

Flathead Lake Watershed Restoration Plan



December 22, 2014

Flathead Lakers:
*dedicated to protecting clean water, healthy ecosystems and
lasting quality of life in the Flathead Watershed.*

The Flathead Lakers is a nonprofit organization working to protect clean water in Flathead Lake and its watershed since 1958. It provides leadership and a strong voice for protecting and improving water quality through advocacy, education and stewardship programs. The Flathead Lakers encourage land and water stewardship, broaden the constituency for responsible land use planning and resource management, and build partnerships to address conservation priorities so that our communities can absorb growth and provide economic opportunities while maintaining our watershed's special natural heritage and quality of life for future generations. For more information, please visit www.flatheadlakers.org.



Together, we can ensure that clean water remains part of the Flathead legacy we leave to our children and grandchildren.

Contents

Executive Summary	5
SECTION 1: Introduction	7
What is a Watershed Restoration Plan?	8
EPA’s Nine Key Elements for WRPs	8
Flathead Lakers	8
Purpose of the Flathead Lake WRP	9
Scope of this WRP	9
SECTION 2: The Flathead Lake Watershed and Water Quality Impairments.....	11
Flathead Lake Watershed.....	11
Flathead Lake.....	12
Causes and Sources of Impairments to the Flathead Lake Watershed (EPA Element 1).....	13
Probable Sources Contributing to Impairments.....	14
Additional Potential Sources of Impairment.....	16
SECTION 3: Estimate of pollutant loading in the watershed and expected load reductions (EPA Element 2).....	17
Pollutant Loading and Reduction Estimates by Source	18
Flathead Lake.....	18
Ashley and Spring Creeks.....	18
SECTION 4: Management Measures and Resources Needed to Achieve Load Reductions in Target Areas (EPA Elements 3, 4, and 5)	24
Goals and Objectives	25
GOAL 1 Nonpoint Source Pollution Education: Expand stakeholder knowledge and understanding of Flathead Lake, its watershed, current and potential threats to water quality, and pollution sources to build a stewardship ethic and increase adoption of clean water best management practices.....	25
GOAL 2 Critical Lands and Waters Restoration & Protection: Conserve and restore critical lands and waters that sustain clean water in Flathead Lake and its watershed.....	29
GOAL 3: Aquatic Invasive Species Prevention and Control: Prevent introductions of new aquatic invasive species and control existing aquatic weeds to protect Flathead waters from their harmful impacts.....	33
SECTION 5: Measuring Progress and Success (EPA Elements 8 and 9).....	36
Monitoring and Load Reduction Estimates (EPA Element 9).....	36
Criteria for determining success (EPA Element 8).....	39
SECTION 6: Project Priorities and Schedule (EPA Elements 6 and 7)	41
References	43
APPENDICES	46
Appendix A: Flathead Lakers Strategic Plan 2015-2018	46
Appendix B: WRP Contract.....	46
Appendix C: Critical Lands and Water Resources Maps	46
Appendix D: Partners.....	46

TABLES

Table 1. Waters listed as impaired in the Flathead Lake Watershed, 2012.....	13
Table 2. Flathead Lake Watershed causes of impairment (Reporting Year 2012).....	15
Table 3. Flathead Lake Watershed sources of impairment, 2012	16
Table 4. Summary of nitrogen and phosphorus loads to Flathead Lake.....	17
Table 5. Existing and reduced sediment loads from eroding streambanks in specific segments of the Flathead-Stillwater TPA.....	21
Table 6. Predicted pollutant removal efficacy.....	37
Table 7. Priority projects and measures and criteria for determining success.....	40
Table 8. Implementation plan and measureable milestones	41

FIGURES

Figure 1. Flathead Lake Watershed.....	11
Figure 2. Flathead Watershed.....	11
Figure 3. TN sources contributing to Upper Ashley Cr.	19
Figure 4. TN sources contributing to Middle Ashley Cr.....	19
Figure 5. TN sources contributing to Lower Ashley Cr.....	19
Figure 6. TN sources contributing to Spring Cr.....	19
Figure 7. TP sources contributing to Lower Ashley Cr.....	20
Figure 8. TP sources contributing to Middle Ashley Cr.....	20
Figure 9. TP sources contributing to Spring Cr.....	20
Figure 10. Percent contribution of sediment sources to upper Ashley Cr. at the downstream end of the segment.....	21
Figure 11. Figure 11. Percent contribution of sediment sources to middle Ashley Cr. at the downstream end of the segment.....	21
Figure 12. Percent contribution of sediment sources to lower Ashley Cr. at the mouth (i.e., the entire Ashley Cr. watershed).....	21
Figure 13. Ashley Creek shade scenario.....	22

Executive Summary

The purpose of the Flathead Lake Watershed Restoration Plan is to identify opportunities to protect and restore water quality in Flathead Lake and the Flathead Lake watershed. The plan describes existing conditions, identifies problems, and proposes actions to reduce nonpoint source pollution.

Flathead Lake is the largest freshwater lake west of the Mississippi River and is treasured for its clean water, recreation opportunities, and beauty. Although the lake is renowned for its water clarity, its quality has been declining due to increasing nutrients from nonpoint source pollution. Its quality has also been compromised by introductions of aquatic invasive species and their impact on a changing food web.

Water quality in Flathead Lake is influenced by the quality of its tributaries and land use and resource management practices in the larger Flathead watershed, which comprises six million acres of scenic landscapes, a population of 121,000 residents (2012 estimate), and abundant fish and wildlife. Clean water and healthy ecosystems profoundly influence quality of life and economic vitality in the Flathead watershed. The Flathead Lake Watershed is a subwatershed of the larger Flathead Lake watershed.

The State of Montana declared Flathead Lake an impaired waterbody in 1996. Flathead Lake is currently listed as impaired for aquatic life due to total nitrogen, total phosphorus, PCBs, and mercury. Ashley Creek, a tributary of the mainstem Flathead River, which flows into Flathead Lake, is listed as impaired for aquatic life, cold water fishery, and recreation due to nitrate/nitrite, low flow alterations, chlorophyll-a, excess algal growth, water temperature, alteration in stream-side vegetation cover, dissolved oxygen, and total kjehldahl nitrogen.

The Montana Department of Environmental Quality (DEQ), with input from stakeholders, including the Flathead Basin Commission, the University of Montana Flathead Lake Biological Station, and the Flathead Lakers, produced the *Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake, Montana*, which was approved by the U.S. Environmental Protection Agency (EPA) in 2002. The Ashley Creek Watershed TMDL is in progress and DEQ plans to complete it by the end of 2014.

This Watershed Restoration Plan relies on information provided in the Flathead Lake TMDL, Ashley Creek TMDLs, and other resources, including the Montana Nonpoint Source Management Plan (2012), and research on effective nonpoint source pollution reduction and education strategies (Sweeney, 2014; Flathead Lakers, 2011; Zhang, 2010; EPA, 2005; Wenger, 1999), for information about water quality impairments, sources of impairment, and measures to address impairments. This information guided development of this plan and its water quality improvement and protection goals, objectives, and actions that address the nine key elements EPA has determined are critical for achieving water quality improvements.

The plan's goals are to: 1) Expand stakeholder knowledge and understanding of Flathead Lake, its watershed, current and potential threats to water quality, and pollution sources and best

management practices to build a stewardship ethic and increase adoption of clean water best management practices, 2) Conserve and restore critical lands and waters that sustain clean water in Flathead Lake and its watershed, and 3) Prevent introductions of new aquatic invasive species and control existing invasive aquatic weeds to protect Flathead waters from their harmful impacts.

This plan was produced by the Flathead Lakers, a nonprofit organization dedicated to protecting clean water, healthy ecosystems, and lasting quality of life in the Flathead Watershed. The Flathead Lakers thank our many partners and the Montana Department of Environmental Quality for their guidance and assistance in producing this plan. We look forward to continuing to work with these partners to implement projects to achieve the plan's goals.

SECTION 1: Introduction

Flathead Lake is truly a national treasure. It is the largest natural freshwater lake west of the Mississippi River. It is one of the cleanest lakes of its size and type anywhere in populated areas of the world. The lake is so clear because it is relatively low in nutrients that promote the growth of algae.

Water quality in Flathead Lake is a barometer of the ecological health of the entire Flathead Watershed. As sediments and nutrients in its tributaries increase, algae growth in the lake increases. The quality of Flathead Lake reflects how well we are living in balance with our environment. Clean water and healthy ecosystems profoundly influence quality of life and economic vitality in the Flathead Watershed.

Water quality in Flathead Lake and its watershed is threatened by increasing sediments and nutrients from urban sprawl, old and poorly maintained septic systems, poor agricultural and timber harvest practices, destruction of riparian vegetation, and air pollution. Montana Department of Environmental Quality (DEQ) has listed Flathead Lake as an impaired waterbody since 1996 due to nutrient and sediment pollution, PCBs, and mercury contamination. Flathead waters also face threats from possible introductions of harmful aquatic invasive species and climate change.

Phase I of the Flathead Lake Total Maximum Daily Loads (TMDL) report was completed in 2001. It identifies the major sources of pollution in the nearly six million acre Flathead watershed, sets pollution and indicator water quality restoration targets needed to achieve state water quality standards, establishes a goal of a 15% reduction in phosphorus and nitrogen loads (plus a 10% margin of safety), and provides guidance for restoration strategies. Phase II, currently being completed by Montana DEQ, will identify and quantify specific pollution sources and allocate reductions needed from those sources to meet the TMDL targets.

Phase I identifies managed and unmanaged forest lands, agriculture, urban areas, septic systems and sewage treatment plants, and airborne pollution as sources of pollution. Its source assessment analysis indicates that the most concentrated area of urban and agricultural lands “poses the greatest immediate threat to Flathead Lake” and suggests that focusing “on-the-ground implementation activities, and educational activities to facilitate implementation” in this area may provide the most benefit in improved water quality.

Water quality standards have also been adopted by the Confederated Salish and Kootenai Tribes (CSKT). The southern half of the lake is on the CSKT Reservation and the tribes manage water quality on the reservation.

Water quality in Flathead Lake is a barometer of the ecological health of the Flathead watershed, which comprises six million acres of scenic landscapes, a population of 121,000 residents (2012 estimate), and abundant fish and wildlife. As sediments and nutrients in its tributaries increase, algae growth in the lake increases, thereby degrading water quality. Clean water and healthy ecosystems profoundly influence quality of life and economic vitality in the Flathead watershed.

What is a Watershed Restoration Plan?

Watershed restoration plans (WRPs) are designed to help protect and restore our country's water resources. Creating a plan is one of the requirements for groups receiving grants under Section 319 of the federal Clean Water Act, which is administered by the U.S. Environmental Protection Agency (EPA). In Montana, the Montana Department of Environmental Quality (DEQ) manages the EPA grants. Below we paraphrase EPA in describing WRPs and their components:

Watershed Restoration Plans provide a framework for managing efforts to both restore water quality in degraded areas and to protect overall watershed health. A WRP is a comprehensive assessment that identifies nonpoint source pollution, its sources, and effects, and outlines a set of strategies to measure and mitigate each.

Because nonpoint source pollution arises from many diffuse sources, and mitigating it often requires voluntary action by individual landowners, successfully achieving water quality goals typically involves years of support through a coalition of stakeholders and a variety of programs and funding sources. WRPs help stakeholders holistically address water-quality issues by fully assessing the contributing causes and sources of pollution and setting priorities for restoration and protection.

EPA's Nine Key Elements for WRPs

Although many different components may be included in a WRP, EPA lists nine key elements critical for achieving water quality improvements and that must be included in all WRPs supported with Section 319 funding. The elements are summarized below and are included in this WRP in the noted sections.

1. Identify causes and sources of pollution. (Section 2)
2. Estimate pollutant loading into the watershed and expected load reductions. (Section 3)
3. Describe management measures to achieve load reductions in targeted critical areas. (Section 4)
4. Estimate the required technical and financial assistance and the relevant authorities needed to implement the plan. (Section 4)
5. Develop an information/education component. (Section 4)
6. Develop a project schedule. (Section 6, Table 8)
7. Describe interim measurable milestones. (Section 6, Table 8)
8. Identify indicators to measure progress. (Section 5, Table 7)
9. Develop a monitoring component. (Section 5)

Flathead Lakers

The Flathead Lakers treasure the special natural, recreational, spiritual, and economic values Flathead Lake and its tributaries provide. The Flathead Lakers, supported by over 1,500 members, is dedicated to protecting clean water, healthy ecosystems, and lasting quality of life in the Flathead Watershed.

Founded in 1958, the Flathead Lakers has a long history of efforts to protect Flathead Lake and water quality. As the Flathead Lakers celebrated its 50th Anniversary in 2008, the Daily Inter Lake wrote:

From its inception as a small group of locals who loved the lake, the organization has grown to a membership of 1,500. Over the years the Lakers have been involved in a variety of water-quality campaigns, ranging from the ban on phosphate detergents to upgrading sewage treatment to managing lake levels.

Their efforts are evident in what is still a remarkably clean lake. But many pressures exist on the precious commodity of water, so the work of the Flathead Lakers is likely to be needed for the next 50 years.

We all owe a debt of appreciation to the Lakers and groups like it that are helping protect a major resource in Northwest Montana.

Purpose of the Flathead Lake WRP

This WRP identifies opportunities for the Flathead Lakers to reduce nonpoint source pollution (NPS) during the next five years, with an initial focus on wetlands, floodplains, riparian areas, lakeshore adjacent to Flathead Lake, and the Flathead River corridor from Columbia Falls to Flathead Lake. Along with the Flathead Lakers Strategic Plan (Appendix I), this WRP will be used to set priorities, seek funding, and implement projects that protect and improve water quality in Flathead Lake and its watershed.

Scope of this WRP

This WRP describes the strategy for how the Flathead Lakers organization plans to work toward reducing nonpoint source pollution in the Flathead Lake Watershed (Figure 1). Over 75% of Flathead Lakers members live in this area. Thus, the Flathead Lakers can influence landowners and other stakeholders in a positive way to improve water quality in this area.

This WRP includes NPS pollution reduction strategies and activities developed based on information provided in the Flathead Lake TMDL Phase I report, research by the University of Montana Flathead Lake Biological Station, and successful collaborative strategies and activities developed with partners in the Flathead Watershed. Our strategies and activities are developed collaboratively with other watershed stakeholders to ensure effective use of resources and to increase chances of success, often accomplishing multiple benefits for watershed citizens. Flathead River to Lake Initiative partners reviewed a draft of the WRP and their recommendations are included.

New information provided in the Flathead Lake TMDL Phase II (in progress) and additional tributary TMDLs (to be completed by DEQ by the end of 2014) will be used to determine future priorities and focus areas for critical lands and water quality protection and restoration, which

may require projects that extend beyond the Flathead Lake Watershed into other parts of the larger Flathead Watershed. New information about pollution sources may indicate important priorities and actions needed that are not included in this WRP or that are beyond its scope.¹ The Flathead Lakers anticipate partnering with a broad range of stakeholders to develop a watershed restoration plan for the entire Flathead Watershed that we expect would incorporate priorities identified in this WRP.

¹ For the TMDL Phase II, a water quality model has been developed for the Flathead Lake Watershed to evaluate the sources and amounts of nutrients entering streams and lakes. The model is expected to allow potential land management scenarios to be simulated to determine how changing land use practices affect the amount of nutrients entering waterways. (<http://montanatmdlflathead.pbworks.com/w/page/46631925/Flathead%20Lake%20Watershed%20Nutrient%20TMDLs>).

SECTION 2: The Flathead Lake Watershed and Water Quality Impairments

Flathead Lake Watershed

The Flathead Lake Watershed (Figure 1), Hydrologic Unit (HU) 17010208, is the focus of this WRP and comprises the lands, rivers, and streams draining into Flathead Lake, including the mainstem Flathead River, from just north of Hungry Horse to the mouth of the Flathead River south of Flathead Lake in Polson. It also includes the Ashley Lake and Lake Mary Ronan subwatersheds.

Waterbodies currently listed in need of TMDL development include Ashley Creek, Spring Creek, and Flathead Lake.

Figure 1. Flathead Lake Watershed

Source: Natural Resources Information Services

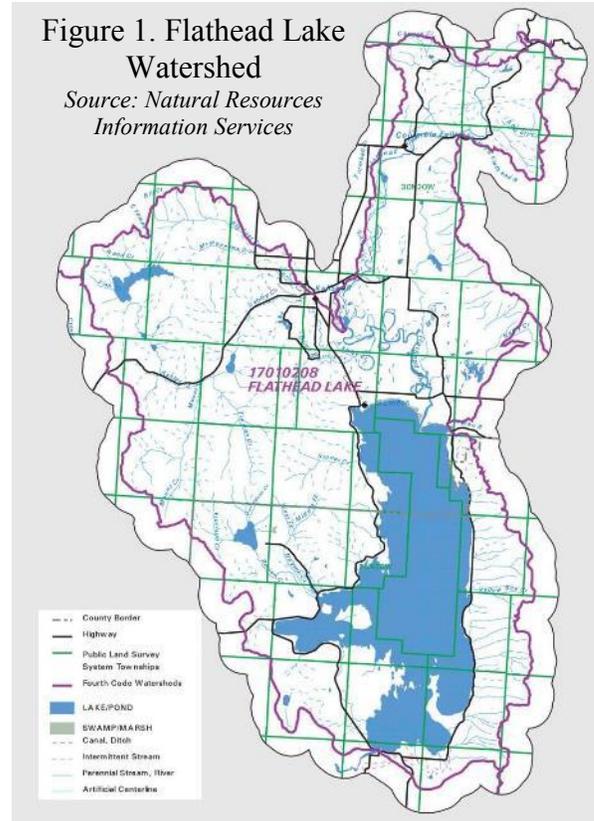


Figure 2. Flathead Watershed

Source: Mobile LoGiStics Manning



The Flathead Lake Watershed drains 726,654 acres (2,940 square miles) and includes federal (Flathead and Kootenai National Forests), tribal (Confederated Salish and Kootenai Tribes) state, and private lands (including large areas owned by Plum Creek Timber Co.).

The Flathead Lake Watershed is part of the larger Flathead Watershed (Figure 2), which includes all the land that drains into Flathead Lake and the Flathead River – a six million acre area stretching west from the Continental Divide to the Salish Mountains and from across the Canadian border in the north to the Clark Fork River in the south. All of this area and the streams and rivers that are tributary to Flathead Lake can influence water quality in Flathead Lake. Water flows from pristine headwaters in Glacier National Park, the Bob Marshall Wilderness and other wild lands, through

forests, farms, and cities. The Flathead Watershed contains the watersheds of the Stillwater, Whitefish and Swan Rivers and three forks of the Flathead River. The three forks of the Flathead River (North, Middle, and South Forks) contribute about 85% of the water entering Flathead Lake.

Headwaters in the mountains and protected areas help sustain fish and wildlife and clean water in the watershed. The Flathead National Forest administers the largest amount of public land in the watershed, approximately 60% of forested lands in the North, Middle, and South Forks of the Flathead, and the Swan and Stillwater drainages. Recharge areas found in Glacier National Park, the Bob Marshall Wilderness, and other undisturbed forested lands provide clean water to the rivers and lakes of the watershed.

The large valleys of the watershed were scoured by recurring glaciers that left a trail of alluvial (gravel, sand, silt, and clay) and outwash (gravel and sand mixture) deposits and glacial till (materials of all sizes pushed by advancing glaciers). Water that enters Flathead Lake flows through shallow aquifers, wetlands, and floodplains formed by the glaciers.

For a detailed description of the physical, biological and cultural characteristics of the Flathead Watershed, see the *Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake* report and *Flathead Watershed Sourcebook: A Guide to an Extraordinary Place*.

Flathead Lake



Flathead Lake is the largest freshwater lake west of the Mississippi River. It is almost 28 miles long and up to 15 miles wide with a maximum depth of 370 feet. Its depth varies by up to 9.8 feet based on flow regulation from Kerr Dam. The waters of the Flathead, Stillwater, Whitefish, and Swan Rivers all join in Flathead Lake. Flows into and through the lake are partially controlled by Hungry Horse Dam on the South Fork of the Flathead River and Kerr Dam near the lake's outlet. The average residence time that water spends in the lake is 2.2 years.

The southern half of the lake is on the Confederated Salish and Kootenai Tribes' Flathead Indian Reservation. The Tribes manage water quality on the reservation, and jointly manage fisheries in the lake with the state of Montana's Department of Fish, Wildlife and Parks. The northern third of the lake is in Flathead County and the southern two-thirds lie in Lake County.

Flathead Lake is one of the cleanest lakes of its size and type anywhere in populated areas of the world. The clarity of Flathead Lake's waters is renowned. In the summer it is often easy to see through 20 feet of the water column. The water is so clear because its pristine headwaters remain relatively low in the nutrients that promote the growth of algae.

Causes and Sources of Impairments to the Flathead Lake Watershed (EPA Element 1)

Flathead Lake is considered one of the cleanest large lakes in the world in temperate, populated areas. However, both the lake and several tributaries are listed by the state of Montana as impaired waterbodies, meaning that they do not meet water quality standards. Table 1 (EPA, 2012, Tracking & Environmental Results website) shows waters in the Flathead Lake watershed listed as impaired for nutrients and sediment, the primary pollutants this plan addresses.

Table 1. Waters listed as impaired in the Flathead Lake Watershed, 2012

Waterbody Name and location	Waterbody ID	Impaired designated use	Nutrient and Sediment Impairments on the 2014 List of Impaired Waters	Size
Ashley Creek, Ashley Lake To Smith Lake	MT76O002_010	Aquatic Life Cold Water Fishery Recreation ¹	Total Nitrogen	15.64 mi
Ashley Creek, Smith Lake to Kalispell Airport Road	MT76O002_020	Recreation ²	Total Nitrogen Total Phosphorus	14.17 mi
Ashley Creek, Kalispell Airport Road To Mouth (Flathead River)	MT76O002_030	Aquatic Life Recreation	Total Nitrogen Total Phosphorus Nitrate/Nitrite as N	13.17 mi
Fish Creek, Headwaters To Mouth (Ashley Lake) (subsequently delisted by DEQ)	MT76O002_050	Aquatic life ³	Sedimentation/Siltation Solids (Suspended/ Bedload)	2.39 mi
Flathead Lake (subsequently delisted by DEQ for sediment/siltation)	MT76O003_010	Aquatic life	Total Nitrogen Total Phosphorus Sedimentation/Siltation	126,006.9 acres
Spring Creek, Headwaters To Mouth (Ashley Creek)	MT76O002_040	Aquatic Life Cold Water Fishery Recreation	Total Nitrogen Total Phosphorus Nitrate/Nitrite as N	4.8 mi

¹ Drinking water not assessed

² Aquatic life, cold water fishery, and drinking water not assessed

³ Insufficient information to determine if drinking water is supported

In addition, Lake Mary Ronan (MT76O004_020), west of Flathead Lake, is listed as threatened for its aquatic life due to algae growth (chlorophyll-a). Chlorophyll-a is not a pollutant and therefore does not require a TMDL. However, it is often associated with high nutrient levels.

The larger Flathead Watershed (Fig. 2) also includes the following designated impaired waters, upstream of the Flathead Lake Watershed:

- Stillwater River, Logan Creek to mouth (sediments, nutrients)
- Whitefish River, Whitefish Lake to mouth / Stillwater River, (sediments, nutrients)
- Whitefish Lake (sediments)
- Sheppard Creek (nutrients)

NPS prevention and reduction activities in these tributaries may also be critical to reaching desired NPS pollution reductions in the Flathead Lake Watershed. We will review these TMDL reports (under development) as they are completed to evaluate their importance in our NPS pollution strategies.

Causes of Impairment for the Flathead Lake Watershed (EPA Element 1)

University of Montana Flathead Lake Biological Station researchers report that since the 1970s there has been an increase in lake primary productivity, a measure of a waterbody's ability to grow algae. An increase in primary productivity in Flathead Lake, a naturally oligotrophic lake, is an indicator of declining water quality caused by an increase in sediments and nutrients in the lake. An increase in algae growth can result in oxygen depletion and reduced clarity.

The TMDL Phase I report and follow up assessments for the development of the TMDL Phase II report, as well as continued studies by Flathead Lake Biological Station and the U.S. Geological Survey (USGS) provide additional information about water quality and pollution sources and causes.

In addition to nutrients and excess algae growth, EPA currently lists the following causes of impairment for the Flathead Lake Watershed: mercury, Polychlorinated Biphenyls (PCBs), Low Flow Alterations, Water Temperature (Table 2. Flathead Lake Watershed causes of impairment, EPA, 2012, Tracking & Environmental Results website).²

Probable Sources Contributing to Impairments

The very qualities that make the Flathead Watershed special are a magnet for population growth. The populations of Flathead and Lake Counties grew by 26% in the 1990s, twice the rate for the state of Montana. From 2000 to 2010, Flathead County's population grew by 22.1% and Lake County's by 8.4%. The pressures and demands that accompany growth can jeopardize clean water in the watershed.

Nutrients in Flathead Lake and its tributaries come from many sources, including point sources, such as municipal wastewater treatment plants, and nonpoint sources, such as septic systems, storm water systems, contaminated groundwater, air pollution, and precipitation runoff. Runoff can be polluted by development, agriculture, forestry, mining, and clearing of native vegetation. Flathead Lake Watershed sources of impairment reported by EPA for 2012 are shown in Table 3 for assessed lakes and rivers in the watershed.³

In addition to nutrients and sediment, the Flathead Lake TMDL Phase II will address mercury and PCB impairments. The Flathead-Stillwater Planning Area TMDLs address nutrients, sediments, and temperature. Pesticides are also of concern and have been found in monitoring wells along the lakeshore and in the shallow groundwater aquifer that flows into the river. A recent groundwater study conducted by the Flathead Lake Biological Station found pharmaceuticals and personal care products contaminating shallow groundwater that is closely connected to the Flathead River.

²http://iaspub.epa.gov/waters10/attains_watershed.control?p_state=MT&p_huc=17010208&p_cycle=2012&p_report_type=

³http://iaspub.epa.gov/waters10/attains_watershed.control?p_state=MT&p_huc=17010208&p_cycle=2012&p_report_type=

Table 2. Flathead Lake Watershed causes of impairment (Reporting Year 2012)

Cause of Impairment	Lakes, Reservoirs, and Ponds Acres	Rivers and Streams Miles	Name of Waterbody
Phosphorus, Total	122,252	36	Flathead Lake Ashley Creek, Ashley Lake To Smith Lake Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.) Spring Creek, Headwaters To Mouth (Ashley Creek) Fish Creek, Headwaters To Mouth (Ashley Lake)
Nitrogen, Total	122,252	33.6	Flathead Lake Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.) Ashley Creek, Ashley Lake To Smith Lake Spring Creek, Headwaters To Mouth (Ashley Creek)
Polychlorinated Biphenyls (PCBs)	122,252		Flathead Lake
Mercury	122,252		Flathead Lake
Sedimentation/Siltation	122,252	18	Flathead Lake Fish Creek, Headwaters To Mouth (Ashley Lake)
Nitrate/Nitrite (Nitrite + Nitrate as N)		18	Ashley Creek, Kalispell Airport Rd To Mouth (Flathead R.) Spring Creek, Headwaters To Mouth (Ashley Creek)
Low Flow Alterations		14.2	Ashley Creek (Smith Lake to Airport Rd)
Chlorophyll-A	6.8	26.6	Ashley Creek, Ashley Lake To Smith Lake; Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.), Lake Mary Ronan
Excess Algal Growth		13.2	Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.)
Temperature, Water		28.8	Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.); Ashley Creek, Ashley Lake To Smith Lake
Alteration in Stream-Side or Littoral Vegetative Covers		33.6	Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.); Ashley Creek, Ashley Lake To Smith Lake; Spring Creek, Headwaters To Mouth (Ashley Creek)
Dissolved Oxygen		33.6	Ashley Creek, Ashley Lake To Smith Lake; Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.); Spring Creek, Headwaters To Mouth (Ashley Creek)
Total Kjehldahl Nitrogen (TKN)		31.1	Ashley Creek, Kalispell Airport Road To Mouth (Flathead R.); Ashley Creek, Ashley Lake To Smith Lake; Spring Creek, Headwaters To Mouth (Ashley Creek)
Other Flow Regime Alterations		4.8	Spring Creek, Headwaters To Mouth (Ashley Creek)
Arsenic		4.8	Spring Creek, Headwaters To Mouth (Ashley Creek)
Physical Substrate Habitat Alterations		4.8	Spring Creek, Headwaters To Mouth (Ashley Creek)
Solids (Suspended/Bedload)		2.4	Fish Creek, Headwaters To Mouth (Ashley Lake)

Table 3. Flathead Lake Watershed sources of impairment, 2012

Probable Source	Rivers and Streams (Miles)	Lakes, Reservoirs, and Ponds (Acres)
Agriculture	19.0	6.8
Atmospheric Deposition - Nitrogen		122,252.0
Baseflow Depletion From Groundwater Withdrawals	4.8	
Channelization	20.4	
Crop Production (Crop Land Or Dry Land)	15.6	
Discharges From Municipal Separate Storm Sewer Systems (Ms4)	13.2	
Flow Alterations From Water Diversions	4.8	
Grazing In Riparian Or Shoreline Zones	15.6	6.8
Impacts From Hydrostructure Flow Regulation/Modification		122,252.0
Irrigated Crop Production	13.2	
Loss Of Riparian Habitat	20.4	
Municipal Point Source Discharges	13.2	122,252.0
Silviculture Activities	2.4	6.8
Silviculture Harvesting		122,252.0
Source Unknown	22.8	122,252.0
Unspecified Urban Stormwater		122,252.0
Upstream Impoundments (E.G., PI-566 Nrcs Structures)		122,252.0
Upstream Source	13.2	

Food web interactions in Flathead Lake complicate an understanding of impairment. Mysis shrimp, a cold-water crustacean also known as opossum shrimp (*Mysis diluviana*) reached Flathead Lake in 1986 after been introduced upstream in Whitefish Lake and Swan Lake. Recent research by the Flathead Lake Biological Station indicates that food web alterations caused by the introduction of Mysis shrimp not only dramatically changed food web dynamics in the lake, but also led to a significant increase in primary productivity affecting water quality. Predation by Mysis on specific zooplankton led to a shift in the dominant phytoplankton species in the lake and an increase in the production of organic compounds via photosynthesis. This research is important in illuminating how complex trophic interactions and the introduction of invasive species can affect water quality.

Additional Potential Sources of Impairment

Additional threats to the quality of Flathead Lake include the potential for coal, oil, and gas development in tributary watersheds, toxic materials spills from train and truck accidents, and the introduction of invasive aquatic species, such as zebra mussels, quagga mussels, and Eurasian watermilfoil.

SECTION 3: Estimate of pollutant loading in the watershed and expected load reductions (EPA Element 2)

Flathead Lake TMDL Phase I identifies the major sources of pollution in the nearly six million acre Flathead watershed, sets pollution and indicator water quality restoration targets needed to achieve state water quality standards, establishes a **goal of a 15% reduction in phosphorus and nitrogen loads (plus a 10% margin of safety)**, and provides guidance for restoration strategies.

It identifies managed and unmanaged forest lands, agriculture, urban areas, septic systems, and sewage treatment plants, and airborne pollution as sources of pollution. Its source assessment analysis indicates that the most concentrated area of urban and agricultural lands “poses the greatest immediate threat to Flathead Lake” and suggests that focusing “on-the-ground implementation activities, and educational activities to facilitate implementation” in this area may provide the most benefit in improving water quality.

The Flathead Lake Biological Station reported in 2001 that a significant portion of the nutrient load delivered to Flathead Lake comes from the more heavily developed and intensely managed areas of the watershed in the Flathead Valley (Table 4). Phase I of the Flathead Lake TMDL identifies urban and agricultural lands along the Flathead River and the land uses along the shoreline of Flathead Lake as important sources of nutrient loading.

Table 4 (originally published as Table 4-2 in the *Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake* report) shows that the mainstem Flathead River contributes 60.28% of the Total Phosphorus, 69.9% of the Total Nitrogen and 75.13% of the Nitrate + Nitrite (NO₃ + NO₂) load to Flathead Lake. This is not surprising given that the Flathead River also delivers approximately 85% of the total inflow to the lake annually.

Table 4. Summary of nitrogen and phosphorus loads to Flathead Lake (adapted from Stanford and Ellis, 2001). Source: Table 4-2 in the *Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake*

Watersheds	BioTP load		TN load		NO ₃ /NO ₂ load	
	metric ton/yr	%	metric ton/yr	%	metric ton/yr	%
Main-stem Flathead(1)	85.96	60.28%	1067.15	69.90%	545.41	75.13%
Swan	7.09	4.97%	108.44	7.10%	30.84	4.25%
Stillwater/Whitefish	12.73	8.93%	119.72	7.84%	48.29	6.65%
Ashley Creek	6.12	4.29%	66.3	4.34%	22.14	3.05%
Stoner Creek	0.15	0.11%	1.04	0.07%	0.11	0.02%
Other shoreline creeks(2)	1.57	1.10%	11.42	0.75%	4.45	0.61%
Shoreline septic (3)	3.7	2.59%	NA	NA	28	3.86%
Precipitation	22.97	16.11%	131.34	8.60%	40.28	5.55%
Point Sources	2.309	1.62%	21.21	1.39%	6.393	0.88%
Total Load	142.599		1526.62		725.913	

The results of a synoptic study of a single storm event prior to the publication of the *Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake* revealed that the largest nutrient loads were delivered from the lower, and most developed portions of the Flathead Watershed. The report suggested that loading from agricultural and urban lands had the greatest impact on Flathead Lake. Shoreline septic discharges and the land uses along the shoreline of Flathead Lake were also listed as important sources of nutrient loading. Subsequent monitoring by the Flathead Lake Biological Station corroborates these findings.

Based on this information, the Flathead Lakers are largely focusing pollution prevention and reduction efforts along the mainstem of the Flathead River, most nutrient and sediment loads (60-70%) to Flathead Lake. The Flathead Lake TMDL Phase II (in progress) and Flathead-Stillwater Planning Area TMDLs will identify and quantify specific pollution sources and allocate reductions needed from those sources to meet the TMDL targets. This information will be valuable for prioritizing strategies to address NPS pollution in the Flathead Lake watershed.

Pollutant Loading and Reduction Estimates by Source

Flathead Lake

Phase I of the Flathead Lake TMDL presents a nutrient loading analysis based on land use by Stanford et al. (2001). Because unmanaged forested land accounts for approximately 80% of the land area in the watershed, the natural background loads from these areas account for the greatest nutrient loading. Precipitation also accounts for a significant percentage of loading, with much of it attributed to natural background sources. As noted above in section 3, the Phase I source assessment indicates that the most concentrated area of urban and agricultural lands “poses the greatest immediate threat to Flathead Lake” and suggests that focusing “on-the-ground implementation activities, and educational activities to facilitate implementation” in this area may provide the most benefit in improved water quality. Therefore, nutrient reductions will focus on other source categories, including agriculture, urban and rural development, managed forests, and wastewater management.

The Flathead Lake TMDL Phase I establishes a nutrient reduction target of 25% (15% reduction with a 10% margin of safety) from 2001 levels. Phase I states that a Flathead Lake Biological Station nutrient load model indicates that “reducing the current nutrient loads by approximately 16 percent would result in achievement of the restoration target [$80 \text{ g C m}^{-2}\text{yr}^{-1}$]. This assumes a reduction of primary productivity from the current [2001] level of approximately $100 \text{ g C m}^{-2}\text{yr}^{-1}$...” The 10% margin of safety is included to account for future increases in nutrient loads from point and nonpoint sources as population growth occurs in the watershed. The source allocation presented indicates that available data preclude precise load allocation to individual sources or source categories. The Flathead Lake TMDL Phase II (in progress) and the Flathead Tributaries TMDL are expected to include a nutrient load allocation and refine potential load reductions by source.

Ashley and Spring Creeks

The Ashley Creek and Spring Creek nutrient TMDLs demonstrate that Upper, Middle, and

Lower Ashley Creek segments and Spring Creek (a tributary of Ashley Creek) all need reductions in total nitrogen (TN) loads to meet their respective TMDL water quality targets. Middle and Lower Ashley Creek segments and Spring Creek all need reductions in total phosphorus (TP) loads to meet their respective TMDL water quality targets. The document proposes a TMDL load allocation for these nutrients to all nonpoint sources “rather than prescribing specific load allocations to each nonpoint source.” The document states that this “accounts for the uncertainty regarding the augmentation of the TN loading from the Smith Lake Area, giving watershed stakeholders flexibility in deciding the best method for implementing nonpoint source reductions.” The same allocation approach is used for TP.

The Flathead-Stillwater TMDLs show nonpoint nutrient sources for each of these waterbodies (during the summer growing season) in the following pie charts (Figures 3- 9):

Figure 3. TN sources contributing to Upper Ashley Cr. Figure 4. TN sources contributing to Middle Ashley Cr.

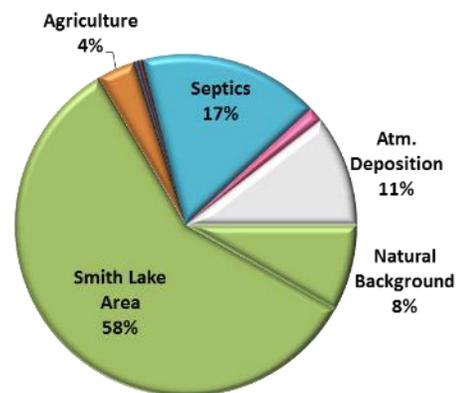
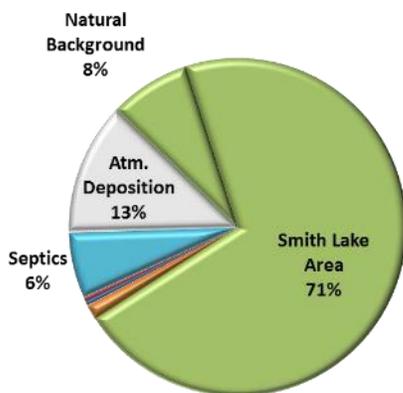
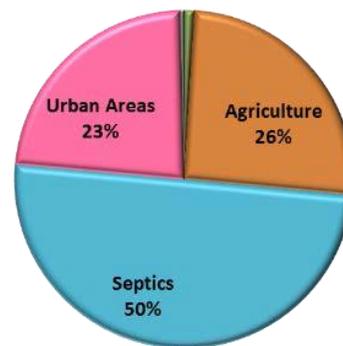
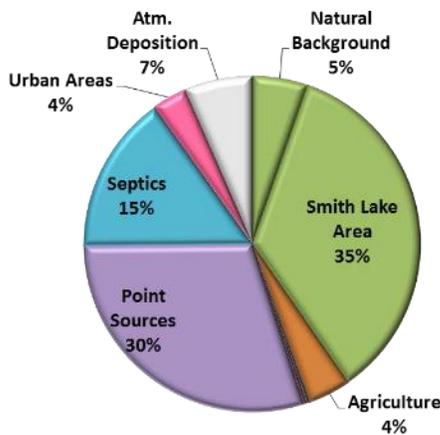


Figure 5. TN sources contributing to Lower Ashley Cr. Figure 6. TN sources contributing to Spring Cr.



The Flathead-Stillwater TMDL states that TN load reductions for Upper Ashley Creek needed to meet the TMDL range from 4% to 82%. TN load reductions needed to meet the TMDL range from 53% to 84% for Middle Ashley Creek. TN load reductions needed to meet the TMDL range from 67% to 97% for Lower Ashley Creek. TN load reductions needed to meet the TMDL range from 24% to 79% for Spring Creek.

Figure 7. TP sources contributing to Lower Ashley Cr. Figure 8. TP sources contributing to Middle Ashley Cr.

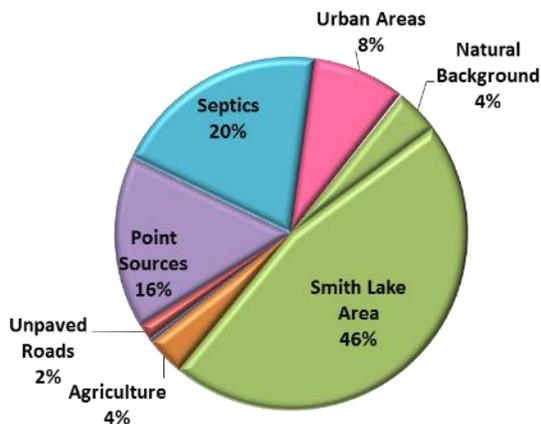
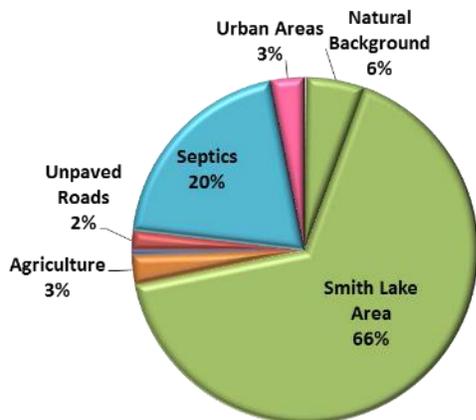
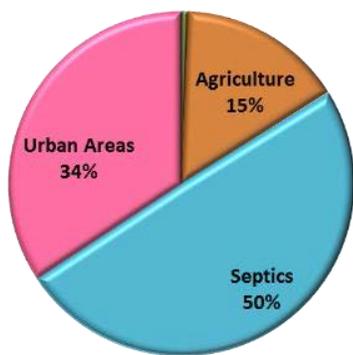


Figure 9. TP sources contributing to Spring Cr.



The Flathead-Stillwater TMDL states that TP loads need to be reduced by 4% to 58% for Middle Ashley Creek, by 26% to 71% for Lower Ashley Creek, and by 32% to 68% for Spring Creek.

The Flathead-Stillwater TMDL states that the “goal of the nutrient restoration strategy is to reduce nutrient input to Ashley Creek and other stream channels from nonpoint sources by increasing the filtering and uptake capacity of riparian vegetation areas, decreasing the amount of bare ground, and limiting the transport of nutrients from rangeland and cropland.”

The following table adapted from the Flathead-Stillwater TMDL (Table 6-18 L) shows the estimated existing sediment loads for the three segments of Ashley, the percent reduction expected with implementation of riparian BMPs, and the allowable sediment load with riparian BMPs (Table 5). The Flathead-Stillwater TMDL provides additional information about human-caused sources of sediments, including bank erosion, upland erosion, and unpaved roads.

Table 5. Existing and reduced sediment loads from eroding streambanks in specific segments of the Flathead-Stillwater TPA

Segment	Estimated Existing Sediment Load (tons/year)	Percent Reduction (i.e., percent human-caused bank erosion)	Allowable Sediment Load with Riparian BMPs (tons/year)
Upper Ashley	255.2	55%	114.8
Middle Ashley	533.7	48%	277.5
Lower Ashley	736.8	48% ¹	388.1

Figure 10. Percent contribution of sediment sources to upper Ashley Cr. at the downstream end of the segment

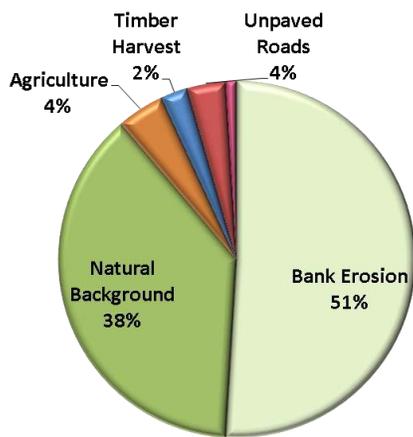


Figure 11. Percent contribution of sediment sources to middle Ashley Cr. at the downstream end of the segment

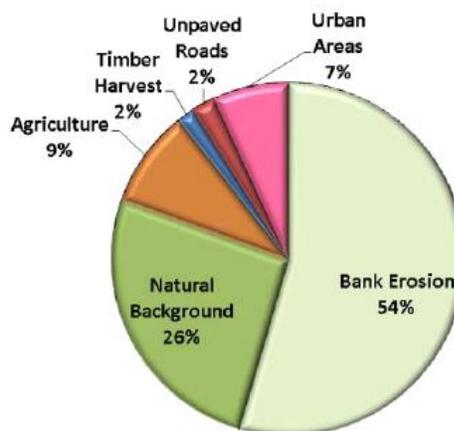
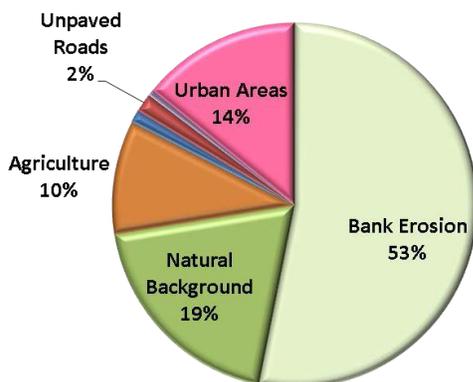


Figure 12. Percent contribution of sediment sources to lower Ashley Cr. at the mouth (i.e., the entire Ashley Cr. watershed)

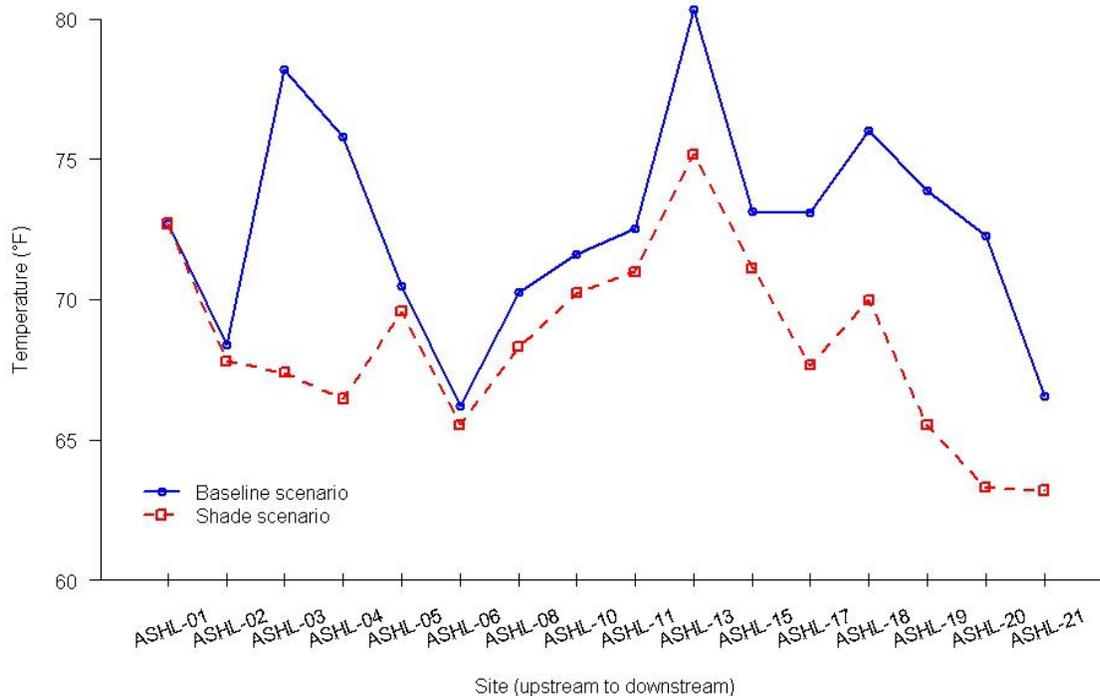


The Flathead-Stillwater TMDL reports that the “goal of the sediment restoration strategy is to limit the availability, transport, and delivery of excess sediment by a combination of minimizing sediment delivery, reducing the rate of runoff, and intercepting sediment transport.” It further states that: “Streamside riparian and wetland vegetation restoration and long term management are crucial to achieving the sediment TMDLs. Native streamside riparian and wetland vegetation provides root mass, which hold streambanks together. Suitable root mass density ultimately slows bank erosion. Riparian and wetland vegetation filters pollutants from upland runoff. Therefore, improving riparian and wetland vegetation will decrease bank erosion by improving

streambank stability and will also reduce pollutant delivery from upland sources."

The Ashley Creek temperature TMDL provides data on existing conditions from which load reductions can be estimated or modeled. The target values for shade, which largely control stream temperatures, are based on a riparian buffer with a minimum effective shade of 79% at sites with the potential for forested riparian vegetation, 64% at sites with the potential for dense riparian vegetation, and 10% at sites with the potential for open/pasture riparian vegetation. These values were used as input for the TMDL's QUAL2K model shade scenario for Ashley Creek in figure below (Figure 13).

Figure 13. Ashley Creek shade scenario



As the figure demonstrates, implementation of BMPs to achieve target shade values could decrease maximum stream temperatures by over 10°F in some reaches. Temperatures can be converted to an instantaneous thermal load (in kilocalories per second) to show load reductions, as demonstrated in the Flathead-Stillwater TMDL (Equation 6-11). To provide a load reduction estimate, the target load (shade scenario) would be subtracted from the existing load (baseline scenario):

$$\text{Relative Heat Load per unit time (kcal/s)} = ((T_F - 32) * (5/9) * Q * 28.3$$

Where:

$$\text{Relative Heat Load per unit time (kcal/s)} = \text{Heat Energy (kcal)/s}$$

T_F = Temperature in °F

Q = Flow in cfs

28.3 = conversion factor

Using the measured August, 2008 streamflow of 5.0 cfs at site ASHL-06, a baseline temperature

of 66.2°F, and a target temperature of 65.5°F, the load reduction would be 56 kcal/s. This value can be converted to a daily load by multiplying by 86,400 kcal/day.

More broadly, the Ashley Creek temperature TMDL states: "The goal of the temperature restoration approach is to reduce water temperatures where possible to be consistent with naturally occurring conditions. The most significant mechanism for reducing water temperature in both Ashley Creek and the Whitefish River is increasing riparian shade." It further states: "Increases in shade can be accomplished through the restoration and protection of shade-providing vegetation within the riparian corridor."

SECTION 4: Management Measures and Resources Needed to Achieve Load Reductions in Target Areas (EPA Elements 3, 4, and 5)

The Flathead Lake TMDL Phase I recommends on-the-ground implementation and educational activities that control urban and agricultural nonpoint source runoff from high density urban and agricultural land uses, and identifies areas in close proximity to Flathead Lake and its tributaries as posing the greatest immediate threat to Flathead Lake.

In addition, the Flathead Subbasin Plan, released by the Confederated Salish and Kootenai Tribes and Montana Fish, Wildlife & Parks in 2004, includes objectives to restore lake shorelines and critical wetland and riparian habitat to restore ecological function and sustain populations of native fish and wildlife in the Flathead River Subbasin.

The Flathead Lakers currently focus on nonpoint source pollution prevention and reduction efforts through public education and targeted conservation and restoration of critical lands, in particular protection and restoration of riparian buffers and wetlands, and aquatic invasive species prevention, education, rapid response, control, and when possible, eradication. The Flathead Lakers implement and encourage landowners and others to implement the following on-the-ground BMPs⁴:

- restore riparian vegetated buffers and wetlands
- conserve riparian vegetated buffers and wetlands
- secure conservation easements restricting development
- install riparian fencing
- install off-stream or water gap livestock watering structures
- develop management plans (e.g., maintain hydrologic and drainage patterns, riparian vegetation, cover crops; weed management, grazing rotation)
- site structures, roads, driveways, and paths to reduce runoff and erosion (e.g., avoid steep slopes and floodplains, follow contours, set back from riparian area)
- replace seawalls with dynamic equilibrium beach or other bioengineering erosion control method
- conserve or restore trees and other vegetation on steep slopes
- maintain and operate septic systems to maximize effectiveness
- manage turf and landscapes, including fertilizer, pesticide, and irrigation to protect water quality
- use permeable materials for driveways, lanes, sidewalks, parking areas
- conserve water
- dispose toxic household products, pharmaceuticals, and personal care products properly
- dispose pet waste properly
- fuel boats properly
- inspect, clean, drain, and dry boats

⁴ Montana Department of Environmental Quality Nonpoint Source Management Plan, 2012; Flathead Lakers *Clean Water Effective Education Literature Review*, 2011.

New relevant information that becomes available during the five-year timeframe, including the TMDL Phase II, will be used to assess and revise proposed actions to maintain and improve water quality in the Flathead Lake Watershed, including actions that may be needed to protect/restore tributaries to the river and the lake.

The Flathead Lakers partner with numerous landowners, organizations, resource management agencies, public officials, and businesses to achieve our water quality protection and improvement goals, and will continue to do so. Over the past decade, we have worked to develop strong working relationships among partners that have already achieved significant results in protecting and restoring critical wetlands and riparian areas, developing and providing watershed education programs, and thwarting aquatic invasive species. By working together, partners can have a bigger impact and use available resources more effectively and efficiently. Achieving the goals and objectives of this plan will not be possible without our partnerships described in Appendix D.

Many of the partners listed in Appendix D also provide technical assistance for projects. Based on our past work with partners, we expect technical assistance for collaborative projects will be provided by various partners, and will include: resource data, mapping, monitoring and data management, restoration project design, plant identification, and project evaluation criteria. When technical assistance cannot be provided by partners, we plan to seek the expertise of other state agency technical staff and consultants.

Financial needs to achieve this plan's goals and objectives are listed below under each goal's "resources needed" section. Sources of financial assistance include in-kind contributions from partners, Flathead Lakers member donations, and grants. Grant programs appropriate for projects to achieve our goals and objectives include: DEQ 319 Grant (restoration and education projects), DNRC Conservation District 223 Program Grant (conservation, restoration, and education projects), DNRC Watershed Planning and Assistance Grant (planning and coordination), Montana Watershed Coordination Council Big Sky Watershed Corps Grant (Flathead River Steward Program and restoration projects), National Fish and Wildlife Foundation (NFWF) Environmental Solutions Grant (conservation and restoration projects), NFWF Five Star and Urban Waters Restoration Grant (restoration projects), NFWF Conoco Phillips Grant (conservation projects), FWP Living with Wildlife Grant (education projects), and North American Wetlands Conservation Act Grant (conservation and restoration projects). Partners may also seek additional funding for conservation and restoration projects from the NRCS Farm Bill conservation programs (EQIP, ALE), MT Fish, Wildlife and Parks (FWP) Habitat Montana program, Montana Fish and Wildlife Conservation Trust, Federal Land and Water Conservation Fund, and Bonneville Power Administration fisheries mitigation program. Foundation grants may also be a source of funding. Potential grant opportunities include the following: Cinnabar Foundation (conservation, education, partner coordination projects), First Interstate Bank Foundation (projects tbd), BNSF Railway Foundation (north shore restoration project), and the Greater Polson Community Foundation (education projects).

Goals and Objectives

GOAL 1 Nonpoint Source Pollution Education: Expand stakeholder knowledge and understanding of Flathead Lake, its watershed, current and potential threats to water quality, and pollution sources to build a stewardship ethic and increase adoption of clean

water best management practices.

Objective 1.1 Make clean water best management practices (BMPs) the norm through stakeholder education and incentive programs.

In 2010-2012, the Flathead Lakers compiled and evaluated nonpoint source pollution education projects and reviewed the research literature on effective education and marketing strategies. We identified a priority to work with landowners, contractors, and businesses that influence landowner decisions about land use practices to inform them about clean water best management practices (BMPs, see above list of BMPs we encourage landowners to adopt). Both the research and our recent experience indicate that as landowners adopt clean water BMPs, neighboring landowners become open to learning more about them. When 15% of landowners in a "neighborhood" adopt a practice, it is likely to become the new norm. We will build on the Clean Water BMPs Tool Kit previously developed to encourage implementation of BMPs by waterfront landowners, nurseries, and landscapers. We will focus outreach in at least two neighborhoods (Rocky Point area on the southwest shore of Flathead Lake, Lakeside area on the northwest shore of Flathead Lake, and/or the Finley Point area) to encourage BMPs implementation with the ultimate goal of at least 15% of lakeshore landowners in each neighborhood adopting clean water BMPs. Additional tours and/or workshops may be focused on other lakeshore or tributary locations if there is a demonstrated need and demand. We will inform neighbors about the BMPs implemented in their neighborhood to encourage wider adoption. Activities to achieve this objective include the following:

- Conduct landowner site visits to recommend site-specific BMPs.
- Encourage landowners to sign up for site visits during all other outreach activities.
- Conduct Walk & Talk Tours for landowners and other stakeholders to sites that illustrate NPS and BMPs, including riparian buffer demonstration sites.
- Conduct workshops for landowners on buffers and other BMPs.
- Produce additional BMP fact sheets for the BMPs ToolKit.
- Give presentations to community groups and encourage those who attend to sign up for a site visit.
- Conduct outreach to nurseries and landscape businesses and partner with those interested to provide BMPs information and education to their clients and develop incentives for installing vegetated riparian buffers.
- Share landowner BMPs success stories through various avenues, such as newsletters, websites, Facebook, and local media.
- Evaluate outreach success, including:
 - Conduct follow up with landowners who had site visits to encourage BMPs implementation, find out about BMP implementation, and assess implementation success.
 - Assess effectiveness of other outreach to promote site visits and BMPs implementation.
 - Conduct surveys to determine the percent of landowners in at least one selected neighborhood implementing BMPs and begin to identify which BMPs are becoming a norm.

Objective 1.2 Expand the use of watershed education programs in schools in the watershed

to prepare students to be critical thinkers and leaders in water and watershed stewardship.

Educating today's youth about water and its uses, Flathead water resources and their value, threats to clean water, watershed connections, and water and watershed stewardship will help protect Flathead waters in the future. The Flathead Lakers initiated our Becoming Watershed Citizens program in 1998 in the Polson school district. In the past few years, we have expanded the program to three additional schools. The Lakers have organized and participated in a variety of additional student water education field trips, camps, and projects.

In 2011, we conducted a survey of teachers to learn more about water and watershed education programs being used, needs, and interest in additional water education opportunities. We learned there is a significant interest in access to existing water and watershed education curricula and materials and significant interest in new educational programs that meet state education standards. Complete survey results are available on the Flathead Lakers website. In addition to sustaining our current program and expanding it to include additional schools and teachers in the watershed, we will use this information and work with partners to develop new programs and materials and to provide teachers with training to help educate future Flathead citizens, including a new curriculum and educator's guide to accompany the *Flathead Watershed Sourcebook*. Activities to achieve this objective include the following:

- Support the six schools currently participating in *Becoming Watershed Citizens* programs by offering an annual student field trip, and engage new schools in the program.
- Disseminate the Flathead Watershed Sourcebook Educator's Guide and provide teacher training on using it for middle school teachers and nonformal educators.
- Provide training workshops for teachers using available water and watershed curricula (e.g. Project WET).
- Produce additional Flathead Watershed educational trunks to allow access by more teachers in the watershed.

Objective 1.3 Expand the constituency for clean water protection and restoration by building our volunteer program.

The Flathead Lakers will build on our past successes and on our current education and outreach program to improve outreach to members, waterfront landowners, boaters and others who enjoy Flathead waters, resource managers, public officials, and citizens. Our objective is to inform them about threats to Flathead Lake and its tributaries and about opportunities to protect and improve water quality.

We will build our volunteer program to provide support for our education and outreach program and projects, and to nurture and build awareness, understanding, and behaviors that protect and improve water quality. Success will strengthen our organization by building program capacity and engaging potential leaders, thereby expanding the Flathead Lakers' capacity to create a norm of clean water stewardship. Activities to achieve this objective include the following:

- Recruit and train at least 20 new volunteers for education programs by 2017 and improve recruitment and retention by implementing strategies identified in effective volunteer program research and information.

Objective 1.4 Develop a board member liaison program to build relationships with Confederated Salish and Kootenai Tribes, federal, state, and local agencies to encourage and support government programs, policies, and decisions that protect and improve water quality in Flathead Lake and its watershed.

Effective public policies and programs are essential for sustaining and improving water quality in the Flathead Watershed over the long term. Building a strong constituency of members and advocates for clean water stewardship is key to influencing public policy and ensuring effective government programs. The Flathead Lakers have had successes in improving policies, programs, and projects that affect water quality, but much work remains. As the Flathead Lakers build the constituency for clean water stewardship through education based on sound scientific information, we will also recruit and support leaders who can strengthen our outreach and build relationships with public officials. Activities to achieve this objective include the following:

- Develop a board member liaison program to build relationships with key public officials in 2015.
- Recruit and support board members and volunteers who can strengthen outreach and build relationships with public officials. Develop criteria for selecting new board member candidates and a list of board member candidates that meet the criteria.

Objective 1.5 Provide recommendations and supporting information to county, state, tribal land use planning decision makers, and resource managers to improve policies, regulations, procedures, and projects that affect water quality.

Activities to achieve this objective include the following:

- Compile relevant information and maps.
- Provide recommendations to land use planning and resource management staff and elected officials regarding lakeshore regulations and other policies, regulations, and proposed projects that affect water quality to ensure strong protection measures are in place.

Goal 1 - resources needed:

- Funding to support and expand the Education & Outreach Coordinator position from $\frac{3}{4}$ to full time (\$35-40,000 per year for a full time position). About 65% of the position is allocated to accomplishing Goal 1 projects.
- Funding for project expenses including travel, outreach materials, and website development and management (approximately \$5,000 per year).
- Watershed education partners.

Goal 1 - measures of success:

1) 15% of lakeshore landowners in 2 watershed "neighborhoods" have adopted one or more BMPs. We believe this can be accomplished through:

- site visits with 50 landowners, with focused outreach in two selected neighborhoods, with 60-70% of landowners visited adopting one or more BMPs

- 15 Walk & Talk Tours
- 10 new fact sheets
- 25 presentations to community groups
- partnerships with nurseries and landscape businesses that can deliver clean water BMPs information to their clients
- 20 landowner BMPs success stories to share with other landowners

2) 8 schools and approximately 1,500 students per year engaged in watershed education programs and learning that will help instill a clean water stewardship ethic in future landowners, decision-makers, and voters (increase from the current 6 schools and approximately 500 students). We believe this can be accomplished through:

- 2 new schools participating in *Becoming Watershed Citizens* program
- 7 additional Flathead Watershed Trunks produced and distributed to teachers (currently 4)
- 15 teachers and nonformal educators using the Flathead Watershed Sourcebook Educator's Guide

3) 20 new volunteers recruited and trained and a total of approximately 100 volunteers working with our education programs on a regular basis.

4) New board liaison program in place reaching 8 or more key public officials to encourage them to make policy and other decisions that will protect/restore water quality.

GOAL 2 Critical Lands and Waters Restoration & Protection: Conserve and restore critical lands and waters that sustain clean water in Flathead Lake and its watershed.

Flathead Lakers convened agency resource managers, scientists, and land trust representatives in 1999 to explore needs and opportunities to protect lands that provide valuable natural services, including clean water, from negative impacts of rapid growth and development. A strong partnership grew to identify, protect, and restore lands critical for sustaining clean water, healthy habitat, prime farmlands, recreation opportunities, and scenic vistas.

With coordination provided by the Flathead Lakers, Critical Lands Project and Flathead River to Lake Initiative partners have since conserved over 6,000 acres of critical lands along the Flathead River and the lake's north shore and restored over three miles of Flathead River riparian areas.

An evaluation in 2012 (*Analysis of Conservation Success*) of all protected areas (private and public) in the Flathead River to Lake Initiative focus area along the mainstem of the Flathead River (from Columbia Falls to the north shore of Flathead Lake) showed that the following have been protected from development by conservation easement or public land management (through June 2012):

- 41% of the 100-year floodplain
- 49% of high quality riparian areas
- 51% of the wetlands
- 43% of the areas overlaying the shallow groundwater aquifer

- 29% of the banks along the Flathead River's main channel
- 34% of the corridors' important agricultural soils.

An internal assessment of future conservation priorities also identified acres of riparian areas, wetlands, floodplain, shallow groundwater, river miles, and prime agricultural soils that remain unprotected and priority landowners to approach regarding conservation and stewardship of these critical areas. A high priority for future conservation and protection from development are the 10 parcels greater than 160 acres in size that each contain more than 80 acres of 100-year floodplain, more than 80 acres of shallow groundwater, border more than 0.3 miles of the Flathead River main channel, have greater than 10 acres of wetland, and have more than 30 acres of quality riparian habitat. Additional priorities for protection include properties around Flathead River sloughs and connected wetlands (e.g. Egan Slough and Brosten Pond), and properties at the north shore of Flathead Lake.

Protecting and restoring these critical lands continues to be an effective way to sustain and improve water quality in Flathead Lake and remains a top priority for the future. Conservation easement conditions include restrictions on future development (e.g., housing, commercial) and a management agreement that includes water quality protection and improvement provisions (e.g., agriculture and forestry practices). We will continue to provide partner and project coordination for the River to Lake Initiative, evaluate and continue the Flathead River Steward Program, and provide landowner education and outreach.

We plan to use the new information that will be provided by the Flathead Lake TMDL Phase II and the Flathead-Stillwater TMDL and collaborate with partners to expand our critical lands conservation and restoration program. The Flathead Lakers have participated in the development of the Flathead Lake TMDL since the project's inception. Phase II includes developing a model to help allocate pollution load reductions needed from various sources. The Lakers will continue to participate on the Flathead TMDL Watershed Advisory Group. When Phase II is completed, we plan to work with agencies and organizations to use the TMDL information to identify and prioritize opportunities to reduce pollution and to implement stewardship and education projects that help achieve the TMDL water quality targets. We plan to identify opportunities to improve sewage treatment (e.g., septic systems, boat holding tank pump-outs, and municipal, commercial, and industrial systems) and reduce river and lakeshore erosion to address problems and concerns.

Objective 2.1 Complete critical lands restoration and conservation projects through the River to Lake Initiative partnership. We believe this can be accomplished through:

- Coordination and management to develop and implement collaborative landowner outreach, project funding proposals, mapping, and project evaluation.
- Project coordination and management to complete at least 2 riparian restoration projects per year with partners.
- Continuation of the Flathead River Steward program, including transitioning to a permanent Steward position by the end of 2016.
- Project coordination to complete at least 1 conservation project per year with partners.
- Outreach to landowners, partners, Flathead Lakers members, and other interested individuals and organizations about restoration and conservation projects, opportunities for technical assistance, relevant meetings and trainings, etc. through R2L and Flathead Lakers newsletters and websites, media, social media, informational handouts, project

tours and conservation heroes celebrations to engage landowners in critical lands stewardship, conservation, and restoration.

Objective 2.2 Restore, maintain, and monitor riparian buffers to stabilize streambanks, decrease stream temperatures, and reduce agricultural runoff. We believe this can be accomplished through the following:

- Engage landowners and coordinate with agency and organization partners to identify and prioritize restoration opportunities to improve water quality.
- Fence riparian areas and build in-stream or off-stream watering facilities for livestock. Priority projects include completing a fencing project along a half-mile of Ashley Creek.
- Revegetate riparian areas to restore native plant communities. Complete at least two projects (or project sections) per year. Priority projects include completing riparian and wetland restoration projects at Foys Bend and Otter Island on the Flathead River and at the Flathead Lake North Shore Wildlife Management Area.
- Help landowners secure funding and provide technical support to implement projects.
- Monitor past and current restoration projects and evaluate results to share with restoration partners and interested landowners. Conduct maintenance needed (e.g., weeding, watering).

Objective 2.3 Develop and maintain dynamic equilibrium beaches and other site-appropriate erosion control measures to reduce erosion on Flathead Lake. We believe this can be accomplished through the following:

- Assist interested lakeshore landowners (contacted through site visits or workshops) with planning and implementing projects.
- Expand the existing dynamic equilibrium beach restoration on the U.S. Fish and Wildlife Service Flathead Lake Waterfowl Production Area to an adjacent private property.

Objective 2.4 Support interested landowners in developing and maintaining demonstration lakeshore riparian buffers to use in education and outreach (see Nonpoint Source Pollution Education Projects above). We believe this can be accomplished through the following:

- Implement new lakeshore riparian buffer demonstration projects to create demonstration buffers on sites with different conditions than our current demonstration site.
- Assist landowner with existing demonstration lakeshore buffer project monitoring and maintenance to ensure its continued success for reducing nonpoint source pollution and as a demonstration site.

Objective 2.5 Build collaborative partnerships to address Flathead Lake TMDL Phase II priorities for watershed restoration. We believe this can be initiated through the following:

- Complete the mainstem Flathead River Channel Migration Zone Map and Bathymetric Map with partners.
- Map critical lands in a new focus area based on TMDL Phase II results and partner recommendations to prioritize and implement NPS pollution reduction and critical lands restoration and conservation projects.

- Work with current and new partners, including the Flathead Regional Wastewater Management Group, to support policies and implement projects to improve wastewater treatment.

Objective 2.6 Advocate water quality protection in land use and resource management policies and in projects with the potential to have a significant impact on water quality.

- Identify, plan, and implement actions to prevent and reduce pollution to sustain and improve water quality, such as improving wastewater treatment policies and requirements.

Goal 2 - resources needed:

- Funding to support the Critical Lands Program Director (approximately \$40,000-\$45,000 per year for a full time position).
- Funding for project expenses including travel (approximately \$2,000 per year)
- Funding to create and sustain a permanent Flathead River Steward position and program (pilot project is currently funded through the Big Sky Watershed Corps program and partner contributions - approximately \$40,000 per year for position and expenses). Partner cost-share commitments to sustain the position.
- Funding for riparian buffer and wetland restoration projects on the lake and tributaries; partner cost-share funding and technical expertise for restoration projects. Projects to be completed during the first two-three years of this WRP include:
 - 2 wetland and creek restoration projects near Columbia Falls: \$500,000.
 - Ashley Creek project: \$6-9,000.
 - 2 Flathead River restoration projects: \$10-50,000/project per year.
- Funding to support and expand the Education & Outreach Coordinator position from 3/4 to full time (approximately \$35,000-\$40,000 per year for a full time position). About 15% of the position is allocated to accomplishing Goal 2 projects.
- Funding to assist a lakeshore landowner implement a demonstration riparian buffer project (approximately \$10,000 depending on site conditions and the project, assuming at least a 50% cost share by the landowner).
- Funding to contract with consultant(s) to help manage collaboration on and implementation of TMDL Phase II NPS reduction projects, including wastewater and septic system improvement projects (approximately \$10,000 per year).
- Funding for outreach to promote critical lands protection and restoration (e.g., River to Lake Initiative website, outreach events) (approximately \$500-600 per year).
- Funding for Critical Lands and Channel Migration Zone mapping (approximately \$10,000-15,000 and \$30,000-35,000 respectively).
- Funding and partner technical expertise for conservation projects (costs are variable by project).
- Sustained partner commitment to participation in and the success of the River to Lake Initiative and critical lands protection and restoration.

Goal 2 - measures of success:

- 1) 6-10 riparian buffer projects (or project phases) completed, restoring 2-3 miles of riparian

buffers.

- 2) 200-500 acres of critical lands protected through conservation easement or partner acquisition and an additional 200-500 acres identified and projects designed.
- 3) Five-year program evaluation report and biennial map update completed showing progress on measured indicators using measures evaluated in the 2012 report, including:
 - total acres protected by conservation easement or public land acquisition
 - areas protected in key categories, e.g., wetlands, floodplains, overlying shallow aquifer)
- 4) Completion of a second demonstration lakeshore riparian buffer.
- 5) Channel Migration Zone and Critical Lands maps completed based on TMDL Phase and partner input.
- 6) Policies and projects to improve wastewater treatment in the watershed identified, developed, advocated, and adopted.

GOAL 3: Aquatic Invasive Species Prevention and Control: Prevent introductions of new aquatic invasive species and control existing aquatic weeds to protect Flathead waters from their harmful impacts.

In 2006, the Flathead Lakers convened a meeting with Flathead Lake Biological Station staff and the Montana Fish, Wildlife & Parks AIS Coordinator to discuss growing concerns about the threat of an introduction of invasive zebra mussels into Flathead waters. Proceeding from that meeting, the Lakers developed our first AIS plan in 2007, which education and outreach, including posting warning signs about the threat and how to prevent accidental introductions at all public boat ramps on Flathead Lake, many of the private ramps, and boat ramps throughout the watershed.

We subsequently worked with partners to establish the Flathead Basin AIS Work Group, which developed the first *Flathead Basin Aquatic Invasive Species Prevention Plan* in 2010. We helped identify needs for new state policies and regulations, and successfully advocated for AIS legislation and additional funding in the 2009, 2011, and 2013 state legislative sessions. We have also worked to build cooperation and collaborative efforts, and secured funding and implemented projects to control, and if possible eradicate, new introductions of invasive aquatic weeds in the watershed.

An introduction of invasive mussels would be extremely harmful to Flathead Lake, its biota, and its many uses, and impossible to eradicate. Mussels would require ongoing management at a significant cost. As headwaters to the Columbia, an infestation here would also spread downstream. Other AIS pose similar threats, although it may be possible to eradicate some invasive aquatic weeds with early detection and treatment.

Preventing new AIS introductions into Flathead Lake and its watershed remains a top priority. Educating boaters, water users, public officials, and the public has been shown to be effective in preventing new introductions in other states (e.g., Minnesota). We plan to expand our AIS program through an outreach campaign targeting specific audiences, by increasing funding for

AIS prevention and control, and by actively participating in AIS prevention and suppression efforts.

Objective 3.1 Plan and conduct AIS prevention, control, rapid response, and stakeholder coordination. We plan to:

- Fund a consultant with AIS expertise to serve as a technical advisor and assist with project development, partner coordination, and project implementation.
- Work with Flathead AIS Work Group partners to plan and implement prevention and control projects, focusing on immediate threats and projects identified in the *Flathead Basin Aquatic Invasive Species Prevention Plan*.

Objective 3.2 Inform and educate stakeholders, including boaters, marinas, boat dealers, and lakeshore landowners, about the threat of AIS and actions they can take to help prevent introductions of new AIS and the spread of AIS present in the watershed/state. We plan to:

- Post and maintain AIS warning signs at boat launch sites in the watershed.
- Recruit volunteers and conduct the Flathead Lake volunteer boat inspection program to inform boaters about the threat and how they can prevent AIS introductions and spread.
- Exhibit the AIS information kiosk display at community events around the watershed.
- Give presentations on AIS threats and solutions to service clubs and community groups. Conduct outreach to marinas and boat dealers to encourage them to share information about AIS with their customers.

Objective 3.3 Advocate for increased and permanent state funding for state boat inspection stations and the state AIS program managed by MT Fish, Wildlife & Parks.

Goal 3 - resources needed:

- Funding (\$5-7,000 per year) to support the Flathead AIS consultant (a consortium including Lake County, the Flathead Basin Commission, and the Flathead Lakers provide funding a for a total amount of \$30,000-40,000 annually).
- Funding to support and expand the Education & Outreach Coordinator position from 3/4 to full time (approximately \$35,000-\$40,000 per year for a full time position). About 15% of the position is allocated to accomplishing Goal 3 projects.
- Successful partnerships through the Flathead AIS Work Group.

Goal 3 - measures of success:

- 1) Flathead Watershed continues to be mussel-free.
- 2) Eurasian watermilfoil eradicated at Beaver Lake (no plants detected for three years) and no new infestations in the watershed.
- 3) Less curlyleaf pondweed observed each year in Flathead Lake and the Flathead River above the lake, with 90% reduction by 2018.
- 4) Sustained partnerships through the Flathead AIS Work Group.

- 5) Increased and permanent state funding secured for the Montana FWP AIS program, including state boat inspection stations; continued operation (by FWP) of boat inspection stations in the watershed (Ronan, West Glacier/Coram) and adjacent areas (Clearwater Junction, Noxon, etc.).
- 6) Successful and growing volunteer boat inspection program in the Flathead Lake watershed, including training at least 5 volunteers per year and conducting volunteer boat inspections.
- 7) Outreach to boaters, marina owners, and boat dealers completed to inform them about the threat of AIS and how they can help, at least 75% agree to share information with clients.
- 8) Updated Flathead Basin AIS Strategic Plan (plan created in 2010).
- 9) “Tiny Critter. Huge Threat.” AIS warning signs posted and maintained at boat ramps in the watershed.

SECTION 5: Measuring Progress and Success (EPA Elements 8 and 9)

Monitoring and Load Reduction Estimates (EPA Element 9)

Progress and success of individual projects and broader programmatic and watershed goals will be measured through evaluation methods appropriate for the project, scale, and timeframe. The Flathead Lake TMDL Phase I establishes a goal of a 15% reduction in phosphorus and nitrogen loads (plus a 10% margin of safety). The Flathead-Stillwater TMDL (Table 5) provides initial estimates for nutrient loads and temperature reductions. These will guide project development and monitoring.

Monitoring is critical to measure changes in the watershed and understand specific sources in a changing landscape. The Flathead Lakers will continue to support and encourage long-term Flathead Lake and tributary monitoring by the University of Montana Flathead Lake Biological Station (FLBS) to determine long-term trends in water quality. Basin-wide and local monitoring will be needed to determine changes in nutrient loads to Flathead Lake from various tributaries and sources and to determine what actions are making a significant difference.

The Flathead Lakers have a long history of supporting the Flathead Basin Water Quality Monitoring Program. FLBS has monitored Flathead Lake and its tributaries regularly since the 1970s. The monitoring program is essential to understanding the condition of Flathead Lake and changes in water quality, and for determining actions needed to protect the lake and clean water. Monitoring information has helped the Flathead Lakers, partners, and others achieve: a ban on the sale of phosphorus-containing detergents, sewage treatment plant upgrades, voluntary actions to reduce nonpoint pollution sources, and policies to protect water quality. Interruptions in monitoring greatly reduce the ability to understand trends and react quickly before small problems become big ones. The Lakers have worked with local legislators to secure and maintain state monitoring funding appropriations, provided information about the value of monitoring to local, state, tribal, and federal representatives and officials, and, at critical times, raised money to support the monitoring program. The Lakers serve on the Flathead Basin Commission's Monitoring Committee. In 2008, the committee updated the Flathead Basin Surface Water Quality Monitoring Plan.

The long-term monitoring program includes collecting water and biological samples in the lake and in its main tributaries, and collecting precipitation samples. A suite of chemical and physical variables are analyzed, including the nutrients phosphorus and nitrogen, net primary productivity (lake sites), organic carbon, chlorophyll-a (lake sites), and turbidity. Analysis of lake zooplankton and phytoplankton samples is also part of the monitoring plan. The sites and variables represent the minimum needed to produce reliable information on nutrient loads to Flathead Lake and long-term trends in water quality.

FLBS presents monitoring information and results in an annual State of the Lake Report to the Flathead Lakers at our annual membership meeting each summer, in a biennial report to the Montana Legislature produced by the Flathead Basin Commission, in the FLBS Report Series,

and in the FLBS newsletter. Water quality research conducted by the FLBS is regularly published in scientific journals.

The Proceedings of the National Academy of Sciences published a FLBS paper, *Long-term effects of a trophic cascade in a large lake ecosystem*, in 2011, that summarizes the research on food web changes in the lake over more than 100 years and their effects on water quality.

The Flathead Lakers routinely seek information and advice, including monitoring results, from FLBS for project development. FLBS staff has provided letters to decision-makers, at our request, describing pertinent research results for relevant policy and project decisions.

On a project-by-project basis, we will consult DEQ’s Load Reduction Estimation Guide (2014) and other guidance from DEQ staff, professionals, and research summaries to develop load reduction estimates.

A summary evaluation of numerous research projects on riparian buffers provides pollution reduction efficacies that can be used to estimate nutrient reductions for our lakeshore and riparian buffer projects. The following load reduction estimates will be used to evaluate efficacy of conservation and restoration of riparian and lakeshore buffers (Table 6).

Table 6. Predicted pollutant removal efficacy (Zhang et al., 2010)

		Predicted removal efficacy, %			
Buffer width =		5 m	10 m	20 m	30 m
Sediment	(a) Slope = 5%; mixed grass and trees	67	76	78	78
	(b) Slope = 5%; grass/trees only	82	91	93	93
	(c) Slope = 10%; mixed grass and trees	77	86	88	88
	(d) Slope = 10%; grass/trees only	92	100†	100	100
	(e) Slope = 15%; mixed grass and trees	58	67	68	68
	(f) Slope = 15%; grass/trees only	73	81	83	83
Nitrogen	(a) Mixed grass and trees/grass only	49	71	91	98
	(b) Trees only	63	85	100	100
Phosphorus	(a) Mixed grass and trees/grass only	51	69	97	100
	(b) Trees only	80	98	100	100
Pesticide		62	83	92	93

† If predicted values exceed 100, the value of 100 was assigned instead.

We will consider using other methods, such as the Livestock Deposition Model, to estimate N and P reductions from pasture and livestock when a project includes fencing to remove livestock from riparian areas. We may modify this model to estimate reductions from lawns and fertilizers when lakeshore buffers are established. For example, if fertilizer inputs prior to the project are known, the model could be modified as follows to calculate N reductions:

$$\text{N reduction} = (\text{annual N from fertilizer application}) \times (\text{contributing fraction of lawn}) \times (\% \text{ of lawn reduced}).$$

Best management practices that encourage and implement are the Flathead Lakers selected based on research that indicates these are effective methods for reducing pollution. Guidance from TMDLs and other studies is used to select pollution sources to address and BMPs to implement.

Our outreach and education strategies have also been selected based on demonstrated effectiveness for encouraging BMPs implementation (Flathead Lakers, 2011).

Additional measurement and evaluation tools will include:

1. *Landowner Survey*: We will track the number of landowners and other stakeholders we reach with our clean water BMPs message. A survey of participants in each education event (e.g., landowner site visits, tours) will be conducted to determine the number and percent of participants who adopt a new BMP. We will record BMPs implemented in a database and map.
2. *Nursery and Landscaper Survey*: A survey of nurseries and landscapers will be conducted to determine the effectiveness of our outreach to encourage them to share BMPs information and education to their clients and the results of their work with clients (e.g. sales of native riparian plants, BMPs adoption, and riparian buffer projects).
3. *Watershed Sourcebook Educator's Guide Assessment*: Teachers and students who participate in the workshops to pilot test the guide's lessons and activities will complete an evaluation to help project partners revise the lessons and activities to make the final guide an effective tool for educators to provide watershed education to their students. With partners, we will also survey the educators who receive the guide to determine how it is being used and obtain their evaluation of its value for student understanding of their watershed and how well it helps prepare them to be critical thinkers and leaders in watershed stewardship. We will also track the number of educators and students who participate in all of our student education projects.
4. *Water Quality Protection Policy and Resource Management Plan Assessment*: We plan to maintain a database of land use and resource management policies, plans, and projects proposed that would have an influence on water quality in the watershed, including any recommendations we make to the decision-makers and the decisions made. We will use this to evaluate our success in ensuring sound decisions for water quality.
5. *Photopoint Monitoring*: Representative photos will show changes over time at lakeshore buffer and river riparian restoration project sites. These photos will be updated at least annually to show changes at the site and evaluate effectiveness of restoration measures implemented.
6. *Conservation Easement Monitoring*: The Flathead Land Trust, FWP, and the Montana Land Reliance will monitor the conservation projects for which they hold respective conservation easements and maintain records of compliance with easement terms and management plans.
7. *Restoration Project Monitoring*: The Flathead River Steward and volunteers will conduct project effectiveness monitoring to track success of activities and to record or model pollutant reductions. They will monitor new restoration project plantings between two and five times each planting season, depending on projects, to record information about plant survival, growth, and condition, and to conduct needed maintenance, such as weeding, watering and replacing plants that do not survive. Projects implemented in

prior years will be monitored at least once per summer for 5 to 10 years. Records of monitoring results and maintenance for each project will be updated annually. We will model estimated nutrient and sediment (where appropriate) reductions resulting from restoration projects using an appropriate tool recommended by DEQ (e.g., Bank Erosion Hazard Index, Livestock Deposition Model). We will also track linear feet of river bank protected and canopy restored by riparian buffers, the number of livestock excluded from the buffer and river bank, and acreage managed with agricultural BMPs.

8. *Critical Lands Conservation Evaluation*: The 2012 *Analysis of Conservation Success* will be updated at least every five years and a map of conservation projects will be updated annually. Measures include total acres of critical lands protected from development by conservation easements or public lands acquisition under conservation management, and a breakdown of specific land attributes protected, e.g. wetlands (acres), riparian areas, floodplain, areas overlying the shallow aquifer, prime agricultural soils, stream miles.
9. *Aquatic Invasive Species Program Evaluation*: The Flathead AIS consultant will prepare an annual report documenting the work he/she has undertaken and completed, and the results to determine success in preventing new introductions of AIS in the watershed, control/eradication of curlyleaf pondweed in Flathead Lake and the Flathead River, and any response needed if a new AIS is discovered. We will also survey marinas and boat dealers to evaluate the success of our outreach to encourage them to share AIS information with their customers, assess success in securing continuing funding support for AIS work from the state legislature, and evaluate our volunteer boat inspection project by tracking number of volunteers, number of boats inspected, and any AIS discovered.

Criteria for determining success (EPA Element 8)

We will use the following criteria (Table 7) to measure the success of specific education, outreach, or stewardship tasks undertaken. This is not an exhaustive list. Annual work plans may include specific measures of success.

Table 7. Priority projects and measures, and criteria for determining success (2015-2020)

Result	Criteria/Measure/Indicator
increased riparian and wetland vegetation	<ul style="list-style-type: none"> • 2-5 acres restored, 1-3 river bank miles restored • 85% survival of plantings • 1-3 miles of riparian fencing installed
riparian buffers protected	<ul style="list-style-type: none"> • 500-1,000 acres conserved, 2-5 river bank miles protected • condition of riparian buffers protected as demonstrated by photo evidence of changes over time • connectivity of riparian buffers protected – percent of river banks with/without riparian vegetation and percent with/without some type of conservation protection (e.g., conservation easement, management plan) • offsite or water gap livestock watering structures installed
lakeshore and river sediment erosion reduced	<ul style="list-style-type: none"> • 2-3 lakeshore demonstration bioengineering erosion control projects successfully established • lake and river demonstration projects used for education/outreach to encourage others to adopt these erosion control methods • 2-3 new projects on lake and river initiated due to outreach
nutrient loading reduced/prevented	<ul style="list-style-type: none"> • estimates for load reductions for BMPs implemented determined on a site by site basis using DEQ recommended methods • percent of vegetated, stable banks along river segments • land use and resource management policies, plans, projects include clean water protection measures
increasing number of landowners implementing clean water BMPs	<ul style="list-style-type: none"> • 10 landowners contacted each year through site visit, 10 through workshops, 50 through River to Lake outreach (field trips, project celebrations, etc.) • 60-70% of landowners contacted have implemented BMPs • 15% of landowners in 2 neighborhoods have implemented BMPs
local nurseries and landscapers sharing BMPs information with clients and selling riparian plants	<ul style="list-style-type: none"> • 5 nurseries and landscapers promoting clean water BMPs and native vegetated riparian buffers
Flathead River Steward Program sustained and collaboration on restoration strengthened	<ul style="list-style-type: none"> • permanent Flathead River Steward position established and funding secured • strong collaborative planning, implementation, monitoring and maintenance of riparian restoration projects • collaborative partnership with NRCS, FWP, FCD and others that effectively plans, implements, and funds projects, conducts outreach, monitors projects, and shares monitoring results • better information about effective local restoration projects and methods (data collected, maintained, and shared with partners and landowners)
watershed-based curriculum developed for middle schools and incorporated in classes	<ul style="list-style-type: none"> • 30-40 teachers trained and using the guide reaching 600-1,000 students per year and evaluations show the guide is a useful tool for watershed education and preparing students to be watershed stewards
expanded participation in <i>Becoming Watershed Citizens</i> education program	<ul style="list-style-type: none"> • 8 schools and approximately 1,500 students participating in the program
no new AIS present in the watershed and reductions or eradication of curlyleaf pondweed in the river and lake achieved	<ul style="list-style-type: none"> • no new introductions of AIS reported; monitoring shows curlyleaf pondweed continues to be reduced or is eradicated in Flathead Lake and Flathead River upstream from the lake

SECTION 6: Project Priorities and Schedule (EPA Elements 6 and 7)

Table 8. Implementation plan and measureable milestones

Impairment	Strategy	Priority Project / Milestones	Location	Timing	Approximate Cost & Potential Funding Sources
nutrients	landowner BMPs education	50 landowner site visits (10 per year)	Flathead Lake lakeshore and/or tributaries with a focus on 2 lakeshore “neighborhoods”	2015-2019	\$200,000 DEQ 319 grant Lakers
		15 Walk & Talk tours (3 per year)		2015-2019	
		landowner workshops		2015-2016	
		10 BMPs fact sheets		2015-2017	
		landscaper/nursery outreach (6-10)		2015-2019	
		publications, media, social media		2015-2019	
		presentations		2015-2019	
nutrients	student education	Watershed Sourcebook educators guide completed	schools in Flathead Lake Watershed + field trips	2015-2016	\$125,000 DEQ 319 grant DNRC HB223 grant Partners Lakers
		<i>Becoming Watershed Stewards</i> program (delivered annually)		2015-2019	
		teacher training			
nutrients, AIS	outreach to agencies –land use policy/ resource mgmt	board liaison & leadership project implemented, policy and resource mgmt. recommendations (as needed)	Flathead Lake Watershed	2015-2019	\$25,000 Lakers
nutrients, sediment	address TMDL Phase II priorities	mapping projects	Flathead R. and new focus area	2016-2017	\$50,000 DNRC Watershed Planning grant
		wastewater mgmt projects	Flathead Lake Watershed	2017-2019	\$50,000 funding tbd
AIS	Flathead Watershed AIS expert	technical advisor for AIS prevention, control, rapid response	Flathead Watershed	2015-2019	\$28,000 (Flathead Lakers contribution only; total approx. \$175,000)
AIS	AIS Education and Outreach	AIS signs - new and replacements	Flathead Watershed boat ramps	2015-2019	\$5,000 DNRC AIS grant Lakers
		volunteer boat inspection project	Flathead Lake		
		information kiosk display	Flathead Watershed		
		marina/boat dealer/ community outreach	Flathead Watershed		

Impairment	Strategy	Priority Project / Milestones	Location	Timing	Approximate Cost & Potential Funding Sources
Nutrients, sediment, temperature	wetland and riparian area conservation, restoration, and stewardship	R2L partner and restoration/conservation project coordination and landowner outreach	Flathead R, Flathead L. north shore, Ashley Cr., and associated wetlands, floodplains, and riparian areas	2015-2019	\$200,000 Lakers, foundation grant, DNRC Watershed Planning grant
		Flathead River Steward transition to permanent program/position		2015-2016	\$40,000 FWP, FCD, NRCS, Lakers, DNRC Capacity grant & DNRC HB223 grant
		2 wetland & creek restoration projects completed		2015-2017	\$500,000 FWP, BPA, NFWF, NAWCA grant
		1-2 Ashley Cr. restoration projects completed		2015-2017	\$10,000 DEQ 319 grant, FWP wildlife programs, USFWS Partners for Fish & Wildlife, NRCS EQIP
		2 Flathead R. restoration projects completed		2015-2017	\$200,000 FWP, BPA, NRCS EQIP, NFWF grants, DEQ 319 grant
		3 future restoration projects tbd planned		2018-2019	\$150,000 NFWF, BPA, FWP, NRCS EQIP, DEQ 319 grant
		2-3 lakeshore erosion control projects completed		Flathead Lake	2016-2019
		critical lands conservation projects	Flathead River, Ashley Creek, other TMDL areas	2016-2019	tbd – site specific NAWCA, BPA, NRCS ALE, NFWF grants
		2-3 demo. lakeshore buffer projects	Rocky Pt, Flathead Lake	2015-2016	\$25,000 DEQ 31 grant, landowners

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APPENDICES

Appendix A: Flathead Lakers Strategic Plan 2015-2018

Appendix B: WRP Contract

Appendix C: Critical Lands and Water Resources Maps

Appendix D: Partners

Appendix A:

FLATHEAD LAKERS

2014 - 2018 Strategic Plan

Adopted October 29, 2013

Flathead Lakers Board of Directors

"The health of our waters is the principal measure of how we live on the land."

Luna Leopold

Executive Summary

The Flathead Lakers is a nonprofit organization working to protect clean water in Flathead Lake and the Flathead Watershed since 1958.

Flathead Lake is the largest freshwater lake west of the Mississippi River. Treasured by many, Flathead Lake is one of the cleanest lakes of its size and type in populated areas of the world. However, water quality is declining due to increasing sediments and nutrients from urban sprawl, old and poorly maintained septic systems, poor agricultural and timber harvest practices, destruction of riparian vegetation, and air pollution. Flathead Lake has been listed as an impaired water body by the Montana Department of Environmental Quality since 1996 due to nutrient and sediment pollution.

This five-year strategic plan establishes organizational direction and program priorities, and identifies steps protect clean water, healthy ecosystems, and lasting quality of life in the Flathead Watershed.

The aim of this plan is to strengthen **organizational capacity** through building membership and fundraising to support expanding and improving our **education, advocacy, and stewardship programs**. Priorities include:

- participating in the Flathead Lake Total Maximum Daily Load (TMDL) water quality improvement planning process and using its results to protect and restore water quality,
- expanding the successful, collaborative Critical Lands Project,
- encouraging waterfront landowners to adopt clean water best management practices (BMPs)
- implementing clean water protection and improvement projects,
- advocating effective clean water protection and improvement policies,
- preventing introductions of aquatic invasive species
- ensuring wastewater treatment is effective in protecting water quality.

Communication, coordination and collaboration with diverse audiences and with partners are essential for achieving the Flathead Lakers' goals. Enhancing outreach to members, partners, and other audiences is proposed through expanding use of the Flathead Lakers' website and new communication opportunities.

This plan will be reviewed annually and modified by the board of directors as needs and priorities change. The plan will be used to generate annual work plans with actions that will help achieve the Flathead Lakers' goals and objectives. It will be used in communicating with members, partnering agencies and organizations, prospective members and funders, watershed stakeholders, and others interested in the future of Flathead Lake and protecting clean water in its watershed.

Introduction

Flathead Lakers

The Flathead Lakers is a nonprofit organization working to protect clean water in Flathead Lake and its watershed for over 50 years. Our organization is governed by a volunteer board of directors and administered by a staff of four (2.85 full-time equivalent). Today, the Flathead Lakers is supported by 1,500 members and diverse organizational and agency partnerships. The Flathead Lakers provides leadership and a strong voice for protecting and improving water quality through advocacy, education and stewardship programs.

The Flathead Lakers encourage land and water stewardship, broaden the constituency for responsible and thoughtful land use planning and resource management, and build partnerships to address conservation priorities so that our communities can absorb growth and provide economic opportunities while maintaining our watershed's special natural heritage and quality of life for future generations.

Flathead Lake

Flathead Lake is the largest freshwater lake west of the Mississippi River. A local, state, and national treasure, Flathead Lake is one of the cleanest lakes of its size and type anywhere in populated areas of the world. However, water quality is threatened by increasing sediments and nutrients from urban sprawl, old and poorly maintained septic systems, poor agricultural and timber harvest practices, destruction of riparian vegetation, and air pollution. Flathead Lake has been listed as an impaired water body by the Montana Department of Environmental Quality since 1996 due to nutrient and sediment pollution, PCBs, and mercury contamination. Flathead waters also face threats from possible introductions of harmful aquatic invasive species and changing weather patterns.

Water quality in Flathead Lake is a barometer of the ecological health of the Flathead Watershed, which comprises six million acres of scenic landscapes, a population of 121,000 residents (2012 estimate), and abundant fish and wildlife. As sediments and nutrients in its tributaries increase, algae growth in the lake increases, thereby degrading water quality. The quality of Flathead Lake reflects how well we are living in balance with our environment. Clean water and healthy ecosystems profoundly influence quality of life and economic vitality in the Flathead Watershed.

Plan Development

This strategic plan is a guide for the Flathead Lakers for the next five years. Over the 15 years since developing the Lakers' first strategic plan, changes have occurred that affect the watershed and its communities. These changes include increased rural residential development and sprawl, the explosion of information and communication technology, increased political partisanship, climate change, a trend toward "footloose" business and industry, and a growing population. The Flathead Lakers must be prepared to address changes and meet future needs that affect our mission, and work in a responsive, organized, and cost-effective manner. This plan was developed to help prepare the Lakers do so.

The Lakers' board and staff gathered information in preparation for a facilitated strategic planning retreat held on January 29-30, 2013. Interviews with board members were compiled and summarized to better understand the vision, values, critical issues and strategies deemed most important by the organization's leaders. Board and staff members explored a variety of topics relevant to the Lakers' mission, including public attitudes toward conservation, the economic value of clean water, the Flathead Lake Total Maximum Daily Load (TMDL)* process, sewage treatment, climate change, storm water runoff, agricultural and forestry nonpoint source pollution, shallow aquifer protection, water quality monitoring, and aquatic invasive species. Board members interviewed key stakeholders to gain insights from a variety of perspectives on perceived future problems related to our mission. This information provided a shared understanding of the current state of the Flathead Lakers and threats to Flathead Lake and clean water.

The strategic planning retreat incorporated personal reflections on the Lakers' history, a staff overview of accomplishments and challenges, formulation of a new organizational vision and mission, an evaluation of strengths, weaknesses, opportunities and threats, and goal setting.

This plan will provide an opportunity to build on past success and measure progress. It will help guide development of a Flathead Lakers Watershed Restoration Plan for our *Ripples of Change for Flathead's Critical Lands and Lakeshores* project. In addition, the plan provides a summary of the contributions the Flathead Lakers will make toward sustaining Flathead Lake, clean water, and watershed health for the benefit of present and future generations.

Implementation of the Plan

The plan will help the Flathead Lakers' leadership determine annual program priorities and create annual work plans and budgets. It reaffirms the board and staff's commitment to our members, our work, and our mission. The plan will be reviewed annually and modified as needs and priorities change.

Status of the Flathead Lakers

Recent Accomplishments and Identified Needs

Since the Flathead Lakers' first strategic plan was created in 1998, we have significantly increased our membership, financial resources, programs, and staff. Accomplishments include the following:

*

TMDL refers to a Clean Water Act requirement to analyze and develop a plan to assure that an impaired water body attains and maintains water quality standards. A specific Total Maximum Daily Load refers to the maximum amount of a pollutant that a water body can receive and still attain or maintain water quality standards for its designated beneficial uses. Montana Department of Environmental Quality and U.S. Environmental Protection Agency completed the *Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake* report in 2001. The plan sets water quality targets, including a 15% reduction in nitrogen and phosphorus loads. Phase II of the plan is expected to be completed in 2014. It will include an allocation of pollutant load reductions needed from various pollution sources to meet the water quality targets.

- With our leadership and coordination, the *Critical Lands Project* and *River to Lake Initiative* partnerships are thriving and have successfully conserved over 5,000 acres of critical lands and restored over three miles of stream and river banks.
- We have successfully advocated for clean water protection in land use and other policies and proposals.
- The Lakers helped achieve landmark success protecting North Fork Flathead headwaters from coal mining and energy development proposals in British Columbia.
- With partners, new state funding was secured for aquatic invasive species (AIS) prevention, education, and control, the Flathead Basin AIS Work Group was established, and a consultant was hired to serve as the Flathead AIS Coordinator.
- We expanded our *Becoming Watershed Citizens* program for students, and conducted research about successful education programs and best education and behavior change strategies to guide education program development and expansion.
- We initiated a new education program to help landowners become better land and water stewards.
- Fund development training for the board and staff in 2011 resulted in new projects and new revenue to help sustain the organization and achieve its goals.

Identified challenges and needs include:

- Improving our outreach to broaden our constituency and create a norm for adopting clean water best management practices.
- Sustaining and building partnerships and collaborating with agencies, community groups, and other stakeholders.
- Learning from other lake/watershed protection organizations in order to apply their best practices to the Lakers' operations and programs.
- Building our funding base to strengthen organizational capacity to expand successful stewardship programs and respond to threats to Flathead Lake and clean water in its watershed.

Opportunities

New information provided by phase II of the Flathead Lake TMDL and a new Flathead Lake food web model, which are both in development, will help us identify opportunities to expand existing programs and to target new projects for protecting Flathead Lake and improving water quality in the watershed, as well as help determine appropriate water quality standards for Flathead Lake.

New information about effective communication practices and technologies should be explored to help us communicate with members, partners, and stakeholders in order to build a clean water stewardship ethic. Securing funding resources to expand our education program, build our volunteer program, and

sustain critical lands conservation and restoration work will be a priority.

The Flathead Lakers will benefit from greater involvement of members who are seasonal residents or visitors to the Flathead Watershed, local businesses, anglers, and boaters. Reaching out to residents of the upper Flathead Watershed can help us protect Flathead headwaters. The Flathead Lakers can more actively seek to engage these audiences by identifying common interests and developing positive working relationships on issues of shared concern.

Stakeholders we interviewed expressed most concern regarding the threat of aquatic invasive species, the potential effects of climate change in the watershed, and the need for effective land use planning related to expected population growth and a new development boom. To address these problems, those interviewed felt the Flathead Lakers should: 1) continue to educate and inform the public, 2) coordinate and build relationships among all those who use and manage our waters and related resources, and 3) determine effective solutions to problems and advocate for these with state and congressional decision-makers. It is essential to make scientific information available to the public and to partner with the University of Montana Flathead Biological Station and others who can provide that information.

Vision, Values, and Mission

The Flathead Lakers' Vision

Our vision is:

That people will understand, value, and protect the Flathead Watershed's exceptionally clean water and the natural heritage it sustains for the benefit and enjoyment of all.

In our vision –

- Citizens and governments are informed about Flathead Lake and its river system, and the natural services they provide families and communities.
- Protecting water quality is a priority in decisions made and actions taken by individuals, communities, and governments.
- Individuals and communities take tangible steps to improve and protect water quality to sustain clean drinking water, healthy lakes and streams, forests, farms, fish and wildlife habitat, and fishable, swimmable waters that support diverse life.

Our Values and Guiding Principles

The Flathead Lakers:

- 1) Appreciate the complexity, beauty, and vulnerability of Flathead waters, their interconnections, and the life they sustain, all of which make the Flathead Watershed a special place.

- 2) Believe the Flathead Lake and river system has both inherent and economic value that is integral to economic vitality and quality of life in the Flathead Watershed
- 3) Value the right of all citizens to enjoy a clean and healthful environment and believe that clean water is essential for the well-being of families and communities in the Flathead Watershed.
- 4) Value the roles of citizens and elected officials in serving as stewards and guardians of our waters so that clean water may be improved and sustained.
- 5) Strive to develop effective programs and solutions to problems that are based on the best available scientific information.
- 6) Respect various points of view and values, and practice and encourage civil dialogue.
- 7) Serve as leaders in engaging watershed stakeholders by building partnerships and relationships, and by providing opportunities for learning, dialogue, and stewardship action.
- 8) Earn public trust and respect through thoughtful, credible decisions and actions.
- 9) Frugally manage financial contributions from our members, donors, and grantors to maximize positive results for Flathead Lake and clean water in its watershed.

Mission

Protecting clean water, healthy ecosystems, and lasting quality of life in the Flathead Watershed.

Strategic Directions and Goals

Strategic Directions

Organizational actions should fall within the following general strategic directions:

- **Serve as the voice for Flathead Lake** by advocating for protecting clean water.
- **Provide information and help educate** citizens, landowners, educators, students, boaters, public officials, and resource managers to help them make informed choices that protect water quality.
- **Build partnerships** with organizations, agencies, businesses, landowners, and citizens to protect and conserve critical lands and waters in the Flathead Watershed.
- **Build community** based on shared values and love for the lake and its surrounding watershed to promote a stewardship ethic.

- **Build a sustainable and effective organization** capable of carrying out our mission.

Goals

Goals are presented in three sections: Stewardship; Education, Outreach & Advocacy; and Organizational Development. Annual objectives and action strategies that include the work of staff, directors, and volunteers will be organized under these sections in annual plans. The goals in each section are listed in priority order. Specific goals, objectives, and actions were discussed by the board and staff during development of this plan. They are included in an appendix to help guide development of annual plans during the next five years.

Stewardship

1) Conserve and restore critical lands and waters that sustain Flathead Lake and its watershed.

Flathead Lakers convened agency resource managers, scientists, and land trust representatives in 1999 to explore needs and opportunities to protect lands that provide valuable natural services, including clean water, from negative impacts of rapid growth and development. A strong partnership grew to identify, protect, and restore lands critical for sustaining clean water, healthy habitat, prime farmlands, recreation opportunities, and scenic vistas.

With coordination provided by the Flathead Lakers, Critical Lands Project and River to Lake Initiative partners have since conserved over 5,000 acres of critical lands along the Flathead River and the lake's north shore and restored over three miles of Flathead River riparian areas.

Protecting and restoring these critical lands continues to be a very effective way to sustain and improve water quality in Flathead Lake and remains a top priority for the future. We plan to use the new information that will be provided by the Flathead Lake TMDL Phase II and collaborate with partners to expand our critical lands conservation and restoration program.

The Flathead Lakers have participated in the development of the Flathead Lake TMDL since the project's inception. Montana Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) completed phase I in 2001. It determined nutrient loading and other water quality targets required to achieve and maintain Flathead Lake water quality.

Phase II was proposed to develop a model to help allocate pollution load reductions needed from various sources. DEQ and EPA expect phase II to be completed by the end of 2014. The Flathead Lakers will continue to participate on the Flathead TMDL Watershed Advisory Group. When Phase II is completed, we plan to work with agencies and organizations to use the TMDL information to identify and prioritize opportunities to reduce pollution and to implement stewardship and education projects that help achieve the TMDL water quality targets. We plan to identify opportunities to improve sewage treatment (e.g., septic systems, boat holding tank pump-outs, and municipal, commercial, and industrial systems) and reduce river and lakeshore erosion to address problems and concerns.

2) Strengthen aquatic invasive species prevention and control efforts to protect Flathead waters from harmful aquatic invaders.

In 2006, the Flathead Lakers convened a meeting with Flathead Lake Biological Station staff and the Montana Fish, Wildlife & Parks AIS Coordinator to discuss growing concerns about the threat of an introduction of invasive zebra mussels into Flathead waters. Proceeding from that meeting, the Lakers developed our first AIS plan in 2007, which included conducting education and outreach, notably, posting warning signs about the threat and how to prevent accidental introductions at all public boat ramps on Flathead Lake, many of the private ramps, and boat ramps throughout the watershed.

We subsequently worked with partners to establish the Flathead Basin AIS Work Group, which developed the first *Flathead Basin Aquatic Invasive Species Prevention Plan* in 2010. We helped identify needs for new state policies and regulations, and successfully advocated for AIS legislation and additional funding in the 2009, 2011, and 2013 state legislative sessions. We have also worked to

build cooperation and collaborative efforts, and secured funding and implemented projects to control, and if possible eradicate, new introductions of invasive aquatic weeds in the watershed.

An introduction of exotic mussels would be extremely harmful to Flathead Lake and its many uses, and impossible to eradicate. Mussels would require ongoing management at a significant cost. As headwaters to the Columbia, an infestation here would also spread downstream. Other AIS pose similar threats, although it may be possible to eradicate some invasive aquatic weeds with early detection and treatment.

Preventing new AIS introductions into Flathead Lake and its watershed remains a top priority. Educating boaters, water users, public officials, and the public has been shown to be effective in preventing new introductions in other states (e.g., Minnesota). We plan to expand our AIS program through an outreach campaign targeting specific audiences, by increasing funding for AIS prevention and control, and by actively participating in AIS prevention and suppression efforts.

3) Sustain and restore the Flathead Basin Water Quality Monitoring Program to assure a continuous record of the condition of Flathead Lake, its tributaries, and pollution sources, which is essential for identifying and addressing pollution problems.

The Flathead Lakers have a long history of supporting the Flathead Basin Water Quality Monitoring Program. Monitoring of the lake and its tributaries is conducted by the University of Montana Flathead Lake Biological Station. The monitoring data is critical for understanding long-term trends and to make good management decisions. Monitoring is necessary for adaptive management. Interruptions in monitoring greatly reduce the ability to understand trends and react quickly before small problems become big ones. The Lakers worked with local legislators to secure and maintain state monitoring funding appropriations, provided information about the value of monitoring to local, state, tribal, and federal representatives and officials, and, at critical times, raised money to support the monitoring program.

The Lakers serve on the Flathead Basin Commission's Monitoring Committee. In 2006, we began working with the Flathead Basin Commission and the Flathead Lake Biological Station to update the Flathead Basin Surface Water Quality Monitoring Plan, which was completed in September 2008.

Over the past 15 years, the original government agency and corporate funding partners have discontinued their support, leaving the state legislative appropriation to the University of Montana the primary funding source for monitoring. The Lakers will continue to work to redress the monitoring funding deficit that has led to cutbacks in monitoring sites and analyses. In addition, we will support new monitoring of pollution sources identified in the Flathead Lake TMDL Phase II, which is essential for eliminating, reducing, or mitigating pollution.

4) Protect Flathead headwaters that deliver clean water to the Flathead River and Flathead Lake and help sustain the Flathead's natural heritage.

The clean waters in its forested mountain headwaters play a significant role in maintaining clean water in Flathead Lake. For over four decades, the Flathead Lakers defended Flathead waters from proposals for coal mining, gold mining, and other energy development in the North Fork headwaters because the proposals posed a high risk of degrading water quality and aquatic health from the headwaters all the way to Flathead Lake. A landmark victory for protecting the North Fork headwaters was achieved in 2010 with the signing by the Premier of British Columbia and the Governor of Montana of an agreement banning mining.

The Lakers continue to support implementation of the agreement, particularly passage of the North Fork Watershed Protection Act by the U.S. Congress, which would withdraw the North Fork watershed on the U.S. side of the international boundary from leasing for oil, gas, and mineral development. The Flathead Lakers will remain vigilant in identifying and responding to new threats to water quality in Flathead headwaters.

5) Learn more about the impacts of climate change on Flathead waters and partner with others to prevent or mitigate negative impacts on Flathead Lake and its tributaries.

Research shows that the timing of precipitation in the Flathead Watershed is changing, that glaciers in Glacier National Park are melting, and that aquatic life is being threatened or may be threatened in the future. Climate change was a top issue that stakeholders we interviewed during our strategic planning process identified as a concern that the Flathead Lakers should address. The Flathead Lakers board and staff will continue to seek opportunities to learn more about the impacts of climate change on Flathead waters in order to identify and implement feasible mitigation strategies through our stewardship program and projects. We will work with partners and learn from the Northern Rockies Climate Change Forum and other groups and experts to identify opportunities to identify strategies we can take in our work to address the impacts of climate change in the watershed.

Education, Outreach & Advocacy

1) Provide education programs to encourage and support adoption of clean water best management practices.

Nutrient pollution in Flathead Lake results from numerous nonpoint sources throughout the watershed. In 2010-2012, the Flathead Lakers compiled and evaluated nonpoint source pollution education projects and reviewed the research literature on effective education and marketing strategies. We used this information to develop our Clean Water BMPs Tool Kit. We identified a priority to work with landowners, contractors, and businesses that influence landowner decisions about land use practices to inform them about clean water best management practices. Both the research and our recent experience indicate that as landowners adopt clean water BMPs, neighboring landowners become open to learning more about them. When 15% of landowners in a "neighborhood" adopt a practice, it is likely to become the new norm. We plan to build and improve our Clean Water BMPs Tool Kit and expand our outreach through a neighborhood approach and through building partnerships with construction and landscape professionals to achieve a ripple effect leading to clean water BMPs becoming the norm for waterfront landowners.

2) Provide water education for students and teachers to ensure young people have the opportunity to learn about water science and the Flathead Watershed to help them gain an appreciation of the value of our waters and of protecting them.

Educating today's youth about water and its uses, Flathead water resources and their value, threats to clean water, watershed connections, and water and watershed stewardship will help protect Flathead waters in the future. The Flathead Lakers initiated our Becoming Watershed Citizens program in 1998 in the Polson school district. An elementary school program includes a curriculum with various lessons and activities and a field trip to the Flathead Lake Biological Station at Yellow Bay. In the past few years we have expanded the program to three additional schools. A middle school program includes a water quality monitoring project. The Lakers have organized and participated in a variety of additional student water education field trips, camps, and projects. In 2011, we conducted a survey of teachers to

learn more about water and watershed education programs being used, needs, and interest in additional water education opportunities. In addition to sustaining our current program and expanding it to include additional schools and teachers in the watershed, we will use this information and work with partners to develop new programs and materials and to provide teachers with training to help educate future Flathead citizens.

3) Improve our outreach to expand the constituency for clean water protection and restoration.

The Flathead Lakers will build on our past successes and on our current education and outreach program to improve outreach to members, waterfront landowners, boaters and others who enjoy Flathead waters, resource managers, public officials, and citizens. Our objective is to inform them about threats to Flathead Lake and its tributaries and about opportunities to protect and improve water quality.

We will build our volunteer program and take advantage of effective technology and communication tools to nurture and build awareness, understanding, and behaviors that protect and improve water quality. Successes will strengthen our organization by attracting new members, support, and leaders, thereby expanding the Flathead Lakers' capacity to create a norm of clean water stewardship.

4) Strengthen our outreach to public officials and build relationships with Confederated Salish and Kootenai Tribes, federal, state, and local agencies and officials to influence government programs, policies, and decisions to protect and improve Flathead Lake and water quality in the Flathead Watershed.

Effective public policies and programs are essential for sustaining and improving water quality in the Flathead Watershed over the long term. Building a strong constituency of members and advocates for clean water stewardship is key to influencing public policy and ensuring effective government programs. The Flathead Lakers have had many successes in improving policies, programs, and projects that affect water quality, but much work remains. As the Flathead Lakers build the constituency for clean water stewardship through education based on sound scientific information, we will also explore opportunities to recruit and support leaders who can strengthen our outreach and build relationships with public officials.

***Organizational Capacity:
Membership, Fundraising, Board and Staff***

1) Institute ongoing, diversified fundraising initiatives to expand and sustain organizational capacity to achieve long-term goals and objectives.

The Flathead Lakers engaged a consultant in 2011 to work with the board and staff to identify options to improve financial sustainability. From this work we developed and implemented a fundraising plan with three major new initiatives and several changes to our funding program. We established a major donor program, a dedicated reserves fund, and an endowment to improve financial sustainability for the future. Our new Lakers Legacy Circle encourages our members to contribute to the long-term health of the organization and its mission. These changes have yielded positive results. The board and staff recognize that to successfully implement the strategic directions and program goals outlined in

this plan, we will need to further build capacity and increase our annual budget. We will continue to build our new fundraising projects and explore new opportunities

2) Maintain and build an active membership to increase financial support for the Flathead Lakers and expand the constituency for clean water protection and improvement.

Members are the heart of our organization. Members provide both financial support and moral authority. To maintain and build an active membership, we will 1) demonstrate the significance and value of our programs through our education and outreach work, 2) develop annual membership recruitment goals and implement strategies to achieve the goals, and 3) build a volunteer program to further engage members in our programs while expanding organizational capacity and skills.

3) Expand board member recruitment and enhance opportunities for board member education and participation in stewardship and education and outreach programs.

The Flathead Lakers will improve our board member recruitment process, including expanding our recruiting scope. We will seek lessons from other effective organizations and associations to strengthen board orientation and opportunities for learning and engaging in program work.

4) Retain and hire qualified staff and invest in developing their professional capabilities to enhance organizational capacity to achieve our goals.

The Flathead Lakers recognize the value of talented and dedicated staff. We recognize the benefits of staff retention, expansion, and education for achieving our goals. The board commits to support and improve staff success, productivity, and satisfaction by providing professional development opportunities to enhance technical expertise and skills, by ensuring a safe and positive work environment, by providing compensation commensurate with responsibilities, and by striving to ensure feasible staff workloads in annual plans. We will expand at least one staff position to build capacity needed to achieve the goals of this plan.

Annual Work Plans

Prioritized work plans will be developed annually based on this strategic plan. The annual plans will document tasks required to fulfill the long-term goals and objectives, delineate who will be responsible for carrying out each task, and identify a timeline for completion. Expenses for completing the tasks in the annual plan will be included in an annual budget and fundraising plan.

Watershed Restoration Plan

This strategic plan will be used as the basis for developing a Flathead Lakers Watershed Restoration Plan (WRP). The WRP will address how the Flathead Lakers intend to work toward protecting and restoring Flathead Lake, with a focus on reducing nonpoint source pollution. The target area for the WRP includes the lands containing wetlands, riparian areas, and lakeshores that are adjacent to Flathead Lake and along the Flathead River between Columbia Falls and Flathead Lake. The WRP

will address the EPA's nine elements of a WRP. The WRP will complement this Strategic Plan and will guide our actions to prevent and reduce water pollution.

2014 - 2018 Flathead Lakers Strategic Plan Appendix

Identified Objectives and Tasks Proposed to Achieve Strategic Plan Goals

The Flathead Lakers board and staff members identified the following objectives and tasks for achieving the strategic plan goals during the planning process. These objectives and tasks can be considered for annual work plans. Goals (in bold) are listed in priority order. Objectives (numbered) and tasks (bullets) are *not* listed in priority order.

Stewardship

- 1) Conserve and restore critical lands and waters that sustain Flathead Lake and its watershed.**
 - 1) Use TMDL information, natural resources information, partner criteria and priorities, and other information to identify target areas for critical lands conservation, restoration, and stewardship, and develop and implement conservation, restoration, stewardship, and education projects.
 - Continue to work with River to Lake Initiative partners and interested landowners to protect and restore critical lands (wetlands, riparian areas, floodplains, shallow groundwater) along the Flathead River mainstem and Flathead Lake's north shore.
 - Identify opportunities and approaches for critical lands conservation and restoration in a priority subwatershed (Whitefish, Stillwater, etc.).
 - Develop resource values maps and information to help identify target areas.
 - Engage partners in identifying interested landowners and potential projects.
 - 2) Continue to participate in the Flathead Lake TMDL and water quality standard setting processes and use the information they produce to develop an action plan to improve water quality.
 - 3) Advocate strong water quality protection in land use and resource management policies and in projects with the potential to have a significant impact on water quality.
 - Review and comment on TMDL proposals and products.
 - Identify, plan, and implement actions to prevent and reduce pollution to sustain and improve water quality, e.g. protection of the shallow alluvial aquifer, improving sewage treatment
 - Identify opportunities and develop and implement projects and actions to ensure effective sewage treatment.
 - Develop relationships and political will to build support for a Water Quality District.
 - 4) Increase funding for River to Lake Initiative critical lands conservation and restoration projects.
 - Explore opportunities for a cooperative local fundraising campaign and establishment of a joint fund that can be used to support purchasing conservation easements.

- 5) Continue to explore partnerships with larger conservation initiatives in the Crown of the Continent Ecosystem to advance critical lands and waters protection.

2) Strengthen aquatic invasive species prevention and control efforts to protect Flathead waters from harmful aquatic invaders.

- 1) Continue to support a Flathead AIS Coordinator to provide expertise on AIS threats and solutions, and to coordinate and help implement AIS prevention, response, and education projects in the Flathead Watershed.
 - Contribute \$5,000 per year, or other amount as decided by the board of directors, to help fund the partnership contract with the AIS consultant serving as AIS Coordinator.
 - In coordination with Lake County and the Flathead Basin Commission, plan projects and provide oversight for the AIS Coordinator.
 - Seek contributions from other agencies and organizations to help support the AIS Coordinator.
- 2) Continue and expand AIS education and outreach efforts to inform boaters, public officials, and the public about AIS threats and AIS prevention and control solutions.
 - Expand and conduct Flathead Lake volunteer boat inspection project in coordination with FWP.
 - Initiate outreach to marina owners and boat dealers to inform them about this threat and how they can help prevent AIS introductions.
 - Include information and a call to action for AIS prevention in presentations to community groups.
 - Exhibit the AIS kiosk display at community events.
- 3) Support increased funding for AIS prevention, control and education.
 - Support state funding for AIS prevention and education.
 - Support federal funding for Columbia Basin, regional, and state AIS programs.
- 4) Partner with agencies and other organizations to control, and when possible, eradicate aquatic weed infestations.

3) Sustain and restore the Flathead Basin Water Quality Monitoring Program to assure a continuous record of the condition of Flathead Lake, its tributaries, and pollution sources, which is essential for identifying and addressing pollution problems.

- 1) Build partnerships to reinstate the discontinued monitoring stations on the Stillwater River, Ashley Creek, and Stoner Creek to restore the long-term trend monitoring program for Flathead Lake water quality.

- Renew dialogue with local, state, tribal, and federal agencies and public officials about the importance of continuous monitoring and the need for reliable funding.
- 2) Support continued operation of the Flathead Lake monitoring profilers and weather stations to provide data to develop a comprehensive food web model that can help guide lake management.
 - 3) Work with agencies to expand water quality monitoring needed to identify and mitigate site-specific pollution sources and evaluate effectiveness of mitigation measures.
 - Identify pollution sources using TMDL and other information, and explore opportunities to stop or mitigate pollution.
 - Initiate dialogue with agencies and partners to identify site-specific monitoring needs and funding sources.
 - Support establishing a baseline of water quality parameters and targets against which to measure site-specific water quality restoration program effectiveness.
 - 4) Develop a comprehensive State of the Watershed Report to track significant indicators of water quality and watershed health and to share technical information in understandable language with the public and public officials.
- 4) Protect Flathead headwaters that deliver clean water to the Flathead River and Flathead Lake and that help sustain the Flathead's natural heritage.**
- 1) Support the federal North Fork Watershed Protection Act.
 - 2) Partner with agencies, organizations, and landowners to identify opportunities to cooperate on mutual objectives and projects that protect headwaters water quality.
 - 3) Support headwaters water quality monitoring.
- 5) Learn more about the impacts of climate change on Flathead waters and partner with others to prevent or mitigate negative impacts on Flathead Lake and its tributaries.**

Education, Outreach & Advocacy

- 1) Provide education programs to encourage and support adoption of clean water best management practices.**
- 1) Expand and continue to share our BMPs Tool Kit with landowners, land use planners, lakeshore construction professionals, and landscapers to encourage practices that reduce polluted runoff.
 - Develop new fact sheets and more in-depth information.

- Continue to offer Walk & Talk Tours.
 - Develop postcards about tours to market to landowners and distribute information via newsletters, planning offices, nurseries, personal contacts, etc.
 - Continue to offer site visits for lakeshore and stream and river bank landowners to share information about and recommend site-specific clean water best management practices.
 - Create a fact sheet explaining the purpose of and process for site visits.
 - Use the “We Care” interactive map on our website to build individual commitment to protecting clean water.
 - Evaluate effectiveness of BMPs education efforts via surveys, interviews, and other methods deemed appropriate and effective.
- 2) Encourage lakeshore landowners to maintain and restore vegetated buffers to prevent and reduce polluted runoff.
- Assist landowners with lakeshore restoration projects.
 - Visit previous restoration projects to monitor and evaluate them and catalog them via We Care Map.
 - Develop incentives for landowners to implement lakeshore restoration projects and other BMPs.
 - Record landowner success stories and use We Care Map.
- 3) Support and encourage clean water BMPs training for construction professionals.

2) Provide water education for students and teachers to ensure young people have the opportunity to learn about water science and the Flathead Watershed to help them gain an appreciation of the value of our waters and of protecting them.

- 1) Support the *Becoming Watershed Citizens* program in schools currently using it and, as funding allows, consider expanding to additional Flathead Lake and watershed communities/school districts.
- 2) Explore opportunities to provide easy access to existing effective water quality education materials and information for K-12 teachers and nonformal educators, including: a) identify how specific programs we recommend relate to Montana Content Standards and Common Core Standards, and b) help teachers make better use of traveling trunks (e.g. by providing training and better advertising).
- 3) Participate in the Flathead Community of Resource Educators (CORE) Watershed Education Committee to develop a curriculum and teacher guide to accompany the Flathead Watershed Sourcebook and deliver it to teachers and students in the watershed.

3) Improve our outreach to expand the constituency for clean water protection and restoration.

- 1) Develop messaging and marketing strategies to increase support for clean water improvement and protection programs and practices, to increase support for the Flathead Lakers organization, and to create accurate public perceptions of the Flathead Lakers.
 - Build a library of personal stories and photographs to use in outreach.
- 2) Identify and implement effective communication technology, including our website and appropriate social media, to communicate with members, prospective members, seasonal residents, boaters, anglers, and interested citizens.
 - Evaluate opportunities to best use our website and other social media to communicate with members, prospective members, seasonal residents, boaters, anglers, other water users, and interested citizens.
 - Seek opportunities to acquire email addresses from more members.
 - Periodically communicate news, announcements, and opportunities to take action through broadcast email.
 - Maintain and evaluate Facebook page.
- 3) Develop and implement a plan for increased and more effective use of news media.
 - Develop positive messages and use radio ads and public service announcements to better reach tourists, recreationists, and seasonal residents, among others.
 - Explore opportunities to share information through weekly newspapers (Lake Co. Leader, Valley Journal, Bigfork Eagle, West Shore News, Flathead Beacon).
- 4) Build partnerships and collaborate with other watershed efforts working to build a norm of clean water protection, e.g. Montana Watershed Coordination Council and Montana Watercourse.
- 5) Develop a plan for identifying and addressing important emerging issues related to our mission before people's opinions are set, e.g. provide opportunities for interested people to discuss their ideas on emerging issues.
- 6) Develop and initiate a plan for measuring effectiveness of education and outreach initiatives and social marketing, e.g. surveys, interviews, etc.
- 7) Use targeted neighborhood outreach to create clean water stewardship norms and build awareness of the Flathead Lakers.
- 8) Improve volunteer tracking, orientation, incentives, website calendar, recognition, and appreciation.
- 9) Identify and publicize ongoing volunteer projects and opportunities, and improve outreach to potential volunteers.
- 10) Seek opportunities to involve members in stewardship and advocacy projects.

- Consider partnering with other organizations to develop a citizen science program.
 - Explore opportunities to connect water quality protection with the geotourism approach (e.g., Dragon Boat Festival could be an opportunity).
- 4) **Strengthen our outreach to public officials and build relationships with Confederated Salish and Kootenai Tribes, federal, state, and local agencies and officials to influence government programs, policies, and decisions to protect and improve Flathead Lake and water quality in the Flathead Watershed.**
- 1) Education and Outreach Leadership Team will explore opportunities and recommend a plan to the Board of Directors.

Organizational Capacity

1) **Institute ongoing, diversified fundraising initiatives to expand and sustain organizational capacity to achieve long-term goals and objectives.**

1) Research and apply for grants; build relationships with relevant foundations.

- Secure funding for building organizational capacity and for outreach and marketing (computer and communications technology).
- Seek grant opportunities to sustain Critical Lands Project, education and outreach projects, and AIS work.

2) Develop and sustain an active legacy program with the goal of 25 participants by 2018

- Seek leaders to be the "charter" members of the Lakers Legacy Circle and to share their example to encourage others to participate.
- Publicize the Lakers Legacy Circle and giving options.

3) Encourage contributions to the Flathead Lakers Endowment Fund.

- Membership & Finance Leadership Team will explore opportunities and recommend options to the Board of Directors.

2) **Maintain and build an active membership to increase financial support for the Flathead Lakers and expand the constituency for clean water protection and improvement.**

1) Double major donors from 18 to 36 by 2018.

2) Recruit and engage members from Butte, Kalispell, Missoula and Great Falls.

3) Identify opportunities to reach new residents and seasonal residents and invite them to join.

- 4) Develop and implement a membership recruitment plan and target annually. This may include a business membership recruitment effort and neighborhood parties.
 - 5) Build personal connections with members and prospective members through our education and stewardship programs to recruit new members and further engage them in the organization (as volunteers, in leadership roles, etc.).
- 3) Expand board member recruitment and enhance opportunities for board member education and participation in stewardship and education and outreach programs.**
- 1) Maintain and expand the board of directors' geographic representation and skills diversity. Achieve greater demographic diversity.
 - Recruit additional board member representation from Kalispell to strengthen the Lakers connection to the business community and Flathead County political leadership.
 - Consider recruiting new board member candidates from members residing in Butte, Missoula, Great Falls and other Montana communities.
 - Identify candidates and recruit at least one woman and one tribal member by 2015.
 - 2) Each board member will serve on at least one permanent board Leadership Team to help guide implementation of the strategic plan and annual plans.
 - 3) Identify and provide opportunities for board members to meet and learn from board members of partner organizations.
- 4) Retain and hire qualified staff and invest in developing their professional capabilities in order to enhance organizational capacity to achieve our goals.**
- 1) Expand Education & Outreach Coordinator staff position to full-time (1 FTE).
 - 2) Expand staff capacity by investing in technology or outsourcing.
 - Purchase new donor management system to streamline membership record keeping.
 - Investigate opportunities to outsource newsletter mailings.
 - 3) Identify and take advantage of opportunities for staff training, including training on water-related scientific research.
 - 4) Anticipate and prepare for staff and board transitions.
 - Identify needs and resources to help guide transitions and identify short-term and long-term actions, such as cross-training and information sharing among staff.
 - 5) Advance overall organizational capacity by learning from other lake protection and watershed organizations, national, regional, and state associations, and other relevant organizations, and by applying effective practices.

- Annually, identify and communicate with one or more lake/watershed protection organizations through conferences, site visits, or telephone or e-mail communications to share knowledge and best operational practices.
 - Take advantage of the experience of other lake/watershed organizations for staff professional development.
 - Staff will develop recommendations for new operational practices, including technology applications and efficiency measures, based on information obtained from other organizations to present to the board at the annual planning meeting.
 - Take advantage of resources available from national, regional, and state associations, such as River Network, Montana Watershed Coordination Council, Montana Nonprofit Association, Flathead Nonprofit Development Partnership

6) Strengthen staff by increasing/adding technical and fundraising skills.

Appendix B: WRP Contract

DEQ Grant Contract No. 212061

Project Title: *Creating Ripples of Change for Flathead's Critical Lands and Lakeshores*

TASK 5 – WATERSHED RESTORATION PLAN (WRP)

Task 5 Funding: 319 Funds \$ 5,000
 Non-Federal Match \$ 2,100

Task 5 Timeline: July 2012 through December 2014

Task 5 Description: Contractor shall prepare a Watershed Restoration Plan (WRP) that will describe the Contractor's strategy for how the Flathead Lakers organization plans to work toward reducing anthropogenic non-point source pollution on private lands within the portion of the Flathead Lake Watershed: described as the land area immediately adjacent to Flathead Lake and along the Flathead River from Columbia Falls to Flathead Lake containing wetlands, riparian areas, and lakeshores. Contractor shall address each of U.S. Environmental Protection Agency's (EPA's) nine minimum elements (detailed below) within the WRP. Contractor shall compile existing data and information to address the nine minimum elements of the WRP. Contractor will consult with partners and relevant stakeholders as needed.

The Flathead Lakers will address EPA's nine elements as follows

1. Identification of causes of water quality impairment and pollutant sources or groups of sources that need to be controlled to achieve needed load reductions by utilization of Flathead Lake TMDL and other existing relevant documents.
2. An estimate of the typical pollutant load reductions expected from management measures relevant to the WRP, as provided in Flathead Lake TMDL and other existing documents.
3. A description of the nonpoint source management measures relevant to the WRP that need to be implemented to achieve load reductions, as referenced in Flathead Lake TMDL and other existing relevant documents.
4. Estimate, or a description of how those estimates would be assessed, of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that shall be relied upon to implement the plan.
5. An information and education component to enhance constituent understanding of the project and encourage their early and continued participation in selecting, designing, and implementing nonpoint source management measures.
6. Proposed schedule for implementing the nonpoint source management measures identified in the plan.
7. A description of interim measurable milestones for determining progress toward implementing nonpoint source management measures or other control actions.
8. A set of criteria that can be used to determine whether the watershed plan's goals are being achieved over time.

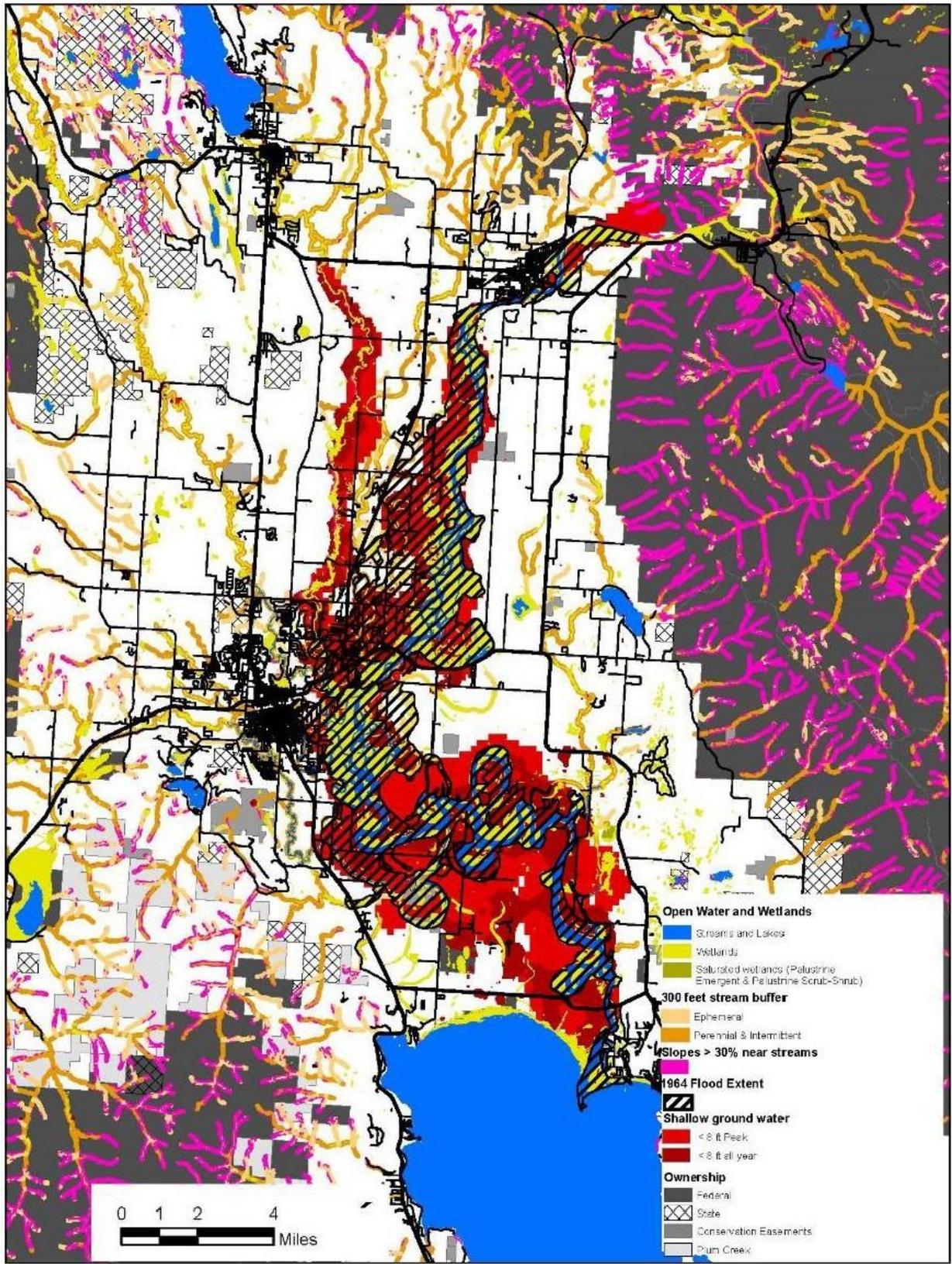
9. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the established criteria (from element 8).

Task 5 Deliverables: Contractor shall submit to DEQ the following deliverables:

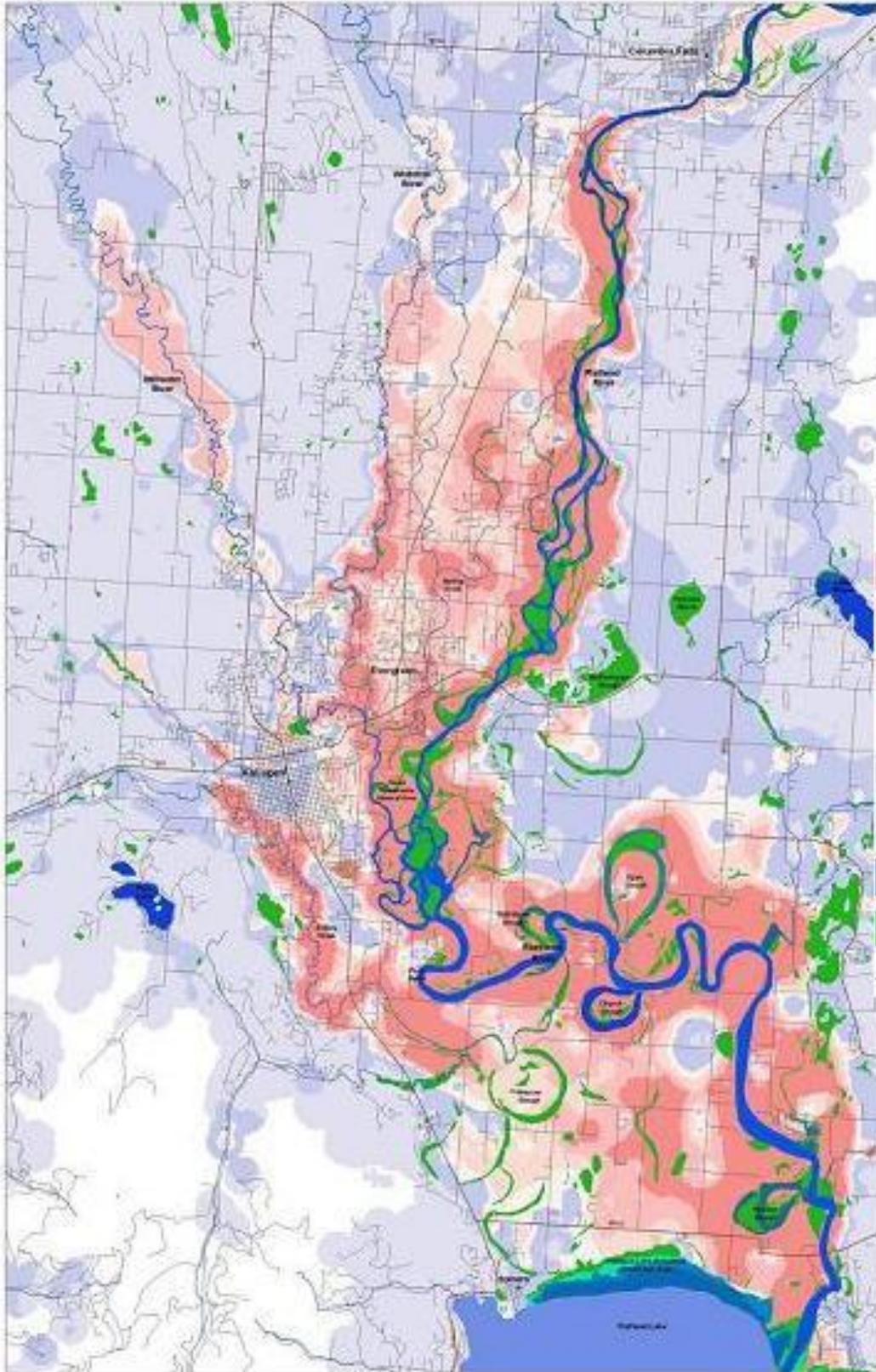
- Documentation of efforts to consult with partners and relevant stakeholders involved in the development and eventual implementation of the WRP. For documentation, at the discretion of the DEQ Project Manager, Contractor shall include a detailed list of individuals, organizations, agencies, and other entities that were contacted for input during the development of the WRP, as well as documentation of meetings and/or correspondence.
- A list of data and information sources (reports, websites, databases and other materials) used or consulted to evaluate conditions in the watershed.
- A complete, draft, *Flathead Lakers Riparian, Wetland, and Lakeshore WRP for Private Lands in the relevant portion of the Flathead Lake Watershed* for DEQ review and comment. Contractor shall submit the draft in electronic (Microsoft Word) format. Contractor shall submit to DEQ the complete, draft WRP no later than two months prior to the expiration of the Contract, so as to allow time for review, comment, and subsequent modification as necessary.

A complete, final, *Flathead Lakers Riparian, Wetland, and Lakeshore WRP for Private Lands in the relevant portion of the Flathead Lake Watershed*, in PDF and hard copy formats. In the final WRP, Contractor shall address any comments provided by DEQ, to the satisfaction of the DEQ Project Manager.

Appendix C: Critical Lands and Water Resources Maps



Depth to Water Table



Depth to Water Table (feet)

- <5
- 5-10
- 10-15
- 15-20
- 20-50
- >50
- Lakes and Rivers
- Wetlands
- Roads

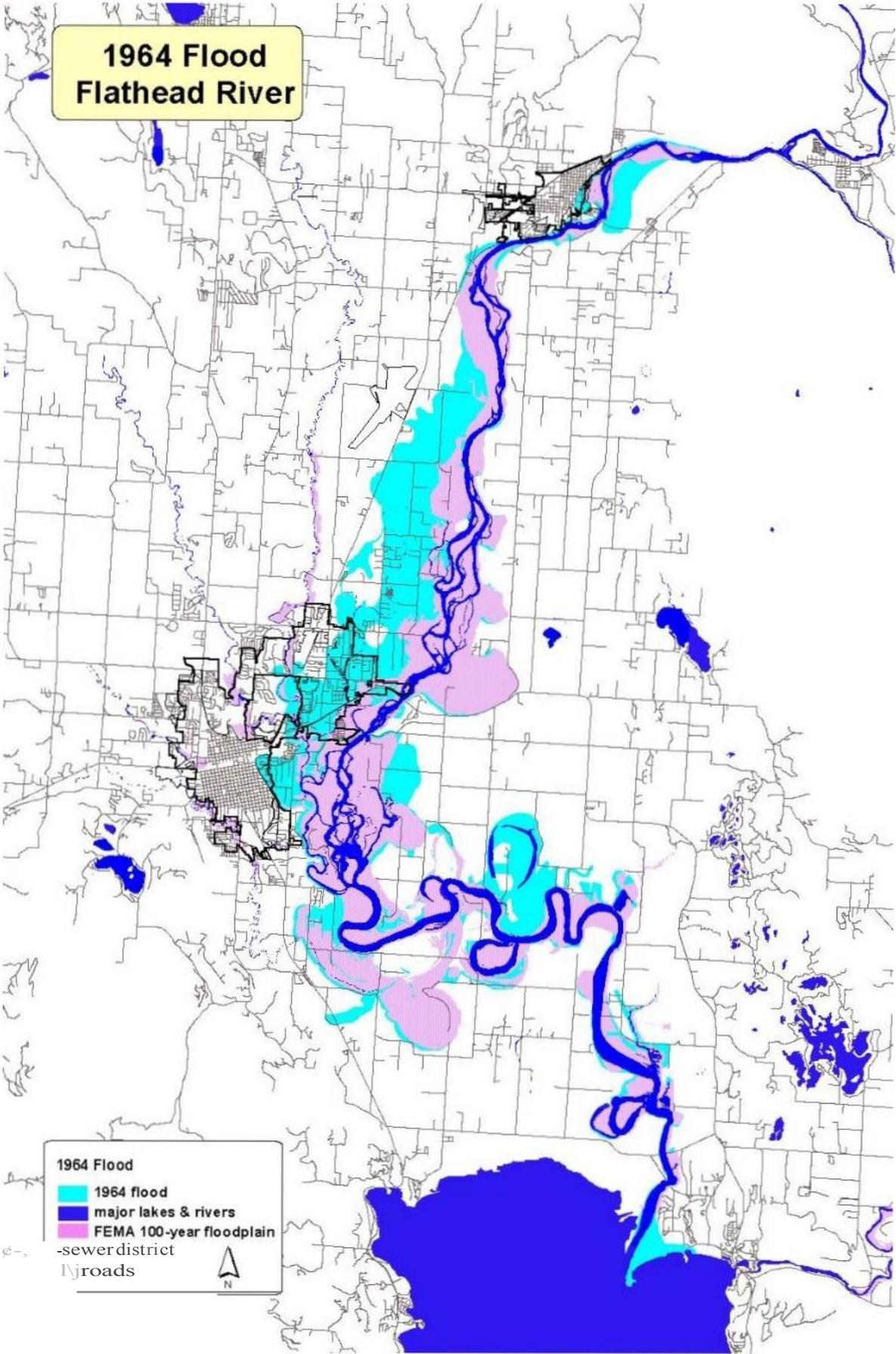


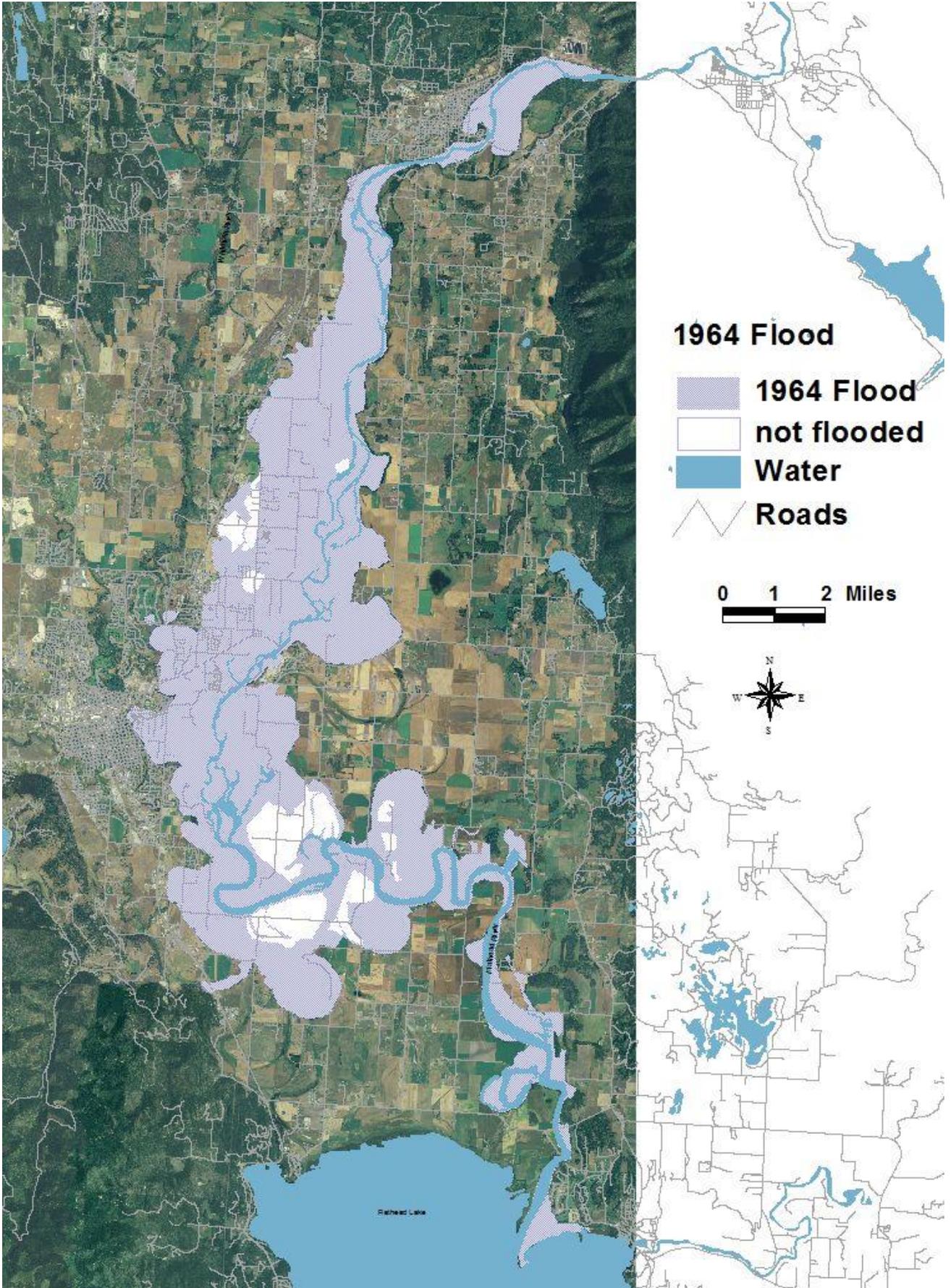
Critical Lands Project
 Information on this map is derived from US Forest Service of Forest and Wetland Inventory and National Wetlands Inventory (NWI). The NWI includes 600-200 1/2 mile grid cells. This NWI data is overlaid on the map to provide the location of wetlands in depth to water table. The Forest Service does not warrant the accuracy or completeness of the data shown on this map and assumes no responsibility for its use by any individual for a particular purpose.

Map produced by:
 Oregon Dept. of Forestry
 P.O. Box 11, Forest Station
 Phone - 408.662.1246
 www.forestland.gov

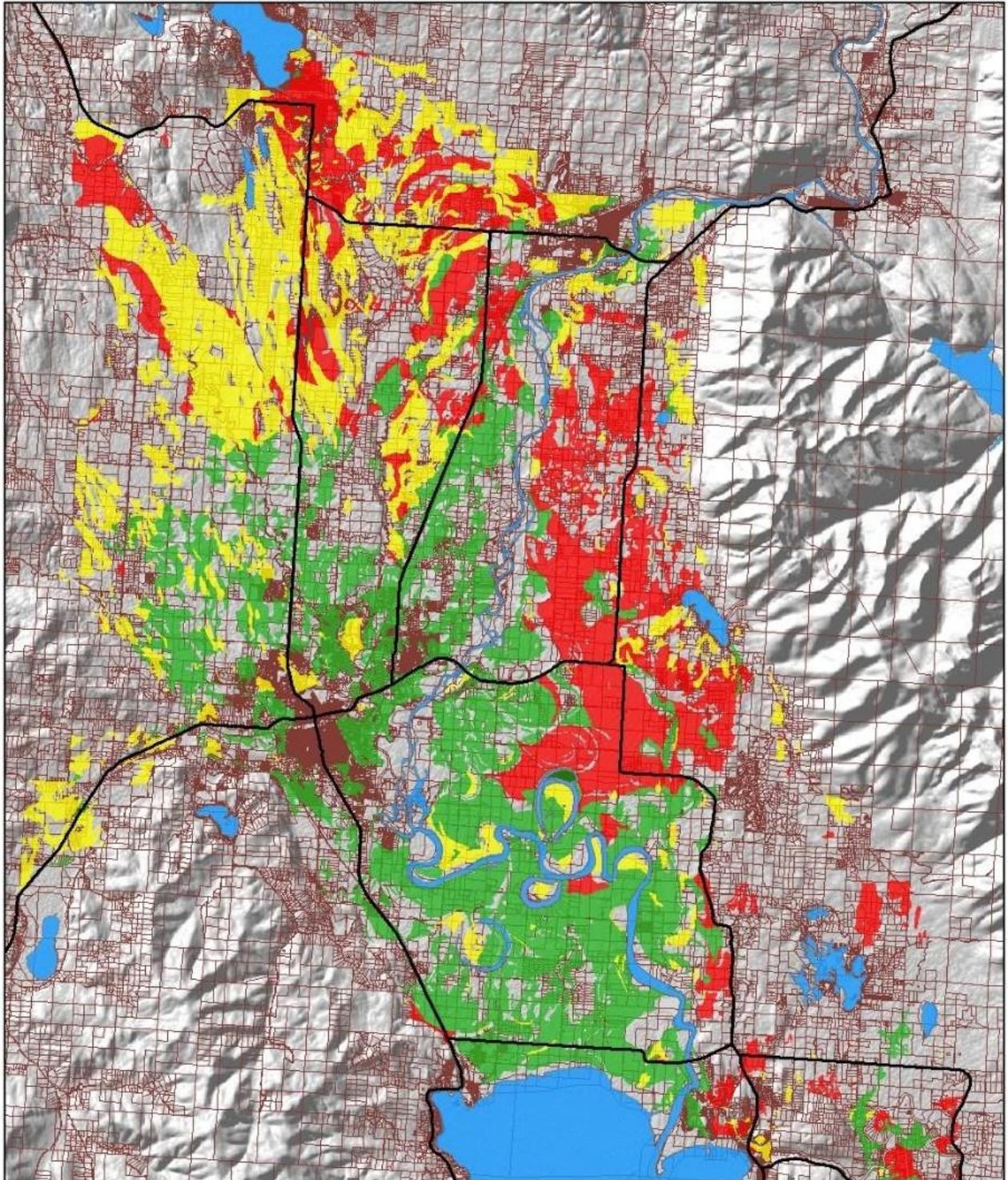
Forest/Lake Biological Station
 2000 University Avenue
 Phone - 408.662.2000
 www.forestland.gov/bio

1964 Flood Flathead River



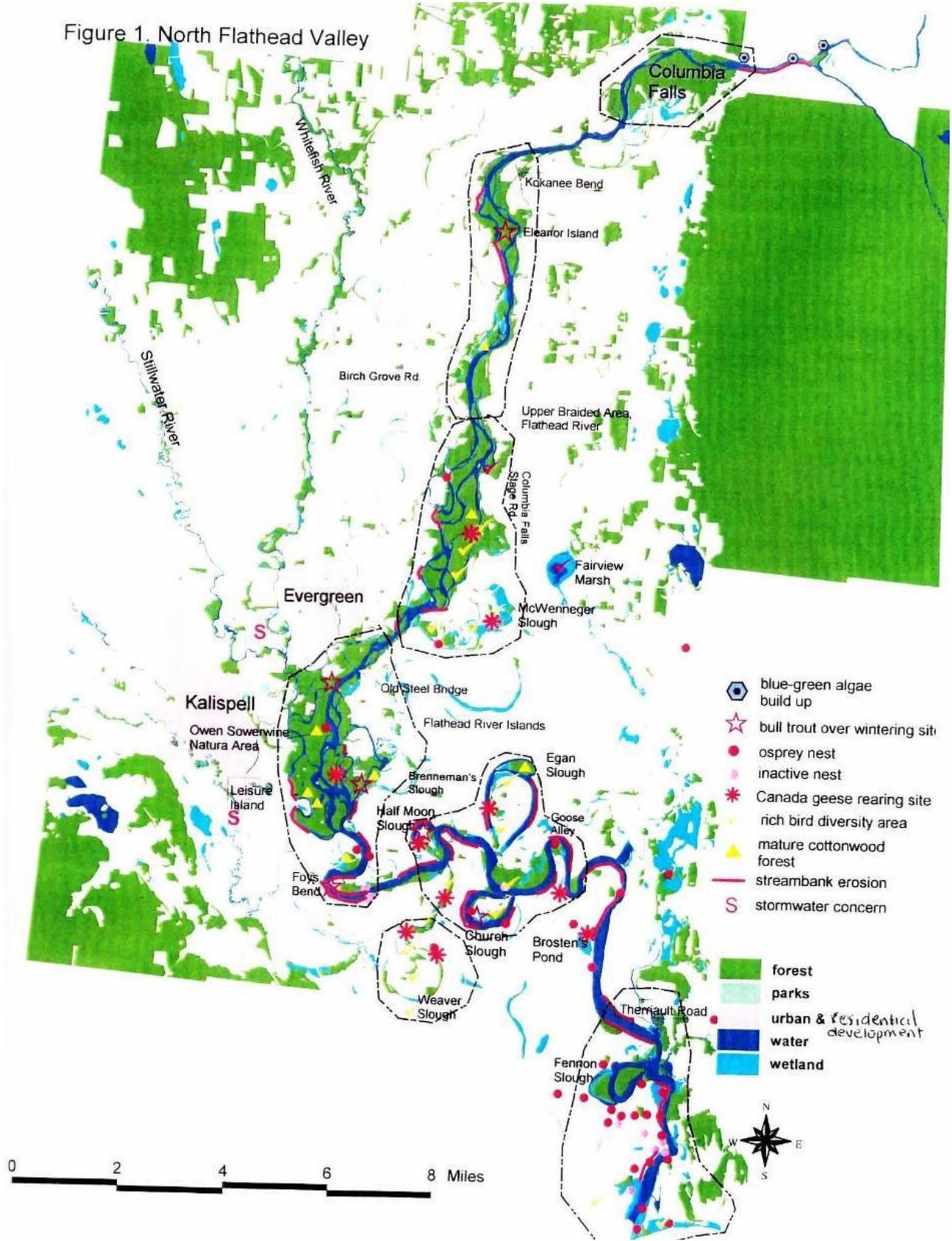


**Prime Agricultural Soils
Flathead Valley**

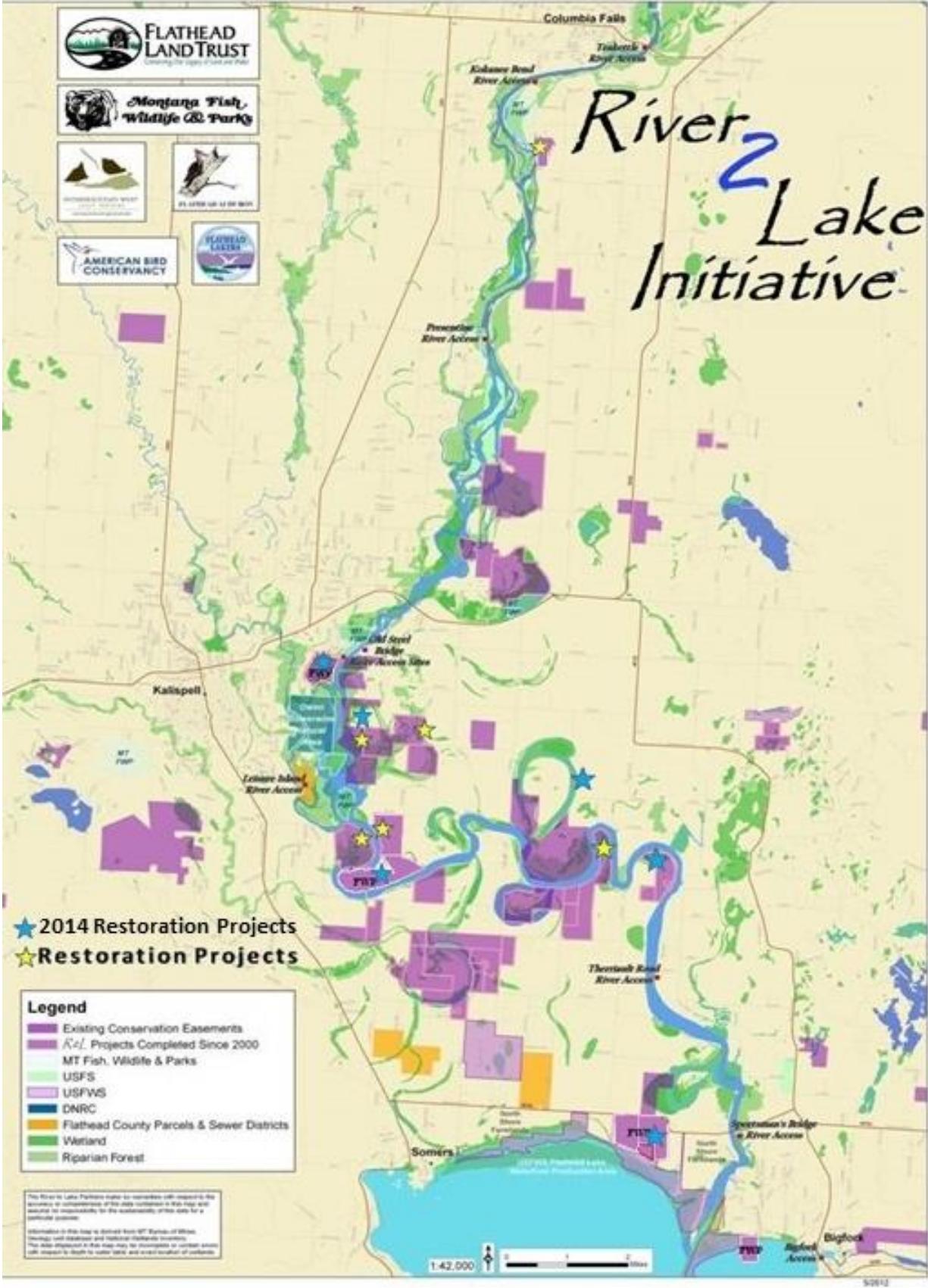


Critical Lands along the Flathead River (Critical Lands Status Report, 2002)

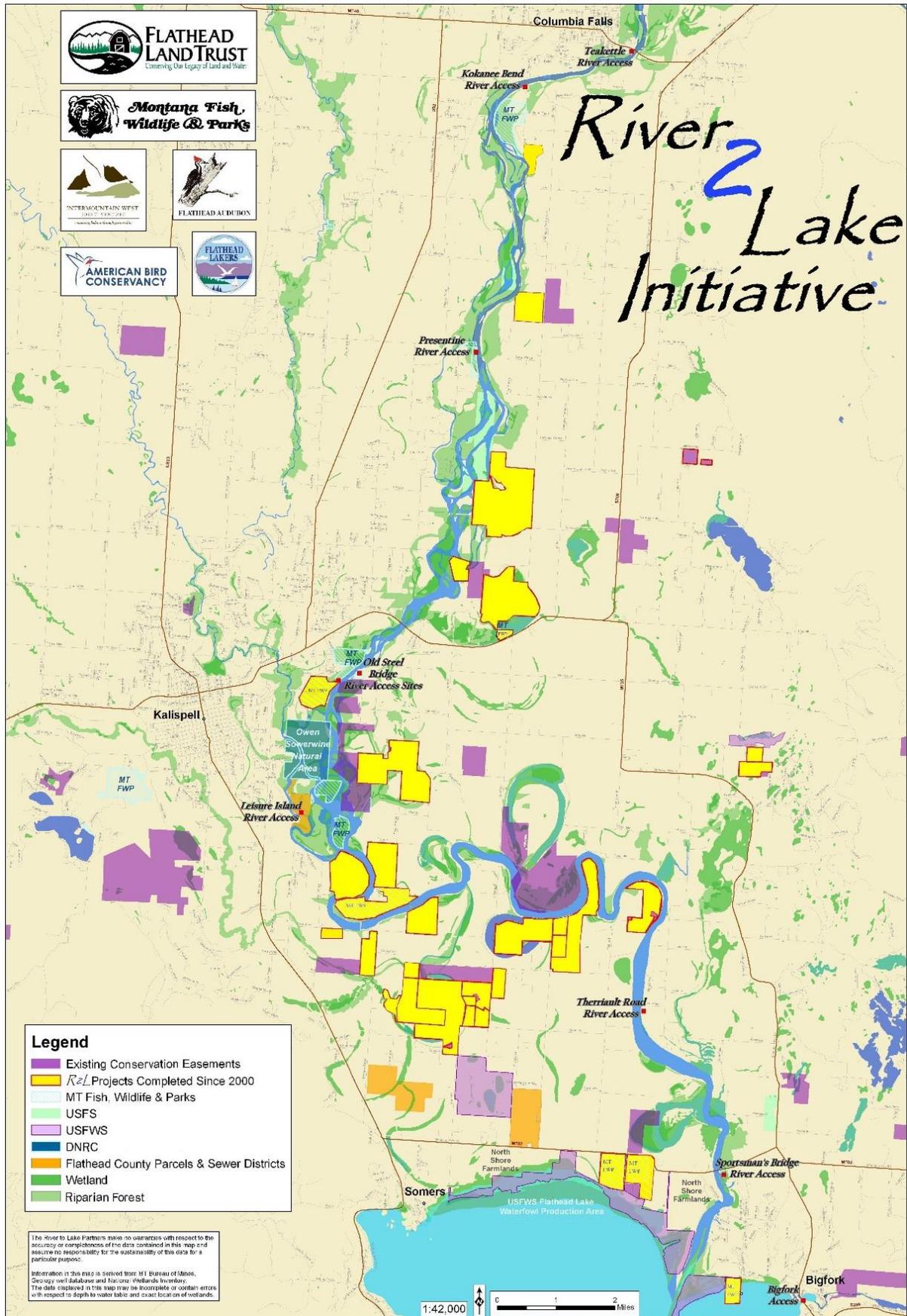
Figure 1. North Flathead Valley



Conservation and restoration accomplishments in Flathead River to Lake Initiative focus area (September, 2013)

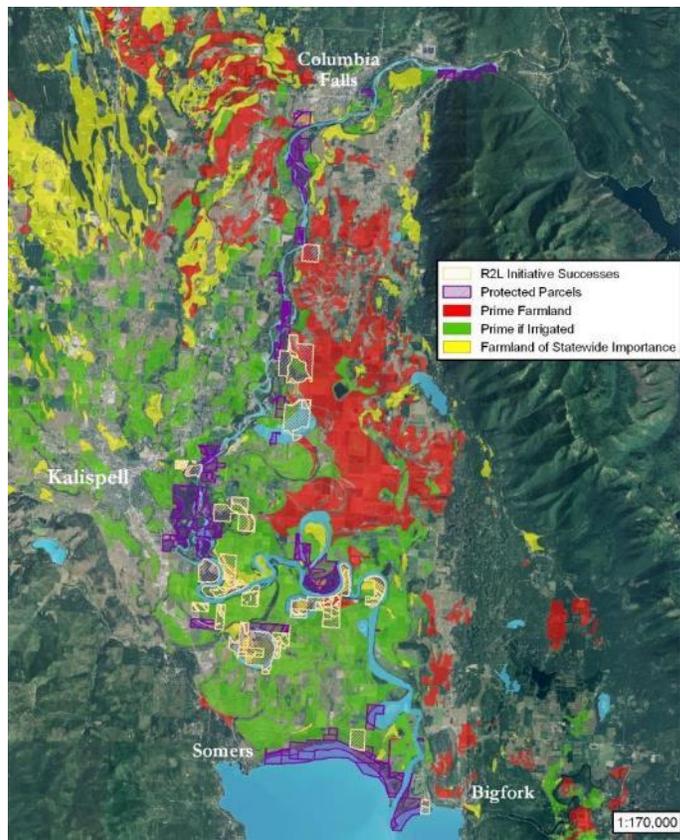
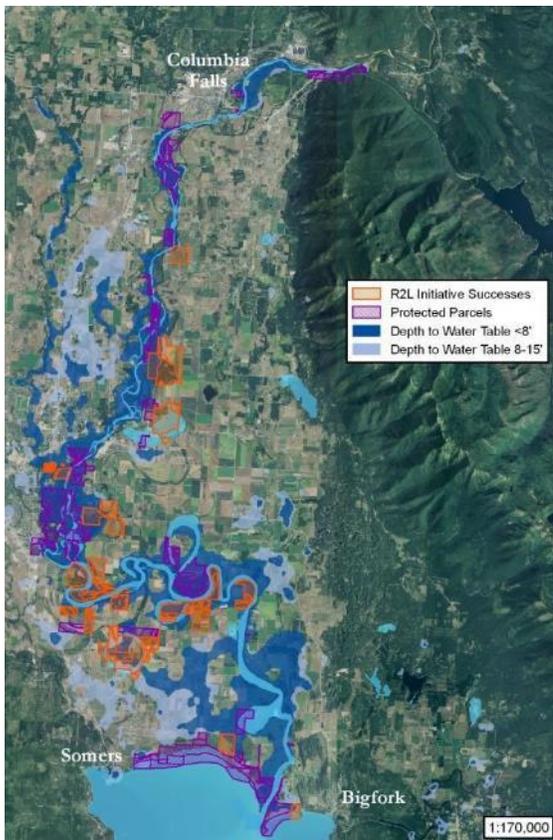
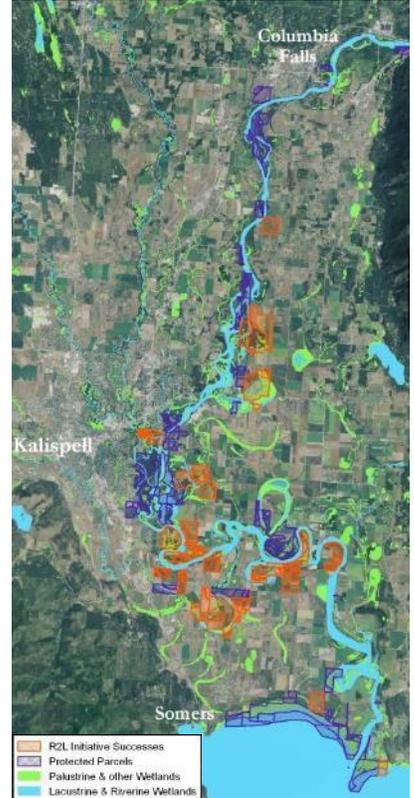
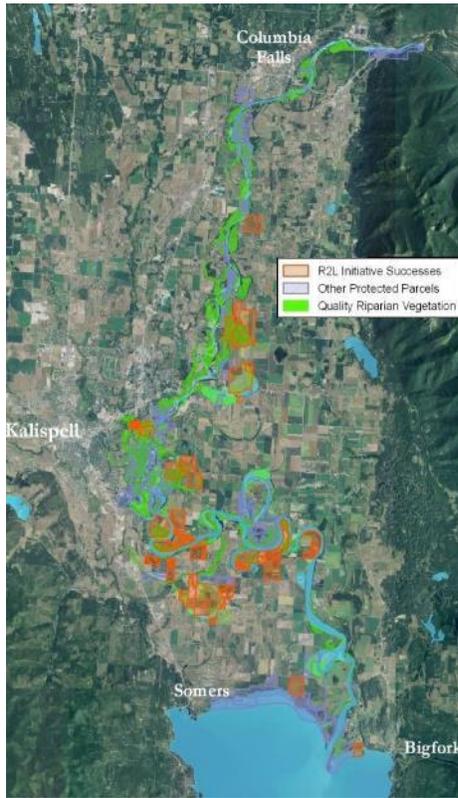
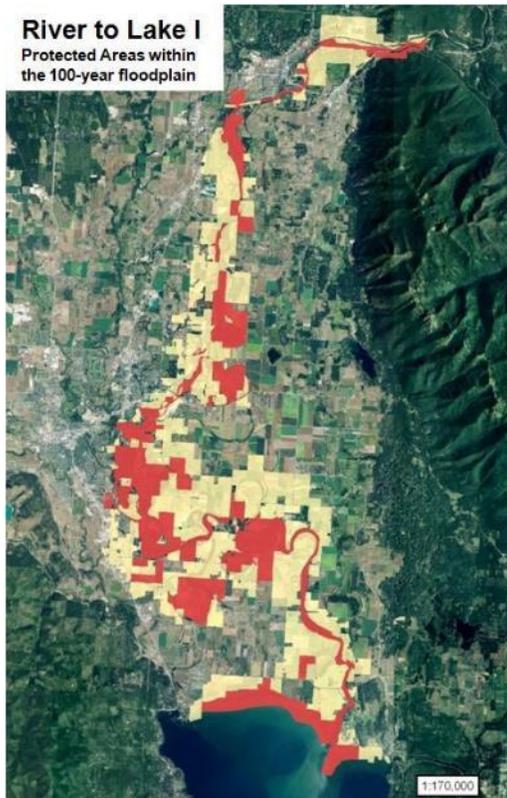


Flathead River to Lake Initiative partners conservation accomplishments (highlighted; 2014)



Protected Areas and Remaining Critical Lands In the Flathead River to Lake Initiative focus area

(Katzman and Casey, 2012. *Flathead River to Lake Initiative Analysis of Conservation Success.*)



Appendix D: Partners

Description and Abbreviations of Partner Affiliations used in Table D-1:

Best Management Practices (BMPs) and Buffers group is a coalition of businesses and agencies committed to the protection of clean water by providing training for the implementation of BMPs and buffer projects. The group met twice in 2011 to share information about the need for BMPs and buffer training for contractors, which led to three BMPs training opportunities in the Flathead Watershed. The group subsequently met to discuss training needs and plan additional contractor workshops.

Critical Lands Project and River to Lake Initiative (CL & R2L): The River to Lake Initiative works to conserve and restore critical lands in the Flathead River corridor between Columbia Falls and Flathead Lake and at the lake's north shore. The Flathead Lakers initiated the Critical Lands Project which led to the R2L with a specific focus area, and facilitate River to Lake Initiative collaboration with local, state, tribal, and federal resource managers, scientists, and conservation group representatives.

Flathead Basin Aquatic Invasive Species (AIS) Working Group: Local resource management agencies and organizations, including the Flathead Lakers, work together to plan and take actions to prevent the introduction of harmful aquatic invaders into Flathead Basin waters and to control invasive aquatic weeds.

Flathead Basin Monitoring Committee (Monitoring): Established by the Montana Legislature, the Flathead Basin Commission is charged with monitoring and protecting the Flathead Lake aquatic environment. The Commission is composed of resource management agency representatives and citizen members. The Commission maintains an office in Kalispell and meets bimonthly. The Flathead Lakers serve on the Flathead Basin Monitoring Committee.

The Flathead Community of Resource Educators (CORE) is a network of individuals & organizations working together to increase awareness & understanding about the natural, historical and cultural resources of the Flathead region. The Flathead Lakers participates in CORE's Watershed Education Committee, which provides practical watershed tools, training and materials for educators in the watershed.

Interviewed Stakeholders (Interviewed): Flathead Lakers board members interviewed six stakeholders to learn their perspectives on perceived future problems in the Flathead Watershed and the role they believe the Lakers should play in addressing the problems. This information, in addition to other background information regarding attitudinal trends and program outcomes in 2012, laid a foundation for shared understanding of the present state of the Flathead Lakers, as a preface to planning for the future.

K-12 Water Educators (K-12): Formal and non-formal K-12 educators in the Flathead region and in the state implement or expand curricula and activities on riparian buffers, best management practices, and watershed education. The educators helped design and/or responded to a Flathead Lakers' water and watershed education survey, which had over 60 responses.

Watershed Planning Team (WRP Team) is composed of the Flathead Lake Board of Directors, Flathead Lakers' staff and a strategic planning consultant. The planning team meets bi-monthly during 2012-2013 and held a strategic planning retreat in January, 2013. The team meets each fall to develop annual plans for the next year.

Table D-1. Flathead Lakers Watershed Restoration Plan Stakeholders/Partners.

Organization/ Name(s)	Contact Information	Affiliation
American Bird Conservancy Dan Casey, Susannah Casey	33 Second St, Ste 10 Kalispell, MT 59901 dcasey@abcbirds.org 406-756-2681	CL & R2L
Audubon Society, Flathead Chapter Linda Winnie, Steve Gniadek (CL & R2L); Patti Mason (CORE)	auduboneducator@gmail.com	CL & R2L; CORE
Bigfork School District #38 Cynthia Clary, Superintendent	600 Commerce St. Bigfork, MT 59911 406-837-7400	K-12
Bonneville Power Administration Mark Reller	321 Fuller Ave, Suite 201 Helena, MT 59601	Monitoring
Clearwater Resource Council Joann Wallenberg	PO Box 1471 Seeley Lak, MT 59868 406-677- 0069	AIS
Confederated Salish and Kootenai Tribes Lynn Ducharme & Art Soukkala (CL & R2L); Clint Folden (AIS Working Group); Jean Matt, Tribal Greenhouse (BMPs); Germaine White (K- 12); Rich Janssen (Monitoring)	PO Box 278 Pablo, MT 59855 lynn@cskt.org (CL & R2L) clintf@cskt.org (AIS) 406-883-2888	CL & R2L; AIS; BMPs; K-12; Monitoring
Environmental Protection Agency Julie Dal Soglio; Jason Gildea	dalsoglio.julie@epa.gov ; 406-457-5025 gildea.jason@epa.gov ; 406-457-5028	Monitoring
Flathead Basin Commission Chas Cartwright (Monitoring, Interviewed); Caryn Miske (CORE; AIS Working Group; Monitoring); Jack Potter (citizen member, Monitoring)	655 Timberwolf Parkway Kalispell, MT 59901 cmiske@mt.gov 406.240.3453	CORE; AIS; Monitoring; Interviewed
Flathead Conservation District Valerie Kurth	133 Interstate Ln Kalispell, MT 59901 vkurth@flatheadcd.org (406) 752-4220	CORE; CL & R2L; K-12; BMPs
Flathead Lake Biological Station¹ Jack Stanford (CL & R2L, Interviewed); Bonnie Ellis CL & R2L, Monitoring); Erin Sexton (Monitoring); Diane Whited (CL & R2L); Mark Lorang (BMPs); Sue Gillespie (K-12); Tom Bansak (AIS)	University of Montana 32125 Bio Station Ln Polson, MT 59860	Monitoring; CL & R2L; BMPs; K-12; Interviewed; AIS

¹ The Flathead Lake Biological Station is a research and education center of the University of Montana. Located at Yellow Bay, it is one of the oldest and finest freshwater research stations in the country. It is the source for scientific information on the Flathead Lake and River Basin ecosystem.

Organization/ Name(s)	Contact Information	Affiliation
Flathead Lake Lodge Doug Averill	PO Box 248 Bigfork, MT 59911 406-837-4391	Interviewed
Flathead Lakers Board (Landowners)	PO Box 70 Polson, MT 59860 lakers@flatheadlakers.org 406-883-1346	WRP Team; BMPs
Flathead Land Trust Paul Travis, Laura Katzman & Ryan Hunter (R2L)	PO Box 1913 Kalispell, MT 59903 lkatzman@bigsky.net 406-752-8293	CL & R2L
Flathead National Forest Teresa Wenum (CORE); Craig Kendall (AIS)	Supervisor's Office Tally Lake District 650 Wolfpack Way Kalispell, MT 59901 (406) 758-5208	CORE; AIS
Flathead River Commission Rusby Seabaugh	295 Lower Valley Rd Kalispell, MT 59901	CL & R2L
Forestation, Inc. Center for Native Plants Andrew Beltz	P.O. Box 1043 Whitefish, MT 59937 andrew@for estoration.org 406-471- 775	BMPs
Glacier National Park Chris Downs (AIS) Laura Law (K-12)	Park Headquarters PO Box 128 West Glacier, MT 59936 406-888-7800	AIS, K-12
Hanson Environmental Erik Hanson	401 W Sussex Missoula, MT 59801 (406) 437-1440	AIS
Intermountain West Joint Venture Dave Smith Ali Duvall	200 E. Broadway Ste 335 Missoula, MT 59807 Dave_W_Smith@fws.gov 406-329-3120	CL & R2L
Kalispell Chamber of Commerce Joe Unterreiner	15 Depot Park Kalispell, MT 59901 406-758-2800	Interviewed
Kalispell Department of Public Works Rebekah Wargo; Susie Turner	201 1 st Ave. E Kalispell, MT 59901 sturner@kalispell.com rwargo@kalispell.com 406-758-7720	BMPs
Lake County Environmental Health Department Susan Brueggeman	106 4 th Ave E Polson, MT 59860 sbrueggeman@lakemt.gov 406-883-7236	AIS, BMPs

Organization/ Name(s)	Contact Information	Affiliation
Lake County Planning Department Joel Nelson; LaDana Hintz	106 4 th Ave E Polson, MT 59860 jnelson@lakemt.gov lhintz@lakemt.gov 406-883-7235	BMPs
Landowners Participants in Site Visits, Workshops and Tours; Owners of demonstration buffer site	c/o Flathead Lakers PO Box 70 Polson, MT 59860 lakers@flatheadlakers.org 406-883-1341	BMPs
Law Practice Roger Sullivan, Attorney	745 S. Main Kalispell, MT 59901 406-752-5566	Interviewed
Montana Department of Agriculture Dave Burch	302 N. Roberts Helena, MT 59601 406-444-3140	AIS
Montana Department of Fish Wildlife and Parks Gael Bissell; Kris Tempel; John Wachsmuth; Alan Wood; Joel Tohtz	490 N Meridian Rd Kalispell, MT 59901 gbissell@state.mt.us 406-751-4580	CL & R2L
Mission Valley Christian Academy Susan Dunn	38907 Montana 35 Polson, Mt 59860 (406) 883-6858	K-12
Montana Department of Environmental Quality George Mathieus	PO Box 200901 Helena, MT 59620 406-444-6697	Monitoring
Montana Land Reliance Mark Schiltz	PO Box 460 Bigfork, MT 59911 mark@mtlandreliance.org 406-837-2178	CL & R2L
Montana Watercourse Stephanie McGinnis (K-12); Janet Bender-Keigley (BMPs)	PO Box 170570 Bozeman, MT 59717-0570 mcginnis@montana.edu 406-994-6425 jkeigley@montana.edu 406-994-6671	K-12; BMPs
Natural Resources Conservation Service Angel Rosario	133 Interstate Lane Kalispell, MT 59901 angel.rosario@mt.usda.gov 406-752-4242	CL & R2L
O'Connor Center for the Rocky Mountain West Larry Swanson	600 University Avenue The University of Montana Missoula, MT 59812-2674 406-243-7700	Interviewed
Polson School District #23 Gail Burghardt (Grade 3); Carla Farnstrom (5); Mary Larson (3); Chris Fisher (3); Darcie Laud (4); Keryl Lozar (3); Tami Morrison (4); Melissa	111 4th Ave East Polson, MT 59860 406-883-6355	K-12

Organization/ Name(s)	Contact Information	Affiliation
Bahr (7-8)		
Ronan School District #30 Charla Lake (5); Jane Whaling (5)	421 Andrew NW Ronan, MT 59864 406-676-3390	K-12
State Senators Verdell Jackson; Janna Taylor	Verdell Jackson vjackmt.tripod.com Janna Taylor www.janataylor.com	AIS
Sustainability Fund Lex Blood	PO Box 902 Kalispell, MT 59903 406-756-3170	CORE
Swan Lakers Jerry D'Aquin	P.O. Box #399 Bigfork, MT 59911 (406) 837- 4511	AIS
Timberlake Landworks Inc. Mike Wilson	PO Box 645 Lakeside, MT 59922 406-249-1604 office@timberlakelandworks.com	BMPs
United States Geological Survey Clint Muhlfeld	Northern Rocky Mountain Science Center Glacier Field Station, GNP West Glacier, Montana 59936 cmuhlfeld@usgs.gov 406-888-7926	AIS
US Fish and Wildlife Service Wade Fredenberg	wade_fredenberg@fws.gov (406) 758-6872	AIS
USFWS Partners for Fish and Wildlife Rox Rogers	780 Creston National Fish Hatchery Kalispell, MT 59901 rox_rogers@fws.gov 406-758-6880	CL & R2L
Watershed Education Network Deb Fassnacht	315 S 4th St Missoula, MT 59801 (406) 541-9387	K-12
Whitefish Lake Institute Mike Koopal (CORE, BMPs, AIS); Lori Curtis (CORE, K-12)	635 Denver St Whitefish, MT 59937 mike@whitefishlake.org lori@whitefishlake.org (406) 862-4327	BMPs; CORE; K-12; AIS

Stakeholders/Partners by Affiliation/Role

Best Management Practices (BMPs) and Buffers Group:

Andrew Beltz, Forestation Inc. and Center for Native Plants
Flathead Lakers Board Members
Janet Bender-Keigley, Montana Watercourse
Jean Matt, Tribal Greenhouse
Joel Nelson, Lake County Planning Department
LaDana Hintz, Lake County Planning Department
Landowners – demonstration buffer site
Landowners who participate in site visits, workshops and tours
Mark Lorang, Flathead Lake Biological Station
Mike Koopal, Whitefish Lake Institute
Mike Wilson, Timberlake Landworks Inc.
Valerie Kurth, Flathead Conservation
District
Rebecca Wargo, Kalispell Department of Public Works
Susan Brueggeman, Lake County Environmental Health Department
Susie Turner, Kalispell Department of Public Works

Critical Lands Project and River to Lake Initiative (CL & R2L):

Angel Rosario, Natural Resources Conservation Service
Bonnie Ellis, Flathead Lake Biological Station
Dan Casey, American Bird Conservancy
Dave Smith, Intermountain West Joint Venture
Diane Whited, Flathead Lake Biological Station
Gael Bissell, Montana Department of Fish Wildlife and Parks
Jack Stanford, Flathead Lake Biological Station
Kris Tempel, Montana Department of Fish Wildlife and Parks
John Wachsmuth, Montana Department of Fish Wildlife and Parks
Alan Wood, Montana Department of Fish Wildlife and Parks
Joel Tohtz, Montana Department of Fish Wildlife and Parks
Laura Katzman, Flathead Land Trust
Ryan Hunter, Flathead Land Trust
Linda Winnie, Audubon Society, Flathead Chapter
Lynn Ducharme, Confederated Salish and Kootenai Tribes
Art Soukkala, Confederated Salish and Kootenai Tribes
Mark Schiltz, Montana Land Reliance
Valerie Kurth, Flathead Conservation District
Rox Rogers, USFWS Partners for Fish and Wildlife
Rusby Seabaugh, Flathead River Commission
Steve Gniadek, Audubon Society, Flathead Chapter
Susannah Casey, American Bird Conservancy

Flathead Basin Aquatic Invasive Species (AIS) Working Group:

Caryn Miske, Flathead Basin Commission

Chris Downs, Glacier National Park
Clint Folden, Confederated Salish & Kootenai Tribes
Clint Mulfield, USGS
Craig Kendall, Flathead National Forest
Dave Burch, Montana Dept. of Agriculture
Erik Hanson, AIS consultant
Janna Taylor, State Senator
Jerry d'Aquin, Swan Lakers
Joann Wallenberg, Clearwater Resource Council
Mike Koopal, Whitefish Lake Institute
Robin Steinkraus, Flathead Lakers
Susan Brueggeman, Lake County Health Dept.
Tom Bansak, University of Montana Flathead Lake Biological Station
Verdell Jackson, State Senator
Wade Fredenberg, U.S. Fish & Wildlife Service

Flathead Basin Monitoring Committee (Monitoring):

Bonnie Ellis, Flathead Lake Biological Station
Caryn Miske, Flathead Basin Commission Executive Director
Chas Cartwright, Flathead Basin Commission Chair
Clint Mulfield, USGS
Craig Kendall, Flathead National Forest
Erin Sexton, Flathead Lake Biological Station
George Mathieus, Montana DEQ
Jack Potter, citizen member, Flathead Basin Commission
Jason Gildea, EPA
Julie DalSoglio, EPA
Mark Reller, BPA
Rich Janssen, CSKT
Robin Steinkraus, Flathead Lakers

The Flathead Community of Resource Educators (CORE) Watershed Committee:

Valerie Kurth, Flathead Conservation District
Teresa Wenum, Flathead National Forest U.S. Forest Service
Mike Koopal, Whitefish Lake Institute
Lori Curtis, Whitefish Lake Institute
Lex Blood, Sustainability Fund
Ashley Mason, Flathead Audubon
Caryn Miske, Flathead Basin Commission
Heidi Sedivy, Flathead Lakers
Robin Steinkraus, Flathead Lakers

Interviewed Stakeholders (Interviewed):

Chas Cartwright, Retired Superintendent, Glacier National Park
Larry Swanson, Director, O'Connor Center for the Rocky Mountain West
Roger Sullivan, Attorney
Joe Unterreiner, President & CEO, Kalispell Chamber of Commerce
Jack Stanford, Director, University of Montana Flathead Lake Biological Station
Doug Averill, owner, Flathead Lake Lodge

K-12 Water Educators (K-12):

Carla Farnstrom (Gr. 5), Polson School District #23
Charla Lake (Gr. 5), Ronan School District #30
Chris Fisher (Gr. 3), Polson School District #23
Darcie Laud (Gr. 4), Polson School District #23
Gail Burghardt (Gr. 3), Polson School District #23
Germaine White, Confederated Salish and Kootenai Tribes
Jane Whaling (Gr. 5), Ronan School District #30
Keryl Lozar (Gr. 3), Polson School District #23
Laura Law, Glacier National Park
Lori Curtis, Whitefish Lake Institute
Mary Larson (Gr. 3), Polson School District #23
Melissa Bahr (Gr. 7-8), Polson School District #23
Patti Mason, Flathead Conservation District
Stephanie McGinnis, Montana Watercourse
Sue Gillespie, Flathead Lake Biological Station
Susan Dunn, Mission Valley Christian Academy
Tami Morrison (Gr. 4), Polson School District #23
Deb Fassnacht, Watershed Education Network

Watershed Planning Team (WRP Team):

Board of Directors

Greg McCormick, President
Dick Siderius, Past President
Bill McLaughlin, Vice President
Laney Hanzel, Secretary
Roger Smith, Treasurer
Larry Ashcraft
Jim Hollensteiner
Mary Ellen Turmell
Ted Williams
Tom Cox
Chuck Sutfin
Steve Rosso

Staff

Robin Steinkraus, Executive Director
Constanza von der Pahlen, Critical Lands Program Director
Heidi Sedivy, Education & Outreach Coordinator
Karen Swan, Administrative Assistant