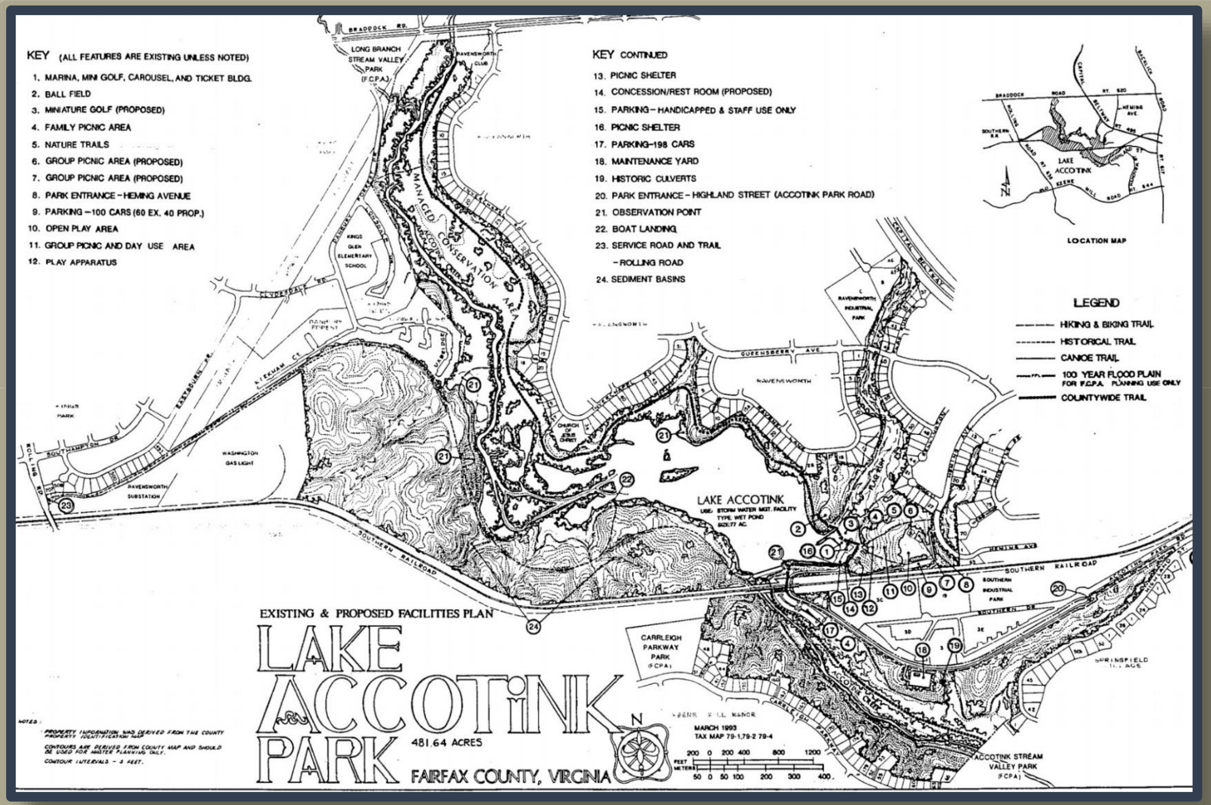
Lake Accotink Park Master Plan Revision

PROJECT BACKGROUND

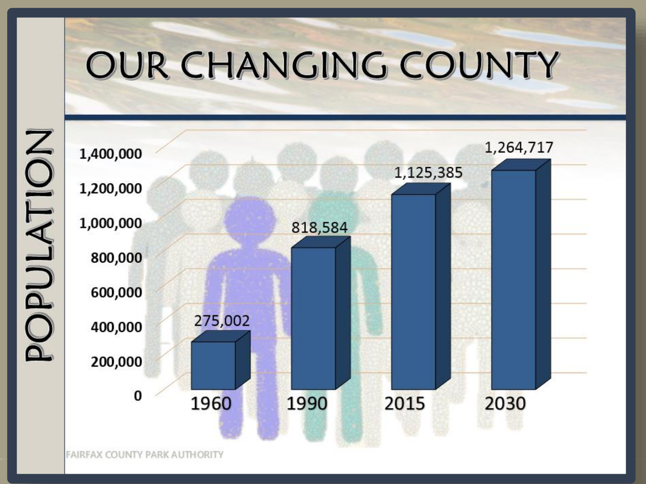
What is a master plan and why are we revising it?

- ❑ A park master plan is a document developed with community input intended to serve as a long-range planning guide for future development within a specific park. The purpose of a park master plan is to:
  - Create a site-specific, long-range vision for the park
  - Identify resources worthy of protection
  - Assess site conditions and community concerns
  - Provide a general guide for appropriate park uses
  - Establish the general location for proposed uses
- ❑ As the character of Fairfax County and the communities around the park change over time, it is prudent to review an approved master plan from time to time, to assess how well the park continues to meet the needs of the community.

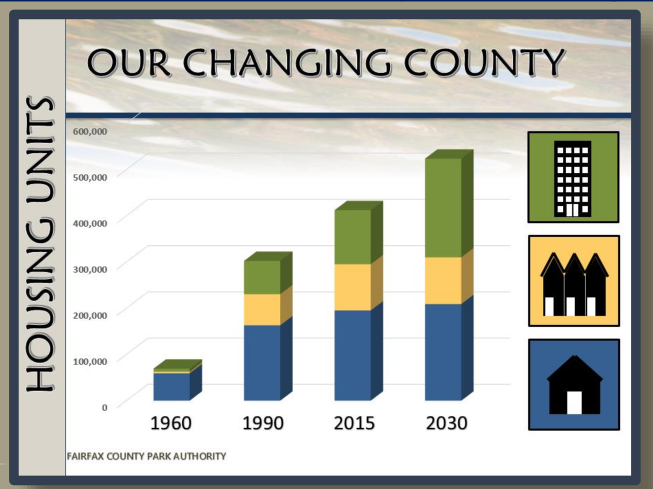


- ❑ The master plan for Lake Accotink Park was last updated in 1993. Fairfax County and the Springfield community have changed a lot over that timeframe and indicated that it would be a good time to review the plan, touch base with the community, and consider if any changes would be in order.
- ❑ The timing to review the plan was supported by the allocation of funds by the Board of Supervisors to the Park Authority for the purpose of analyzing the long-standing problem of sediment flowing into the lake. Since the lake was created in 1943, it has been inundated with sediment from upstream erosion, resulting in the need to dredge the lake on three separate occasions. As costs continue to increase, a goal is to find a more sustainable solution for how to manage this site.

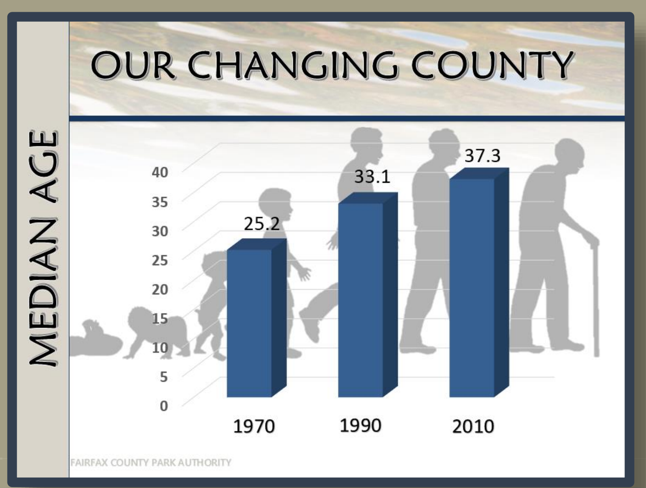
How is our county changing?



Fairfax County's population has grown tremendously since Lake Accotink first became a park in the 1960s.



More and more residents live in smaller homes without the traditional yard. They are seeking outdoor places to relax and recreate.



Changing demographics, such as age, influence the types of facilities that people want to experience at a park.

Has there always a lake here?

- ❑ No! It used to be just a stream. Lake Accotink's background is tied to our country's military history. The War Department purchased a large plot of land to serve as a summer camp for the engineering corps. When the camp was turned into a more permanent facility – named Camp A. A. Humphreys – the dam was constructed in 1918 to create a source of drinking water. The original dam was removed a few short years later in 1922 because it threatened the stability of the nearby train trestle.

Picture of the original 1918 dam

Mid-construction of the 1943 dam

- ❑ Ultimately, the Army Corps of Engineers rebuilt the dam in 1943, creating the lake we know today. The existing dam has been maintained and repaired but remains essentially the same dam constructed in 1943.
- ❑ As the property became of less importance to the federal government, the Park Authority began leasing the land in 1960.
- ❑ In 1965, the Park Authority was able to purchase the property through the Federal Lands to Parks program, establishing Lake Accotink Park.

What has happened with the master plan revision thus far?

- ❑ A goal of the master plan for Lake Accotink Park is to find a balance between meeting the recreational needs of the community while protecting natural and cultural resources.

- ❑ That makes it important to hear what the community thinks. So far, the Park Authority has met with the community on numerous occasions to gauge their preference on a variety of topics.
  - March 14, 2016 - Public Information meeting and Open House
  - May 16, 2016 – Lake Sustainability Workshop
  - October 27, 2016 – Facilities and Programming Workshop
  - December 5, 2016 – Trails Workshop
  - April 24, 2017 – Natural and Cultural Resources Workshop
- ❑ We've reached out to connect with visitors in the park and posted signs in the park to make people aware of our project. We've connected through schools, places of worship, and local businesses to get more people involved. We've posted on Facebook and done press releases. We've posted surveys on the project webpage and received thousands of responses and almost daily receive requests from individuals who want to be kept in the loop about the project.

Lake Accotink Park Master Plan Revision

PROJECT BACKGROUND

So what's next?

- After tonight's meeting, the master plan team will prepare a draft plan based on all the input we've received and the research that has been done.
- It is currently anticipated that we will have a draft plan to share with you during the fall of 2018. We try not to hold large meetings during the summer when lots of folks are on vacation.
- We'll post the draft plan on line for you to review and host another meeting when we present the plan to you. It's an opportunity for us to say "This is what we heard from you. Did we get it right?" If you have questions, we'll aim to answer them!
- After the plan is presented there will be at least a 30-day comment period to share your thoughts, opinions, concerns, and hopefully a few "attaboys".

Is it too late to get involved?

- Not at all! Your thoughts and comments are welcomed throughout the process!
- You can always reach us by email. That's probably the easiest way.

parkmail@fairfaxcounty.gov

- We're told that snail mail still works, so you have that option too.

Gayle Hooper, Project Manager
Planning & Development Division, FCPA
12055 Government Center Parkway, Suite 406
Fairfax, Virginia 22035

- More of a conversationalist? Here's our phone number.

703-324-8700

- Or find out more on our project webpage

https://www.fairfaxcounty.gov/parks/planning-development/lakeaccotink

Lake Accotink Management Option "A"

NO DIRECT MANAGEMENT

Description

- No specific action taken to address the influx of silt within the lake (although Stormwater Planning will continue to work to improve upstream conditions)
- Allow lake to continue to fill with silt
- Existing dam structure would remain in place

Result

- Estimated loss of recreational value by 2025 or so
- Continued infill with vegetation, similar to upstream condition
- Possible extension of trail network into newly created wetland areas; however, this would be in the long term as infill would be slow and incremental

Primary Cost Elements

- Existing dam structure would require yearly maintenance and repair
- Existing dam structure would likely require significant repair and upgrades on an estimated 30-year cycle

Lake Accotink Management Option "A"

NO DIRECT MANAGEMENT

Establishing the Program

- No dredging necessary
- No offsite disposal of sediment necessary (no trucking of sediment through adjacent communities)

Establishing the Program

$ 0

Maintaining the Program

- Yearly dam maintenance and repair
- 30-year cycle for major dam repairs
- No maintenance dredging required

Yearly Dam Maintenance

$13,000 annually

Major Dam Repairs

$4,700,000 every 30 years

Neighborhood Impacts

- No hauling of sediment through neighborhoods

Recreational Considerations

- Continued decline in recreational value of lake
- Loss of recreational value of lake by approx. 2025
- Possibility to extend nature trails and walkways

Environmental Considerations

- Sediment capture levels will continue to decline until eventually reaching a state of equilibrium
- Increasing areas of wetland vegetation
  - Provides additional habitat
  - Provides additional filtering of adjacent run off
  - Without direct management, will likely be heavily impacted by invasive species
- Retention of dam structure continues to prevent migration of aquatic species along Accotink Creek, although may afford some protection of species immediately below the dam.

Lake Accotink Management Option "B"

CONTINUE CURRENT DREDGING METHOD

Description

- This approach would continue to provide major dredging of the main body of the lake at roughly 15-year intervals
- Sediment removed from the lake would need to be hauled from the park, requiring approx. 35,000 truck trips routed through adjacent neighborhoods
- The existing dam structure would remain in place

Result

- Recreational value of the lake would be retained, maintaining opportunities for boating
- Dredging operations would interrupt usage of the lake and aesthetics of the park for approximately 2 years during each dredging operation

Primary Cost Elements

- Removal of approx. 350,000 cubic yards of sediment with each dredge
- Trucking of dredge material offsite for disposal
- Existing dam structure would require yearly maintenance and repair
- Existing dam structure would likely require significant repair and upgrades on an estimated 30-year cycle

Aerial Image after the 2007-2008 dredging operation, indicating the previous dredging pattern

Lake Accotink Management Option "B"

CONTINUE CURRENT DREDGING METHOD

Establishing the Program

- ❑ Dredging the main body of the lake to remove approx. 350,000 cubic yards of sediment
- ❑ Offsite disposal of sediment necessary

Initial Dredge
$ 29,276,000

Maintaining the Program

- ❑ Repeated dredging every 15 years with offside disposal of sediment
- ❑ Yearly dam maintenance and repair
- ❑ 30-year cycle for major dam repairs

Repeated Dredging
$ 29,276,000+
Every 15 years

Dam Maintenance
$13,000 annually
$4,700,000 / 30 years

Neighborhood Impacts

- ❑ Hauling approx. 35,000 truckloads of sediment through adjacent neighborhoods for disposal with the initial dredge and each 15-year repeated dredge operation

Recreational Considerations

- ❑ Continued recreational value of lake for boating
- ❑ Interruption of recreational use of the lake and park aesthetics for approximately two years during each dredging operation

Environmental Considerations

- ❑ Retention of current levels of sediment capture
- ❑ Retention of dam structure continues to prevent migration of aquatic species along Accotink Creek although may provide some protection for species immediately below the dam
- ❑ No significant improvement to water quality within the lake or watershed.

Lake Accotink Management Option "C"

ANNUAL DREDGING WITH SEDIMENT FOREBAY

Description

- ❑ This approach would initially provide a major dredge of the lake, removing 350,000 cubic yards of sediment, plus an additional 150,000 cubic yards of sediment to create a forebay at the upper end of the lake
- ❑ All 500,000 cubic yards of sediment removed from the lake would need to be hauled from the park, requiring approx. 50,000 truck trips routed through adjacent neighborhoods
- ❑ After the initial dredge and forebay construction, smaller dredges would remove approx. 12,000 cubic yards of sediment from the forebay every year or two, routing an additional 1,200 truck trips through the community
- ❑ The existing dam structure would remain in place

Result

- ❑ Recreational value of the lake would be retained, maintaining opportunities for boating
- ❑ Initial dredging operations would interrupt usage of the lake and aesthetics of the park for approximately 2 years during each dredging operation
- ❑ Annual dredging operations would have a much lower impact on usage of the lake and park aesthetics

Primary Cost Elements

- ❑ Removal of approx. 500,000 cubic yards of sediment with the initial dredging operation
- ❑ Annual removal of approx. 1,200 cubic yards of sediment material
- ❑ Trucking of all dredge material offsite for disposal
- ❑ Existing dam structure would require yearly maintenance and repair
- ❑ Existing dam structure would likely require significant repair and upgrades on an estimated 30-year cycle

Potential location of upstream sediment forebay

Potential location of in-lake sediment forebay

Lake Accotink Management Option "C"

ANNUAL DREDGING WITH SEDIMENT FOREBAY

Establishing the Program

- Dredging the main body of the lake to remove approx. 350,000 cubic yards of sediment
- Dredging of an additional 150,000 cubic yards to establish the sediment forebay
- Offsite disposal of sediment necessary

Initial Dredging
$ 45,044,000

Maintaining the Program

- Annual/Biennial dredging of the sediment forebay to remove approx. 12,000 cubic yards of sediment
- Offsite disposal of sediment necessary
- Full dredge required every 30 to 40 years

Annual/Biennial Dredging
$ 776,472

Dam Maintenance
$13,000 annually
$4,700,000 / 30 years

Neighborhood Impacts

- Hauling approx. 50,000 truckloads of sediment through adjacent neighborhoods for disposal with establishment of the management plan
- Every year or two, hauling an additional 1,200 truckloads of sediment through adjacent neighborhoods for maintenance of the forebay

Recreational Considerations

- Continued recreational value of lake for boating
- Interruption of recreational use of the lake and park aesthetics for approx. two years during the initial dredge and establishment of the forebay
- Minimal interruption of recreational use of the lake during annual/biennial dredge of forebay

Environmental Considerations

- Enhanced levels of sediment capture relative to current management method
- Establishment of the forebay would impact areas that have currently reverted to a wetland condition
- Retention of dam structure continues to prevent migration of aquatic species along Accotink Creek although may provide some limited protection for species immediately below the dam

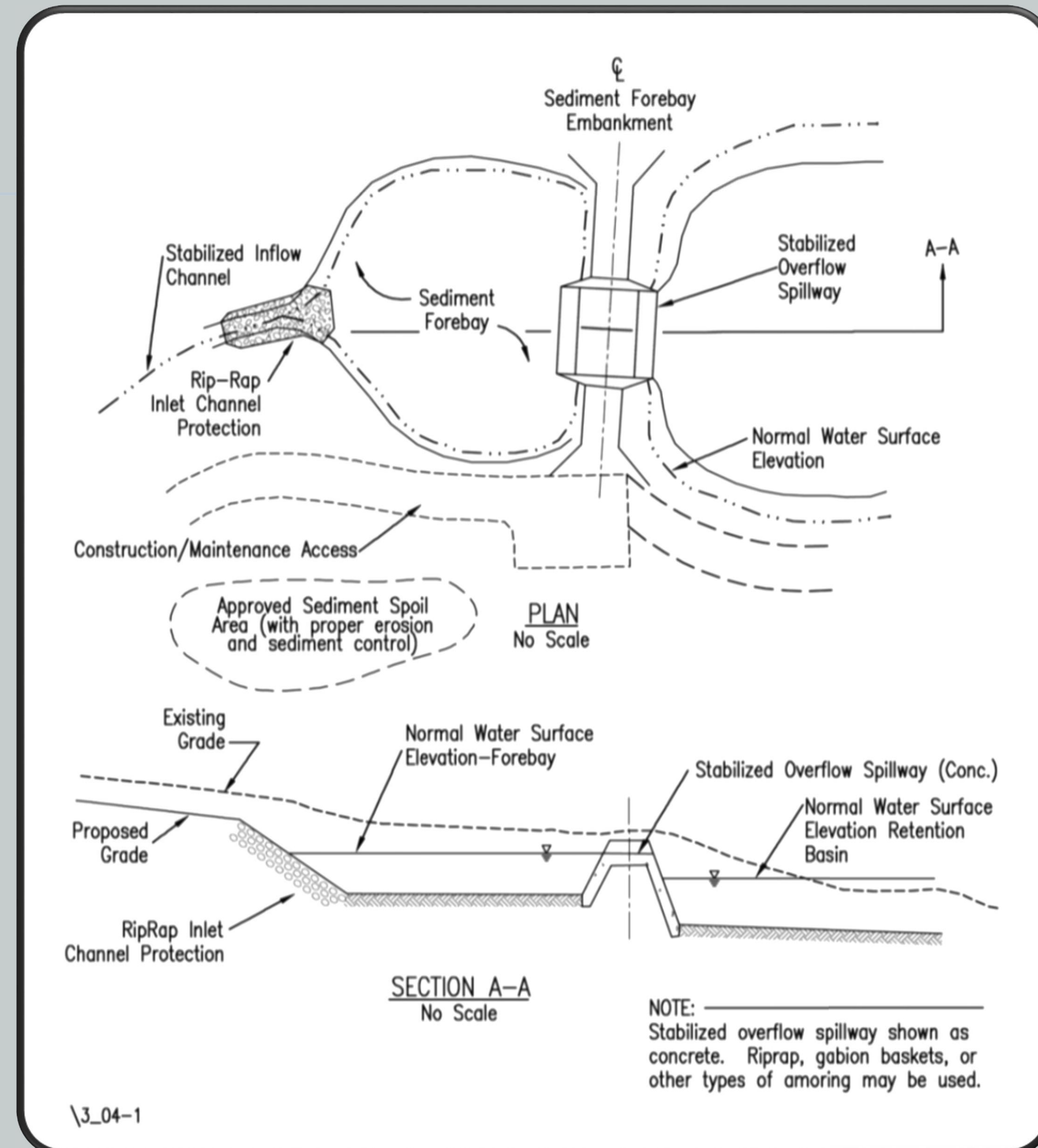
Lake Accotink Management Option "C"

BIENNIAL DREDGING WITH SEDIMENT FOREBAYS

Just WHAT is a forebay?

A forebay is a human-made pool of water in front of a larger body of water. The larger body of water may be natural or engineered. Forebays serve a number of functions in a variety of settings, and they can be found in many regions of the world. While constructing a forebay can add to the initial costs of water control and containment, it reduces maintenance costs in the long term, making it a cost effective move in many settings.

Commonly, a forebay is used to trap sediment and debris. A sediment forebay helps to isolate the sediment deposition in an accessible area, which facilitates maintenance efforts. This keeps the larger body of water cleaner and clearer. For things like dams, which often become clogged with sediment, a forebay can extend the life of the dam and reduce maintenance costs. Trapping sediment is also useful for preserving natural bodies of water which would slowly fill in over time, if people want to keep a body of water clear for their use. In reservoirs used to store water for human uses, reducing sediment deposition in the lake with a forebay increases capacity, reduces maintenance, and cuts down on the need for filtering.



Typical Sediment Forebay Plan and Section

From the Virginia Stormwater Management Handbook

Lake Accotink Management Option "D"

INSTALLATION OF UPSTREAM "BEAVER DAMS"

Description

- ❑ Installation of sheet pile "walls" within the channel to encourage sediment deposition.
- ❑ Will convert the existing forested wetland areas to "beaver swamps" over time
- ❑ These features are not accessible for maintenance

Result

- ❑ This approach provides only short-term benefit to sediment reduction and, within the limited context of Lake Accotink Park, does not serve to resolve the overall condition of Lake Accotink (although it may remain a valid strategy within a larger, watershed management approach)
- ❑ This approach would entail significant disturbance of relatively stable upstream areas.

Cost Elements

- ❑ Installation of "beaver dam" structures
- ❑ Mitigation of wetland impacts

Conceptual Image of "Beaver Dam" Installation

Although included in the study, this option has been removed from consideration due to the extent of impacts with only limited, short-term benefits.

Lake Accotink Management Option "E"

SINGLE THREAD CHANNEL, RECLAIMED LAND

Description

- This management approach would seek to restore Accotink Creek to a condition reflective of the original water channel that existed prior to the steam being dammed.
- The recreated stream channel would be sized to accommodate future storm flows
- Surrounding land area would be reforested to create wetland habitat to support area wildlife and increase biodiversity

Result

- Recreational value of the lake would be eliminated; however, opportunities for trails and nature observation areas would be increased
- Eliminates concern for dam safety and potential downstream impacts if the dam were to be breached.

Primary Cost Elements

- The primary cost factor is the initial establishment of the management plan (revision to the dam structure, "sculpting" of sediment to establish the stream channel, reforestation)
- Annual maintenance would focus on insuring the vegetation is established well and addressing any invasive species that seek to infill. This cost would reduce some over the years as the vegetation becomes better established.

Conceptual Alignment of Single Thread Channel

Lake Accotink Management Option "E"

SINGLE THREAD CHANNEL, RECLAIMED LAND

Establishing the Program

- ❑ Partial removal of existing dam structure
- ❑ "Sculpting" of existing sediment in place to establish a defined stream channel, sized to accommodate necessary storm flow
- ❑ Reforestation of reclaimed land area
- ❑ No dredging operation required

Maintaining the Program

- ❑ Annual maintenance to assure that vegetation is appropriately established and invasive species minimized (required maintenance will diminish over time as landscape becomes established).
- ❑ Eliminates the need for any continued dredging operations

Neighborhood Impacts

- ❑ Establishment utilizes sediment on site. No requirement to haul material off-site for establishment of program or for long-term maintenance.

Recreational Considerations

- ❑ Loss of recreational lake
- ❑ Opportunity to create new wetland trails and observation areas

Environmental Considerations

- ❑ Elimination of sediment capture with potential impacts downstream
- ❑ Removal (or partial removal) of dam structure might allow aquatic species to migrate further upstream but may also be detrimental to species immediately downstream of the existing dam
- ❑ Creation of additional landscaped buffer areas to filter runoff
- ❑ Creation of additional habitat area for wildlife

Lake Accotink Management Option "E"

SINGLE THREAD CHANNEL, RECLAIMED LAND

Existing Dam Spillway

Conceptual Image of Lowered and Notched Spillway
with Reclaimed, Vegetated Land Area

Options "E" and "F" require modification to the existing dam structure to allow water to flow through without significant retention of water behind it. This could conceivably be done in a variety of ways.

There is a possibility that enough of the structure could be removed so that it, technically, would no longer be considered a dam. This would eliminate the need for weekly maintenance operations, costly long term repairs, and continued payment of insurance to cover the possibility of a dam breach.

Restoring a more natural flow of water would permit aquatic species greater flexibility to travel up and down stream.

Removal of the dam structure would eliminate the lake as a sediment trap. There may be some filtering out of sediment by the expansion of vegetated land area; however, much of the sediment flow would continue down stream.

The images to the left demonstrate conceptually how the dam and the area around it might change if Options "E" of "F" are chosen.

Lake Accotink Management Option “F”

SINGLE THREAD CHANNEL WITH SMALLER LAKE

Description

- Similar to Option E, this management approach would modify the existing dam to allow creation of a single thread stream channel through “sculpting” of the existing sediment.
- Sediment would be sculpted to create a rise on the north side of the stream channel, creating a space to retain a smaller lake for recreational purposes.
- Reclaimed land area would be revegetated, creating new habitat areas
- Trails might be expanded into the vegetated area for nature observation

Result

- Recreational value of the lake would be retained but within a reduced footprint (Approximately 20 acres, about 8 feet deep)
- Smaller lake will be off-line from the main flow of water. Flag Run, the primary tributary of the smaller lake, is being restored, minimizing the influx of sediment to the new, smaller lake
- Eliminates concern for dam safety and potential downstream impacts if the dam were to be breached.

Primary Cost Elements

- The primary cost factor is the initial establishment of the management plan (revision to the dam structure, “sculpting” of sediment to establish the stream channel, reforestation)
- Annual maintenance would focus on insuring the vegetation is established well and addressing any invasive species that seek to infill. This cost would reduce some over the years as the vegetation becomes better established.

Conceptual Alignment of Single Thread Channel with Smaller, Off-line Lake

Lake Accotink Management Option "F"

SINGLE THREAD CHANNEL WITH SMALLER LAKE

Establishing the Program

- Partial removal of existing dam structure
- "Sculpting" of existing sediment in place to establish a defined stream channel, sized to accommodate necessary storm flow
- Reforestation of reclaimed land area
- No dredging required/No offsite transport of sediment

Maintaining the Program

- Annual maintenance to assure that vegetation is appropriately established and invasive species minimized (required maintenance will diminish over time as landscape becomes established).
- Eliminates the need for any continued dredging operations

Neighborhood Impacts

- Establishment utilizes sediment on site. No requirement to haul material off-site for establishment of program or for long-term maintenance.

Recreational Considerations

- Retention of recreational lake, although in a notably smaller footprint (±20 acres)
- Opportunity to create new wetland trails and observation areas

Environmental Considerations

- Elimination of sediment capture with potential impacts downstream
- Removal (or partial removal) of dam structure would allow aquatic species to migrate further upstream but may also be detrimental to species immediately downstream of the existing dam
- Creation of additional landscaped buffer areas to filter runoff
- Greatest opportunity to enhance biodiversity through the creation of multiple habitat types.

Lake Accotink Management Option “F”

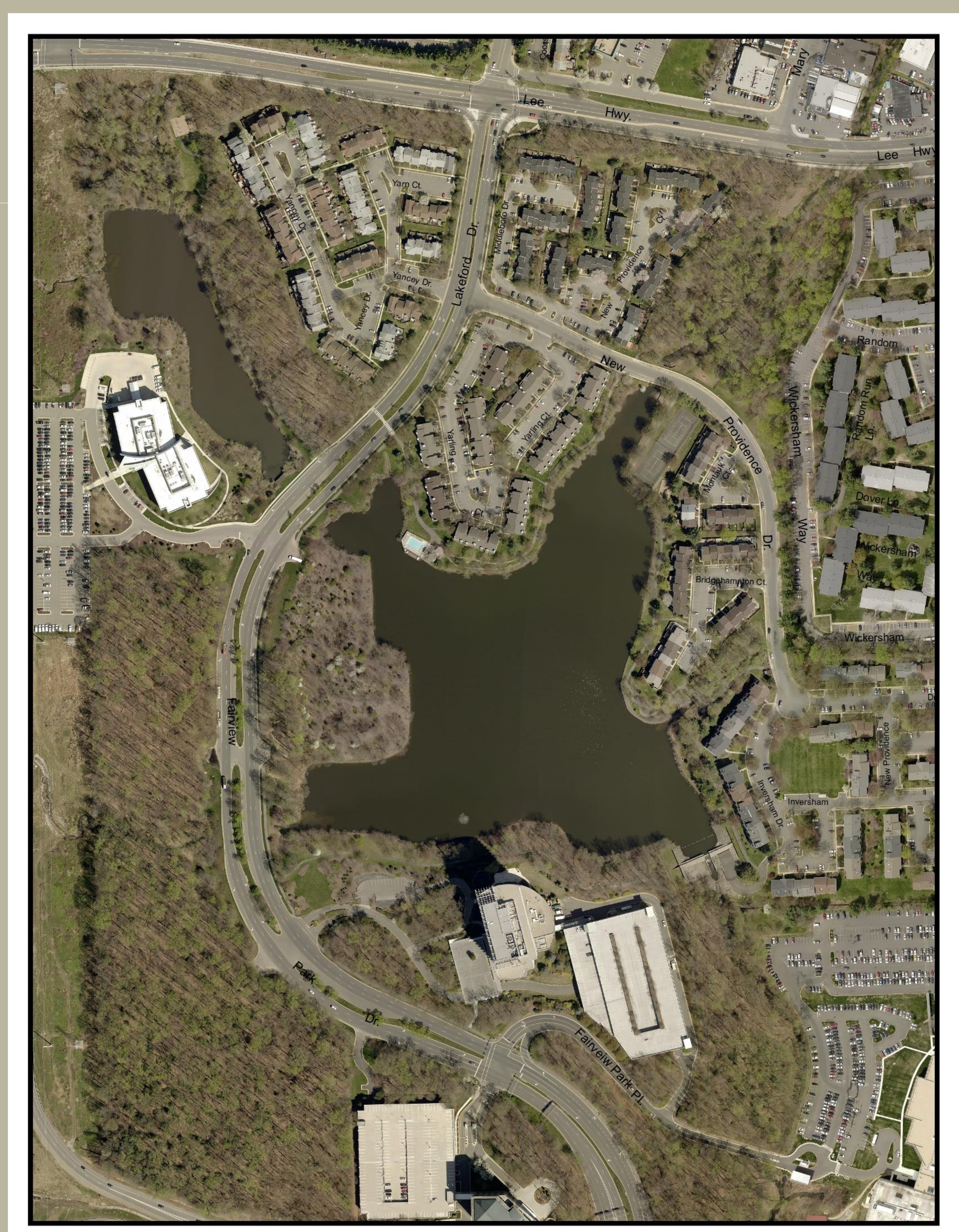
SINGLE THREAD CHANNEL WITH SMALLER LAKE

Comparable Lake Sizes

When considering Option “F”, it may be helpful to think of some similarly sized lakes for a frame of reference.

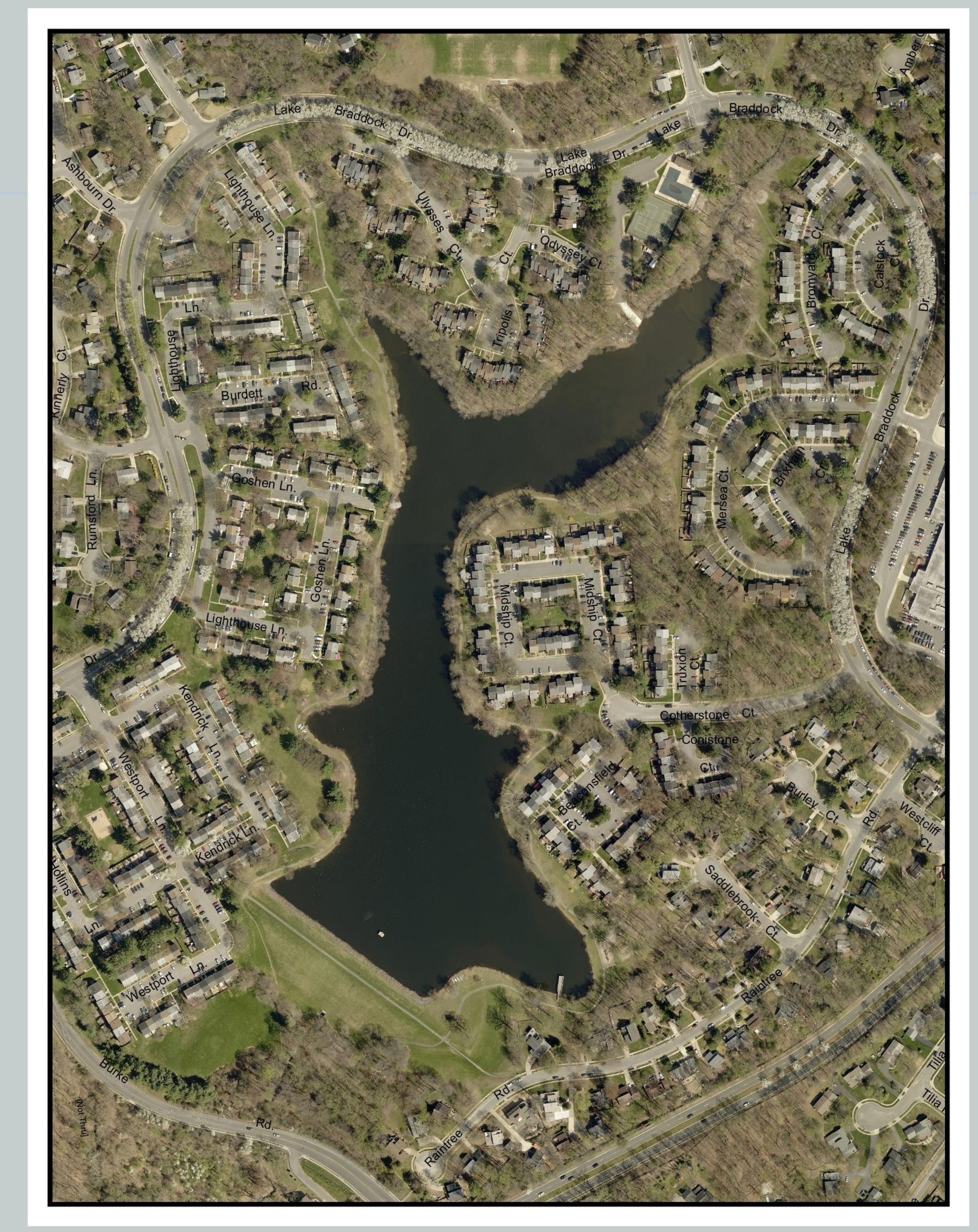
Fairview Lake

± 16 acres in Falls Church



Lake Braddock

± 18 acres in Burke



Lake Accotink Management Option “F”

SINGLE THREAD CHANNEL WITH SMALLER LAKE

Comparable Lake Sizes

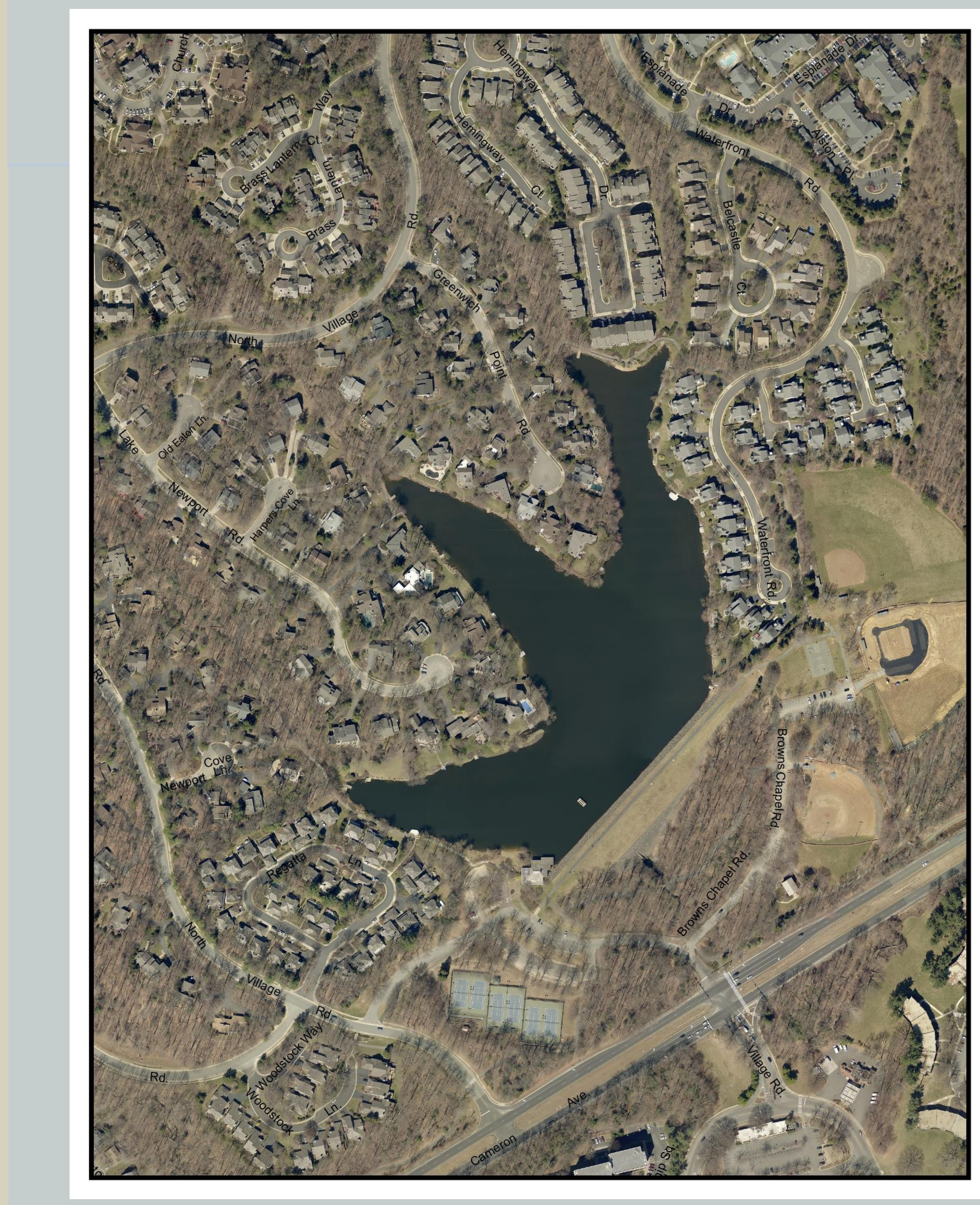
When considering Option “F”, it may be helpful to think of some similarly sized lakes for a frame of reference.

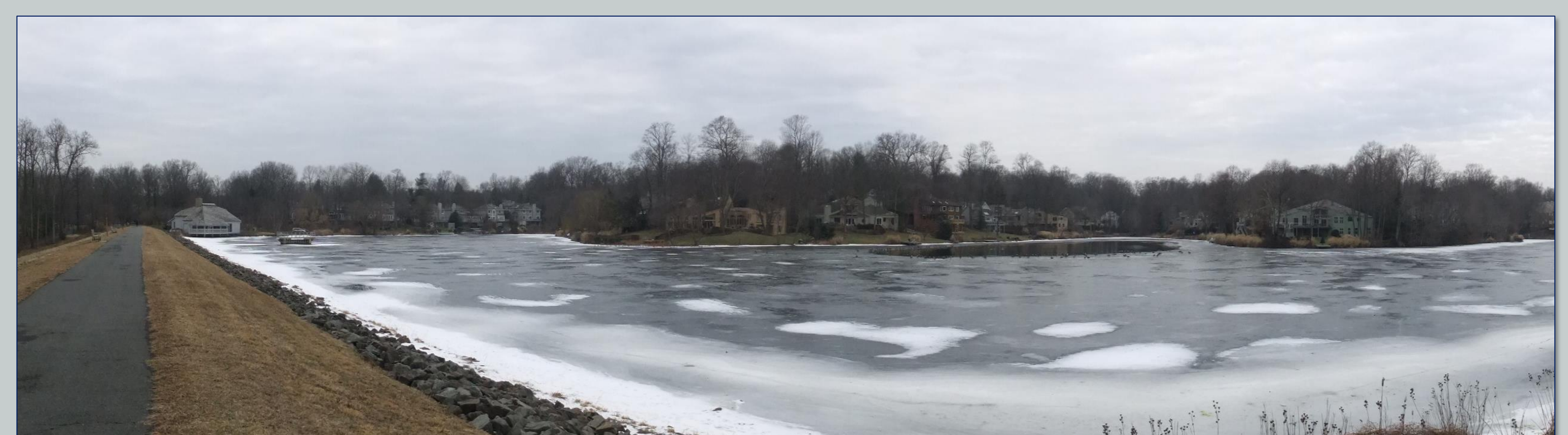
Lake Fairfax

± 20 acres in Reston

Lake Newport

± 14 acres in Reston





Lake Accotink Management Option “F”

SINGLE THREAD CHANNEL WITH SMALLER LAKE

These images were created to help visualize how the view from the shoreline might change if Option “F” were to be implemented.

A View from the Marina

B View from the North Shore of the Lake

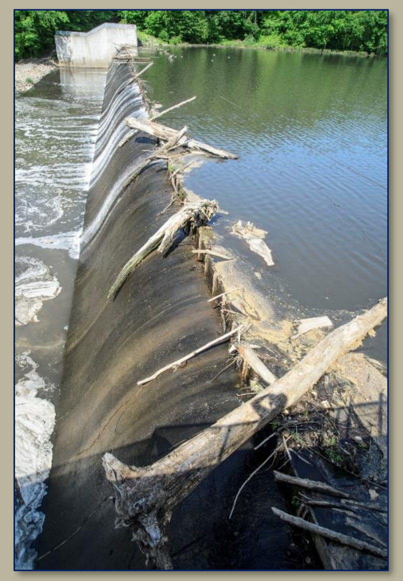
REMOVING THE DAM

The fragmentation of river habitats through dams and poorly designed culverts is one of the primary threats to aquatic species in the United States (Collier et al. 1997, Graf 1999). The impact of fragmentation on aquatic species generally involves loss of access to quality habitat for one or more life stages of a species. For example, dams and impassable culverts limit the ability of migratory fish species to reach preferred spawning habitats and thermal refuges.

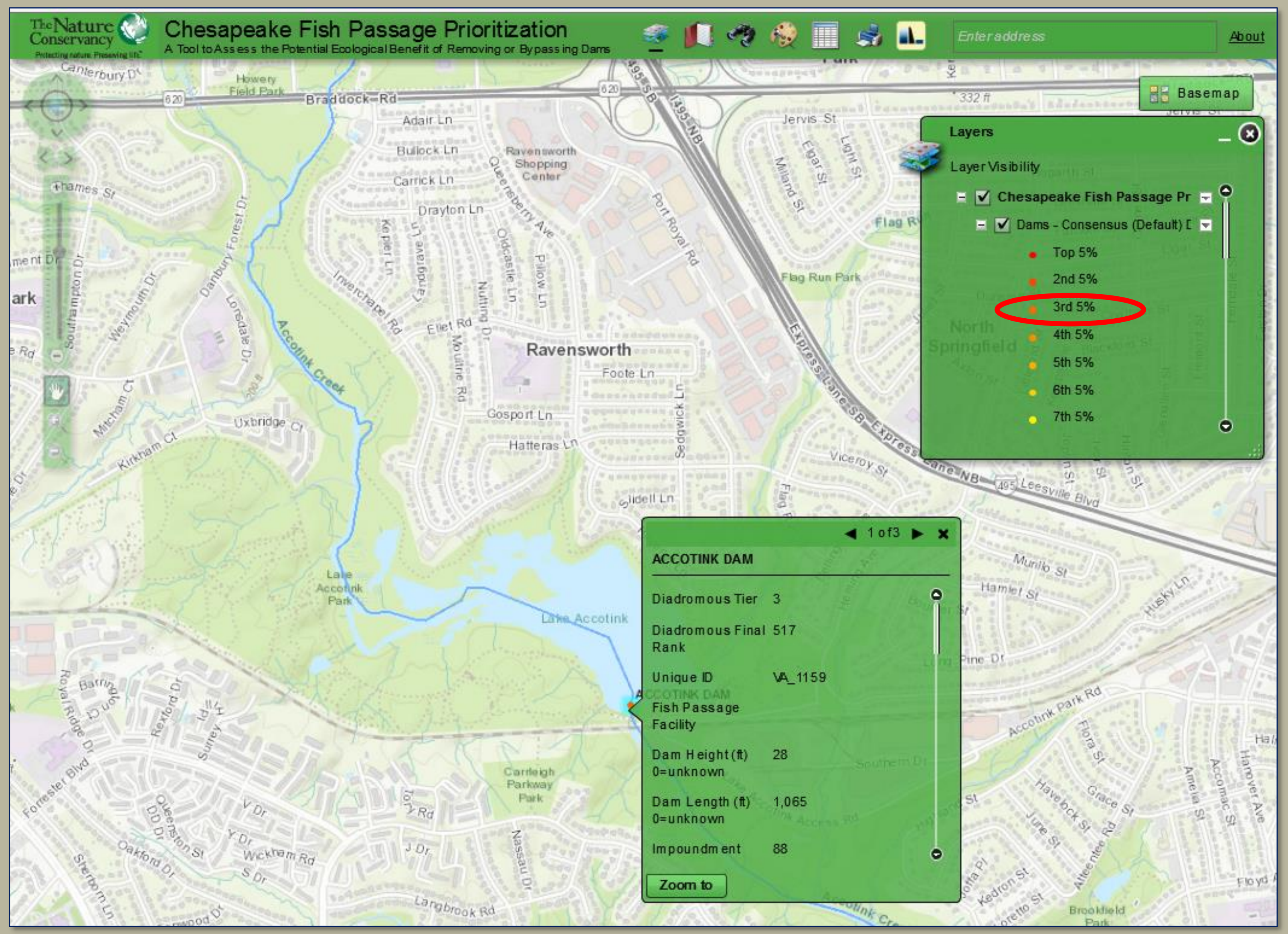
Some dams provide valuable services to society including low or zero-emission hydro power, flood control, and irrigation. Many more dams, however, no longer provide the services for which they were designed (e.g. old mill dams) or are inefficient due to age or design. However, these dams still create barriers to aquatic organism passage.

Through the signing of multiple Chesapeake Bay program agreements and funding by the US Fish and Wildlife Service and the NOAA Restoration Center, the Chesapeake Fish Passage Prioritization Project identified 3,357 miles of streams to be opened to benefit Alewife, blueback herring, American shad, hickory shad, American eel or brook trout. In many cases, these connectivity restoration projects have yielded ecological benefits such as increased anadromous fish runs, improved habitat quality for brook trout, and expanded mussel populations.

Based on an evaluation of 40 separate metrics, the Chesapeake Fish Passage Prioritization Project has ranked the dam at Lake Accotink as a high priority for removal to support the movement of migratory fish species.



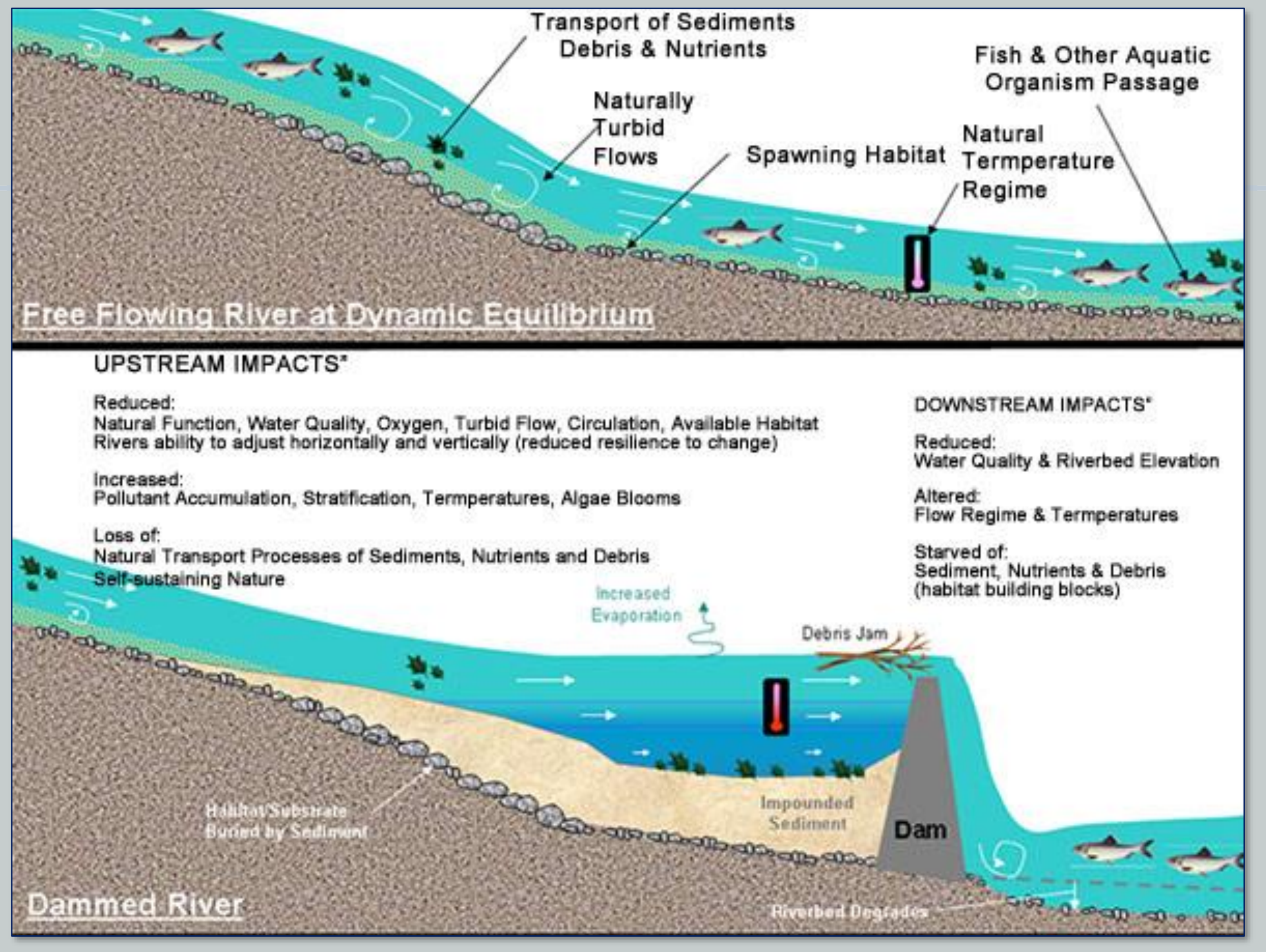
Lake Accotink dam



Screen Shot from the Chesapeake Fish Passage Prioritization Project Mapping Tool showing Lake Accotink dam as a Tier 3 (out of 20) priority for removal

Here are a few thoughts to consider

- Reproductive success, which often depends on appropriate timing for reaching spawning or breeding habits, can be improved by the removal of dams that prevent the migration of aquatic organisms. Dam removal decreases the risk of mortality for organisms that would otherwise have to pass through dams. For instance, many dams across the United States have no fish passage structures; removal of these dams allow migratory and resident fish populations to gain access to habitats blocked off by dams.
- Dam removal can enable the return of native species by restoring the pre-dam, riverine habitats on which native species depend.
- When natural flow fluctuations are restored to a river, biodiversity and population densities of native aquatic organisms increase.
- Soon after dam removal, streams rapidly begin showing signs of restoration. Fish migrate freely up and down stream, seasonal flow changes are observed, clogs of silt that impair spawning and feeding dissipate along with unnatural temperature variations.
- Researchers believe that dam removal benefits non-migrating fish and other organisms as well. One study determined that darter populations likely increased due to improved habitat quality and access to new river regions created by dam removal.



- Studies demonstrate that dam removal restores natural water flows, which serve to inundate terrestrial areas, such as flood plains. If the dam were to be removed, riparian areas would likely flood more frequently, promoting riparian plant growth, revitalizing inland wetlands, and creating small ephemeral ponds which serve as nurseries for aquatic species. Furthermore, the rise in riparian vegetation would create new habitat and food for a wide range of species.
- It is important to note that in some dam removal cases, the diversity of certain organisms that prefer lake-like conditions may decline.

Coming to a neighborhood near you?

Options "B" and "C" both include some form of dredging. In the past, there have been opportunities to dispose of the dredged sediment within the park or at a nearby concrete plant.

Unfortunately, those options are not available to us. If Options "B" or "C" are chosen for the management of Lake Accotink, the spoils from the dredging will likely need to be trucked off-site for disposal.

Although the logistics have not been studied in detail, it can be expected that, due to the location of the park and limited access options, most, if not all, of those truck trips will be forced to travel through the adjacent residential communities.

Here are a few points you might want to keep in mind as you evaluate the options.

How many trucks?

Option "B"

Option "B" would seek to remove 350,000 cubic yards of sediment with each 15 year dredging cycle.

- *That would mean **35,000** truckloads or*
- *An average of **68** truck trips per day for two years or*
- *Approximately one truck every **12** minutes.*

Option "C"

Option "C" would seek to remove 500,000 cubic yards of sediment with the initial dredge.

- *That would mean **50,000** truckloads or*
- *an average of **108** truck trips per day for two years, or*
- *Approximately one truck every **8** minutes*

Option "C" would also do smaller dredges on an annual or biennial basis to remove 12,000 cubic yards.

- *That would mean an additional **1,200** truckloads every year or two.*

ASSUMPTIONS:

Based on the type of road the trucks will need to traverse, it is reasonable to assume the use of dump trucks capable of hauling 10 cubic yards at a time;

And, in the past, major dredging operations have lasted two years. Minus weekends and a few holidays, let's assume about 255 working days in a year or 510 days in two years.

And, per Fairfax County Noise Ordinance standards, construction activities can occur between 7 am to 9 pm on weekdays (14 hours a day)

What would be the impacts of so many trucks?

Embarking on an aggressive dredging program would require development of a construction management plan. Procedures would be put in place to minimize the impacts of construction, but, the impacts would not be eliminated.

- *Significant fuel consumption*
- *Related impacts to air quality from the increase in emissions*
- *Noise (Per the recently updated Noise Ordinance, construction activities can occur from 7 am until 9 pm on weekdays; 9 am to 9 pm on Saturdays, Sundays, and federal holidays)*
- *Dust*
- *Increased traffic congestion*
- *Impact to road surfaces from repeated use by heavy duty vehicles*
- *Likely temporary loss of parking availability for park patrons for vehicle staging*
- *Safety concerns related to balancing the needs of construction vehicles and park patrons*
- *Visual impacts on park experience*
- *Impacts to surrounding environment*
- *Potential impacts to cultural resources*