The Importance of Summit Lake & its Watershed

British Columbians want lakes to provide good water quality, aesthetics and recreational opportunities. When these features are not apparent in recreational lakes, questions arise. People begin to wonder if the water quality is getting worse, if the lake has been affected by land development, and what conditions will result from more development within the watershed.

The BC Lake Stewardship Society (BCLSS), in partnership with the Ministry of Environment (MoE), has designed a program, entitled The BC Lake Stewardship and Monitoring Program (BCLSMP), to help answer these questions. Through regular water sample collections, we can begin to understand a lake's current water quality, identify the preferred uses for a given lake, and monitor water quality changes resulting from land development within the lake's watershed. The level for a particular lake depends on study objectives as well as funding and human resources available. This report provides the 1985-1987, 1998-2000 and 2008-2010 results of a Level III program for Summit Lake.

Through regular status reports, the BCLSMP can provide communities with monitoring results specific to their local lake and with educational material on lake protection issues in general. This useful information can help communities play a more active role in the protection of the lake resource. Finally, this program allows government to use its limited resources efficiently thanks to the help of area volunteers and the BC Lake Stewardship Society.

Summit Lake’s monitoring program began in 1998 and has been coordinated by volunteers who live on Summit Lake, in partnership with the MoE. This status report summarizes information derived from the program. Quality of the data has been found to be acceptable and data quality information is available upon request.

A watershed is defined as the entire area of land that moves the water it receives to a common waterbody. The term watershed is misused when describing only the land immediately around a waterbody or the waterbody itself. The true definition represents a much larger area than most people normally consider. The watershed area of Summit Lake is 155 km².

Watersheds are where much of the ongoing hydrological cycle takes place and play a crucial role in the purification of water. Although no “new” water is ever made, it is continuously recycled as it moves through watersheds and other hydrologic compartments. The quality of the water resource is largely determined by a watershed’s capacity to buffer impacts and absorb pollution.

Every component of a watershed (vegetation, soil, wildlife, etc.) has an important function in maintaining good water quality and a healthy aquatic environment. It is a common misconception that detrimental land use practices will not impact water quality if they are kept away from the area immediately surrounding a water body. Poor land-use practices anywhere in a watershed can eventually impact the water quality of the downstream environment.

Human activities that impact water bodies range from small but widespread and numerous non-point sources throughout the watershed to large point sources of concentrated pollution (e.g. waste discharge outfalls, spills, etc). Undisturbed watersheds have the ability to purify water and repair small amounts of damage from pollution and alterations. However, modifications to the landscape and increased levels of pollution impair this ability.
Summit Lake is located in the Omineca region of B.C. 50 km north of Prince George near Highway 97, and is the most southerly lake in the actric drainage along Hwy 97. The lake is U-shaped, approximately 12 km long, has several islands, three basins, and a complex shoreline. The lake lies at an elevation of 706 m, and has maximum and mean depths of 16 m and 6.4 m, respectively. It has a surface area of 13.8 km², including a total island surface area of 0.9 km², and a shoreline perimeter of 41.8 km (with an additional island shoreline perimeter of 11.7 km). Summit Lake contains the following sport fish: rainbow trout, lake trout, whitefish (general), lake whitefish, and bull trout (FISS, 2011). The lake also contains dace, brassy minnow, largescale sucker, longnose sucker, minnow (general) northern pike, northern pikeminnow (formerly northern squawfish), peamouth chub, prickly sculpin, redside shiner, sculpin (general), sucker (general), and white sucker. Within the past 5 years, Summit Lake has not been stocked (FISS, 2011).

The lake has nine inflows: Erickson Creek, Echo Creek, Thorpes Creek, O’Dell Creek, Miller Creek, Neilson Creek, Upper Summit Creek, Teapot Creek and Enquist Creek, 1 outflow: Crooked River, and a wetland called Loon Marsh on the west end of the lake. The flushing rate, a factor that affects water quality, is the rate of water replacement in a lake and depends on the amount of inflow and outflow of a lake. The higher the flushing rate, the faster excess nutrients can be removed from the system. The flushing rate for Summit Lake is 1.96 years (Carmichael & Weibe, 2000) suggesting the lake has a moderate ability to assimilate additional nutrients.

The map below shows the land use within the Summit Lake watershed. The watershed contains 320 residential lots, including 188 lakeshore/island lots. Approximately 172 residences within the watershed are used on a full time basis, with 95 of them owned by the Crown. (Latimer 2011, Pers. Comm.) There are two forestry camps and one scout camp along the shore. Forested land makes up 39% of the watershed, forest cover openings comprise 41%, and water is 13%. Privately owned land comprises 2.3 km² (1.5% of the watershed). In 1978, a shoreline survey using 12 sites was conducted by the Ministry of Environment. In 1999, a shoreline photo survey was conducted along Summit Lake in order to identify lakeshore development practices that may impair Summit Lake water quality. Results revealed that 49% of properties had removed riparian vegetation within 15 m of the lake, 7% had out-house (less than 30 m from lake) or cabin (within 15 m of the lake) encroachment, and 17% had breakwaters (concrete, cobble or pressure-treated wood) or beach creation (Carmichael & Wiebe, 2000). All residents are encouraged to consider the potential impacts of their land use practices. Tips to keep Summit Lake healthy are provided on page 7. The lake is used for general recreational purposes and provides good public access.
Non-Point Source Pollution and Summit Lake

Point source pollution originates from municipal or industrial effluent outfalls. Other pollution sources exist over broader areas and may be hard to isolate as distinct effluents. These are referred to as non-point sources of pollution (NPS). Shoreline modification, urban stormwater runoff, onsite septic systems, agriculture, and forestry are common contributors to NPS pollution. One of the most detrimental effects of NPS pollution is phosphorus loading to water bodies. The amount of total phosphorus (TP) in a lake can be greatly influenced by human activities. If local soils and vegetation do not retain this phosphorus, it will enter watercourses where it will become available for algal production.

**Agriculture**

Agriculture including grains, livestock, and mixed farming, can alter water flow and increase sediment and chemical/bacterial/parasitic input into water bodies. Potential sources of nutrients (nitrogen & phosphorus) include chemical fertilizers and improperly situated winter feeding areas.

**Onsite Septic Systems and Grey Water**

Onsite septic systems effectively treat human waste water and wash water (grey water) as long as they are properly located, designed, installed, and maintained. When these systems fail, they become significant sources of nutrients and pathogens. Poorly maintained pit privies, used for the disposal of human waste and grey water, can also be significant contributors.

Properly located and maintained septic tanks do not pose a threat to the environment, however, mismanaged or poorly located tanks can result in a health hazard and/or excessive nutrient loading to the lake. Excessive nutrients such as phosphorus can cause a variety of problems including increased plant growth and algal blooms.

**Stormwater Runoff**

Lawn and garden fertilizer, sediment eroded from modified shorelines or fill projects, oil and fuel leaks from vehicles, snowmobiles and boats, road salt, and litter can all be washed by rain and snowmelt from properties and streets into watercourses. Phosphorus and sediment are of greatest concern, providing nutrients and/or a rooting medium for aquatic plants and algae. Pavement prevents water infiltration to soils, collects hydrocarbon contaminants during dry weather and increases direct runoff of these contaminants to lakes during storm events.

**Forestry**

Timber harvesting can include clear cutting, road building, and land disturbances, which alter water flow and potentially increase sediment and phosphorus inputs to water bodies.

**Boating**

Oil and fuel leaks are the main concerns of boat operation on small lakes. With larger boats, sewage and grey water discharges are issues. Other problems include the spread of aquatic plants and the dumping of litter. In shallow water operations, the churning up of bottom sediments and nutrients is a concern.

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**Summit Lake Bathymetric Map**

<table>
<thead>
<tr>
<th><strong>Trophic Characteristics</strong> (North Arm and Southeast Basin values averaged when applicable)</th>
<th>1986</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Surface Temp. (°C)</td>
<td>-</td>
<td>22</td>
<td>21</td>
<td>21</td>
<td>22.5</td>
<td>25</td>
<td>22.5</td>
</tr>
<tr>
<td>Min Near-bottom Oxygen (mg/L)</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.0</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Spring Sampling TP (µg/L)</td>
<td>14</td>
<td>19</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Avg. Chlorophyll a (µg/L)</td>
<td>-</td>
<td>3.2</td>
<td>3.8</td>
<td>4.8</td>
<td>3.6</td>
<td>2.8</td>
<td>2.4</td>
</tr>
<tr>
<td>Avg. Secchi Depth (m)</td>
<td>-</td>
<td>3.0</td>
<td>2.6</td>
<td>2.8</td>
<td>2.7</td>
<td>2.6</td>
<td>2.9</td>
</tr>
</tbody>
</table>

**Lake characteristics**

Area: 1384 ha  
Max depth: 16 m  
Mean depth: 6.4 m  
Shoreline length: 53.5 km  
Elevation: 706 m

Map obtained from FISS (2011), lake surveyed July 1979
**Temperature**

Lakes show a variety of annual temperature patterns based on their location and depth. Most interior lakes form layers (stratify), with the coldest water near the bottom. Because colder water is more dense, it resists mixing into the warmer, upper layer for much of the summer. When the warmer oxygen rich surface water distinctly separates from the cold oxygen poor water in the deeper parts of the lake, it is said to create a thermocline, a region of rapid temperature change between the two layers. In spring and fall, these lakes usually mix from top to bottom (overturn) as wind energy overcomes the reduced temperature and density differences between surface and bottom waters. In the winter, lakes re-stratify under ice with the densest water (4°C) near the bottom. Because these types of lakes turn over twice per year, they are called dimictic lakes. These are the most common type of lake in British Columbia. Summit Lake is a dimictic lake.

Lakes of only a few metres depth tend to mix throughout the summer or layer only temporarily, depending on wind conditions. In winter, the temperature pattern of these lakes is similar to that of deeper lakes. Temperature stratification patterns are very important to lake water quality. They determine much of the seasonal oxygen, phosphorus and algal conditions. When abundant, algae can create problems for most lake users.

The review of ice-on/ice-off dates is important to the growing issue of climate change, particularly with how it’s affecting B.C. lakes.

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**Dissolved Oxygen**

Oxygen is essential to life in lakes. It enters lake water from the air by wind action and plant photosynthesis. Oxygen is consumed by respiration of animals and plants in summer, including the decomposition of dead organisms by bacteria. A great deal can be learned about the health of a lake by studying oxygen patterns and levels.

Lakes that are unproductive (oligotrophic) typically will have sufficient oxygen to support life at all depths through the year. But as lakes become more productive (eutrophic), and increasing quantities of plants and animals respire and decay, more oxygen consumption occurs, especially near the bottom where dead organisms accumulate.

In productive lakes, oxygen in the isolated bottom layer may deplete rapidly (often to anoxia), forcing fish to move into the upper layer (salmonids are stressed when oxygen levels fall below about 20% saturation) where temperatures may be too warm. Fish kills can occur when decomposing or respiring algae use up the oxygen. In the summer, this can happen on calm nights after an algal bloom, but most fish kills occur during late winter or at initial spring mixing because oxygen has been depleted under winter ice.

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The graph above shows the 2009 seasonal temperature data in the North Arm, which is comparable to data from 1998-2000, 2008 & 2009 for that site. The lake was fully mixed at spring sampling on May 9. Surface (0.5 m) oxygen remained near saturation, only dropping below 8 mg/L on Aug. 29. Mid-depth and bottom oxygen levels decline throughout the summer, with bottom waters dropping below 4 mg/L (fish would likely not be supported in these levels) in mid-August and continuing through September. Surface and mid–depth waters mix after Aug. 29, while the aeration of bottom waters didn’t occur until after sampling on Sep. 26.

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The figure above shows the 2010 dissolved oxygen (DO) pattern for Summit Lake in the North Arm, which is comparable to data from 1998-2000, 2008 & 2009 for that site. The lake was fully mixed at spring sampling on May 9. Surface (0.5 m) oxygen remained near saturation, only dropping below 8 mg/L on Aug. 29. Mid-depth and bottom oxygen levels decline throughout the summer, with bottom waters dropping below 4 mg/L (fish would likely not be supported in these levels) in mid-August and continuing through September. Surface and mid–depth waters mix after Aug. 29, while the aeration of bottom waters didn’t occur until after sampling on Sep. 26.
Trophic Status and Phosphorus

The term “trophic status” is used to describe a lake’s level of productivity and depends on the amount of nutrients available for plant growth, including tiny floating algae called phytoplankton. Algae are important to the overall ecology of the lake because they are food for zooplankton, which in turn are food for other organisms, including fish. In most lakes, phosphorus is the nutrient in shortest supply and thus acts to limit the production of aquatic life. When in excess, phosphorus accelerates growth and may artificially age a lake. As mentioned earlier (page 3), total phosphorus (TP) in a lake can be greatly influenced by human activities.

The trophic status of a lake can be determined by measuring productivity. The more productive a lake is the higher the algal growth and therefore the less clear the water becomes. Water clarity is measured using a Secchi disc, a black and white disc used to indicate the depth of light penetration. Productivity is also determined by measuring nutrient levels and chlorophyll (the green photosynthetic pigment of algae). The concentration of chlorophyll a in lake water is an indicator of the density of algae present in that same water and is directly related to the Secchi depth. Phosphorus concentrations measured during spring overturn can be used to predict summer algal productivity.

Lakes of low productivity are referred to as oligotrophic, meaning they are typically clear water lakes with low nutrient levels (1-10 µg/L TP), sparse plant life (0-2 µg/L chl. a) and low fish production. Lakes of high productivity are eutrophic. They have abundant plant life (>7 µg/L chl. a) including algae, because of higher nutrient levels (>30 µg/L TP). Lakes with an intermediate productivity are called mesotrophic (10-30 µg/L TP and 2-7 µg/L chl. a) and generally combine the qualities of oligotrophic and eutrophic lakes.

Lake sediments can themselves be a major source of phosphorus. If deep-water oxygen becomes depleted (or anoxic), a chemical shift occurring in bottom sediments. This shift causes sediment to release phosphorus to overlying waters. This internal loading of phosphorus can be natural but is often the result of external phosphorus addition. Lakes displaying internal loading often have elevated algal levels and generally lack recreational appeal.

Summit Lake’s average spring TP values (1986, 1998-2000 & 2008 - 2010) are shown in the table on p. 3 and in the graph of TP and TDP (total dissolved phosphorus) below. Data from 1986 (14 µg/L), 1998 (19 µg/L), 1999 (18 µg/L), 2000 (18 µg/L Southeast Basin only) and 2008 (18 µg/L) suggest mesotrophic conditions, while data from 2009 (9 µg/L) and 2010 (10 µg/L) suggest oligotrophic conditions (Nordin, 1985). When considering all data collected between 1986 and 2010, the changes observed in average TP values may simply be due to natural variability within the lake.

Internal phosphorus loading occurs when the bottom sediments release orthophosphorus (OP) into the bottom waters, generally under anoxic conditions (Nordin 2011, Pers. Comm.). The following graph displays the phosphorus cycling in Summit Lake in the Southeast Basin in 2008. It appears that internal loading is taking place in the latter half of the summer, peaking on Sep. 21 when bottom TP reached 181 µg/L, and OP, the form released from bottom sediments, spiked to 156 µg/L (86% of the TP). Data for the Southeast Basin from 1998, 1999, 2000, 2009 & 2010 followed a similar pattern, with peaks in bottom TP occurring in Sep. each year. In the North Arm in 2008, there was a small peak in TP on Sep. 21, and OP comprised 17% of the TP (9 µg/L). Bottom DO was 2.5 mg/L, suggesting the increase was due, in part, to internal loading. The portion of TP not comprised of OP during the peak was likely due to organic (plankton, weeds, etc.) and inorganic (sediment) settling. Data for the North Arm from 1998, 1999, 2000, 2009 & 2010 follow a similar pattern with internal loading occurring in late summer each year. Additionally, data suggest internal loading occurred in late Apr. 2010 in the North Arm, prior to spring overturn. Peaks in bottom TP in the North Arm were substantially lower than in the Southeast Basin. It’s difficult to determine the significance of internal loading without first calculating the overall phosphorus budget for a lake, however it’s important to note that the data show the peak bottom TP values are less in 2008-2010 than in 1998-2000.
It’s important to note, that the naturally brown (humic) water may have caused Secchi results to be lower than expected for this lake.

The above graph of seasonal Secchi data for the Southeast Basin in 2008 show the relationship between Secchi and chlorophyll $a$ in Summit Lake. The Secchi depths ranged from 1.9 m (Jun. 1) to 3.2 m (Sep. 8). Seasonal Secchi readings for the Southeast Basin from 1998-2000 and in 2009 & 2010, and for the North Arm in 1998-2000 & 2008-2010 fell within a similar range. Seasonal Secchi readings from each year did not show a consistent relationship with seasonal chlorophyll $a$ values.

The following graph shows the average chlorophyll $a$ readings for Summit Lake in 1998-2000 & 2008-2010, and the number of readings (n). Average chlorophyll $a$ values in the North Arm ranged from 2.3 $\mu$g/L (2010) to 5.4 (1998) and in Southeast Basin values ranged from 2.4 $\mu$g/L (2010) to 4.8 $\mu$g/L (2000). These data suggest the lake is in the mesotrophic category (Nordin, 1985), however humic lakes are typically associated with higher concentrations of chlorophyll $a$ than clear lakes (Wetzel, 2001). In both basins, 2008-2010 data suggest chlorophyll $a$ values have decreased slightly compared to data from 1998-2000, however this may be due to natural variability for this lake.

Aquatic Plants

Aquatic plants are an essential part of a healthy lake. Factors that affect the type and amount of plants found in a lake include the level of nutrients (i.e. phosphorus), temperature, and introduction of invasive species.

Aquatic plants were surveyed in Summit Lake (Warrington, 1980) and include: Potamogeton (pondweed) species, Ranunculus (buttercup) species, Scirpus (bulrush) species, Najas flexilis (bushy pondweed), Meyanthes trifoliata (bog-bean), Sparganium (bur-reed) species, Nuphar (pond lily) species, Scheuchzeria palustris (pod grass), Calla palustris (wild calla), Utricularia (bladderwort) species, Equisetum (horsetail) species, and Bidens beckii (water marigold), however it is likely a larger number of species are present.

Aquatic plants play an important role in the lifecycles of aquatic insects, provide food and shelter from predators for young fish, and also provide food for waterfowl, beavers and muskrats.

Many aquatic plant species can spread between lakes via boaters potentially resulting in species introduction. Be sure to check for and remove all aquatic plant fragments from boats and trailers before entering or when leaving a lake.

A Historical Look at Summit Lake

The Summit Lake monitoring program was initiated well after local land development and possible impacts to the lake began. While this program can accurately document current lake water quality, it cannot reveal historical baseline conditions or long term water quality trends. Here lies the value in coring lake sediments. Past changes in water quality can be inferred by studying the annual deposition of algal cells (in this case diatoms) on the lake bottom.

The deepest point in Summit Lake was cored on October 4, 1999 by Ministry of Environment staff (Cumming, 2000). The 39 cm core, which represents approximately 300 years in the lake’s history, was analyzed by Dr. Brian Cumming of Queen’s University. His report is available upon request.

Historical changes in relative diatom abundance were measured directly by microscopy. By knowing the age of various core sections and the phosphorus preferences of the specific diatom in each section, historical changes in lake phosphorus concentrations, chlorophyll, and water clarity can be estimated.

The core contained approximately 150 diatom taxa. The core data indicate that Summit Lake has undergone only minor changes in types and amount of diatom algae, and has maintained a relatively low estimated phosphorus concentration over the past 300 years. Increases did occur to many sediment metal concentrations circa 1950, perhaps as a result of completing and using the Hart Highway. Overall, the data show few changes over the last 200 year record, indicating a relatively stable history for Summit Lake.
Should Further Monitoring Be Done on Summit Lake?

Based on nutrient and chlorophyll $a$ data Summit Lake is exhibiting slightly oligotrophic to mesotrophic conditions. Secchi data suggest the lake is eutrophic, however the naturally humic water may have caused these results to be lower than expected for this lake. Historical average spring overturn TP values fall in the mesotrophic category for 1986, 1998-2000, and 2008. Recent data from 2009 and 2010 fall under the oligotrophic classification. It’s likely this is due to natural variability for the lake. Seasonal phosphorus data indicate internal loading occurred in the Southeast Basin in Sep. in 1998-2000 and 2008-2010. Data suggest internal loading occurred in the North Arm in late summer from 1998-2000, in 2008 and 2009, and twice in 2010 (in late Apr. and late Aug.). Proportionately, the levels of phosphorus in the Southeast Basin are much higher (ranging from 2 - 8 times higher) than in the North Arm during bottom P-release periods. Additionally, in both basins, peak bottom TP values are less in 2008-2010 as compared to 1998-2000. Average summer chlorophyll $a$ values indicate the lake is slightly mesotrophic, however, as previously mentioned, humic lakes are typically associated with higher chlorophyll $a$ values than clear water lakes.

If volunteers are willing, the continued monitoring of Summit Lake through the collection of a minimum of 12 Secchi and surface temperature readings taken at regular intervals throughout the sampling season (from ice-off to ice-on) would valuable for comparison against the data presented here. It would also be valuable to collect full DO/T profiles (to determine thermocline location and stability, the extent of anoxia in bottom waters, and the timing of stratification and overturn), true colour readings (as this is a humic lake), and nitrogen data (to determine the N:P ratio for this lake).

Volunteers are also encouraged to record ice on/off dates as these are valuable for climate change studies.

Tips to Keep Summit Lake Healthy

Yard Maintenance, Landscaping & Gardening
- Minimize the disturbance of shoreline areas by maintaining natural vegetation cover.
- Minimize high-maintenance grassed areas.
- Replant lakeside grassed areas with native vegetation.
- Do not import fine fill.
- Use paving stones instead of pavement.
- Stop or limit the use of fertilizers and pesticides.
- Do not use fertilizers in areas where the potential for water contamination is high, such as sandy soils, steep slopes, or compacted soils.
- Do not apply fertilizers or pesticides before or during rain due to the likelihood of runoff.
- Hand pull weeds rather than using herbicides.
- Use natural insecticides such as diatomaceous earth. Prune infested vegetation and use natural predators to keep pests in check. Pesticides can kill beneficial and desirable insects, such as lady bugs, as well as pests.
- Compost yard and kitchen waste and use it to boost your garden’s health as an alternative to chemical fertilizers.

Agriculture
- Locate confined animal facilities away from waterbodies. Divert incoming water and treat outgoing effluent from these facilities.
- Limit the use of fertilizers and pesticides.
- Construct adequate manure storage facilities.
- Do not spread manure during wet weather, on frozen ground, in low-lying areas prone to flooding, within 3 m of ditches, 5 m of streams, 30 m of wells, or on land where runoff is likely to occur.
- Install barrier fencing to prevent livestock from grazing on streambanks and lakeshore.
- If livestock cross streams, provide gravelied or hardened access points.
- Provide alternate watering systems, such as troughs, dugouts, or nose pumps for livestock.
- Maintain or create a buffer zone of vegetation along a streambank, river or lakeshore and avoid planting crops right up to the edge of a waterbody.

Onsite Sewage Systems
- Inspect your system yearly, and have the septic tank pumped every 2 to 5 years by a septic service company. Regular pumping is cheaper than having to rebuild a drain-field.
- Use phosphate-free soaps and detergents.
- Don’t put toxic chemicals (paints, varnishes, thinners, waste oils, photographic solutions, or pesticides) down the drain because they can kill the bacteria at work in your onsite sewage system and can contaminate waterbodies.
- Conserve water: run the washing machine and dishwasher only when full and use only low-flow showerheads and toilets.

Auto Maintenance
- Use a drop cloth if you fix problems yourself.
- Recycle used motor oil, antifreeze, and batteries.
- Use phosphate-free biodegradable products to clean your car. Wash your car over gravel or grassy areas, but not over sewage systems.

Boating
- Do not throw trash overboard or use lakes or other waterbodies as toilets.
- Use biodegradable, phosphate-free cleaners instead of harmful chemicals.
- Conduct major maintenance chores on land.
- Use absorbent bilge pads to soak up minor leaks or spills.
- Check for and remove all aquatic plant fragments from boats and trailers before entering or leaving a lake. Eurasian milfoil is an aggressive invasive aquatic weed. Be sure to familiarize yourself with this plant and remove and discard any fragments.
- Do not use metal drums in dock construction. They rust, sink and become unwanted debris. Use polystyrene (completely contained and sealed in UV treated material) or washed plastic barrel floats. All floats should be labeled with the owner’s name, phone number and confirmation that barrels have been properly emptied and washed.
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References


