

Semi-aquatic Mammals: A Love/Hate Relationship for Land Managers

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Semi-aquatic Mammals?



Beaver
Castor canadensis



Muskrat
Ondatra zibethicus



American Mink
Neovison vison



River Otter
Lontra canadensis



Why do we care?

+ Pros

- Facilitate unique connections between aquatic and terrestrial systems
- Increase nutrient availability/cycling
- Increase primary production
- Increase habitat heterogeneity
- Increase species richness & biodiversity
- Sensitive bio-indicators/apex predators of pollution in aquatic systems



Why do we care?

■ Cons

- Drainage issues
- Depredation of commercial fisheries
- Depredation of domestic animals
- Damage to ornamental/desirable trees
- Damage to desirable aquatic plants
- Damage to man-made dams, dikes, and WCSs



American Mink

Neovison vison

+ Ecological Role

- Semi-aquatic generalist carnivores of:
 - Muskrat
 - Crayfish
 - Small mammals
 - Frogs
 - Fishes
- Sensitive bio-indicators of pollution
- Prefer areas of high prey abundance
- Presence has been positively correlated with:
 - Water availability
 - Aquatic vegetation
 - Water depth
 - Habitats that support their prey species



American Mink

Neovison vison

Damage

- Invasive in Europe, South America, and Asia
 - Even contributing to the declines of the Water Vole *Arvicola amphibius*, European Mink *Mustela lutreola*, and numerous waterfowl species
- Relatively little damage in North America
 - Damage to captive fish resources
 - Damage to domestic poultry



American Mink

Neovison vison



Control

- **Exclusion**
 - Netting
 - Chicken wire
- **Habitat Modification**
- **Direct Removal**
 - Protected as furbearers in Illinois
 - Trapping must be handled by a licensed trapper or Nuisance Wildlife Control Operator
 - See Illinois Digest of Hunting & Trapping Regulations



River Otter

Lontra canadensis

+ Ecological Role

- Recovered throughout much of the Midwest as a result of reintroduction efforts by state agencies
 - Now present throughout IL
- Sensitive bio-indicators of pollution
- Apex predators that strongly influence aquatic food web
- Precipitate trophic cascades in aquatic systems.
Indirectly affecting:
 - Phytoplankton density
 - CO₂ Uptake
 - Disease transmission
 - Indirect increase in biodiversity
- Facilitate nutrient transport between freshwater and terrestrial systems
 - Shoreline habitat diversity
- Charismatic flagship species



River Otter

Lontra canadensis

Damage

- Collaborative hunters
- Can cause significant damage for commercial fish hatchery operations
- Have been implicated as a significant predator for reintroduction efforts of threatened and endangered turtles



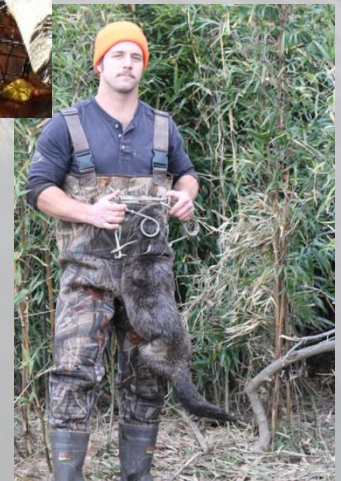
River Otter

Lontra canadensis



Control

- **Exclusion**
 - Netting
 - Chicken wire
- **Habitat Modification**
- **Direct Removal**
 - Protected as furbearers in Illinois
 - Trapping must be handled by a licensed trapper or Nuisance Wildlife Control Operator
 - IDNR River Otter registration permit required & all harvested otters must be tagged with CITIES tag
 - 5 otter/trapper limit
 - See Illinois Digest of Hunting & Trapping Regulations



Muskrat

Ondatra zibethicus

+ Ecological Role

- Foraging and lodge building can influence
 - Hydrology
 - Nutrient availability
 - Wetland structure
 - Biodiversity
- Likely play a role in the construction of valuable hemi-marsh habitat
- Riparian mussel foraging can influence bivalve populations and distribution



Muskrat

Ondatra zibethicus

Damage

- Aquatic generalist herbivores that can negatively impact aquatic restoration efforts and plantings
- Burrowing can compromise shorelines, man-made dikes and dams, and water control structures



Muskrat

Ondatra zibethicus



Control

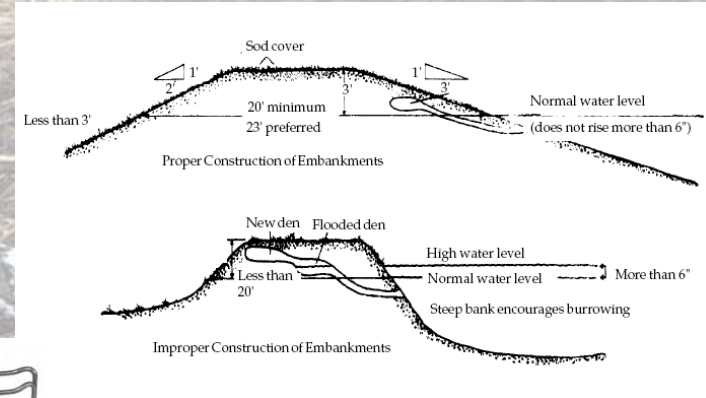
- **Exclusion**

- Fencing
- Stone rip rap dams
- 3 to 1 slopes

- **Habitat Modification**

- **Direct Removal**

- Protected as furbearers in Illinois
- Trapping must be handled by a licensed trapper or Nuisance Wildlife Control Operator
- See Illinois Digest of Hunting & Trapping Regulations



Beaver

Castor canadensis

+ Ecological Role

- Recovery from the brink of extinction
- Profound influence on habitat structure
 - Damming
 - Foraging
- Promote succession in wetland habitats through foraging
- Change the physical structure and flow of streams, soil profile, and current velocity
- Influence nutrient availability, macroinvertebrate assemblages, and aquatic habitat structure for other species
- “Ecosystem Engineers” and “Keystone Species”



Beaver

Castor canadensis

Damage

- Flooding as a result of dams results in millions of dollars in damages annually
- Foraging and flooding can also cause considerable damage to ornamental trees and commercial timber
- Ecological damage in some contexts



Beaver

Castor canadensis



Control

- **Exclusion**
 - Fencing desirable trees
- **Habitat Modification**
 - Continual removal of dams
- **Direct Removal**
 - Protected as furbearers in Illinois
 - Trapping must be handled by a licensed trapper or Nuisance Wildlife Control Operator
 - See Illinois Digest of Hunting & Trapping Regulations
- **Clemson Pond Levelers**



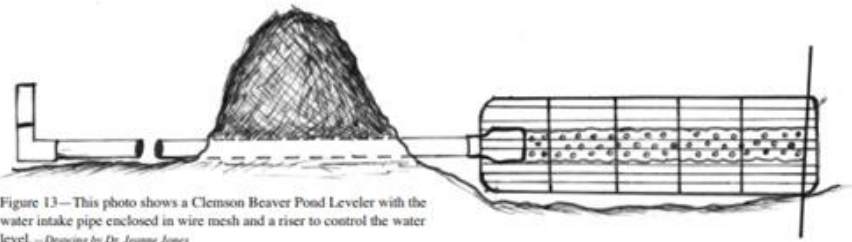


Figure 13—This photo shows a Clemson Beaver Pond Leveler with the water intake pipe enclosed in wire mesh and a riser to control the water level. —Drawing by Dr. Jeanne Jones



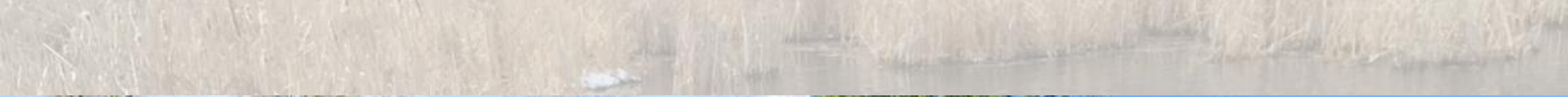












Conclusions

- **Adaptive management is key when managing human/wildlife conflict**
 - “It is not the strongest of the species that survive, nor the most intelligent that survives. It is the one that is most adaptable to change.” –C. Darwin
- **There is no panacea for mitigating these issues**
- **Often it is not the animal that is the problem, but the perspective (or lack thereof) of the landowner**



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Questions?



Lake County Forest Preserves

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