

5.0 AQUATIC PLANT IMPLEMENTATION PLAN SECTION

The *Long Lake Comprehensive Lake Management (CLM) Plan* was finalized and approved by the WDNR in March 2015. The Implementation Plan Section of the *Long Lake CLM Plan* (March 2015) includes the following management goals along with specific management actions developed to help reach those goals. The *Long Lake CLM Plan* (March 2015) can be found on the WDNR website located here:

<https://apps.dnr.wi.gov/lakes/grants/project.aspx?project=99027324>

2015 Long Lake Comprehensive Lake Management Plan

1. Increase LLPA's Capacity to Communicate with Lake Stakeholders and Facilitate Partnerships with Other Management Entities
 - Use education to promote lake protection and enjoyment through stakeholder education
 - Continue LLPA's involvement with other entities that have responsibilities in managing (management units) Long Lake
2. Maintain Current Water Quality Conditions
 - Monitor water quality through WDNR Citizens Lake Monitoring Network
3. Control Existing and Prevent Further Aquatic Invasive Species Infestations within Long Lake
 - Continue Spot Treatment Herbicide Control Strategy targeting CLP on Long Lake
 - Continue Targeting EWM/HWM on Long Lake with Spot Herbicide Treatments and Hand-Harvesting, as Appropriate
 - Continue Clean Boats Clean Waters watercraft inspections at Long Lake public access location
 - Reduce occurrence of purple loosestrife on Long Lake
 - Reduce occurrence of common reed (Phragmites) on Long Lake.
4. Improve Fishery Resource and Fishing by protecting and restoring the shoreland condition of Long Lake
 - Investigate restoring highly developed shoreland areas around Long Lake
 - Protect natural shoreland zones around Long Lake
 - Coordinate with WDNR, Boy Scout Camp, LLFC, and private landowners to expand coarse woody habitat in Long Lake
5. Maintain Navigability on Long Lake
 - Support responsible actions to gain reasonable navigational access to open water areas of Long Lake
 - Investigate conducting advanced studies to understand sedimentation within the lake

Figure 5.0-1. Long Lake management goals (numbered) and actions. Long Lake Comprehensive Management Plan (March 2015)

During an update to their *Aquatic Plant Management (APM) Plan* in 2019, the LLPA revisited Management Goals #3 and #5 from their *CLM Plan*. This *APM Plan* update established the following APM-related management goals (Figure 5.0-2). The LLPA will continue to follow the remaining goals outlined in the 2015 *CLM Plan*. The *Long Lake Aquatic Plant Management Plan* (July 2019) can be found on the WDNR website located here:

<https://apps.dnr.wi.gov/lakes/grants/project.aspx?project=115661305>

2019 Long Lake Aquatic Plant Management Plan (Update)

3. Manage Existing and Prevent Further Aquatic Invasive Species Infestations within Long Lake
 - Continue Clean Boats Clean Waters watercraft inspections at critical public access locations
 - Coordinate professional monitoring of AIS (approx. every 5 years)
 - Coordinate Periodic Quantitative Vegetation Monitoring (approx. every 5 years)
 - Coordinate Periodic Community Mapping (floating-leaf and emergent) Surveys (approx. every 10 years)

5. Manage Existing and Prevent Further Aquatic Invasive Species Infestations within Long Lake
 - Support responsible actions to gain reasonable navigational access to open water areas of Long Lake (mechanical harvesting plan)

Figure 5.0-2. Long Lake 2019 APM goals (numbered) and actions. From Long Lake Aquatic Plant Management Plan (July 2019)

2026 APM Plan Update

The objective of this APM Plan update is to revisit the aquatic plant-related goals and actions of the 2019 *APM Plan* and adjust them appropriately based upon current best management practices (BMPs), the lessons learned during the years since the last plan was developed, and the information gathered during the Onterra studies completed to date. The LLPA will continue to follow the remaining goals outlined in the 2015 *CLM Plan* as it applies to general restoration and protection.

Within the following updated APM Plan, the LLPA has developed three APM goals. Goal #1 outlines the mechanical harvesting plan. This management goal is applicable to future permit applications, therefore the LLPA will be seeking official WDNR approval/acceptance of this management action. Goals #2 and #3 are useful for the LLPA to account for and plan future aquatic plant surveys and management plan updates, particularly as turnover in the LLPA board of directors occurs. While Goal #4 and Goal #5 are technically not related to aquatic plant management, the LLPA chose to include them within this Plan as a way of formalizing their lake management intentions within this document and providing guidance to the future LLPA board.

Within the following management actions, the LLPA Board of Directors is listed as the facilitator for all management actions. The Board of Directors will be responsible for deciding whether the formation of sub-committees and/or directors is needed to carry out the various management actions.

Management Goal 1: Maintain Navigability on Long Lake

Management Action:	Increase recreational use through planned and permitted mechanical harvesting activities – Mechanical Harvesting Plan
Timeframe:	Continuation of Current Effort
Facilitator:	LLPA Board of Directors
Description:	<p>The WDNR oversees the management of aquatic plants on inland lakes. The manual cutting and raking of native aquatic plant species within a 30-foot-wide area containing a pier, boat lift, or swim raft is exempt from a state permit provided that the cut plants are removed from the lake (and wild rice is not being removed). However, the use of mechanized or mechanical devices in all instances requires a WDNR permit.</p> <p>The LLPA understands the importance of aquatic vegetation within Long Lake. However, nuisance aquatic plant conditions exist in certain parts of the lake, caused largely by a combination of submersed aquatic invasive species (primarily curly-leaf pondweed) and disturbance-tolerant native vegetation. Photograph 5.0-1 shows the nuisance plants from the Chinatown harbor in June 2024. Curly-leaf pondweed and white-water crowfoot are the main rooted aquatic plants in this area, with filamentous algae and duckweed caught on the surface-matted plants. Representatives from the Long Lake Haven Association at Chinatown correctly state that these plants are extremely difficult if not impossible to navigate through, and are impacting lake access for their members.</p> <div data-bbox="444 1083 1414 1745" data-label="Image"> </div> <p>Photograph 5.0-1. Surface-matted aquatic plants in Chinatown harbor. Photo credit Onterra, June 3, 2024.</p>

Management of nuisance aquatic plants has occurred on Long through contracted mechanical harvesting since 2016. The LLPA reviewed its historic mechanical harvesting strategy as a part of this project, constructing a revised strategy to meet the current needs of LLPA riparians and lake users. Map 11 outlines the updated strategy, summarized by the following bullet points:

Design Parameters

- Navigation Path (30-ft wide) – this lane removes a swath of plants just lakeward from the pier-face (i.e. end of docks) to allow easier access to deeper water. Modifications were made to the Chinatown area to address high traffic access needs (Figure 5.0-3).
- Riparian Spoke (10-ft wide) - These lanes connect docks to common use access lanes. Riparians can opt in to this program, paying the LLPA a set fee for this service. The maximum number of riparians enrolled in this program has been 70, which equates to slightly less than one acre in total.

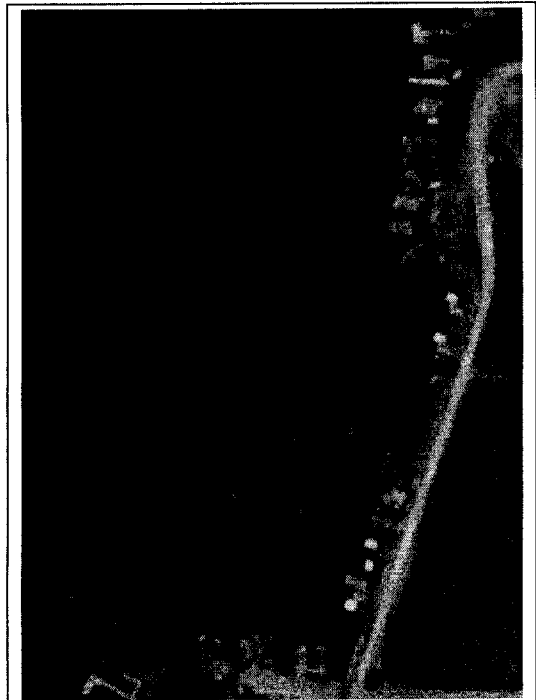


Figure 5.0-3. Mechanical harvesting plan for Chinatown. 30-ft wide navigation path shown in purple.

Implementation

- No harvesting shall occur before June 1 to avoid impacting valuable fish spawning habitat.
- The WDNR is not likely to permit riparian spokes during early June due to fisheries concerns. Harvesting operations shall not disturb spawning or nesting fish.
- Harvesting shall be done in a manner to minimize accidental capture of fish. Any game fish accidentally captured shall be released immediately. Attempts should be made to release all other fish and aquatic species.
- Harvesting locations are limited to areas on the permit map. The contracted mechanical harvester shall have an onboard GPS unit loaded with the spatial data reflecting the mechanical harvesting lanes to ensure compliance.
- Submerged plants are the target for this permit and removal of floating-leaf (e.g. water lilies) species needs to be minimized because of their ecological value and niche occupation.
- Aquatic plants that are cut must be removed from the water.

	<ul style="list-style-type: none"> • “Floaters” consisting of dislodged or free-floating plants may be targeted outside of areas on harvest map so long they are outside of the pier head, and the harvester is set to its shallowest cutting setting. • The current harvester would avoid shallow water (>3 feet deep) harvesting to minimize sediment disturbance. • Reports summarizing harvesting activities shall be given to the WDNR by November 30, each harvesting season. The harvest report should include a breakdown by geographic area, summarizing the amount of effort, quantity of plants removed, proportions of plant species removed, and fish/amphibian bycatch amounts. <p>The LLPA seeks multi-year mechanical harvesting permits, which are available to applicants that have APM Plans that have been updated in the last 5 years. Fluctuations in curly-leaf pondweed and native plant populations are likely. It is anticipated that some years would require extensive mechanical harvesting, other years many not require as much. The LLPA typically performs two cuttings per year, once in early-June and again in early-July. If nuisance conditions persist throughout the summer, a third mechanical harvesting event in August may occur.</p>
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Management Action:	Facilitate riparian actions to minimize nuisance aquatic plants through manual removal methods
Timeframe:	Continuation of Current Effort
Facilitator:	LLPA Board of Directors
Description:	<p>The mechanical harvesting action discussed above aims to restore navigation and access to deeper water parts of the system. While a component of the mechanical harvesting plan includes riparian access spokes, this action may not meet riparian expectations for recreation. In practice, the mechanical harvester needs to stay lakeward from the end of docks (i.e. pier-face). Conducting mechanical harvesting outside of the predefined lanes or in waters shallower than 3 feet deep would be a violation of the LLPA’s harvesting permit.</p> <p>The LLPA encourages riparian owners to manage aquatic plants within their recreational footprint if desired. Each riparian owner can legally remove aquatic vegetation in a 30-foot wide area of one’s frontage directly adjacent to one’s pier without a permit. This access lane can extend perpendicularly into the lake as far as desired. A few exceptions apply, including if the area is a designated Sensitive Area, the desire area is greater than the 30 feet wide, or if a mechanical assistance mechanism, like a mechanical cutter or diver-assisted suction harvesting equipment is being used. Simply wading into the lake and removing aquatic plants with a non-mechanical device (e.g. rake or v-cutter) within this footprint is legal so long as all the dislodged or cut aquatic plants are removed from the lake. Riparians can hire contractors to remove plants in this manner without a permit so long as they stay in the designated 30-ft wide corridor and</p>

use non-mechanical removal methods. The following links provide additional information on legal manual removal of aquatic plants by riparians:

https://dnr.wisconsin.gov/sites/default/files/topic/Lakes/plants/RiparianOwnerExemption_NoPermitNeeded.pdf

https://dnr.wisconsin.gov/sites/default/files/topic/Lakes/plants/RiparianOwnerExemption_PermitNeeded.pdf

If aquatic plant impediments do not fit the criteria exempt from WDNR permitting, the impacted property owner or community group may seek a contractor to remove plants with a diver-assisted suction harvest equipment or other similar permissible equipment. These efforts will require a WDNR permit currently under NR109 (under updated NR107 if rule revision passes), which will require a specific map of where the operations will be occurring, the aquatic plant species to be harvested, and the disposal plan for removed vegetation.

Several Long Lake property owners have purchased commercially available mixing props, often referred to as aqua thrusters. Mixing props are used to reduce algal surface mats from accumulating. The WDNR does not advocate for mixing props, but allows their use without a permit if the prop direction is parallel to the water surface and does not impact the sediment. If aqua thruster use results in movement of silt from the lake bottom, it is in violation with the law unless a Chapter 30 permit is granted. More information on mixing props can be found here under “mixing prop or other mixing devices:”

<https://dnr.wisconsin.gov/topic/Waterways/construction/mechanizedAPM.html>

Management Goal 2: Ensure the LLPA maintains current and operational management plans

Management Action:	Periodically update lake management plan
Timeframe:	Continuation of current effort; periodic
Facilitator:	
Description:	<p>The LLPA will impose that all board and committee members should review and be familiar with the current <i>Aquatic Plant Management Plan</i> and reference the Implementation Plan Section (5.0) while fulfilling their duties as leaders in the LLPA.</p> <p>The term <i>Best Management Practice (BMP)</i> is often used in environmental management fields to represent the management option that is currently supported by that latest science and policy. When used in an action plan, the term can be thought of as a placeholder with anticipation of having an evolving definition over time.</p> <p>Historically, lake groups would update Comprehensive Lake Management (CLM) Plan at roughly 8-10 year increments. A CLM Plan would focus on numerous aspects of lake management, including water quality, watershed, shoreland, and aquatic plants. Especially after the adoption of NR193 in 2020 (Surface Water Grant program), having an approved Aquatic Plant Management (APM) Plan completed within the last five years is a requirement of certain grants and permitted activities. APM Plans have a narrow focus compared to CLM plans, largely constructed to address aquatic plant-related aspects of a waterbody.</p> <p>Typically during every-other 5-year APM Plan update, lake groups also choose to address additional aspects more commonly included with a CLM Plan, such as an investigation of water quality parameters.</p> <p>A component of an updated APM Plan would include a solicitation of stakeholder perceptions and perspectives, such as a stakeholder survey. During the next Plan update, the LLPA could consider a replicate defined population survey, as was conducted as part of this project, or a more open survey to solicit a wider audience of lake users.</p> <p>APM Plans typically take 1.5-2 years to complete, with the first year consisting of field data collection followed by meetings and planning activities. The WDNR Surface Water Grant program allows funding potential for planning projects, currently with application deadlines occurring September 15 (preapplication) and November 15 (final) of the preceding year. More information on the WDNR Surface Water Grant program is available at:</p> <p style="text-align: center;">https://dnr.wisconsin.gov/aid/SurfaceWater.html</p>

	<p><u>Aquatic Plant Management Plan</u></p> <p>Embedded within a CLMP is a plan to manage and monitor aquatic plants. This aspect is referred to as an <i>Aquatic Plant Management (APM) Plan</i>. BMPs for aquatic plant management change rapidly, as new information about effectiveness, non-target impacts, and risk assessment emerges. To be eligible to apply for grants that provide cost share for AIS control and monitoring, “a current plan has a completion date of no more than 5 years prior to submittal of the recommendation for approval. A [whole-lake] point-intercept survey of the aquatic plant community conducted within 5 years of the year an applicant applies for a grant is required.” The WDNR is currently working to revise the aquatic plant management codes (NR107 & NR109) with similar APM Plan requirements.</p> <p>While not required, the LLPA will strive to include a water quality monitoring component within every-other APM Plan update. Since the 2026 APM Plan does not contain a water quality investigation, the 2031 APM Plan will consider including this component. For Long Lake, this is particularly important as the impacts of zebra mussels continue to manifest on the water quality of the system.</p>
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Management Goal 3: Monitor Aquatic Vegetation on Long Lake

Management Action:	Conduct periodic point-intercept aquatic plant surveys
Timeframe:	Periodic: at least once every 5 years, Timing: during July-August
Facilitator:	LLPA Board of Directors
Description:	<p>The point-intercept method as described Wisconsin Department of Natural Resources Bureau of Science Services, PUB-SS-1068 2010 (Hauxwell et al. 2010) have been conducted on Long Lake in 2007, 2010, and 2013 by the WDNR, and 2018 and 2024 by Onterra. This survey provides quantitative population estimates for all aquatic plant species within a lake and is designed to allow comparisons with past surveys in Long Lake as well as comparisons to other waterbodies throughout the state.</p> <p>At each point-intercept location within the <i>littoral zone</i>, information regarding the depth, substrate type (soft sediment, sand, or rock), and the plant species sampled along with their relative abundance (rake fullness) on the sampling rake is recorded.</p> <p>The LLPA will ensure whole-lake point-intercept surveys are conducted at least once every five years to maintain eligibility for WDNR multi-year mechanical harvesting permits.</p>

Management Action:	Consider conducting periodic community mapping (floating-leaf and emergent) surveys
Timeframe:	Elective: every 10 years or when prompted
Facilitator:	LLPA Board of Directors
Description:	<p>A key component of any aquatic plant community assessment is the delineation of the emergent and floating-leaf aquatic plant communities within each lake as these plants are often underrepresented during the point-intercept survey. The emergent and floating-leaf community mapping survey (often referred to as <i>community mapping survey</i>) creates a snapshot of these important communities within each lake as they existed during the survey and is valuable in the development of the management plan and in comparison with future surveys.</p> <p>This survey would delineate the margins of floating-leaf (e.g., water lilies) and emergent (e.g., cattails, bulrushes) plant species using GPS technology (preferably sub-meter accuracy) as well as document the primary species present within each community. This survey was conducted on Long Lake in 2014 and repeated in 2024.</p> <p>The LLPA will consider conducting this survey at roughly 10 year intervals to understand if these populations are expanding or contracting over time, and to avoid during development of mechanical harvesting strategies. The survey would also track the occurrences of non-native emergent species, such as purple loosestrife.</p>

Management Action:	Conduct periodic professional EWM mapping surveys
Timeframe:	Elective: every 5 years or when prompted Timing: during latter part of growing season
Facilitator:	LLPA Board of Directors
Description:	<p>As the name implies, the late season EWM Mapping Survey is a professionally contracted survey completed towards the end of the growing season when EWM is at its anticipated peak growth stage, allowing for a true assessment of the amount and density of EWM within the lake. For Long Lake, this survey would likely take place in mid-August to the end of September, depending on the growing conditions of the particular year. This survey would include a complete meander survey of the system's littoral zone by professional ecologists and mapping using GPS technology (sub-meter accuracy is preferred).</p> <p>The LLPA has monitored the EWM population through periodic late-season EWM mapping surveys. The EWM population has remained relatively low in Long Lake, after first being detected in 2002. Unless prompted by a specific rationale, such as a large and noticeable increase in the EWM population, the LLPA will consider implementing this survey every 5 years during APM Plan updates.</p>

Management Action:	Conduct periodic professional CLP mapping surveys
Timeframe:	Elective: every 5 years or when prompted Timing: during early part of growing season
Facilitator:	LLPA Board of Directors
Description:	<p>As discussed in the Non-Native Aquatic Plant Section (3.3), CLP was first “officially” recorded from Long in 2007. The LLPA initiated herbicide management of the CLP population in 2007 and continued until 2018. While the directed treatments were moderately effective where conducted, the CLP population continued to expand beyond what could be financially targeted on an annual basis. Since the CLP population had progressed past an early-infestation stage and was now considered an established population within the lake, the WDNR indicated future herbicide permits would not be supported. The LLPA created an updated APM Plan (finalized in 2019) that discontinued CLP herbicide management and shifted to mechanical harvesting to mitigate nuisance plant conditions.</p> <p>Undoubtedly, a robust and widespread base of turions is present in the sediments of Long Lake. These turions are viable in the sediments for 10 years or more after being deposited, with inconsistent sprouting levels occurring each season based upon unknown environmental conditions. In some years there will be a higher amount of CLP sprouting and therefore a higher CLP population.</p> <p>The LLPA would give consideration to periodically monitoring the CLP population within Long Lake, particularly during APM Planning projects. That being said, the population has likely reached a maximum capacity, and documenting population swings may be more of an academic exercise than having practical importance on driving management decisions.</p>

Management Goal 4: Discourage Resident Canada Goose Populations

Management Action:	Decrease Canada goose populations
Timeframe:	Continuation of current effort.
Facilitator:	LLPA Board of Directors
Description:	<p>Canada geese prefer to linger upon open lawns near waterbodies because of the lack of cover for potential predators. The presence of geese on a lake resident's beach may not be an issue; however, the feces the geese leave are unsightly and pose a health risk. Geese feces may become a source of fecal coliforms.</p> <p>Green space around the lake allows riparians to use the nearshore areas for recreation. There is also a substantial amount of green space at the Long Lake State Park where Canada geese congregate, with access to nearby sanitary settling ponds where goose nesting occurs.</p> <p>Vegetated and wooded natural shorelines are the best way to discourage geese from coming on to properties. As the primary line of defense, WDNR and other state/federal agencies encourage lake organizations to install natural vegetation buffers. Starting in 2014, a program was enacted by the WDNR and UW-Extension to promote riparian landowners to implement relatively straight-forward shoreland restoration activities. This program, now called the Healthy Lake and Rivers Grant program, provides education, guidance, and grant funding to promote installation of best management practices aimed to protect and restore lakes and rivers in Wisconsin. The cost share allows \$1,000 per practice, up to \$25,000 per annual grant application. More details and resources for the program can be found at:</p> <p style="text-align: center;">https://healthylakeswi.com</p> <p>In some instance, resident Canada geese populations can reach large numbers even if substantial shoreland buffers are installed. In these instances, there are a few action steps that can be taken to manage or reduce Canada goose population.</p> <p>The US Fish and Wildlife Services (USFWS) has a program where nest sites can be registered and egg addling can occur. Addling is the process of applying an oil to the egg to terminate embryo development but leave the egg intact so the goose does not lay additional eggs. The LLPA would need to hire a professional with the proper permits and certification to conduct this work. In extreme scenarios, the USFWS and US Department of Agriculture Wildlife Services may consider euthanizing a portion of the resident Canada goose population during their molting stage. In 2021, fifty-five geese were removed from Long Lake as a part of this program. More information can be found here:</p> <p style="text-align: center;">https://dnr.wisconsin.gov/topic/WildlifeHabitat/damage</p> <p style="text-align: center;">https://apps.fws.gov/rcgr/</p>

Management Goal 5: Ensure proper water flow within the Watercress Creek inlet

Management Action:	Work with appropriate agencies and landowners to facilitate maximum water flow in the Watercress Creek between Tittle Lake and State Highway 67
Timeframe:	Continuation of current effort.
Facilitator:	LLPA Board of Directors
Description:	<p>Watercress Creek is the primary inlet to Long Lake, entering through Tittle Lake. Watercress Creek is considered a Class II trout stream, indicating it supports a good population of trout with, at minimum, a one-year-old, self-sustaining population, but requires stocking to maintain a quality fishery due to limited natural reproduction.</p> <p>The LLPA has periodically organized volunteers to clean out natural debris within the Watercress Creek, facilitating navigability and stream flow. It is asserted that when functioning incorrectly, a delta forms at the mouth of the Watercress Creek in Tittle Lake (Figure 5.0-4).</p> <p>The LLPA believes that a constriction in the culvert under the driveway to the Boy Scouts of America camp on Long Lake is greatly reducing natural flow of this inlet. This culvert has shifted and sunk from its original design, and has become partially occluded with emergent vegetation and debris. The LLPA would like to work with the landowner and appropriate state agencies to restore this culvert to function as designed.</p>

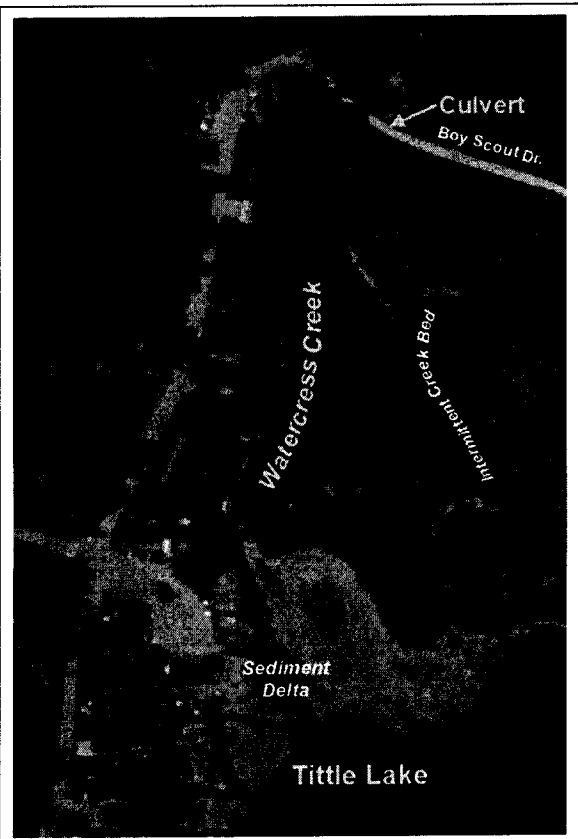


Figure 5.0-4. Watercress Creek Inlet.