

Rapid Presenting of Rapid Prototyping for Wetland Restoration

Wetland Restoration Decision Statement:

(revision Tue 9 Dec)

When, where, and how do we manage embankments¹ to achieve natural flow regimes² within riparian habitats of Erie NWR while not exceeding budgetary, political and/or legal constraints.

¹ Embankments include natural and artificial structures which alters hydrology...roads, trails, railroad grades, beaver, water control structures, dikes/levees

² Hydrologic flow and associated processes surrogate for biological integrity, diversity and environmental health

Layers

- ned1mcontour_eri
- PENNDOT_LOCAL
- PENNDOT_STATE
- trails_usfws
- local_roads_penn
- relic_transportatic
- NHD_streams
- PA_SP_NAD83_nc
- PA_SP_NAD83_so
- boundary
- soilsalb
- nwi_usfws
- naip_1-1_1c_s_pe
- slope
- mrlc01
- nedhill
- nedmos

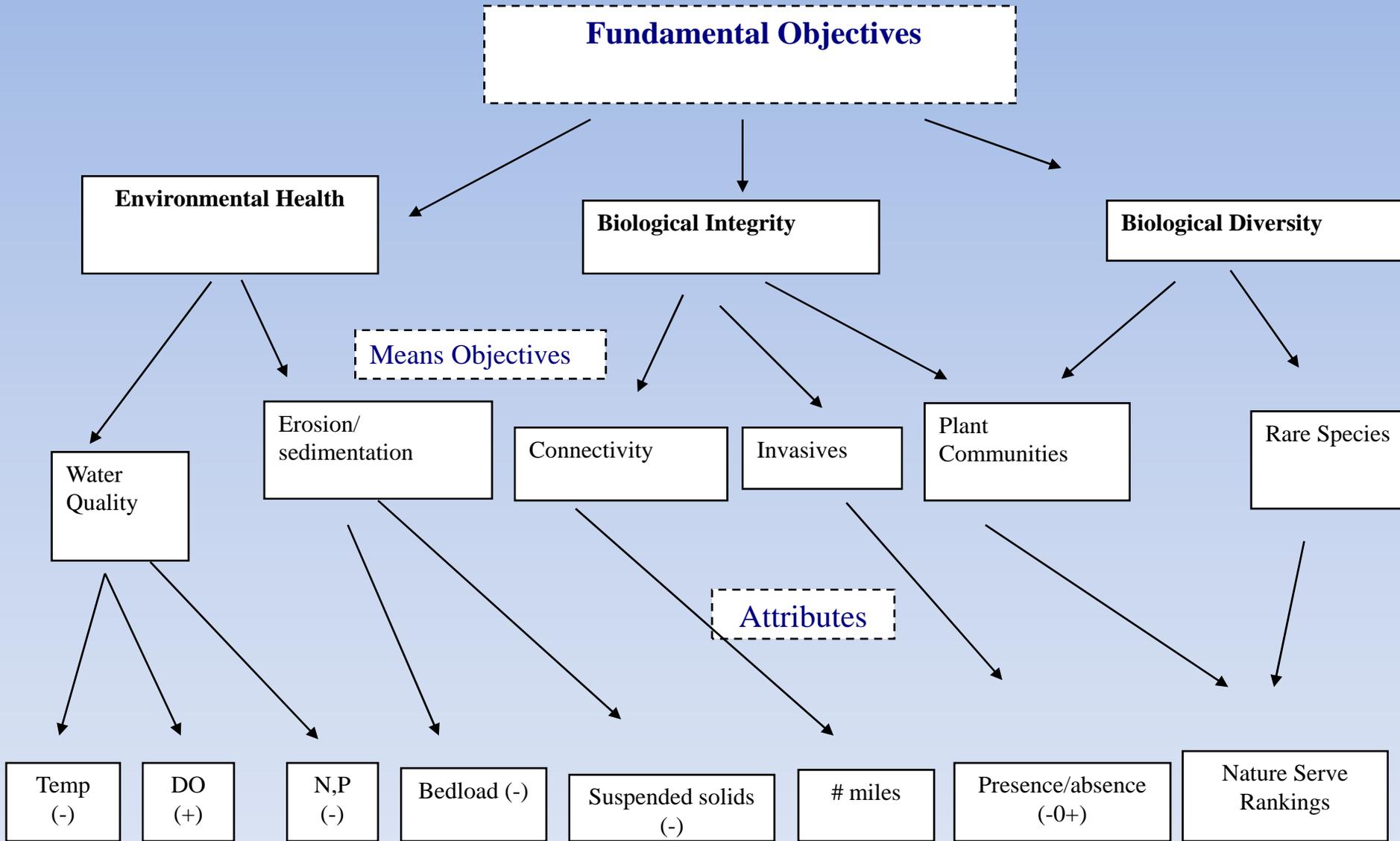
Display Selection Source Catalog



Alternatives

- **Take out water control structures – full or partial**
- Take out water control structures – modification
- **Embankment removal, including reseeding costs**
- Embankment modification
- WCS – remove boards
- WCS management
- No Action
- Beaver Management
- **Install culverts/bridges**
- Beaver Control
- Install flap gate
- Active manipulation of WCS via staff time (hire biotech?)

	Replace Culvert at township road	Open WCS	Remove Embankment & WCS
BioIntegrity1 connectivity	2	1	1
BioIntegrity2 invasives	1	1.5	1.5
BioIntegrity3 NatureServe VegCom	1	2	3
BioDiversity rare species/communities	0	0	0
BioDiversity α diversity, β diversity δ diversity	-	-	-
EnvironmentalHealth Water Quality	1	2	3
EnvironmentalHealth Natural Stream Flow	1	2	3
EnvironmentalHealth Erosion and Sedimentation	3	1	1
Public Maintain/Improve public relations and acceptance for alternatives.	1	0	0
Public Minimize flooding of non-refuge roads, trails, infrastructure	0	0	0
Cost Implementation	2	3	1
Cost Staff	2	2	3



Questions?

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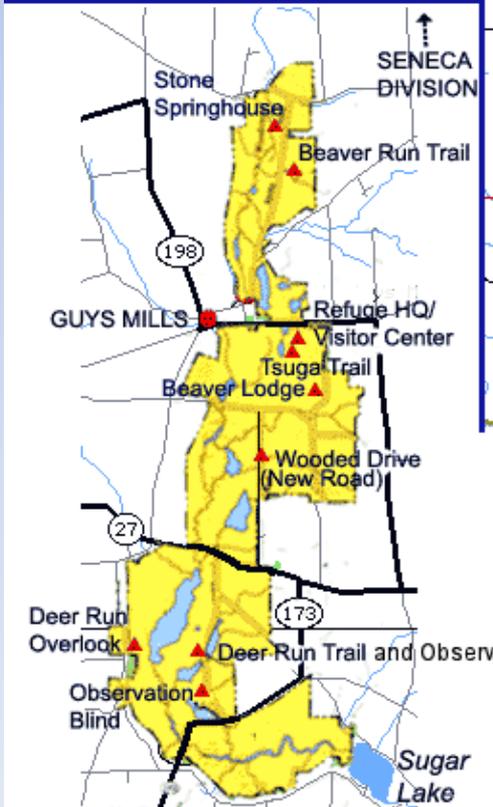
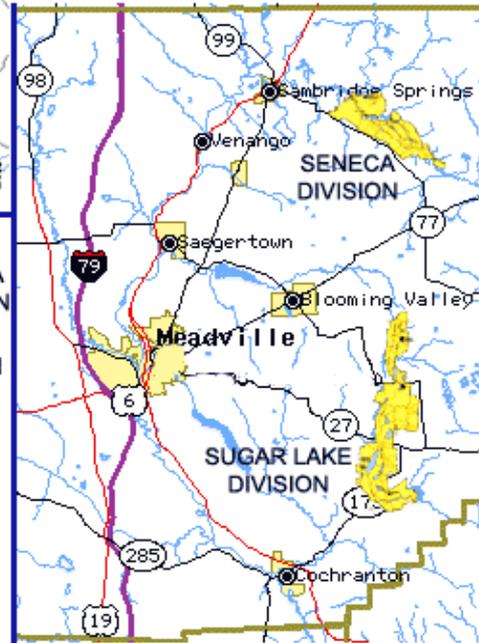
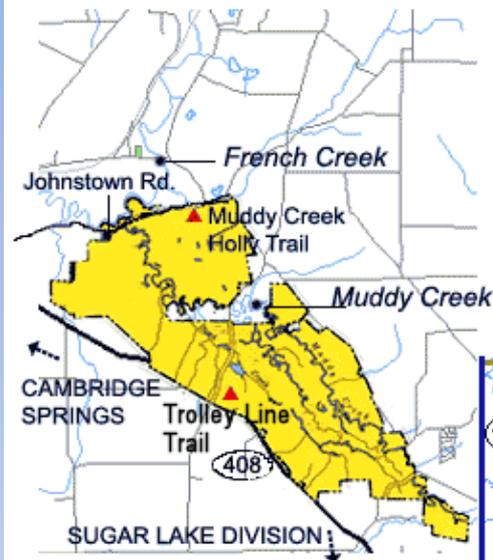
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Erie NWR

- Established in 1959
- Purpose “inviolable sanctuary for migratory birds”
- 16 Impoundments from 1 to 175 acres
- Moist Soil dugouts, misc dikes to capture flood waters
- History of managing impoundments for waterfowl

Click on a red triangle for a virtual tour of the Erie National Wildlife Refuge.



Objectives

- **Environmental Health**

- Improve/Maintain Water Quality
- Restore Natural Stream Flow magnitude, timing (seasonal), variability
- Minimize unnatural (catastrophic/short term) erosion and sedimentation (Mercury possible issue)

Objectives

- **Biological Integrity**

- Increase connectivity for FW Mussels, host fish species, and other native fish (addresses biodiversity of stream biota)
- Minimize/Eliminate/Prevent introduction invasive species
- Increase extent, quality, and conservation priority (example Nature Serve Ranking) of wetland and riparian plant communities associated with a dynamic and naturally flowing stream system.

Objectives

- **Biological Diversity**

- (Minimize negative impacts to existing mussel beds)
- Minimize impacts to existing S1-2 and/or G1-3 rare species/communities within the footprint of work site
- Increase alpha, beta, gamma diversity of wetland and riparian plant communities associated with a dynamic and naturally flowing stream system.

Objectives

- **Refuge Management**
 - Minimize cost to implement alternative
 - Minimize cost to monitor and maintain alternative
- **Public Buy In**
 - Maintain/Improve public relations and acceptance for alternative
- **Public Safety**
 - Minimize flooding of non-refuge roads, trails, and infrastructure

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