Weaver

* Monumental Mills Dam was removed in 2016, opening 248 miles for fish passage. The dam was in poor condition and gifted from the landowner to be removed.
  + The original corps permit required dredging before removal, which would have been expensive and time consuming. After VA DGIF acquired the dam, we didn’t need a permit because it was a cooperating project with USFWS and was exempt from the nationwide permit.
  + Herring were found from eDNA samples downstream of the Monumental Mills Dam.
* Culvert assessments continue in Virginia from the CBP funding project in FY 2015.
  + Almost 2000 total sites have been assessed in Virginia, including 319 in 2016.
    - Of culverts assessed in 2016, many were passable, but about 20% had a moderate, significant, or severe barrier to fish passage.
  + Site prioritization was done using NAACC tiered HUC12 data and alosine model framework.
* The NAACC plans on conducting a critical linkages analysis, which the VA Fish and Wildlife Conservation Office hopes to utilize in further prioritization efforts.
* Monitoring started last year on the White Oak Run Pool and Weir Fishway; herring were found upstream of the passage project.
* This coming spring, we have plans to use an electronic fish counter on high and low tide fishways at Walker’s Dam.
  + The counter is designed so that fish are funneled into tunnels and the change in water conductivity from the fish’s body is counted as an individual.

**Pennsylvania**, Ben Lorson

* There were two dam removals in Pennsylvania this year. A Brook Trout project in Clinton County opened about 10 miles in a class A wild trout stream.
* PA FBC is receiving $50,000 a year specifically for dam removals in York and Lancaster Counties as a part of the Clean Water Act Section 401 Water Quality Certification.
  + In 2015, $20,000 of these funds were used on the Heistand Sawmill Dam removal project, which opened 13 upstream miles. The next upstream dam owner is now on board for removal on Chickies Creek.
* Three to four possible removals in 2017 are anticipated for Pennsylvania.
  + Some are initiated by the dam owners and are pursued even if they have low biological uplift, while others are targeted based on high potential uplift.
  + Pennsylvania’s dam safety program has been a great collaborator with PA FBC, communicating potential projects for removal.
  + Much of the low-hanging fruit projects have been completed in York and Lancaster counties, so we may need to revisit projects that were not prioritized in the past.
    - Andrews: Maryland is in a similar situation and may need some other motivators in regards to dam removal such as help from the dam safety programs.
      * Weaver: Virginia dam safety isn’t proactive on dam removal enforcement.
      * Pennsylvania has dam safety classifications where the safety program is proactive and enforces repair or removal on high classifications, but doesn’t enforce as strongly for low classifications.

**Maryland**, Jim Thompson

* Maryland is in a similar position as Pennsylvania as much of the low hanging fruit projects have been completed.
  + MD DNR is trying to reach some of these more difficult dams and involving dam safety is an angle to utilize. A dam which has been on our radar from a safety perspective breached over the summer. Since it was labeled as a low hazard dam, Maryland’s dam safety program (MDE) did not enforce repair or removal before the breach.
    - Maryland has 80 dams that are similarly labeled as low hazard but are in poor condition. Some of these dams have extensive upstream mileage to be opened and could be removed relatively cheaply. This safety aspect will be used as a removal incentive going forward.
      * Lorson: Often it comes to economics – if removal is less expensive than repair then removal may be preferred. Safety and economics are the trigger even though the money may come from an environmental standpoint.
    - A conversation regarding enforcement of dam safety should happen between MDE and MD DNR to increase proactive actions taken by MDE for potential dam removal projects.
* The removal of Bloede Dam is imminent. Permits are in hand but we are working on getting better conditions.
* NAACC culvert assessments are also taking place in Maryland. MDE is trying to repair 1300 corrugated metal culverts inexpensively, which may reduce passage potential. DNR is working with SHA and MDE to determine which culverts we can repair with this strategy and which we can work to repair with improved passage.

**General Fish Passage Updates**, Mary Andrews

* Overcoming Policy and Permitting Challenges to Implementing Natural Infrastructure Solutions Workshop
  + Workshop focused on dam removal and riparian floodplain restoration projects.
  + Takeaway from the workshop: We as a workgroup need to do a better job of selling the infrastructure, resiliency, flood control, and other benefits to dam removal in addition to the habitat/fish species restoration to increase our success.
    - For example, Bloede is being removed largely for safety reasons.
    - Lorson: Think it is important to keep the fish passage as our main focus but it can be helpful to show to project stakeholders how the other factors may benefit them.
    - McClain: Flexibility in messaging is critical to speak to the audience in a language that they care about. Our goals aren’t changing but we can we can message more effectively than just fish passage.
      * O’Brien: The various messaging techniques may open other funding opportunities.
* Infrastructure and coastal resiliency related funding dam removals and culvert replacements
  + There are many funding opportunities related to culvert flooding and dam safety.
  + NOAA has two funding opportunities coming out in January
    - Community based restoration program (funded Bloede removal)
    - Coastal resiliency funding from NOAA will be a joint federal funding opportunity (FFO) with the National Ocean Service Office.
    - Dam removal and culverts will be a great fit for these and we should take advantage.
  + Water Resources Development Act (WRDA) contains a dam bill that states funding will be available for repair or removal of dams. The bill also mentioned establishing an office in FEMA to fund these projects. About $7m is expected in this pot, while legislation writes for up to $25m.
    - Davis: The focus on habitat might not even be on their radar – including habitat benefit on their scoring guidelines would help our types of projects secure funding.
    - Run of river dams show no change in the 100 year flood (FEMA’s priorities)
      * Some smaller dams have effect locally on smaller events (5-10 year floods). We could show FEMA how helpful this is to local infrastructure for counties and thus should be a priority.
      * Weaver: The economics of removal vs repair may make removal a more attractive option for public infrastructure.
    - Devers: We are being asked to create a list of potential projects over the next five years. We should be including other reasons for removal such as flooding when naming these priorities.
* The GIT funding project to update the Fish Passage Prioritization Tool (FPPT) should have a contractor selected soon, with a contract out likely in late January. The tool will be updated to java script, incorporate culvert prioritization, and add new layers based on newly available data.

**Maryland’s Efforts to Develop 5-year Fish Passage Plan**, Julie Devers

* Identify priority dams
  + Actions needed
  + Short list to work on together
    - We started by looking through the FPPT tiered 1-3 anadromous dams and worked to fill information gaps. Ideally we will narrow to about 10 dams to start working on together. We are through the tier 1 anadromous dams and will continue on lower tiered and Brook Trout priority dams/
* Identify priority road crossings
  + are fish present
    - Assessments have been completed on various rivers for multiple target species.
      * The Choptank, Chester, and Marshyhope were showcased in the presentation.
    - SERC has a proposal into NOAA for a project to select road stream crossings identified as blockages and test if NAACC is categorizing them correctly by using eDNA downstream and upstream of the blockage.
      * Andrews: NOAA has possible funding for innovative projects, where there may be funding for eDNA. We hope state funding for eDNA work will continue. eDNA can give presence and even abundance.
      * Thompson: Matt Ogburn at SERC has showed that eDNA can be easy, more accurate than icthyoplankton, and can take samples without flowing water.
  + Actions needed
  + Provide list to county roads and SHA
* Identify additional road-stream crossings to assess
  + Overlay dams and culverts
    - Determine if blockages of different types are closeby to understand passage potential.
  + Overlay fish data
* Steps forward
  + Improve communications between partners and dam owners
    - Payment to landowners as an incentive for dam removal can be done through purchase of the dam or transferring land surrounding the dam into a conservation easement.
  + Continue to develop priorities
    - Work with USFWS state highway biologists to make inroads with State Highway Administration (SHA).
      * O’Reilly: In Virginia, the Department of Transportation meets regularly to discuss projects with regulatory agencies. This provides an opportunity for collaboration.
        + Davis: Maryland holds similar meetings but interactions with SHA have been reactive; we are working to develop a relationship that leads to proactive work.
      * Andrews: MD’s SHA is considering allocating $3-5m to Bloede through mitigation banking. If so, they’ll have to identify which projects are on their list to mitigate for. This can give us a window into what they are planning for the next few years. The mitigation credit will likely be in stream restoration.
  + Include brook trout areas on priority development

**Federal Dam Removal Analysis Guidelines for Sediment**, Jennifer Bountry

* Requirements for looking at sediment with dam removal differ throughout the nation so the Bureau of Reclamation has developed these federal dam removal analysis guidelines for sediment. The guidelines are close to being ready for peer review and should be finalized in early 2017.
* In the recent decades, dam removal has been increasingly documented as a river restoration opportunity. The USGS is conducting a database development to see how many dam removal projects are undergoing monitoring.
* Guidelines needed for a wide range of dam removals and range of sediment issues (volume of sediment, sensitivity of habitat, water quality, etc.)
* A U.S. Subcommittee was tasked with developing these national guidelines to link the risk of sediment, impacts to the level of data collection, analysis, modeling, and sediment management alternatives.
* Guidelines procedures:
  + Identify Objectives
  + Collect Data
  + Determine Sediment Volume
    - Estimate expected reservoir sediment erosion
    - Is the reservoir wide or narrow relative to the river? Cohesive or non-cohesive?
    - Does the sediment need to be mechanical removed or stabilized?
      * Justification for these actions can be made if you examine what would happen to the river sediments with no action
    - Determine the ratio of reservoir sediment volume (VS) to mean annual sediment load (QS). Values of this ratio place the relative reservoir sediment volume into impact categories.
      * Criteria for negligible reservoir sediment volume: VS < 0.1 QS
      * Fast-track for projects with little to no sediment risks to avoid the extensive, unnecessary sediment analysis.
      * Alternative reconnaissance criteria such as reservoir to channel wide or dam height to bank-full height ratios.
  + Estimate Risk
    - Reservoir area: headcut into infrastructure, non-native vegetation and fish, well yield reduction
    - Downstream area: burial of habitat, elevated sediment loads, flood increase, erosion of property, burial of water intakes
    - Categorize sediment consequences into low, medium or high
      * Based on sediment size, time scale, geographic reach, & benefits of restored sediment
    - Risk = Probability x Consequence
      * Probability: reservoir sediment volume relative to mean annual sediment load
      * Consequences: potential sediment impacts should they occur
      * *The greater the risk, the greater the level of investigation.*
    - May be opportunities to stage removal to minimize risk.
  + Develop Dam Removal and Sediment Management Plans
  + Conduct Sediment Analysis
    - Negligible cases consist of simple computations
    - Small risk includes conceptual models, total stream power calculations, and mass balance calculations.
    - Medium and large risk cases include the above and a geomorphic analysis.
  + Assess Uncertainty
  + Sediment Impacts Tolerable?
  + Monitoring and Adaptive Management
* Guideline completion
  + The USBR hopes to add more case studies to increase relevancy
  + The guidelines will be shared for interagency review, finalized and posted to the web soon. Contact Jennifer if you’d like to be involved in the review.
  + ACTION: The Federal Dam Removal Analysis Guidelines for Sediment will be distributed to the workgroup for review. Any comments should be sent to [runion.kyle@epa.gov](mailto:runion.kyle@epa.gov) by noon on Friday, January 13th.

**Patapsco River Dam Removal Case Studies**, Mary Andrews

* Patapsco River Restoration
  + Habitat restoration opened 42 stem miles, 374 tributary miles
  + Target species include river herring, American shad, hickeory shad, and American eel
  + Removal of aging infrastructure as a safety hazard
  + Maryland sediment and erosion control guidelines
    - No equipment in the stream channel.
    - Diversions designed to pass a 2 year event
    - Tractive force of unlined channels not to change by more than 10%
    - No sediment release
  + Union Dam:
    - The state of Maryland spent 10 years in design for the removal of Union Dam (2010).
    - 24 ft. spillway height with a length of 220 ft.
    - Breached
    - Little to no sediment behind the dam
    - Cost: approx. $1.5m
  + Simkims Dam
    - Simkins Dam removal (2010) was opportunistic as the owner went bankrupt and couldn’t afford upkeep on the dam.
    - 10ft height with a length of 150 ft.
    - Sediment release estimated at 73,000 CY
    - Characterize reservoir sediment
      * 94% coarse sand with some gravel.
      * No contaminants found above regulatory thresholds.
      * Looking back to apply the federal guidelines to this project, the reservoir sediment volume relative to average annual sediment load falls into the medium/large range.
      * Results of DREAM (Dam Removal Express Assessment Model): Release 88-104k cy sediment.
        + Up to 4 ft immediate deposition downstream of Simkims, 2ft downstream of Bloede
      * This was the first project in MD that allowed for equipment in the channel and passive sediment release. A sediment curtain was used to reduce transfer.
    - Cost: approx. $850,000
  + Bloede Dam
    - The Bloede Dam is the first blockage on the river and is in the removal process now.
    - Height of 30 ft and a 220 ft spillway.
    - Maximum sediment behind dam: 320,000 CY
    - Cost: approx $15m (sewer line relocation raises price significantly)
    - Cross sections were made to assess sediment using impoundment probe borings and geoprobings.
    - A forest was formed on a sediment bank above the dam to be lost when the dam is removed.
    - The VS : QS falls into the large range.
    - The silt’s stratigraphic position (lowermost) mean they are difficult to remove.
    - Long term monitoring:
      * Cross sections, DEM, Structure-From-Motion, facies and site mapping, grain size analysis, permanent photo monitoring sites, biological monitoring
* Discussion
  + Andrews: Bloede was a hydropower dam but was decommissioned quickly because the sediment load filled turbines so quickly that they’d have to dig out every 2-3 years on the backside of the impoundment.
  + Pipe needs to be removed based on the depth of refusal measurements. The support structures for the pipe aren’t built down to bedrock so the sediment is required for stability.
  + Trees on the floodplain to be removed for safety reasons downstream. We don’t want them to be knocked down and flow downstream during large storms.
  + Weaver: Embrey Dam is similar to Bloede. More sediment than was behind the dam moves in ~5-10 year events. Dredging after each storm was costly and had little effect.
  + Bloede has no place other than downstream to move sediment as it sits in an incised river valley with steep slopes. Hauling became the most feasible option but was still extremely costly.

**Dam Removals Involving Sediment Release Discussion**

* Andrews: We’ve developed adaptive management plan for Simkims and Bloede which have worked well and can be used as examples. In these, we established where we might find problem areas and the triggers for these problems. Management actions were developed to resolve each issue from these triggers. The permitting agencies refer to the adaptive management plan in our permits, which helps define what our responsibility is in the river rather than being held responsible for all of them.
* Alan: In the risk assessment model, when you decide to release sediments, does the condition of contaminants being both downstream and upstream affect any actions?
  + Bountry: We’ve compared to state guidelines. Some occur naturally, but in other cases anthropogenic contaminants exceeded background or acceptable levels quickly.
* O’Brian: Where would a public outreach/involvement component be included in the 9 step process to walk through dam removal? Possibly when considering if sediment impacts are tolerable.
  + Randle: Step 2 includes a communications aspect.
* McClain: How best should we take this to regulatory agencies in our own states?
  + Bountry: Finds it especially helpful to explain the reasoning of the guidelines and apply to a case study to show where the guidelines help remove problem areas.
  + Randle: We’ve also talked about rolling this out as an educational workshop to show folks how best to use the guidelines.
    - Andrews: The workgroup could assist by hosting a workshop.
* Thompson: is the USACE involved? Are they able to incorporate into their permitting process?
  + Bountry: We’ve presented to the USACE – we are unsure if they’ve taken actions or plan to comment but they are aware.

**Wrap-up**

* Upcoming meeting topics
  + State specific meetings have been taking place which seem more helpful than more often full workgroup meetings. The FPWG may stay with one meeting a year.
  + A smaller group will have hands on meetings with a contractor regarding the update to the FPPT.
  + State FP Coordinators have agreed offline on counting dams that are blown out and have no plans for repair toward our mileage goal.
  + Funding for culvert retrofits?
    - NOAA coastal resiliency would be a good fit if you can show the target species is there.
* Adam Wright introduction, DoD contact

Adam Wright

DoD/DoN Chesapeake Bay Program

1510 Gilbert Street

Building N-26 Room 3300

Norfolk, VA 23510

Email: [adam.g.wright@navy.mil](mailto:adam.g.wright@navy.mil)

Phone: 757-341-0424

Fax: 757-341-0399

* ACTION: Mary will follow up with the American Society of Civil Engineers regarding infrastructure issues with dam removals and will keep the workgroup updated about this conversation.
* Indicator: The water year ends September 30th. Culverts will be addressed with the FPPT update – they may receive their own category for counting mileage opened.
* Virginia is hosting the annual NEAFWA conference in Norfolk on April 9-11.