

Figure 5-11. Project Synopsis: Penn Lake Use Attainability Analysis

A Use Attainability Analysis (UAA) is a scientific assessment of a water body's physical, chemical, and biological conditions. This assessment provides the foundation for a lake-specific best management practices (BMPs) plan that is used to maintain or attain the existing and potential beneficial uses of a lake, such as swimming, fishing, or aesthetic viewing.

Goals for Penn Lake

Nine Mile Creek Watershed District

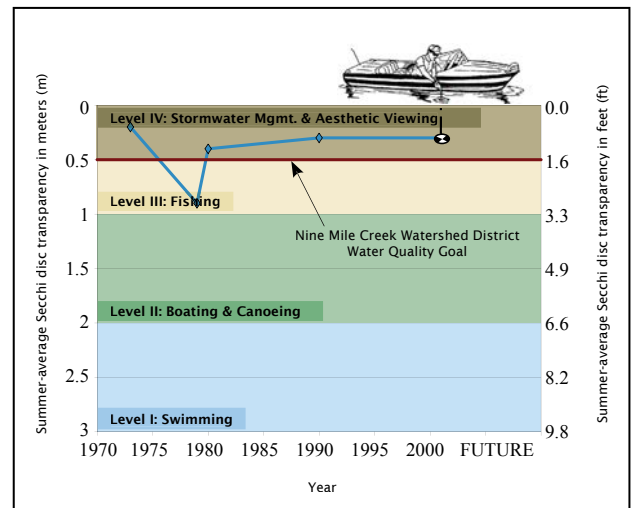
Water Quality Goal:

Level IV Classification—intended for runoff management and aesthetic viewing; Secchi disc reading ≤ 0.5 m.

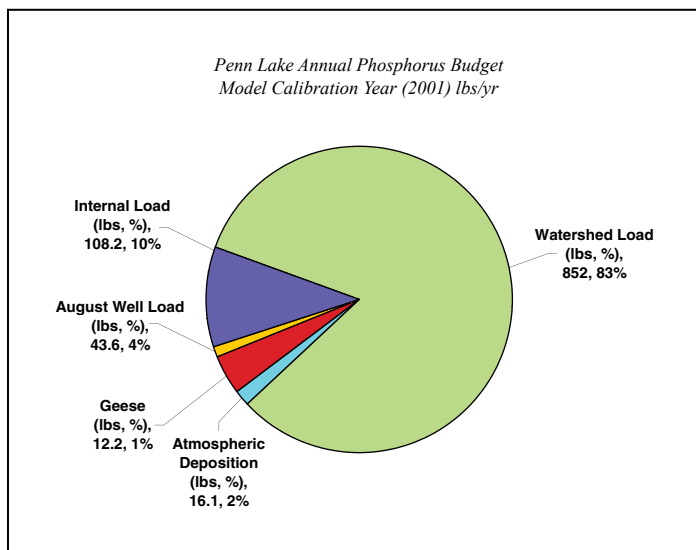
Investigative Techniques

The Penn Lake UAA includes both a water quality analysis and prescription of protective measures for Penn Lake and its watershed. This analysis and prescription is based on:

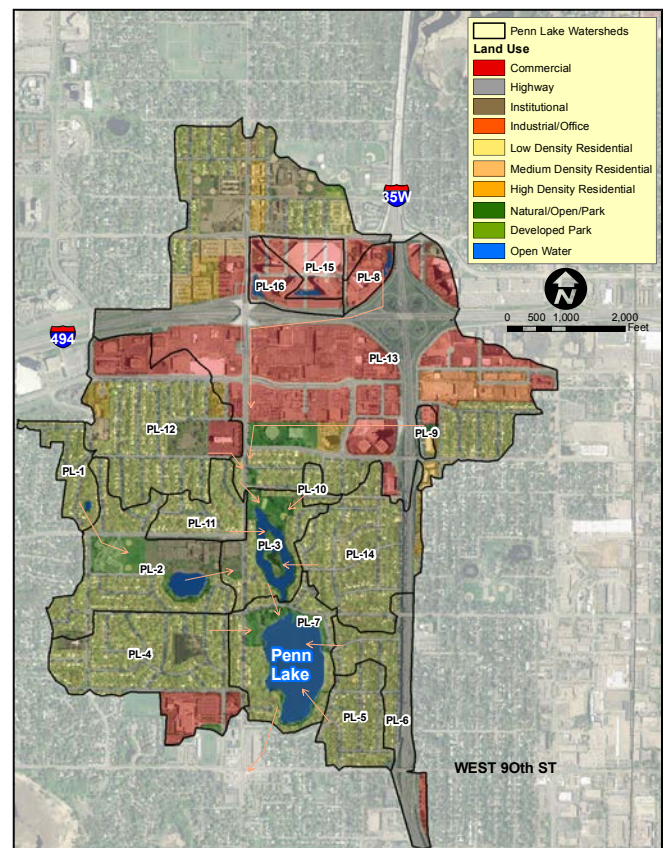
- Historical water quality data
- Aquatic plant surveys
- Intensive lakewater quality study
- P8 computer simulation modeling of runoff water quality
- Lake hydrologic and phosphorus budget analyses (see below)
- Best management practices (BMPs) analysis



This graph illustrates Penn Lake's historic and predicted future summer-average water clarity (transparency). Transparency is measured as the depth at which a black-and-white patterned disc (a Secchi disc) disappears from view as it is lowered into the water.



The annual phosphorus budget indicates watershed runoff contributes the largest amount of phosphorus to Penn Lake (~83 percent), while geese contribute roughly 4 percent of the annual phosphorus load.



The land use on a lake's watershed directly impacts the water quality in the lake. Therefore, the Penn Lake UAA assessed existing and ultimate watershed land-use conditions.



Purple loosestrife is an exotic species that invades wetlands and lake shorelines. It out-competes native species and, if left unchecked, will eventually become the dominant plant wherever it appears.



Purple loosestrife can be managed by releasing root-boring weevils onto the plants.



Digging loosestrife by hand is another possible management method.

Water Quality Problems

- **Recreational Issues**

Problem: Summer algal blooms (caused by high phosphorus levels)

Cause: Urban stormwater runoff conveying large amounts of phosphorus to the lake

- **Biological Issues**

Problem: Exotic lake weed species (see left)

Cause: Purple loosestrife

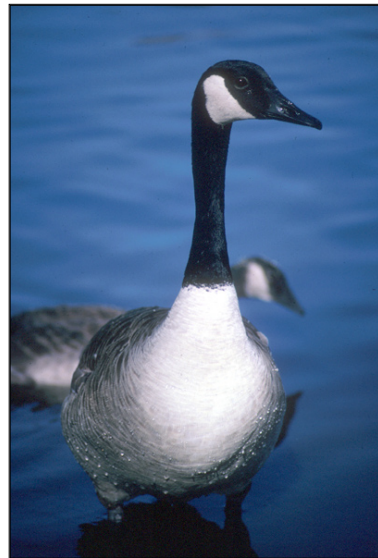
Recommended Remedial Measures*

Conventional Runoff BMPs

- Pretreatment of runoff from future 35W expansion

Biological Management Techniques

- Manage purple loosestrife by releasing specific beetle species
- Continue annual goose removal program



The annual goose removal program continues to help reduce this source of phosphorus to Penn Lake.



Geese are herded into a pen where the Department of Natural Resources assesses the birds, relocating some to distant locations and slaughtering others for donation to local food shelves.