

Lake Almanor Watershed Management Plan



Almanor Basin Watershed Advisory Committee

April 2009

Prepared by the Sierra Institute
for Community and Environment



PREFACE

The Almanor Basin Watershed Advisory Committee (ABWAC) was created in 2005 by the Plumas County Board of Supervisors as part of a Proposition 13 grant from the Department of Water Resources. The group's purpose is to address water quality, land use, and critical habitat issues in the Lake Almanor Basin. The committee is comprised of eleven community volunteers: four members from the four major communities bordering the lake, one from neighboring Lassen County (in which a portion of the watershed lies), one from the Native American Maidu community, one Planning Commission liaison, and four at-large members.

The Almanor Basin Watershed Advisory Committee as of April 2009:

Carl Felts, Chair	East Shore/Hamilton Branch
Ryan Burnett, Vice Chair	Chester
Aaron Seandel	Peninsula/North Shore
Peggy Fulder	Lassen County
Lorena Gorbet	Maidu Community
Mike Mitzel	Member At-Large
Rich Rydell	Plumas County Planning Commission
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This watershed plan was made possible by grants from the Sierra Nevada Conservancy and the Plumas County Board of Supervisors.

TABLE OF CONTENTS

Section	Page
Preface.....	i
Table of Contents.....	1
Introduction.....	3
Goal 1: Protect, maintain, and improve water quality and riparian and terrestrial habitat in the Lake Almanor Basin.....	4
Objective 1: Establish an ongoing, comprehensive water quality monitoring program for Lake Almanor and its tributaries.....	5
Objective 2: Develop an integrated basin-wide approach to solid waste and waste water management.....	9
Objective 3: Minimize erosion, sedimentation, and contaminated runoff from upstream sources.....	11
Objective 4: Minimize urban run-off and effectively manage stormwater.....	13
Objective 5: Identify critical habitat areas and prioritize areas for protection or restoration.....	15
Objective 6: Identify and monitor indicator species to assess watershed management activities and overall basin health.....	17
Objective 7: Maintain healthy fish populations in Lake Almanor and its tributaries, including a cold water fishery.....	18
Objective 8: Prevent the spread and establishment of invasive species in the Almanor Basin.....	19
Objective 9: Advance watershed stewardship through a comprehensive outreach and education program and the development of educational material.....	21

Continued on next page...

Section	Page
Goal 2: Maintain and improve quality of life in basin communities; minimize the negative social impacts of development and maximize the benefits.....	24
Objective 10: Protect and enhance opportunities for recreation and public access without compromising water quality or wildlife habitat.....	25
Objective 11: Ensure that land conversions (e.g., recreation lands to developments and TPZ lands to general forest) maximize benefits and minimize negative impacts to basin quality of life and wildlife habitat.....	26
Objective 12: Through education, create and maintain fire safe communities.....	27
Objective 13: Protect visual resources, including open space and scenic highway corridors.....	28
Objective 14: Ensure healthy air quality.....	29
Objective 15: Coordinate basin planning to ensure adequate infrastructure for new and existing developments, including transportation corridors for commuting and recreational travel. (Infrastructure includes roads, wastewater systems, stormwater management systems, etc.).....	30
Objective 16: Ensure that attainable housing is available for local workers, and avoid economically stratified housing.....	31
Goal 3: Establish ongoing investment, restoration, and coordinated management in the watershed.....	32
Objective 16: Improve coordination between organizations and agencies working locally, and increase opportunities for collaborative partnership projects.....	33
Objective 17: Work with agencies and other organizations to obtain investment in the watershed to support basin monitoring, restoration, and future coordination.....	35

INTRODUCTION

The Lake Almanor Basin is located at the intersection of the Sierra Nevada and Cascade mountain ranges in northeastern California. The basin forms the headwaters of the North Fork of the Feather River and is a key component of the State Water Project and hydropower production for Northern California. Based on a 2007 assessment, the Almanor watershed is currently believed to be in good condition (LAWA 2007). This management plan will help protect water quality, critical habitat, and quality of life in the Almanor Basin in light of the multitude of threats outlined in the watershed assessment.

The Almanor Basin Watershed Advisory Committee (ABWAC) is an official advisory committee to the Plumas County Board of Supervisors. The committee is charged with making management recommendations to help ensure the long-term health of the watershed. This plan identifies priority action areas based on the Watershed Assessment (2007), a Stakeholder Report (2003), ABWAC meetings and discussions, and the results of public workshops and other outreach efforts. The plan contains watershed goals and outlines specific objectives that ABWAC is considering, and includes tasks to meet those objectives.

Each task is given a due date or a priority level (high, medium, low). High priority tasks should be completed by January 2010, medium priority tasks in 2-3 years, and low priority task in 3-5 years. This is a living document; over time, priorities may change and new tasks may be added. ABWAC will review this plan on an annual basis to ensure that tasks are completed and priorities are still appropriate.

Goal 1: Protect, maintain, and improve water quality and riparian and terrestrial habitat in the Lake Almanor Basin.

This goal addresses the physical aspects of the watershed. We recognize that water quality and the quality of wildlife habitat are closely linked to and affected by society. Public outreach and education will play an important role in meeting this goal and its associated objectives.

Goal 2: Maintain and improve quality of life in basin communities; minimize the negative social impacts of development and maximize the benefits.

This goal addresses the social, economic, and cultural aspects of the watershed and will help ensure that the Almanor Basin continues to be a desirable place to live and visit.

Goal 3: Establish ongoing investment, restoration, and coordinated management in the watershed.

The goal addresses building partnerships and securing funding for long-term, coordinated management and monitoring in the Almanor Basin.

GOAL 1

Protect, maintain, and improve water quality and aquatic, riparian, and terrestrial habitat in the Lake Almanor Basin.

Objectives:

1. Establish an ongoing, comprehensive water quality monitoring program for Lake Almanor and its tributaries.
2. Develop an integrated basin-wide approach to solid waste and waste water management.
3. Minimize erosion, sedimentation, and contaminated runoff from upstream sources.
4. Minimize urban run-off and effectively manage stormwater.
5. Identify critical habitat areas and prioritize areas for protection or restoration.
6. Identify and monitor indicator species to assess watershed management activities and overall basin health.
7. Maintain healthy fish populations in Lake Almanor and its tributaries, including a cold water fishery.
8. Prevent the spread and establishment of invasive species in the Almanor Basin.
9. Advance watershed stewardship through a comprehensive outreach and education program and the development of educational material.

Objective 1: Establish an ongoing, comprehensive water quality monitoring program for Lake Almanor and its tributaries.

For many years, the Department of Water Resources conducted most of the water quality monitoring for Lake Almanor. PG&E, the U.S. Forest Service, the Central Valley Regional Water Quality Control Board, and Plumas County have also monitored constituents in the lake. However, these efforts have not been coordinated, and no long-term, comprehensive monitoring program has been developed. In 2008, the Department of Water Resources halted its Lake Almanor monitoring program, leaving the lake with only Plumas County’s summer *E. coli* monitoring program at heavily used beaches.

An on-going comprehensive monitoring program is necessary to track water quality over time to assess the lake’s health. While water quality monitoring for 2009 has been secured, funding is needed to support a long-term program.

A reconnaissance-level field survey conducted for the Watershed Assessment confirmed unpublished reports of the existence of milfoil in Lake Almanor (see Section 6.5.5). The assessment recommends further investigation to determine its extent and potential for spreading.

The Watershed Assessment also recommends conducting an assessment of major tributary streams and installing flow gauges on those tributaries (see Section 6.5.5). Establishing long-term flow gauges on major tributaries would document the impact of future land use changes on flow regime patterns. In addition, a baseline assessment of major tributaries, coupled with ongoing stream condition monitoring, would identify erosion and stream degradation issues before they become significant problems.

Objective 1.1: Implement a continuous water quality monitoring program for Lake Almanor.

	Action	Product(s)	Completed by	Due by or priority
1	Develop a monitoring program that will track water quality over time and provide an early warning system for possible water quality problems.	<ul style="list-style-type: none"> • List of constituents • Monitoring station locations • Monitoring schedule 	Water Quality Subcommittee and TAG	January 2010
2	Make recommendations for funding options for on-going monitoring. (See Objective 18.1)	<ul style="list-style-type: none"> • List and explanation of recommended funding options 	Water Quality Subcommittee	High priority
3	Explore opportunities for a citizen’s monitoring program.	<ul style="list-style-type: none"> • Summary of options • Recommended action 	Staff and Water Quality Subcommittee	December 2009

	Action	Product(s)	Completed by	Due by or priority
4	Make a recommendation for a continuous, long-term monitoring program to the Board of Supervisors.	<ul style="list-style-type: none"> • Recommendation submitted 	ABWAC	March 2010
5	Release a request for proposals for implementing the monitoring program identified in Task 4 above.	<ul style="list-style-type: none"> • RFP 	Plumas County Flood Control District	March 2010, dependent on funding
6	Hire a contractor to implement the monitoring program.	<ul style="list-style-type: none"> • Contractor contract 	Flood Control District	March 2010
7	Manage, and make publicly available, a comprehensive water quality database.	<ul style="list-style-type: none"> • Database • Website updates 	Sierra Institute staff	Ongoing updates
8	Develop GIS maps that display baseline and trend water quality data along with changes in land use.	<ul style="list-style-type: none"> • GIS maps 	Sierra Institute staff	Baseline maps by December 2009, then as trends are identified
9	Create an annual state of the lake report for the general public that assigns water quality grades (for temperature, <i>E. coli</i> , visibility, invasive species, etc.) and explains water quality.	<ul style="list-style-type: none"> • Annual report • Newspaper article 	Sierra Institute staff	Annually in summer
10	Link monitoring results to management recommendations as appropriate.	<ul style="list-style-type: none"> • Recommendations informed by monitoring results 	ABWAC	Ongoing

Objective 1.2: Assess the condition of tributary streams and conduct ongoing flow and stream conditions monitoring.

Action		Product(s)	Completed by	Due by or priority
1	Work with PG&E to develop a plan to install flow gages on tributaries to Lake Almanor, as recommended in the Watershed Assessment (Section 7.3.4).	A plan outlining: <ul style="list-style-type: none"> • priority tributaries • the cost of installing flow gages • who will install and maintain the gages • who will collect and analyze the data 	Sierra Institute staff, ABWAC, PG&E, and TAG, with input from landowners	High priority
2	Seek funding 1) to install flow gages and 2) for a tributary conditions assessment. (See Objective 18.1)	<ul style="list-style-type: none"> • Grant proposals, if applicable 	Sierra Institute staff and Water Quality subcommittee	Following development of a flow gage installation plan
3	Install flow gages on tributary streams.	<ul style="list-style-type: none"> • Flow gages installed 	To be determined	As funding allows
4	Conduct a conditions assessment of tributary streams, as recommended in the Watershed Assessment (Section 7.3.5). (Also see Objective 5.3)	<ul style="list-style-type: none"> • Tributary assessment 	Consultant	As funding allows
5	Work with partners, including the TAG, to identify priority tributary streams to be monitored, what to monitor for, and how often.	<ul style="list-style-type: none"> • List of priority tributaries • List of constituents to monitor for • Monitoring schedule 	Water Quality Subcommittee and TAG	Within one year after the lake monitoring program is implemented
6	Identify funding possibilities to implement the monitoring program.	<ul style="list-style-type: none"> • List of possible funding options 	ABWAC subcommittee and staff	Ongoing
7	Recommend a tributary monitoring program to the Board of Supervisors.	<ul style="list-style-type: none"> • Tributary monitoring recommendation 	ABWAC	Within two months of funding identified

Action		Product(s)	Completed by	Due by or priority
8	Develop GIS maps that display baseline and trend water quality data along with changes in land use.	<ul style="list-style-type: none"> • GIS maps 	Sierra Institute staff	As data become available
9	Link monitoring results to management recommendations as appropriate.	<ul style="list-style-type: none"> • Recommendations informed by the results of monitoring activities 	ABWAC	Ongoing as data become available and trends are identified

Objective 2: Develop an integrated, basin-wide approach to solid waste and wastewater management.

The disposal of sewage and solid waste increasingly presents challenges for Plumas County, and for the Almanor Basin in particular. Many are concerned about the potential for improperly maintained septic systems to contaminate the lake, and the lack of coordinated wastewater management in new developments. It is essential to improve the public’s understanding of septic systems and septic system maintenance and of the relationship between septic systems and Lake Almanor’s water quality. The Stakeholder Assessment Report (2003) points out that many residents in the Basin come from areas with centralized sewer systems; it is not uncommon for people to move into homes without understanding that the house utilizes a septic system. Many residents need a better understanding of septic system maintenance and care. In addition, it is critical that new developments and new individual homes properly address wastewater treatment and disposal, and that wastewater management is approached in an integrated manner rather than on a case-by-case basis. Basin-wide approaches to wastewater management should be advanced.

In addition to sewage and wastewater, management of solid waste needs to be improved across the basin. Electronics, appliances, furniture, and yard waste are often illegally disposed of because of the cost of taking these items to transfer stations. Options to minimize illegal dumping through education and the use of free dump days should be pursued.

Objective 2.1: Develop an integrated, basin-wide approach to sewage and wastewater treatment and disposal.

	Action	Product(s)	Completed by	Due by or priority
1	Work with partners to seek funding for and implement a septic system “pump and map” program that would offer pumping incentives to homeowners in priority areas who agree to have the location of their septic tanks mapped. (Full project concept still to be determined.)	<ul style="list-style-type: none"> • Location of septic tanks • Homeowners educated about the location of their systems and the importance of proper maintenance • Septic systems pumped 	Sierra Institute and Plumas County staff, working with CSDs, local realtors, and others.	Ongoing, as funding sources are identified
2	Work with partners to provide educational programs and materials to the public about septic systems and septic system maintenance, and of the relationship between septic systems and Lake Almanor’s water quality. (Also see Objective 9)	<ul style="list-style-type: none"> • Public workshop • Newspaper articles • Distribute brochures 	ABWAC/Staff and partners	Ongoing starting July 2009

Action		Product(s)	Completed by	Due by or priority
3	Work with realtors and partners to develop and distribute septic system information kits to people who purchase homes utilizing septic systems.	<ul style="list-style-type: none"> Septic system awareness kit 	ABWAC, Basin realtors, other partners	High priority
4	Explore options for requiring a septic system inspection at the time of sale, if such inspections are not already required.	<ul style="list-style-type: none"> Possible recommendation to Supervisors or the Planning Commission 	ABWAC	High priority
5	Research examples of “developer agreements” that explicitly address wastewater treatment and disposal.	<ul style="list-style-type: none"> Summary of examples 	Sierra Institute staff	High priority
6	Work with Plumas County to produce developer agreements that address wastewater treatment.	<ul style="list-style-type: none"> Recommended template for a developer agreement 	ABWAC, Plumas County, Planning Commission	Medium priority

Objective 2.2: Develop an integrated, basin-wide approach to recycling and solid waste management.

Action		Product(s)	Completed by	Due by or priority
1	Support free e-waste, hazardous waste and tire dumping opportunities for the Almanor Basin.	<ul style="list-style-type: none"> Free disposal days 	County task force and ABWAC	In progress. Dates have been established for e-waste and hazardous waste disposal.
2	Support basin-wide curb-side recycling and green waste pickup.	<ul style="list-style-type: none"> Implementation 	ABWAC and Plumas County	Medium priority

Objective 3: Minimize erosion, sedimentation, and contaminated runoff from upstream sources.

Timber harvesting, associated road building, and maintenance of existing unsurfaced roads can contribute significant amounts of sediment to streams and other water bodies if not properly managed. Unmanaged off-road vehicle use of roads and non-road routes can also lead to an increase in erosion and sedimentation as well. Sediment from upstream sources can negatively impact water quality and degrade aquatic habitat and hydrologic function.

The Watershed Assessment notes that “impacts from timber harvesting and related unsurfaced roads in the Lake Almanor watershed appear to be reasonably well controlled. However, limited information was available, and a more comprehensive monitoring program could help to clarify the current situation and ensure that problems do not develop. Given the large portion of the watershed managed primarily or secondarily for timber production, this issue is significant and more information is needed to adequately characterize the conditions.”

Objective 3.1: Support efforts to seek funding for and implement a forest road inventory and assessment. (Watershed Assessment Section 7.3.2)

	Action	Product(s)	Completed by	Due by or priority
1	Seek funding for a forest road assessment to identify problem areas. If possible, include with funding for a tributary assessment (Objective 1.2).	<ul style="list-style-type: none"> • Submit proposals for funding 	Sierra Institute staff	Low priority
2	Develop and release a request for proposals for a contractor to conduct the assessment.	<ul style="list-style-type: none"> • RFP 	Sierra Institute staff	Low priority

Objective 3.2: Help minimize the impact of OHV use.

	Action	Product(s)	Completed by	Due by or priority
1	Review and provide comment on the OHV plan developed by the U.S. Forest Service.	<ul style="list-style-type: none"> • Comments 	ABWAC	Low priority
2	Identify and prioritize problem areas based on work already completed by the Forest Service, and determine if additional information is needed.	<ul style="list-style-type: none"> • Reports • Recommendation for next steps 	ABWAC and/or Sierra Institute staff	Low-medium priority

Action		Product(s)	Completed by	Due by or priority
3	Survey unmanaged off-road vehicle routes to determine usage trends. (Watershed Assessment Section 7.3.3)	<ul style="list-style-type: none"> • Seek funding for survey • Survey of off-road vehicle routes 	To be determined	Low priority
4	Support work between local supervisors and stakeholders (PG&E, Collins Pine, Forest Service) to minimize the impact of OHV use on the Chester Meadows area.	<ul style="list-style-type: none"> • Attend meetings as appropriate 	ABWAC	High priority

Objective 3.3: Take steps to help minimize shoreline erosion.

Action		Product(s)	Completed by	Due by or priority
1	Evaluate PG&E’s Shoreline Management Plan and PG&E’s responsibilities for shoreline management, especially with respect to PG&E versus county responsibility.	<ul style="list-style-type: none"> • Review and report at meeting • Additional action if necessary 	ABWAC	Low priority
2	Support lakeside homeowners in shoreline erosion prevention measures, as appropriate.	<ul style="list-style-type: none"> • Outreach and education 	ABWAC	Low-medium priority

Objective 3.4: Take steps to help minimize sedimentation from construction, timber harvesting, and associated road building.

Action		Product(s)	Completed by	Due by or priority
1	Identify existing and potential problem areas.	<ul style="list-style-type: none"> • Maps 	Land Use subcommittee	Medium priority
2	Select priority action areas.	<ul style="list-style-type: none"> • List of priorities • Next steps 	Land Use subcommittee	Medium priority
3	Encourage floodplain function by encouraging the use of bridges instead of culverts.	<ul style="list-style-type: none"> • Recommendations 	ABWAC	Medium Priority

Objective 4: Minimize urban run-off and effectively manage stormwater.

Lake Almanor and its tributaries receive runoff from roads, golf courses, lawns, and other surfaces around homes and developed areas. Runoff often contains potential pollutants, including sediment, biological contaminants, synthetic chemicals, fertilizers, and septage. Increased development around the lake has led to increasing concerns about urban runoff, especially associated with new developments and associated golf courses. It is important to minimize the pollutants in runoff to ensure a healthy lake environment.

Objective 4.1: Determine the feasibility of requiring *new* developments in the Basin to include low impact development techniques for managing stormwater and runoff.

Action		Product(s)	Completed by	Due by or priority
1	Research examples of low impact development techniques that are working in other watersheds.	<ul style="list-style-type: none"> • Report and presentation to ABWAC • Pamphlets 	Sierra Institute staff	Medium priority
2	Help minimize directly connected impervious surfaces.	<ul style="list-style-type: none"> • Recommendations 	ABWAC	Medium priority
3	Recommend low impact development techniques to the Board of Supervisors and the Planning Commission (or county consultants), and submit comments on the environmental documents for proposed developments in the basin.	<ul style="list-style-type: none"> • Recommendations for the General Plan • DEIR/EIR comments 	ABWAC	Medium priority

Objective 4.2: Reduce the impact of runoff from *existing* developments in the Basin.

Action		Product(s)	Completed by	Due by or priority
1	Research options and examples from other communities, including Lake Tahoe.	<ul style="list-style-type: none"> • Short report and presentation to ABWAC 	Sierra Institute staff and/or Land Use Subcommittee	Low priority
2	Submit a recommendation to the Board of Supervisors and incorporate the recommendation into comments on environmental documents for proposed developments.	<ul style="list-style-type: none"> • Recommendation • DEIR comments 	ABWAC	Low priority

Objective 4.3: Ensure that fertilizers applied to golf courses in the Basin do not negatively impact water quality.

Action		Product(s)	Completed by	Due by or priority
1	Explore golf course best management practices, including use of low impact fertilizers and chemicals.	<ul style="list-style-type: none"> • Interviews • Short report 	Land Use subcommittee, with assistance from the Technical Advisory Group and Sierra Institute staff	Low priority
2	Recommendations for improving proposed and existing golf courses, if applicable.	<ul style="list-style-type: none"> • DEIR comments • Recommendations 	ABWAC	Low priority

Objective 5: Identify critical habitat areas and prioritize areas for protection or restoration.

The Lake Almanor watershed provides habitat for a diverse assemblage of wildlife species, including a number with special management concerns. The basin has been designated an Important Bird Area by Audubon California. According to the Watershed Assessment, one federal threatened and two federal endangered species, and four State of California threatened and four state endangered animal species, are found in the basin. A number of these threatened and endangered species breed here, including the Greater Sandhill Crane and Willow Flycatcher. In addition, the Watershed Assessment and Stakeholder Assessment highlighted the summer presence of the Eastern Tehama deer herd, and the herd’s population decline, as a major concern that needs to be addressed. Of particular concern to biologists is the limited wetland and meadow habitat remaining in the Almanor Basin, and the critical importance of this habitat to wildlife and human populations alike.

	Action	Product(s)	Completed by	Due by or priority
1	Work with local biologists to identify and prioritize critical habitat areas.	<ul style="list-style-type: none"> • Critical habitat areas highlighted on a map and their importance described 	Wildlife subcommittee	July 2010
2	Identify specific habitat sites and possible management actions for each site.	<ul style="list-style-type: none"> • Specific habitat areas identified. 	Wildlife Subcommittee	Within one of year of completing Action 1
3	Seek funding for a stream conditions assessment, as recommended in the Watershed Assessment (Section 7.3.5), to identify priority areas for protection and/or restoration. (Also see Objective 1.2.)	<ul style="list-style-type: none"> • Grant proposals • Proposals could include funding for stream and road assessments 	Sierra Institute staff	October 2009
4	Conduct a stream conditions assessment. If appropriate, contribute to a restoration plan for priority areas.	<ul style="list-style-type: none"> • Investigate existing tributary data, especially data from the Forest Service • Stream conditions assessment • Restoration plan 	Contractor	May 2010

	Action	Product(s)	Completed by	Due by or priority
5	Offer educational public workshop(s).	<ul style="list-style-type: none"> • Collect public questions, comments, and concerns 	Wildlife subcommittee and staff	Starting June 2009
6	Support school-based stewardship education programs.	<ul style="list-style-type: none"> • To be determined 	ABWAC and staff	Ongoing
7	Explore opportunities for funding and for partnerships to advance and/or implement habitat protection and restoration efforts.	<ul style="list-style-type: none"> • List of opportunities • Help ensure that deer migration corridors and access to water are protected 	Wildlife subcommittee and staff	Following completion of task 5.4
8	Work with PG&E in the development of the Habitat Management Plan as described in FERC relicensing agreement.	<ul style="list-style-type: none"> • Stakeholders meeting with PGE, Collins Pine, CPUD, DFG, 	Wildlife subcommittee and staff	Within one year of Settlement Agreement implementation
9	Be involved in the decisions relating to the Stewardship Council Lands in the Basin.	<ul style="list-style-type: none"> • Attend meetings and provide input 	ABWAC and staff	Ongoing

Objective 6: Identify and monitor indicator species to assess watershed management activities and overall basin health.

Almanor Basin plants and animals can reveal a great deal about ecosystem health and the effects of land management strategies. The selection and monitoring of appropriate indicator species can be used to track the overall health of the Lake Almanor Basin. In addition to native vertebrates, invasive and macroinvertebrate species can be effective indicators.

Action		Product(s)	Completed by	Due by or priority
1	Work with local biologists to identify appropriate indicator species.	<ul style="list-style-type: none"> List of indicator species 	Wildlife subcommittee	Ongoing
2	Offer educational public workshop(s) and/or newspaper articles.	<ul style="list-style-type: none"> Collect public questions, comments, and concerns 	Wildlife subcommittee	Starting June 2009
3	Develop recommendation(s) for a scope of work that considers the following: <ul style="list-style-type: none"> Who will conduct monitoring? (Could there be opportunities for citizens monitoring?) Who will pay for monitoring? Who will analyze the data and report the results? 	<ul style="list-style-type: none"> One or more recommendations 	Wildlife subcommittee	July 2009
4	Submit recommendation(s) to the Board of Supervisors.	<ul style="list-style-type: none"> Attend Board meeting 	ABWAC	July/August 2009

Objective 7: Maintain healthy fish populations in Lake Almanor and its tributaries, including a cold-water fishery.

Lake Almanor is a popular fishing destination. The lake is known for producing trophy sized fish. Rainbow and brown trout, landlocked Chinook salmon, large- and small-mouth bass, green sunfish, Sacramento perch, channel catfish, and brown bullhead catfish can all be found in the lake. The ABWAC recognizes that maintaining a healthy fishery is vital to maintain a healthy ecosystem and a thriving tourism economy.

	Action	Product(s)	Completed by	Due by or priority
1	Inventory fish populations in the basin (by species and relative abundance) by compiling existing data into one database.	<ul style="list-style-type: none"> Database of fish species present in Lake Almanor and tributaries, with population estimates 	ABWAC, staff, and partner organizations	Low-medium priority
2	Work with the Forest Service to identify potential projects and opportunities for collaboration.	<ul style="list-style-type: none"> Identification of potential projects and opportunities 	ABWAC and the Forest Service fisheries biologist	Medium priority

Objective 8: Prevent the spread and establishment of invasive species in the Almanor Basin.

Non-native plants and animals have the potential to significantly alter aquatic and terrestrial ecosystems in the Lake Almanor watershed. They are known as “invasive” species because they often cause economic and environmental damage and can be extremely difficult to eradicate. Invasive species are usually transported by human activity, frequently on vehicles.

One of the largest threats currently facing the basin is the potential for a Dreissenid mussel infestation. Quagga and zebra mussels, closely related species from the Dreissena genus, are native to Eastern Europe and Russia. Once they become established, they are extremely difficult, if not impossible, to eradicate: as many as 700,000 mussels per square meter have been reported in infested areas. Zebra mussels were first found in North America in 1988 in the Great Lakes. In the summer of 2007, quagga mussels were found in the Colorado River Aqueduct, and they have recently been found in southern California reservoirs.

U.S. Congressional researchers have estimated that the zebra mussel infestation of the Great Lakes area cost industries, businesses, and communities more than \$5 billion between 1993 and 1999. In California, the mussels threaten water delivery systems, hydroelectric facilities, agriculture, recreational boating and fishing, and the environment. While there are other invasives with the potential to wreak havoc on local ecosystems, preventing the infestation of these mussels is a top priority.

Objective 8.1: Take action to help ensure that the Lake Almanor Basin remains free of quagga and zebra mussels.

	Action	Product(s)	Completed by	Due by or priority
1	Launch, and commit to, an education campaign for residents (seasonal and year-round) and visitors.	<ul style="list-style-type: none"> • Newspaper articles • Homeowners association meetings • Signs at boat ramps 	ABWAC, mussel subcommittee and staff	Ongoing, high priority if necessary
2	Hold an educational workshop with representatives from Fish & Game.	<ul style="list-style-type: none"> • Workshop 	ABWAC and Sierra Institute staff	May 2009
3	Work with partners to coordinate a response to the mussel threat and implement the above tasks.	<ul style="list-style-type: none"> • Invite partners to the May workshop with Fish & Game • Involve partners in discussions about monitoring and inspections 	Sierra Institute staff and ABWAC	In progress and ongoing high priority if necessary

Action		Product(s)	Completed by	Due by or priority
4	Explore the feasibility of an inspection program for boats prior to launch.	<ul style="list-style-type: none"> • Research what others are doing • Recommendation if appropriate 	Sierra Institute staff and ABWAC members	Ongoing
5	Based on action by PG&E and the Department of Fish and Game, consider a volunteer monitoring program at boat ramps around the lake.	<ul style="list-style-type: none"> • Recruit volunteers for at least two monitoring sites if necessary • Receive training from Fish & Game • Conduct monthly monitoring 	Sierra Institute staff, ABWAC members, community volunteers	Dependent on PG&E's plan for Lake Almanor

Objective 8.2: Help minimize the impact and spread of invasive species currently established in the basin, and work to prevent additional invasives from establishing through education, monitoring, assessments, and work with partners.

Action		Product(s)	Completed by	Due by or priority
1	Determine the extent of milfoil in Lake Almanor and its potential to spread.	<ul style="list-style-type: none"> • Milfoil survey 	Contractor	Low priority. Dependent on funding
2	If warranted, work with partners to develop a management/eradication plan to prevent the spread of milfoil.	<ul style="list-style-type: none"> • Milfoil management/eradication plan 	Contractor and partners	Low priority
3	Research invasive species management plans from other areas and develop recommendations for Almanor.	<ul style="list-style-type: none"> • Survey of existing plans • Recommendations 	ABWAC	Low priority

Objective 9: Advance watershed stewardship through a comprehensive outreach and education program and the development of educational material.

Some of the current threats to habitat and water quality, like improperly maintained septic systems and illegal OHV use, can be addressed through outreach and education programs. Outreach will also help to garner citizen interest and involvement in the watershed and its management.

Objective 9.1: Promote opportunities for community-wide watershed education.

	Action	Product(s)	Completed by	Due by or priority
1	Host or present educational workshops for the general public and/or homeowners associations.	Topics: <ul style="list-style-type: none"> • Septic system • State of the Watershed • Indicator species • Invasive zebra/quagga mussels 	ABWAC and staff	Ongoing
2	Offer family-oriented educational outdoor activities.	<ul style="list-style-type: none"> • Bird walks • Tours • Trash clean-ups • Meadow exploration 	ABWAC, staff, and partners	Ongoing, especially in summer
3	Support and, where possible, collaborate with and promote existing educational opportunities.	<ul style="list-style-type: none"> • Sierra Institute Center of Forestry tours • 6th grade watershed education program • Chester High School limnology program 	ABWAC, staff, and partners	Ongoing
4	Coordinate ABWAC activities with the Chester High School limnology program as appropriate.	<ul style="list-style-type: none"> • More student involvement in public watershed work and public knowledge of the limnology program 	ABWAC and staff	Ongoing

Objective 9.2: Host a watershed awareness booth and/or provide watershed information at community events, including games and educational items for children.

Action		Product(s)	Completed by	Due by or priority
1	Develop and prioritize a list of events to attend.	• List	ABWAC/Sierra Institute staff	Spring 2009 and ongoing
2	Develop booth/material to be used.	• Booth • Lemonade stand?	ABWAC/Sierra Institute staff	Late Spring 2009
3	Contact event coordinators for details.	• Staff report	Sierra Institute staff	Late Spring 2009
4	ABWAC members sign up for duty at each event.	• List	ABWAC	Summer 2009
5	Attend event!	• Host a booth at the event	ABWAC/Staff	Summers, ongoing

Objective 9.3: Contribute educational watershed articles to the Chester Progressive and other Plumas and Lassen County newspapers.

Topics:		Completed by	Due by or priority
1	State of the Watershed	ABWAC and Sierra Institute staff	Yearly in August
2	Indicator species	Wildlife Subcommittee	Yearly in August
3	Septic systems	Land Use	Ongoing, yearly
4	Invasive zebra/quagga mussels	Staff	Ongoing
5	Shoreline erosion	ABWAC or staff	High priority
6	Additional topics as appropriate	ABWAC or staff	Ongoing

Objective 9.4: Produce and distribute a quarterly watershed newsletter to inform and educate partner organizations and the public.

Action		Product(s)	Completed by	Due by or priority
1	Suggest ideas for articles.	• Suggestions submitted to watershed coordinator	ABWAC	Ongoing
2	Write articles and produce the newsletter.	• Newsletter	Watershed coordinator	July, October, January, April
3	Distribute newsletter and submit key articles to the Chester Progressive.	• Articles submitted to Chester Progressive	Watershed coordinator	End of July, October, January, April

Objective 9.5: Engage stakeholders in the development and finalization of management recommendations prior to submittal to the Plumas County Board of Supervisors.

Action		Product(s)	Completed by	Due by or priority
1	Hold workshops and solicit public input prior to voting on and submitting recommendations to the Board of Supervisors, as appropriate.	• Workshops held and comments collected	ABWAC	Ongoing
2	Encourage the public to attend and participate in ABWAC meetings.	• Newspaper articles, additional outreach as appropriate	Sierra Institute staff, ABWAC members	Ongoing

Objective 9.6: Maintain and promote an up-to-date website that will serve as an educational resource for residents and land managers in the Almanor Basin.

Website elements		Completed by	Due by or priority
1	Water quality monitoring database	Sierra Institute staff	Yearly, or as data become available
2	Reports and presentations		Ongoing
3	Project updates and information		Ongoing
4	Google Earth watershed tours		Ongoing
5	ABWAC meeting minutes and additional committee information		Monthly

GOAL 2

Maintain and improve quality of life in basin communities; minimize the negative social impacts of development and maximize the benefits.

Objectives:

10. Protect and enhance opportunities for recreation and public access without compromising water quality or wildlife habitat.
11. Ensure that land conversions (e.g., recreation lands to developments and TPZ lands to general forest) maximize benefits and minimize negative impacts to basin quality of life and wildlife habitat.
12. Through education, create and maintain fire safe communities.
13. Protect visual resources, including open space and scenic highway corridors.
14. Ensure healthy air quality.
15. Coordinate basin planning to ensure adequate infrastructure for new and existing developments, including transportation corridors for commuting and recreational travel. (Infrastructure includes roads, wastewater systems, stormwater management systems, etc.)
16. Ensure that attainable housing is available for local workers, and avoid economically stratified housing.

Objective 10: Protect and enhance opportunities for recreation and public access without compromising water quality or wildlife habitat.

Public access to Lake Almanor has always been limited, and it has only become more limited as access points have been converted into private resorts or developments that provide members-only access or charge day-use fees. At present, despite 52 miles of shoreline, there are only two free public boat launches on Lake Almanor. Efforts under this objective should be linked to the 2105 re-licensing process.

Action		Product(s)	Completed by	Due by or priority
1	Work with the Planning Commission, county consultants, the Board of Supervisors, and basin stakeholders to ensure that recreation and access issues are specifically addressed in the General Plan.	<ul style="list-style-type: none"> • Meetings • Recommendations for the General Plan 	ABWAC	Medium priority
2	Work with the 2105 Committee and others in their work to improve public access to the lake.	<ul style="list-style-type: none"> • Attend and contribute to meetings 	ABWAC	Medium priority
3	Track land use changes around the lake and bring significant proposed changes to the public’s attention so that citizens are aware of these proposals and can offer comments early in the process.	<ul style="list-style-type: none"> • Meetings and articles if appropriate • Information on website 	ABWAC with staff support	Medium-high priority
4	Examine the usefulness of having an ABWAC member participate in PG&E’s recreational flow technical advisory group.	<ul style="list-style-type: none"> • Recommendation 	ABWAC with staff support	Low priority
5	Support efforts to expand non-motorized trails.	<ul style="list-style-type: none"> • Participate in meetings to develop the Plumas County Trails Master Plan • Work with Trails for Plumas County on expanding trails in the Almanor Basin 	ABWAC and staff	Medium priority

Objective 11: Ensure that land conversions (e.g., recreation lands to developments and TPZ lands to general forest) maximize benefits and minimize negative impacts to basin quality of life and wildlife habitat.

Zoning conversions can lead to significant land use changes that can impact human communities, infrastructure, and natural resources. As conversions are proposed, it is important to assess the potential impacts, especially in the context of other proposed changes within the basin.

Action		Product(s)	Completed by	Due by or priority
1	Assess land use conversions to determine if there are potential impacts.	<ul style="list-style-type: none"> • Assessment • Coordinate with the Planning Commission 	Land Use Subcommittee and staff	Ongoing
2	Submit recommendations to the Board of Supervisors.	<ul style="list-style-type: none"> • Recommendations 	ABWAC	Ongoing as appropriate

Objective 12: Through education, create and maintain fire safe communities.

Communities in Plumas County, including the Almanor Basin, are surrounded by forestland and an over-abundance of hazardous fuels. The “Plumas County Communities Wildland Fire Mitigation Plan” was developed in 2005 by the Plumas County Fire Safe Council to reduce the risk to homes and communities through education and outreach programs, the development of partnerships, and implementation of preventative activities such as hazardous fuel reduction, defensible space, land use, or building codes.

The State Board of Forestry and Fire Protection adopted “General Guidelines for Creating Defensible Space” in February 2006 to help reduce the potential impact of wildfire. These guidelines should become part of the environmental documents for all proposed developments. These guidelines should also be adopted by existing developments.

Objective 12.1: Work with developers, homeowners, and the county, along with local Fire Safe Councils and agencies, to help ensure that risk reduction recommendations and fire safe practices are incorporated into basin planning and management.

Action		Product(s)	Completed by	Due by or priority
1	Host a joint meeting of the Almanor Basin Fire Safe Council and the ABWAC, or a subcommittee, to discuss the Community Fire Plan and opportunities for partnership.	• Meeting(s)	ABWAC and Fire Safe Council	Medium priority
2	Hold educational public workshop(s).	• Workshop	ABWAC and partners	Ongoing medium priority
3	Submit recommendations to the Board of Supervisors based on discussions with the Fire Safe Council.	• Recommendations	ABWAC	Medium priority
4	Submit comments on environmental documents for proposed developments in the basin.	• Comments submitted	ABWAC	Medium priority

Objective 12.2: Reduce hazardous fuels on public land.

Action	Product(s)	Completed by	Due by or priority
Support the Forest Service in reducing hazardous fuel loading on public land, particularly Wildland Urban Interface areas.	• Meeting(s)	ABWAC, Fire Safe Council, Forest Service	Ongoing

Objective 13: Protect visual resources, including open spaces and scenic highway corridors.

Sweeping mountain views and clear streams and lakes contribute to a picturesque landscape that has made the Almanor Basin a premier destination for tourists, second-home owners, recreationists, and retirees. Maintaining this scenic value is critical for promoting the basin as a destination area, enriching the local economy through tourism and development, and maintaining quality of life for those who live in the basin.

Objective 13.1: Help maintain visual resources.

	Action	Product(s)	Completed by	Due by or priority
1	Identify and prioritize areas in which scenic values are threatened, and determine if these areas are adequately protected.	<ul style="list-style-type: none"> • List of priorities 	ABWAC	Medium priority
2	Make recommendations to the Board of Supervisors, the Planning Department, the Planning Commission, or county consultants working on the General Plan update.	<ul style="list-style-type: none"> • Recommendations 	ABWAC	Medium priority

Objective 14: Ensure healthy air quality.

Smoke and other air pollutants tend to settle in mountain valleys and compromise air quality. Affordable/attainable housing can contribute to maintaining good air quality by eliminating the need for workers to commute longer distances from more affordable communities outside the basin. Additional air quality concerns often stem from smoke from woodstoves and wildfires.

	Action	Product(s)	Completed by	Due by or priority
1	Identify existing air quality data for the basin; review the data and identify problem areas.	<ul style="list-style-type: none"> • List 	ABWAC subcommittee	Low priority (State standards are established and tracked)
2	Make the data publically available.	<ul style="list-style-type: none"> • Website 	Sierra Institute staff	Low priority
3	Develop an air quality subcommittee if problems are identified.	<ul style="list-style-type: none"> • Active subcommittee 	ABWAC	Low priority
4	Promote education through workshops, articles, or other means, if necessary.	<ul style="list-style-type: none"> • Articles or workshops as appropriate 	ABWAC/Sierra Institute staff	Low priority
5	Submit recommendations to the Board of Supervisors if appropriate.	<ul style="list-style-type: none"> • Recommendation 	ABWAC	Low priority
6	Offer to work with the Planning Commission or county consultants to ensure that air quality issues are adequately addressed in the General Plan.	<ul style="list-style-type: none"> • Contact made 	ABWAC	Low priority

Objective 15: Coordinate basin planning to ensure adequate infrastructure for new and existing developments. (Infrastructure includes roads, wastewater systems, stormwater management systems, etc.)

Thousands of new lots are ready or near ready to be built upon in the Almanor Basin. New development often lacks adequate analysis of pre-existing conditions and does not adequately evaluate the effects of a project in the context of other activities, current or planned. Transportation, road maintenance, air pollution mitigation, and habitat and water quality protection need to be incorporated into discussions about housing and new developments.

	Action	Product(s)	Completed by	Due by or priority
1	Develop a checklist to evaluate proposed developments.	<ul style="list-style-type: none"> • Evaluation checklist 	ABWAC subcommittees	December 2009
2	<p>Review and comment on environmental documents for proposed developments and projects in the basin.</p> <p>Review proposals to make sure that the cumulative effects of proposed projects, housing developments, and zoning changes are analyzed within the context of existing <i>and</i> proposed projects in the basin. If cumulative effects are not adequately analyzed, make comments with specific suggestions for improvement.</p>	<ul style="list-style-type: none"> • DEIR comments 	ABWAC and Sierra Institute staff	Ongoing as documents become available

Objective 16: Ensure that attainable housing is available for local workers, and avoid economically stratified housing.

Basin workers are increasingly forced to live outside of the communities they work in due to the trend toward higher-end development in the basin. Ensuring attainable housing will help create opportunities for basin workers to live locally. Attainable housing will directly benefit air quality by eliminating the need for workers to commute longer distances from more affordable communities outside of the basin.

Action		Product(s)	Completed by	Due by or priority
1	Explore incentives and regulations to ensure developers make attainable housing available in their projects.	<ul style="list-style-type: none"> Brief report on examples from other areas 	Sierra Institute staff	Low priority
2	Work with the Planning Commission and/or county consultants to develop an affordable housing element for Chester-Lake Almanor in the Plumas County General Plan.	<ul style="list-style-type: none"> Attainable housing provided for in the General Plan 	Planning Commission and ABWAC	Completion of General Plan update, following completion of Task 1

GOAL 3

Establish ongoing investment, restoration, and coordinated management in the watershed.

Objectives:

17. Improve coordination between organizations and agencies working locally, and increase opportunities for collaborative partnership projects.
18. Work with agencies and other organizations to obtain investment in the watershed to support basin monitoring, restoration, and future coordination.

Objective 17: Improve coordination between organizations and agencies working locally, and increase opportunities for collaborative partnership projects.

Many organization, agencies, and committees work in the Almanor Basin, yet too often management and outreach efforts are uncoordinated. Under this objective, ABWAC will work to bring managers together to explore opportunities for partnerships and leverage resources for linked work.

Objective 17.1: Attend the meetings of other groups and agencies working locally on watershed issues to exchange information about projects and work and discuss partnership opportunities.

Group/organization		Product(s)	Completed by	Due by or priority
1	Feather River CRM	<ul style="list-style-type: none"> Attend meetings and look for opportunities for partnerships 	Watershed Coordinator and/or ABWAC members	Ongoing
2	Feather River RCD			Quarterly
3	Plumas Watershed Forum			Ongoing
4	U.S. Forest Service			Ongoing
5	Planning Commission	<ul style="list-style-type: none"> Report on workshops, meetings, tours attended 	Chair or subcommittee	Ongoing
6	WATERS (quarterly watershed coordinators meeting)		Watershed Coordinator	Quarterly

Objective 17.2: Help coordinate and host an annual Lake Almanor Clean-up as a partnership event between ABWAC, Feather River CRM, PG&E, Plumas County, and the community.

Action		Product(s)	Completed by	Due by or priority
1	Hold an annual lake clean-up.	<ul style="list-style-type: none"> Lake Almanor Clean-up 	ABWAC, staff, partners	Annual in September
2	Explore opportunities for additional collaboration between clean-up partners.	<ul style="list-style-type: none"> Discussion with partners 	ABWAC and staff	Ongoing

Objective 17.3: Use educational public workshops to create and maintain partnerships and facilitate the exchange of information between partners and the public.

Action		Product(s)	Completed by	Due by or priority
Host educational workshops with a diverse group of partners.		• Workshops	ABWAC	Ongoing

Objective 17.4: Help establish a water quality database for the whole Feather River watershed.

Action		Product(s)	Completed by	Due by or priority
1	Explore the feasibility of a watershed-wide database, including funding needs.	• Workshops	Sierra Institute staff, ABWAC, and partners	Low-medium priority
2	Identify data sources.	• List of data sources for all branches of Feather River	Sierra Institute staff and partners	Low-medium priority
3	If appropriate, seek funding to establish a database.	• Identify who will house, update, and maintain the database • Submit grant proposals	Sierra Institute staff and partners	Low-medium priority

Objective 17.5: Investigate new institutional structures for basin coordination.

Action		Product(s)	Completed by	Due by or priority
1	Investigate the feasibility of incorporating the basin as one district or city.	• Recommendation	ABWAC	Low priority
2	Explore possibilities for new organizational structures for the ABWAC, including a watershed council model.	• Recommendation	ABWAC and staff	Medium priority

Objective 18: Work with agencies and other organizations to obtain investment in the watershed to support monitoring, restoration, and future coordination.

The basin’s vast public and private working forestlands are crucial for providing wildlife habitat, carbon sequestration, clean water, and jobs for local residents. Securing investment in the ecosystem services that working landscapes provide can help to pay for lake and tributary monitoring, prevent critical habitat from being lost, and help keep working lands working. Increasing investment in ecosystem services will increase the likelihood that the Almanor Basin’s most valuable living resource, its forest and riparian land, is sustainably managed for the good of the ecosystem, the economy, and local communities.

Objective 18.1: Identify and recommend sustainable funding opportunities for water quality monitoring, restoration, and coordination.

Action	Product(s)	Completed by	Due by or priority
Form a subcommittee to explore funding options. (Also see Objective 1.1)	<ul style="list-style-type: none"> Recommended actions from subcommittee 	ABWAC and staff	High priority

Objective 18.2: Work toward implementation of an ecosystem services pilot project in the Lake Almanor Basin to fund monitoring and coordinated management.

Action elements	Product(s)	Completed by	Due by or priority
1 Hold team meetings to develop a pilot project.	<ul style="list-style-type: none"> Identify existing institutional mechanisms for investment Brief inventory/overview of basin services Identify existing methods for calculating value 	Sierra Institute staff and partners	High priority
2 Seek additional funding for an ecosystem services pilot.	<ul style="list-style-type: none"> Proposals submitted 	Sierra Institute staff	High priority
3 Implement ecosystem services pilot.	<ul style="list-style-type: none"> Implement pilot project and increase investment in the basin 	Sierra Institute staff	High priority