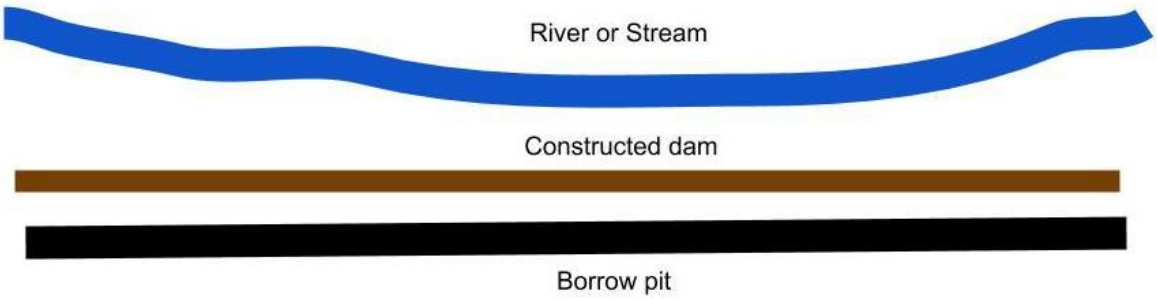
Impoundment Construction
Thomas R. Biebighauser

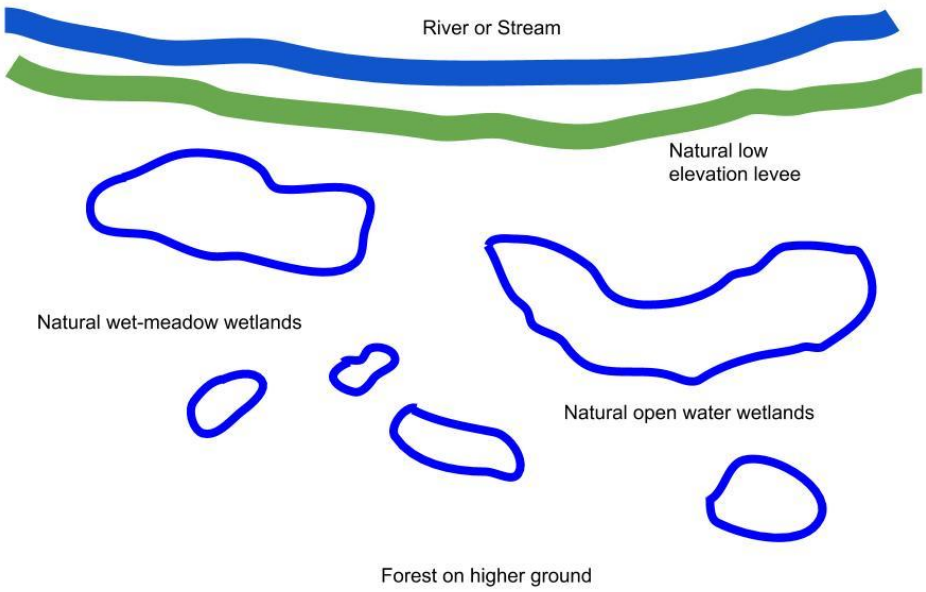
Techniques used to build wetlands for waterfowl and wildlife have greatly changed since the 1900's. The author was taught to construct large impoundments containing deep water to improve habitat for ducks and geese while majoring in Wildlife Management at the University of Minnesota in the 1970's. Here are the main points that were imparted about managing wetlands and waterfowl:

1. Nesting success for waterfowl may be improved by constructing long and high dams (dikes, levees) to prevent seasonal flooding of natural wetlands and floodplains.
2. Impoundments should be built by surrounding large fields, forests, and existing natural wetlands with dams. The dams should be built high with steep sides to lower construction costs.
3. It unnecessary and too costly to dig deep core trenches that are based on clay or bedrock under dams to prevent leaking.
4. Water control structures and pumps should be installed so that moist soil management may be practiced. This involves draining all water from the impoundment in the Spring and returning it in the Fall using pumps.
5. Large and deep canals (ditches) should be built so that water may be diverted from rivers to fill impoundments in the Fall for hunting season.
6. Ditches should be dug between wetlands so they may be drained for management.
7. Natural wetlands should be connected with ditches so that they may be drained to remove carp.
8. Fields should be created within and around impoundments and planted to corn or wheat so they may be flooded in the Fall to improve duck hunting.

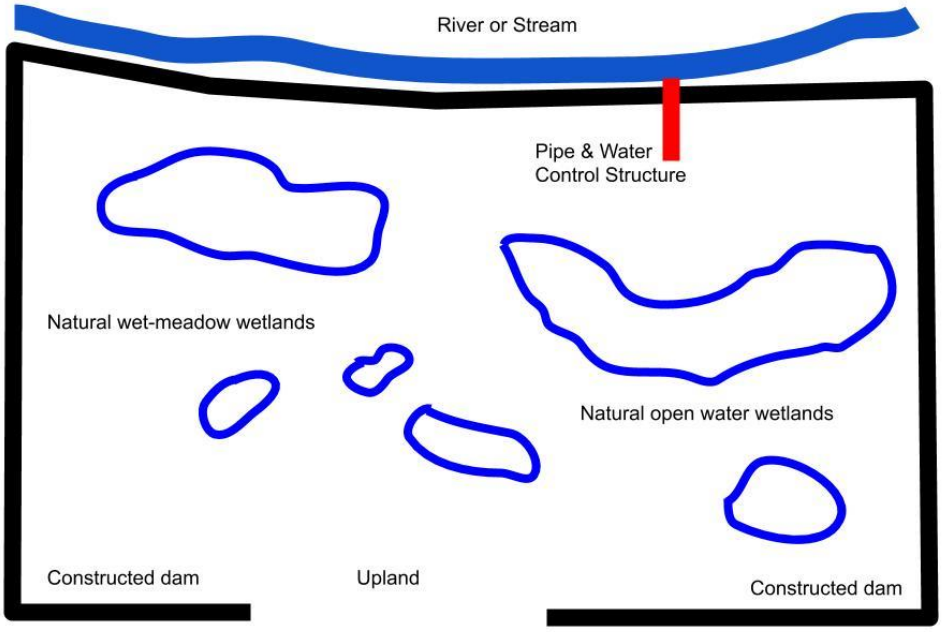
The author has built over 1,400 dams for impoundments since 1979.



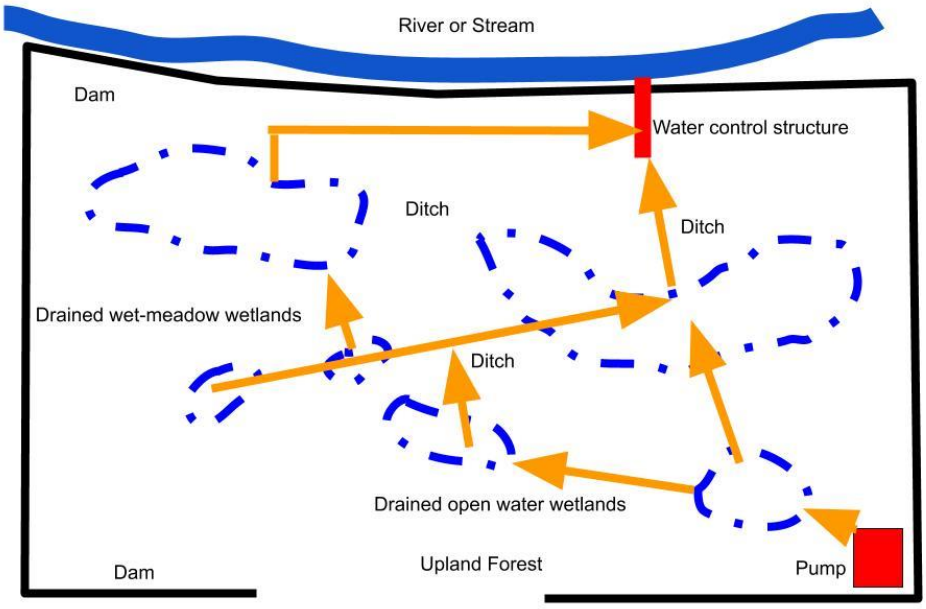
Constructed dam showing area where soil was removed to build a dam for an impoundment



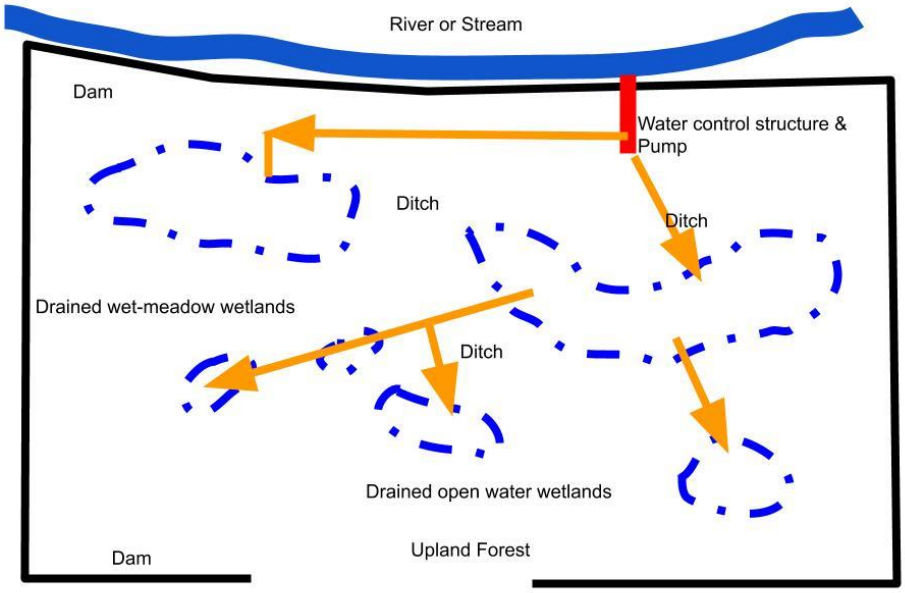
Natural wetlands located on a floodplain



Impoundment built with dam and water control structure



Ditches are dug to drain the natural wetlands. This way water can be directed into the dried basins from an uphill or downhill location.



This impoundment is designed to be filed by pushing water uphill. Water soon leaves the natural wetlands when pumping ends.

Advantages of building impoundments:

1. Large areas may be inundated with deep water.
2. Water may be completely removed to control unwanted fish such as carp.
3. Water may be removed in the Spring so the area may be farmed.
4. Water may be removed to facilitate the repair of dams and water control structures.
5. Water may be added by pumping in the Fall season for duck hunting.
6. Prevents rivers and streams from flooding the impoundment.

Disadvantages of building impoundments:

1. Destroys natural wetlands within and near the impoundment.
2. Prevents floodwaters from naturally filling wetlands.
3. Prevents native fish from accessing floodplains for feeding and spawning.
4. Deep waters receive little use by ducks and geese because the impoundment supports nonnative fish that control waterfowl food.
5. Use by migratory waterfowl and shorebirds is significantly reduced compared to natural wetlands with varying hydroperiods.
6. Deep waters support the nonnative American bullfrog.
7. Can dry large areas because of leaking dams, water control structures, and lenses of sand and gravel within the pool area.
8. Long dams often built across natural wetlands, filling these wetlands with soil.
9. Borrow pit ditches where soil was removed to build the dams often become ditches that drain wetlands.
10. Natural wetlands are drained when water is not pumped into the impoundment.
11. Dams require regular maintenance including the repair of muskrat burrows, beaver canals, removal of trees, and washouts caused by flooding.
12. Electricity costs are very high for pumping water.
13. Maintenance of pumps, water control structures, dams, and spillways are time consuming and costly.
14. The ditches dug to move water into and out of impoundments become blocked by beaver, and by dense growths of cattails.
15. Prevents wood used by turtles and birds from entering the impoundment.
16. Artificial appearance with straight lines and high dams.
17. Dams cause erosion along stream and river banks.
18. Impoundments become dominated by cattails and reed canary grass, and nonnative plants, receiving little use by waterfowl.
19. The soil removed from digging ditches is often used to build nesting islands, and the nesting islands are generally placed in wetlands that are drained.

The author is now working to restore natural wetlands destroyed by the construction of impoundments to improve habitat for a diversity of native wildlife and fish species.