INDEX

1 Summary 4
- Loudoun Water Mission 6
- Strategic Plan Vision 6
- Strategic Plan Principles 8

2 Site Analysis 10
- Connect the Corridor 12
- Expand Community 14
- Amplify Character 18

3 Concept Plan 20
- Reservoir Precincts 22
- Overall Site Plan 30
- Focus Areas 31
- Reservoir Park 32
- Reservoir Preserve 36
- Western Access 40

4 Design Guidelines 44
- Access and Parking 46
- Entry trails 48
- Primary trails 48
- Boardwalks 48
- Hiking trails 48
- Overlooks 50
- Shelters and Pavilions 50
- Water-based Play 50
- Storm Water Gardens 50
- Edge Ecologies 51

A1 Appendix | Site Discovery 52
- County Inventory and Analysis 54
- Regional References 58
- Ecological Strategies 59
- Scale Comparisons 60
- Identity and Access 62
- Landscape Structure 64
- Existing Character 66
- Existing Use and Program 68

A2 Appendix | Design Workshop 72
- Character Precedent Review 74
- Concept Design Studies 76

A3 Appendix | Phase 1 Concept Plans 78
- Concept Plan Draft | Phase 1 80
- Site Concept Studies 82
- Precinct Concept Studies 83

1 SUMMARY

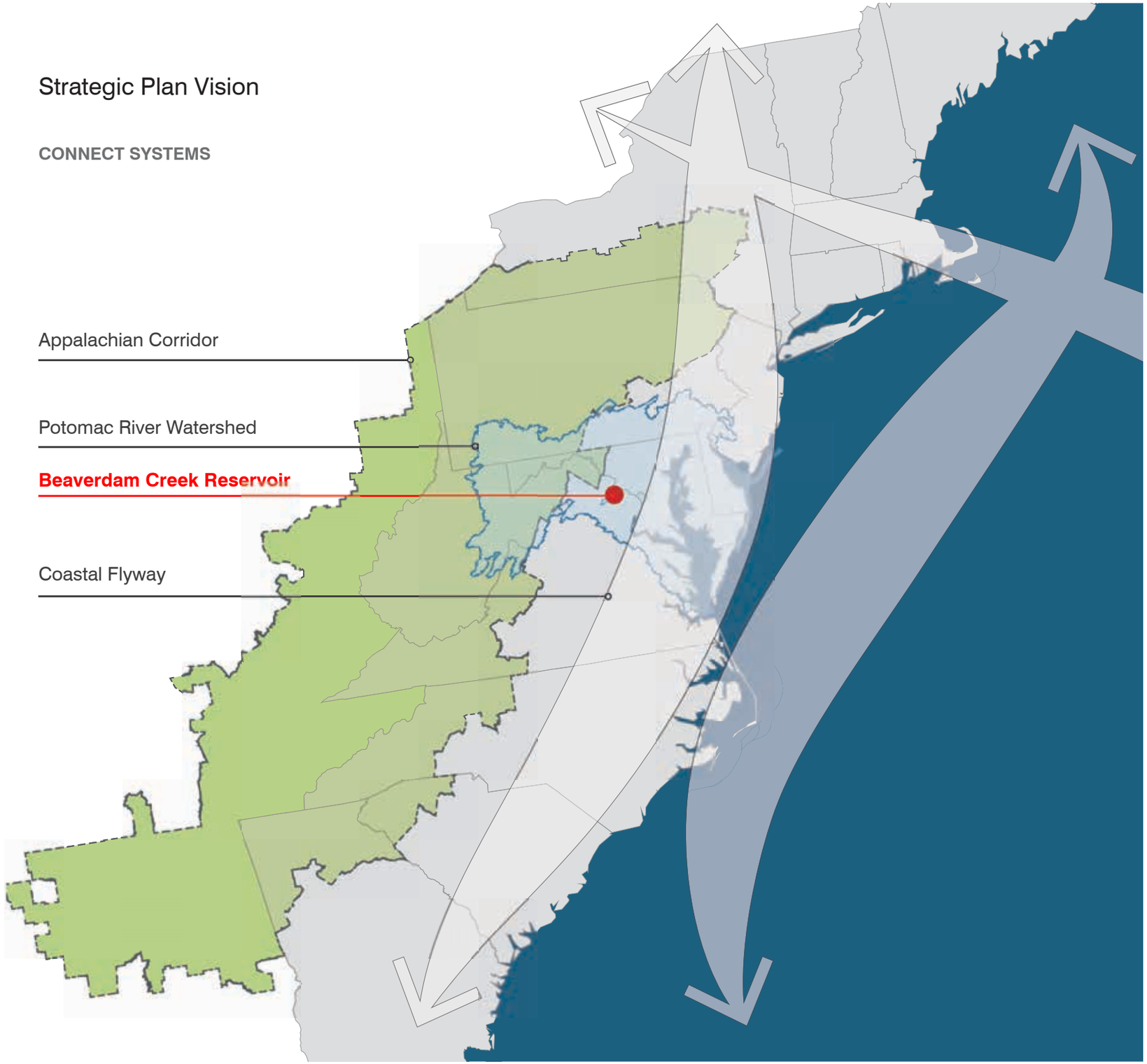
Loudoun Water Mission

“To sustainably manage water resources in advocacy of ***health***, ***environment*** and ***quality of life***.

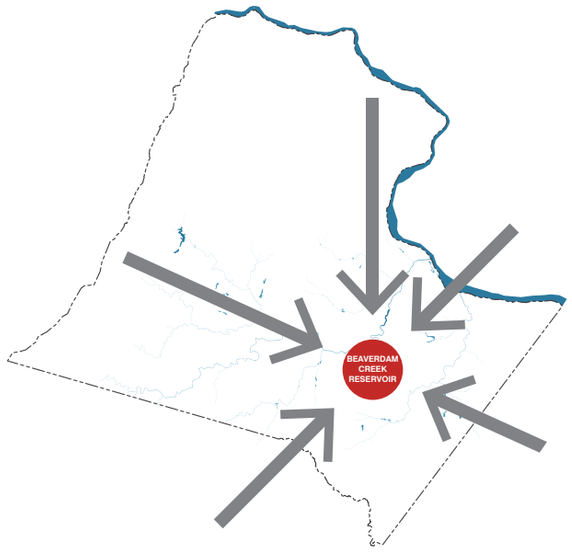
... To bring our customers ***clean, healthy water*** that is ***safe to drink***. ”

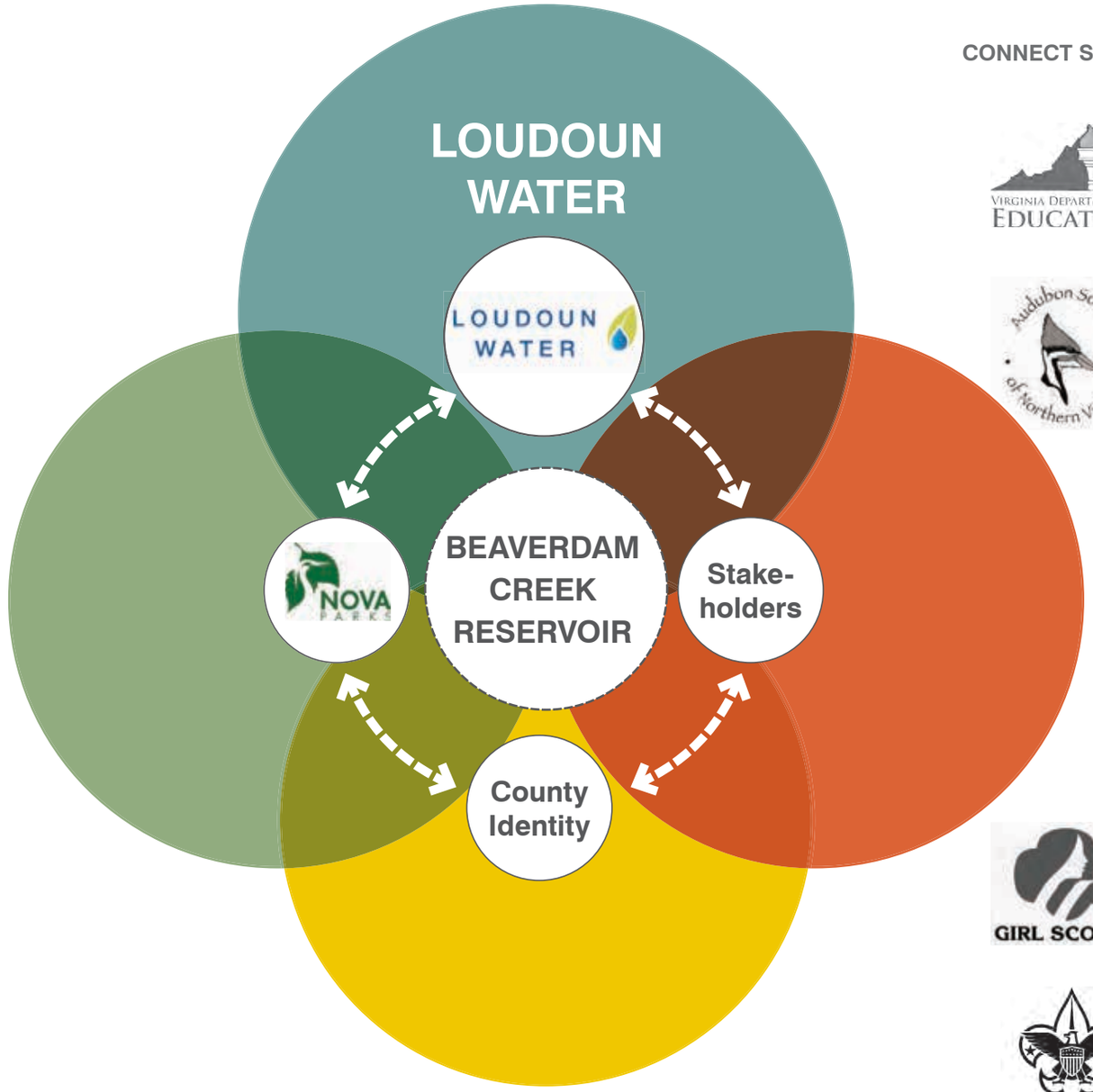
Strategic Plan Vision

CONNECT SYSTEMS



CONNECT THE COUNTY





CONNECT STAKEHOLDERS AND STEWARDS

VIRGINIA DEPARTMENT OF EDUCATION

potomac conservancy

VIRGINIA Department of Game & Inland Fisheries

Audubon Society of Northern Virginia

PADDLENova

Loudoun Wildlife Conservancy Established 1995

GOOSE CREEK ASSOCIATION

DUCKS UNLIMITED

GIRL SCOUTS

One.♡.

Northern Virginia Bird Club Founded in 1953

BOY SCOUTS OF AMERICA

Loudoun County Public Schools Established in 1870

LOUDOUN COUNTY VIRGINIA 1757

SUMMARY | Principles

Strategic Plan Principles

Future design and implementation efforts at Beaverdam Creek Reservoir should support thte mission of Loudoun Water and focus on articulating and expanding the value of the County water supply as a critical component of the public utility infrastructure and public space future of the County.

1 RESERVOIR AS RESOURCE

- Demonstrate value of water utility
- Articulate mission and actions that increase resilience of water supply

2 ECOLOGICAL STEWARDSHIP

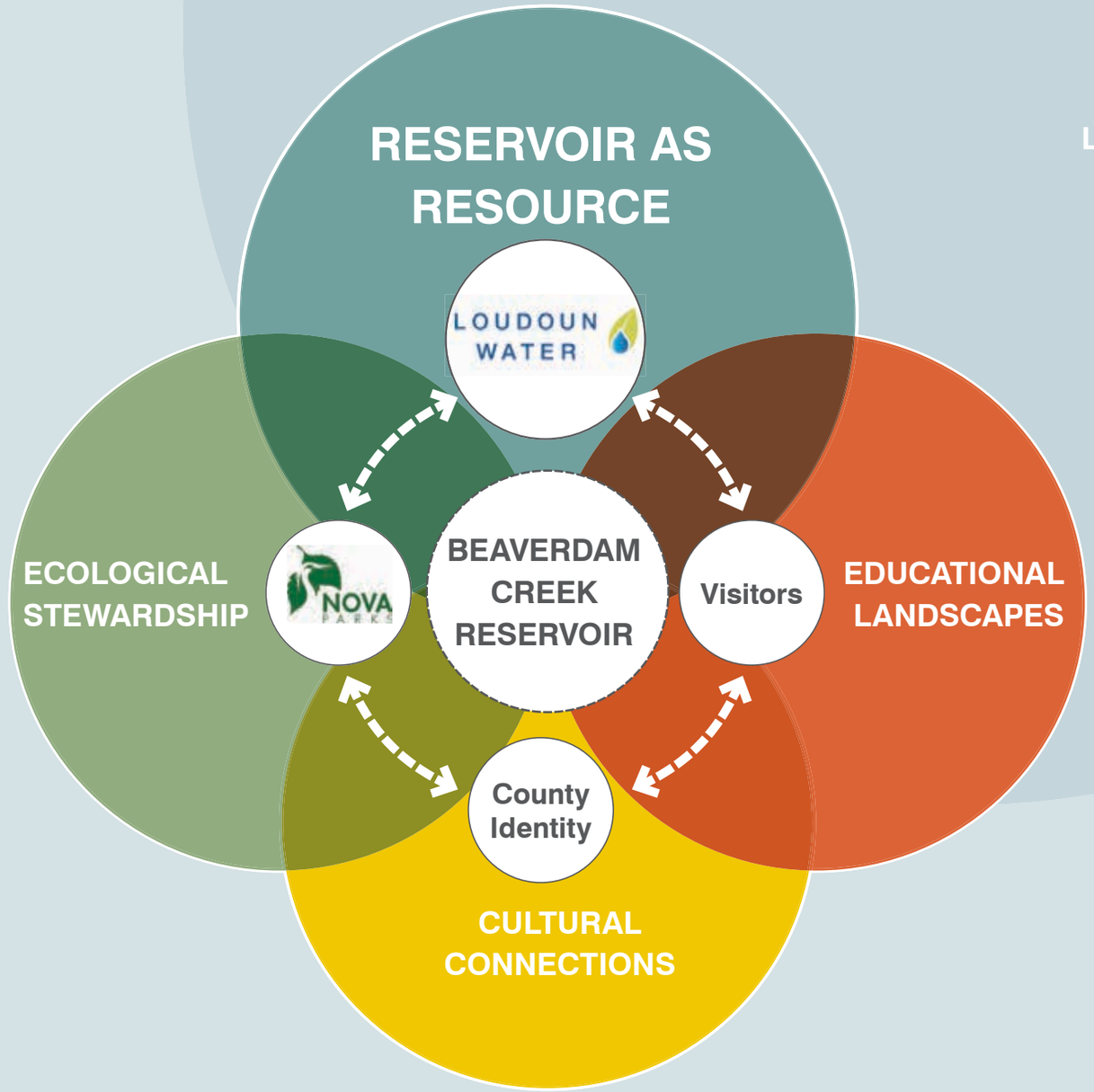
- Healthy ecosystems improve water quality
- Minimize development impact and increase biodiversity
- Add outdoor labs or interpretive stations to support mission

3 EDUCATIONAL LANDSCAPES

- Create a range of landscape types for a diverse community
- Encourage active play, passive recreation, and open-ended exploration

4 CULTURAL CONNECTIONS

- Cultivate strategic partnerships
- Respond to adjacent use and development
- Improve access based on existing opportunities

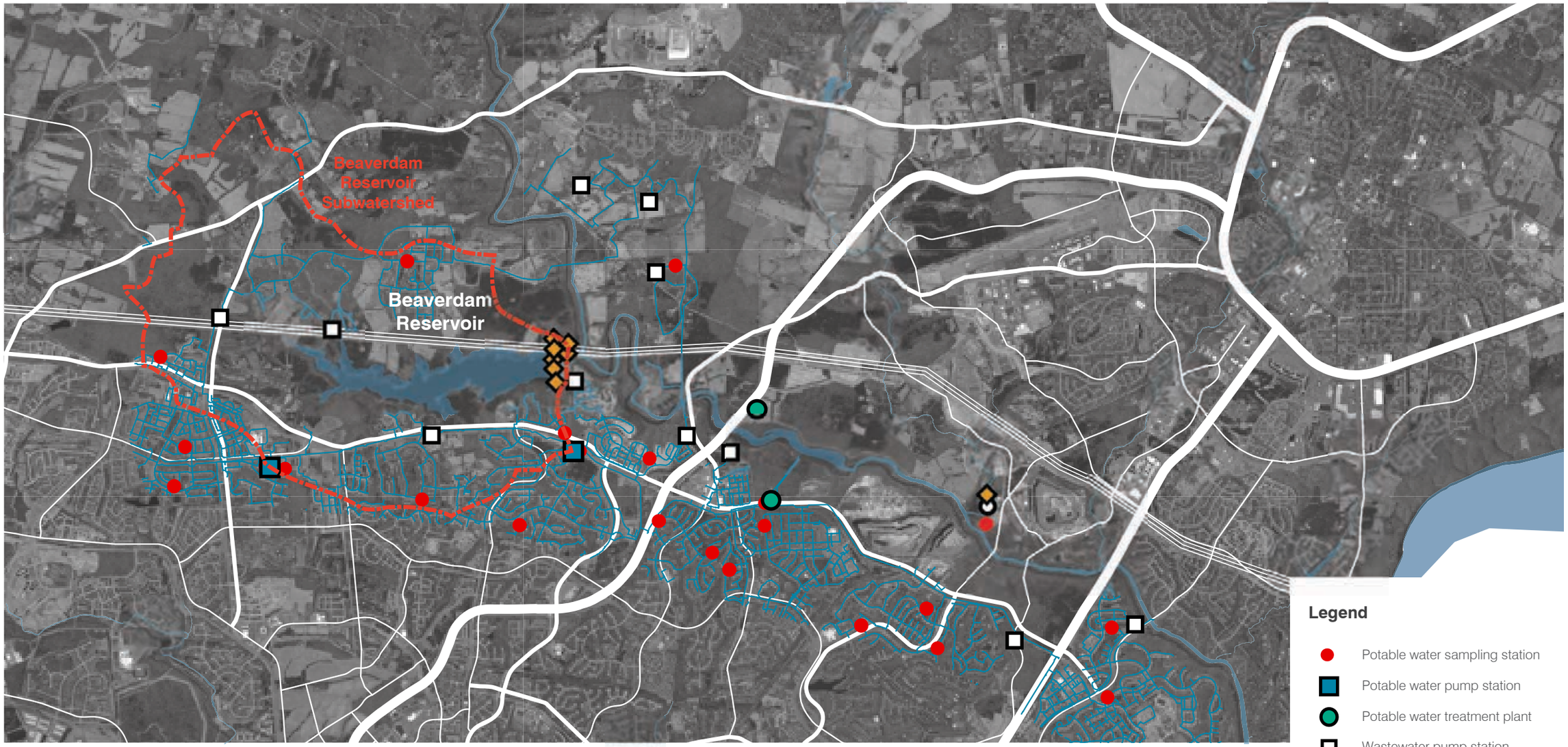


Loudoun Water Service Area

Goose Creek Watersheds

2 SITE ANALYSIS

Public Utility Corridor

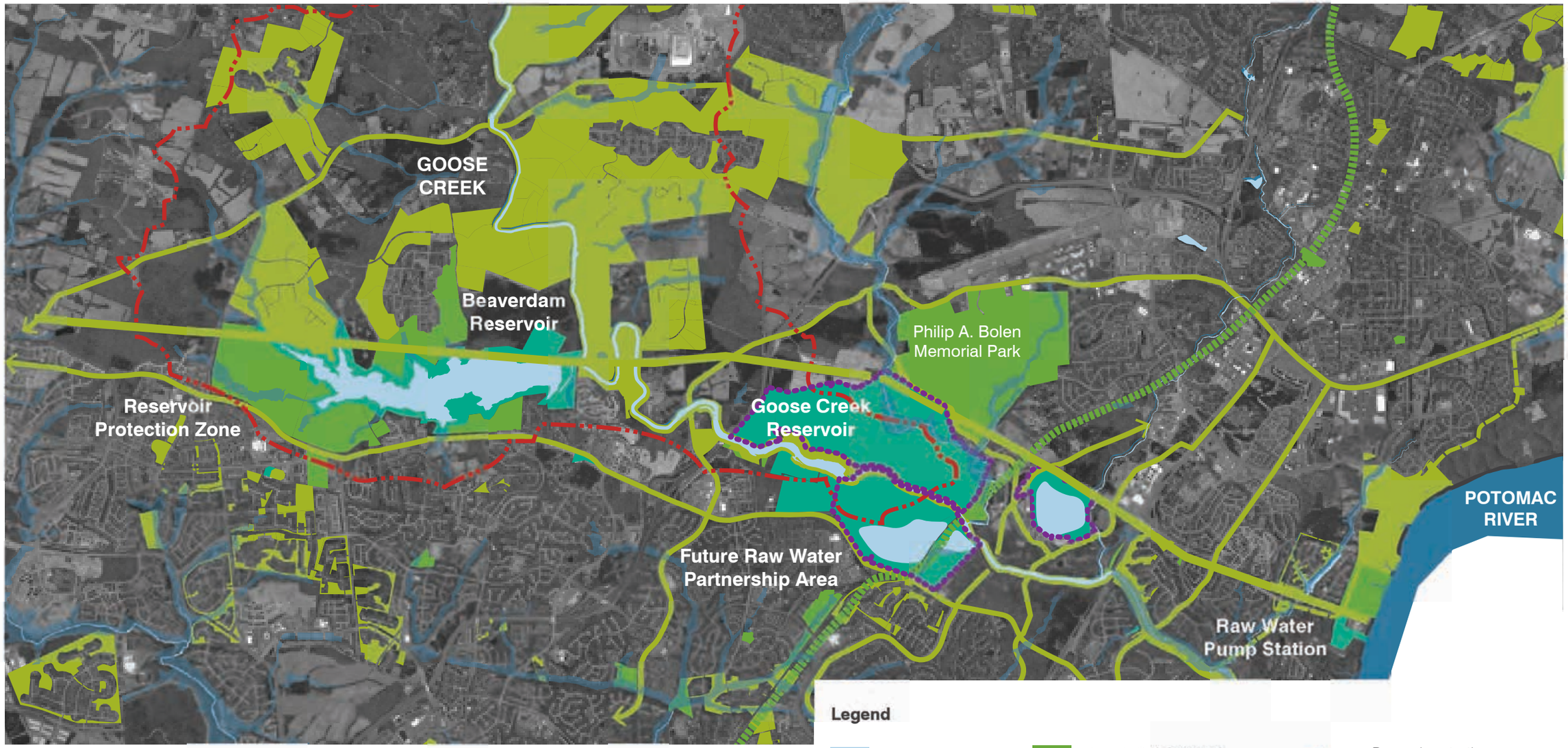


Utility infrastructure as potential armature for orientation and education within Reservoir sub-basin:

- Potable water sampling stations (6)
- Potable water pump stations (2)
- Wastewater pump stations (4)

Of the four waste water pump stations proximate to the Reservoir, two are on the site parcel, along with several wells.

Public Space Corridor



Development Patterns

The Reservoir context has changed dramatically over time as farmland has given way to new neighborhoods of development.

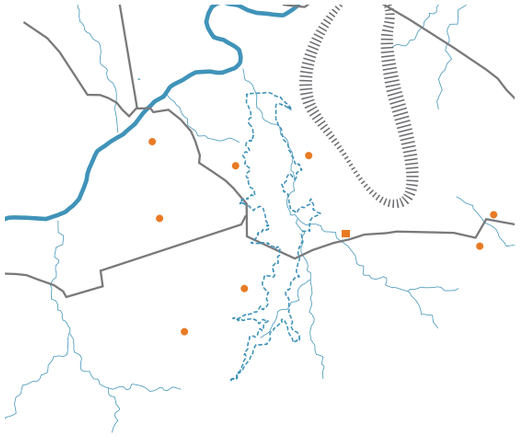
1757 to 1926
Hand-drawn maps of the pre-existing conditions at the Reservoir site show the emergence of a small community and cultural buildings at the confluence of county roads and stream corridors.

1957
Farmland is the primary use of land in Loudoun County.

1988
The 350-acre Beaverdam Creek Reservoir is completed in 1972 in order to add water storage capacity to the existing Goose Creek Reservoir and safegaurd against drought. Dulles Airport was dedicated in 1962 and contributed to the growth of the County.

2002 to 2016
Development communities expand at Broadlands, Waxpool, and Brambleton neghborhoods.

1853 GOOSE CREEK AS COUNTY SPINE

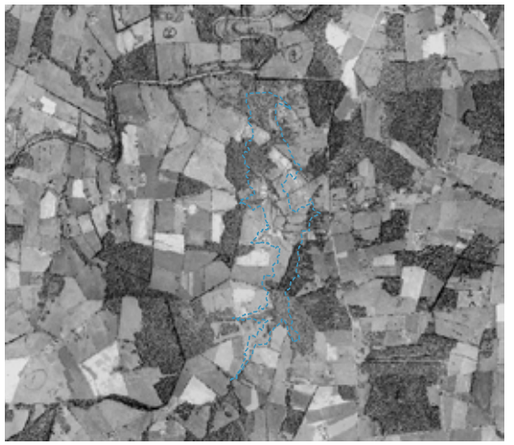


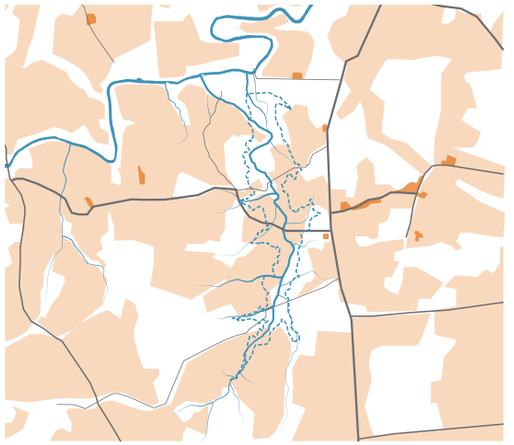
Fewer primary roads mapped. Streams and nearby plateau drawn as prominent landscape figures. District boundaries sub-dividing the County correlate directly with roads - and Goose Creek.

1926 NEIGHBORS AND NEW ROADS

Waxpool neighborhood established. Belmont Ridge Road precursor developed along eastern edge of Beaverdam Creek.

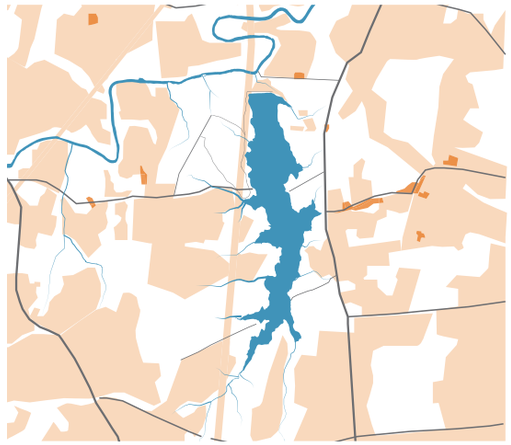
1957 AGRICULTURAL FIELDS





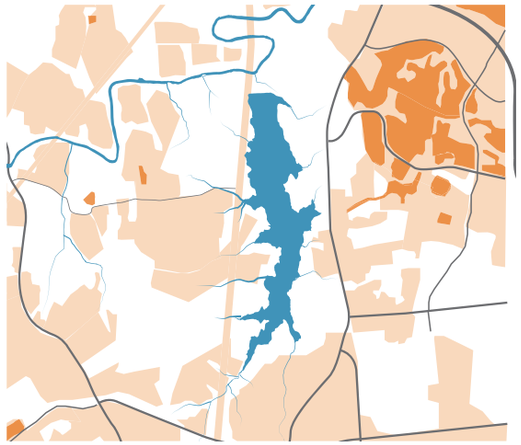
Truss bridge over Beaverdam Creek remains in place, visible when water drawn down or low during drought (1999 & 2007).

1988 AERIAL (RESERVOIR COMPLETE 1972)



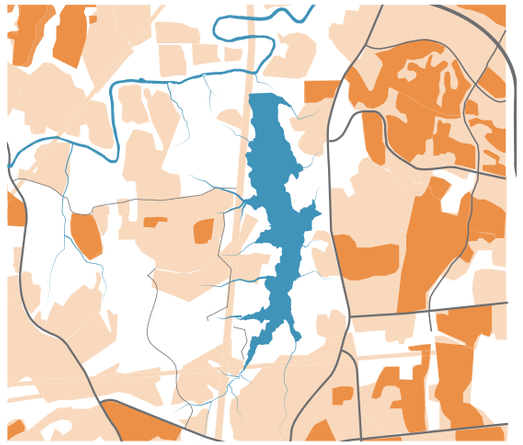
- Reservoir completed in 1972
- Added 1.34 million gallons of water storage to existing Goose Creek Reservoir as safegaurd to drought

2002 BROADLANDS EXPANDS

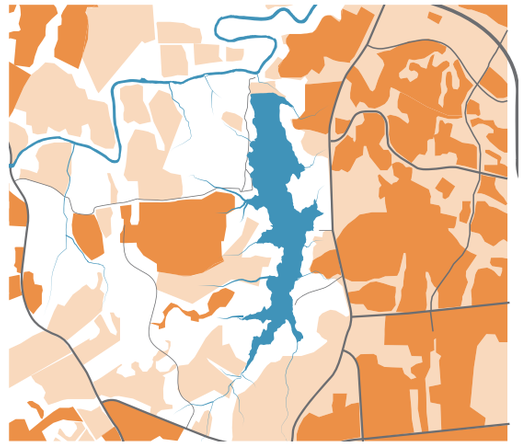


- Former farmland at northwest corner of reservoir remains as one of largest adjacent areas of intact forest

2006 WAXPOOL & BRAMBLETON



2016 EXPANDED COMMUNITY



From Singular to Signature

The Reservoir exists as an ecological and program hotspot largely hidden from neighbors by dense woods and marginally accessible at challenging entry points.

EXISTING SINGULAR IDENTITY CONNECT TO ADJACENT RESIDENTS

Land use pressure from adjacent development suggests a response that consolidates future access adjacent to already developed areas to better serve the existing communities.

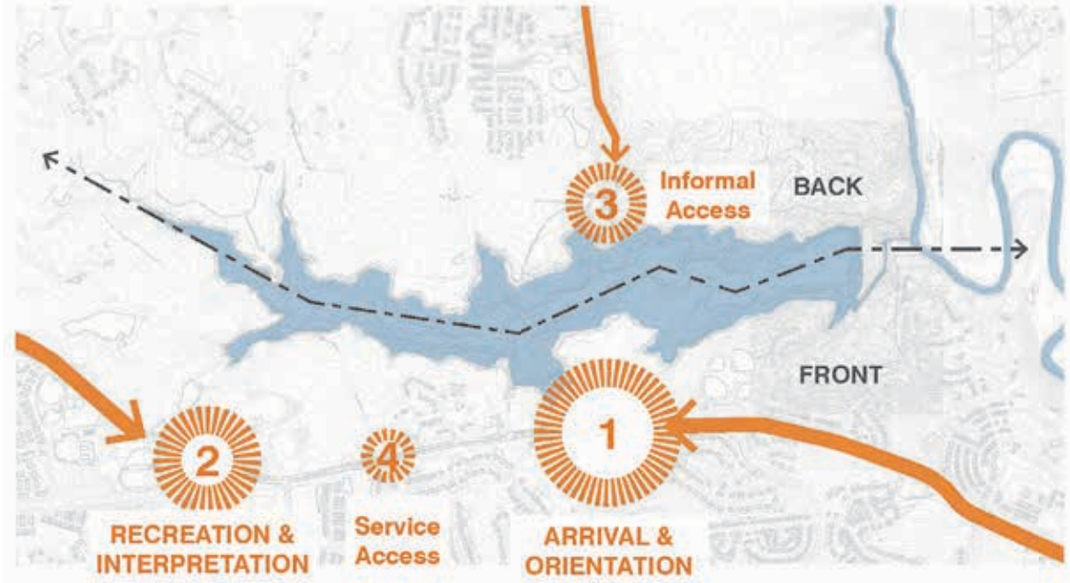
EMBRACE ECOLOGY LIMIT ACCESS TO IMPROVE HABITATS

Ecological energies should be amplified to increase biodiversity by strategic control of public access and impact to land and water.

Legend

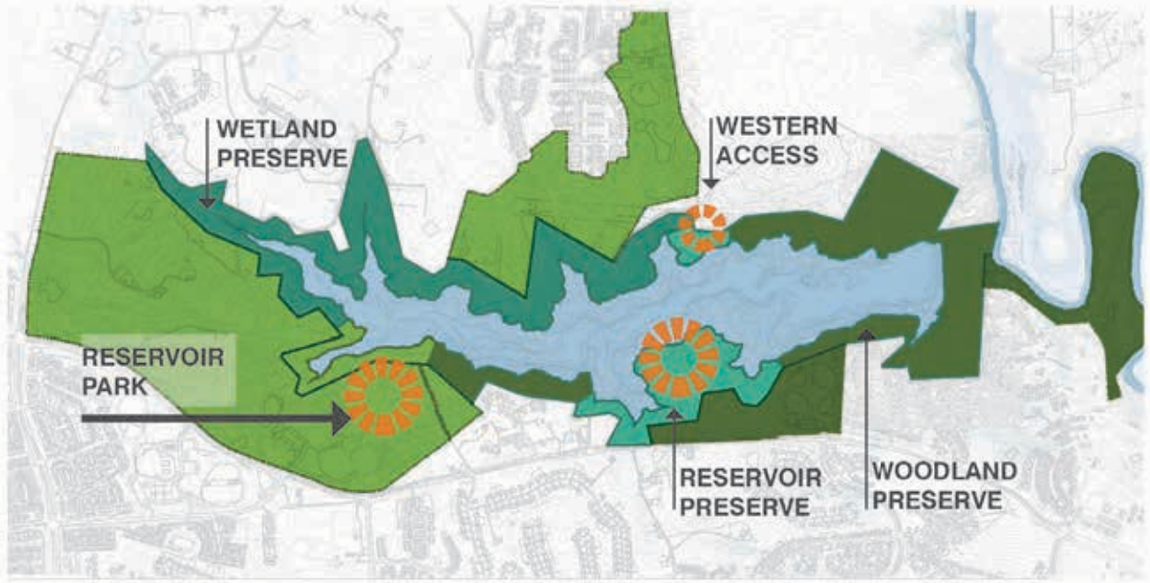
- Development pressure
- Ecological potential

CONSOLIDATE ACCESS PRIORITIZE FUTURE PROGRAM



Access consolidated to two new and primary entry points, with existing secondary access maintained for informal and service use.

SIGNATURE SPACES PRECINCTS AND PROGRAMS



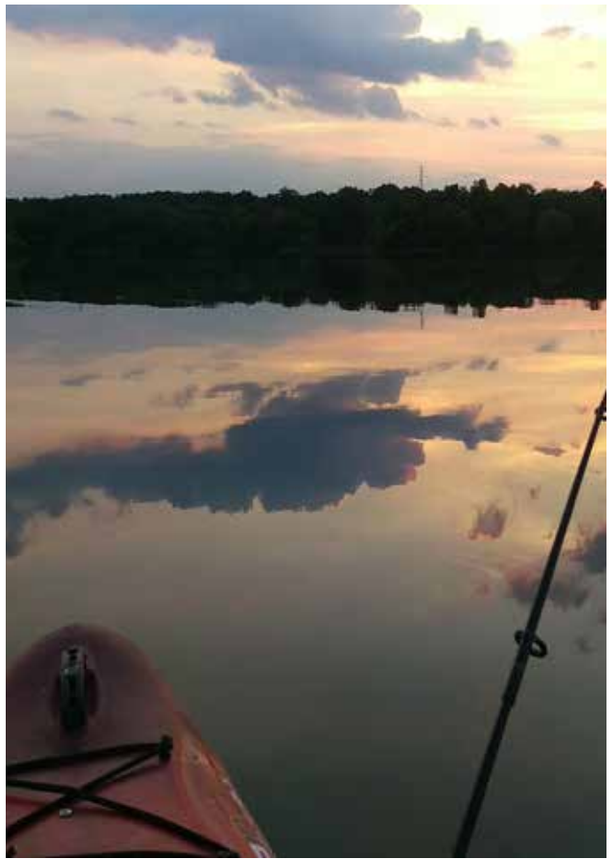
The primary entry point establishes a new reservoir identity, where land-focused precincts give way to water-focused recreation and interpretation.

Preserve Existing Character

The Reservoir is well-used and appreciated by visitors and neighbors for the range of experiences it offers, from rest and refuge to exercise and activity. Future development for public use should maintaina these aspects as much as possible where they are compatible with the goals and mission of the water utility.

Paddle canoes and kayaks as low-impact recreation.

Natural areas and hiking trails.

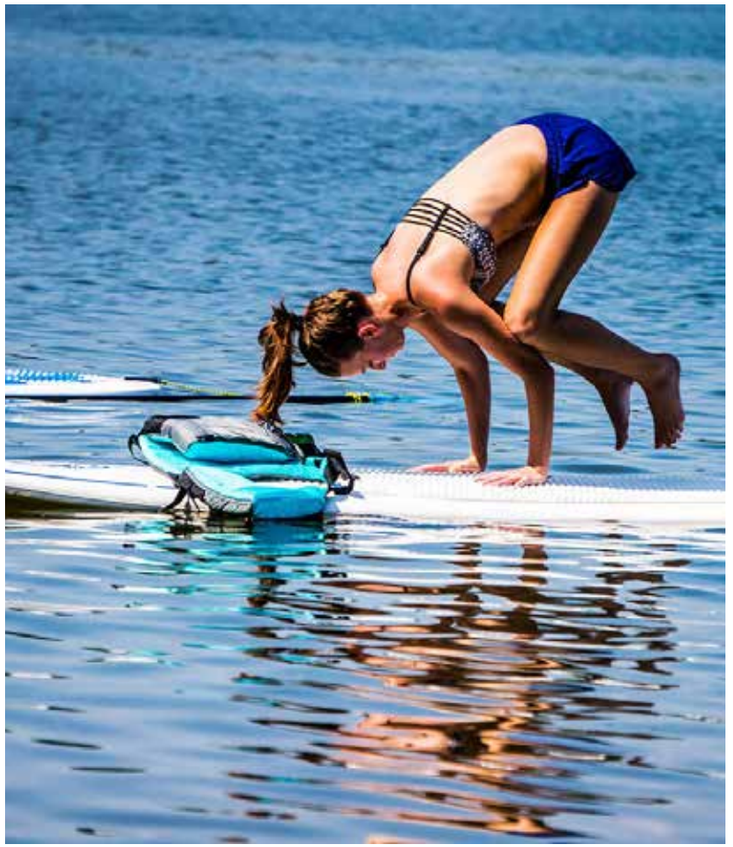


Quiet moments in morning and evening.

Promote Health and Habitat

On the water, amplify existing use where appropriate; promote health and habitat.

Fishing, bird-watching, and other wildlife-focused recreation.



Paddleboard yoga attracts residents of all ages.

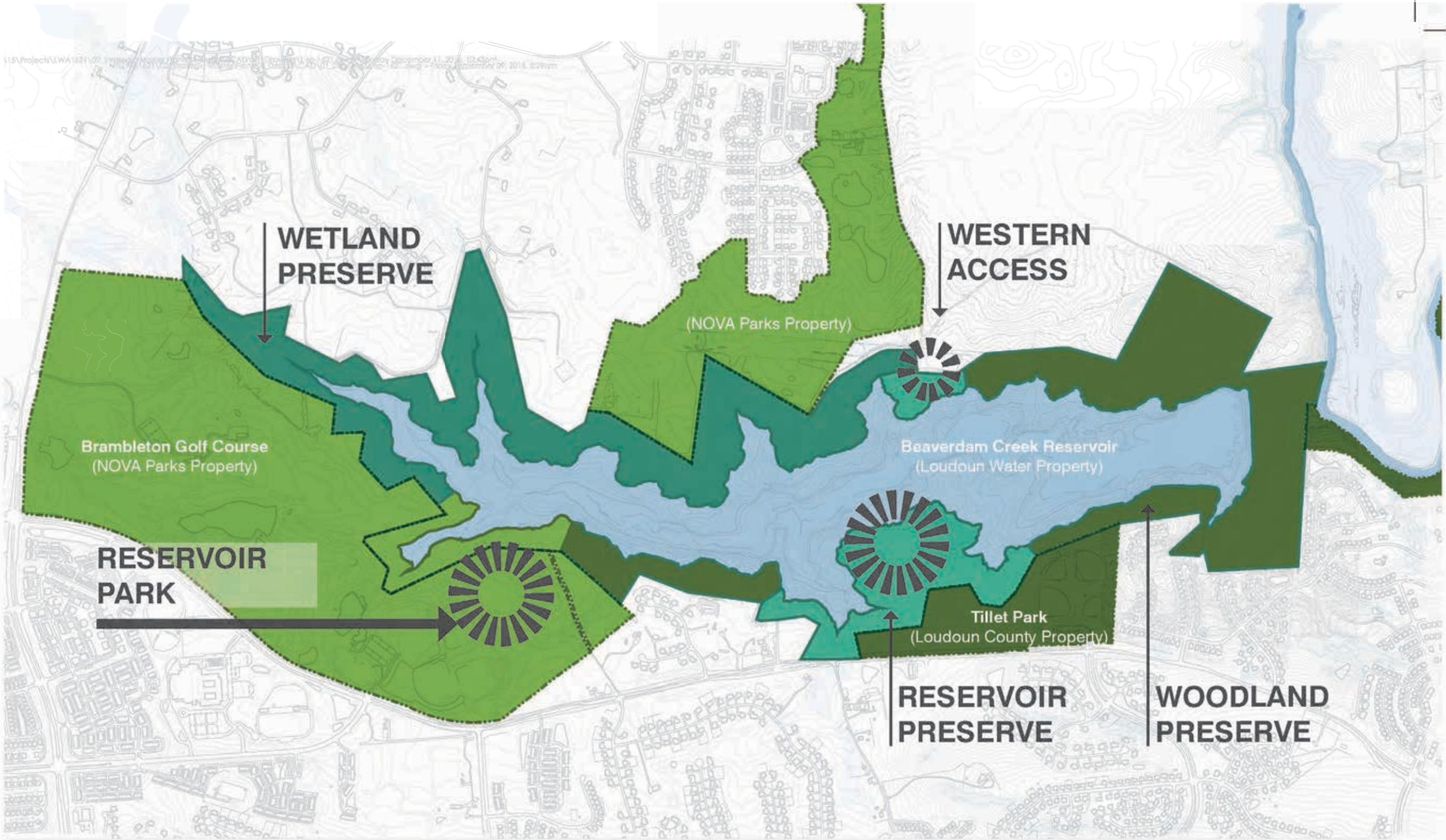
Crew access and training is a major use on the Reservoir.

3 CONCEPT PLAN

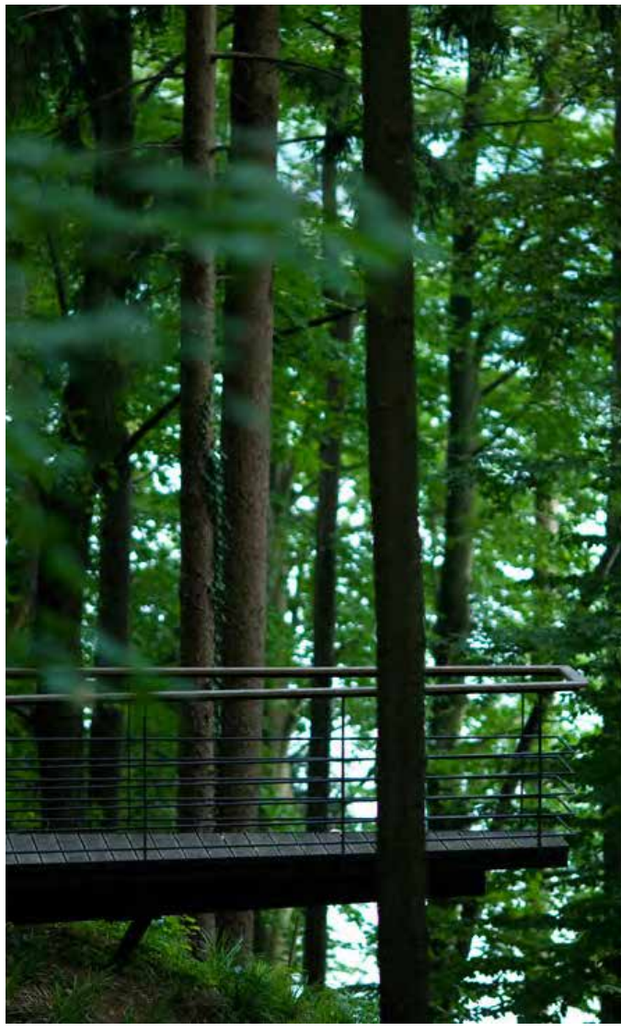
Reservoir Precincts

New access to the Reservoir helps orient visitors to the Park spaces and establish a framework for guiding the character of future development and use.

Phased development
The primary access areas may be developed in coordination with adjacent stakeholders and landowners. NOVA Parks and Loudoun County Parks will become strategic partners in expanding amenity offerings and maintaining park spaces.



The primary entry point establishes a new reservoir identity, where land-focused precincts give way to water-focused recreation and interpretation.



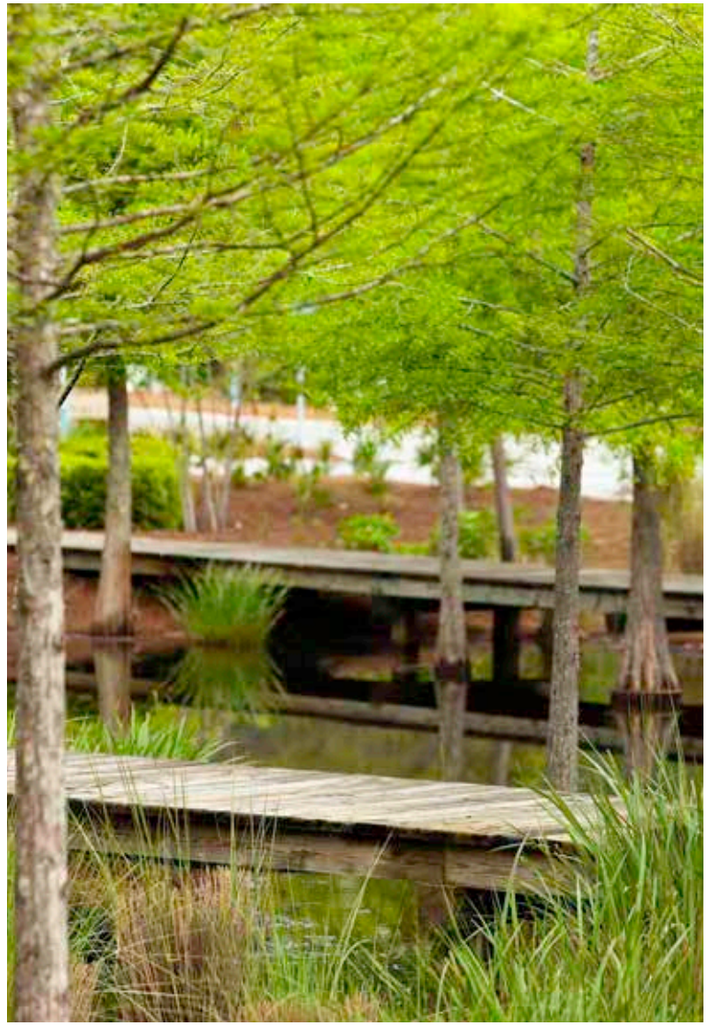
1 RESERVOIR PRESERVE

Public arrival without direct access to water
Pedestrians remain above water
Refined material palette, salvage on-site materials

2

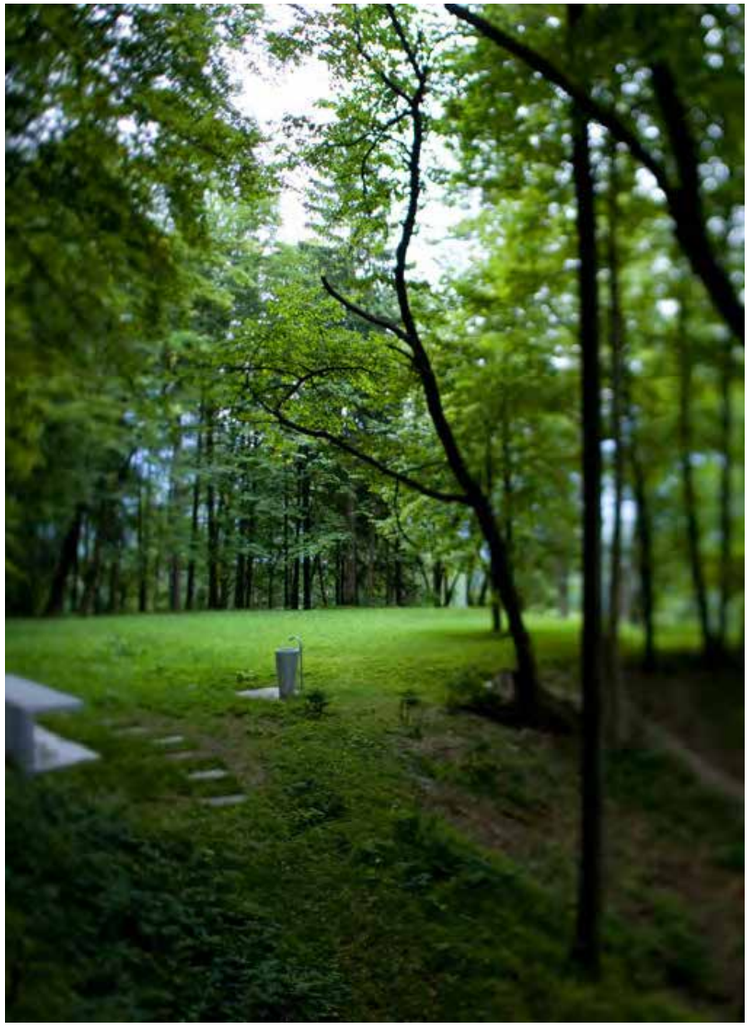
RESERVOIR PARK

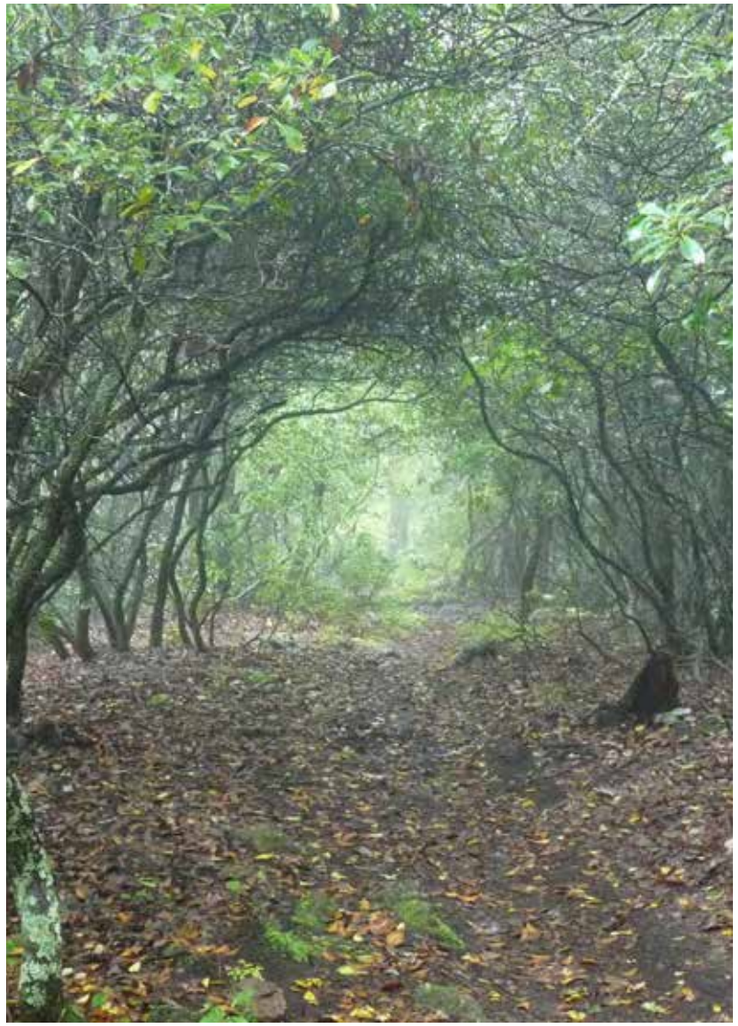
Public access to water mediated as appropriate to activity
Discrete moments of pause and discovery
Coarser material palette



3 WATER ACCESS

Public access to water mediated as appropriate to activity
Discrete moments of pause and discovery
Coarser material palette





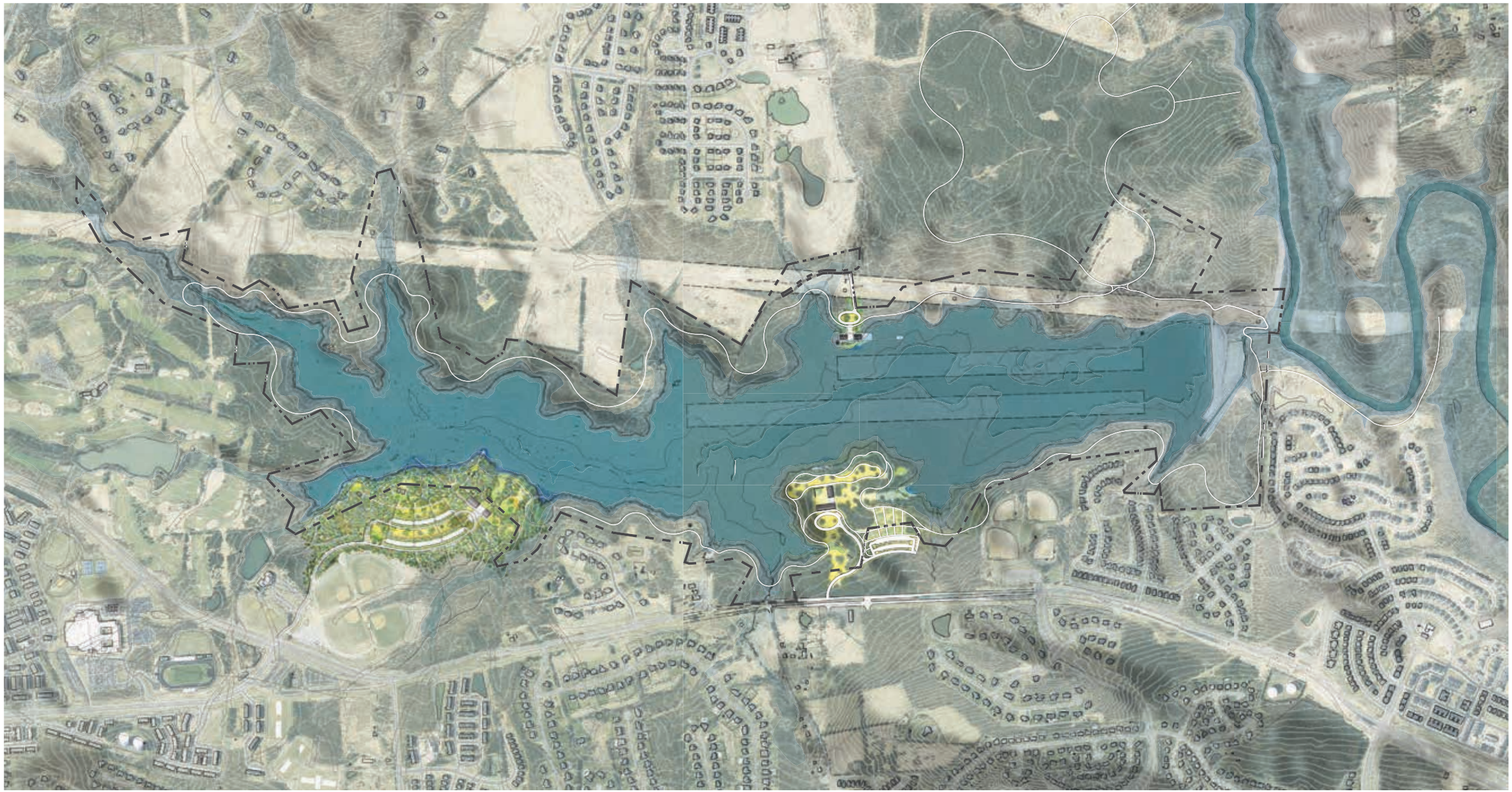
4 WOODLAND RESERVE

Focus on land and forest
Contemplative spaces
Unique relationship to land and planted form

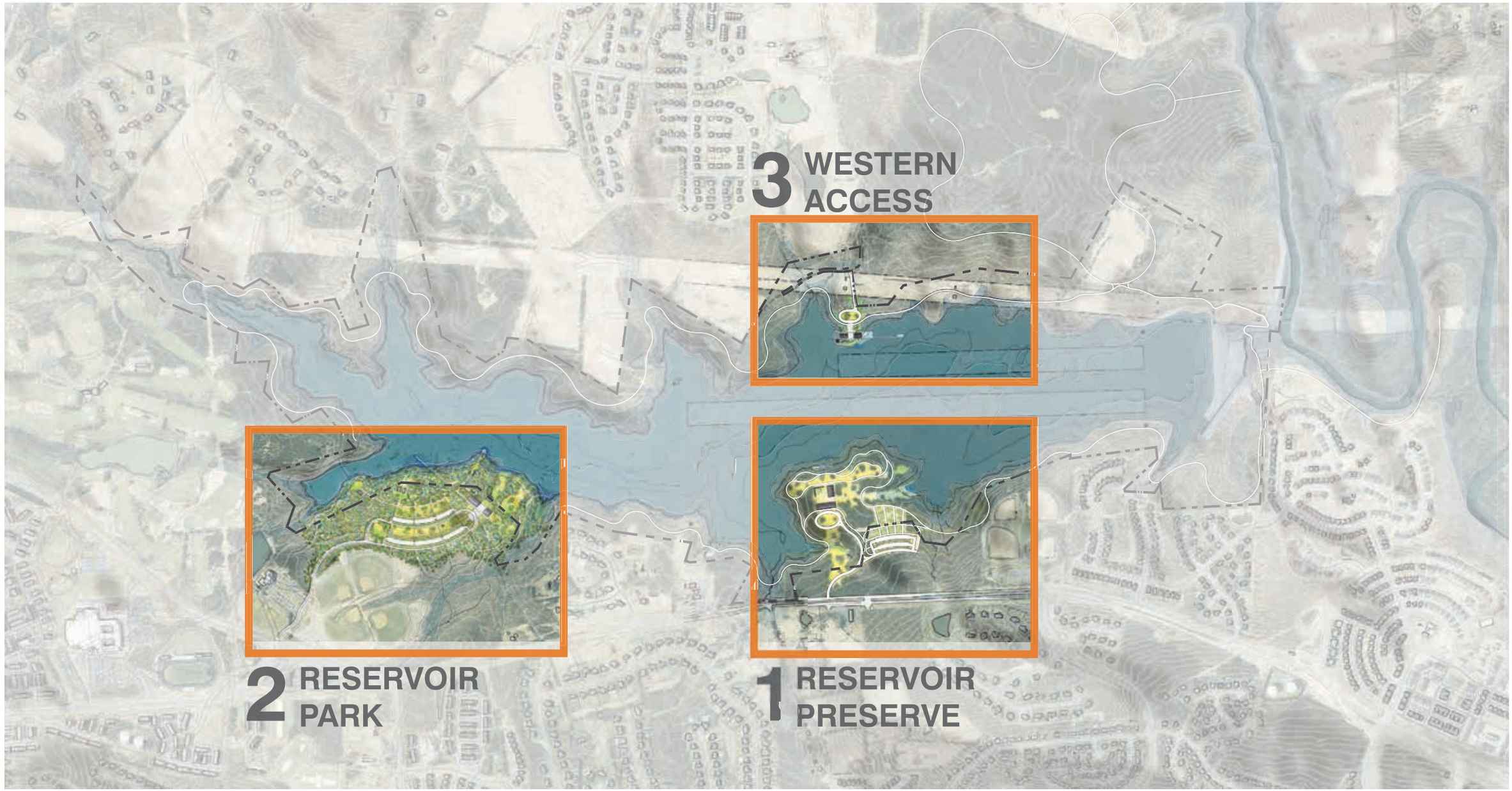
5 WETLAND RESERVE

Limited public access to water
Immersive experience of expanded (more diverse) wetland ecology

Overall Site Plan



Focus Areas



Reservoir Park

1. Entry gate
   Reservoir-focused signage
2. Entry drive & turnarounds
   Plowable paved surfaces
3. Parking areas
   Permeable surfaces (approximately 300 spaces)
4. Storm water bioretention gardens
5. Parking paths
   Major routes from parking
6. Primary spine
   Accessible surfaces at major trails
7. Boating path
   Access for crew & other boating
8. Reservoir trails
   Natural surface, completes proposed Reservoir Circuit Trail
9. Reservoir Pavilion
   Interpretation and boat storage
10. Reservoir shelters
    100-person capacity (30' x 60')
11. Rental boat operation
    (approximately. 20' x 30')
12. Water-focused interpretation
    Play & informal gathering
13. Reservoir overlook
14. Boardwalks
15. Boating docks
    Crew & recreational access
16. Alford Road access
    Service road
17. Stream gardens
18. Wetland gardens

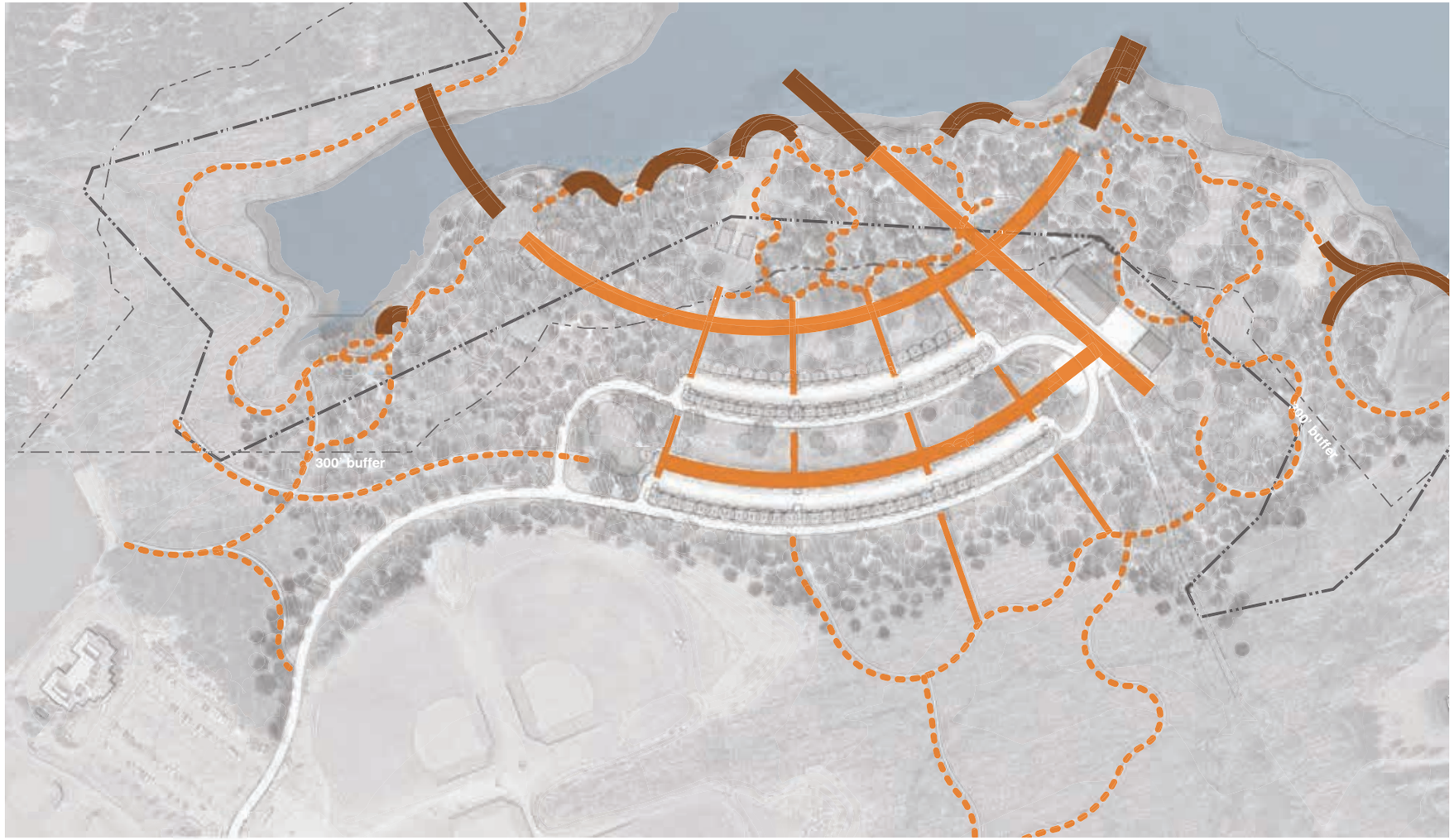

Reservoir property
300' buffer
300' buffer
1
2
3
4
5
6
7
8
9
10
10
10
11
12
12
12
13
14
14
14
15
16
17
18

Reservoir Park | Access and Parking

Legend

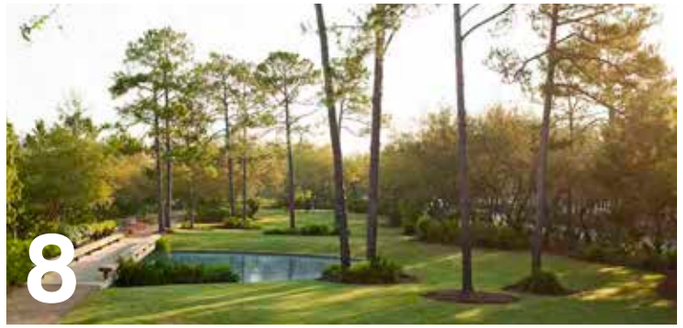
- Vehicular road
- Service road
- Entry path
- Primary path
- Multi-use circuit trail
- Hiking trails
- Boardwalks
- Parking

Paths and Trails



Reservoir Preserve

1. Entry gate
   Reservoir signage
2. Entry drive
   View to arrival garden
3. Parking & stormwater gardens
   Approx 60 spaces
4. Arrival garden
5. Visitor education center
   Gathering lawn
6. Woodland lawn
7. Wetland garden
   Biofiltration & weirs
8. Woodland clearing
   Preserve existing trees
9. Reservoir overlook
10. Reservoir boardwalk
    Limited water access
11. Reservoir trails
    Natural surfaces



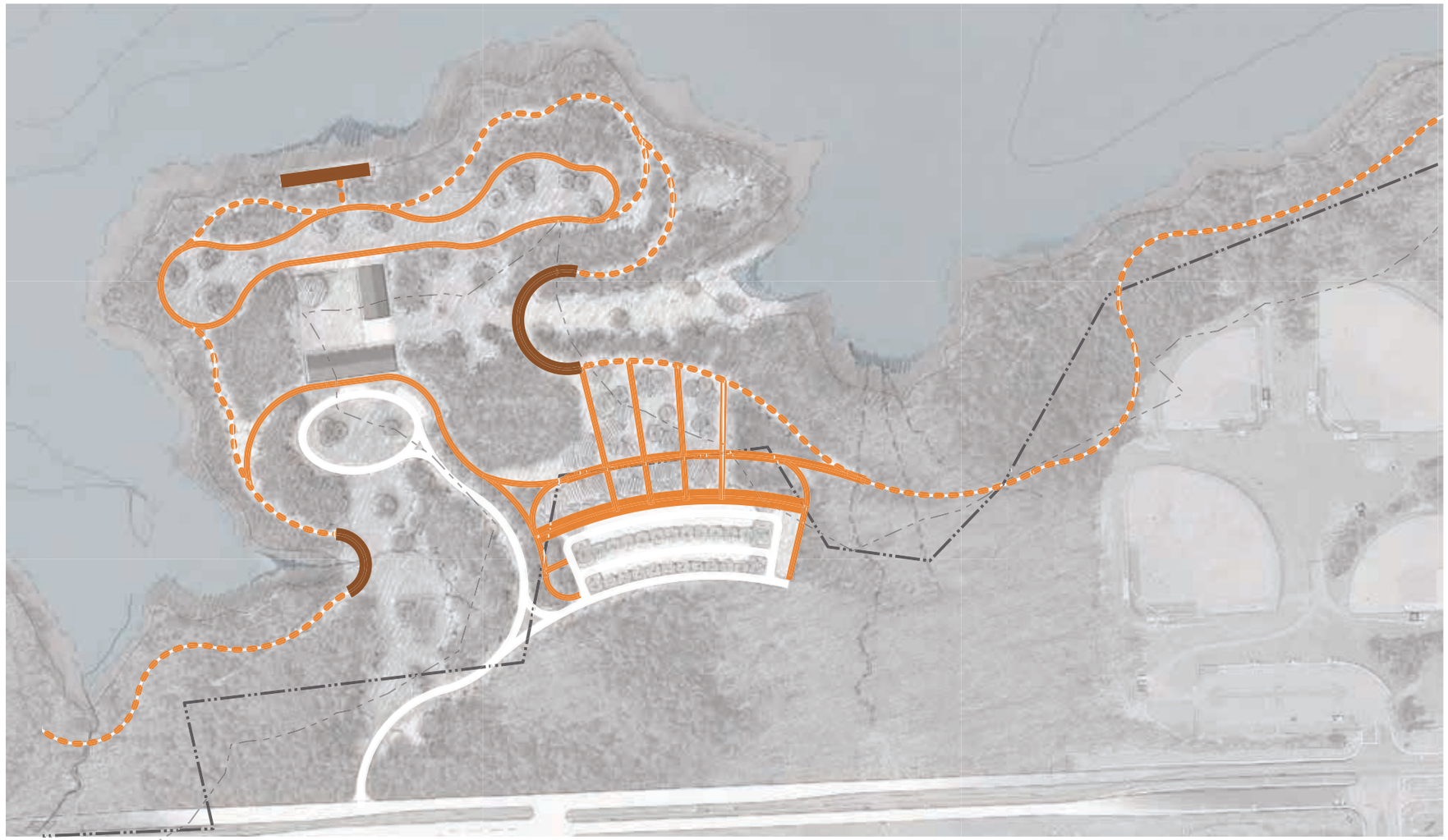

11
9
9
8
5
6
7
10
4
8
10
3
10
11
2
11
1

Reservoir Preserve | Entry and Parking

Legend

- Vehicular road
- Service road
- Entry path
- Primary path
- Multi-use circuit trail
- Hiking trails
- Boardwalks
- Parking

Paths and Trails



Western Access

1. Entry gate
Reservoir signage

2. Entry road
View to Reservoir

3. Parking & stormwater gardens
Boat trailers (approx 6 spaces)

4. Arrival garden

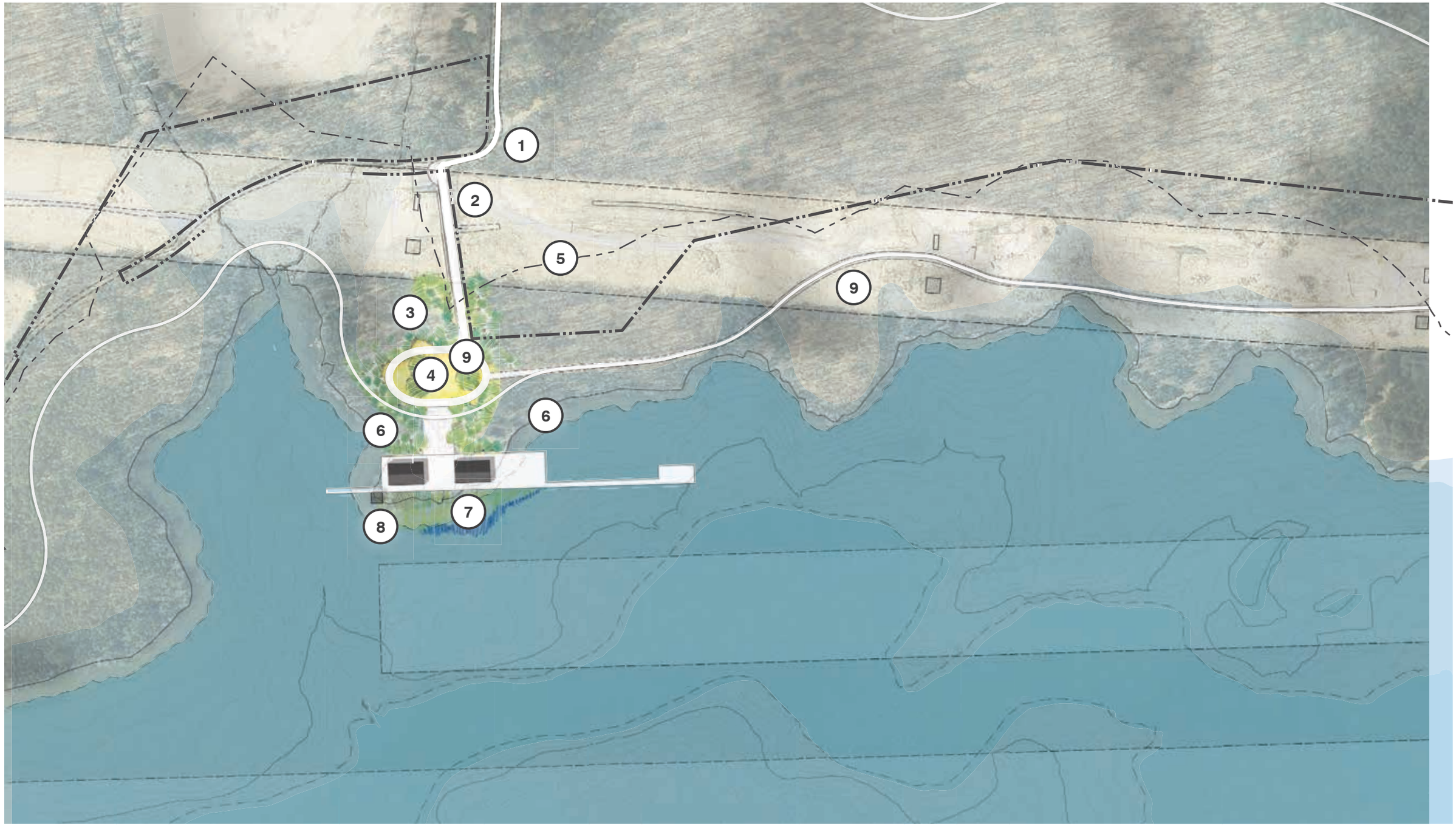
5. Woodland clearing meadow
Warm-season native grasses at existing utility easement

6. Wetland garden
Biofiltration & weirs

7. Boating deck & pavilions
Direct water access
Storage & infrastructure

8. Boating tower
Restricted access

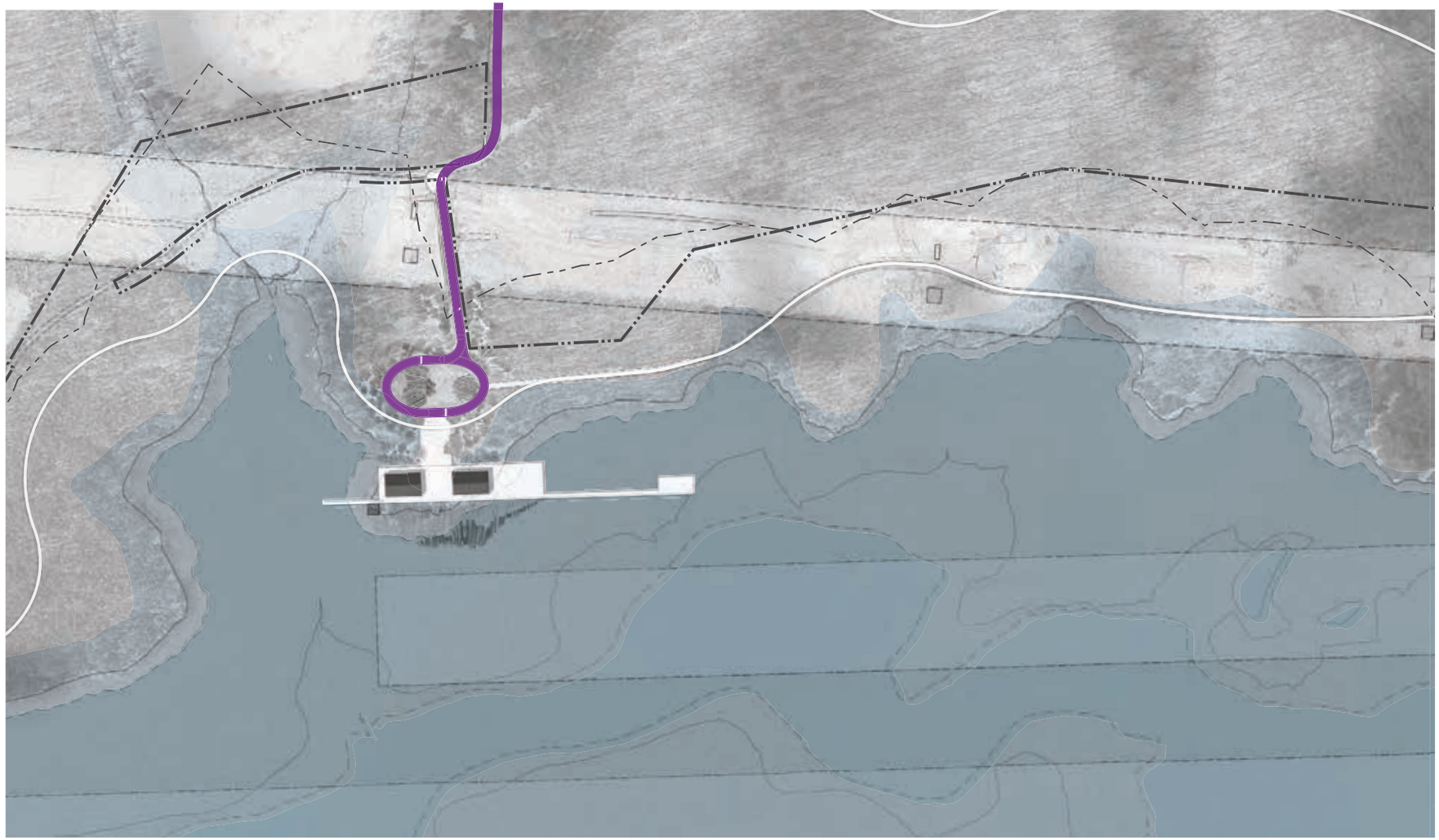
9. Reservoir trails
Natural surfaces


1
2
3
4
5
6
6
7
8
9
9

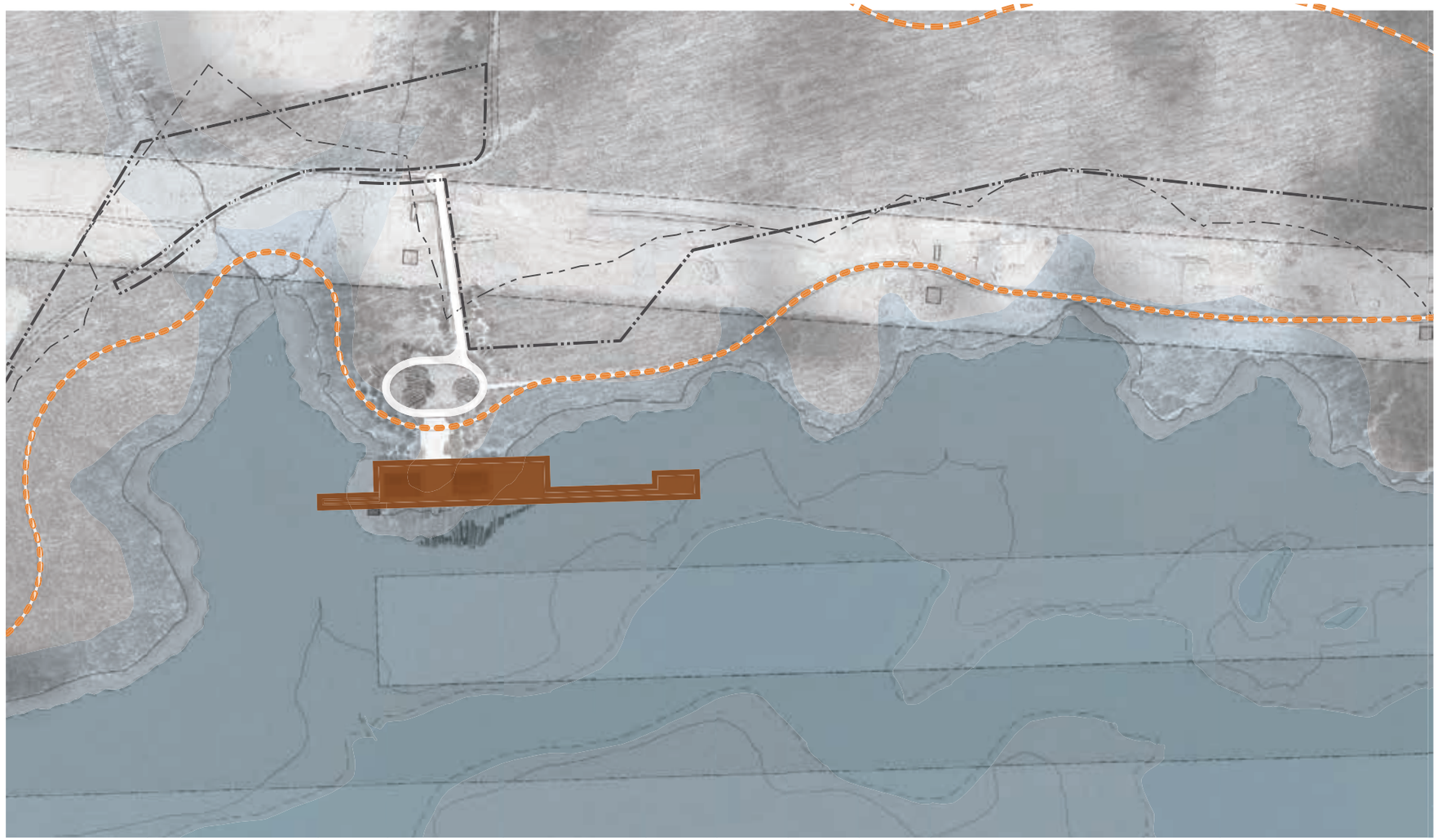
Western Access | Entry and Parking

Legend

- Vehicular road
- Service road
- Entry path
- Primary path
- Multi-use circuit trail
- Hiking trails
- Boardwalks
- Parking



Paths and Trails

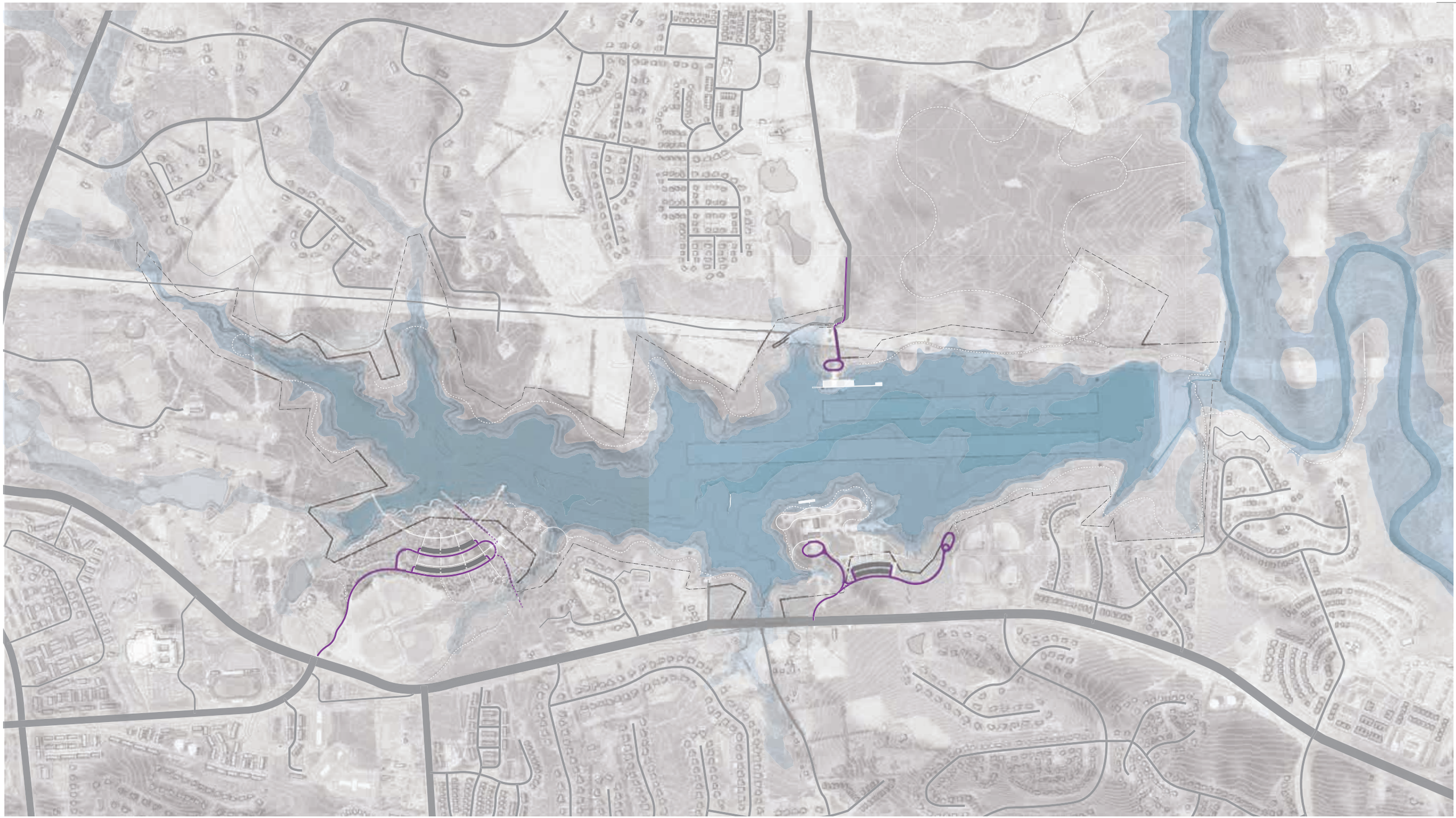


4 DESIGN GUIDELINES

Access and Parking

Legend

- Vehicular road
- Service road
- Entry path
- Primary path
- Multi-use circuit trail
- Hiking trails
- Boardwalks
- Parking



Entry Trails

Connection to Reservoir Park

Major entry trails
The entry trails will be the major links to the park and carry higher volumes of non-vehicular traffic. Typically 16’ wide with an asphalt or concrete surface, these paths allow multiple kinds of users to move to the Reservoir Park and beyond.

designed use

Primary Trails

Connection within Reservoir Park

Circuit trails
The primary circulation pathways allow access to the interior of Reservoir Park as well as providing smaller scale connections to adjoining neighborhoods. Typically 12’ wide with a crushed stone surface and curb edge these pathways provide an accessible surface for multiple user groups.

designed use

Boardwalk Trails

Destination within Reservoir Park

Boardwalks
The Boating Arc Trail is an additional orienting and structuring device of the Reservoir Park. It is typically 12’ wide, crushed stone surface and has no edging in order to minimize impact on adjacent ecologies. Timber frame bridges, boardwalks, and overlooks span stream crossings and reservoir edge.

designed use

Hiking Trails

Circuit around the Reservoir

Hiking trails
The hiking trails are primarily located within the riparian portion of the park. These trails will not allow mountain bikes and will provide access to scenic elements of the riparian forest and barrancos. These paths will be natural surface trails typically 2’-3’ wide allowing for a more rugged experience within the park.

designed use

Overlooks

Overlooks around the reservoir could take on a myriad of forms. Some should be terrestrially based while others should float above the water surface. Overlooks should have varying experiences: from close-up wetland and cove views, to long, down-water views. Where possible, overlooks should be constructed from material from the site (stone, site harvested timber) and should be built no more than 30” above grade to minimize the need for handrails that could block views.

Shelters and Pavilions

Structures should be as ‘light on the land’ and sited to minimize site grading and clearing, using materials that, if not harvested from the site, blend in to the existing character of the site. This could include natural timbers, weathering steel, or stone. Structures should emphasize water collection and, ultimately, diversion or flow to the reservoir. These could employ rain chains instead of downspouts, splash zones instead of gutters, or downspout discharge areas that emphasize and articulate the presence of water runoff.

Water-based Play

Play areas and facilities adjacent to the reservoir should reinforce the narrative of water as a resource, thus highlighting the mission of Loudoun Water. Such areas encourage play that is as educational as it is fun. Natural ground surfaces (mulch or stone) are safe for falls. Structures are not brightly painted and remain visual
background” in the surrounding forest. The playground should be sited to remove as few trees as possible and retain as much shade as possible without requiring new planting.

Storm Water Gardens

Storm water gardens help filter surface water runoff and enhance the amount native, hydric plant species on site. In addition to filtering water and removing phosphorous, storm water gardens provide habitat for pollinators and small mammals and amphibians. These gardens are typically adjacent to pedestrian through-ways and take advantage of existing slopes and drainage ways to minimize the need for clearing and grading.

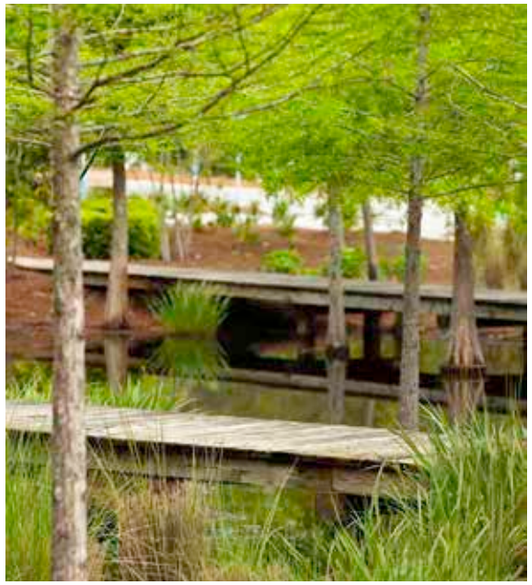












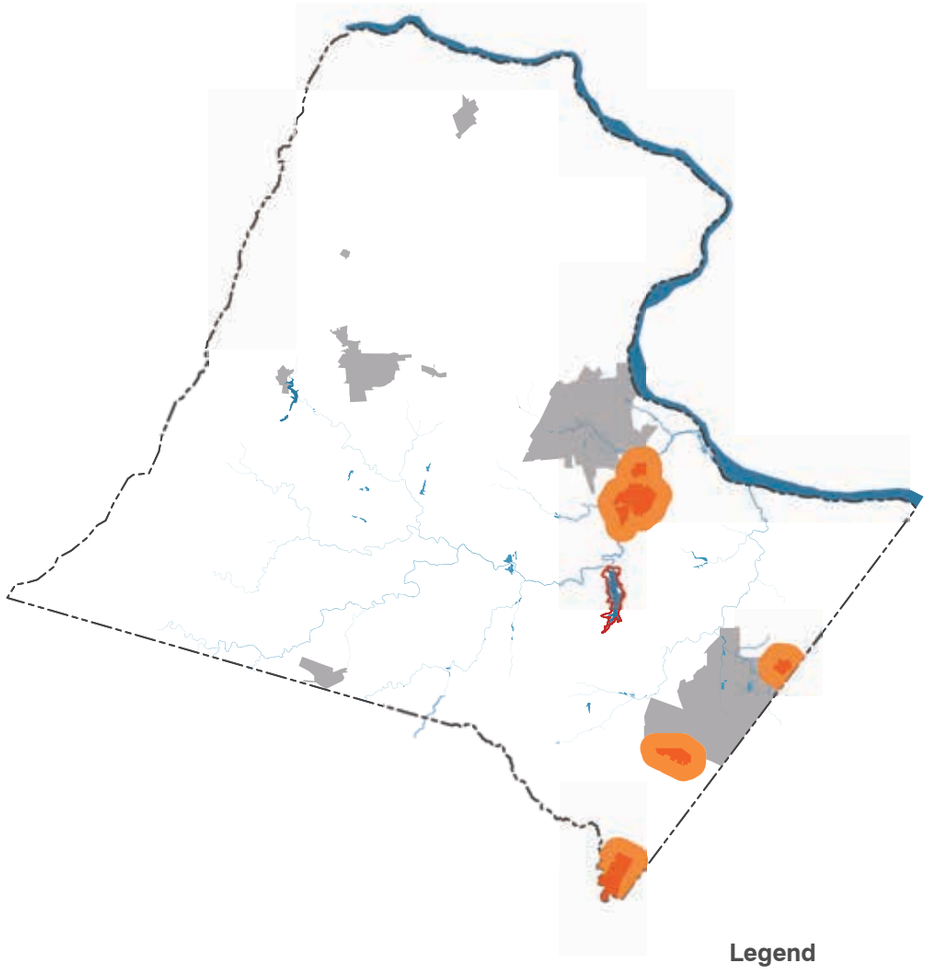
Edge Ecologies

Reshaping the reservoir edges should focus on increasing native wetland vegetation to support indigenous mammals and amphibians. Wetland banks are graded to promote a wider range of hydric plant types than currently exist at the reservoir.

Invasive plants are managed around more highly developed areas during and after construction, and at select edges of the water to minimize spreading.

A1 APPENDIX | SITE DISCOVERY

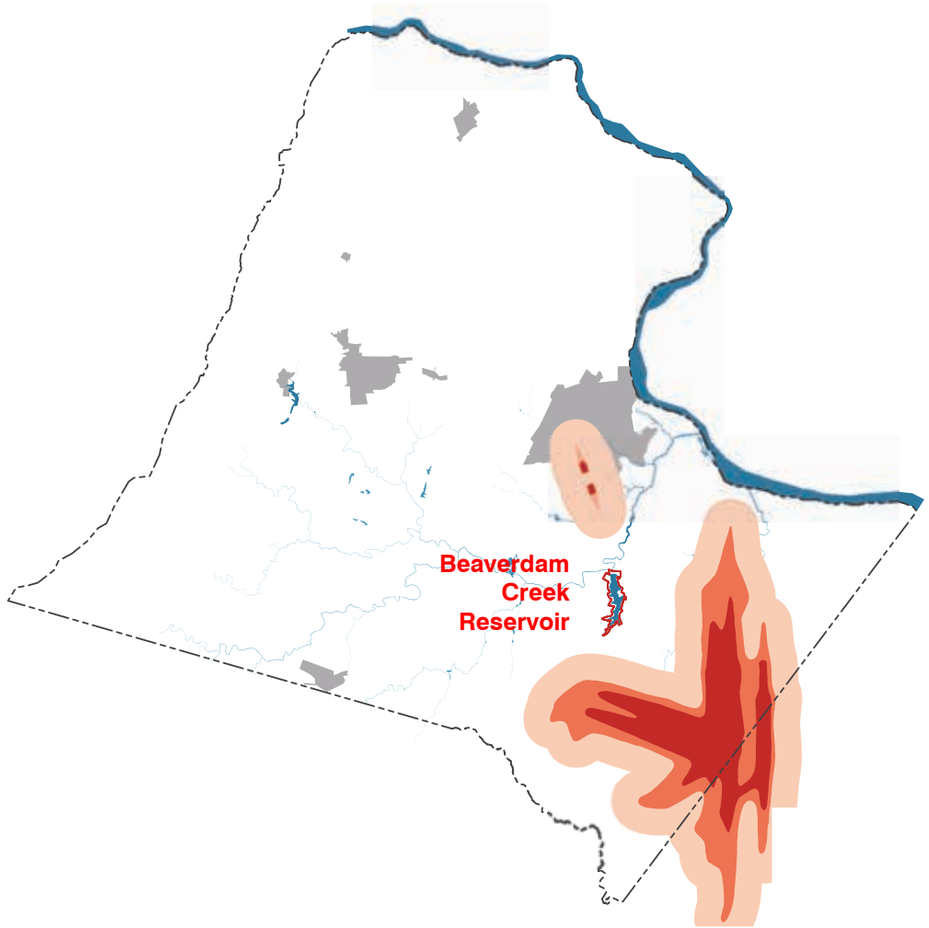
QUARRY IMPACT



Legend

- Quarry impact zone
- Quarry limit

AIRPORTS ATTRACT & IMPACT



Beaverdam Creek Reservoir is proximate and between two major sources airports:

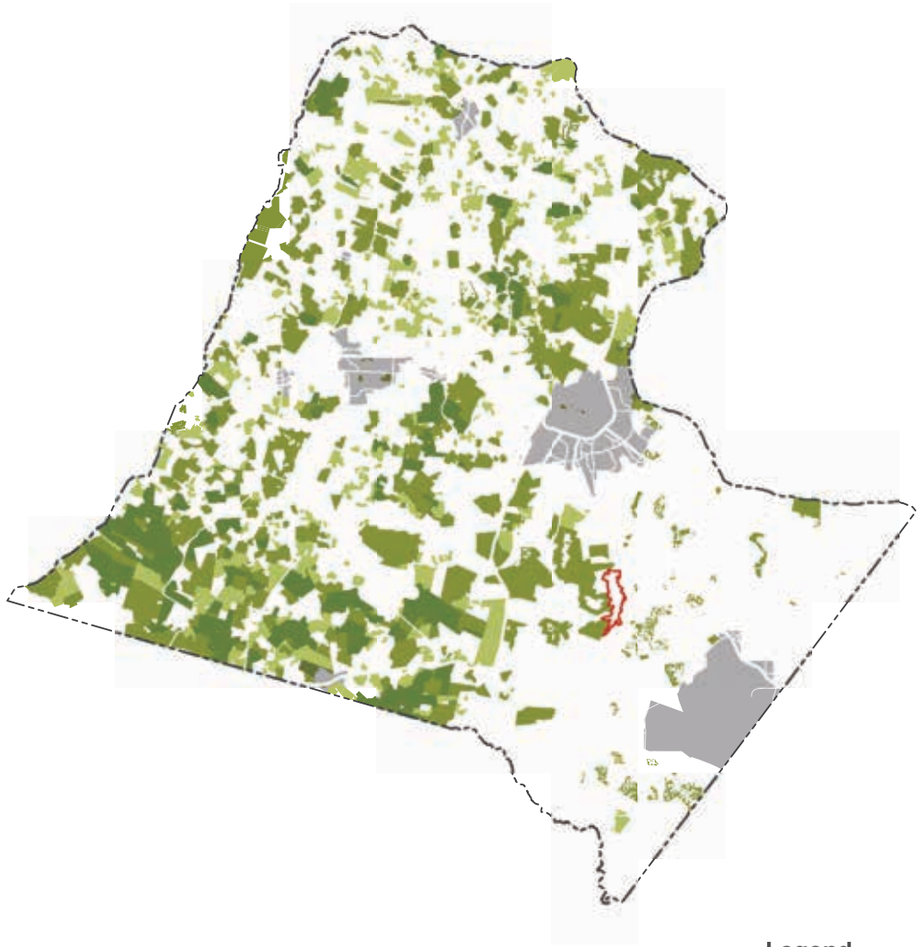
- Dulles Airport
- Leesburg Executive Airport

Following the dedication of Dulles Airport in 1982, the county has seen rapid expansion and is one of the fastest growing counties in Northern Virginia.

Legend

- Highest sound impact
- Medium impact
- Low impact

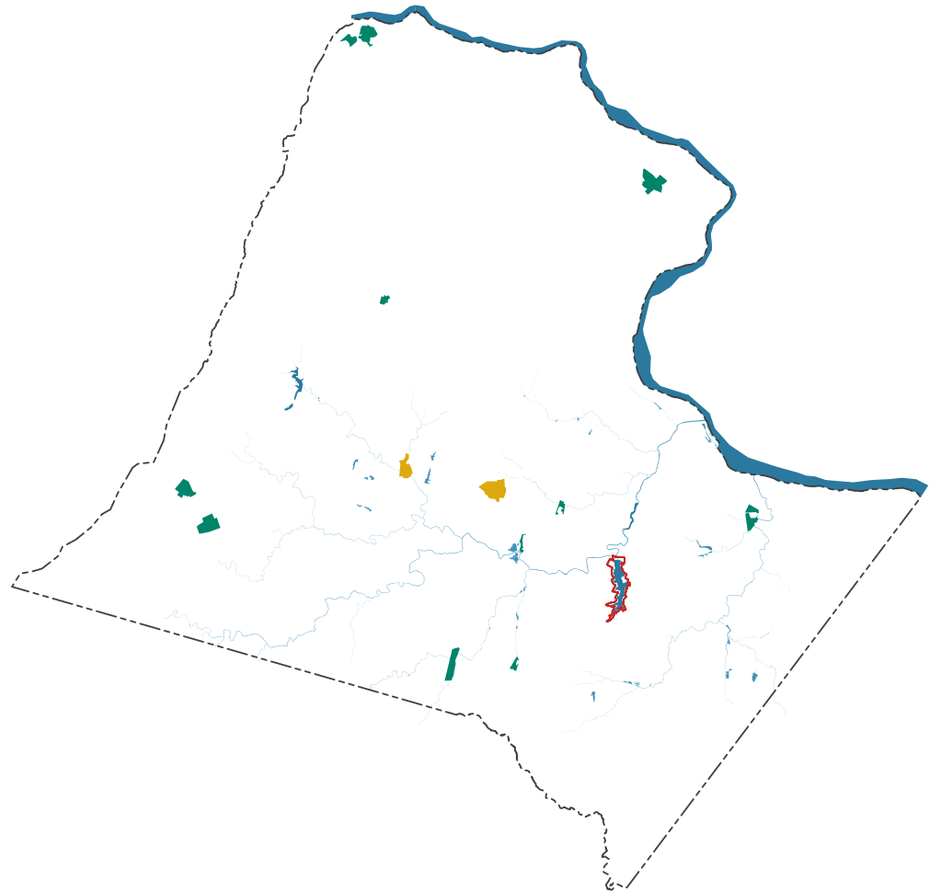
AGRICULTURE & EASEMENTS



Legend

- Conservation easements
- Agricultural districts in conservation
- Agricultural districts

WETLAND BANKS



Legend

- Wetland banks
- Proposed wetland banks

POLICY ZONES TRANSITION ZONE FOCUS

Loudoun County has been rapidly expanding from the east adjacent to Fairfax County and Dulles Airport. The ounty is known as a major DC suburb, with strong connections to its agricultural and rural heritage.

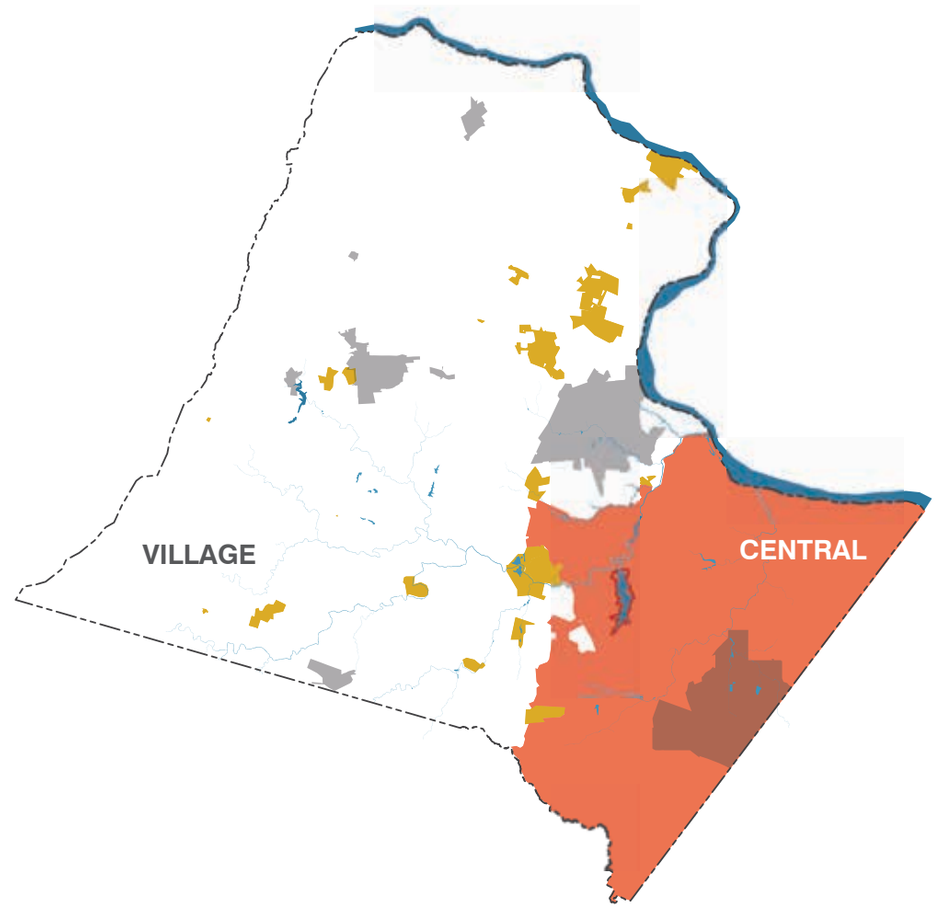
The division of suburban growth and agricultural interests is underscored by Policy Areas that divide the county along north-south lines, closely approximated by Route 15 and Belmont Ridge Road:

- Suburban
- Transitional
- Rural

Legend

- Policy Area - Suburban
- Policy Area - Rural
- Policy Area - Transitional

WATER UTILITY SERVICE AREAS



Loudoun Water provides water to approximately 230,000 residents of Loudoun County from two primary sources: Goose Creek and the Potomac River.

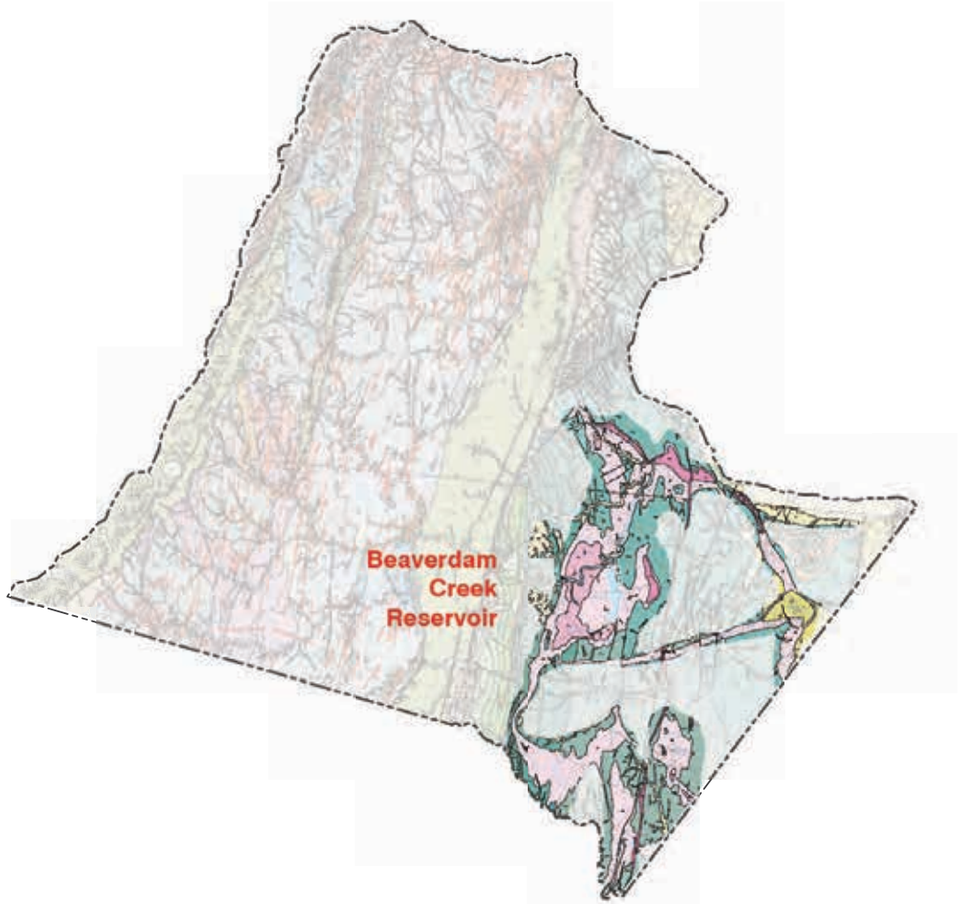
Reservoirs in Maryland, West Virginia, and Virginia augment the Potomac River through shared supply agreements. Goose Creek receives water from Beaverdam Creek Reservoir and Goose Creek Reservoir. Beaverdam Reservoir fills Goose Creek Reservoir when water levels get low and vice versa.

As of January 2014, Loudoun Water treats drinking water from Goose Creek. Loudoun Water purchased Goose Creek Water Treatment Facility from Fairfax in 2014 and completed numerous upgrades to ensure the quality of water provided to customers.

Legend

- Central service area
- Village service areas

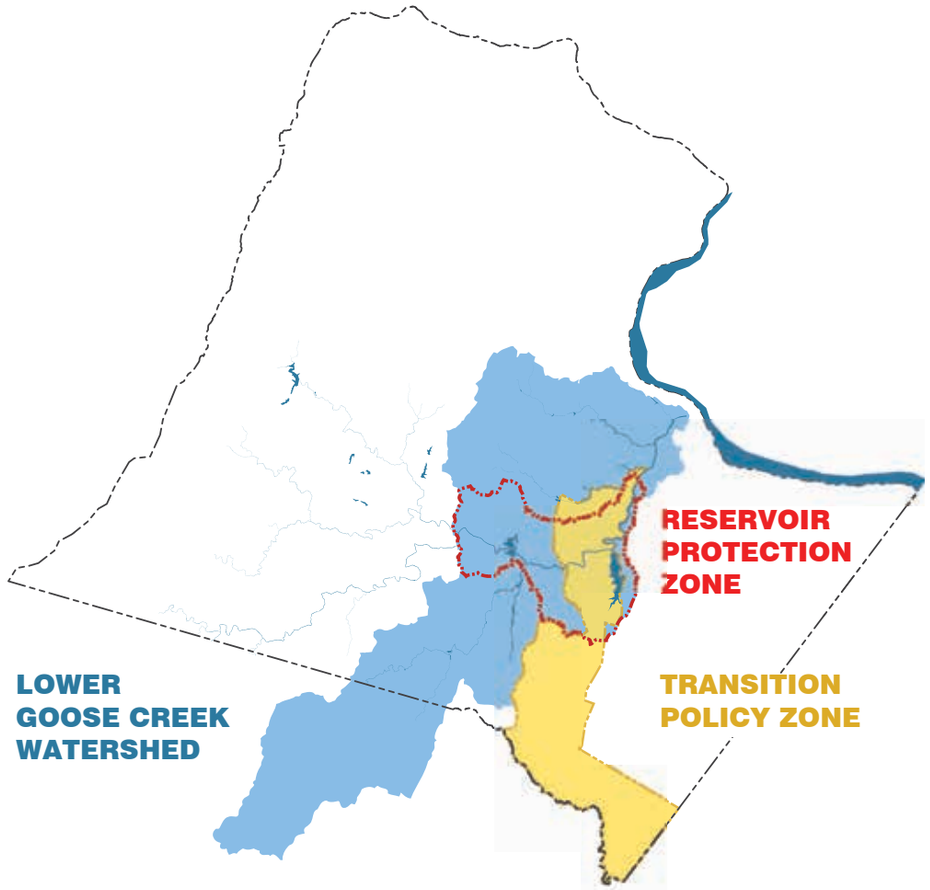
GEOLOGIC SEAM DIABASE DIKES



Characteristic geology of land adjacent to the reservoir includes a seam of narrow dikes and differentiated sheets of high-titanium, quartz-normative tholeiitic diabase.

Dikes vary from several feet to more than 500 feet wide and sheets exceed 2,000 feet in thickness. Diabase - also known as “trap rock” - is used as crushed stone and as ornamental stone. It has been used as a building stone, for landscaping and to erect dry-stone farm walls.

RESERVOIR IN TRANSITION WATER UTILITY CENTRAL TO COMMUNITY



Beaverdam Creek Reservoir is uniquely positioned to help redefine policy boundaries with a hydrologic focus to be a new water-focused policy area that could connect adjacent ecological areas of the state and region.

The estimated 1,000 miles of perennial steams in Loudoun County drain directly or indirectly into the Potomac River and ultimately into the Chesapeake Bay.

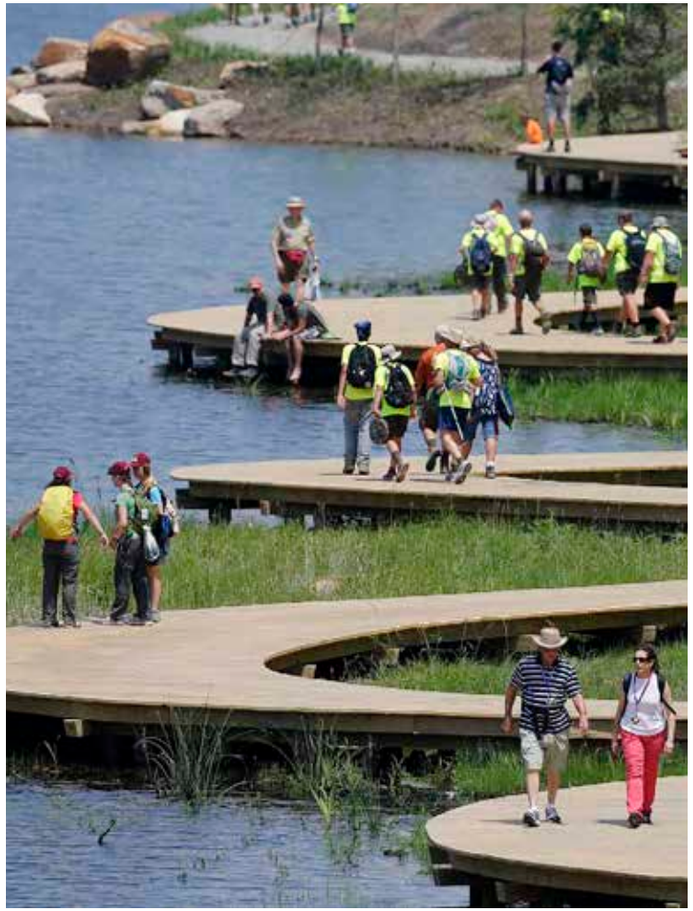
The county helps collect information on streamflow as part of its Water Resources Monitoring Program.

Reservoir Protection Zones are areas defined in the Facilities Standards Manual (FSM) that are required to follow additional regulations and development standards to ensure the integrity of public drinking water sources. The data are to be used as tools in the development review and planning phases.

Regional References

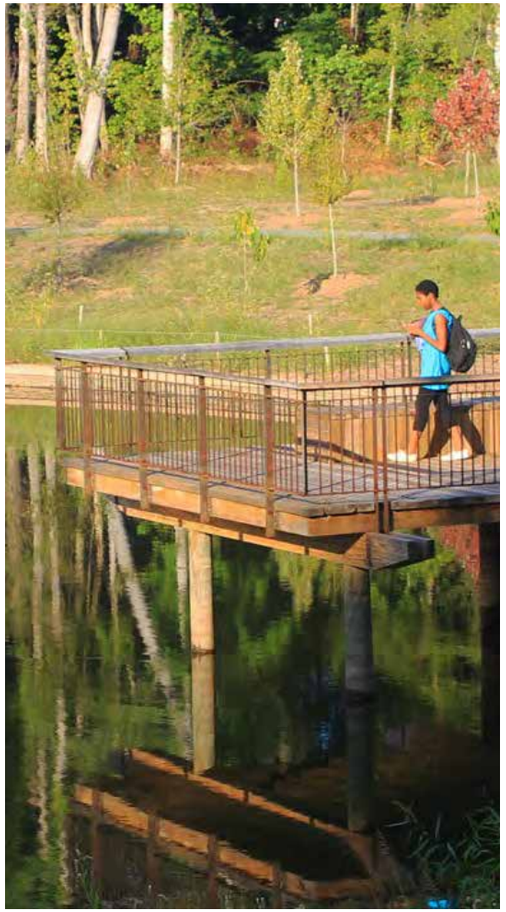
Related projects by NBW help inform future Park character and establish a framework for guiding development and use at the Reservoir.

WaterColor, Santa Rosa (FL)



Summit Scouting Reserve (WV)

The Dell, University of Virginia (VA)



Duke Water Reclamation Pond (NC)

Ecological Strategies

LOW-IMPACT | NO WATER ACCESS

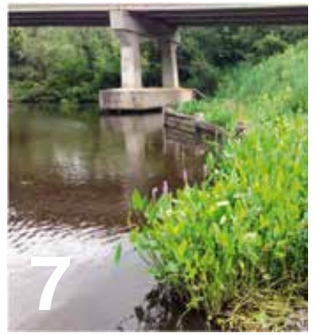
Habitat program for low-impact and no direct access to water from land:

1. Filtering wetlands introduced as buffer to keep feet off of the shoreline, and as the focus of educational opportunities and passive recreation opportunities such as bird-watching and walking.

2. Boardwalks become habitat enhancements in their own right, functioning to:
- provide concealment habitat for game fish and fish prey
- provide nursery habitat for small fish

3. Standing snags would also be appropriate in this precinct:
- perch sites and nesting habitat for birds of prey, wading birds, bats, insects
- partially submerged, nursery habitat for small fish
- stalking habitat for wading birds

LOW-IMPACT | ACTIVE RECREATION



Habitat program for active recreation - fishing, paddling, rowing, hiking, yoga - and introduce habitat amendments to increase wildlife diversity:

4. Submerged or partially submerged coarse woody debris, brush piles, stake beds:
- concealment habitat for game fish and fish prey
- basking sites for reptiles
- perching, stalking habitat for birds

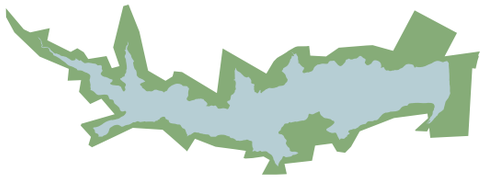
5. Rocks:
- concealment for game fish and fish prey
- attractive for crustaceans, mollusks, amphibians
- breakwaters

6. Standing snags:
- perch sites and nesting habitat for birds of prey, wading birds, bats, insects
- when partially submerged provides nursery habitat for small fish

7. Aquatic emergent vegetation:
- nursery habitat for fish
- stalking habitat for wading birds
- feeding & nesting for diverse waterfowl & songbird species
- habitat for dragonflies pollinators
- food & sheltering habitat for aquatic mammals such as beaver, muskrat, otter, mink

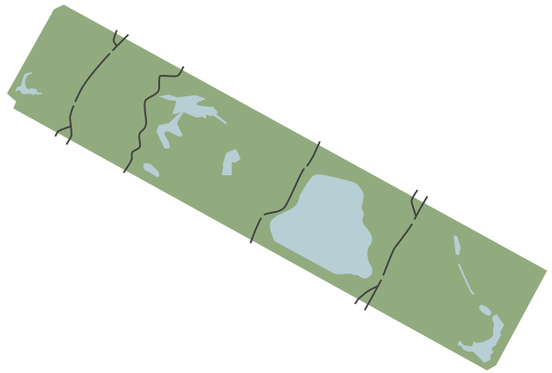
Public Works as Public Space

Comapring related park and natural areas to Beaverdam Creek Reservoir suggests the range of program and access types that are possible at such a large body of water.



CENTRAL PARK
NEW YORK NY

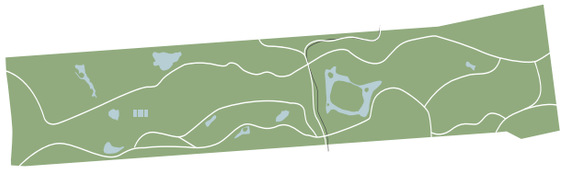
Constructed reservoir as civic amenity and vital city resource



Turtle Pond

GOLDEN GATE PARK
SAN FRANCISCO CA

Trails link a series of small constructed reservoirs.



Botanical Garden Trail

GREAT FALLS PARK
GREAT FALLS VA

Intimate and expansive experiences along trail network that includes broad range of relationships to the river.

Billy Goat Trail

THE SUMMIT BECHTEL SCOUTING RESERVE
GLEN JEAN WV

Wetland edges of primary lake that serves as water resource for thousands of acres of camp development.

Ampthitheater during Jamboree

DUKE WATER RECLAMATION POND
DURHAM NC

Low-impact opportunities for viewing that encourage education and limit access to water storage.

Overlook at forebay

LOUDOUN WATER AQUIARY
LOUDOUN COUNTY VA

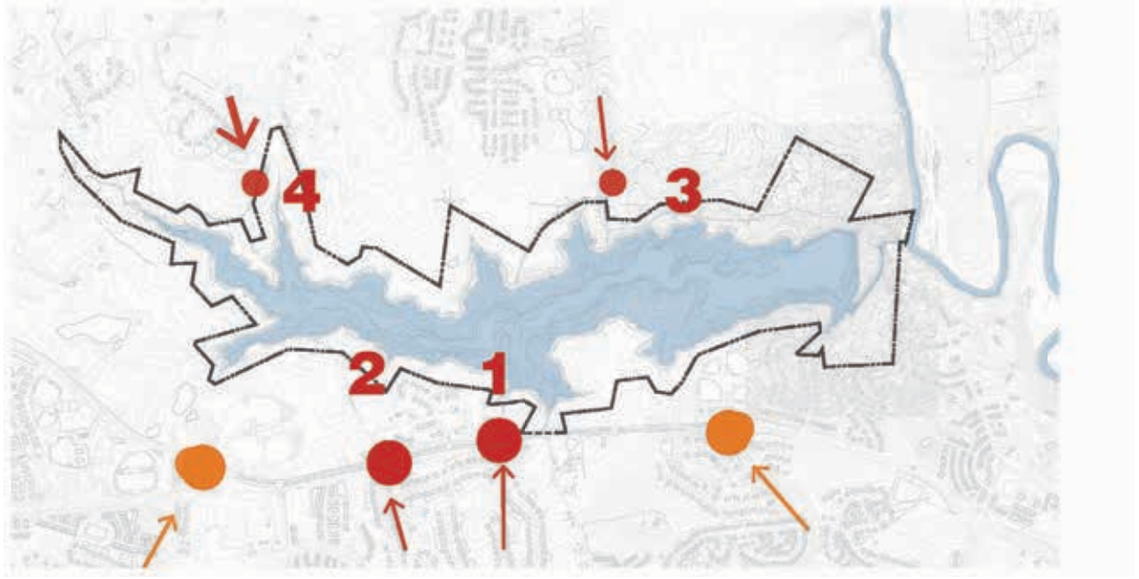
Constructed stormwater catchment as educational landscape

Scupper wall

Identity and Access

New public access to the Reservoir might priorities for the .

EXISTING ACCESS OPPORTUNITIES & CONSTRAINTS



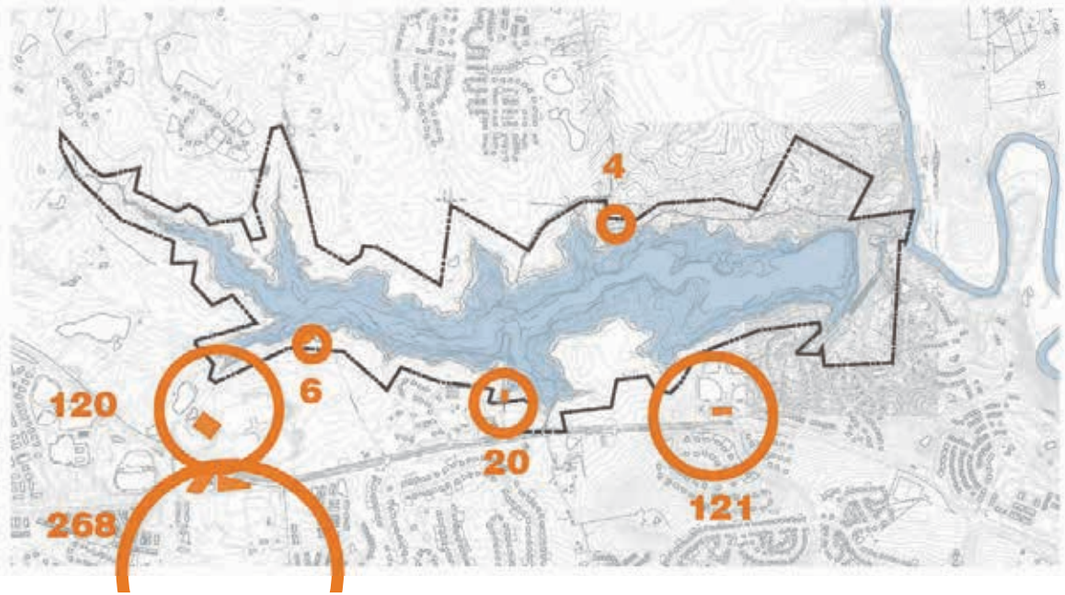
1. The primary access point adjacent to Mount Hope Church conflates the Reservoir and Church identities and parking areas.

2. Access at Alford Road is challenging due to limited visibility and a steep shoulder.

3. The access road from Evergreen Mills Road is long, winding, and narrow. Visitors drive past several housing developments and private lots, which confuses the Reservoir identity.

4. Informal access from Beaverdam Drive uses neighborhood and utility maintenance roads and is not desirable for future public access.

EXISTING PARKING CAPACITY



Existing parking lots within LWA parcels and adjacent to Beaverdam Creek Reservoir:

- Total spaces on-site: 30
- Total spaces adjacent: 389

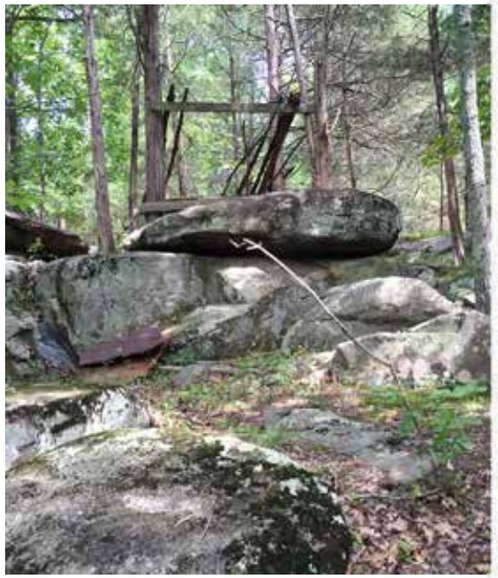
Expanding parking at adjacent parcels could remove pressure from development at Reservoir edges.

EXISTING TRAILS INCOMPLETE CIRCUIT

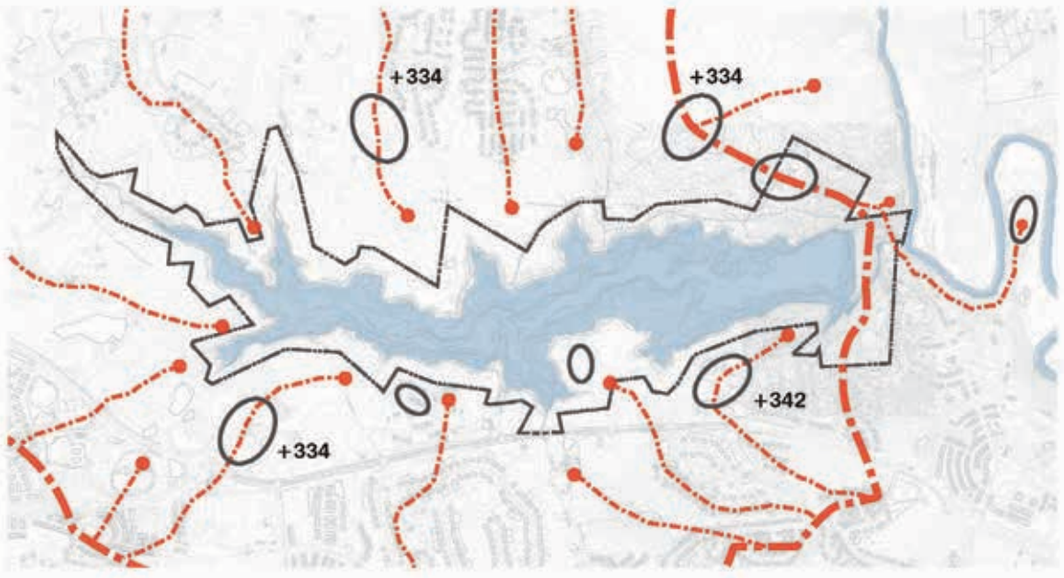
The Beaverdam Creek Trail is recognized locally and used by many hikers. Limiting access to the dam would be important for expanding the trail network.

Trails mapped by NBW and from data at AllTrails.com.

Landscape Structure



PROSPECT RIDGES LINK VISITORS TO VIEWS



Terrain in and around the Reservoir is characterized by broad, flat peninsulas and low-lying ground mostly accessible on foot.

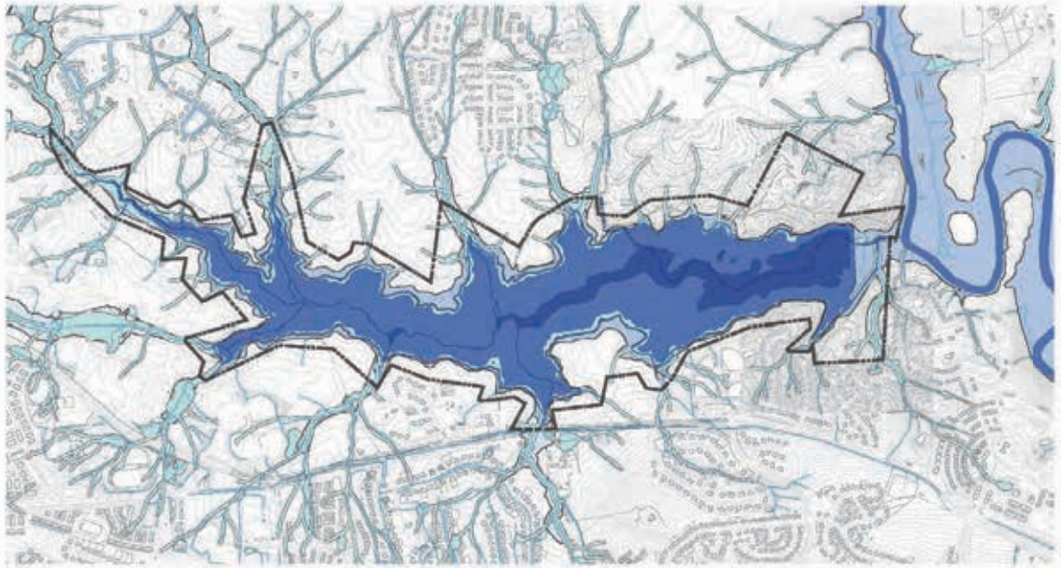
STEEP SLOPES CONNECTIONS TO CREEK

Terrain in and around the Reservoir is characterized by broad, flat peninsulas and low-lying ground mostly accessible on foot.

Legend

Steep slopes (>15%)

SUBTLE FLUCTUATIONS REVEAL SWEEPING FLATS

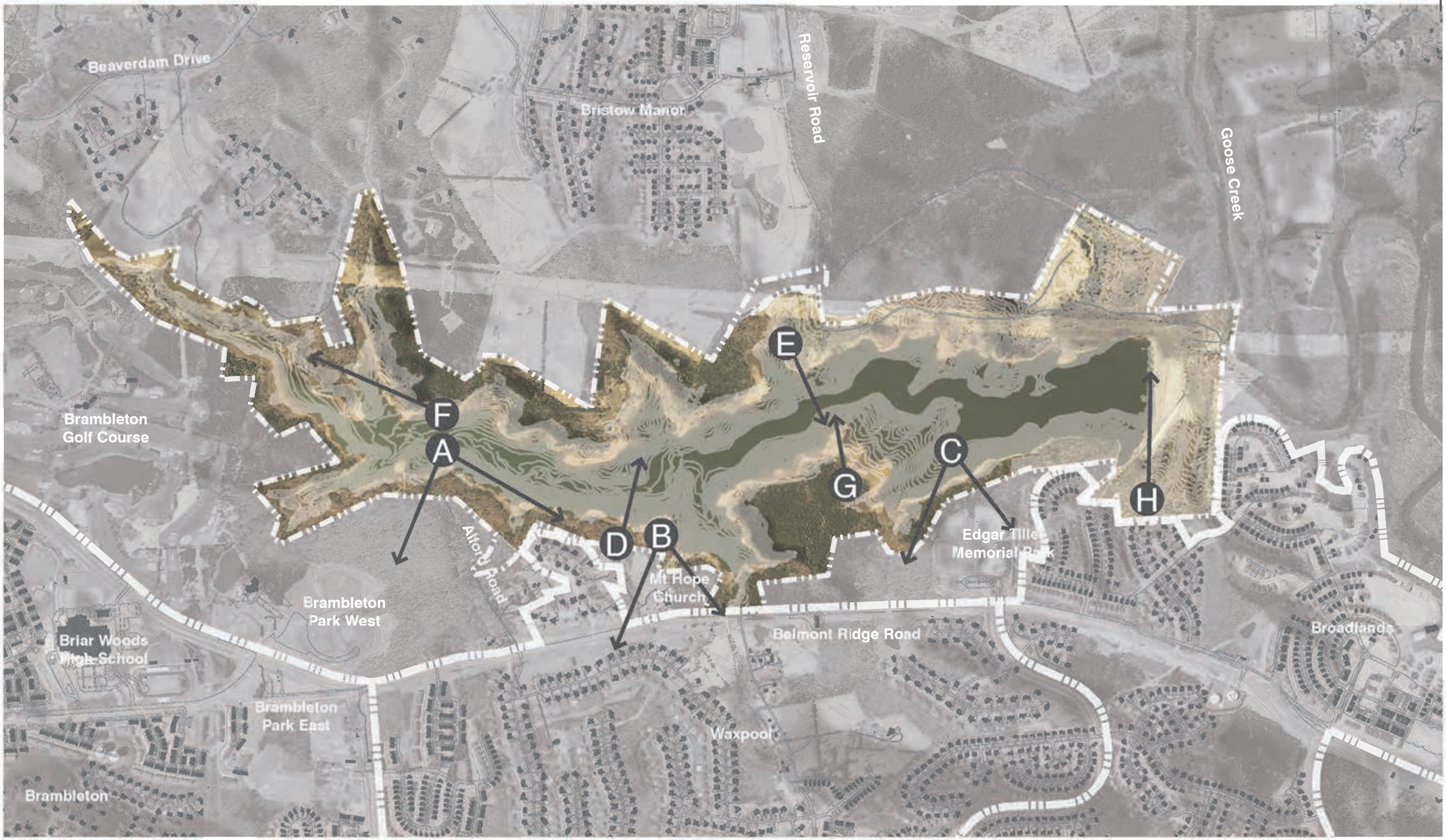


Water levels at the Reservoir fluctuate mildly except during construction or dam maintenance projects when the Reservoir is drained to 25-feet below operating level.

Legend

- Goose Creek
- Former Beaverdam Creek
- Reservoir Typical Water Level
- Reservoir Low Water (Maintenance)
- Reservoir High Water (Operation)
- County Wetlands
- County Drainagways
- FEMA Base Flood Elevations
- FEMA 500-year Flood Elevations

Existing features

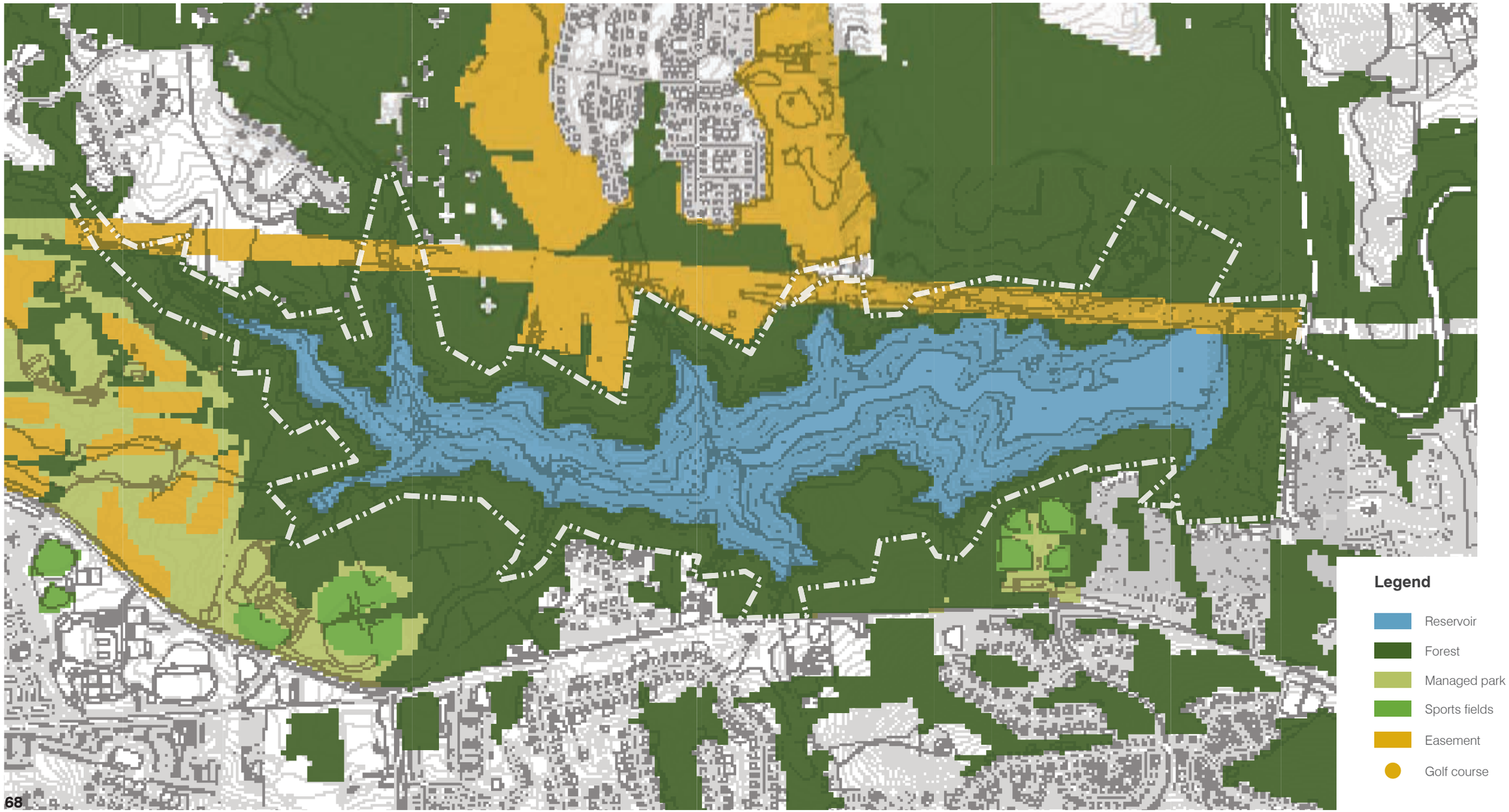


1" = 1000'

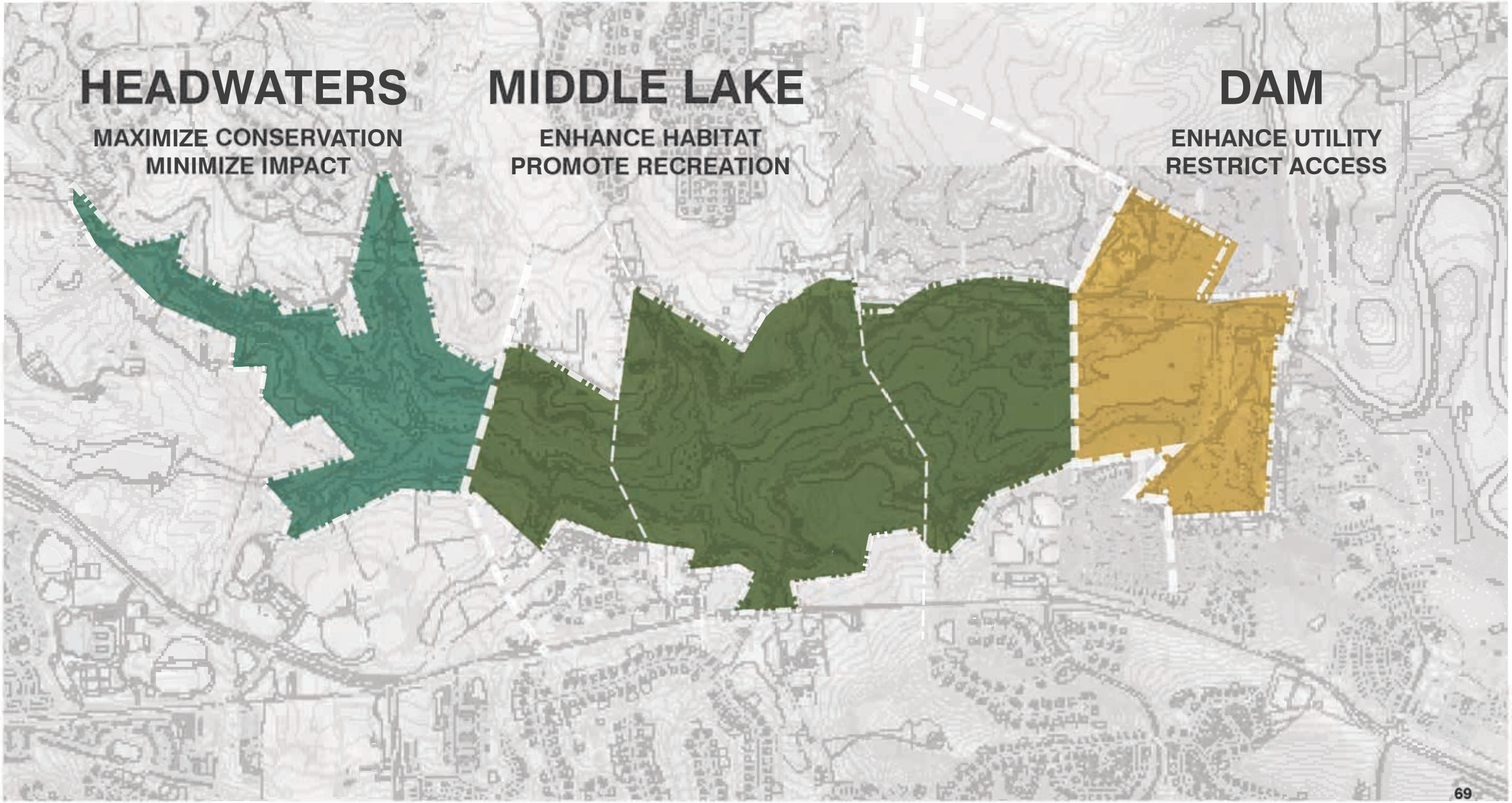
0' 500' 1000' 2000'

N

Existing Features



Existing Water Use Areas



Existing Crew Access

Observations
Current crew access is informal and unstructured. Access will be maintained for use of Reservoir as practice facility.
No current intention by Loudoun Water or NOVA Parks to host formal crew races or events at the Reservoir.

A2 APPENDIX | DESIGN WORKSHOP

Character Precedent Review

VEHICULAR ACCESS AND PARKING

PEDESTRIAN CIRCULATION

Fall protection?
Section view of wetland and water?

THRESHOLDS / PUBLIC EDGE

GATHERING SPACES AND SPECIAL PLACES

INTERPRETATION / EXHIBITS

Interactive for kids

Information displays very nice!

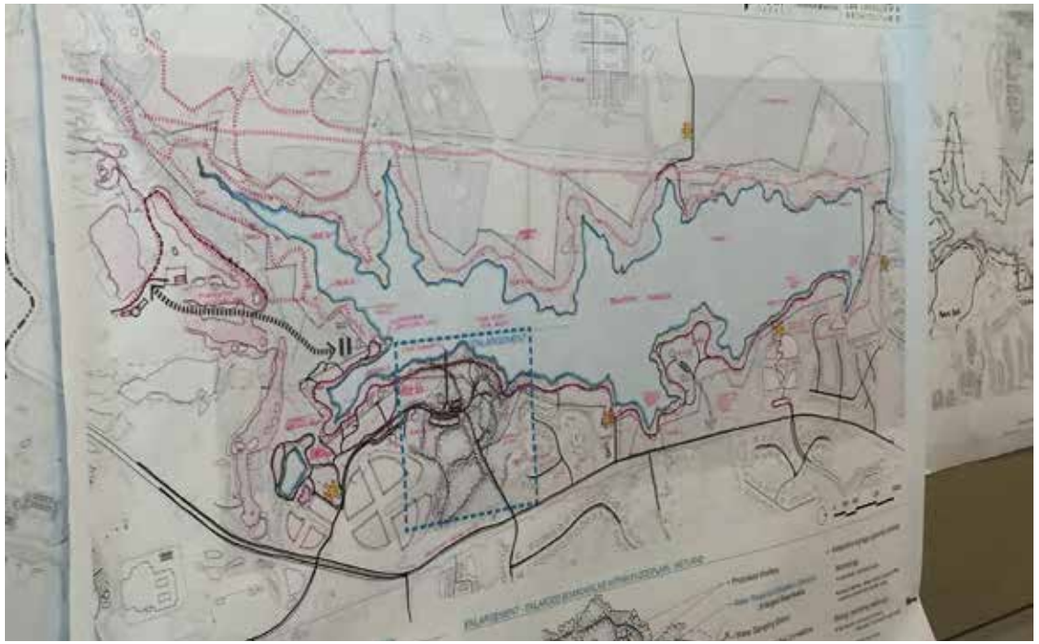
VISITOR CENTER

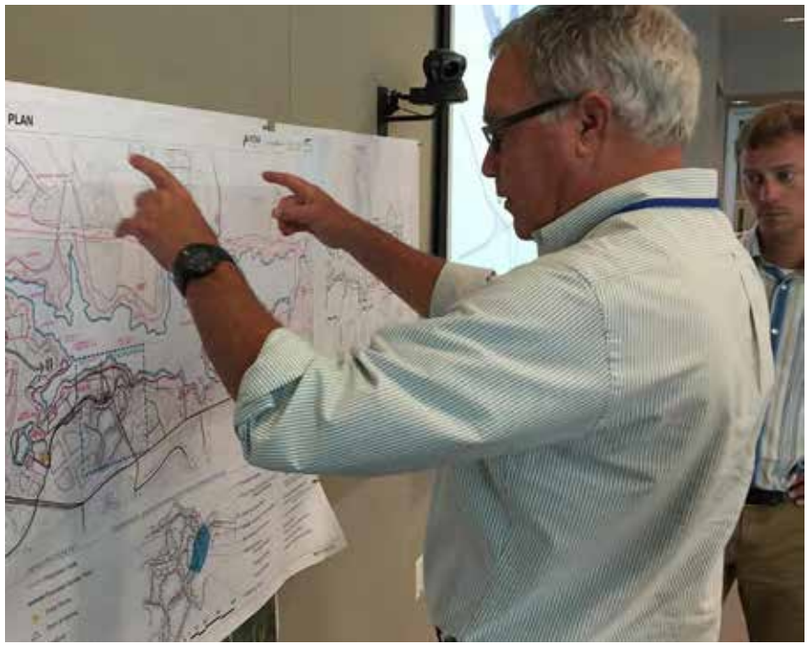
Nice connection to water.

Like natural light, and view of water.

SHORELINE EDGE / WATER ACCESS

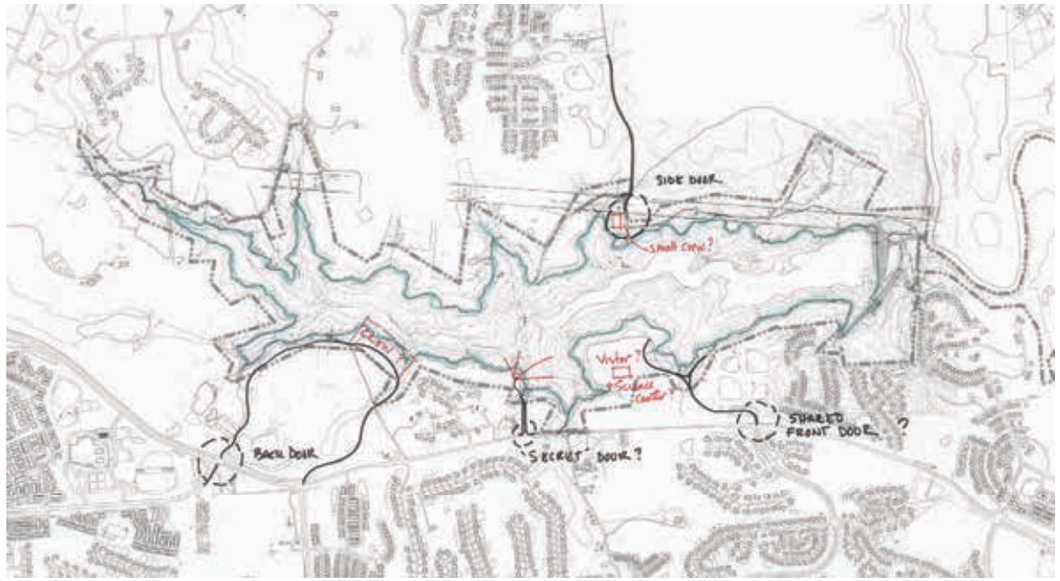
PAVILION / INTERPRETIVE STATION



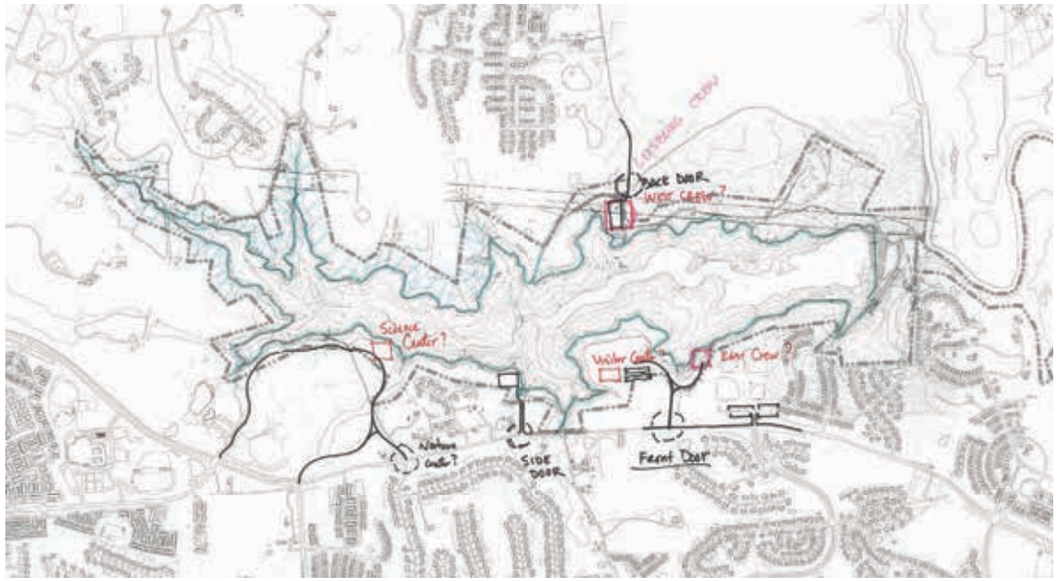

PLAN

Concept Design Studies

CONCEPT 1 | SHARED FRONT DOOR



CONCEPT 2 | NEW FRONT DOOR



CONCEPT 3 | CREW REALIGNMENT

CONCEPT 4 | CONSOLIDATE AND SEPARATE

A3 APPENDIX | PHASE 1 CONCEPT PLANS

Concept Plan Draft | Phase 1

NOVA Parks presented a Phase 1 Concept Plan for coordinated development with NBW and Loudoun Water based on Strategic Concept Plan guidelines.

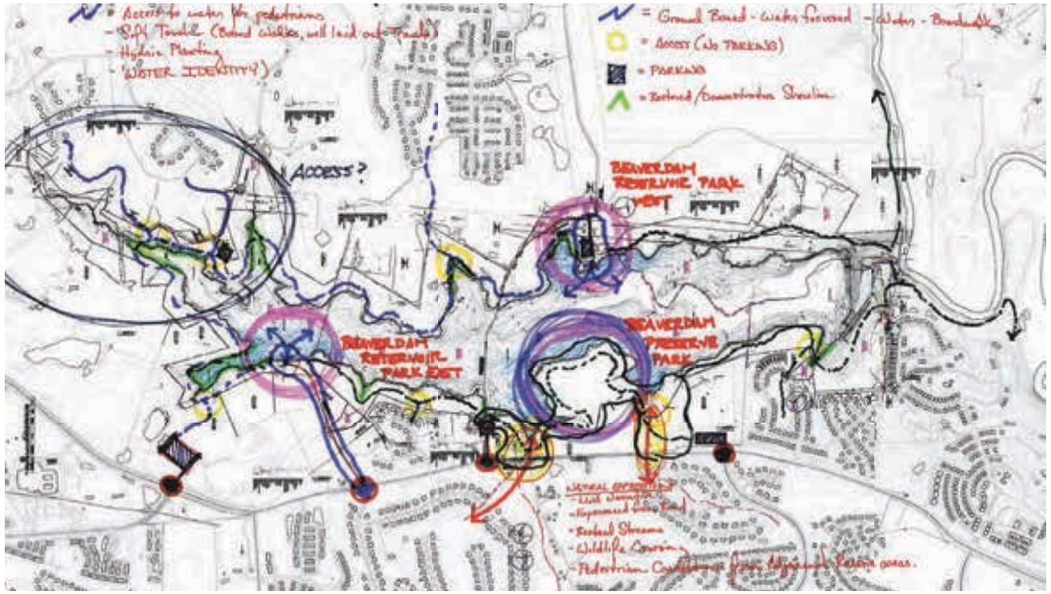
NOVA PARKS PHASE 1 PLAN

NBW RESERVOIR PARK PRECINCT PLAN


1
2
3
4
5
6
7
8
9
10
11
12
13

Site Concept Studies

PRECINCTS AND ACCESS



LARGE CROSSINGS

CONSOLIDATE PROGRAM AREAS

MAXIMUM WATER ACCESS

Precinct Concept Studies

WEST RESERVOIR ACCESS

RESERVOIR PARK

RESERVOIR PRESERVE VISITOR CENTER