Concurrent Sessions A: Dam Removal I - Dam Removal in Virginia: "Dammed If You Don't, Undammed If You Do"

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Dam Removal in Virginia: “Dammed If You Don’t, Undammed If You Do”

Fish Passage 2013

Dam Removal 1: June 25, 2013

Alan Weaver, DGIF Fish Passage Coordinator
VA’s Multi-faceted Fish Passage Approach

- Chesapeake Bay Partner (goals, etc.)
- Fishway construction (e.g. vertical slot; several Denil fishways; pool and weir)
- Breaching low-head dams
- Notching low-head dams
- Dam removal (complete and partial)
- Monitoring fishways and rivers
  - Spring adults and summer/fall juveniles
  - Target species...
Total Catch (millions of pounds)
Target Species for Fish Passage

American shad (Alosa sapidissima)

Alan Weaver, VDGIF
Alewife (*Alosa pseudoharengus*)
Blueback herring (*Alosa aestivalis*)
Hickory shad (**Alosa mediocris**)

Juvenile sea lamprey (**Petromyzon marinus**)
Striped bass (*Morone saxatilis*)

Alan Weaver
American eel elver (*Anguilla rostrata*) in Boshers fishway (James R.)
Examples of the Two Main Approaches to Restoring Fish Passage at a Dam

Technical Fishway Construction
Bosher’s Dam Vertical Slot
(James R.)

Remove the Barrier
Embrey Dam Removal
(Rappahannock R.)

Lee Walker, VDGIF

Hal Wiggins, USACOE
Charles Lake Dam, Kimages Creek at VCU Rice Center (trib to tidal James east of Richmond)
October 2006 high flow event caused Charles Lake Dam to fail
200 foot wide section removed in 2010 to restore natural tidal creek and fish passage
Results:
blueback herring
alewife
juvenile blueback herring
blue catfish
white perch
flathead catfish
gizzard shad
yellow perch
black crappie
several turtle species
- Embrey Dam (built in 1910 for hydropower)
- Rappahannock R.
- Run-of-river dam
- No longer in use
- Barrier to anadromous fish
- Partial barrier to eels
22’ high x 900’ wide
Ambursen type dam
44 bays
Inspection walkway inside Embrey Dam

Alan Weaver
1855 Crib Dam on Rappahannock River (was just upstream of Embrey)
Embrey Dam Removal Summary

- Pre-removal monitoring by VDGIF - 1995
- State sediment and feasibility studies (~ $100,000)
- Owner agreement (City of Fredericksburg)
- Corps Recon, Feasibility, Decision Document (non-fed cost sharing by City, State, County)
- Implementation - $10 million
- Senator John Warner obtained full federal support
- Too many partners to list
- Dredged 250,000 yds$^3$ of sediment pre-breach
- 10 bays blown in February 2004
- Completed mechanical removal by March 2005
- Post-removal monitoring by VDGIF
Operation “Noah-Shiva”
The Army breached a 100-foot long section of the Embrey Dam using more than 600 pounds of explosives./Robert A. Martin, The Free Lance-Star
544th Army Rangers teamed with 555th Redhorse Squadron (Airforce Reserves) to blow 130’ breach in Embrey
1910 Embrey Dam and 1855 Crib Dam Complete Removal – 2005
Stream Habitat Restoration (former Embrey pool restored to natural riverine condition)
106 miles reopened

184 miles of free-flowing river!
Female American shad 5 miles upstream of breach in 2004

Hickory shad immediately upstream of breach in 2004
American Shad Interannual Trend of Relative Abundance in the Upper Tidal Rappahannock River at Fredericksburg (boat electrofishing 1.5 miles below dam/ removal)
American Shad Interannual Trend of Relative Abundance in the Rappahannock River at Mott's Run (boat electrofishing 5 miles above dam removal)
American shad  28 miles upstream of Embrey removal – 2008 (& 1 seen in 2013)
Blueback herring – 2009 & 2013
Striped bass - 2013
Current Dam Removal Projects

- **Harvell Dam – Appomattox River (Petersburg)**
  - NOAA/USFWS/Virginia funding
  - Permitting phase
  - Probably not until 2014

- **Monumental Mills Dam (Hazel River – Rapp. R. trib)**
  - USFWS/Virginia funding
  - Possible AR-NOAA funding
  - Permitting phase
  - Neighbor significant opposition (King’s Grant claim)
Denil Fishway (very little passage success)

Harvell Dam, Appomattox River, Petersburg
Pre Removal

Bathymetric mapping

Froehling and Robertson for VDGIF
Post Removal Rendering

Bathymetric mapping

Froehling and Robertson for VDGIF
Down Stream South Bank

3D Model to show predicted conditions based on bathymetric and field survey data

Froehling and Robertson for VDGIF
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Monumental Mills Dam – Hazel River (trib to Rapp.)

Alan Weaver
Virginia Fish Passage Miles Summary

- 950 total miles reopened to date
- Approximately 2,500 miles Baywide to date
- 653 of those 950 miles are accessible by anadromous fish (fishway and removal)
- 388 of the 950 miles were reopened by removal/breach
  - 193 of the 388 are accessible by anadromous fish
  - 195 of the 388 are accessible by catadromous and resident fish only
Dam Removal Challenges

- Owner permission/cooperation
- Neighbor/community support
- Local river group support
- Funding (especially looking forward)
- Land ownership post-removal (reliction)
- Historical mitigation
- Environmental permitting
  - Sediment release
  - Time of year restrictions (anadromous fish; fw mussels)
Chesapeake Fish Passage Prioritization
James AMS and dams

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