

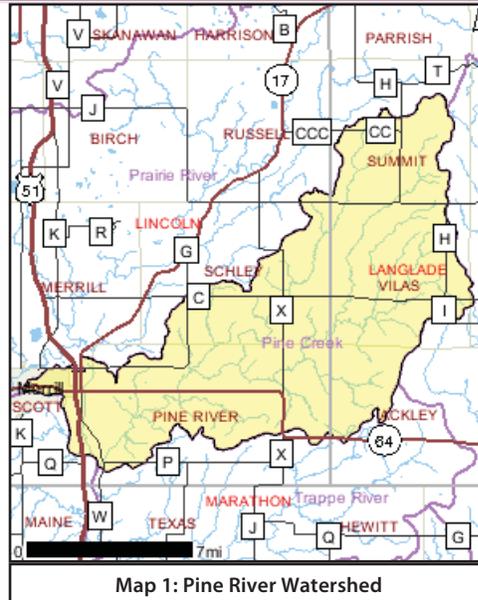
## 2011 Water Quality Management Plan Update

Central Wisconsin Basin, Wisconsin

October 2011

The Pine River Watershed is located in Lincoln and Langlade counties. A Lincoln County Nonpoint Source (NPS) assessment report conducted by the DNR in 1982 indicated that the Pine River Watershed contained streams with a moderate value for county residents or a moderate potential for water quality or fishery improvement. Land use in the watershed indicates a high NPS pollution potential.

The Pine River Watershed was ranked per the Nonpoint Source Priority Watershed Selection Criteria. There was insufficient data for ranking this watershed; therefore it is ranked a low priority throughout the Central Wisconsin basin. More monitoring needs to be conducted to get a better understanding of the watershed and its resources.



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### Watershed Details

#### Population and Land Use

Land use in the Pine River Watershed is dominated by forest cover (53%), followed by agriculture with 25% of the watershed's total area. Wetlands and open water encompass most of the remaining area with 17% and 4%, respectively. Urban and suburban land use is minimal with three-tenths of a percent and three-quarters of a percent, respectively.

Land Use	Acres	Percent of Area
Forest	43,823.57	53.14%
Agriculture	20,841.73	25.27%
Wetland	13,625.02	16.52%
Open Water & Open Space	3,183.58	3.86%
Suburban	623.82	0.76%
Urban	245.97	0.30%
Grassland	124.32	0.15%
Barren	0.00	0.00%
<b>Total Acres in Watershed</b>	<b>82,468.01</b>	

#### Hydrology

The hydrology of the Pine River Watershed is driven by the complex interactions between surface water and groundwater. The upper half of the watershed is situated on a glacial outwash plain that is dominated by forests and wetlands. The flat topography and land use in the upper portion of the watershed slows runoff and allows precipitation to slowly infiltrate into the groundwater. The groundwater then forms seeps and springs that coalesce to form the cool headwater streams found throughout the upper watershed. As the headwater streams follow the slope of the watershed, southwest towards the Wisconsin River, they combine to form

larger streams and rivers that flow through a more complex landscape.

The lower portion of the Pine River Watershed becomes hillier and agricultural land use becomes more common where adequate drainage can sustain pastures and croplands. With the steeper terrain and more intense agricultural land use comes accelerated runoff and increased soil erosion, which alters the nature of streams in the lower watershed. For example, the lower portion of the Pine River has lost aquatic habitat complexity due to siltation and appears to be transitioning into a eutrophic state due to excess nutrients entering the system from agricultural runoff.

## Ecological Landscapes

The Pine River Watershed is located in the Forest Transition Ecological Landscape which lies along the northern border of Wisconsin's Tension Zone, through the central and western part of the state, and supports both northern forests and agricultural areas. The central portion of the Forest Transition lies primarily on a glacial till plain deposited by glaciation between 25,000 and 790,000 years ago. The eastern and western portions are on moraines of the Wisconsin glaciation. The growing season in this part of the state is long enough that agriculture is viable, although climatic conditions are not as favorable as in southern Wisconsin. Soils are diverse, ranging from sandy loam to loam or shallow silt loam, and from poorly drained to well drained.

The historic vegetation of the Forest Transition was primarily northern hardwood forest. These northern hardwoods were dominated by sugar maple and hemlock, and contained some yellow birch, red pine, and white pine. Currently, over 60% of this Ecological Landscape is non-forested. Forested areas consist primarily of northern hardwoods and aspen, with smaller amounts of oak and lowland hardwoods. The eastern portion of the Ecological Landscape differs from the rest of the area in that it remains primarily forested, and includes some ecologically significant areas. Throughout the Ecological Landscape, small areas of conifer swamp are found near the headwaters of streams, and associated with lakes in kettle depressions on moraines. Ground flora show characteristics of both northern and southern Wisconsin, as this Ecological Landscape lies along the Tension Zone.

## Historical Note

Many Christmas tree farms can be found in the Pine River Watershed in Lincoln and Langlade counties. Wisconsin is a national leader in growing and harvesting Christmas trees. Wisconsin ranks fifth in number of trees harvested (1.6 million in 2002), third in number of acres under cultivation (47,699 acres in 2002), and sixth in number of farms (1,387 in 2002). The National Christmas Tree Association publishes a fact sheet which includes the following information:

There are approximately 25-30 million real Christmas trees sold in the U.S. every year. There are close to 350 million real Christmas trees currently growing on Christmas Tree farms in the U.S. alone, all planted by farmers. For every real Christmas tree harvested, 1 to 3 seedlings are planted the following spring. There are about 350,000 acres in production for growing Christmas trees in the U.S.; much of it preserving green space. There are close to 15,000 farms growing Christmas trees in the U.S., and over 100,000 people are employed full or part-time in the industry. The most common Christmas tree species are: balsam fir, Douglas-fir, Fraser fir, noble fir, Scotch pine, Virginia pine and white pine.

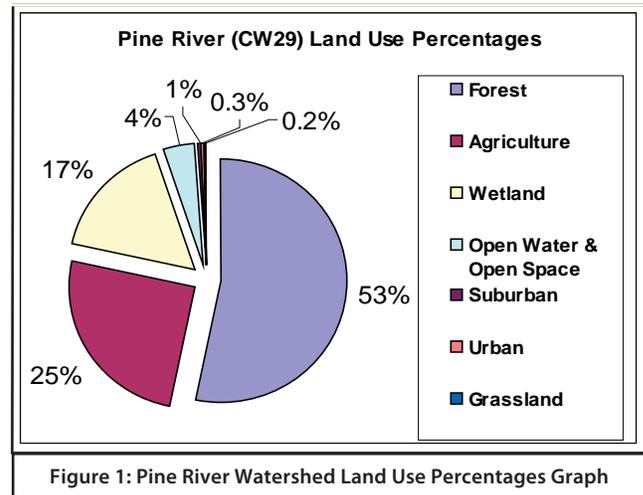
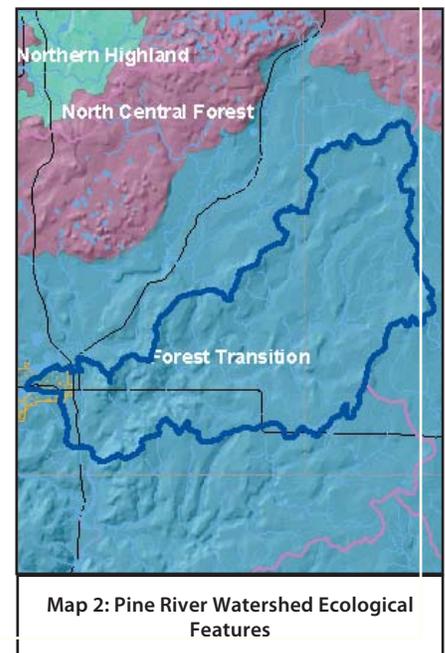


Figure 1: Pine River Watershed Land Use Percentages Graph



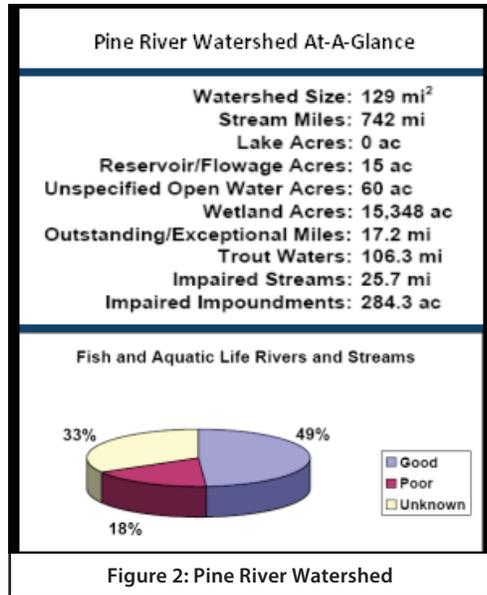
## Watershed Condition

### Overall Condition

Over 17 miles of Exceptional Resource Waters are found in the Pine River Watershed along stretches of Little Oxbo Creek, Mccloud Creek, Oxbo Creek, and Rajek Creek (all of which are Class I trout streams, also). Another 78 miles of Class II Trout streams are spread among sections of North Branch Pine River, McCloud Creek, Pratt Creek, East Branch Pratt Creek, Lloyd Creek, Pine River, Pat Smith Creek and several unnamed streams. In addition, over 11 miles of Class III trout waters are found along the Pine River. The Wisconsin River has been on the 303(d) list for PCBs and Mercury since 1998. The Wisconsin River and Merrill Flowage are also impaired by an unknown pollutant.

### River and Stream Condition

According to the WDNR's Register of Waterbodies (ROW) database, there are over 741 miles of streams and rivers in the Pine River Watershed; 143 miles of which have been entered into the WDNR's assessment database. Of these 143 miles, approximately half are meeting Fish and Aquatic Life uses and are specified as in "good" condition and about 18% of streams are considered to be in "poor" condition and are listed as impaired. The condition of the remaining third of these stream miles is not known or documented.



Additional uses for which the waters are evaluated include Fish Consumption, General Uses, Public Health and Welfare, and Recreation. As Table 2 shows, most of these uses have not been directly assessed for the watershed. However, a general fish consumption advisory for potential presence of mercury is in place for all waters of the state and over 21 miles of rivers and streams in the watershed are indicated as not supporting fish consumption.

Table 2: Designated Use Support Summary for Pine River Watershed Rivers and Streams (all values in miles)					
Use	Supporting	Fully Supporting	Not Supporting	Not Assessed	Total Size
Fish Consumption			21.17	122.28	143.45
Fish and Aquatic Life	11.9	58.08	25.67	47.8	143.45
General				143.45	143.45
Public Health and Welfare				143.45	143.45
Recreation				143.45	143.45

### Stream Narratives

#### East Branch Pratt Creek

A macroinvertebrate sample was collected from East Branch Pratt Creek in 2010 and had an excellent mIBI score (10.32) indicating good water quality in this stream.

#### North Branch Pine River 2/1/91

The North Branch of Pine River is 16.5 miles of cold Class II trout water. Sand, gravel, or granite operations exist on or near the k is a tributary to Pine River in Lincoln County that is a little over five miles in length. The first two miles from the mouth of Oxbo Creek are listed as an Exceptional Resource Water (ERW) and a cold Class I trout water. A 1971 stream survey report indicated streambank pasturing was having an adverse impact on fish habitat from Swamp Road upstream.

#### Little Oxbo Creek

One macroinvertebrate and one fish collection occurred in the Little Oxbo Creek in 2010. The cold water fish IBI scored good (60) and the mIBI scored excellent (9.24), these scores indicate the water quality in this stream is capable of support a robust aquatic community.

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### Lloyd Creek

Biological data indicate that Lloyd Creek has fair to good water quality. Fish were collected from Lloyd Creek in 2009 and again in 2010 and both of these collections yielded excellent fIBI scores. A macroinvertebrate collection from 2010 yielded a fair mIBI score.

### McCloud Creek

Two fish and two macroinvertebrate collections occurred in McCloud Creek in 2010 and all of the resulting IBI's scored excellent, indicating excellent water quality in this creek.

### North Branch Pine River

The North Branch of Pine River is 16.5 miles of cold Class II trout water. Sand, gravel, and granite operations exist in the North Branch of the Pine River watershed but their impact on water quality, if any, is unknown. Seven fish and two macroinvertebrate samples have been collected in the North Branch of Pine River since 2007 and the resultant fIBI and mIBI scores indicate good water quality in this stream.

### Oxbo Creek

Oxbo Creek is a tributary to Pine River in Lincoln County that is a little over five miles in length. The first two miles from the mouth of Oxbo Creek are listed as an Exceptional Resource Water (ERW) and a cold Class I trout water. A 1971 stream survey report indicated streambank pasturing was having an adverse impact on fish habitat from Swamp Road upstream. A macroinvertebrate sample was collected in 2010 near the mouth of Oxbo Creek and the mIBI score was good (6.38), indicating good water quality.

### Pat Smith Creek 2/1/02

Pat Smith Creek is a 4.4-mile tributary to Pine River that is classified as a cold Class II trout water. A 1980 comprehensive survey of Pat Smith Creek indicated streambank pasturing and resulting streambank erosion was adversely affecting fish habitat and water quality. Elimination of streambank pasturing at the northeast quarter, of the northeast quarter, of Section 20, T31N, R8E would benefit the creek. Two fish samples and one macroinvertebrate sample collected since 2001 indicate good water quality in Pat Smith Creek.

### Pine River

The DNR Report titled "Lincoln County Water Quality and Nonpoint Assessment Report" indicates that the Pine River had severe water quality problems compared to other Lincoln County streams. Problems include high nutrient levels and high bacteria counts. Sources of these impacts are usually from NPS runoff and animal waste. The effect on water quality of active sand and gravel sites on the Pine River in Lincoln County is unknown.

### Pratt Creek

Two macroinvertebrate samples were collected from Pratt Creek in 2010 the resultant mIBI scores were good (6.62) and excellent (11.06), indicating good water quality in this stream.

### Rajek Creek

Both a fish and a macroinvertebrate sample was collected from Rajek Creek in 2009, the cool water fIBI scored excellent (90) and the mIBI score good (6.89), indicating good water in this stream.

## Lake Health

The WDNR's ROW database shows that there are about 15 acres of reservoirs and flowages and another 60 acres of unspecified open water in the Pine River Watershed. Of these, approximately 15 acres of lakes are entered into the state's assessment database; none of which have been assessed for Fish and Aquatic Life use or any other use. The Merrill Flowage, which lies partially within the Pine River Watershed, is the only impoundment entered into the assessment database and it is indicated as not supporting Fish and Aquatic Life uses.



Figure 3: Sedge or "wet" meadows (photo courtesy WDNR)

## Merrill Flowage

Merrill Flowage is a very soft water drainage lake (impoundment) on the Wisconsin River having slightly acidic, light brown water of low transparency. The shoreline is entirely upland hardwood. The littoral zone is 55% sand, 25% percent silt, 17% gravel, and three percent rubble. About 30% of the flowage is less than three feet deep. The fish population consists of northern pike, walleye, largemouth bass, smallmouth bass, and panfish. The flowage is used by migratory waterfowl during both the spring and fall migrations. Public access to the impoundment is possible via the Wisconsin River. There are 41 dwellings and 5 factories on the perimeter of the flowage. The water control structure has a 15-foot head and is owned by the Wisconsin Public Service Corporation.

## Wetland Health

### Wetland Status:

An estimated 17% of the current land use in the Pine River Watershed is wetlands. Currently, about 87% of the original wetlands in the watershed are estimated to exist. Of these wetlands, the majority include sedge or “wet” meadows (66%) and forested wetlands (28%). Wet meadows may have saturated soils, rather than standing water, more often than not. Sedges, grasses, and reeds are dominant, but look also for blue flag iris, marsh milkweed, sneezeweed, mint, and several species of goldenrod and aster.

### Wetland Condition:

Little is known about the condition of the remaining wetlands but estimates of reed canary grass (RCG) infestations, an opportunistic aquatic invasive wetland plant, into different wetland types has been estimated based on satellite imagery. This information shows that reed canary grass dominates 23% of the existing emergent wetlands, 7% of the existing scrub wetlands, and 2% of the remaining forested wetlands and “wet” meadows, each (See Figure 4). Reed canary grass domination inhibits successful establishment of native wetland species.

### Wetland Restorability:

Of the 1,952 acres of estimated lost wetlands in the watershed, approximately 63% are considered potentially restorable based on modeled data, including soil types, land use, and land cover (Chris Smith, DNR, 2009).

## Groundwater

The following groundwater information is for Lincoln and Langlade counties (from Protecting Wisconsin’s Groundwater through Comprehensive Planning website, <http://wi.water.usgs.gov/gwcomp/>), which roughly approximates to the Pine River Watershed.

Merrill is the only municipal water systems in the Pine River Watershed to have a wellhead protection plan. Both Lincoln and Langlade counties have adopted animal waste management ordinances.

From 1979 to 2005, total water use in Lincoln County has decreased from about 14.6 million gallons per day to 9.9 million gallons per day. Industrial water use is the greatest component of use in the county and the decrease in total water use over this period is due to a decrease in industrial use. Industrial water use actually increased dramatically until 1985, before declining by the year 2000. The proportion of county water use supplied by groundwater has been variable but increased from 23% to 43% during the period 1979 to 2000, and decreased to 26% in 2005.

During this same period, total water use in Langlade County has increased from about 6.9

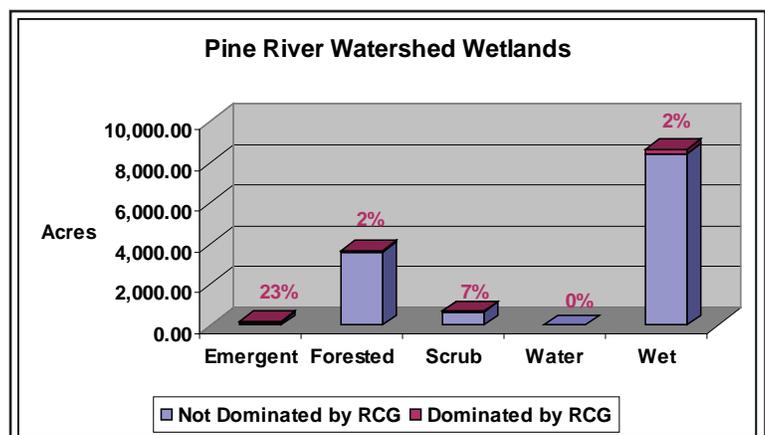


Figure 4: RCG Domination of Pine River Watershed Wetlands Graph

million gallons per day to about 34.3 million gallons per day, due primarily to increases in aquaculture and irrigation uses. Industrial use has declined over the same period. The proportion of county water use supplied by groundwater has fluctuated from about 59% to 99% during the period 1979 to 2005.

**Private Wells**

Ninety-six percent of 155 private well samples collected in Lincoln County and 83% of 193 private well samples collected in Langlade County from 1990-2006 met the health-based drinking water limit for nitrate-nitrogen. Land use affects nitrate concentrations in groundwater. An analysis of over 35,000 Wisconsin drinking water samples found that drinking water from private wells was three times more likely to be unsafe to drink due to high nitrate in agricultural areas than in forested areas. High nitrate levels were also more common in sandy areas where the soil is more permeable. In Wisconsin’s groundwater, 80% of nitrate inputs originate from manure spreading, agricultural fertilizers, and legume cropping systems.

A 2002 study estimated that 12-18% of private drinking water wells in the region of Wisconsin that includes Lincoln and Langlade counties contained a detectable level of an herbicide or herbicide metabolite. Pesticides occur in groundwater more commonly in agricultural regions, but can occur anywhere pesticides are stored or applied. There are no atrazine prohibition areas in Lincoln or Langlade counties. Almost all (98%) of 45 private well samples collected in Lincoln County and all five well samples collected from Langlade County met the health standard for arsenic.

**Potential Sources of Contamination**

There are no Concentrated Animal Feeding Operations (CAFOs) or licensed landfills within the watershed; nor are there any Superfund sites within the watershed.

WDNR’s Remediation and Redevelopment (RR) Program oversees the investigation and cleanup of environmental contamination and the redevelopment of contaminated properties. The RR Program provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin through its Bureau for Remediation and Redevelopment Tracking System (BRRTS) database (WDNR 2010e).

The database shows that there are eight open-status sites that have contaminated groundwater and/or soil in and around the Town of Merrill, which lies on the western edge of the Pine River Watershed. The status of the sites indicates that the environmental investigation and cleanup required are underway or have yet to begin. These sites include one Leaking Underground Storage Tank (LUST) site and seven Environmental Repair (ERP) sites. A summary of these sites is included in the table below.

BRRTS #	Location Name	Start Date	Activity	Remediation	Waste	Substance
235546726	Halron Oil Co.	04/27/2006	ERP	2	0	Diesel Fuel (Petroleum)
235546636	Interstate Trucking – Solvents	04/17/2006	ERP	4	1	Chlorinated Solvents (VOC)
235286286	Richard Williams Furniture Strip-ping	11/26/2001	ERP	1	0	Chlorinated Solvents (VOC)
235000622	Koch Margaret Antique Store	10/20/1995	ERP	2	0	Chlorinated Solvents (VOC)
235099625	WI DOT - Private Property	10/05/1995	ERP	2	0	Engine Waste Oil (Petroleum)
335000224	Merrill Gravel & Construction	02/14/1990	LUST	1	2	Diesel Fuel (Petroleum)
235000003	Semling-Menke Co. (Semco) - Bulk Facility	08/18/1987	ERP	3	3	Polychlorinated Biphenyl (PCB)
235000028	Lincoln Wood Products - Coal Gas	08/08/1986	ERP	3	0	Unknown Substance; Polynuclear Aromatic Hydrocarbons (Petroleum)

The Petroleum Environmental Cleanup Fund Award (PECFA) program was created in response to enactment of federal

regulations requiring release prevention from underground storage tanks and cleanup of existing contamination from those tanks. PECFA is a reimbursement program returning a portion of incurred remedial cleanup costs to owners of eligible petroleum product systems, including home heating oil systems. Over \$157 million has been spent on petroleum cleanup from leaking underground storage tanks in Lincoln County and more than \$8 million has been spent in Langlade County through the PECFA program, which equates to \$251 and \$435 per county resident, respectively.

## Point and Nonpoint Pollution

The Pine River Watershed is listed as a low priority overall for nonpoint source (NPS) pollution due to low rankings for stream, groundwater, and lake NPS pollution.

## Waters of Note

### Trout Waters

Class I trout streams are high quality trout waters that have sufficient natural reproduction to sustain populations of wild trout, at or near carry capacity. Consequently, streams in this category require no stocking of hatchery trout. These streams or stream sections are often small and may contain small or slow-growing trout, especially in the headwaters. Class II trout streams may have some natural reproduction, but not enough to utilize available food and space. Therefore, stocking is required to maintain a desirable sport fishery. These streams have good survival and carryover of adult trout, often producing some fish larger than average size. Class III trout waters are marginal trout habitat with no natural reproduction occurring. They require annual stocking of trout to provide trout fishing. Generally, there is no carryover of trout from one year to the next (<http://dnr.wi.gov/fish/species/trout/streamclassification.html>).

Little Oxbo Creek, Mccloud Creek, Oxbo Creek, and Rajek Creek all contain segments of Class I trout water. Another 78 miles of Class II Trout streams are spread among sections of North Branch Pine River, McCloud Creek, Pratt Creek, East Branch Pratt Creek, Lloyd Creek, Pine River, Pat Smith Creek and several unnamed streams. In addition, over 11 miles of Class III trout waters are found along the Pine River.

**Table 4: Pine River Watershed Trout Waters**

WADRS ID	Official Waterbody Name	Local Waterbody Name	WBIC	Start Mile	End Mile	Trout Class	Trout ID	Counties
1501749	Unnamed	Creek 13-9 (T32N, R8E)	3000153	0	1.02	CLASS II	3529	Lincoln
1498456	Unnamed	Creek 27-16 (T33N, R9E)	1478900	0	0.99	CLASS II	2136	Langlade
1501933	Unnamed	Creek 34-5 (T32N, R8E)	3000192	0	1.53	CLASS II	3541	Lincoln
12543	East Branch Pratt Creek	East Branch Pratt Creek	1479300	0	3.38	CLASS II	2140	Langlade
12533	Little Oxbo Creek	Little Oxbo Creek	1477500	0	3.77	CLASS I	904	Lincoln
12544	Lloyd Creek	Lloyd Creek	1479500	0	5.93	CLASS II	2141	Langlade
12536	McCloud Creek	Mccloud Creek	1478600	0	8.18	CLASS II	2134	Langlade
12537	McCloud Creek	Mccloud Creek	1478600	8.18	13.73	CLASS I	906	Langlade
12530	North Branch Pine River	North Branch Pine River	1476800	0	16.53	CLASS II	2129	Langlade, Lincoln
12534	Oxbo Creek	Oxbo Creek	1477700	0	2.03	CLASS I	905	Lincoln
12527	Pat Smith Creek	Pat Smith Creek	1476000	0	4.39	CLASS II	2126	Lincoln
1497173	Unnamed	Pat Smith Creek	1476300	0	1.65	CLASS II	2127	Lincoln
12525	Pine River	Pine River	1475800	6.29	17.5	CLASS III	3035	Lincoln
12526	Pine River	Pine River	1475800	17.5	23.48	CLASS II	2125	Langlade
12542	Pratt Creek	Pratt Creek	1479200	0	7.46	CLASS II	2139	Langlade

WADRS ID	Official Name	Local Name	WBIC	Start Mile	End Mile	Trout Class	Trout ID	Counties
12528	Rajek Creek	Rajek Creek	1476400	0	5.86	CLASS I	903	Lincoln
18377	Unnamed	Unnamed Creek 12-13 (T32n, R8e, S23, Sesw, 35)	1476900	0	1.84	CLASS II	2130	Lincoln
12531	Unnamed	Unnamed Creek 12-3 (T32n, R8e, S12, Swne, 35)	1477100	0	2.05	CLASS II	2131	Lincoln
12548	Unnamed	Unnamed Creek 15-4 (T32n, R9e, S15, Sese, 34)	1479900	0	1	CLASS II	2145	Langlade
12538	Unnamed	Unnamed Creek 19-16 (T32n, R9e, S?, Sese, 34)	1478700	0	0.62	CLASS II	2135	Langlade
12546	Unnamed	Unnamed Creek 22-8 (T32n, R9e, S22, Senw, 34)	1479700	0	2.92	CLASS II	2143	Langlade
12547	Unnamed	Unnamed Creek 23-3 (T32n, R9e, S23, Swne, 34)	1479800	0	1.47	CLASS II	2144	Langlade
12545	Unnamed	Unnamed Creek 28-1 (T32n, R9e, S28, Nwnw, 34)	1479600	0	2.37	CLASS II	2142	Langlade
12532	Unnamed	Unnamed Creek 29-10 (T33n, R9e, S29, Nws, 34)	1477300	0	1.93	CLASS II	2132	Langlade
12540	Unnamed	Unnamed Creek 32-5 (T32n, R9e, S32, Senw, 34)	1479000	0	0.86	CLASS II	2137	Langlade
12541	Unnamed	Unnamed Creek 32-8 (T32n, R9e, S32, Senw, 34)	1479100	0	1.74	CLASS II	2138	Langlade
12535	Unnamed	Unnamed Creek 36-9 (T32n, R8e, S36, Nesw, 35)	1478400	0	2.26	CLASS II	2133	Lincoln
12529	Unnamed	Unnamed Creek 5-6 (T31n, R8e, S5, Nwnw, 35)	1476700	0	1.82	CLASS II	2128	Lincoln

## Outstanding and Exceptional Resource Waters

Wisconsin has designated many of the state's highest quality waters as Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs). Waters designated as ORW or ERW are surface waters which provide outstanding recreational opportunities, support valuable fisheries and wildlife habitat, have good water quality, and are not significantly impacted by human activities. ORW and ERW status identifies waters that the State of Wisconsin has determined warrant additional protection from the effects of pollution. These designations are intended to meet federal Clean Water Act obligations requiring Wisconsin to adopt an "antidegradation" policy that is designed to prevent any lowering of water quality, especially in those waters having significant ecological or cultural value.

Outstanding Resource Waters (ORWs) typically do not have any point sources discharging pollutants directly to the water (for instance, no industrial sources or municipal sewage treatment plants), though they may receive runoff from non-point sources. New discharges may be permitted only if their effluent quality is equal to or better than the background water quality of that waterway at all times. No increases of pollutant levels are allowed. If a waterbody has existing point sources at the time of designation, it is more likely to be designated as an Exceptional Resource Water (ERW). Like ORWs, dischargers to ERW waters are required to maintain background water quality levels; however, exceptions can be made for certain situations when an increase of pollutant loading to an ERW is warranted because human health would otherwise be compromised (<http://dnr.wi.gov/org/water/wm/wqs/orwerw/>). Over 17 miles of Exceptional Resource Waters are found in the Pine River Watershed along stretches of Little Oxbo Creek, Mccloud Creek, Oxbo Creek, and Rajek Creek.

**Table 5: Pine River Watershed Outstanding and Exceptional Resource Waters**

WADRS ID	Official Waterbody Name	Local Waterbody Name	WBIC	ORW/ERW	ORW/ERW ID	Start Mile	End Mile	Counties
12533	Little Oxbo Creek	Little Oxbo Creek	1477500	ERW	257	0	3.77	Lincoln
12537	McCloud Creek	McCloud Creek	1478600	ERW	259	8.18	13.73	Langlade
12534	Oxbo Creek	Oxbo Creek	1477700	ERW	258	0	2.03	Lincoln
12528	Rajek Creek	Rajek Creek	1476400	ERW	256	0	5.86	Lincoln

## Impaired Waters

A 25-mile section of the Wisconsin River is listed as impaired by PCBs and mercury. Merrill Flowage is also on the 303(d) impaired waters list for an unknown pollutant due to contaminated sediments.

**Table 6: Pine River Watershed Impaired Waters**

Stream Name	WB ID Code	Start Mile	End Mile	Pollutants	Impairments	Sources	Counties
Wisconsin River	1179900	268	289.17	PCBs, Mercury	Contaminated Fish Tissue	Source Unknown, Atmospheric Deposition - Toxics	Lincoln, Marathon
Wisconsin River	1179900	289.17	293.67	Unknown Pollutant	Chronic Aquatic Toxicity	Contaminated Sediments	Lincoln
Merrill Flowage	1481100	0	284.31	Unknown Pollutant	Chronic Aquatic Toxicity	Contaminated Sediments	Lincoln

## Fish Consumption

Wisconsin's fish consumption advisory is based on the work of public health, water quality, and fisheries experts from eight Great Lakes states. Based on the best available scientific evidence, these scientists determined how much fish is safe to eat over a lifetime based on the amount of contaminants found in the fish and how those contaminants affect human health. Advisories are based on concentrations of the following contaminants along with angler habits, fishing regulations and other factors.

The Wisconsin River from its dam at Merrill downstream to the dam at Nekoosa has a specific fish consumption advisory in effect for polychlorinated biphenyls (PCBs).

Studies indicate the people exposed to PCBs are at greater risk for a variety of health problems. Infants and children of women who have eaten a lot of contaminated fish may have lower birth weights and be delayed in physical development and learning. PCBs may affect reproductive function and the immune system and are also associated with cancer risk. Once eaten, PCBs are stored in body fat for many years. Each time you ingest PCBs the total amount of PCB in your body increases (Proposed Guidance for the Classification, Assessment, & Management of Wisconsin Surface Waters, Lowndes & Helmuth, March 12, 2007).

## Aquatic Invasive Species

Rusty crayfish have been verified and vouchered in the Wisconsin River, Pine River, and Merrill Flowage. The Wisconsin River is also home to Eurasian water-milfoil.

Database Key	Waterbody Name	Aquatic Invasive Species	Status	Subtype	Start Date	WBIC
22175654	Wisconsin River above Lake Wausau	Eurasian Water-milfoil	Verified and Vouchered	Mainbody	12/31/2007	1179900
22574454	Wisconsin River - Lincoln and Marathon counties	Rusty Crayfish	Verified and Vouchered	-	12/31/1983	1179900
22705100	Pine River	Rusty Crayfish	Verified and Vouchered	-	12/31/1982	1475800
22707214	Merrill Flowage	Rusty Crayfish	Verified and Vouchered	-	-	1481100

### Species of Special Concern

The following species are state-listed Threatened, Endangered, and Special Concern species that have been observed in Lincoln and Langlade counties, in which the Pine River Watershed is located.<sup>1</sup>

Common Name	Species Name	Wisconsin Status
Adder's-Tongue	Ophioglossum vulgatum	Special Concern
Algae-Like Pondweed	Potamogeton confervoides	Threatened
American Shore-Grass	Littorella americana	Special Concern
Autumnal Water-Starwort	Callitriche hermaphroditica	Special Concern
Braun's Holly Fern	Polystichum braunii	Threatened
Deam's Rockcress	Arabis missouriensis var deamii	Special Concern
Dwarf Huckleberry	Vaccinium cespitosum	Endangered
Fairy Slipper	Calypso bulbosa	Threatened
Farwell's Water-milfoil	Myriophyllum farwellii	Special Concern
Georgia Bulrush	Scirpus georgianus	Special Concern
Green Arrow-Arum	Peltandra virginica	Special Concern
Hidden-Fruited Bladderwort	Utricularia geminiscapa	Special Concern
Hooker Orchis	Platanthera hookeri	Special Concern
Indian Cucumber-Root	Medeola virginiana	Special Concern
Lake-Cress	Armoracia lacustris	Endangered
Large-Flowered Ground-Cherry	Leucophysalis grandiflora	Special Concern
Large Roundleaf Orchid	Platanthera orbiculata	Special Concern
Leafy White Orchis	Platanthera dilatata	Special Concern
Little Goblin Moonwort	Botrychium mormo	Endangered
Marsh Willow-Herb	Epilobium palustre	Special Concern
Marsh Valerian	Valeriana sitchensis ssp uliginosa	Threatened
North Eastern Bladderwort	Utricularia resupinata	Special Concern

*1*Endangered: continued existence in Wisconsin is in jeopardy.

Threatened: appears likely, within the foreseeable future, to become endangered.

Special Concern: species for which some problem of abundance or distribution is suspected but not yet proven.

Rule: protected or regulated by state or federal legislation or policy; neither endangered nor threatened.

\* indicates: A candidate for federal listing.

\*\* indicates: Federally Endangered or Threatened.

Northern Black Currant	Ribes hudsonianum	Special Concern
Northern Bog Sedge	Carex gynocrates	Special Concern
Pale Beardtongue	Penstemon pallidus	Special Concern
Pale Bulrush	Scirpus pallidus	Special Concern
Pale Green Orchid	Platanthera flava var herbiola	Threatened
Prickly Hornwort	Ceratophyllum echinatum	Special Concern
Purple Bladderwort	Utricularia purpurea	Special Concern
Purple Clematis	Clematis occidentalis	Special Concern
Sheathed Sedge	Carex vaginata	Special Concern
Showy Lady's-Slipper	Cypripedium reginae	Special Concern
Slim-Stem Small- Reedgrass	Calamagrostis stricta	Special Concern
Small Yellow Water Crowfoot	Ranunculus gmelinii var hookeri	Endangered
Sparse-Flowered Sedge	Carex tenuiflora	Special Concern
Spotted Pondweed	Potamogeton pulcher	Endangered
Vasey's Pondweed	Potamogeton vaseyi	Special Concern

Table 9: Special Concern, Threatened, or Endangered Animals in Lincoln and Langlade Counties

Common Name	Species Name	Wisconsin Status	Taxa
American Bittern	Botaurus lentiginosus	Special Concern	Bird
Bald Eagle	Haliaeetus leucocephalus	Special Concern	Bird
Blanding's Turtle	Emydoidea blandingii	Threatened	Turtle
Bog Fritillary	Boloria eunomia	Special Concern	Butterfly
Cyrano Darner	Nasiaeschna pentacantha	Special Concern	Dragonfly
Delicate Emerald	Somatochlora franklini	Special Concern	Dragonfly
Dorcas Copper	Lycaena dorcas	Special Concern	Butterfly
Elfin Skimmer	Nannothemis bella	Special Concern	Dragonfly
Elktoe	Alasmidonta marginata	Special Concern	Mussel
Franklin's Ground Squirrel	Spermophilus franklinii	Special Concern	Mammal
Freija Fritillary	Boloria freija	Special Concern	Butterfly
Frigga Fritillary	Boloria frigga	Special Concern	Butterfly
Great Gray Owl	Strix nebulosa	Special Concern	Bird
Green-Faced Clubtail	Gomphus viridifrons	Special Concern	Dragonfly
Jutta Arctic	Oeneis jutta	Special Concern	Butterfly
Least Clubtail	Stylogomphus albistylus	Special Concern	Dragonfly
Northern Goshawk	Accipiter gentilis	Special Concern*	Bird
Osprey	Pandion haliaetus	Threatened	Bird
Pygmy Snaketail	Ophiogomphus howei	Threatened*	Dragonfly
Red-Disked Alpine	Erebia discoidalis	Special Concern	Butterfly
Red-Shouldered Hawk	Buteo lineatus	Threatened	Bird
Redside Dace	Clinostomus elongatus	Special Concern	Fish
Riffle Snaketail	Ophiogomphus carolus	Special Concern	Dragonfly
Round Pigtoe	Pleurobema sintoxia	Special Concern	Mussel
Skillet Clubtail	Gomphurus ventricosus	Special Concern	Dragonfly
Slippershell Mussel	Alasmidonta viridis	Threatened	Mussel
Smokey Eyed Brown	Satyroides eurydice fumosa	Special Concern	Butterfly

Common Name	Species Name	Wisconsin Status	Taxa
Splendid Clubtail	Gomphurus lineatifrons	Special Concern	Dragonfly
Spruce Grouse	Falcipennis canadensis	Threatened	Bird
Stygian Shadowfly	Neurocordulia yamaskanensis	Special Concern	Dragonfly
Tawny Crescent Spot	Phyciodes batesii	Special Concern	Butterfly
Water Shrew	Sorex palustris	Special Concern	Mammal
West Virginia White	Pieris virginiensis	Special Concern	Butterfly
White-Tailed Jackrabbit	Lepus townsendii	Special Concern	Mammal
Wood Turtle	Clemmys insculpta	Threatened	Turtle
Zebra Clubtail	Stylurus scudderii	Special Concern	Dragonfly

## State Wildlife Areas

### Ackley Wildlife Area

Shortly after the turn of the century, harvest of the original hardwood, hemlock, and pine timber types occurred on the area now known as the Ackley Wildlife Area. Later, wild fires and abortive attempts at farming reduced the cover types to grasses, shrubs, and aspen. These activities resulted in the wildlife area and surrounding lands developing into ideal habitat for sharp-tailed grouse.

This property was originally created in 1951 as an area to manage for prairie (sharp-tailed) grouse. Since that time wildlife managers have developed 27 shallow waterfowl flowages encompassing more than 400 acres of water. The remainder of the property is a mix of native grasslands, aspen, and northern hardwood stands. If you like hunting, Ackley provides excellent opportunities to pursue a variety of game species. Deer, turkey, black bear, ruffed grouse, woodcock, waterfowl, beaver, muskrat, fisher, and coyote are abundant on this property and on the 27,000 acres of surrounding county forest lands. Ackley Wildlife Area is located on State Highway 64, 12 miles west of Antigo or 14 miles east of Merrill. The headwaters of Little Oxbo Creek can be found within the wildlife area.

The Ackley Wildlife Area is managed to provide opportunities for public hunting, trapping, and other outdoor recreation while protecting the qualities of the unique native communities and associated species found on the property. Current management objectives include maintaining the health, vigor, and diversity of northern hardwood stands and the aspen type to provide wildlife habitat and aesthetic values. Wetlands are managed to maintain and enhance the quality and extent of emergent marsh to benefit waterfowl. Native grasslands are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous stands. Where feasible, populations of invasive species are controlled or eliminated by cutting, pulling, burning, herbicide treatment, and/or bio-control.

## Watershed Actions

### Grants and Projects

#### Lake Protection Grant - Restoring Langlade County Shorelands through Cooperation & Conservation 09/01/2005 – Complete

- Langlade County, in cooperation with the County Land Conservation Department, conducted a shoreland restoration project to continue and improve on past efforts and funding acquired through a previous lake protection grant. The project 1) Funded shoreland protection specialist, 2) Assisted property owners with shoreland restoration plans, 3) Monitored shoreland restoration sites, 4) Implemented cost sharing program with LCD, 5) Updated shoreland protection web page, 6) Updated and printed "Caring for Our Shores", 7) Continued shoreland friends program 8) Maintained and enhanced shoreland restoration demonstration sites, 9) Continued shoreland protection information/education program, and 10) Developed marketing strategies. Project deliverables included: 1) Hiring of

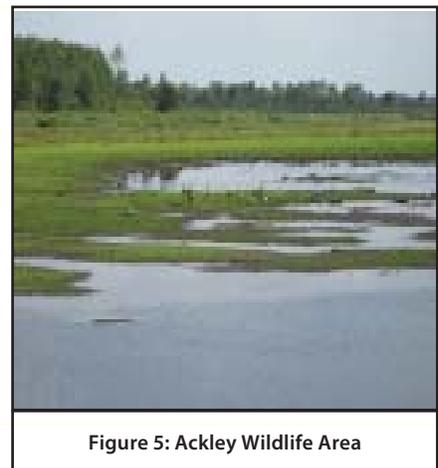


Figure 5: Ackley Wildlife Area

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shoreland protection specialist, 2) Project summary/report including number and description of new restoration properties/projects started with grant funds and evaluation of monitoring of past shoreland restoration sites, 3) Updated web page, 4) Updated “Caring for Our Shores” document, 5) Shoreland friends information packet, and 6) Photographs of shoreland demonstration sites. The Department of Natural Resources was provided with a copy of the summary/report, the updated “Caring for Our Shores”, a shoreland friends information packet, demonstration site photos, and was notified when the web page had been updated.

*Lake Protection Grant – Langlade County: Operation Enduring Shorelands 08/01/2002 – Complete*

- Langlade County conducted a project that focused on improving and developing new techniques for implementing Lake Classification and shoreland zoning regulations. The main areas where work was done are: 1) Marketing and outreach: Lake Marketing Blitz, Reference Site Network and “Shore Steward” program, shoreland demonstration sites (using the old ones and new ones), web site and computer kiosk updates, workshops for development professionals. 2) Lake Protection Specialist: Provided assistance on shoreland restoration including site visits and plan review. 3) Program Assessment and Improvement: Transplanted program, implementing alternative restoration techniques, research of financial incentive program that would be self-sustaining. 4) Collaboration with other Entities: Assistance to local groups, and coordination and expansion of DNR Sensitive Area Designations. This project was eligible for partial payments on a quarterly basis. A project progress report was to accompany and be approved by the department prior to approval and payment of partial payment requests. An executive project summary was to be submitted and approved by the Department prior to the project final payment. DNR was provided with a copy of reports and publications produced in both written and electronic (PDF) format. DNR was also be provided with a summary of all the efforts under this grant that are not included in reports or other written documents.

*Lake Protection Grant - Shoreland Protection Project - Lincoln County 09/01/1999 – Complete*

- The county zoning office implemented recommendations of the Land Use Advisory Committee to develop an updated shoreland protection ordinance for Lincoln County, including prescription models for shoreline restorations and mitigation practices.

*Lake Protection Grant - Langlade County: Shoreland Protection Implementation 09/01/1999 – Complete*

- The county continued to staff a Shoreland Protection Specialist to help implement the new waterway classification system and zoning regulations. Activities included establishing 10 shoreland restoration demonstration projects, creating and maintaining a shoreland restoration database, and creating and maintaining a shoreland protection/restoration web site with a zoning office front counter kiosk for public access. Scope amendment April 04, 2002, reads as follows: The county will continue to staff a Shoreland Protection Specialist to help implement the new waterway classification system and zoning regulations. Activities will include establishing shoreland restoration demonstration projects, monitor and education on compliance with mitigation (i.e. restoration sties), creating and maintaining a shoreland protection/restoration web site with a zoning office front counter kiosk for public access.

*Lake Protection Grant – Lincoln County Lakes Classification and Ordinance Development 11/01/1998*

- The project included the development of a lakes classification system, a scoring mechanism, based on the lake classifications, and accompanying ordinance development for all Lincoln County lakes. As part of the educational focus of the project, a “Shoreland Owners Development Guide” was developed.

*Lake Protection Grant – Langlade County Shoreland Protection Project 04/01/1998 – Complete*

- Langlade County proposed extensive revisions to its shoreland zoning and other regulations in conjunction with development of a countywide waters classification system. A comprehensive education and training program was developed and conducted to support its development, adoption, and implementation. Deliverables included: 1) Proposed and final copy of the revised shoreland ordinance and any other regulations developed for lake protection; 2) Proposed and final copy of the waters classification report and maps; 3) Copies of slides, videos and printed materials developed for the information and education program; 4) A progress report at 12 months or at the time of reimbursement request describing the status of the above deliverables; and 5) A final report summarizing the project’s development, achievements and deliverables.

*Lake Protection Grant – Langlade County Ordinance Development Project 05/05/1995 – Complete*

- Langlade County proposed to conduct inspections and research to enhance and improve current shoreland

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regulations, develop a zoning ordinance to enhance lake protection programs, and coordinate an educational program, including information shoreland lot erosion control, failing private sewage system education, and shoreland development compliance regulations. Reimbursement requests were possible every three months and must have been accompanied by a short progress report.

## Monitoring

### **Lakes Baseline and Trends Monitoring**

River Monitoring to comply with Clean Water Act implementation - water quality standards: use designations, criterion, permit issuance and compliance, assessments and impaired waters management.

Fisheries projects include a wide variety of “baseline” monitoring and targeted fieldwork to gain specific knowledge related to Wisconsin’s fish communities.

In close cooperation with UW Extension and Wisconsin Sea Grant, education efforts focus on working with resource professionals and citizens statewide to teach boaters, anglers, and other water users how to prevent transporting aquatic invasive species when moving their boats. Additional initiatives include monitoring and control programs.

### **Volunteer Monitoring**

The Citizen Lake Monitoring Network, the core of the Wisconsin Lakes Partnership, involves over 1,000 citizen volunteers statewide. The goals are to collect high quality data, to educate and empower volunteers, and to share this data and knowledge. Volunteers measure water clarity, using the Secchi Disk method, as an indicator of water quality. This information is then used to determine the lakes trophic state. Volunteers may also collect chemistry, temperature, and dissolved oxygen data, as well as identify and map plants, watch for the first appearance of Eurasian water-milfoil near boat landings, or alert officials about zebra mussel invasions on Wisconsin lakes.

Monitoring work in this watershed consists of lake monitoring and surveys for water quality, aquatic plants, aquatic invasive species, and ice observations.

## Basin/Watershed Partners

Langland County Waterways Association and Lincoln County Lakes and Rivers Association are working with the DNR to recruit volunteers to conduct aquatic invasive species inventories, develop and disseminate aquatic invasive species educational materials, and develop an aquatic invasive species taskforce.

## Recommendations

- Watershed Resource Management (WRM) should conduct an impact assessment study on North Branch Pine and the Pine rivers if the non-metallic mining operations on them appear to affect water quality (Type B).
- District WRM should conduct nonpoint impact assessment monitoring on Pat Smith Creek and the Pine River (Type B).
- Fish and Aquatic Habitat Staff should conduct baseline monitoring on watershed streams.
- Conduct NPS appraisal monitoring on East Branch Pratt, Little Oxbo, Lloyd, McCloud, Oxbo, Pratt and Rajek creeks, and the North Branch of the Pine River (Type B).

### **Volunteer Monitoring in the Watershed**

There are no citizen monitors in the CW29: Pine Creek Watershed.

## Contributors

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Ackley Wildlife Area, Langlade County

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Wisconsin DNR's mission involves preserving, protecting, and restoring natural resources. Watershed Planning provides a strategic review of water condition to enhance awareness, partnership outreach, and the quality of natural resource management.

# Pine River Watershed