

## ***Recommendations and Future Directions***

This report evaluates the current health of Snohomish County lakes and identifies a variety of problems that threaten lake health and enjoyment. The following sections summarize the proposed water quality targets for lakes, recommendations for individual lakes, proposed criteria for public actions at lakes, and steps that lake residents and users can take to protect lake health.

### ***Water Quality Targets***

The ideal would be for all lakes in Snohomish County to be in healthy condition. For this to happen, the lakes listed as in healthy condition need to be protected to maintain their health, lakes that are currently at risk need to be improved, and lakes listed as impaired need to be restored.

Quantifiable targets to achieve these goals would be for lakes that “Need Protection” to maintain at least their 1990-2002 average water clarity and their 1996-2002 average epilimnion and hypolimnion total phosphorus concentrations (with a few exceptions for needed improvements as described in the individual reports). The targets for lakes that “Need Improvement” or “Need Restoration” would be to increase their 1992-2002 average water clarity and reduce their 1996-2002 average epilimnion and hypolimnion total phosphorus concentrations (also with a few exceptions).

Washington State water quality standards (WAC 173-201A-030(5)) currently set 10 µg/l as the criterion for epilimnion total phosphorus concentrations in lakes that have ambient average concentrations of 4 to 10 µg/l. The criterion for all lakes with greater than 10 µg/l average total phosphorus concentrations is 20 µg/l. The data provided in this report suggest that these standards are inappropriate for some lakes. However, developing more refined numeric criteria (i.e. specific total phosphorus values) would require detailed lake specific studies in most cases. Therefore, this report recommends the use of the general targets described above for each lake category until more detailed studies, if any, are completed.

### ***Summary of Recommendations for Individual Lakes***

Table 11 summarizes the recommendations for individual lakes contained in this report. The first three general recommendations apply to every lake, although they may be more critical at some lakes. The waterfowl recommendations apply to numerous lakes that have problems with excess waterfowl. Implementing these general recommendations, together with the Steps That Citizens Can Take listed after Table 11, are the most important actions for protecting and restoring lake health.

The remainder of Table 11 contains a summary of specific additional recommended actions for individual lakes.

**TABLE 11.**

<b>LAKE</b>	<b>SUMMARY OF LAKE RECOMMENDATIONS</b>
ALL LAKES	<ul style="list-style-type: none"> <li>Lakes are sensitive to additional nutrient impacts, so effective enforcement of County grading and drainage standards is essential for controlling runoff to lakes and limiting new sources of nutrients. Snohomish County's NPDES permit requires conformance with the detailed standards in the current Department of Ecology Stormwater Manual for the Puget Sound Region.</li> </ul>
ALL LAKES	<ul style="list-style-type: none"> <li>Existing homes on the lake shore should re-establish zones of native vegetation next to the water to filter out pollution before it reaches the lake. New bulkheads should be avoided where possible. Even where bulkheads exist, native vegetation can be established above and below the structures.</li> </ul>
ALL LAKES	<ul style="list-style-type: none"> <li>Monitoring the condition of lakes over time is critical for keeping them clean. Monitoring of water clarity, nutrients, algae, and aquatic plants should continue at all lakes. For some lakes, monitoring should be expanded to identify the specific sources of nutrients causing the current problems.</li> </ul>
MANY LAKES	<ul style="list-style-type: none"> <li>At some lakes, the number of waterfowl (mainly resident waterfowl) are so large that they contribute a significant amount of nutrients and fecal bacteria to the lakes. In these cases, waterfowl control measures should be taken. In addition, Snohomish County should consider legislation to prohibit feeding of waterfowl.</li> </ul>
ARMSTRONG	<ul style="list-style-type: none"> <li>Monitoring should focus on water clarity, algae, and phosphorus.</li> <li>Nutrient sources that feed the algal blooms should be identified and addressed.</li> </ul>
BEECHER	<ul style="list-style-type: none"> <li>Additional monitoring is needed to better characterize current lake conditions and identify future changes.</li> <li>A bathymetric map and an aquatic plant survey should be completed to establish baseline conditions.</li> </ul>
BLACKMAN	<ul style="list-style-type: none"> <li>Monitoring should focus on algal blooms and nutrient release from the sediments.</li> <li>The remaining wetlands in the watershed should be protected for their valuable role in filtering pollution that flows toward the lake.</li> <li>Resident waterfowl numbers should be reduced significantly.</li> </ul>
BOSWORTH	<ul style="list-style-type: none"> <li>(See general recommendations for all lakes.)</li> </ul>
BRYANT	<ul style="list-style-type: none"> <li>Monitoring should focus on potential impacts from the closed landfill.</li> </ul>
CASSIDY	<ul style="list-style-type: none"> <li>Monitoring should focus on nutrients and algae.</li> <li>The extensive wetlands and native vegetation surrounding the lake should be preserved.</li> <li>The purple loosestrife should be controlled to protect the habitat values of the natural wetlands.</li> </ul>
CHAIN	<ul style="list-style-type: none"> <li>The extensive wetlands surrounding the lake should be preserved to protect the lake from development impacts.</li> </ul>

COCHRAN	<ul style="list-style-type: none"> <li>• (See general recommendations for all lakes.)</li> </ul>
CRABAPPLE	<ul style="list-style-type: none"> <li>• Monitoring should determine if water clarity begins to decline again as it did for several years in the 1990s, especially in light of continued development in the watershed.</li> </ul>
ECHO	<ul style="list-style-type: none"> <li>• Resident waterfowl numbers should be reduced.</li> </ul>
FLOWING	<ul style="list-style-type: none"> <li>• (See general recommendations for all lakes.)</li> </ul>
GOODWIN	<ul style="list-style-type: none"> <li>• Monitoring should focus on water clarity and nutrients.</li> <li>• Milfoil control efforts should continue.</li> </ul>
HOWARD	<ul style="list-style-type: none"> <li>• Monitoring should focus on understanding the build-up of nutrients in the hypolimnion and the algal blooms that occur at several meters depth.</li> </ul>
KAYAK	<ul style="list-style-type: none"> <li>• Additional monitoring is needed to better characterize current lake conditions and identify future changes.</li> <li>• A bathymetric map and an aquatic plant survey should be completed to establish baseline conditions.</li> </ul>
KETCHUM	<ul style="list-style-type: none"> <li>• Monitoring should continue to track nutrient levels in the farm runoff.</li> <li>• A rehabilitation plan developed for the former dairy farm should be implemented.</li> <li>• Monitoring should help to identify potential toxic algal blooms.</li> <li>• Wetlands north and south of the lake that are important in filtering pollution should be protected.</li> <li>• A long-term aquatic vegetation management plan should be developed.</li> </ul>
KI	<ul style="list-style-type: none"> <li>• (See general recommendations for all lakes.)</li> </ul>
LOMA	<ul style="list-style-type: none"> <li>• Monitoring should determine if water clarity continues to decline and should focus on identifying the causes for the decline.</li> <li>• Resident waterfowl numbers should be reduced.</li> </ul>
LOST	<ul style="list-style-type: none"> <li>• Because of the steep slopes draining to the lake, existing homes on the lake shore should be especially encouraged to reduce fertilizers and re-create buffers of native vegetation to filter pollution.</li> </ul>
MARTHA N.	<ul style="list-style-type: none"> <li>• Monitoring should focus on algal blooms and on oxygen depletion and nutrient release in the metalimnion.</li> </ul>
MARTHA S.	<ul style="list-style-type: none"> <li>• Monitoring should focus on changes in water clarity and nutrients.</li> <li>• Monitoring should also focus on understanding the potential release of nutrients in the hypolimnion.</li> <li>• Resident waterfowl numbers should be reduced.</li> </ul>
MEADOW	<ul style="list-style-type: none"> <li>• Additional monitoring is needed to better characterize current lake conditions and identify future changes.</li> <li>• The extensive wetlands surrounding the lake should be protected to filter pollution and provide fish and wildlife habitat.</li> <li>• Steps should be taken to prevent the non-native frog-bit plants from spreading to other lakes. These plants should also be monitored carefully to document their growth in the lake.</li> </ul>

NINA	<ul style="list-style-type: none"> <li>Monitoring should determine if water clarity continues to decline and identify the causes of the decline.</li> <li>Additional monitoring is needed to better characterize current lake conditions and identify future changes.</li> <li>A bathymetric map and an aquatic plant survey should be completed to establish baseline conditions.</li> <li>Resident waterfowl numbers should be reduced.</li> </ul>
PANTHER	<ul style="list-style-type: none"> <li>(See general recommendations for all lakes.)</li> </ul>
RILEY	<ul style="list-style-type: none"> <li>The extensive wetlands surrounding the lake should be protected to filter pollution and provide fish and wildlife habitat.</li> </ul>
ROESIGER	<ul style="list-style-type: none"> <li>Milfoil control efforts should continue.</li> <li>Forest management and harvest activities in the watershed should take precautions to control runoff and reduce nutrient pollution.</li> </ul>
ROWLAND	<ul style="list-style-type: none"> <li>Additional monitoring is needed to better characterize current lake conditions and identify future changes.</li> <li>The extensive wetlands surrounding the lake should be protected to filter pollution and provide fish and wildlife habitat.</li> <li>The golf course should be managed to limit nutrient runoff.</li> </ul>
RUGGS	<ul style="list-style-type: none"> <li>Monitoring should focus on nutrients, algae, and aquatic plants and on identifying the sources of sediment that is filling the lake.</li> <li>A bathymetric map and an aquatic plant survey should be completed to establish baseline conditions and begin to track changes.</li> </ul>
SERENE	<ul style="list-style-type: none"> <li>No large-scale efforts should be made to control aquatic plants (except for the purple loosestrife).</li> <li>Resident waterfowl numbers should be reduced.</li> </ul>
SHOECRAFT	<ul style="list-style-type: none"> <li>Milfoil control surveys should continue to ensure that these plants do not re-infest the lake.</li> </ul>
SPRING	<ul style="list-style-type: none"> <li>A bathymetric map and an aquatic plant survey should be completed to establish baseline conditions.</li> <li>No large-scale efforts should be made to control aquatic plants.</li> </ul>
STEVENS	<ul style="list-style-type: none"> <li>Detailed monitoring of the lake should continue in order to quantify the effects of the aeration system and identify possible causes of reduced water clarity.</li> <li>Resident waterfowl numbers should be reduced.</li> </ul>
STICKNEY	<ul style="list-style-type: none"> <li>The extensive wetlands around the west side of the lake should be preserved to protect the lake from the impacts of development within its large watershed.</li> <li>Resident waterfowl numbers should be reduced.</li> </ul>
STORM	<ul style="list-style-type: none"> <li>(See general recommendations for all lakes.)</li> </ul>
SUNDAY	<ul style="list-style-type: none"> <li>Monitoring should focus on nutrients, algae, and aquatic plants.</li> <li>No large-scale efforts should be made to control aquatic plants without carefully evaluating the alternatives and potential impacts.</li> <li>Resident waterfowl numbers should be reduced.</li> </ul>
WAGNER	<ul style="list-style-type: none"> <li>(See general recommendations for all lakes.)</li> </ul>

### Criteria for Future Actions

The recommendations listed in Table 11 do not indicate who should be responsible for funding and implementing the actions. Clearly, all the citizens of Snohomish County benefit from maintaining and protecting the health of the public access lakes. Therefore, the general public, through local and state government agencies, has some responsibility to be involved in actions at these lakes. However, adequate funding to address lake health problems is not currently available.

The following criteria are recommended to guide the allocation of scarce public funds for lake protection and restoration:

1. Prevention is preferable to restoration; therefore, actions to prevent or limit damage to lakes should have high priority.
2. However, where feasible, lakes which are “at risk” should be improved and “impaired” lakes should be restored to healthy conditions.
3. Lakes with the most severe problems and with significant declining water quality trends should have priority.
4. Restoration actions should be based on sound science with adequate data to support understanding of existing problems and to predict lake responses to restoration measures.
5. Control of non-native invasive species should have priority over management of native species.
6. Lakes that are the most heavily used by the public should receive priority.
7. Lakes with strong commitment from local residents should have priority.

### Steps That All Citizens Can Take

The responsibility for lake protection does not rest solely with public agencies, however. In fact, citizens working individually or in organized groups can have the most impact on lake health. The following recommendations are simple steps that citizens can take to address many of the main causes of lake problems.

- ◆ Learn about lake ecology and lake health;
- ◆ Use lawn and garden fertilizers sparingly; test the soil first; choose low or no phosphorus fertilizers;
- ◆ Retain or plant native vegetation adjacent to the water to protect the shoreline and filter pollution;
- ◆ Infiltrate or filter the runoff from rooftops, driveways, and patios rather than piping it to the lake;
- ◆ Cover or mulch bare soil areas;
- ◆ Use pesticides, herbicides, and household chemicals sparingly and never near the water;
- ◆ Maintain septic systems regularly—have them inspected every two years and pumped when needed;
- ◆ Conserve water both inside and outside;
- ◆ Learn to identify non-native invasive aquatic plants and animals; check boats and trailers for invaders; never empty an aquarium into a lake;
- ◆ Clean up pet wastes and keep livestock away from the lake shore;
- ◆ Do not feed geese or ducks; and
- ◆ Join with neighbors or the local property owners’ association to work together to protect the lake.