



Pig Lake Implementation Plan

Introduction

In 2018-2019, Crow Wing and Cass Counties, Soil and Water Conservation Districts (SWCDs), and citizens partnered to develop a comprehensive watershed management plan for the Pine River. This process consisted of:

- 1) Ten stakeholder meetings that included citizens, businesses, lake associations, state agencies, and local officials.
- 2) Prioritized water and soil health issues and concerns for the watershed
- 3) Developed action items for specific watershed areas
- 4) State and local agencies adopted a ten-year watershed conservation plan.

The Pig Lake plan is based on the Pine River Comprehensive Watershed Management Plan. The plan characterized Pig Lake as having a decrease in water visibility (water clarity), high sensitivity to phosphorus, and high economic significance to the community. The plan categorized the lake and land as Enhance/Protect Management. This plan does not address Aquatic Invasive Species (AIS) because Counties have their own AIS Plan.

Why?

Because this is Minnesota's favorite place. Lakes are our heritage and our way of life, and there is a direct correlation between water quality and economic sustainability in this area. If we work to keep our lakes clean future generations will continue to enjoy them.

Management Focus For This Lake Is:

ENHANCE/ PROTECT

-- Fix It --

Definition: Reduce phosphorus loading through stormwater and agricultural best management practices.

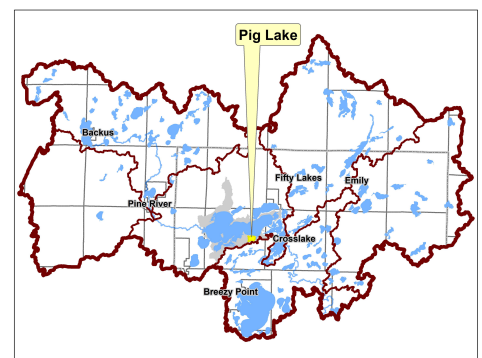
PROTECT

-- Keep It --

VIGILANCE

-- Keep It --

Location of lake within the watershed:



"Harmonizing people, water, forests, and the economy in a place to renew your spirit."

Why does it matter?



Property Values

What is your lake home worth?

Studies on Minnesota lakes show that lake property values are directly tied to water quality. For a three-foot decrease in water clarity, prices were reduced up to \$594 per shoreline foot. For a three-foot increase in clarity, prices increased up to \$423 per shoreline foot. This change in value can be a significant financial loss or gain to an individual property owner as well as a community.



Fishing & Recreation

Do you enjoy fishing and swimming? Minnesota's native gamefish, such as walleyes, need clear water to see their prey, aquatic plants to hide and spawn in, and shade to keep cool. Keeping native plants in the lake and trees along the shoreline provide shade, spawning habitat, and protection for the game fish we love to catch. These plants and trees also help stop runoff and keep the lake clear for swimming and recreational activities.



Habitat

Do you enjoy watching loons, bald eagles, turtles, butterflies, songbirds and other wildlife at the lake?

These animals depend on shoreline plants for nesting and cover, trees and forests for their homes, and native plants and flowers for pollinating. Keeping some of your yard natural enhances the habitat for these animals, ensuring their survival.

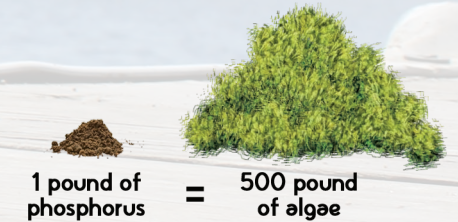
Be a good neighbor, take care of your lake!



Want to learn more about taking care of lakes? Watch a short video at: <https://youtu.be/dwjAoRwLrmM>



Phosphorus is a nutrient found in manure, leaves, soil, and fertilizer. Under natural conditions phosphorus is typically scarce in water. Human activities, however, have resulted in excessive phosphorus loading into our lakes. Phosphorus triggers harmful algae blooms.



Plan goals and current status

This plan set numerical, measurable goals for each lake to achieve in the next 10 years. Pig Lake project status related to each goal is indicated below.

Phosphorus Reduction

- 1 Reduce annual phosphorus loading into declining lakes by 5% by implementing long-term stormwater best management practices in residential and road areas.
Pig Lake Status
 - o Phosphorus source: **Nearshore**
 - o Phosphorus load to the lake per year: **80 lbs**
 - o 5% Reduction Goal: **4 lbs**
 - o "Enhance" goal: **20 rain gardens in 10 years**

Shoreline Restoration

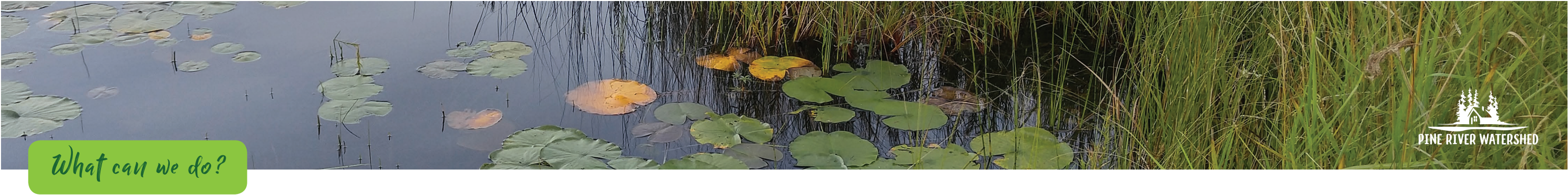
- 2 Maintain and enhance/restore two miles of riparian vegetation near streams and lakes with over 10% impervious surface/disturbed area through outreach to private residents.
- 3 Pig Lake Status
 - o Average Impervious surface: **11.7%**
 - o Number of parcels that are high priority for management (Map 1): **20 parcels**
 - o Ten-year goal: **4 projects**

Shoreline and Land Protection

- 4 Protect and enhance forest cover, outstanding lake water quality, habitat, surficial sand aquifers, and downstream drinking water by promoting 75% land protection in targeted minor watersheds.
- 5 Protect two miles of undeveloped riparian lands, ice ridges and forested riparian corridors through outreach to private residents.
Pig Lake Status
 - o Current % of the minor watershed protected: **66% (Whitefish chain of lakes)**
 - o Additional acres needed to reach the 75% protection goal: **1,498 acres (Whitefish chain of lakes)**
 - o Acres that have the potential to be protected: **20 acres**

Groundwater

- 6 Maintain high quality drinking water in wells by encouraging landowners to have their subsurface sewage treatment systems maintained every three years to achieve a 90% maintenance rate for the watershed.
Pig Lake Status
 - o Estimated number of septic systems in the shoreland zone above the surficial sand aquifer: **48**
- 7 Locate and seal 30 unused residential wells per year to prevent groundwater contamination.
Pig Lake Status
 - o Estimated number of wells in the shoreland zone above the surficial sand aquifer: **48**
- 8 Manage chlorides reaching surface and groundwater from road salts and water softener salts going into sewage treatment systems.



Private landowners can help improve lake water quality and achieve watershed plan goals by implementing the following projects below. Technical and financial assistance is available to help with these projects.

Goal	Implementation Action	Minimum 10-year goal	Annual Goal	Where	Lead Entity	Supporting Entities	Estimated Cost	Landowner Cost
Phosphorus Reduction	1 Install rain gardens and stormwater management practices to capture rainwater and let it infiltrate instead of running off into the lake.	20 rain gardens <i>(4 lbs phosphorus)</i>	2 projects/year	Map 1	Crow Wing SWCD <i>Cost share available</i>	WAPOA, Landowners	\$5,000 each \$100,000 total	Cost share may vary.
Shoreline Restoration	2 Install shoreline buffers of native plants to protect the shoreline from erosion and provide habitat for fish and wildlife.	4 projects	1 every other year	Map 1	Crow Wing SWCD <i>Cost share available</i>	WAPOA	\$4,000 each \$16,000 total	Cost share may vary.
	3 Plant trees along your shoreline	500 trees	50/year	Map 1	Crow Wing SWCD Tree Sale https://crowwingswcd.org/annual-tree-plant-sale/	Landowners	\$36 for 25 trees \$720 total	\$36 for 25 trees
Shoreline & Land Protection	4 Develop a Forest Stewardship Plan (minimum 20-acre area).	1 forest plan	1 in 10 years	Map 2	Crow Wing SWCD <i>Cost share available</i>	Landowners	\$600	Cost share may vary.
	Sign up for Sustainable Forest Incentive Act (SFIA) to receive payments to keep wooded areas undeveloped (minimum 20-acre area).	20 acres	20 acres in 10-year period	Map 2	Crow Wing SWCD	Landowners	\$1,264	Requires a Forest Stewardship Plan (above)
	5 Permanently protect undeveloped land and shoreline with conservation easements.			Map 2	Crow Wing SWCD	NWLT, TNC, MLT, DNR, MHB, Landowners	\$21,817	Attorney fees, title commitment, closing costs
Monitoring	Continue to monitor Secchi depth annually to track trends.	10-year trend analysis	Minimum of 5 readings per year	Site 201	WAPOA	Crow Wing County	\$0	\$0
Groundwater	6 Have subsurface sewage treatment systems maintained/pumped every three years.	Pump 3 times in 10 years	Pump every 3 years	Map 3	Crow Wing County, Cass County	Crow Wing SWCD, Cass SWCD, Landowners, WAPOA, Lake Associations	Approx. \$140 each	Approximately \$140 each
	7 Seal unused wells in the Shoreland Zone.	10 wells	1/year	Map 3	Crow Wing County <i>Cost share available for half of total</i>	Landowners	\$1,000 each \$10,000 total	Approximately \$500 each
	8 Minimize chloride use on driveways, sidewalks, and in water softeners.	Only use minimum amount necessary	--	Map 1	Landowners	--	\$0	\$0

Acronyms: SWCD = Soil and Water Conservation District • NWLT = Northern Waters Land Trust • MHB = Mississippi Headwaters Board • TNC = The Nature Conservancy • MLT = Minnesota Land Trust • WAPOA = Whitefish Area Property Owners Association



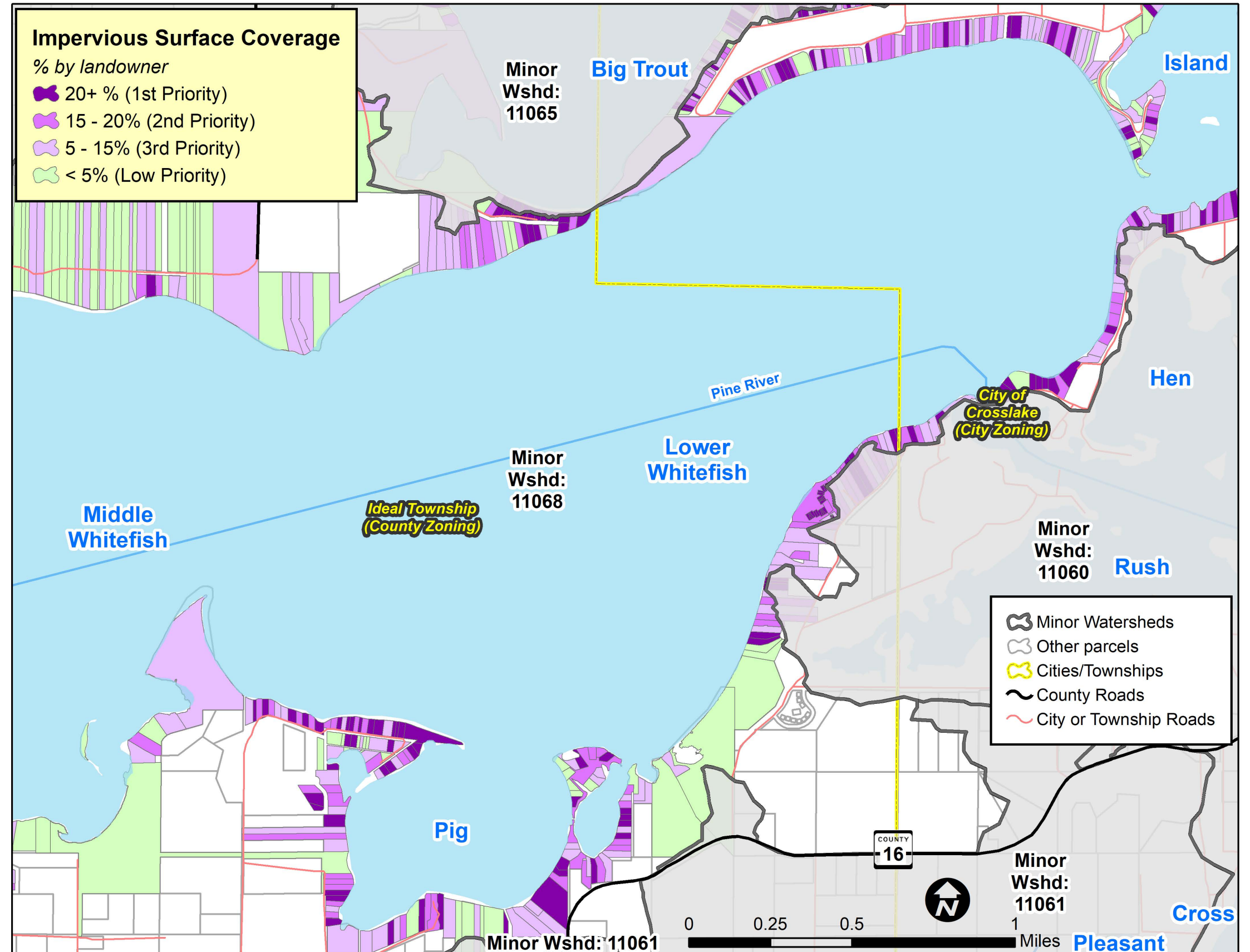
Impervious surface is where rain cannot soak into the ground and therefore runs over the surface, which includes roofs, driveways, sidewalks, and patios. When rain water soaks into the ground it gets filtered; when it runs off the land into the lake it carries with it dirt and chemicals that can harm the lake.

The Crow Wing County shoreline ordinance allows up to 25% of a lake lot to be impervious (total square footage of impervious items such as the house, shed, sidewalks, etc divided by the total lot size). For example, a 100 ft wide x 1,000 ft deep lot = 100,000 sq. ft. To stay under 25% impervious, the total house + garage + sidewalk + driveway must remain below 25,000 square feet. Contact Crow Wing County Land Services Department with any questions (218-824-1010, landservices@crowwing.us).

Lakes with more than 15% impervious surface are required to have stormwater management. This map shows each parcel around the shoreline and its percent impervious surface. Parcels that are dark purple are the highest priority for stormwater management such as rain gardens, shoreline buffers and tree planting to minimize runoff into the lake. Large parcels that are light green could be candidates for easements for permanent protection.



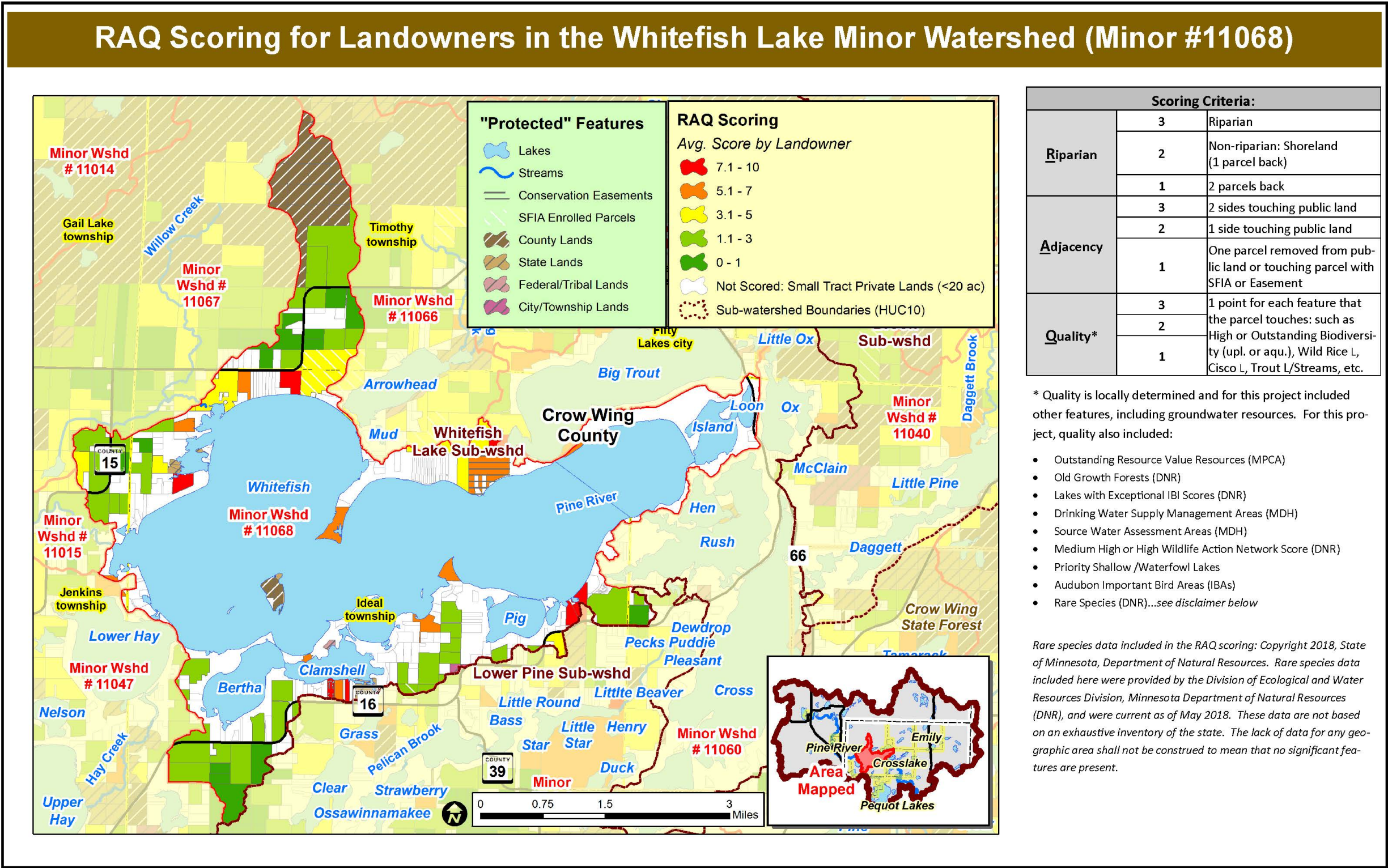
Want to learn more about rain gardens?
Watch a video at:
<https://youtu.be/ZHeY6CUAS8s>

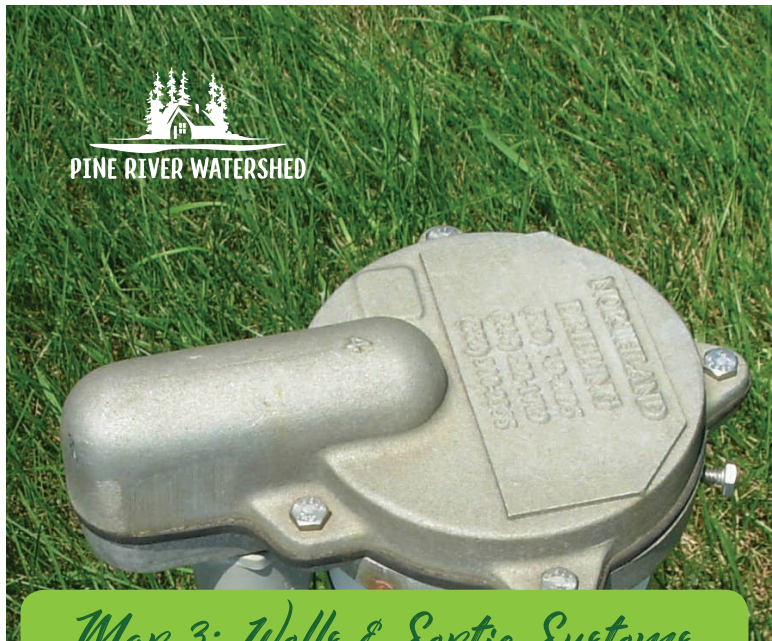




Map 2: Protection.

This map shows each parcel in the land area that drains towards the lake. Parcels that are red or orange are the highest priority for increasing protection of the land. Landowners in these high priority areas can contact the SWCD for protection options such as Forest Stewardship Plans, the Sustainable Forest Incentive Act, and Conservation Easements.





Map 3: Wells & Septic Systems.

The groundwater in the Pine River Watershed is very shallow and the soils are sandy, which is called a surficial sands aquifer. This shallow nature makes the groundwater susceptible to contamination.

Septic tanks and holding tanks, if not properly maintained, can leak into the ground and reach the groundwater, which makes it unsafe to drink.

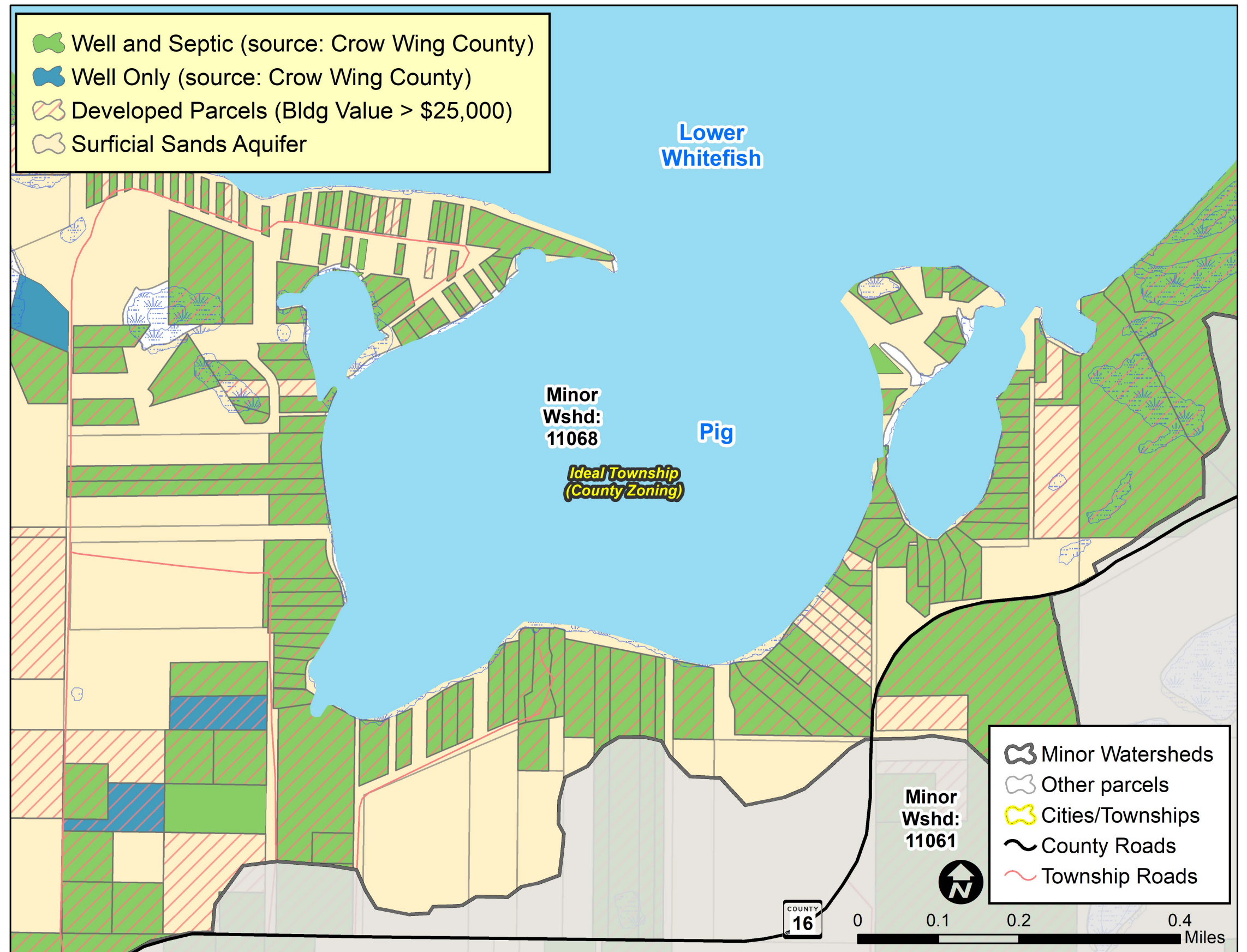
The area around your wellhead should also be protected so that contaminants can't seep into the groundwater and your well. Don't park your car, apply fertilizer or chemicals, or dump waste near your wellhead.

Any unused wells should be sealed to 1) prevent children and animals from falling in, 2) prevent contamination from entering the groundwater, and 3) prevent liability issues with old, unused wells. Contact a well driller to seal any unused wells.

This map shows the locations of wells around the Lakeshore. It is assumed that where there are wells there are also septic systems. Property owners can refer to the Groundwater section on page 4 for guidance on properly maintaining their septic system and protecting their drinking water.



Want to learn more about wells?
Watch a 5 minute video here:
<https://youtu.be/gRSHJpe8pq8>





Want to find out more?

Find out more! To dig deeper into the plan details, visit: www.crowwing.us/1476/Pine-River-1W1P

Plan Administration

This plan will be implemented through a Memorandum of Understanding between Cass County, Cass SWCD, Crow Wing County, and Crow Wing SWCD.



Crow Wing County (218) 824-1010
Crow Wing SWCD (218) 828-6197
Cass County (218) 547-7241
Cass County SWCD (218) 547-7399