Original in 319 File & w/ Mary Ellen Dennis

SUMMIT
ENVIRONMENTAL CONSULTANTS, INC.

ANDROSCOGGIN LAKE WATERSHED SURVEY
TOWNS OF WAYNE AND LEEDS

Prepared for:
TOWN OF WAYNE

Prepared by:
SUMMIT ENVIRONMENTAL CONSULTANTS, INC.
640 Main Street
Lewiston, Maine 04240

Carrie R. Fichter
Staff Engineer

James W. Bouquet, PE
Principal Engineer

December 11, 2000
Project 3309:1112.DOC

Table of Contents

ACKNOWLEDGEMENTS

The following people were instrumental in carrying out the tasks necessary to complete the Androscoggin Watershed Survey project and deserve special recognition:

Martha Hodinott, President of the Androscoggin Lake Improvement Corporation (ALIC)

Jack Mahoney the Project Coordinator and long-time water quality monitor on Androscoggin Lake

Their efforts in recruiting volunteers and arranging meetings resulted in the successful completion of the Watershed Survey.

Watershed Volunteer Surveyors

Ken Bate
Lisa Davis
Gloria Foss
Ken Floss
Peter Gordon
Martin Gawron
Tom Gomolka
Debbie Hite
Dick Hoddinott
Rachel Hudson
Steve Hudson
Jamie Isaacson
Tom Isaacson
Tag Lindsey
Liz Manduca
Mark Manduca
Brian Meldrum
Carroll Paradis
Dave Petell
Beth Pochopien
Alan Richardson
Burt Stevens
Steph Thomas
Chuck Thomas
Dave Trider
Sara Yindra
Dick Parent

Steering Committee

The following individuals donated their time to provide input and support for the survey:

Peter Ault
Aaron Buckley
Dwight Buckley
John Capen
Lisa Davis
Mary-Ellen Dennis
Mike Deyling
Martin Gawron
Tom Gomolka
Martha Hoddinott
Jack Mahoney
Linda McKee
Dick Parent
Dave Petell
Beth Pochopien
Walter Reiter
Randy Veilleux
John Yindra
Sara Yindra

Technical Staff

Mary-Ellen Dennis, Maine Department of Environmental Protection
United States Environmental Protection Agency
Mike Deyling, Summit Environmental Consultants, Inc.
James Bouquet, Summit Environmental Consultants, Inc.

1.0 INTRODUCTION

Androscoggin Lake is located in the Town of Wayne and Leeds, Maine. It has a surface area of approximately 3993.1 acres with a direct watershed of 18.1 square miles. A portion of the Dead River watershed (approximately 6 miles long) was included in the Survey due to it's potential for flow reversal into Androscoggin Lake during periods of high flow.

Water quality data from Androscoggin Lake show an average Trophic State Index (TSI) of 58. TSI is a measure of the Lake's alga productivity. At present the average TSI for monitored Maine lakes is 48 out of a possible 100. Thus, the average Maine Lake is considered to have moderate algal production. Androscoggin Lake has a TSI that indicates moderate algal production usually associated with average transparency and average chlorophyll-a. However, as evidenced by an algae bloom in 1999, water quality is subject to significant variations on an annual basis as a result of climatologic conditions (i.e. temperature and precipitation) and nutrient loading. For additional Androscoggin Lake water quality (secchi disk transparency and graphs, chemical and trophic state parameters and temperature and dissolved oxygen profiles) see Appendix A.

A diverse array of activities occurs on and adjacent to the Lake that creates non-point source pollution pressures on Lake water quality through erosion of soil and transport of sediment to the Lake. Some of these activities include construction of permanent and seasonal residences along the lake shore, unpaved camp access roads, Town and State roadways, boat launch areas, farms, two private campground businesses, moderate to heavy recreational and fishing boat traffic, and continued development within the watershed.

2.0 OBJECTIVES

The primary objectives of the watershed survey were to:

1. Educate the general public about non-point source pollution and it's effect on Androscoggin Lake water quality.
2. Identify and prioritize existing sources of erosion and sediment transport within the watershed.
3. Prepare a series of recommendations for areas identified as posing threats to water quality.

The survey is the initial step in developing a watershed Management Plan and subsequent Implementation Projects in the future. Of equal importance, the watershed survey helped raise awareness in the Towns of Wayne and Leeds of the connection between land use and water quality.

3.0 METHOD

The Town of Wayne acted as project sponsor and worked in conjunction with the ALIC to implement the Survey. The ALIC used its membership base as a means of recruiting volunteers to assist in the completion of the Survey.

On April 26 and 29, 2000, a team of 28 volunteers participated in training sessions. The training included a classroom session to describe non-point source pollution, describe the Survey process, identify Survey sectors, familiarize volunteers with base maps, provide examples of erosion concerns, describe accurate record-keeping and answer questions from landowners. A field session followed and included observations of both stable and unstable soil conditions, and information on how to locate and document the observed conditions.

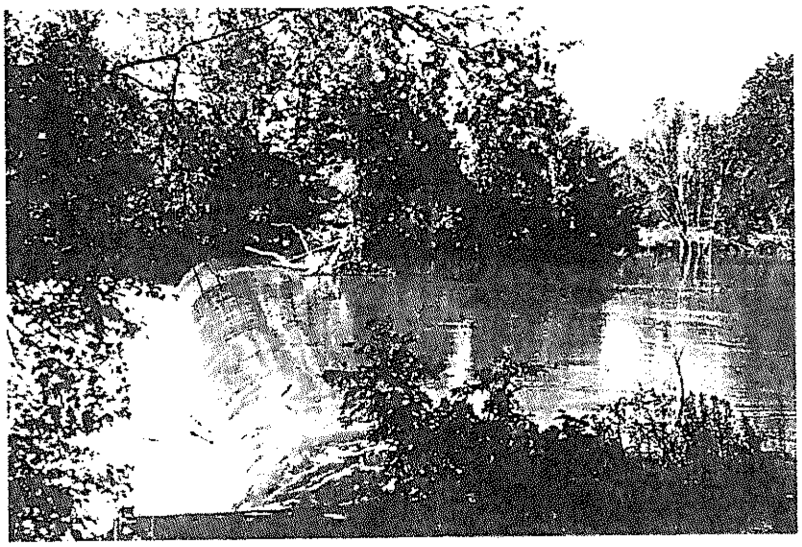
For the purpose of this Survey, the watershed was divided into thirteen survey sectors delineated on Figure1. The lake experiences seasonal variation is water level, which causes shoreline erosion. The volunteers conducted their survey during the spring and summer of 2000. During this period, significant run-off occurs and the Lake experiences its highest use and highest levels. In late summer, a technical team arranged visits to the sites identified by volunteers to verify conditions and establish recommendations for particular sites. Although winter activities pose less concern with respect to sediment loading, a review of snowplowing and road sanding operations will be made to evaluate potential impacts caused be those activities.

3.1 Dead River Impact

Under normal flow conditions, Androscoggin Lake discharges via an approximately six-mile segment of the Dead River to the Androscoggin River. Because of the slight elevation difference between the Lake surface and the Androscoggin River at normal stage (water level), a rise in stage in the Androscoggin River from precipitation within its watershed results in conditions that can allow flow reversal (backflow) from the Androscoggin River to Androscoggin Lake.

In the 1930s, a dam was installed on the Dead River in an attempt to limit flow from the Androscoggin River to Androscoggin Lake during high flow conditions. However, during significant long term or high intensity precipitation events, overtopping of the dam occurs and flow reversal takes place. This phenomena typically occurs several times during a normal year. The figure below shows flow reversal over the Dead River dam after a period of heavy precipitation.

Since flow reversal occurs during high flow conditions in the river, the flow reversal typically results in a very high sediment load being discharged to the Lake. While specific erosion features are not identified on the Dead River in this Survey Report, the backflow likely contributes significant sediment (and associated phosphorous) to the Lake.



Flow Reversal - Dead River Dam

Because of the large scale of discharge events involving the Dead River flow reversal, potential solutions will require complex engineering and are likely to be very high cost items. Nonetheless, the effect of backflow into the Lake should be considered in developing long-term Watershed Management Plans and future implementation Projects.

3.2 Survey Sectors

The watershed was divided into thirteen survey sectors and are delineated on the Androscoggin Lake Watershed base map presented as Figure 1.

Sector A (1): This sector includes the north portion of the Androscoggin Lake watershed. The northern boundary includes the north portion of the watershed located north of Route 133. The eastern boundary bisects Berry Pond Road and lies halfway between Route 133 and Richmond Mill Road. The western boundary is a line that connects Berry Pond Road to Tucker Road. The southern boundary is Tucker Road and Route 219 in the Town of Wayne.

Sector A (2): This sector includes the northwestern portion of the Androscoggin Lake watershed. The north boundary begins at Tucker Road, runs easterly, and then bisects Route 106 and the Central Maine Railroad. The southern boundary is Route 219. The eastern boundary is a line that connects Berry Pond Road to Tucker Road.

Sector B (1): This sector includes the northeastern portion of the Androscoggin Lake watershed. The north boundary starts at Route 133 in the Town of Wayne and runs easterly to Morrison Heights Road. The eastern boundary follows Morrison Heights Road approximately 1.75 miles to the southern boundary line. The southern boundary is a line that connects the southern tip of the eastern boundary and the Androscoggin Lake shoreline.

Sector B (2): This sector includes the eastern portion of the Androscoggin Lake watershed. Its northern boundary is 1.75 miles south of Route 133. The eastern boundary is Morrison Heights Road and stops approximately 0.5 miles north of the Winthrop-Monmouth town line. The southern boundary is a line that connects the southern most point of the eastern boundary and the Kennebec County Line.

Sector C (1): This sector includes the southeastern portion of the Lake's watershed. It's eastern boundary begins 0.5 north of the Winthrop-Monmouth town line, continues south, bisects Route 202 and Blue Hill Road and ends approximately 0.25 miles north of Norris Hill Road. The southern boundary is a parallel line that connects the southern tip of the eastern boundary and Route 202. The western boundary follows Route 202 north, bisects Blue Road and then follows Blue Road to Curtis Corner. The western boundary is a line that connects Curtis Corner and the northern tip of the eastern boundary.

Sector C (2): This sector is south of C(1) and includes the southern portions of the Androscoggin Lake watershed. Its northern and eastern boundaries are sector C (1)'s southern boundary. The western boundary begins at Route 106, runs south, and lays to the west of Island Pond and ends at Route 202.

Sector D: This sector includes the southwestern portion of the Androscoggin Lake watershed. The northwestern boundary of Sector D is Merrill Road. The west boundary crosses Route 106 and continues southward on the east side of Route 106 to Bernie Hartford Road. The south and eastern boundaries is a line that connects Bernie Hartford Road to Wilson Pond Road.

Sector E (1): This sector includes northwestern portions of the Androscoggin Lake watershed. The boundary on the north is Route 219 and the boundary to the south is Cemetery Road.

Sector E (2): This sector includes western portions of the Androscoggin Lake Watershed. The northerly boundary extends to Cemetery Road and the southerly boundary is at Merrill Road.

Sector Lake Shore North (LSN): This sector includes the north shore of Androscoggin Lake bounded by the Kennebec County line to the west and Davis Point to the east.

Sector Lake Shore East (LSE): This sector includes the east shore of Androscoggin Lake bounded by Davis Point to the north and Paradise Point to the south.

Sector Lake Shore West (LSW): This sector includes the west shore of Androscoggin Lake, the shorelines of Androscoggin Island and Norris Island. Lake Shore West is bounded by the Kennebec County line to the north and approximately 0.5 miles south of the Dead River to the south.

Sector Lake Shore South (LSS): This sector includes the south shore of Androscoggin Lake bounded by Paradise Point to the east and approximately 0.5 miles south of the Dead River to the west.

3.3 Ranking of Sites

For each verified site, a BMP or series of BMPs was recommended. In addition, where possible, a generalized repair or mitigation approach was developed for lower priority, yet widespread problem sites. This approach may allow a large number of low priority sites to be easily addressed rather than left unattended due to their relatively low priority ranking.

The criteria used for ranking sites are as follows:

Priority:

A priority rating of ***high, medium, low or none*** is assigned to each site. The following criteria were used:

1. Size of the area affected by the problem
2. Slope
3. Soil Type
4. Proximity to the lake shore, stream, ditch or other pathway to the lake
5. Natural treatment capacity.

- ***High*** – Direct flow to tributary or Lake, usually greater than 100 square feet of disturbance.
- ***Medium*** – Sediment transported off-site to buffer or wetland, generally less than 100 square feet of impact.
- ***Low*** – Erosion with limited sediment transport off-site even if the disturbed area is large.
- ***None*** – Currently no sediment transport off-site, or at the time of the technical team follow-up, the site was determined to not have an impact on the Lake.

Technical Level to Install/Perform Repair(s):

- ***High*** – Complex fix, technical assistance and engineering required.
- ***Medium*** – Moderate complexity fix, technical assistance necessary, need some equipment.
- ***Low*** – Simple technical fix, landowner can usually do work, minimal training needed or contractor can do without engineering/technical assistance.

Cost:

High - > $2,500
Medium - $500 to $2,500
Low - <$500

4.0 RESULTS

4.1 Site Identification

Volunteers identified 193 potential impact sites through the survey process. Of these, 164 were determined by the technical team to have a potential impact on water quality and are documented in this report. The remaining 29 sites either did not have a significant impact on water quality or could not be located. The number of sites identified in each sector is as follows:

- 13 sites in sector A(1)
- 26 sites in sector A(2)
- 28 sites in sector B(1)
- 14 sites in sector B(2)
- 3 sites in sector C(1)
- 5 sites in sector C(2)
- 24 sites in sector D
- 22 sites in sector E(1)
- 1 sites in sector E(2)
- 22 sites in sector LSN
- 3 sites in sector LSS
- 0 sites in sector LSE
- 3 sites in sector LSW

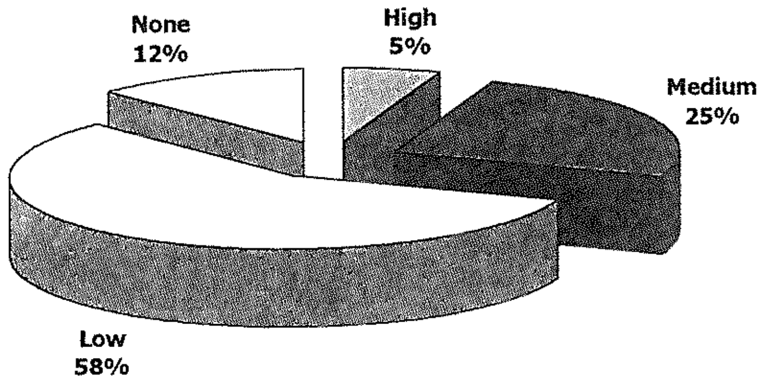
4.2 Priority Ranking

Identified sites were assigned a priority rating of low, medium, high or none. The majority of sites (58%) were identified as low priority. Five percent of the sites in the watershed were rated high and 25% were ranked as medium priority because of impact to Androscoggin Lake water quality. Twelve percent of the sites were ranked as "none" and are not currently affecting Lake water quality.

The assignment of high, medium, low and none should be interpreted cautiously. Nine sites in the watershed were rated "high" priority due to their direct impact to Androscoggin Lake's water quality. Although high priority sites require action, the cumulative impact to water quality of many low priority sites often outweighs that of a few high priority sites. All of the listed sites in Table 1 should be considered for remediation or stabilization.

The following chart illustrates the percentage of high, medium, low or "none" sites that were identified during the survey:

Percentage of Sites by Priority



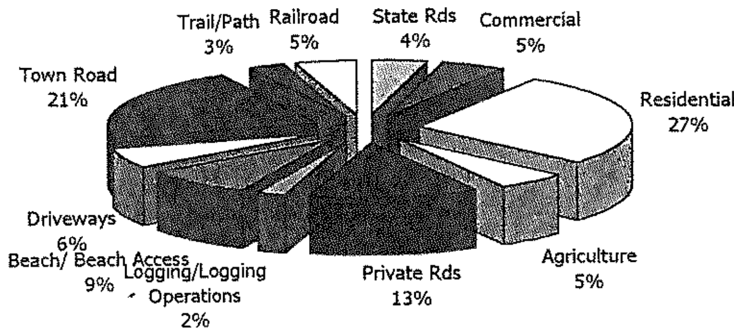
4.3 Land Use Breakdown

A total of eleven land use types were associated with the identified sites. These included:

A = Agriculture	D = Driveways	RR = Railroad
B/BA = Beach/Beach Access	L = Logging/Logging Operation	S = State Roads
	P = Private Roads	T = Town Roads
C = Commercial	R= Residential	T/P = Trail/Path

Residential sites account for 27% of the identified erosion sites. State and town roads combined comprise 25% of the sites, private roads account for 13%, driveways account for 6%. Beach and beach access sites were combined to account for 9% of the identified sites, followed by agricultural sites (5%), commercial and logging operations, 5% and 2%, respectively, railroad sites (5%) and trail/path sites account for 3% of the surveyed sites. The following chart illustrates the land use breakdown.

Percentage of Site by Land Use



The Androscoggin Lake Watershed Map (Figure 1) provides locations for the verified sites. Table 1 contains a summary of the sites and includes the following information: Sector and Site ID Number, Photo Number, Land Use Type, Type of Problem, Recommendations, Technical Level to Install or Perform, Cost, and Priority.

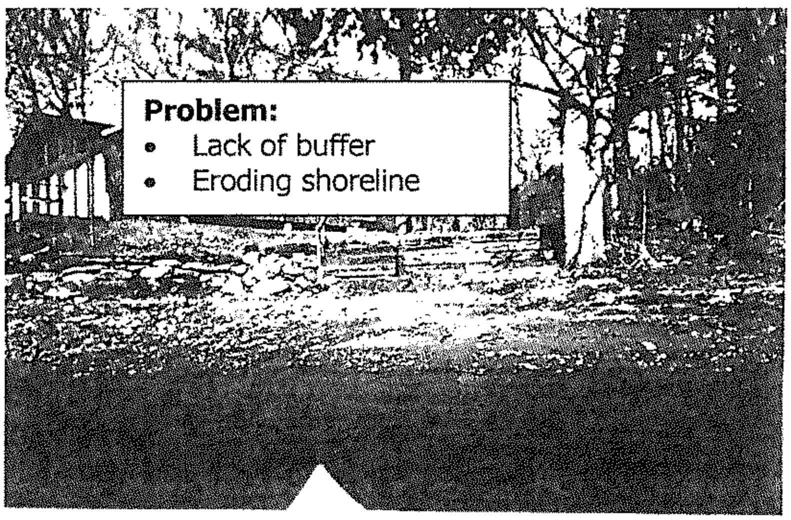
To use the Androscoggin Lake Watershed Survey summary table, go to the table and locate a site in Column 1 "Sector/Site ID". The first part of the ID refers to the Sector as described in Section 3.1. The second part of the ID is the sequential numbering of the sites.

An example of common problems identified and recommended BMPs is provided below for each land use. A picture depicting common problems for each land use type is included. A complete set of photographs taken by the survey teams can be found in the Androscoggin Lake Watershed Photograph Archive located at the Town of Wayne Town Office.

Residential Sites

Fifty-two residential sites were identified. Of the 52 sites, 34 are either low priority or no impact, 17 are medium priority, and one high priority site was identified. Solutions for 35 sites are simple technical fixes (low) with low cost. Three sites are simple technical fixes with medium cost and 7 sites require technical assistance (medium) with medium cost. One identified site is a high priority but judged to be a simple technical fix with low cost.

Common Problems Identified:	Recommended Solutions:
• Bare soil; lack of buffer	• Establish/enhance buffer
• Sediment transport to the Lake	• Reestablish and enhance vegetation along shoreline
• Slight to moderate ditch erosion	• Stabilize ditch with riprap or vegetate
• Slight to moderate surface erosion	• Stabilize shoreline
• Eroding shoreline	



Solution:

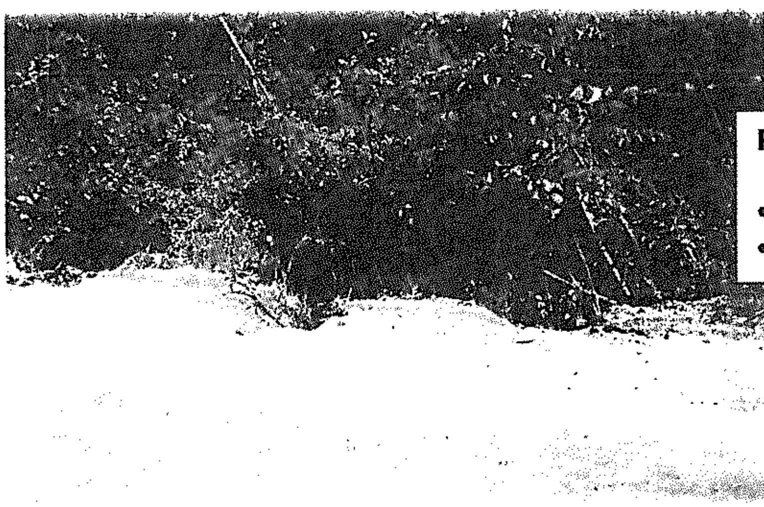
- Seed and mulch the eroded area

Although most residential sites are low priority, they are the largest percentage of survey sites found in the Androscoggin Lake watershed.

State and Town Road Sites

Thirty-nine Town Road sites and eight State Road sites were identified. Of the 47 sites, 25 are low priority, simple technical fixes and low cost, 6 are medium priority, moderate complexity fix and medium cost, and 2 sites are high priority. Of the two high priority sites, one is a simple technical fix with low cost and one requires a high level of technical assistance with high cost.

Common Problems Identified:	Recommended Solutions:
• Slight to severe shoulder erosion	• Stabilize with fill, rip rap and vegetate
• Surface erosion; sparse vegetation	• Enhance vegetation along roadway
• Slight ditch erosion	• Stabilize ditch with riprap or vegetate
• Damaged and/or clogged culvert	• Replace and/or clean culvert
• Unstable culvert inlet/outlet	• Rip rap around culvert inlet/outlet
• Poor road shaping	• Reshape road
• Stockpiled soils	• Install silt fence or vegetate berm



Problems:

- Ditch and shoulder erosion.
- Removal of winter sand.

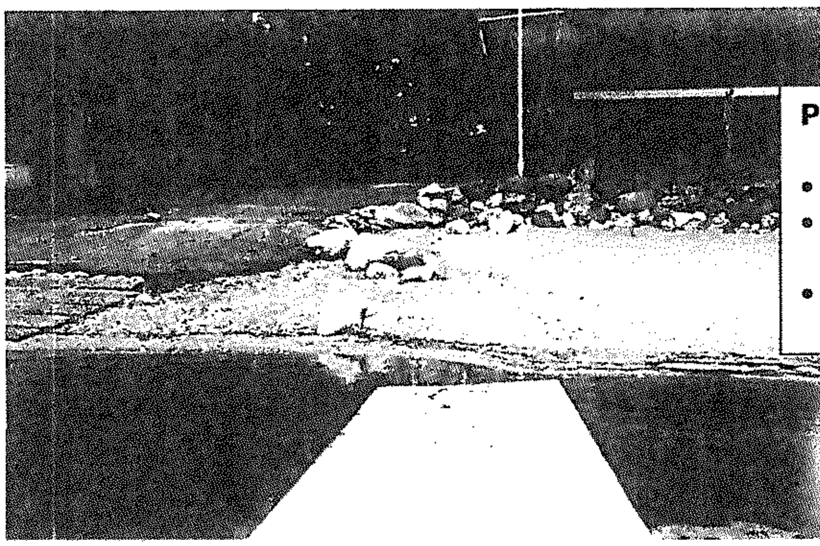
Solution:

- Reshape eroded shoulders and vegetate.
- Reshape ditches so ditches can handle volume of runoff.
- Stabilize ditches with vegetation, erosion control matting, or stone.

Beach and Beach Access Sites

Fifteen sites were identified and accounts for 7% of the identified sites. Of the 15 sites, 8 are either low priority or no impact, 6 are medium priority. One high priority site was identified but judged to be a simple technical fix with medium cost. Ten of the solutions are simple technical fixes with low cost. One solution requires technical assistance to divert runoff to the Lake.

Common Problems Identified:	Recommended Solutions:
• Shoreline erosion • Bare soil; lack of buffer • Unstable beach access • Direct runoff to Lake	• Install rip rap to stabilize beach • Establish vegetative buffer • Seed and mulch high use areas • Divert direct runoff to vegetated areas



Problem:

- Bare soil
- Direct runoff to Lake
- Moderate surface erosion

Solution:
- Seed and mulch to establish vegetation.
- Divert direct runoff to vegetated areas.
- Install erosion controls, as needed.

Driveway Sites

Twelve sites were found and account for 6% of the sites identified. All twelve sites are either low priority or no impact. Nine solutions are simple technical fixes with low cost. One solution requires technical assistance with medium cost.

Common Problems Identified:	Recommended Solutions:
• Slight to moderate surface erosion • Slight ditch and shoulder erosion • Bare soil	• Establish vegetation along driveway • Seed and mulch ditch and shoulder • Use less erodable surface materials

Problem:

- Driveway ends at Lake shoreline.
- Bare soil
- Sediment transport direct to lake.

Solution:
- Establish vegetative buffer.
- Use coarser less erodable surface materials for driveway.
- Install turnouts; open top culvert or water bars to direct runoff to vegetated buffers where runoff can be treated.

Private Road Sites

Twenty-nine sites were identified and account for 13% of the identified sites. Of the 29 sites, 17 are either low priority or no impact, simple technical fixes and low cost. Eight sites are medium priority, medium to simple technical level of complexity to fix with medium cost. Four high priority sites were identified. Two high priority sites are simple technical fixes with low cost. Two high priority sites are medium complexity fixes, one with medium cost and the other with a high cost solution.

Common Problems Identified:	Recommended Solutions:
• Slight to moderate surface erosion	• Stabilize with fill, rip rap and vegetate
• Bare soil; sparse vegetation	• Enhance vegetation along roadway
• Accumulated sand at road shoulder	• Remove winter sand
• Damaged and/or clogged culvert	• Replace and/or clean culvert
• Unstable culvert inlet/outlet	• Rip rap around culvert inlet/outlet
• Slight ditch erosion	• Stabilize ditch with riprap

Problem:

- Damaged Culvert.

Solution:

- Replace or repair culvert.

Logging/Logging Operation Sites

Four sites were found and account for 2% of the identified sites. Three sites are low priority and one site is medium priority. Two of the solutions are simple technical fixes with low cost. Two solutions were determined to be of moderate complexity and require technical assistance.

Common Problems Identified:	Recommended Solutions:
• Runoff has direct access to ditch and lake • Slight surface erosion • Debris in contact with water	• Install silt fence and temporary culvert at access point • Enhance vegetation • Remove debris

Problem:

- Logging debris in ditch with runoff to Lake.

Solution:

- Remove debris.
- Install silt fence and temporary culvert at access point.

Commercial Sites

Nine commercial sites were found during the watershed survey and account for 5% of the sites identified. Two sites are low priority, simple technical fixes with low cost. At the time of the technical team follow-up, two of the sites were determined to not have an impact on Androscoggin Lake. Two sites are medium priority, high technical level solution and medium cost. One site is medium priority, low cost, and simple technical fix. Two sites are high priority, medium cost and medium technical level to fix. No representative photograph was available for these sites.

Common Problems Identified:	Recommended Solutions:
• Bare soil	• Seed and mulch
• Siltation in drainageway	• Install erosion control such as a silt fence
• Direct flow to Lake	• Install diversion controls

Agriculture Sites

Ten agriculture sites were found during the watershed survey and account for 5% of the sites identified. Six sites are low priority and simple technical fixes with low cost. At the time of the technical team follow-up, four of the sites were determined to not have an impact on Androscoggin Lake. No photographs were available for these sites.

Common Problems Identified:	Recommended Solutions:
• Bare soil	• Seed and mulch; use erosion controls
• Slight ditch erosion	• Seed and mulch or stabilize ditch

Trail/Path Sites

Five trail/path sites were found and account for 3% of the identified sites. Three of the sites are low priority, simple technical fixes with low cost. At the time of the technical team follow-up, two of the sites were determined not to have an impact on the Androscoggin Lake. No photographs were available for these sites.

Common Problems Identified:	Recommended Solutions:
• Unstable beach access	• Stabilize banks
• Surface erosion	• Enhance vegetation
• Stockpiled soils	• Remove or stabilize stockpile

5.0 General Recommendations

Solving problems associated with soil erosion and runoff should occur at many levels (individuals, associations, government, school, businesses) and in different time frames (short term, intermediate, and long term) in order to be effective. Everyone including students, residents, business owners, and government officials has a part in maintaining a healthy watershed.

5.1 Individuals

- Prevent erosion and control stormwater runoff. Immediately stabilize and mulch any disturbed soils.
- Avoid clearcutting the existing trees and vegetation on your house site. Consult with the Town Code Enforcement Officer before cutting trees.
- Encourage natural vegetation along the lakeshore, streams and ditches. Encourage natural topography and drainage systems. Do not alter the shoreline. Leave existing rocks and vegetation in place along the shoreline.
- If you remove natural vegetation, seed and mulch bare soil with native deep-rooted, woody vegetation and plant shallow-rooted shrubs and grasses along lake shores, stream sides and road ditches.
- Do not rebuild beaches.
- Limit the use of pesticides, herbicides and fertilizers on lawns and gardens.
- Avoid the use of household toxins. Use non-phosphorous detergents (list of alternate products is available from the Maine Department of Environmental Protection (DEP)).
- Maintain your septic systems. Remove sludge and scum from the septic tank every 3 to 5 years.
- Do not use garbage disposals; they contribute unnecessary grease and solids to your septic system.
- Do not use septic system additives advertised to eliminate the need to periodically pump out the sludge. If any thing, these products can cause the system to fail prematurely.
- Conserve water. Currently, the average Maine resident uses an estimated 75-100 gallons of water per day. But only about 4 gallons of this is actually needed for survival. Take shorter showers. Don't let the water run when you are brushing your teeth, shaving, washing or rinsing dishes, washing fruit or vegetables, or waiting for water to get cold for a drink.

- Control animal waste.
- Reduce pollution from boating and recreational activities. Minimize wakes close to the shoreline.
- Reduce pollution from motor vehicles. Do not wash cars near the Lake, streams or drainage ditches.
- Get involved with the Androscoggin Lake Improvement Corporation and become a steward of Androscoggin Lake.

5.2 Road Associations

- Minimize road runoff by planning a regular, comprehensive maintenance schedule, and then adhere to it,
- Use appropriate Best Management Practices on the road.
- Get a copy of "Camp Road Maintenance Manual – A Guide for Landowners". This reference is a must for any road association. A copy may be obtained from Kennebec County Soil and Water Conservation District (SWDC) – 9 Green Street, Room 307, Augusta, Maine 04330, at a cost of $4.50.
- For more extensive problems, seek a Professional Engineer's help. Contact the Androscoggin or Kennebec County SWDC to request technical assistance.

5.3 Municipal Officials

- Review public policy and ordinances to assure full protection of Androscoggin Lake.
- Participate in and support the Androscoggin Lake watershed projects.
- Participate in the Androscoggin Lake Watershed Management and Implementation Plans.
- Promote training for road crews, planning boards and conservation commissions.
- Help the Maine DEP enforce the Erosion and Sediment Control law that requires landowners to properly install and maintain erosion control practices (such as hay bale barriers, silt fences, and hay mulch) anytime filling or soil disturbances activities are conducted.

5.4 Government Officials

- Maine DEP's Division of Watershed Management has a Nonpoint Source Training Center that provides numerous training courses on an ongoing basis.
- Maine DEP, Kennebec County SWCD, Androscoggin County Soil and Water Conservation District are available to help provide or facilitate workshops.

5.5 Androscoggin Lake Improvement Corporation

- Continue to work with Androscoggin or Kennebec County SWCD and Maine DEP to bolster public support for watershed projects.

- Participate in the development of Lake Watershed Management and Implementation Plans.
- Provide educational materials and guidance to residents of Androscoggin Lake.
- Continue to provide water quality monitoring information to the Androscoggin Lake community.

5.6 Schools

- Schools can become involved by teaching lake and stream ecology.
- Students can be given a chance to perform community service through watershed projects either initiated by the school or others.

6.0 Funding

The Maine DEP administers the Nonpoint Source (NPS) Grants Program "to provide financial assistance for projects that prevent, control or abate water pollution by nonpoint sources. There are four categories of NPS grant projects:

1 Watershed Survey Project: This report represents the culmination of a Watershed Survey for Androscoggin Lake.

2 Project to develop a Watershed Management Plan: This category of project is designed to develop a watershed management plan for a specific project watershed area, to achieve locally supported watershed management to prompt widespread implementation of BMPs or other management measures in order to reduce or eliminate NPS pollution in targeted surface waters.

3 Project to Implement a Watershed Management Plan: This category of project is designed to implement a watershed management plan for a specific project watershed area, to achieve locally supported watershed management to prompt widespread implementation of BMPs or other management measures in order to reduce or eliminate NPS pollution in targeted surface waters.

4 NPS Implementation Project: These are broad category projects for a wide variety of actions to address NPS pollution. Activities include technical assistance, education and outreach, and demonstration projects.

Androscoggin Lake Improvement Corporation has funded and supported a variety of investigations surrounding the Androscoggin Lake.

References

Maine Department of Environmental Protection and Congress of Lake Associations. "A Citizen's Guide to Lake Watershed Surveys - How to Conduct a Nonpoint Source Phosphorous Survey". Revised 4/97.

Maine Department of Environmental Protection, the Maine State Planning Office/Maine Coastal Program and the University of Maine Cooperative Extension. "Watershed: An Action Guide to Improving Maine Waters". April 1990.

Glossary

Algal Bloom: A growth of algae resulting from excessive nutrient (phosphorous) levels or other physical and chemical conditions that enable algae to reproduce rapidly. The overgrowth of algae can form scum and mats, and reduce the amount of oxygen in water when they decay.

Best Management Practices: (BMPs) Conservation practices to reduce nonpoint source impacts from construction, agriculture, timber harvesting, marinas, and stormwater. The State of Maine has developed manuals describing these techniques.

Buffer: (vegetative buffer) Areas of vegetation, left undisturbed or planted between a developed area and water body. Buffer vegetation should include trees, shrubs, bushes, and ground cover plants.

Culvert: A conduit through which surface water can flow under or across roads and driveways. Culverts are usually a pipe and can be made of metal, wood, plastic, or concrete.

Erosion: Wearing away of rock or soil by the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical and chemical forces. Human activity can greatly speed this process.

Erosion Control: Physical measures installed prior to and through the duration of filling or grading activities in order to prevent soil erosion. A silt fence, hay bales, and hay mulch are examples of erosion controls.

Nonpoint Source: An indirect discharge, not from a pipe or other specific source, usually as a result of stormwater runoff.

Phosphorous: An element found throughout the environment; it is a nutrient essential to all living organisms. Phosphorous binds to soil particles, is found in fertilizers, sewerage, and motor oils, and is found in high concentrations in stormwater runoff. The amount of phosphorous present in a lake determines the lake's production of algae. A very small change in phosphorous levels can dramatically increase alga growth.

Runoff: That part of precipitation or snowmelt that runs off the land and into water bodies. It can carry pollutants from the air and land into a water body (polluted runoff).

Sector: (survey sector) A geographic portion of the watershed assigned to a survey team.

Technical Team: In a watershed project, the individuals responsible for providing training, technical advice, and review and analysis of data gathered by the steering committee and volunteers.

Watershed: The geographic region within which water drains into a particular river, stream, or body of water. A watershed includes hills, lowland, and the body of water into which the land drains. The ridges of land separating the watersheds define watershed boundaries. All land is located in a watershed. Approximately 50% of the land area in the State of Maine are located in a lake watershed.

Tables

Table 1: Androscoggin Lake Watershed Sites

Table 1
Androscoggin Lake Watershed Sites

Sector/ Site ID	Photo #	Land Use	Type of Problem	Land Use / Description	Recommendation	Technical Level to Install/ Perform	Cost	Priority
A1/1-4	none	T, R	Currently None	Erosion washout over culvert at Location 1	Fill and stabilize under road between ponds	Medium	Medium	Medium
A1/3	none	T	SLSHE	Accumulated sand and gravel at road shoulder, could wash into stream	Plant vegetative buffer.	Low	Low	Medium
A1/5	none	D	MSE, SLSE	Downslope ditches - well vegetated; however, sand/gravel accumulated at bottom of hill, potentially wash into stream	Continue to monitor.	Low	Low	Low
A1/6	none	D	MSE, BS	Downslope ditches - well vegetated; however, sand/gravel accumulated at bottom of hill, potentially wash into stream	Continue to monitor.	Low	Low	Low
A1/7	none	D	MSE, BS	Weak vegetation	Continue to monitor.	Low	Low	Low
A1/8	none	D	SLSHE	Culvert with sparse vegetation on side, none on top	Continue to monitor.	Low	Low	Low
A1/9	none	S	Currently None	Marshy area feeding Bear Creek with flows into Lake. Vegetation well established.	None	None	None	None
A1/10	none	R, D	Currently None	Three houses within 200 yards of lake; five houses within 50 yards and two trailers; lawns appear stable.	Continue to monitor vegetation	Low	Low	Low
A1/11	none	T	SLSHE	Large culvert 0.05 miles from Route 219; Sand from road getting to culvert	Sweep area; Riprap/Stabilize ditch erosion	Medium	Medium	Low
A1/12	none	T	SLSE, SLSHE, BS	Steep road turns to dirt halfway up hill	Continue to monitor for erosion	Low	Low	Low

Table 1
Androscoggin Lake Watershed Sites

Sector/ Site ID	Photo #	Land Use	Type of Problem	Land Use / Description	Recommendation	Technical Level to Install/ Perform	Cost	Priority
A1/25	none	L, LO	Woods	Logging Operations; runoff has direct access to ditches; however, runoff unlikely to reach lake.	Install silt fence and temporary culvert at access point.	Medium	Medium	Low
A1/25A	none	Unknown	CS	Clearing and grading along drainageway	Install erosion & siltation controls.	Medium	Medium	Low
A1/26	none	A	Currently None	Strawberry Fields	None	None	None	None
A2/1	1 & 2	R	MDE	Mostly sand--some trees no grass culvert flows into large wash	Place Riprap to stabilize slope.	Medium	Medium	Low
A2/1A	1,2	C	Currently None	Gravel Pit	Continue to monitor.	Low	Low	Low
A2/2	3	R	SLDE	Culvert with water to west	Fill and vegetate over culvert.	Low	Low	Low
A2/2A	3,4,5	S	SLDE	Culverts across from Private Farm, swiftly moving water with hay bale usage.	Continue to monitor.	Low	Low	Low
A2/3	none	R	MDE	Steep hill with a deep ditch.	Stabilize ditch with riprap or vegetate.	Medium	Medium	Low
A2/3A	6 to 10	S	SLDE, SLSE	Some rills; culvert with flowing water	Continue to monitor.	Low	Low	Low
A2/4A	11	S	SLSE	Erosion along Road	Establish vegetative buffer.	Low	Medium	Low

Appendix A

Androscoggin Lake Water Quality Data

WATER QUALITY MONITORING REPORT

This report contains summaries for variables most often used to measure the water quality of lakes and ponds in Maine. These variables are relatively inexpensive to measure, and are easily monitored by volunteers in the Volunteer Lake Monitoring Program and staff of the Department of Environmental Protection.

A. SECCHI DISK TRANSPARENCY AND GRAPHS:

Secchi disk transparency is a measure of the water clarity, or transparency, of the lake. All Secchi disk readings are in meters [1 meter (m)= 3.28 feet]. Factors which reduce clarity are algae, zooplankton, water color and silt. Since algae are the most abundant item, measuring transparency indirectly measures the algal productivity. Secchi disk readings can be used to track changes in water quality over time. Transparency values in Maine vary from 0.4m to 20.0m, with the average being 4.9m. Unless a lake is highly colored (see explanation of color below), a transparency of 2m or less indicates a water quality problem that has resulted in an algal bloom. In Maine, the mean (average) Secchi disk readings are related to algal productivity using the following guidelines: Productive= 4m or less; Moderately productive= 4-7m; Unproductive= 7m or greater.

Usually two transparency graphs are displayed. The first graph is provided if data were collected the previous year and illustrates the seasonal variation that can occur during the monitored months. The second graph represents the average Secchi disk readings for each year data is available. The bars on this graph represent the minimum and maximum Secchi disk readings for that year. This graph allows tracking of water quality over many years.

B. SUMMARY OF CHEMICAL AND TROPHIC STATE PARAMETERS:

COLOR: The amount of "color" in a lake refers to the concentration of natural dissolved organic acids such as tannins and lignins, which give the water a tea color. Color is measured by comparing to Standard Platinum Units (SPU). Lakes that are considered colored (>25 SPU) can have reduced transparency readings and increased phosphorus values. This does not mean the lakes are more productive, the color simply interferes with the test so better results can not be achieved. Chorophyll a (Chla) is best indicator of productivity in colored lakes and should be used if possible. Color varies from 0 to 250, with the average in Maine being 28 SPU.

pH: The pH of a lake reflects how acidic or basic the water is and helps determine which plant and animal species are present. The measure of the acidity is on a scale of 1-14, with 7 being neutral. Acid waters are below 7, alkaline waters are above 7. pH varies in Maine from 4.45 to 9.35, the average is 6.7. A one unit change in pH represents a 10 fold change in acidity or alkalinity.

ALKALINITY: Alkalinity is a measure of the capacity of water to neutralize acids and is also known as the buffering capacity. It is due primarily to the presence of naturally available bicarbonate, carbonate, and hydroxide ions, with bicarbonate being the major form. Alkalinity in Maine varies from 0.3 milligram per liter (mg/l) to 150.3 mg/l, with the average being 12.2mg/l.

CONDUCTIVITY: Conductivity is a measure of the ability of water to carry an electrical current and is directly related to the dissolved ions (charged particles) present in water. The values for most of Maine lakes and ponds are generally low (30 to 40 uS/cm). Conductivity varies from 12 microsemins per centimeter (uS/cm to 790 uS/cm, with the average being 44 uS/cm. Fishery biologists use conductivity values to calculate fish yield estimates. Conductivity will increase if there is an increase of pollutants entering the lake or pond.

TOTAL PHOSPHORUS MEANS (ppb): Total Phosphorus (TP) is one of the major nutrients needed for plant growth. It is generally present in small amounts and limits the plant growth in lakes. It is measured in parts per billion (ppb). As phosphorus increases, the amount of algae also increases. TP varies from 1 ppb to 110 ppb with the average being 14 ppb. EPI Core=Epilimnetic core sample (mixed sample from epilimnion) was taken; Surf Grab= Surface grab sample taken; Bot.Grab= Bottom grab sample taken (1 m above bottom of lake); PRO. Grab=Profile grab samples taken and averaged.

SECCHI DISK: The significance of Secchi disk data was explained above. MIN. = minimum or lowest Secchi disk depth recorded for that year. Summary would have the lowest Secchi disk reading ever recorded for that lake. MEAN=Average of monthly averages of Secchi disk reading for that year. Summary would be average for all years data has been taken. MAX.=Maximum or deepest Secchi disk reading taken for that year. Summary would be the deepest reading ever recorded for this lake. N=number of months readings were taken that year. Summary N=number of years of data.

CHLOROPHYLL A (ppb) CHLOROPHYLL A (Chl a) is a measurement of the green pigment found in all plants including microscopic plants such as algae. It is used as an estimate of algal biomass, the higher the Chl a number the higher the amount of algae in the lake. Chl a varies from 0.3 ppb (parts per billion) to 60.9 ppb, with the average 4.6 ppb; MIN. = minimum or lowest Chl a depth recorded for that year. Summary would have the lowest Chl a reading ever recorded for that lake. MEAN=Average Chl a reading for that year. Summary would be average for all years data has been taken. MAX.=Maximum or highest Chl a reading taken for that year. Summary would be the highest reading ever recorded for this lake.

TROPHIC STATE INDICES: The Trophic State Index (TSI) is a scale which ranks lakes from 0 to 100+ with 0 supporting very little algae and 100+ being very productive. TSI can be calculated from the Secchi disk, Chl a or total phosphorus results. TSI for a year is only calculated when there are at least five months of data. Lakes with TSI values greater than 60 may support blooms (less than 2m Secchi disk reading). Lakes with TSI values over 100 indicate extreme productivity and annual algae blooms. TSI values can be used to compare lakes with similar water color and track water quality trends within a lake. Lakes with color over 25 SPU will only have a valid TSI if the value is calculated from Chl a. EPI PHOS= Epilimnetic Phosphorus samples taken to determine the TSI; C=core G=grab samples taken; SEC= TSI value calculated using the mean Secchi disk (water color < 25 SPU to ensure valid TSI); CHL=TSI calculated using the mean Chl a.

C. LATE SUMMER TEMPERATURE / DISSOLVED OXYGEN PROFILES:

Dissolved Oxygen (D.O.) is the measure of the amount of oxygen dissolved in the water. All living organisms, except for certain types of bacteria, need oxygen to survive. Organisms living in the water have the ability to use the oxygen dissolved in the water to breath. Too little oxygen severely reduces the diversity and population of aquatic communities. Therefore the amount of D.O. in the water is very important to aquatic life. Low oxygen can directly kill or stress organisms such that they will not be able to successfully reproduce or grow. Water with less than 1 part per million (ppm) of oxygen is considered anoxic (no oxygen present); less than 5 mg/l of oxygen is generally considered so stressful that most coldwater fish will avoid these areas. Anoxic conditions can also promote TP release from sediments.

Temperature is the measure of heat in the water and can affect the waters chemistry and biology. For example, the amount of oxygen water can hold is directly related to the temperature of the water. The higher the temperature the less oxygen the water can hold. Oxygen will naturally decline during the summer months as water temperatures rise. Lakes deeper than 25-30 feet can also stratify, with warm water riding over cooler deep water, restricting circulation in the lake. This can contribute to oxygen loss in the lower waters. Temperature can also determine the kinds of plants and animals found in the lake or pond. Certain species of fish, insects and algae will predominate during the cooler temperatures of the spring and fall, yet disappear during the warmer temperatures of summer. For instance, salmonids generally prefer temperatures below 20°C (68°F) but can tolerate slightly higher temperatures for short periods of time. However, constant exposure to temperatures of greater than 20°C may result in some fish being more susceptible to disease or not being able to reproduce as well. Conversely, other more tolerant species will predominate during the more stressful summer months. The late summer temperature and dissolved oxygen profiles in data report represent the lake's most stressed open water period.
m=Depth data was recorded, in meters; °C=Temperature in degrees Celsius; Date is sampling date; ppm=Dissolved oxygen reading in parts per million (ppm).

LAKE: ANDROSCOGGIN L (VLMP)
TOWN: LEEDS
COUNTY: ANDROSCOGGIN

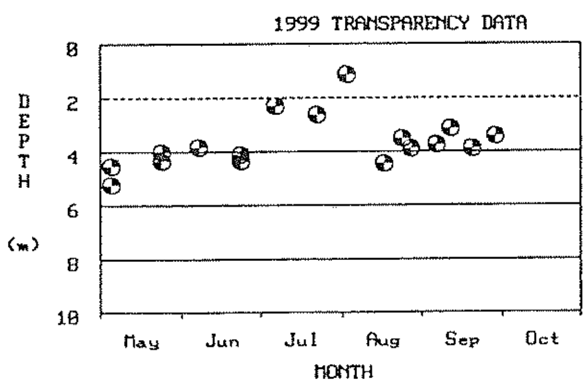
MIDAS: 3836
*TRUE BASIN: 1
*SAMPLE STATION: 1

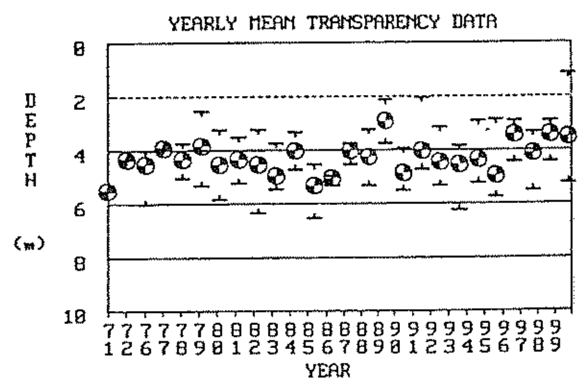
WHOLE LAKE INFORMATION
MAX. DEPTH: 12 m. (38 ft.)
MEAN DEPTH: 5 m. (15 ft.)
DELORME ATLAS #: 12
USGS QUAD: WAYNE
IFW REGION B: Belgrade Lakes (Augusta)
IFW FISH. MANAGMENT: Warmwater & Coldwater

TRUE BASIN CHARACTERISTICS
SURFACE AREA: 1616.0 ha. (3993.1 a.)
FLUSHING RATE: 1.55 flushes/yr.
VOLUME: 69982395.0 cu. m. (56769 ac.-ft.)
DIRECT DRAINAGE AREA: 46.90 sq. km. (18.11 sq. mi.)

* PLEASE NOTE THE FOLLOWING: The SAMPLE STATION # refers to the location sampled. The term TRUE BASIN is used to define areas within a lake that are separated by shallow reefs or shoals and therefore function as separate lakes. There are approximately 50 lakes in the state that have more than 1 True Basin. True Basin Characteristics are now being included in the first section of these reports to enable users of the Phosphorous Loading Methodology to better evaluate the data. If there is no data for a particular True Basin, True Basin Characteristics must be obtained from the DEP. ANDROSCOGGIN L has 1 True Basin(s).

SECCHI DISK TRANSPARENCY GRAPHS:





Note: 1999 graphs may indicate multiple readings taken on a given day.

SUMMARY OF CHEMICAL AND TROPHIC STATE PARAMETERS:

YEAR	MEAN COLOR (SPU)	MEAN pH	MEAN ALK (mg/l)	MEAN COND. (uMHOS /cm)	TOTAL PHOS. MEANS (ppb) EPI CORE	SURF GRAB	BOT. GRAB	PRO. GRAB	SECCHI DISK (m.) MIN.	MEAN	MAX.	N	CHLOROPHYLL A(ppb) MIN.	MEAN	MAX.	TROPHIC STATE INDICES EPI PHOS C	G	SEC	CHL
1971	-	-	-	-	-	-	-	-	5.5	5.5	5.5	1	-	-	-	-	-	-	-
1972	-	-	-	-	-	3	-	-	4.3	4.3	4.3	1	-	-	-	-	-	-	-
1976	-	-	-	-	14	-	-	-	4.0	4.5	6.0	5	2.8	3.5	4.1	51	-	54	44
1977	-	-	-	-	45	-	-	-	3.9	3.9	3.9	1	3.3	3.3	3.3	-	-	-	-
1978	-	-	-	-	9	16	-	-	3.7	4.3	5.0	6	-	-	-	-	-	56	-
1979	20	6.90	16.0	40	13	-	-	-	2.5	3.8	5.3	6	2.9	2.9	2.9	-	-	63	-
1980	20	6.80	11.0	46	-	-	-	-	3.2	4.5	5.8	6	2.7	2.7	2.7	-	-	54	-
1981	20	6.80	12.0	38	13	-	-	-	3.5	4.3	5.2	5	1.9	3.0	4.0	-	-	56	39
1982	-	-	-	-	-	-	-	-	3.2	4.5	6.3	5	-	-	-	-	-	54	-
1983	-	-	-	-	-	-	-	-	3.7	4.9	5.4	6	-	-	-	-	-	49	-
1984	-	-	-	-	-	-	-	-	3.3	4.0	4.7	4	-	-	-	-	-	-	-
1985	15	-	10.0	39	11	-	-	-	4.5	5.3	6.5	4	-	-	-	-	-	-	-
1986	-	-	-	-	11	-	-	-	4.9	5.0	5.3	4	1.7	4.4	8.1	-	-	-	-
1987	-	-	-	-	-	-	-	-	3.7	4.0	4.5	3	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	3.2	4.2	5.3	5	-	-	-	-	-	58	-
1989	-	-	-	-	-	-	-	-	2.1	2.9	3.7	6	-	-	-	-	-	78	-

LAKE: ANDROSCOGGIN L (VLMP)
TOWN: LEEDS
COUNTY: ANDROSCOGGIN

MIDAS: 3836
*TRUE BASIN: 1
*SAMPLE STATION: 1

SUMMARY OF CHEMICAL AND TROPHIC STATE PARAMETERS:

YEAR	MEAN COLOR (SPU)	MEAN pH	MEAN ALK	MEAN COND. (uMHOS /cm)	TOTAL PHOS. MEANS (ppb) EPI CORE	SURF GRAB	BOT. GRAB	PRO. GRAB	SECCHI DISK (m.) MIN.	MEAN	MAX.	N	CHLOROPHYLL A(ppb) MIN.	MEAN	MAX.	TROPHIC STATE INDICES EPI PHOS C	G	SEC	CHL
1990	-	-	-	-	-	-	-	-	3.9	4.8	5.5	4	-	-	-	-	-	-	-
1991	20	7.15	13.0	45	14	-	-	-	2.0	4.0	4.7	5	-	-	-	-	-	60	-
1992	15	7.14	12.0	43	14	-	-	-	3.1	4.4	5.3	6	5.0	5.0	5.0	-	-	55	-
1993	-	7.92	13.0	44	12	-	-	-	3.8	4.5	6.2	6	5.9	5.9	5.9	-	-	54	-
1994	-	-	-	-	11	-	17	-	2.9	4.3	5.2	6	4.2	4.2	4.2	-	-	56	-
1995	23	-	11.3	-	12	-	21	-	2.8	4.9	5.7	6	-	-	-	48	-	49	-
1996	25	-	-	-	15	-	16	-	2.9	3.4	4.4	6	2.4	5.4	10.0	53	-	69	55
1997	-	-	-	-	17	-	18	-	3.3	4.1	5.5	6	1.2	4.7	13.5	-	-	59	51
1998	-	-	-	-	18	-	30	-	2.9	3.4	4.4	5	3.1	5.5	8.5	58	-	69	56
1999	16	-	6.0	43	20	-	36	-	1.1	3.5	5.2	5	3.3	9.8	49.0	61	-	68	72
SUMMARY:	19	7.00	11.6	42	16	10	23	-	1.1	4.3	6.5	26	1.2	4.6	49.0	54	-	59	53

LATE SUMMER TEMPERATURE / DISSOLVED OXYGEN PROFILES:

DEPTH	SAMPLE DATE 08/02/99		08/16/99		08/23/99		08/26/99		09/06/99		09/11/99		09/19/99		09/28/99	
m	°C	ppm	°C	ppm	°C	ppm	°C	ppm	°C	ppm	°C	ppm	°C	ppm	°C	ppm
0.0	-	-	-	-	25.1	7.6	-	-	-	-	-	-	-	-	-	-
1.0	26.0	9.2	23.0	5.6	24.0	7.6	23.0	7.8	24.0	8.0	-	-	20.0	9.6	19.0	9.2
2.0	-	-	-	-	23.0	7.6	-	-	-	-	-	-	-	-	-	-
3.0	26.0	9.0	23.0	6.0	22.8	7.2	23.0	7.8	24.0	7.8	24.0	7.6	20.0	9.0	19.0	8.6
4.0	-	-	-	-	22.8	7.2	-	-	-	-	-	-	-	-	-	-
5.0	25.0	8.6	22.0	6.0	22.6	7.1	23.0	6.8	24.0	7.5	-	-	20.0	8.4	19.0	8.8
6.0	-	-	-	-	22.5	7.1	-	-	-	-	-	-	-	-	-	-
7.0	23.0	2.6	22.0	5.2	22.4	7.0	22.0	6.0	24.0	6.2	-	-	19.0	8.0	19.0	8.6
8.0	-	-	22.0	5.2	22.3	7.1	22.0	0.0	22.0	5.6	23.0	7.0	-	-	-	-
9.0	23.0	1.4	22.0	4.0	22.3	6.8	21.5	3.2	22.0	3.8	-	-	17.0	8.4	19.0	8.6
10.0	21.0	0.8	22.0	3.0	22.2	5.6	21.5	3.2	22.0	3.4	-	-	16.0	8.8	19.0	8.0
11.0	21.0	0.6	-	-	22.0	5.6	21.0	3.2	21.0	3.4	23.0	5.8	16.0	8.6	19.0	7.2
12.0	-	-	-	-	-	-	-	-	-	-	-	-	16.0	8.2	18.5	7.8

WATER QUALITY SUMMARY

Androscoggin Lake, Leeds
Midas: 3836, Basin: Primary-01

The Maine Department of Environmental Protection (ME-DEP) and the Volunteer Lake Monitoring Program (VLMP) have collaborated in the collection of lake data to evaluate present water quality, track algal blooms, and determine water quality trends. This dataset does not include bacteria, mercury, or nutrients other than phosphorus.

Water quality monitoring data for Androscoggin Lake has been collected since 1971. During this period, 9 years of basic chemical information was collected, in addition to Secchi Disk Transparencies (SDT). In summary, the water quality of Androscoggin Lake is considered to be below average, based on measures of SDT, total phosphorus (TP), and Chlorophyll-a (Chla). The potential for nuisance algal blooms on Androscoggin Lake is high.

Water Quality Measures: Androscoggin Lake is an uncolored lake (average color 19 SPU) with an average SDT of 4.3m (14ft). The range of water column TP for Androscoggin Lake is 9-20 parts per billion (ppb) with an average of 16 ppb, while Chla ranges from 1.2-49 ppb with an average of 4.6 ppb. Recent dissolved oxygen (DO) profiles show a small amount of DO depletion in deep areas of the lake. The potential for TP to leave the bottom sediments and become available to algae in the water column (internal loading) is moderate, based on deep water phosphorus sampling done since 1994.

The flushing rate is the amount of time required for the lake water to be renewed each year. The average flushing rate is about 1-1.5 flushes per year for Maine lakes. The flushing rate for Androscoggin Lake is 1.55 flushes per year.

Androscoggin Lake suffered its first significant algal bloom in 1999. Although the abnormally warm and dry conditions in 1999 may have contributed to this, the lake water quality is considered at high risk for further decline. The DEP and the Androscoggin Lake Improvement Corp. (ALIC) are cooperating in a lake diagnostic study beginning in 2000. This will include a watershed survey to find runoff sources of phosphorus, an evaluation of the contribution of phosphorus from backing up of the Androscoggin River during high water events, extensive lake and stream monitoring, and a watershed analysis.

See ME-DEP Explanation of Lake Water Quality Monitoring Report for measured variable explanations. Additional lake information can be found on the World Wide Web at: pearl.spatial.maine.edu and/or state.me.us/dep/blwq/lake.htm, or telephone ME-DEP at 207-287-3901 or VLMP at 207-225-2070.

Filename: 3836ANDR, Revised: 02/2000, By rjb