STATE OF MAINE
NONPOINT SOURCE POLLUTION
ASSESSMENT
REPORT

1989

Department of Environmental Protection

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MAINE NONPOINT SOURCE POLLUTION ASSESSMENT REPORT

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Maine Department of Environmental Protection

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SECTION 1

EXECUTIVE SUMMARY

The clean water in Maine's rivers and streams, lakes, coastal waters, wetlands, and groundwater is a precious resource, a source of pride for Maine residents, and a critical component of the natural environment that is so attractive to visitors. It deserves our best efforts for protection.

Two types of pollution threaten our water quality: Point Sources and Nonpoint Sources. Point Sources are the easier of the two to identify because they are direct discharges to waterbodies, mostly by way of pipes. Examples include discharges, usually licensed, from sewage treatment plants and factories. For the past 15 years Maine has made steady progress in cleaning up Point Source pollution. One dramatic result has been the return of gamefish to several large rivers along which manufacturing and sewage treatment facilities are located.

Nonpoint Source (NPS) pollution is more difficult to identify: it is broad-based and generally landuse related. It results when large numbers of the same human activities contribute pollution in diffuse manners after sporadic storm events. Individual sites may contribute relatively small doses of pollutants, but the cumulative loading from all sources in a watershed is devastating to water quality. NPS sources addressed in this report are agriculture, silviculture, construction, resource extraction, urban runoff, waste disposal, and some other minor sources. The principal pollutants contributed by these sources are nutrients, sediment, pesticides, organic enrichment, toxic substances, petroleum and its by-products, salts, and hydrologic and thermal changes.

Despite the progress in cleaning up Point Source pollution, degraded water quality persists in a number of waterbodies in the state, and there are many other waterbodies that are threatened with nonattainment of their designated uses as the result of Nonpoint Source pollution. Currently, 1017 miles of Maine's rivers and streams do not support their designated uses; that is, one or more uses are impaired because of NPS pollution. There are 35 lakes and ponds, totalling over 37,000 acres, for which the Department has documented data, that do not support their use standards. There are 34,000 additional acres of lakes considered to be impaired for which the information source was professional and public input. Threatened lake acreage, from public input and monitoring data, equals about 53,000 acres. In addition, NPS pollution has caused an estimated 187,000 acres of groundwater aquifers to fail to meet their safe drinking water standards. It has also impaired the uses of several estuaries along Maine's coast. The impact of NPS pollution on Maine's wetlands has not been studied in detail and is therefore not well-known at present. These statistics underscore the urgent need to address NPS pollution through a statewide program.

The purpose of this Nonpoint Source Pollution Assessment Report is to:

- describe the role of federal, state, regional, and local agencies regarding clean water and NPS pollution control
- assess the water quality of Maine's waterbodies
- explain the principal NPS pollutants, their sources, and their impacts on water quality
- describe existing programs for controlling NPS pollution and introduce initiatives for accelerated control
- describe Maine's proposed process for identifying best management practices (BMPs) for controlling NPS pollution

BMPs are the building blocks of an NPS pollution control program. A BMP is a conservation practice or a way of performing an activity such that water quality is protected. Although this report identifies the process for defining BMPs, a second report, the Nonpoint Source Management Plan, will integrate all BMPs into a comprehensive, statewide program.

The term "water quality" in the context of this report derives its meaning from the concept of "designated use". The Maine Water Classification System, included in Appendix A of this report, assigns designated uses to waterbodies of the state. As detailed above, declining water quality leads to the failure of a waterbody to support its designated uses. The success of Maine's NPS Pollution Control Program will be measured by the degree to which the impaired uses of Maine's waterbodies are restored.

At the time this document went to press additional comments were received from the NPS Advisory Committee members and from other reviewers. Because of the late date these comments couldn't be incorporated into the report. They will be included in future revisions.

SECTION 2

INTRODUCTION

2.1 Authority for Developing Nonpoint Source Program

The 1987 Amendments to the federal Clean Water Act authorized a new direction and focus for water quality efforts by each state. Nonpoint Sources of water pollution, typically diffuse and not resulting from a discharge at a specific, single location such as a pipe, have been recognized as impediments to meeting the goals of the Act. The Act establishes as a national policy that a program for the control of Nonpoint Sources of pollution be developed and implemented in an expeditious manner so as to attain the goals of the Act.

The Amendments represent a comprehensive revision of the Clean Water Act and mandate that a number of new state water pollution control initiatives be carried out. Section 319 of the Act, which provides the basis for implementation of Nonpoint Source control programs, identifies the requirements which a state must satisfy in order to qualify for financial assistance under the Act. Two documents must be completed by Maine and approved by the U.S. Environmental Protection Agency: the "Maine Nonpoint Source Assessment Report" and the "Maine Nonpoint Source Management Program". The Management Plan will be printed under separate cover.

2.2 Scope of the Assessment Report

The Assessment will cover:

(1) Data collection and public input;

(2) Effects of pollutants on aquatic ecosystems;

(3) Categories and subcategories of NPS pollution sources;

(4) Water quality status summary of Maine's waterbodies;

(5) Inventory of state, regional, and local agency programs for NPS pollution control with analysis of limitations and the need for new initiatives;

(6) Proposed processes for identifying and revising Best Management Practices.

2.3 Section 319 Requirements

Section 319 of the federal Clean Water Act specifically describes the contents of the State Assessment Report:

(1) Contents of the Report

The Governor of each state shall, after notice and opportunity for public comment, prepare and submit to the administrator for approval, a report which:

a) Identifies those navigable waters within the State which, without additional action to control Nonpoint Sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of the Act;

b) Identifies those categories and subcategories of Nonpoint Sources or, where appropriate, particular Nonpoint Sources which add significant pollution to each portion of the navigable waters identified above in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements;

c) Describes the process, including intergovernmental coordination and public participation, for identifying best management practices and measures to control each category and subcategory of nonpoint sources and, where appropriate, particular nonpoint sources identified under the previous subparagraph for reducing, to the maximum extent practicable, the level of pollution resulting from such category, subcategory, or source; and

d) Identifies and describes state and local programs for controlling pollution added from nonpoint sources to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which will receive federal assistance.

(2) Process

The necessary steps to complete the Assessment Report were:

a) Obtain and utilize existing data and water quality information;

b) Evaluate the quality and reliability of data and information

c) Catalogue the surface and ground waters of the state into a "Waterbody System" to be used for planning purposes and for tracking water quality information;

d) Identify waterbodies which do not meet use standards and waterbodies that are threatened with non-attainment;

e) Identify the pollutants causing impairments and the sources of the pollutants.

SECTION 3

METHODOLOGY

3.1 PUBLIC PARTICIPATION

Information on the water quality of Maine was gathered from written reports and interviews with water quality professionals and the public.

Over 300 people were contacted including biologists, water resource investigators, chemists, soil scientists, permit specialists, foresters, municipal officers, and lay persons with water-oriented interests or experiences, such as members of Trout Unlimited, Soil and Water Conservation Districts, local fish and game clubs, boating clubs, lay monitoring groups, lake associations and other similar environmental organizations.

During June and July of 1988, the Maine Department of Environmental Protection Bureau of Water Quality Control conducted a Nonpoint Source Pollution Survey (Figure 1). Approximately 1044 survey forms were sent out to 495 municipalities, 400 lake associations, 126 sportsmen's clubs, the State's 16 Soil and Water Conservation Districts, the State's 7 Regional Fisheries Biologists of the Department of Inland Fisheries and Wildlife (DIF&W) and others such as the Soil Conservation Service, and citizens who reported NPS pollution incidents. Accompanying each survey form was a list of waterbodies which were not attaining classification standards due to NPS pollution. It was explained that the purpose of the survey was to obtain information on NPS problems that the DEP did not know about.

Of the 495 municipalities surveyed, 241 (49%) responded. Of those municipalities that responded, 85% reported that there were no significant NPS pollution problems in the municipality. This overwhelming "no problem" response from the State's municipal officials is a clear indication that:

1) The survey needs to be revised and redone for future assessments, and

2) public awareness of NPS pollution needs to be heightened.

Of the 400 lake associations surveyed, 23 (6%) responded. Of those associations responding, 44% reported that there are significant NPS pollution problems within their respective waterbodies. Of the 126 sportsmen's clubs, only 6 (5%) responded. Of those responding, 83% reported that they knew of no significant NPS pollution problem. All of the Soil and Water Conservation Districts responded. Thirteen of the districts (81%) reported that there were additional NPS problems within their Districts.

All 7 Regional Fisheries Biologists reported that there were additional NPS problems in their regions. Because the NPS survey was administered at a time of year when Regional Fisheries Biologists are very busy doing census work and because their input to this process was considered extremely important, a special effort was made to collect responses from this group.

The waterbodies identified by these groups for which there are no existing data from monitoring by the Department of Environmental Protection appear in Tables 3 and 4 and are indicated as "Evaluated" waterbodies.

Figure 1. Maine's Survey Form on the Effects of Nonpoint Source Pollution.

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF WATER QUALITY CONTROL

NONPOINT SOURCE POLLUTION SURVEY

Completed By:______________________ Affiliation:______________________ Date:__________

Address:____ Phone:__________

Do you know of any waters significantly impacted by nonpoint source pollution which are NOT listed in the draft assessment of nonpoint source-impacted waters?

___YES - Please complete entire form ___No - Please stop here and return questionnaire

****
If you want to report nonpoint source pollution problems on more than one water body or groundwater location, this form can be photocopied or additional copies can be obtained from the Bureau of Water Quality Control.
****

1. Name of water body or location of groundwater: ______________________________

2. Use(s) impacted: ___Drinking Water Supply; ___Swimming; ___Boating; ___Fishing; ___Wildlife Habitat; ___Aesthetics; Other - ______________________________

3. Observed nonpoint pollution effects: ___Muddiness; ___Sediment Deposits; ___Odors; ___Lack of Transparency Due to Algae; ___Fish Kills; ___Absence of fish; Other - ______________________________

4. Rate (from 1 to 5; 1 = minimal & 5 = severe) the overall severity of the problem: ___

5. What are the sources of the nonpoint pollution causing the problem? ______________________________

____

6. Additional comments and/or suggestions: ______________________________

____

____

3.2 DATA COLLECTION

Data were obtained from special reports furnished by the Soil Conservation Service, various records from the State Department of Environmental Protection, Resource Conservation and Development (RC&D) plans, the State 304(b) Report. Data were also derived from the following ongoing and special state monitoring programs and studies were used:

- -Acid Precipitation Monitoring Program
- -Ambient Biomonitoring Program
- -Assimilation Capacity Studies (ASCAP)
- -Bioaccumulation Monitoring Program
- -Biological Toxins Monitoring Program
- -Compliance Monitoring
- -Dioxin Monitoring Program
- -Hydroelectric Monitoring
- -Lake Diagnostic Studies
- -Lake Modeling Studies
- -Lake Planning and Management Studies
- -Marine Monitoring Program
- -Phosphorus Monitoring Program
- -Primary Monitoring Network
- -Shellfish Sanitation Monitoring Program
- -Toxicity Testing
- -Volunteer Monitoring Program

For a complete listing of published sources consulted in the Nonpoint Source Assessment refer to LIST OF REFERENCES at rear of text.

3.3 WATERBODY IDENTIFICATION SYSTEM

The computer software system used to manage river and stream water quality information was the Environmental Protection Agency's Waterbody System (WBS). Waterbody-specific information was provided for assessed surface waters of the state using WBS coding forms.

The seven major river drainage basins of the State were further divided into 64 minor river basins (See Map 1). Table 1 presents, by river basin, the four types of waterbodies found in Maine. Information obtained on the quality of each river and stream waterbody was entered into the computerized "waterbody system" software that has been developed by the U.S. Environmental Protection

Agency (USEPA). The categories of information that were obtained to assess each waterbody and that are stored on the "waterbody system" have been referenced in Table 2.

The Waterbody System was used to manage the extensive amount of information generated by the Assessment and includes water quality data for waterbodies (rivers and lakes). The information specifies whether the assessment of use support was based on monitoring or on indirect evaluation of water quality. It also contains an evaluation of whether the available information permitted a reliable assessment (and, if not, a strategy for completing the assessment), the source(s) of nonpoint pollution to the waterbody, the availability of possible control methods or programs, and any recommendations concerning improvements to control methods or programs (assessment information regarding the remaining lake and pond waterbodies is being maintained in a separate data base). Specific comments relating to the impaired segments of each waterbody were included to indicate the length/area of impairment, the use(s) which were not being supported or threatened, and the causes and sources of pollution. The entire Assessment data base has not been included in this report but is referenced under Appendix F of this report. Persons interested in reviewing this information may do so at the offices of U.S. Environmental Protection Agency/Region I or at the Maine Department of Environmental Protection.

"Monitored waters" were those waterbodies for which the Assessment was based on current (no more than five years old) water quality monitoring data. "Evaluated waters" were waterbodies for which the Assessment was based on information other than current site-specific monitoring data, such as land use information, surveys of fisheries biologists or citizen compliants. The percentages of assessed river miles and lake acres either evaluated or monitored have been summarized by river drainage basin in Figures _ and _, respectively.

Figure 1 River Basins and Drainage Areas

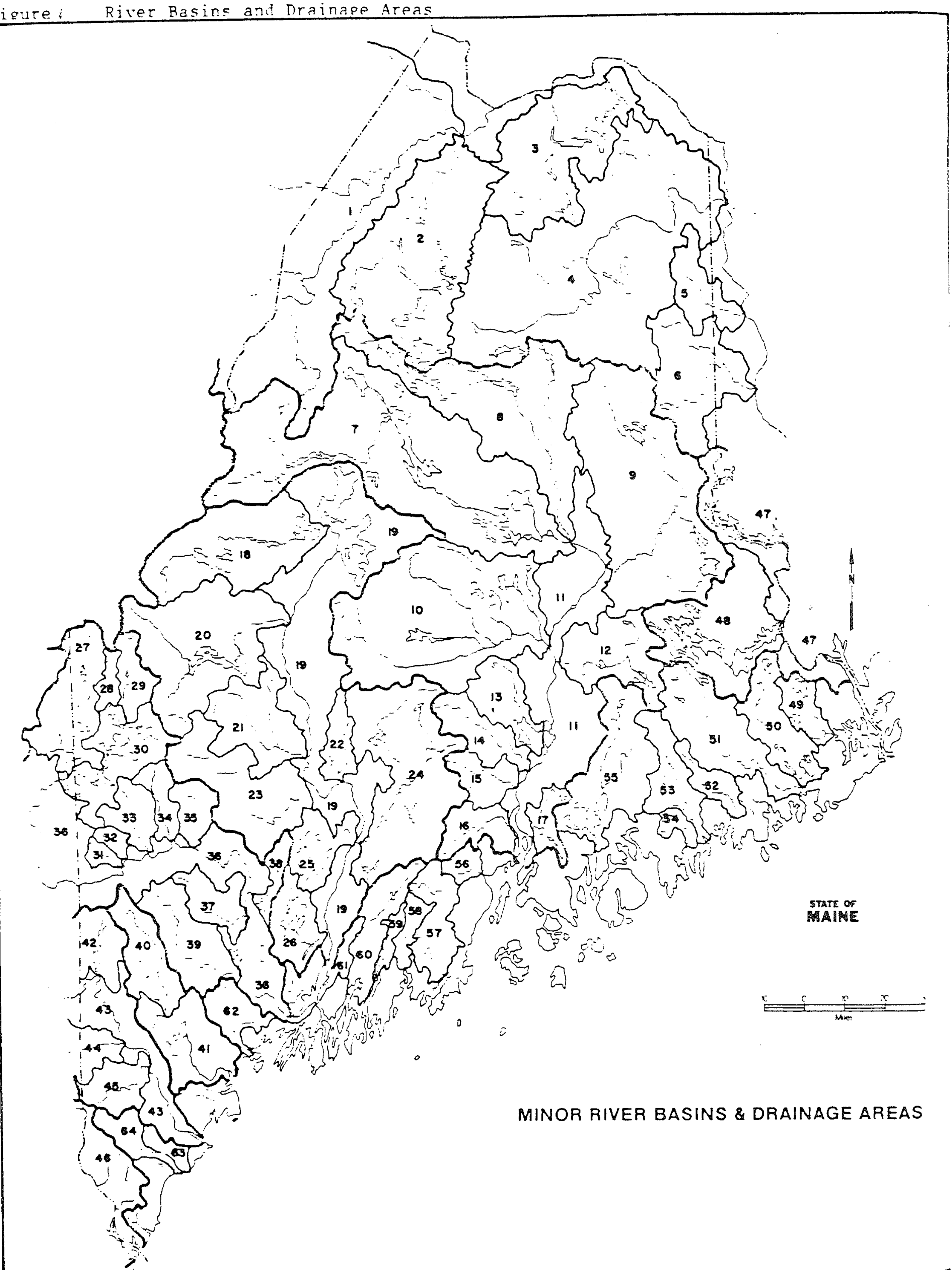
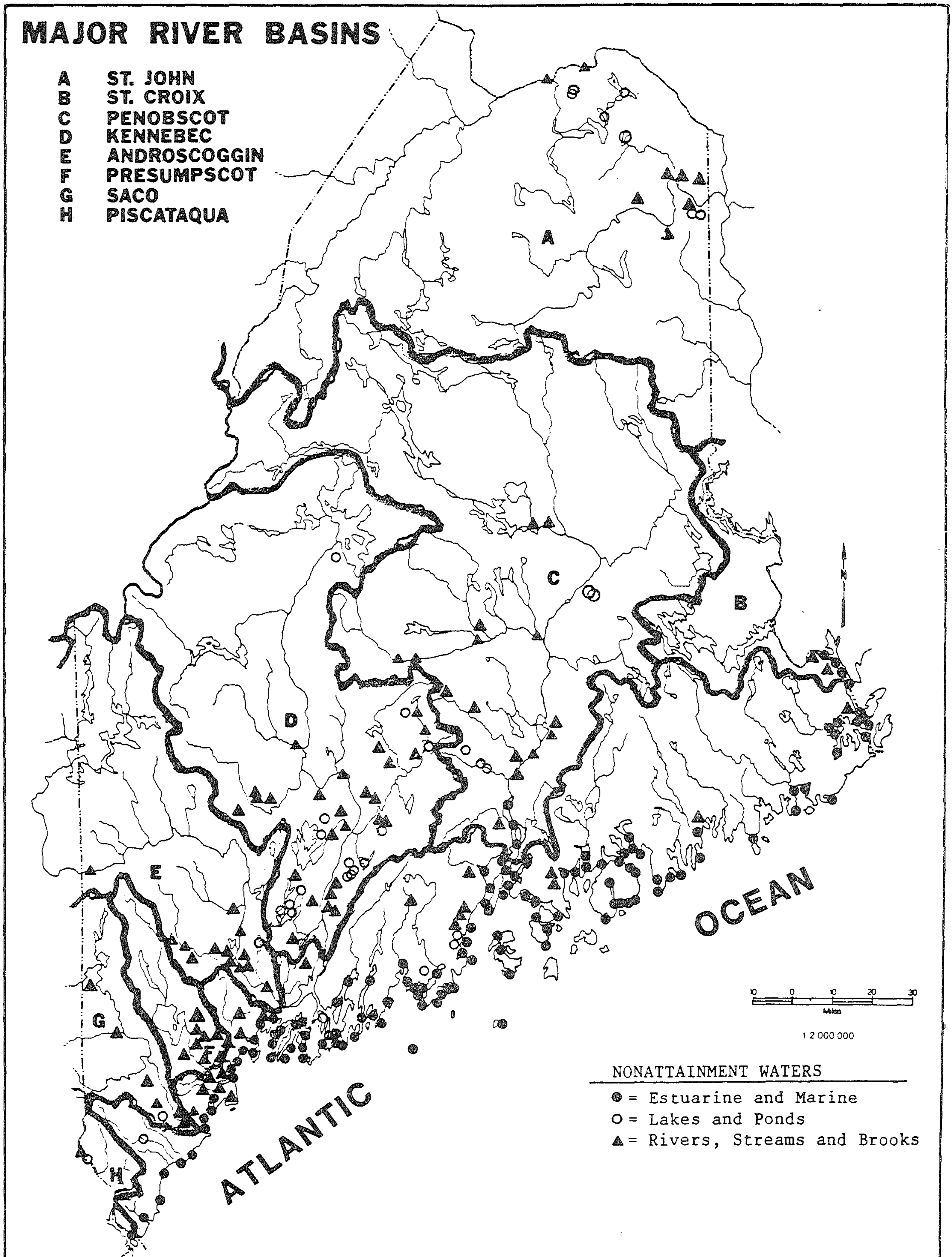


Figure 2 State of Maine: Surface Water Quality Attainment Status



3.4 WATER CLASSIFICATION SYSTEM

Water quality assessments for each surface waterbody were made on the basis of the state surface water classification system and the uses designated for each class by the Maine Water Quality Standards (Class AA, A, B or C for streams, for example -See Table 2). In the event that water quality of a section of stream, river, lake or pond was such that one or more designated uses were not possible, the mileage or acreage of that impaired section of stream, river, lake or pond was considered to be "Not Supported" for the defined use. If one or more designated uses were only partially impaired, the section was defined as "Partially Supported." If all designated uses were possible but a threat to water quality clearly existed, the section was assessed as "Fully Supported but Threatened." EPA's "Criteria for Designated Use Support Classification" was used as a guideline for determining use support status (Appendix B). Designated uses for a waterbody were presumed to be supported in the absence of negative data or information. (See Appendix _ for more information on Maine Classification System)

Water quality assessments for groundwaters were based on the single designated use for groundwater in Maine: drinking water.

TABLE 1. MAINE DESIGNATED SURFACE WATERBODIES

Rivers & Streams
Lakes and Ponds
Marine and Estuarine Waters
Groundwater
Wetlands

Table 2. SUMMARY OF CLASSIFIED USES

Class A: water quality uniformly excellent contact recreation when compatible public water supply with disinfection high quality waters with significant ecological value
Class B: water quality consistently exhibits good aesthetic values swimming and recreation public water supply with filtration and disinfection high quality habitat for aquatic biota, fish and wildlife irrigation and other agricultural uses
Class C: minimal contact recreation and other uses where water ingestion is not probable irrigation of crops not consumed without cooking habitat suitable for aquatic biota, fish and wildlife compatible industrial uses
Totals

SECTION 4

STATEWIDE WATER QUALITY SUMMARY

4.1 POLLUTANTS CAUSING NON-SUPPORT OF DESIGNATED WATERBODY USES

Nonpoint Source Pollutants are agents whose presence in a stream, lake or other surface or underground waterbody causes the specific waterbody to fail to meet the standards of use by which it has been classified. By definition, therefore, point and nonpoint source pollutants are the same. Only the method of introduction of the pollutant is different: nonpoint sources are diffuse, their origins may be hard to identify, and quantitative assessment and control are difficult.

4.1.1 Nutrients

Nitrogen and phosphorus are the two major nutrients bringing about conditions that degrade water quality. All plants require these two elements in relatively high quantity, although nitrogen is present in plants at levels roughly ten times those of phosphorus. In a fresh water environment low concentrations of these nutrients usually limit plant growth.

Nitrogen and phosphorus generally are present in natural waters at levels below 0.3 and 0.05 mg/l, respectively. When these nutrients are introduced into a lake or stream, aquatic plant productivity may increase dramatically. This process is called eutrophication. The presence of algal blooms may render waters unfit for swimming and also may change the habitat of the lake, perhaps rendering it unfit for bottom-dwelling fish as the oxygen levels in the colder bottom waters are depleted by aerobic bacteria that degrade dead organic matter.

In addition to eutrophication, excessive nitrogen causes other water quality problems. Dissolved ammonia at concentrations above 0.3 mg/l may be toxic to fish. Nitrates in drinking water are potentially dangerous. Blue

Baby Syndrome, in which nitrates are converted to nitrites in the gut of newborn humans and livestock, the oxygen-carrying capacity of hemoglobin is reduced , resulting in brain damage or even death.

Nitrogen is present in soils in several forms: 1) organic nitrogen that is bound up in plant and animal residues and only released by the decaying process; 2) water-soluble nitrates; 3) ammonia; and 4) atmospheric nitrogen in the soil pore spaces. Nitrate and ammonia are the two forms usable by plants. They are also the forms most easily lost from the soil. Nitrate, since it is water-soluble and negatively charged, is easily transported by soil water or surface runoff. The ammonium ion, on the other hand, is positively charged and is adsorbed onto soil particles, and is transported with sediment.

Atmospheric nitrogen is also fixed by species of blue-green algae common among the nuisance species of eutrophic lakes. For this and other reasons, phosphorus is more frequently the limiting nutrient in eutrophication of freshwater systems.

The natural source of phosphorus in soils is phosphorus-containing minerals and phosphorus recycled from detritus and animal wastes. Phosphorus is found in dissolved, particulate, or colloidal forms; only the soluble, inorganic form is avail for plant growth. The phosphorus content of soils is usually low, between 0.01 and 0.2 percent by weight. Most of this is unavailable for plant uptake. Manures and fertilizers are used to increase the level of available phosphorus in the soil. Inorganic phosphorus can be either dissolved or associated with sediments. Much of the sediment-held portion acts as if it were permanently fixed on the soil, but it can be released in soluble form under certain conditions.

Eutrophication of Lakes and Ponds

The trophic state of a lake or pond may be derived from measurements of transparency, and chlorophyll and phosphorus content of a lake or pond. The function of trophic state determination is twofold. It functions as an early warning system for threatened lakes and ponds where quality is deteriorating as a result of human activity. A trend of increasing trophic state in a Maine lake is a violation of Maine's Class GPA water quality standard and is a justification for more intensive control of nonpoint source pollution in the watershed. The second function of the trophic state determination is to monitor water quality trends in lakes which have periodic algal blooms and which are being managed for restoration of water quality.

One of the physical symptoms of eutrophication is a phenomenon known as an algal bloom. This occurs when a lake or pond develops high nutrient concentrations (phosphorus > 15 ppb) through inputs of suspended soil particles and their associated nutrients. During an algal bloom the phytoplankton community has very low diversity and the dominant species becomes so abundant that water transparency is reduced to six feet or less. The water looks green or blue (sometimes olive or black when the algae are dying) and may have a soupy appearance. If an algal bloom occurs in a public water supply, it may give the water an unpleasant odor or taste.

Lake Vulnerability Index

Because phosphorus is the usual limiting nutrient in Maine's lakes, it has been possible to develop a method for predicting lake vulnerability on the basis of changes in nutrient conditions. The function of the Vulnerability Index (VI) is to identify lakes and ponds which are very susceptible to conditions of increasing trophic state. The VI is a predictive model which relates a lake or pond's hydrologic characteristics and rate of watershed development

(1984 to 1986) to the length of time in years it will take for phosphorus concentrations in the lake to increase by 1 part per billion. Using these data will provide a focus for future assessment and make it possible to control nonpoint pollution before it leads to cultural eutrophication.

4.1.2 pH

pH is the relative measure of the concentration of hydrogen ions. In Maine pH by itself is not toxic, but in aquatic systems low pH leads to the mobilization of metals such as aluminum, lead, and zinc. These metals in solution can be toxic to aquatic life. Low pH also keeps mercury mobile in aquatic systems.

4.1.3 Sediment

Sediment is a generic term for soil that has been moved by erosion and deposited by water.

4.1.3.1 General Effects of Sediment on Water Quality

Sediment can dramatically reduce water quality. This pollution occurs when soil particles, which often carry chemicals and nutrients, fill streams, reservoirs, lakes, wetlands, and estuaries. Sediment increases flooding by decreasing the capacity of streams and drainageways, increases costs for treating public water supplies, diminishes the recreational value of waterbodies, and affects aquatic habitats. Sediment is a contributing factor to eutrophication (See discussion in Section 4.1.1).

Measures to control sedimentation, particularly retention or sendimentaiton basins in new urban developments which retain the "polluted" water may be a threat to groundwater which often underlies the basins in sandy soils. Evaluations of these measures and their effects will be considered in Maine's NPS Management Plan.

4.1.3.2 Sediment Yield to Surface Waters

Not all eroded soils reach area water bodies. Much is deposited in depressions or is filtered out by natural barriers such as woodland or grass strips. Road ditches also can collect large volumes of sediment from adjacent cropland. The percentage of the sediment from all sources (including gullies, roadsides and streambanks) reaching a point in a stream system is referred to as the sediment delivery ratio. When this ratio is known or can be closely approximated, the sediment yield is estimated by computing gross erosion and multiplying by the sediment delivery ratio.

Since no two watersheds are exactly alike, the amount of sediment reaching surface waters varies. A study in Fort Fairfield by SCS and the Northern Maine

Regional Northern Maine Regional Planning Commission estimated that over a 10-year period, 15 to 18 percent of soil eroded from two heavily cultivated watersheds (drainage areas of 3,350 and 1,800 acres) reached area water bodies.

Several factors influence the amount of sediment that is delivered to waterbodies: 1) rainfall, 2) drainage area, 3) soil erodibility, 4) stream gradients, and 5) proximity of eroding areas to waterways. The size of the drainage area is important in sediment transport because the distance to downstream points is greater in larger watersheds and the opportunities for deposition are more numerous.

4.1.3.3 Effects of Sediment on Fish and Wildlife

Sediment deposits and turbidity can reduce the ability of a lake, stream or wetland to produce fish and other aquatic organisms in the food chain. This happens when primary plant productivity, which includes the growth rate of the microscopic and filamentous algae that are the foundation of the food chain, is impaired by reduced light penetration due to suspended solids. Fish habitat can be destroyed when sediment buries spawning areas. Young fish can be killed outright when silt-laden water is drawn through the gills. Sediment-caused reductions in the number of aquatic insects that live and reproduce on the stream or pond bottoms limit the primary food source of salmon, trout and bass. Over long periods of time, some species of fish may grow more slowly or disappear entirely from a waterbody. Poor fishing discourages fishermen, causing a subtle but important economic impact on an area.

Sediment has numerous detrimental effects on the aquatic life of a stream, including decreases in production of plant life due to less transparent water, and a decrease in the feeding effectiveness of trout and salmon resulting from less light penetration. The abrasion of fish gills by suspended solids can cause fish to be more susceptible to disease. As sediment accumulates, other permanent damage becomes evident. This includes destruction of spawning beds, nursery areas for fry, and destruction of habitat for such fish foods as aquatic insects.

Wetlands can protect lakes and ponds from sediment and nutrients by trapping and filtering runoff. However, excessive deposits in the wetland itself can put serious limitations on the value of the area for nesting and breeding. Waterfowl, songbirds, and furbearers are among the wildlife affected. Wetlands can also be groundwater recharge areas, and when sedimentation occurs, drinking water supplies may be jeopardized.

4.1.4 Pesticides

Pesticides, which include herbicides, pesticides, fungicides, miticides, and nematocides, are used extensively in agricultural, silvicultural, and increasingly in urban applications. These chemicals may endanger surface and ground water quality as they are lost from fields and lawns and gardens by leaching and by removal in runoff water or in runoff sediments. Pesticides or their degradation products may persist and accumulate in aquatic ecosystems.

Bioconcentration occurs if an organism ingests more of a pesticide than it excretes. When the organism is eaten by another animal higher up the food chain, the pesticide will then be passed to that animal and to other animals higher in the food chain. Herbicides in an aquatic environment can destroy the food source for higher organisms, which may then starve.

Because many pesticides are readily adsorbed by soil, the pesticide concentrations of sediments are generally higher than that of runoff water. As might be expected, pesticide runoff varies directly with rainfall intensity and inversely with time elapsed after pesticide application. Photochemical and microbial degradation of pesticides vary widely with pesticide formulation, soil texture, and soil water chemistry. Half-life of pesticides in soil systems ranges from less than 20 days to greater than 100 days.

An estimated 2.1 million pounds of active pesticide ingredients are used in Maine each year. Many of these pesticides break down rapidly after application but breakdown products may also produce harmful effects. Much more research on the effects of pesticides on human health and aquatic life is necessary if meaningful assessments of the severity of pesticide pollution in this state are to be made.

By definition, many commonly used pesticides are hazardous materials. Any infiltration of pesticides which contaminates groundwater and, consequently, drinking water supplies is a high priority for nonpoint source pollution control.

The pesticide aldicarb provides a good case study on groundwater contamination by pesticides in Maine. In 1980, the manufacturer of aldicarb found that about 170 domestic wells (50% of all those sampled) adjacent to treated potato fields contained aldicarb. About 25 wells exceeded the federal drinking water standard of 10 ppb. Filtration of the unpotable water provided a stop-gap measure while corrective actions were initiated. In 1984, the Board of Pesticides Control restricted the use of aldicarb by:

(1)Establishing an application setback of 500 feet from wells

(2)Prohibiting application during the spring groundwater recharge period

(3)Allowing fields to be treated only in alternate years, and

(4)Reducing allowable application rates.

At the recommendation of the State's Groundwater Standing Committee, the Legislature funded a three year pesticide sampling program to determine the nature and extent of the problem of pesticide contamination of groundwater. The study was begun in 1985 by the Maine Geological Survey. It focused on wells in, or adjacent to, fields where pesticides were applied, the following pesticides were detected, most at very low concentrations: alachlor, aldicarb, arsenic, atrazine, chlorothalonil, dicamba, dinoseb, endosulfan, ethylene thiorea, hexazinone, metribuzin, methamidophos, and pichloram. Methamidophos (Monitor) was the pesticide most frequently found, and dinoseb (now banned) was the only pesticide found in concentrations exceeding established drinking water standards. While ETU, the breakdown product of Maneb and Mancozeb were found, the unrealiability of the detection methods makes it difficult to quantify the problem.

4.1.6 Toxics, Organic and Metallic

Toxics are pollutants that are dangerous in relatively small quantities, that is, in parts per million or parts per billion (ppm or ppb). They come in a bewilderingly large and growing variety of forms that are frequently hard to detect. Many toxic substances do not readily decompose. Some such substances, including DDT, mercury, lead, and polychlorinated biphenyls (PCBs) concentrate as they are passed up the food chain; concentrations of dangerous chemicals in fish can thus be thousands of times greater than those in surrounding waters, thus making them unsafe for human consumption.

Hazardous Substances

A substance is considered to be hazardous if it appears on any of four lists of hazardous wastes that are contained in the Hazardous Waste Management Rules of the Department of Environmental Protection's Bureau of Oil and Hazardous Waste. Included in the lists are over 400 wastes known to contain toxics harmful to human health and the environment. Substances posing a very high risk are classified as "acutely hazardous" and are subject to lower levels of tolerance. For example, a substance is considered hazardous if it contains PCBs in concentrations greater than 50 ppb.

4.1.7 Petroleum and Byproducts

Contamination of groundwater with petroleum products, especially gasoline and its additives, is a continuing problem in Maine, with hundreds of documented cases of fouled well water. It takes very little gasoline to destroy a water supply. A concentration of one ppm can render water unsuitable for drinking. Thus, one gallon of gasoline can seriously pollute one million gallons of water. Most of the reported cases of petroleum contamination in Maine have been caused by leaks from underground storage tanks. Contamination may also result from aboveground spills as well as from highway runoff. Gasoline can travel quickly through soil into groundwater. Conditions underground prevent the rapid breakdown of petroleum products, and these may remain in the soil and groundwater for years as a plume that travels through the earth in the direction of groundwater.

Gasoline and its additives can cause severe illness and even death when respired or absorbed through the skin. Fortunately, the most common first indicator of exposure is odor, and this prompts most people to investigate the problem. Long-term exposure to very low concentrations of gasoline and its additives may increase the risk of developing cancer. The State Toxicologist has set 50 ppb as a safe level in well water for periods of use up to two years in duration.

4.1.8 Salts

Some salts commonly encountered in Maine are compounds containing Sodium (Na), Calcium (Ca), Potassium (K), or Magnesium (Mg) that are bound to Chlorine. These compounds appear in common items such as table salt and road salt (NaCl). Salts are highly soluble and become nonpoint sourced pollutants when they are used on a large scale for snow and ice-melting, dust control, and water softening. The solubility leads to transport of salts by surface runoff or by leaching.

The chloride component of salts has no known health effects when high concentrations of it are found in drinking water. However, high concentrations do impart salty taste to water and also shorten the lifespan of plumbing fixtures and appliances.

Sodium has been shown to cause high blood pressure in humans, which in turn increases the risk of heart disease. Drinking water with high levels of sodium may expose people to risk levels that cannot be managed by diet alone.

4.1.9 Other Pollutants

4.1.9.1 Hydrologic Modifications

Section to be developed at next revision.

4.1.9.2 Thermal Modifications

Section to be developed at next revision.

4.2 CATEGORIES AND SUBCATEGORIES OF NONPOINT POLLUTION SOURCES

This section of the Assessment describes the categories and subcategories of nonpoint source pollution which appear to have the most significant impacts on water quality in Maine. It is intended to provide basic information on the nature of these sources in Maine and allow comparison with the sources described in other states' Assessments. For information about which waters in Maine are affected by these nonpoint pollution sources, see Tables 2-5 and Appendixes I-V.

4.2.1 Agriculture

4.2.1.1 Cropland and Other Land Uses

a) Soil Erosion

Maine has approximately 1.2 million acres of cropland, according to the 1987 Study of Nonpoint Agricultural Pollution. Only 25 percent (302,000) of these acres is used for row crops in fields 10 acres or larger. Some of this cropland is continuously farmed in row crops, and the remainder is planted in rotation with grain or hay. Soil losses from sheet and rill erosion vary widely.

The average annual soil loss rate by sheet erosion for Maine's 302,000 acres of land used for row crops is 3.8 tons per acre per year. Tolerable soil loss for most Maine soils, as established by the Soil Conservation Service (SCS), is an average of 3 tons per acre per year over the crop rotation cycle. This limit represents the rate of the natural soil-building process. Thus, the average annual soil loss for the State's cropland is about 25% higher than the suggested tolerable limit. This does not include soil losses from gullies or eroding streambanks and roadside banks and ditches.

Approximately two-thirds of the acres in row crops are under good soil and water conservation management, with soil losses held to tolerable limits (as defined by the USDA-Soil Conservation Service). The average soil loss rate on the remaining 175,000 acres in row crops is about 7.8 tons per acre per year -two and one-half times the suggested limit. Erosion on these 110,000 acres could be brought to tolerable levels through one or more conservation practices. In addition to creating off farm pollution problems, depending on soil conditions, fields with severe erosion problems experience reduced productivity over a long period of time. According to the 1987 Study of Nonpoint Agricultural Pollution (SNAP Report) there are several dominant factors that determine erosion rates:

1) long, steep slopes;

2) planting crops in rows that run up and down slopes;

3) crop rotations that leave the soil surface exposed for extended periods, especially during the winter months.

The complexity of estimating sediment yield to streams makes it difficult to generalize about delivery ratios. However, the amount of sediment from cropland reaching streams is assumed to be greater in the heavily cultivated areas of Aroostook County than in other parts of Maine. This assumption is based on the high cropland density and high average erosion rates. Soil texture, topographic relief, and intensive farming practices also lend support to this assumption.

Local field conditions in other parts of Maine have also yielded high rates of sediment delivery to streams. For example, nearly 100% of the soil eroding from a particular field can eventually be delivered directly to a stream system if the runoff encounters no obstructions and there is no flattening of the land slope. On the other hand, a wide expanse of forest, wetlands, or other dense vegetative cover below the eroding area may filter out essentially all of the sediment.

b) Fertilizers

Over 58,000 tons of chemical fertilizers are applied to agricultural lands in Maine each year. Runoff and infiltration of nutrients from chemical fertilizers can cause the same nonpoint source pollution problems as nutrients from animal wastes. Chemical fertilizers are used by most farmers to maintain agricultural productivity.

A serious pollution problem with the use of chemical fertilizers in Maine is that they can be moved from the fields where they are applied to water-bodies. Phosphorus-laden soil particles can be moved into lakes and ponds by soil erosion. The nitrogenous components of chemical fertilizers which are readily dissolved by water can be transported by surface runoff or by leaching to surface or groundwater resources.

c) Pesticides

Chemicals to control weeds, insects, and fungi are considered by their users to be very important tools in production agriculture. They help to assure quantity and quality of products delivered to markets. Weed control assures that the crop planted will not have to compete with weeds for available nutrients and moisture, thus enabling the maximum production possible. Insect control assures that the crop produced is clean and bug-free. Fungi control is important since some high-value crops such as fruits and vegetables are extremely susceptible to damage by fungi. Some fungi are so damaging to host plants that whole fields must be destroyed to eradicate a fungal infestation.

Their are proponents in Maine of alternative forms of agriculture in which chemicals are not used. Biological and mechanical pest control methods are substituted for pesticides, and nutrients from organic sources are used. Intensive labor inputs and the differences between the relative economies of scale are factors that will affect the widespread adoption of organic and other farming methods.

Most herbicides are used on annual crops such as corn, potatoes, and other vegetables. The first application is usually pre-emergent, that is, applied before weed germination. In some crops a selective herbicide may be used after germination has occurred. Insecticides are applied while the crop is growing if field checks indicate that threshold levels of the target pest are exceeded.

In orchards the types and frequency of application of chemicals is very weather-dependent. In dry weather the "sticker" that binds the chemical to plant surfaces keeps the chemical where it does its job. During rainy periods frequent applications may be necessary.

Not all pesticides are problems. They vary greatly in their affinity for soils (that is, how strongly they are attracted and held), the length of time that they remain active, and their toxicity. Pesticides, like other substances applied at the soil surface, become a nonpoint source pollution problem when they are transported from application sites to receiving waterbodies. Transport is water-dependent, and so it only occurs after a rainstorm of sufficient intensity to cause leaching or runoff.

4.2.1.2 Animal Wastes

Agricultural operations in Maine produce approximately 2.1 million tons of manure each year. The vast majority (71.6%) of these animal wastes are produced by dairy farming. Poultry production accounts for 17.1% of the State's animal waste. Beef cattle produce 6.8% of the total. Horses, hogs and sheep combined produce only 4.5% of the total tonnage.

Animal waste production is distributed quite unevenly across the State. Virtually no agriculture exists in the forested northwestern third of the

State. Agriculture in the northern and eastern areas of the State is largely dedicated to raising crops rather than animal husbandry. It is in the southern and central regions of Maine that much of the State's animal waste is produced. The lower Kennebec River Basin, for example, contains over 36% of Maine's dairy herd, accounting for 26% of all the manure produced from all sources in the State. Similarly, 17.4% of Maine's dairy herd is located in the lower Penobscot River Basin and 12.2% of the herd is located in the lower Androscoggin River Basin. About half of the chicken manure in Maine is produced in the lower Androscoggin River Basin.

Animal wastes are sources of the nutrients nitrogen and phosphorus. Also, the presence of these organic wastes in waterbodies leads to decreased dissolved oxygen levels as the organic components are decomposed by bacteria.

There are several reasons why animal wastes represent a nonpoint pollution source. First, over the years many farmers have discounted the nutrient content of manure. Many have spread enough commercial fertilizers to provide all of their crop needs in addition to spreading several tons per acre of manure. This results in overapplication of nutrients. Second, distribution of the manure produced in the state each year is localized. Increasing herd sizes and large concentrations of livestock on individual farms make it difficult to spread optimum amounts of manure on all available acres. Fields closest to the sources of the manure tend to receive large amounts of manure year after year. Lastly, there is a lack of storage facilities needed to store manure during the months outside of the growing season. The high capital costs of these structures as well as eligibility for and applicability of traditional cost-sharing funds frequently determine whether a structure is included in a farmer's expansion plans.

4.2.2 Silviculture

About 89% of the land area of the state, or 19 million acres, is forested. Annually, 286,000 acres of trees are harvested (5-year average, 1982-1986). It is estimated that one-half of the logging activity takes place in the unorganized towns of the State.

Silvicultural activities are analogous to those of production agriculture. Crops (trees) are harvested; seedbeds must be prepared for planting new trees; pests such as weed species, insects, and fungi are controlled both mechanically and chemically. The scale of forestry activities in the state can result in the production of NPS pollutants such as sediment, pesticides, and hydrologic and thermal alterations. A common opinion regarding the impacts of silvicultural activities (and of other land uses, too) on water quality is that these impacts are temporary, and therefore not significant. The fact is that the impacts are cumulative, especially with regard to nutrients and stream bed-loading.

Previous drafts of this Assessment Report contained a synopsis of two studies carried out with 208 funds in the late 1970's. These studies focused on erosion and sedimentation problems associated with logging in Maine. The synopsis and the studies documents are available from either the NPS Coordinator or the Department of Conservation/Maine Forest Service.

4.2.2.1 Harvesting

Harvesting is the cutting and removal of trees. Removal is performed by skidders which skid (drag) the trees to a landing (clearing) where the logs are loaded onto trucks. The act of operating heavy equipment and dragging heavy logs in the forest can disturb the soil surface. The result is a surface very vulnerable to erosion when hard rains occur.

Throughout forests, as with any other land cover, there are numerous channels and streams which may need to be crossed to gain access to the areas to be harvested. Where roads cross streams, culverts or bridges are installed. Skidders may also cross small channels where the channels are small enough to cross without culverts or bridges. There is potential for hydrologic alterations of small streams where multiple crossings are made, and impairment of aquatic habitats may result. Very small streams are frequently reproductive areas for many aquatic species.

As opposed to agriculture where the same fields are harvested annually and access has been established, timber harvesting often requires the installation of new roads. These woods roads plus the landing areas and areas disturbed by their installation can be sources of sediment if not stabilized with permanent vegetation. The associated road ditches intercept stormwater and direct it to channels and ultimately to waterbodies.

The performance of timber harvesting activities near small streams can have significant impacts on their aquatic habitats. Removal of the canopy results in more of the sun's energy reaching the ground, and thus raising its temperature. Cutover forest land also results in increased runoff volume and peak discharge after a rainfall event. The net result is the delivery of additional heat energy and sediment to nearby streams.

Because of the low volume of small streams, it takes relatively small amounts of heat to significantly raise water temperature. In other words, small streams have very little buffering capacity with regard to temperature changes. Therefore, logging operations that do not maintain adequate buffer strips around small streams can have serious impacts.

4.2.2.2 Reforestation

Like agricultural fields, plantations that have been cleared and scarified in preparation for planting have potential for erosion to occur.

New plantings usually require control of sprouting and invasion of unwanted species. This is usually done with chemicals. A rainstorm that occurs shortly after herbicide application can result in discharge of chemicals to receiving waterbodies.

Insect control is sometimes necessary to maximize the number of trees in a plantation that will survive or reach maturity without serious defects. Most insecticide application on forests is done aerially. This can result in the delivery of chemicals directly to streams.

4.2.3 Construction

4.2.3.1 Public Roads and Bridges

One construction activity with potential for significant impacts on water quality is highway construction and maintenance. Since roads run long distances, there are usually many streams and intermittent drainages which must be crossed. In some cases, segments of streams must be channelized or straightened with the result that, at least for the short-term, sediment is generated.

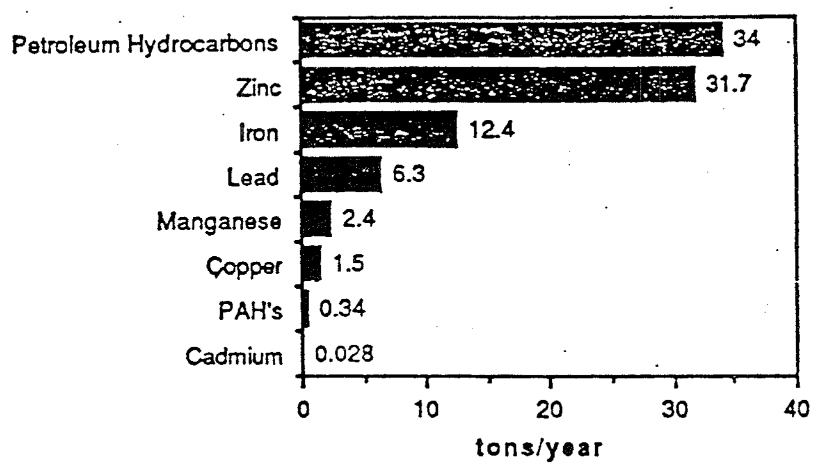
Building roads at acceptable grades involves cutting into hills and filling depressions. Often borrow pits near the right-of-way must be used to provide fill or base material. Borrow pits may be difficult to stabilize because of steep slopes and a lack of topsoil. Stabilizing borrow pits often requires regrading, trucking of topsoil, liming and fertilizing, and seeding with permanent grasses.

When new and expensive roads are built, state and local governments have vested interests in maintaining their safety and quality. Maintenance includes such activities as road salting, re-paving, ditch and bank cleaning, metal cleaning and painting. Road salting and the associated sand-salt storage piles can deliver significant amounts of sediment to surface water and salt to groundwater. The scraping clean of roadbanks and ditches without re-stabilization can lead to significant erosion and delivery of sediment directly to waterways.

Road construction also includes drainage systems for the disposal of storm-water. These systems can include manholes, stormsewers, open ditches, and pipes. Because the surface within a highway right-of-way is almost completely impervious, nearly all of the rain that falls on it becomes runoff. Water control structures are designed to convey stormwater as it is generated without causing flooding of road surfaces that would be a public safety hazard. The drainage systems act as conduits for sediment, litter, applied sand and salt, and oils and greases and other suspended or dissolved pollutants associated with vehicular traffic.

Stormwater runoff from highways is considered to contribute significantly to the total pollutant load of PAHs, lead and zinc. Annual estimates of runoff pollutants from highways is given in the following figure (Hoffman et al., 1985). In this study, the highway occupied 16% of the land area examined or approximately 6 miles. This is similar to the length of Interstate 295 in Portland.

FIGURE 3 Annual Inputs of Pollutants from Highways



4.2.3.2 Land Development

As the number of people living and working in Maine increases, so does the need for new homes and businesses. Consequently, the problems associated with nonpoint source pollutants from construction activities also intensify. On a statewide basis the water quality degradation caused by construction activities is not as great as the amount caused by other major nonpoint sources, since new development tends to occur near existing urban centers, along the coast, and in the southernmost counties. However, local impacts on water quality may be severe because of the high unit loads involved. Erosion rates from construction sites typically are ten to twenty times that of agricultural and silvicultural lands, and runoff rates can be 100 times higher. Thus, even a small amount of construction may have a significant impact on water quality at the local level.

Runoff rates are greatly increased in developed areas because of the amount of impervious surface area which prevents infiltration of rainfall or snowmelt into the soil. Reduced groundwater recharge rates are another result. Although difficult to assess, this impact should be addressed when NPS Management Plans and BMP's are developed.

Construction site erosion rates are highly variable because of different site characteristics. Time of year, soil type, slope length and steepness, the amount of area disturbed, and the type of construction activity being conducted are all involved. In Maine, construction is often started in early spring when the ground is thawing, rainfall and runoff are at their peak, soils may be saturated, and the growth of vegetation has not yet resumed. Rough grading of commercial and industrial sites can expose large areas to rainfall or snow melt, which, even on gentle slopes, can carry sediment. Heavy equipment can further aggravate the situation by compacting soil, thereby making it more impermeable and consequently increasing the amount of runoff and erosion.

Construction sites also generate pollutants other than sediment, including:

(1) Nutrients from fertilizer, such as phosphorus, nitrogen, and other nutrients, that can be attached to sediment particles or dissolved in water;

(2) Petroleum products;

(3) Construction chemicals, such as cleaning solvents, paints, asphalt, acids and salts; and

(4) Solid wastes, ranging from litter to trees and stumps, scrap building materials, and demolition debris.

Large scale developments such as industrial sites, shopping centers, subdivisions, roads, electrical transmission lines and pipelines have a significant potential to impact the water quality of Maine whether they occur in urban or rural settings, primarily because of the amount of land area exposed to erosive forces. Although such sites are usually rapidly stabilized after completion of construction, because of permanent drainage systems and large paved areas, off-site impacts may be long-term because of increased stormwater runoff, its potential to erode downstream areas, and the direct discharge of pollutant-bearing runoff to receiving waterways.

4.2.4 Urban Land

4.2.4.1 Urban Development

As forested or other open land is converted to residential,commercial, or industrial use, both the volume and the quality of surface runoff change, presenting a potential threat to water resources. The ratio of impervious surface areas to total drainage area greatly increases as roofs, driveways, parking lots and roads are placed over previously permeable soils. In addition to reducing groundwater recharge the irregularities of the forest floor are flattened out for lawns and gardens, thus reducing the surface storage area. Natural drainage ways are straightened and runoff is concentrated in ditches. These changes combine to significantly increase the amount of water leaving the site as runoff.

Small scale construction usually does not include any erosion and sedimentation control provisions during the building period and is not typified by storm drainage systems. A single small construction project may not have a major impact on downstream hydrology. However, with the present growth rate in Maine, there will be serious cumulative impacts. That is, many small scale construction projects may have an additive hydrological impact which is as significant as major construction projects.

If the trend in Maine toward extensive development in previously rural areas continues, particularly since the clearing of forest land is involved, the potential for sediment and phosphorus export to surface waters will inevitably increase. The overall impact of new construction on export of sediment and nutrients to surface waters in Maine is a function of the amount of development within a watershed, the types of construction (single-family, clustered multi-unit, commercial); the soils, length and steepness of slopes, areas disturbed, timing of construction; and the degree of implementation by contractors of the erosion & sedimentation control plans prepared by engineering consultants.

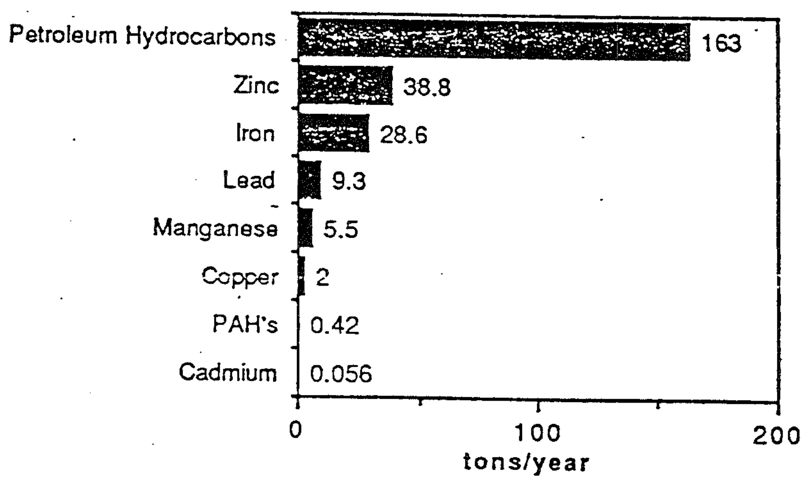
4.2.4.2 Stormwater Runoff

One major concern for stormwater runoffin developed areas is the variety of pollutants that it conveys to receiving waters. In Puget Sound, a two year runoff sampling program detected arsenic, cadmium, chromium, copper, lead and zinc in all samples and nickel in over fifty percent of the samples. Levels of cadmium, copper, lead, nickel and zinc were considered to be elevated (Puget Sound Water Quality Authority, 1988). Stormwater also contains suspended solids, nutrients, bacteria, oil and grease including PAHs, PCBs and pesticides.

Another concern is the hydrologic changes that urbanization causes to areasdownstream from the growing area. As Maine's coastal population grows, the acres of impervious surfaces such as streets, parking lots, highways, rooftops and driveways also increases. The net change is that both the volume and discharge rate for runoff increase for every storm. In rural areas rainfall is first intercepted by vegetation. The leaf surfaces must be wetted before it drips, collects, and runs onto the ground surface where it is absorbed by the soil. In developed areas the impervious surfaces are wetted quickly and surface runoff occurs much earlier during the storm. In order to prevent flooding, water is directed into drains. Storm drains direct water into streams, lakes, rivers and coastal waters.

No estimate of pollutants in stormwater in Maine has been made. The following graph depicts annual estimates of pollutants (in tons/year) from stormwater runoff into the Pawtuxet river in Rhode Island, which is believed to be the representation of Maine marine waters. The situation here is likely to be similar to that in Maine's Marine Waters.

FIGURE 4   Annual Inputs of Pollutants from Runoff



With the reduction of industrial discharges and the addition of secondary treatment plants, the relative contribution of stormwater runoff to the pollution load is increasing. In fact, oil and grease concentrations in an urban runoff study in Richmond, California, 1984), were frequently greater than the 15 mg/liter allowed in Maine's industrial discharge licenses. Although parking lots and commercial property accounted for only 11% of the land area examined in Richmond, CA., it was predicted that controlling discharges from these areas would reduce the oil and grease emission by over 50%

Stormwater runoff has been found to contain higher levels of fecal coliforms in other parts of the U.S. than the maximum allowed to be discharged by sewage treatment plants in Maine. In Baltimore, Maryland, pathogens and enteroviruses were found in storm sewer runoff. Two surveys in Canada found that 5-13% of the houses had illegal sanitary connections to storm sewers. It cannot be assumed that Maine is free from the problem of sewage contamination in stormwater drains; however, the Bangor and Portland areas are currently dealing with this problem.

Stormwater runoff from highways is considered to contribute significantly to the total pollutant load of PAHs, lead and zinc. Annual estimates of runoff of pollutants from highways is given in the following figure (Hoffman et al., 1985). In this study, the highway occupied 16% of the land area examined or approximately 6 miles. This is similar to the length of Interstate 295 in Portland.

As is apparent in the preceding figure; lead, zinc and PAH runoff from highways can be a major component of the total stormwater runoff.

Many of the pollutants found in stormwater are associated with suspended solids. For example, 81 to 96% of the hydrocarbons are associated with suspended solids. 1984). Also, in a stormwater runoff study of nine urban areas, the suspended sediments contained one thousand times higher concentrations of metals than the liquid fraction. Reduction of the suspended solid load in stormwater runoff can help reduce metal and hydrocarbon pollution associated with runoff.

Stormwater runoff, whether in storm drains or in combined sewer overflows is clearly one of the next environmental issues to be addressed in Maine. Addressing the problem should include monitoring to identify problem areas, creative engineering and planning, treatment, public education and enforcement where necessary. Maine's Non-Point Source Pollution Control Program will focus on these issues.

While wastewater treatment facilities exist in many municipalities, a common goal of Maine municipalities is to have separate sanitary and storm sewers. The need to keep urban runoff out of conventional wastewater treatment plants rsults from the excessive quantities of water involved and the rapid rate of flow which cause a "shock load" which usually cannot be treated. In municipalities with old, combined sanitary and storm sewers (CSO's), urban runoff mixes with sanitary wastewater and is often bypassed directly into the local river, lake, or estuary as a (point source) discharge from a combined sewer overflow. Further complicating the problem is the fact that conventional treatment plants are not very effective in treating some types of pollutants (such as heavy metals) that are contained in urban runoff.

Rainwater running off roofs, lawns, streets, industrial sites and other areas contributes most of the liquid flow to urban runoff. From the moment it hits urban surfaces, rainwater starts picking up contaminants. Even roofs can contribute significant amounts of pollutants which have accumulated as dust between rain storms. A large volume of urban runoff is comprised of sediment and debris from decaying pavements and buildings which can clog waterways, reducing hydraulic capacity (and thus increasing the chance of flooding) and degrading aquatic habitat. Heavy metals and inorganic chemicals (including copper, lead, zinc, phosphorus, nitrate, ammonia and cyanide) from transportation activities, building materials and other sources are significant pollutants. Nutrients are added to urban runoff from fertilizers applied around homes and in parks. Petroleum products from spills and leaks, particularly from gas stations and storage tanks, as well as polycyclic aromatic hydrocarbons from petroleum combustion are important components of urban runoff. Pathogens from animal wastes and ineffective septic tanks are other important urban contaminants that may affect groundwater as well as surface water.

Of equal importance is the sheer volume of stormwater leaving urban areas. When natural groundcover is present over an entire site, approximately 10 percent of the stormwater runs off the land and into nearby surface waters. When paved surfaces account for 10%-20% of the area of the site, 20% of all stormwater becomes surface runoff. As the percentage of paved surfaces expands, the volume and rate of runoff, as well as the corresponding pollutant load also grows.

As population increases in Maine, so will the problem of urban runoff. As urban runoff increases, the inadequacy of local stormsewer systems is likely to become more apparent. <u>The first phase</u> of urban wastewater management was to provide treatment for sanitary wastewater. <u>The second phase</u> is currently underway and seeks to eliminate combined sewer overflows. <u>The third phase</u> will address the treatment of stormwater, where necessary, to attain Maine's water quality standards. While the costs of planning for growth often seem prohibitive to local officials (such as building a stormwater treatment system large enough to handle infrequent and seemingly harmless stormwater flows) such measures could prevent costly water cleanups in the future. When considering the use of stormwater management structures, it is important to consider potential impacts on the groundwater due to increased infiltration in areas under the basins, due to possible concentration of runoff pollutants.

4.2.4.3 Combined Sewer Overflows

Combined sewers are pipes which carry both sewage and stormwater. During storms the volume of discharge may reach a level which cannot be handled by the sewage treatment plant. The excess, a mixture of stormwater and sewage, overflows untreated into downstream waters, frequently a harbor or estuary.

There is a common misconception that bacteria is the only problem associated with combined sewer overflows. Runoff from CSOs contains high levels of metals and organic pollutants (e.g., PCBs and PAHs) as well as high concentrations of bacteria nutrients and suspended solids. Metals and organic pollutants can concentrate in sediments and accumulate in bottom dwelling animals and then be passed up the food chain to fish, birds and man. Fecal coliform bacteria discharged in the CSOs may result in closures for contract recreation such as swimming and sailboarding and for the harvesting of shellfish. In Puget Sound and in San Francisco Bay, the bottom dwelling animal community living near the CSOs was found to have reduced numbers of species and individuals at the stations closest to the CSOs.

The following graph depicts an estimate of annual CSO hydrocarbon and metal pollutant discharges for Maine as estimated by EPA/NOAA (1987).

FIGURE 5 Annual Loading from Combined Sewer Overflows

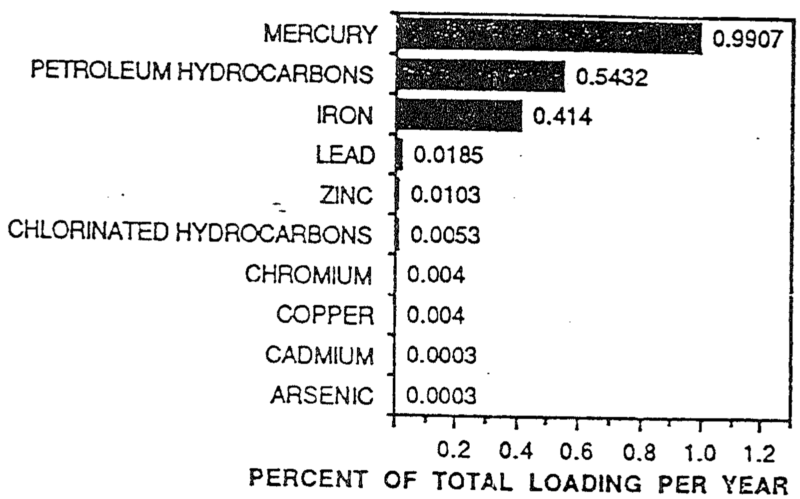
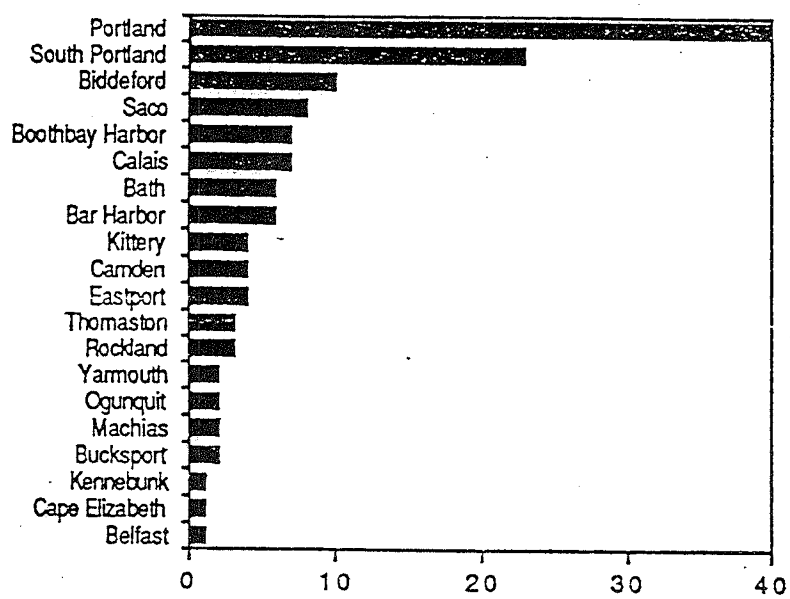


FIGURE 6 Number of CSO's Entering Marine and Estuarine Waters by Municipality



Elevated levels of lead and PAHs associated with hydrocarbon pollution have been found in sediments near CSOs in Portland, South Portland, Camden, Belfast and Rockland. No sampling has occurred in the vicinity of other CSOs.

A monitoring program to assess CSO pollutant input is a critical need in Maine. Portland, Westbrook and South Portland have been asked by the DEP to submit plans for monitoring their CSOs.

4.2.5 Resource Extraction

4.2.5.1 Gravel Pits

The commercial mining operations presently active in Maine produce sand and gravel, clay, dimensional stone, crushed stone, limestone, topsoil, peat, and gravel. There are also small-scale, hobby-type activities of gold panning and gem mining in Maine. These activities may affect surface water quality, groundwater levels and groundwater quality.

Sand and gravel mining is by far, the most extensive mining activity in Maine (estimated at 7,200,000 tons/year). Approximately thirty monitoring wells have been placed in gravel pits as part of the sand and gravel aquifer mapping program. Most have demonstrated acceptable groundwater quality. Most groundwater quality problems associated with gravel mining historically have not been the pits themselves, but subsequent use of the pits after mining has ceased. Pits have become illegal dumpsites as well as locations to store road salt. There are many municipalities in Maine where the local gravel pit has become the local landfill.

Most gravel pits are excavated in glacial outwash deposits which are composed of coarse sands and gravels. These deposits have large pores between particles which allow water to percolate through very rapidly. The pores can make up as much as 50% of the total volume, and therefore these deposits have tremendous storage capacities. This is where sand and gravel aquifers are located.

Since most gravel pits are located over aquifers or within their recharge areas, there is some risk of contamination to the groundwater by the mining activity itself. The first step in opening a new pit is the stripping of topsoil. This removes the organic cap which has the ability to remove some suspended and dissolved contaminants. Removal of the sand and gravel overburden reduces the distance between the surface and the top of the water table, resulting in less filtering capability. Operation of heavy equipment which is dependent upon petroleum products and other chemicals carries the risk of spills or leaks which result in discharge of hazardous pollutants to groundwater.

4.2.5.2 Other Mining Activities

There has been sporadic metal mining activity in Maine for almost a century and-a-half, including at least three boom periods. Mines in Maine have produced iron, copper, zinc, gold, silver and other metals. All of these mining operations, however, have tended to be small in scale, and transitory. There has been no metal mining in Maine since 1977 when the Kerr-American copper mine ceased operations in Blue Hill. The discovery, in 1978, of a massive copper/zinc deposit near Bald Mountain in Aroostook County in northern Maine has renewed interest in metal mining. This discovery not only located one of the largest and highest-grade copper deposits in North America, but it also suggested that other major mineral resources might be hidden under the mantles of Maine's soils and vegetation.

This discovery, along with the emerging legacy of pollution from abandoned-mine tailings, has fueled concern about future mining in Maine. The Kerr-American Copper Mine, a bedrock shaft mine, left behind tailings which have caused heavy metal contamination problems in Carleton Stream and Salt Pond. This NPS pollution has impacted aquatic life and resulted in Salt Pond being closed to shellfish harvesting. With proposals now being discussed for an open pit mine 2,800 feet wide and 800 feet deep at Bald Mountain, the necessity for modern metal mining technology and planning becomes apparent. At the Bald Mountain Mine there would be two wastewater control systems - one having to do with ore processing, the other having to do with general site drainage and the mine pit. Ore wastes (tailings) would be carried by water to a tailings impoundment. Snow and rainfall entering the pit along with some groundwater seepage would be treated for exposure to the sides and bottom of the mine and the resulting discharge regulated by license as a point source of pollution.

Although exploration for minerals in Maine is not very intensive at present, ten years ago there were 18 different firms spending $4 to $5 million per year for mineral exploration in Aroostook, Hancock and Washington counties. If metal prices increase, it is likely that knowledge gained during those studies will result in new mines being established. The nonpoint source pollution of groundwater and surface waters through metal mining is not a reality for today, but a potential problem in the near future.

4.2.6 Waste Disposal

4.2.6.1 Wastewater Treatment Facilities

a) SEPTIC SYSTEMS

A malfunctioning septic system has a serious potential to pollute surface waters. Sometimes a malfunctioning septic system will just create a pond of contaminated water over the leach field only during the spring. Usually, however, the problem becomes progressively more chronic and results in wastewater running into surface waters. Although septic systems installed since 1974 (when a modern system for the regulation of subsurface disposal of wastewater was adopted) sometimes "break out", it is the hodgepodge of substandard systems installed prior to 1974 that pose the greatest threat to the State's waters. Often these outdated systems are densely clustered in old shorefront developments.

It is difficult to assess the extent of discharges to surface waters from malfunctioning septic systems. Usually, it is only when a neighbor or passer-by complains to municipal or State officials that action is initiated to eliminate this nonpoint source of pollution.

On a Statewide basis, septic systems, even if properly functioning, seem to be the largest single cause of unpotable groundwater. This contamination from septic systems is a significant threat when the systems are not installed according to the rules for subsurface disposal of wastewater. Septic systems can also have a cumulative effect on groundwater quality when there are too many of them in a given area or when they are clustered by design. It is in densely settled, largely unsewered counties such as Sagadahoc and York that the greatest potential exists for cumulative impact. With there being at least 230,000 septic systems in the State and the present groundwater problem attributed to them, their long-term threat to subsurface water supplies merit further study. Historically, the highest priority for water pollution control efforts has been given to the municipalities and urban areas of Maine. The traditional engineering approach has been to construct a network of sewers to convey wastewater to a central location for treatment, with subsequent discharge into surface waters. In suburban and rural areas of the State, the cost of constructing, operating, and maintaining community wastewater treatment facilities is prohibitive, hence the reliance on septic tank leach field systems. Although such systems have been in use in rural Maine for years, their potential for problems is high, primarily due to poor maintenance. Moreover, increased loadings beyond the design capabilities of these systems can result in overloaded soils and groundwater contamination.

Multiple subsurface discharges in a small area, as in the case of subdivisions, are a growing cause of concern in Maine. According to one estimate, each system in a subdivision may discharge an average of 41 grams of nitrate-nitrogen per day. Large subdivisions, particularly those on sand and gravel aquifers, thus have the potential for polluting substantial quantities of groundwater. Discharges may not only endanger the water quality of wells within the subdivision itself, but also those of neighboring property owners if the disposal systems are not properly designed, constructed and maintained.

The principal threats to groundwater quality from septic systems are nitrates, bacteria and viruses which are discharged from septic tanks to leach fields and ultimately to the soil in various concentrations and varying rates. The septic systems of commercial operations can also pose a localized threat to groundwater due to the inability of septic systems to treat substances such as solvents. Domestic wastewater entering a septic systemleach field has a nitrate concentration of about 30 mg/l. If there is inadequate opportunity for denitrification in the soil or inadequate opportunity for dilution, poorly designed or densely sited systems can cause groundwater to exceed the drinking water standard for nitrates of 10 mg/l. From a health standpoint, nitrates are among the most serious threat since they may be converted to nitrite in the intestinal tracts of infants and cause methemoglobinemia (blue baby syndrome). Very little is known about the attenuation of pathogenic organisms in subsurface wastewater disposal system, in particular the ability of soils to restrict the transport of viruses by groundwater. The State Plumbing Code offers some protection of private and public wells by requiring minimum setback distances of 100 and 300 feet respectively.

Like other waste disposal facilities, those which handle the sludge from septic tanks and cesspools (septage) have the potential to contaminate groundwater resources. Landspreading is the most common method of septage disposal. Properly sited and managed, these facilities need not pose a serious threat. Since 1974, all municipalities have been required by law to provide means of disposal for all septic tank and cesspool waste generated within the municipality. Approximately 50% of the towns have not yet done so, which suggests that some wastes are improperly handled.

b) Municipal/Industrial Facilities

As a result of the attempt to clean the nation's waters, wastewater treatment facilities have been constructed throughout the country. Maine, although it has a disproportionate number of unsewered areas, is no exception and has built many new facilities to remove the dissolved organic matter, solids and other impurities from liquid waste prior to its discharge into the State's waters. These facilities, however, can create new contamination problems. The use of wastewater lagoons and land application of wastewater, sludge and septage are of particular concern as nonpoint source of pollution.

Wastewater treatment often involves wastewater storage in lagoons. Depending on the geologic setting, constant percolation may have a signficant potential for contamination of groundwater. Because lagoons have not been recognized in the past as potential contaminators, groundwater monitoring plans associated with them have generally been inadequate. It is estimated that 118 billion gallons of fluids enter groundwater nationwide as a result of planned or chance discharge from these surface impoundments.

The amount of subsurface discharge from wastewater lagoons occurring in Maine is unknown. One factor which minimizes the extent of groundwater contamination from this source is that the lagoons are generally located along large rivers or the ocean. Being located close to the groundwater discharge areas keeps the potential area of groundwater contamination relatively small.At one time there were eight known industrial subsurface wastewater systems in Maine. Six of the eight dischargers were metal-finishing or electrical component facilities. All were in existence prior to DEP jurisdiction over groundwater discharges. In most of these situations the wastewaters contained metals which are toxic even in small quantities, such as lead, hexavalent chromium and cadmium. The DEP required these discharges to be eliminated and there is presently no subsurface disposal of industrial wastewater in Maine except for that which may leak from wastewater treatment lagoons.

Land application of wastewater generally involves disposal of pretreated wastewater on the land surface by one of several distribution methods. When sanitary wastewater is sprayed by irrigation systems as a means of disposal, there is minimal impact on groundwater quality. This finding is supported by national and local research which indicates that properly operated systems do not exceed primary or secondary drinking water standards. Observation wells located at the down gradient perimeter of irrigation sites demonstrates that some contamination from wastewater application does occur, nitrates above background levels for example, but thus far, no violation of drinking water standards has been documented. The wastewater disposal systems of industrial food processing operations may also affect groundwater quality to some extent. Parameters of concern are organic loading as measured by oxygen demand, iron, manganese, nutrients, salts, and dissolved solids. There are presently 27 licensed land application sites in Maine.

Disposal of treated wastewater is obviously a better alternative than raw disposal, with regulation as the key to maintaining Maine's water classification standards. Great care must be taken, however, that wastewater treatment measaures designed to protect surface water quality do not inadvertently cause problems with groundwater quality.

4.2.6.2 Solid Waste Landfills

In 1986, the citizens of Maine generated over three quarters of a million tons of municipal solid waste. By 1994 the quantity is projected to increase by approximately 4.5% to a little over 800,000 tons annually if current population trends continue and no new recycling efforts are implemented. Eighty percent of this total comes from the southwest portion of the State (as delineated with the greater Bangor area in the northeast corner). The trend of numbers of municipal solid waste landfills in the State of Maine is as follows:

YEAR	Number of Landfills
1977	454
1980	334
1984	288
1986	265

Increasing recognition of the environmental problems associated with solid waste disposal sites has led to the closure of 189 sites during the last eleven years. The water quality benefits of fewer solid waste landfills, however, is slightly offset by the expansion of some remaining facilities.

Groundwater contamination is a serious threat from landfills due to movement of water through the waste. Materials released by natural decay processes, chemical reactions and dissolution in a landfill are almost certain to leave the confines of those landfills which don't have impermeable liners. If this waste-laden water, known as leachate, enters the soil beneath the landfill, groundwater contamination will probably occur. Landfills located on sand and gravel aquifers are the worst polluters of groundwater due to the ease with which this leachate can reach the groundwater table. In some parts of the

State, more than 70% of all solid waste disposal facilities are located on mapped sand and gravel aquifers.

Although solid waste is a serious nonpoint pollution problem today, there has been significant progress in Maine toward developing a comprehensive approach to solid waste management. Ten years ago, almost every town in Maine had an open burning dump. Many of these sites were located immediately adjacent to streams and lakes. Nearly all were polluting groundwater or surface water. Public perception of solid waste disposal has slowly changed, and Maine's lawmakers and citizens have responded. With the "grandfathered" dumps being closed, solid waste incinerators being constructed and operated, the consolidation of some municipal landfills and an increasing commitment to recycling, Maine is slowly moving toward environmentally acceptable methods of solid waste disposal.

4.2.6.3 Hazardous Waste Disposal

Disposal Sites

An abandoned warehouse full of pesticides, a junkyard that had accepted electrical transformers which contained PCB-laden oils, a neighborhood with chemically contaminated drinking wells and a hazardous waste "recycling" facility all have one thing in common - they have been identified as uncontrolled hazardous substance sites within Maine by the Department of Environmental Protection. There are presently no licensed hazardous material disposal sites in Maine, so the problem is limited to past disposal practices and, to an unknown extent, on-going illegal activities. Most individual problems in the State come to the DEP's attention through citizen complaints or facility inspections. Clearly, the full extent of the problem is not yet known although the DEP has obtained information indicating that numerous contaminated sites have not been reported by site owners.

At present the DEP has assessed some 116 suspected hazardous waste sites in the State. Of those, 61 have been confirmed as potential problems and 42 of these sites have caused groundwater contamination. Presently, there are seven sites in Maine that have been designated as Superfund sites. These include the Winthrop landfill, the McKin disposal site, O'Connor's Salvage Yard, the Saco Tannery Pits, the Brunswick Naval Air Station and the Saco landfill. The Union Chemical site has been proposed as a Superfund site, but has not yet been officially designated as such. Cumberland County ranks highest in the relative extent of its groundwater problems due to hazardous substances because of the presence there of two very extensive contamination areas - the Brunswick Naval Air Station and the McKin site in the town of Gray.

Storage and Treatment Sites

There are two types of legal hazardous waste facilities which are of concern as nonpoint pollution sources in the State: storage and storage/treatment facilities. A storage facility exists when an industry generates and stores hazardous wastes prior to shipping to an out-of-state disposal facility. In 1987, there were 18 Maine industries storing about 274,000 gallons of hazardous waste on-site for more than 90 days. One of these has been shown to have polluted groundwater due to leakage from an underground storage tank. It has not been determined what effect the other 17 storage facilities may have had on groundwater. The only type of hazardous waste currently approved for underground storage is ignitables.

There are a number of industrial facilities across the State which generate hazardous wastes and store them in aboveground tanks or barrels for less than 90 days. By definition, these facilities are not considered a waste facility and are not required to obtain a license. In the past, the total number of these unregulated facilities was thought to be small. Although the total number is still unknown, indications now are that there are many more industries storing hazardous wastes for less than 90 days than was previously suspected.

A storage/treatment facility can be one of two types. One is where wastes from other industries and generators is accepted, stored, and treated for recycling with some waste ultimately being sent to a disposal site. The other type is where a generator stores and treats its own waste on site. Both types have wastes that are ultimately sent to an off-site facility. There are approximately 28 storage and treatment facilities in Maine at present. In 1987, approximately 433,000 gallons of hazardous waste were treated in Maine at these facilities.

Contamination of groundwater in Maine from hazardous waste has also resulted from improper disposal and leakage at landfills, leachfields, lagoons, dry wells and spills. This contaminated groundwater has been documented as affecting at least 43 private wells in the State. With no standard regulating storage procedures and limited site screening activities, hazardous substances are likely to an unknown culprit in many of Maine's groundwater contamination incidences.

Oil Conveyance

Eight major oil spills have occurred in the last three decades on Maine's coast (Map facing page). The environmental effects of these spills is not completely known. However, losses of commercial species such as clams and/or lobsters were documented in three of the spills.S. Fish and Wildlife Service, 1980). In the Long Cove spill at Searsport, tumors and reduced growth rate were found in clams. Bloodworms harvested from Long Cove had high mortalities during shipping for some time after the spill.

After the Tamano spill in Casco Bay, all types of bottom dwelling animals were adversely effected, particularly the shrimplike animals called amphipods which were eliminated from heavily oiled locations. Waterbirds also experienced high mortalities.

The long-term effects of oil spills are unknown; however, PAHs contributed by oil spills are accumulated in sediments and animals. Degradation of PAHs is slow; and may affect marine animals for a long time.

Boating Activity

Recreational boating activity is increasing in Maine. Casco Bay, for example, is home for approximately 5000 boats. The direct effect of boating activity is the pollution load from oily wastes, bottom paints and bacteria. Indirect effects related to boating activities include runoff from boat yards and marinas of oily wasates and/or bottom paints. Bottom paint containing tributyl tin are regulated but not eliminated by state law.

SPILLS

Hazardous substance spills pose a serious threat to surface and groundwater if they are not cleaned-up as thoroughly and quickly as possible. Spills of hazardous substances are often released as the result of transportation accidents. This makes them particularly difficult to clean-up due to traffic, location and, sometimes, an inability to determine precisely what contaminant has been spilled.

Maine's paper industry uses many hazardous substances which must be transported through the State. Caustic acid, sulfuric acid and chlorine are essential to production, but dangerous if spilled en route. The potential for large spills at storage facilities and on highways can become a serious NPS pollution problem. In 1986, approximately 3,050 gallons of sulfuric acid were spilled in Maine. Nineteen other types of chemicals were involved in hazardous material incidents that year.

Fortunately, from the perspective of clean up and quantification, most hazardous substance incidents occur at facilities where managers have a good idea of how much of what substance has leaked and are aware of DEP regulations regarding reporting and clean up. Thirty of the hazardous material spills in 1986 were industrial, eight were terminal spills, five were transportation related, three were residential, and fourteen were from mystery sources.

As long as hazardous substances are transported around the State the possibility for spills will be present and the quality of Maine's water resources will be at risk. Given this inevitable threat, it is imperative that the DEP's full response and enforcement authority be maintained at the highest possible level of function.

4.2.7 Other Sources

4.2.7.1 Atmospheric Deposition (Acid Rain)

In the northeastern corridor of States, Maine is further downwind from the major industrialized region of the U.S. than any other state. This location leads to lower levels of acidic deposition than any other state north of the Ohio River. Maine's precipitation is estimated to be 2 to 4 times more acidic than normal, largely due to sulfate and nitrate. Current loadings of sulfate are 15 to 20 kg/ha statewide, decreasing to the north and inland. Similar data for nitrate are 7 to 12 kg/ha, decreasing northward. These values represent deposition of approximately 125,000 metric tons of sulfate and 75,000 metric tons of nitrate on the State each year.

Regional dry deposition inputs of acid precursors are generally assumed to be significant relative to wet inputs. This nonpoint pollution is deposited on the entire landscape in a more or less uniform manner. Dry and particulate deposition is difficult to measure, and little scientific consensus exists as to relative pollutant rates either within or among regions. Dry deposition decreases away from its source due to dispersion and removal and, thus, may be expected to be less in Maine than in areas closer to industrialized areas. Maine, however, has numerous instate sources of sulfate, such as the paper industry. Maine has both the highest concentration and highest total emissions of atmospheric sulfate in New England. Available data suggest that dry deposition of sulfate adds at least an additional 50% to wet inputs especially at higher elevation, and decreases in importance in northern sections. Measured SO_2 concentrations at one site in east-central Maine are low relative to other northeastern U.S. data. NOx dry deposition and the nitrogen - sulphur ratio also decrease with distance from the source suggesting that NOx dry deposition may be of relatively low significance.

Available data indicate that the sulfate from acidic precipitation passes through Maine watersheds into surface or groundwaters, and eventually is transported to the ocean. Sulfate from acidic deposition entering deep groundwater is of small significance relative to normal concentrations. However, the sulfate concentrations of surface waters are probably at least double those of prehistoric times, due to polluted precipitation. In contrast to sulfate, more than 90 percent of the nitrate is biologically utilized, and does not enter surface or groundwaters.

Chemical changes in soils and groundwater resulting from the deposition of sulfate, nitrate, and associated hydrogen ions have the potential to alter surface water quality by acidification. Acidification is the lowering of pH, and this increases the solubility of aluminum and other toxic trace metals. Most problematic from an inventory perspective is the potential for episodic acidification in streams and brooks, and the associated short-term biological impacts. Such episodes in response to rainfall events or snowmelt are well documented in a few systems, but their extent and severity statewide is unknown.

The number of chronically acidic lakes in Maine is small. The results from the 1984 Eastern Lake Survey projected that between 8 and 21 Great Ponds in Maine were acidic (those with an acid neutralizing capacity less than 0). Based on all known data for Maine (nearly 1000 lakes sampled), we are aware of 18 acidic lakes at least 4 hectares in size. Thirteen of these lakes had a pH less than 5.0 at the time of sampling. Four of the 18 are High Elevation Lakes in western Maine. Two-thirds (12) are seepage lakes having no outlet. If lakes as small as 1 acre (0.4 hectare) in size are included, 55 are known to be acidic (37 had a pH less than 5.0 at the time of sampling.

Sixty percent of the acidic lakes are seepage lakes. However, this type of lake is transitional into bog lakes, and it is apparent that many darkwater acidic systems exist. The darkwater lakes are thought to be, at least in part, naturally acidic.

Twenty percent of the acidic lakes are small (<4 ha.) drainage lakes, and it is possible that significant numbers of these lakes that are unsampled, are acidic. However, sampling has largely focused on the lakes expected to be most sensitive, such as high elevation lakes in chemically resistant bedrock. Therefore, fewer than three percent of the general population of small lakes are expected to be acidic. In a probable worst-case scenario, fewer than 100 small acidic drainage lakes (less than 3% of approximately 3000) are undiscovered. The number is likely much less than that, due to past sampling programs which were biased toward sampling those lakes thought to be most stressed or sensitive.

There are probably only a few unsampled acidic lakes in the 4 hectare and greater size, based on the Eastern Lakes Survey. Similarly, it is unlikely that a significant number of unknown acidic lakes exists in the seepage lake class, excluding bog waters. Some uncertain number of unsampled small drainage lakes may be acidic, although the number is probably much less than 100, and probably less than 50. Thus, including the 55 acidic lakes known to exist in Maine, there are a total of 100 or fewer non-dystrophic acidic lakes larger than 1 acre. Although 55 acidic lakes have been identified, the number acidified to an acid neutralizing capacity of less than zero by acidic deposition is less than 55. Many of these lakes are acidic due to natural factors.

Paleolimnological investigations in New England have concluded that some lakes apparently have become acidified in the past 20 to 50 years. However, most are inferred to have had a pH of less than six in pre-historical times. Therefore, only lakes that currently have a pH less than six are considered to be at risk. Utilizing the same database from which the number of acid lakes was inferred, 45 Maine lakes are identified with pH between 5.0 and 6.0, and an acid neutralizing capacity of less than 20 ug/l. The actual number may be considerably higher, especially if small unsampled lakes are included. However, the only available long term data from lakes with pH or about 6.0 (EPA Long Term Monitoring lakes at the University of Maine/DEP Tunk Mountain Watershed Site) suggest that their acid neutralizing capacity has increased since 1982. (While five years is much too short a period to indicate trends, it is apparent that even these very sensitive lakes are not immediately at risk to acidification.)

No direct data is available that indicates temporal pH trends. Paleolimnological diatom analyses of sediment cores from eight low pH Maine lakes has suggested that only Mud Pond (T 10 SD, 5 acres), and Unnamed Pond (T 3 ND, 15 acres) have a lower pH now than they did 100+ years ago. Both ponds have a pH of 4.8, and a diatom-inferred historical pH of less than 5.5. No evidence exists that any adverse biological effects have occurred in these two ponds due to inferred acidification but this is probably due to a lack of data.

4.2.7.2 Underground Storage Tanks

In 1987, over 625 million gallons of automotive gasoline were pumped in Maine. This product is stored in an estimated 25,000 underground tanks, many of which are the older, base steel type that are unprotected against corrosion. The DEP has investigated over 500 leaking underground storage tanks. Over the past year, however, new cases of underground leaks are being reported at a rate of about one a week. In Maine, 90% percent of the rural population drinks groundwater and each year about 70 wells are reported as being contaminated by gasoline from leaking underground storage tanks (LUST). The most alarming aspect of this problem is that there are an estimated 6,500 sites in the State that have been polluted by LUST while only about 1,000 of these sites have yet been discovered. At 176 of these sites, over 400 private wells have been polluted (Appendix II).

The most common petroleum product stored in underground tanks is gasoline. Gasoline contains numerous toxic and carcinogenic chemicals such as benzene, toluene and m-xylene which are soluble in water to varying degrees. Another common constituent of gasoline is MTBE (methyl tertiary butyl ether) which is used as an octane enhancer. This chemical, at 25^{o}C, is 80 times as water soluble as toluene and 240 times as soluble as m-xylene. Although MBTE is less toxic than some gasoline constituents, it seems to increase the solubility of other, more hazardous components of gasoline. Concentrations of gasoline containing MTBE can be very high within contamination plumes in comparison to gasoline plumes which do not have this additive. In fact, concentrations of gasoline in household wells have reached 600,000 ppb which contrasts with similar scenarios of well contamination of gasoline (without MTBE) in the range of 10 to 30,000 ppb. Since there is concern over human toxicity in connection with MBTE, the State toxicologist has set a recommended maximum concentration of 50 ppb. Likewise, gasoline and fuel oil also have recommended maximum concentration levels of 50 ppb. These maximum concentrations are only recommendations, however, as they pertain to private water supplies.

Regulation has focused on the liability of LUST owners/operators and technological aspects of the emerging LUST problem: better tanks, better piping, better tank tests, and better leak detection. A statute enacted in 1985 allows the DEP to take remedial actions including replacement or restoration of water supplies threatened or contaminated by oil, petroleum products or their byproducts. A process for assigning liability arising from LUST incidents was also established to recover costs associated with remediation and reduced property values. The commissioner of the DEP may order persons found responsible for oil discharges that have caused or created a threat to public health or the environment, including but not limited to the contamination of water supply, to take temporary or permanent remedial actions including a requirement that the responsible party restore or replace the water supplies.

Amendments to the Oil Discharge Law (38 MRSA, Section 561 et seq.) which were adopted in 1986, direct the Departments of Environmental Protection, Human Services and Public Safety to develop a comprehensive plan to address standards for new underground storage facilities, appropriate procedures to improve leak detection, strategies for tank abandonment, and define the roles and responsibilities of each participating State agency. The new regulations require all underground storage tanks with capacity of more than 500 gallons to be registered with the DEP, establish design and installation standards to be enforced by the DEP, initiate a program for training of State-certified tank installers, and establish abandonment procedures for all tanks which have been out of service for more than 12 months. This cooperative effort to search for solutions to the LUST problem has started to show results. Over 2000 unprotected underground storage tanks (many of them leaking) have been removed under this program.

In 1987, a ten year compliance schedule was approved by the Maine Legislature for upgrading underground storage tanks and associated equipment. Under the new requirements, no one may operate, maintain or store oil in a registered underground storage facility or tank which is not constructed of cathodically protected steel, fiberglass, or other noncorrosive material approved by the Department of Environmental Protection. Depending upon the age of the tank and whether it is located in a geologically sensitive area, the tank owner has between two and ten years to replace it under the compliance schedule.

4.2.7.3 Road Salting

The spreading of salt and sand-salt mixtures on Maine's roads may save many lives each winter but has a detrimental effect on groundwater quality. Each year 50,000 - 60,000 tons of salt are used for the de-icing of roads during the winter months. Some of this salt is spread in pure form, but most is mixed with sand and spread for traction as well as deicing. While Maine already uses a lower percentage of salt in its sand-salt mixture than other state in New England (80-250 lbs. of salt is mixed with each cubic yard of sand), roadside contamination is going to be a problem as long as any sodium chloride is used. Road salt application, however, affects highly localized areas, is attenuated rapidly by natural processes and poses little long-term threat to groundwater outside the road's right-of-way. So although roadsides may account for a significant amount of groundwater contamination in Maine, they represent a localized problem for which simple drainage solutions may be applicable.

The larger road salting problem lies in the storage of salt and sand-salt mixtures which can act as in-place nonpoint source pollutants, particularly when sand-salt piles are uncovered and runoff from the site reaches nearby surface water or groundwater. The contamination plume from each uncovered sand-salt pile is estimated to pollute an average of ten acres of groundwater. The concentration of salt in groundwater associated with these sites is usually much higher than along roadsides, with salinity sometimes exceeding that of sea water. A case study of such pollution effects involves a resident of the Town of Glenburn whose well was polluted by a sand-salt pile. Her skin itched after taking a shower, her house plants died, her plumbing disintegrated, and her sodium-restricted diet was made meaningless due to sodium in her drinking water. In May of 1986, DEP hydrogeologists determined that the Glenburn sand-salt storage pile was responsible for the 1,800 mg/l chloride concentration in her well. As of May of 1986, 135 wells were known to have been contaminated in Maine due to uncovered sand-salt piles. One of these was the Sabattus municipal well which was replaced at a cost of $123,000. Some of the other sand-salt piles which have impacted groundwater and polluted private wells include the Maine Department of Transportation lots in Freeport, Gardiner, Hermon, Jefferson, Rockwood, Turner, Unity, West Gardiner, and Winthrop. Public water supplies in New Gloucester and York have also been affected. The York site cost the town $300,000 in a legal suit and an estimated $550,000 will eventually be spent to run municipal lines to affected homeowners.

The extent and seriousness of the salt storage problem caused a change in State law (38 MRSA, Section 451-A) which mandates that all sand-salt piles be covered by 1996 to prevent the generation of salty leachate. Exceptions are allowed if the piles are to be located on groundwater dicharge zones adjacent to water bodies of such size or quality that the classification of the water body would not be violated by a salty discharge.

4.2.7.4 Snow Dumps

Snow dumps are locations where excess snow collected during the winter months is disposed of, adjacent to or into surface waters. These activities can be a serious nonpoint source problem due to a variety of pollutants that are included with the snow. Deicing compounds, litter, and exhaust residues are all potential pollutants to the waters of Maine.

The snow dump pollutants of principal concern are sand, salt, and lead, depending on the location of the dump. If the site is located on a wetland, below the high tide mark or in a large river, the sand can build up bars and fill wetlands and navigation channels, while the salt will be diluted to such low concentrations that it is not likely to adversely affect water quality. If the site is located on a small stream, the sand will still be a problem and the salt may not receive enough dilution to prevent a water quality problem. When the lead contained in snow dumps enter surface waters, much of the lead ends up in sediments near the dump with the potential for sediment lead levels to increase over the years. Groundwater may be contaminated by lead and salt if the snow is dumped into gravel pits or other aquifer recharge areas.

There are approximately two dozen municipal snow dumps in Maine. Sand accumulation from them has been a continuing concern of the U.S. Army Corps of Engineers. In the past two years, the Corps has threatened enforcement action against several municipal snow dumps, including Portland's Back Cove site, for violating the dredging and filling section of the Clean Water Act. In 1987 and 1988, the DEP received complaints regarding snow dumps in Augusta, Gardiner, Hallowell, Kittery, Portland, Wiscasset, and Kennebunk. Only four complaints addressed a pollution problem while the others dealt with the dumps' impacts on wharf access. Augusta, Gardiner, and Hallowell now use "land storage" which means they dump snow adjacent to a river rather than directly into it.

Pollutant concentrations in snow dumps are highly variable but the range found in the Augusta snow dump is of interest:

	Chloride (ppm)	Lead (ppm)	Phosphorus (ppm)
Snow in Field	less than 0.5	less than 0.02	0.011-0.030
Snow in Dump	0.05-35.0	0.07-1.7	0.16-2.4
Kennebec River (above dump)	not done	less than 0.02	0.021
Kennebec River (below dump)	not done	less than 0.02	0.025

Snow dumps are not the most pressing nonpoint pollution problem in the State of Maine; however, the potential for pollution will increase as urban sprawl continues and snow dumps become more numerous. Preventative legislation, regulating dump location and requiring waste discharge licenses, is a step in the right direction. The unregulated alternative, with the size of our cities continuously growing, would certainly result in more serious pollution problems from this nonpoint source.

4.2.7.5 Hydrologic Modifications

a) DREDGING

Dredging harbors or channels so that ships, commercial fishing and other commercial vessels and recreational boats can moor and navigate is a generally accepted practice. As recreational boating activity increases in Maine, there will be a heightened interest in extending dredging activities.

Sediments naturally accumulate in areas that are dredged. Therefore, in order to keep these harbors and channels navigable they must be dredged repeatedly. Also, the sediments which are redeposited in the dredged areas are likely to be more contaminated than the sediments which were removed.

Generally, if dredged sediments are fine-grained, disposal of dredged material is in open ocean or estuaries. The decision of where to dispose of dredged material is based principally on economic considerations. Because most harbors and channels in Maine have fine-grained sediments most material is deposited in the open ocean. In fact, over 96% of the 1.5 million cubic yards of material dredged by the U.S. Army Corps of Engineers (CORPS) in the last ten years was deposited in estuaries or open ocean.

There are a number environmental problems associated with dredging:

(1) Pollution is spread by moving sediments contaminated with PAHs. PCBs and metals from harbors and bays to clean open ocean areas.

(2) Buried pollutants are released from the sediments exposed by dredging activity.

(3) The bottom dwelling animal community is destroyed in both the area

which is being dredged and in the area where the dredged material is disposed.

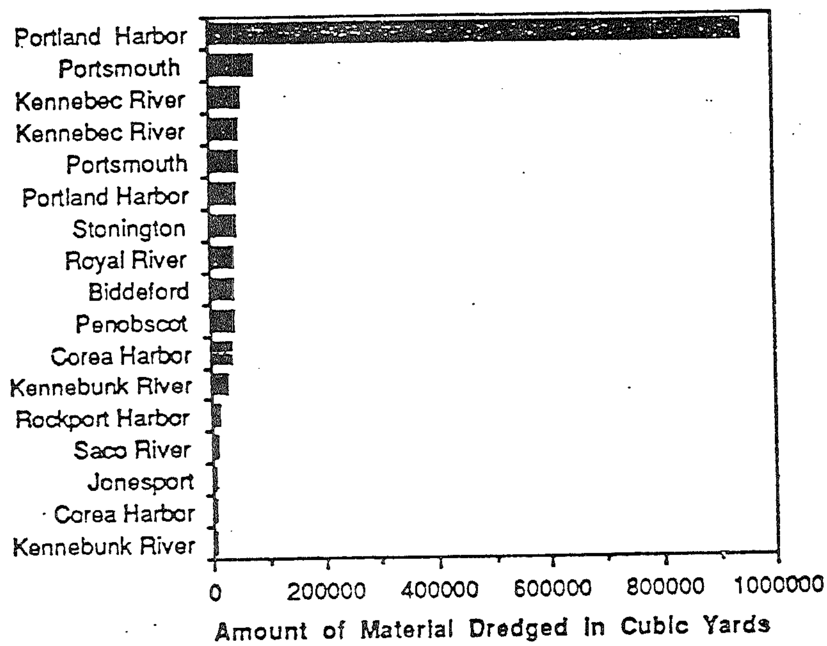
Since contaminants are associated with fine grained sediments. Maine needs to examine the procedures for testing sediments proposed for dredging to assure that the information is adequate to make decisions about proper disposal methods and locations. Bottom sediments in industrial or commercial areas and areas of dense boating activity are contaminated by PAHs, metals, etc. Tests conducted by the (CORPS), showed that sediment contamination may be a significant consideration in Boothbay Harbor, Camden Harbor, Eastport Harbor, St. George River, Kennebunk River, Penobscot River, Pepperell Cove in Kittery, Rockland Harbor, Stonington Harbor and York Harbor.

Maine's largest port, Portland, is dredged much more extensively than all other areas in Maine. Dredging channels in Portland Harbor area is of concern because of the elevated metals, PAHs and PCBs found in the sediments.

Rockport Harbor and the Penobscot River are two areas which were recently dredged in Penobscot Bay. A survey of Penobscot Bay prior to dredging found elevated levels of PAHs and lead in the area of Rockport Harbor and elevated levels of PAHs, lead, cadmium, copper, chromium, zinc, silver and nickel in the mouth of the Penobscot River.

Most large projects are undertaken by the CORPS. The following graph shows the CORPS' dredging activities for the past ten years. Each dredging project is listed separately (CORPS, personal communication).

FIGURE 7 - Amount of Material Dredged in Last 10 Years

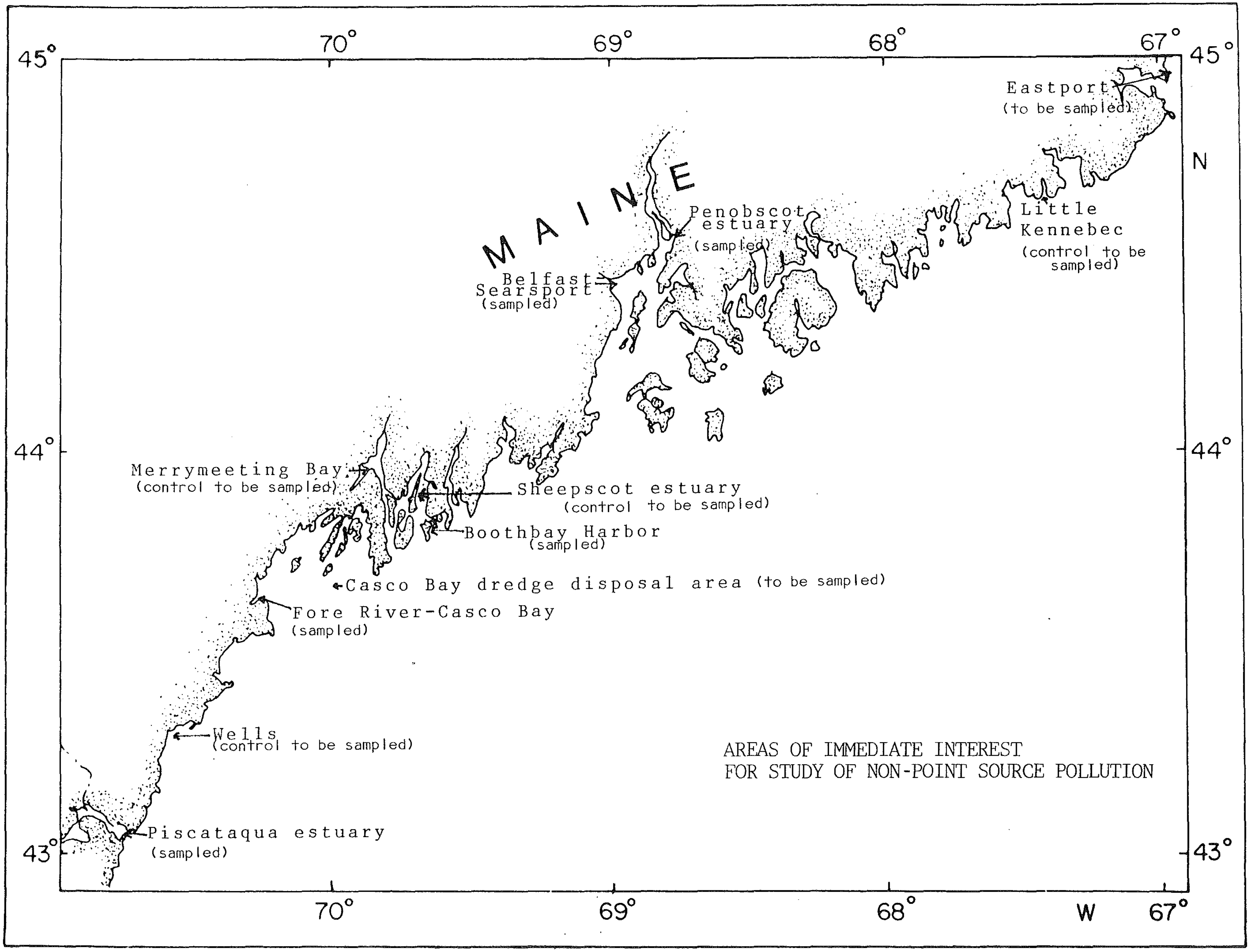


Dredging projects not undertaken by the CORPS add another 64,000 cubic years of material per year (range 10,000 to 130,000 cu yds.) to the amounts given above (New England River Basins Commission, 1981). The majority of these "non-CORPS" projects dispose of the dredged material in open ocean.

Upcoming dredging projects by the CORPS include: the Kennebec River (1989), a maintenance (50,000 cu. yds.) in Portsmouth and, when funds are available, the Saco River (CORPS, personal communication). Many other coastal communities such as Wells and Scarborough have proposed projects now in the review phase.

With the exception of the Saco and Royal River projects, the disposal site for the projects listed above was in the open ocean or, as in the case of the Portsmouth and Kennebec River projects, in estuarine waters. The level of pollution harbored in the sediments from urban runoff, industrial dischargers and spills and discharges from boats in most of the harbors listed above is unknown and should be examined as part of the marine monitoring program.

b) Impoundments



AREAS OF IMMEDIATE INTEREST
FOR STUDY OF NON-POINT SOURCE POLLUTION

4.2.7.6 <u>Federal Lands</u>

There are three federally owned land areas that have contributed pollution to Maine waters. Brunswick Naval Air Station in Cumberland County has been designated as a Superfund site. Loring Air Force Base in Limestone, Aroostook County, has scored high enough under the Superfund evaluation system to merit proposal, but has not yet been proposed as a Superfund site. An Installation Restoration Program is underway at Loring. A third federal installation in Maine where State water quality standards have been violated is the Portsmouth Naval Shipyard in Kittery. A RECRA Corrective Action Order is pending for the Portsmouth Naval Shipyard and hence the Superfund program may not be implemented there.

4.3 IDENTIFICATION OF WATERBODIES IMPAIRED AND THREATENED BY NONPOINT SOURCE POLLUTION

Section 319 of the federal Clean Water Act (CWA) requires that the assessment of Maine's NPS problems be based on the State's Water Classification Program (38 MRSA, Article 4-A). That statute defines a water quality problem as the nonattainment of the standards ascribed to a waterbody's particular classification. While the State law does not require the identification of waterbodies that are attaining but are threatened with nonattainment of classification, the CWA does, and those waterbodies are identified in this section of the report.

The status of designated-use support in Maine rivers and streams, lakes and ponds is displayed in Tables 3 and 4, respectively. The data in these tables summarize the sources of NPS pollution in rivers and lakes of Maine. Extremely limited data on attainment of water quality of estuarine waters prevents an adequate assessment of the importance of NPS pollution at the present time.

Overall, Maine's water quality is very good. Many of the rivers and marine waters that were grossly polluted two decades ago have recovered since the enactment of the U.S. Clean Water Act in 1972. Most of the eastern and northern portions of Maine contain waters that are relatively pristine; affected principally by atmospheric deposition, timber-harvesting activities, recreational activities and natural disasters such as forest fires and floods. Although relatively few water quality monitoring stations are located in remote areas of Maine, data from these stations is considered to be representative of unmonitored remote waters, thus, facilitating the evaluation of unmonitored waters.

In the more populated areas of Maine, water quality is affected by a combination of point sources such as residential/commercial discharges, treated industrial effluents, treated municipal effluents and untreated municipal wastewater (including combined sewer overflows) and nonpoint sources such as urban and suburban stormwater runoff, agriculture, construction-related runoff, and waste disposal practices. Almost all of the municipal and industrial effluents in Maine now receive the equivalent of best practicable treatment; hence the improvements in the water quality of rivers and marine waters which have occurred during the last twenty years.

Table 6. Maine Attainment Status: Monitored Surface and Ground Waters.

Hydrologic Subunit	Area or Length in Maine	Area or Length Not Attaining Water Quality Standards	
Major Rivers	1,184 mi	124 mi	(10.5%)
Minor Rivers, Streams and Brooks	30,488 mi	265 mi	(0.9%)
Lakes and Ponds	1,554 mi^2	57.8 mi^2	(3.2%)
Estuarine and Marine Waters	1,633 mi^2		
Groundwater	30,995 mi^2		

Approximately 1017 miles of the State's river and stream miles (or 3.2%) were not fully supporting designated uses and the remaining 30,655 miles were fully supporting designated uses. Eighty-one percent of the miles assessed as not fully supporting were based on evaluated information rather than on data gathered through water quality monitoring. Eighty-four percent of the fully supporting miles were based on evaluated information.

4.3.1 Rivers and Streams

Maine's classification standards for rivers, streams and brooks are based on three measurements of water quality - (1) bacteria levels, (2) dissolved oxygen, and (3) impacts on aquatic life. Maine's bacterial standards are designed to protect swimmers from microorganisms originating from human waste, and therefore, are unlikely to be violated by nonpoint sources of pollution. However, the presence of bacteria of non-human origin can be an indication that organic contaminants are present which might lead to failure to meet the the other two standards. Perhaps Maine's bacterial standard should be expanded to be more useful in the assignment of NPS pollution.

The water quality monitoring program conducted by the Department of Environmental Protection has identified 49 small watercourses in Maine (Table 5) which appear not to be meeting their dissolved oxygen standards owing to NPS pollution. It seems, however, that no large rivers in Maine fail to meet their dissolved oxygen standards as the result of nonpoint source pollution. Often, marshes and bogs, which are a source of organic matter, cause low dissolved oxygen levels in brooks and streams, but these natural conditions do not constitute a violation of Maine's dissolved oxygen standards. Where bogs and non-forest land uses occupy the same watershed, care must be taken in assessing the cause of low dissolved oxygen levels, high nutrient levels, and other constituents which may have multiple sources.

Maine's assessment of water quality in rivers, streams and brooks is, at this point, inconclusive as to the the effects of NPS pollution on dissolved oxygen levels. However, no dissolved oxygen problems have yet been documented in forested watersheds. The waterbodies listed in Table 3 lie in settled areas of the State, and represent about 3.2% of the total miles of streams in the State.

Riverine aquatic organisms are extremely sensitive to the effects of NPS pollution. Maine's program for assessing aquatic life quality in the past, however, has been largely oriented toward evaluating the effects of pollution from point sources. Furthermore, the aquatic life standards and the regulations for their implementation are currently being developed by the DEP's Division of Environmental Evaluation and Lake Studies. Increased emphasis on evaluating the biological effects of NPS pollution is planned for the future. The prospects of financing a NPS biomonitoring program in Maine and the design of such a program will be discussed in Maine's NPS Pollution Management Plan.

According to the results of Maine's NPS pollution survey there are many river, stream and brook segments with impaired uses in Maine which may be threatened with nonattainment of classification due to NPS pollution.

The distribution of these waterbodies, as well as the monitored waterbodies, can be seen in Table 3. Specific NPS pollution assessment needs for riverine waters will be discussed in the State of Maine Nonpoint Source Pollution Managment Program see Map for these and other NPS threatened/impacted waters. Additionally, an undetermined length of intermittent and minor perennial rivers and streams were not assessed.

11. (MAP)

Rivers; NPS Problems

NONPOINT SOURCE POLLUTION ASSESSMENT – MAINE DRAINAGE BASINS – RIVERS AND STREAMS

MAJOR BASIN	CO	SUB-BASIN	CO	SUB-SUB-BASIN (WATERBODY)	WB NO.	TOWN	10	20	30	40	50	60	70	80	TYPE ASSESS	DATA SOURCE	DRAIN AREA	STREAM LENGTH	WATER CLASS
St. John River	1	St. John River	14	Prestile Stream	149R	& 150R, Houlton	I								E	Munic.		28	B
St. John River	1	St. John River	14	B Stream	152R	Houlton	I								E	DIF&W		18	B
St. John River	1	St. John River	14	Meduxnekeag River	152R	& 153R, Houlton	I			I					E	SCS		71	B
St. John River	1	St. John River	14	Main Str below Ft Kent	116R	116R, 117R, 118R	I			I					E	Munic.		10	C
St. John River	1	Fish River	13	Perley Brook	128R	Ft. Kent	I			I					E	SCS		14	
St. John River	1	Fish River	13	McLean Brook	123R	St. Agatha, T17R4	I								E	DIF&W		8	
St. John River	1	Fish River	13	Dickey Brook	124R	St. Agatha, T17R5	I								M	DIF&W		12	
St. John River	1	Fish River	13	Daigle Brook	124R	New Canada, T17R5	I	I							M	DIF&W		7	
St. John River	1	Aroostook River	14	Little Madawaska River	145R	Caribou	I								E	SCS		65	
St. John River	1	Aroostook River	14	Limestone Stream	146R	Limestone	I								E	SCS		7	
St. John River	1	Aroostook River	14	Main Stream	36-144R	P.I., Caribou, Ft. Fairfiel	I								E	SCS		62	
St. John River	1	Aroostook River	14	Everett Brook	143R	Ft. Fairfield	I			I					M		96	4	A+B
SUB-TOTAL, BASIN #1																		306	
Penobscot River	2	Mattawamkeag	23	Dyer Brook	238R	Island Falls	I	I							E	SASWCD		13	B
Penobscot River	2	Penobscot River	25	Allen Stream	224R	Dexter, E. Corinth	I								E	SCS		3	B
Penobscot River	2	Penobscot River	25	Black Stream	224R	Levant, Hermon	I								E	SCS		16	B
Penobscot River	2	Penobscot River	25	Crooked Brook	224R	Charleston	I								E	SCS		8	B
Penobscot River	2	Penobscot River	25	French Mill Stream	224R	Exeter	I								E	SCS		8	B
Penobscot River	2	Penobscot River	25	Great Brook	224R	Bangor	I								E	SCS		1	B
Penobscot River	2	Penobscot River	25	Main Stem	229R	Medway				I					E	Munic.		5	C
Penobscot River	2	Penobscot River	25	Main Stem	234R	Brewer				I					E	Munic.		6	C
Penobscot River	2		25	Soudabscook Stream			I			I					E	DIF&W		20	
Penobscot River	2	Kenduskeag Stream	25	Entire Stream			I			I					E	SCS		25	
Penobscot River	2	Kenduskeag Stream	25	Burnham Brook	225R	Garland	I								M		215	3	B
Penobscot River	2	Kenduskeag Stream	25	Unnamed Brook	225R	Corinth	I								M			2	B
SUB-TOTAL, BASIN #2																		110	
Kennebec River	3	Kennebec River		Bond Brook	333R	Augusta			I	I					E	DEP/BWQC		1	
Kennebec River	3			Nash Brook	307R	Alder Stream Twp.		I							E	Private		1	A
Kennebec River	3			Wesserunsett Stream	314R	Brighton Plt, Athens	I	I		I					E	SCSWCD		36	B
Kennebec River	3			Beaver Brook	316R	Farmington			I	I					E	Munic.		16	B
Kennebec River	3			Hardy Brook	317R	Farmington			I						E	Munic.		1	B
Kennebec River	3			Pine Brook	317R	Wilton		I							E	FCSWCD		1	B
Kennebec River	3			Varnum Stream	317R	Wilton		I							E	FCSWCD		15	B
Kennebec River	3			Wilson Stream	317R	above Wilton		I							E	FCSWCD		8	B
Kennebec River	3			Wilson Stream	318R	Wilson L. to Mt. Blue			I	I					E	FCSWCD		4	C
Kennebec River	3			Roseanne Brook	334R	Winthrop			I	I					E	DIF&W		1	B
Kennebec River	3	Sandy River	33	Muddy Brook	316R	New Sharon		I							E	DIF&W		8	
Kennebec River	3	Sandy River	33	Main Str above Strong	315R	Avon, Phillips		I							E	DIF&W		18	
Kennebec River	3	Sandy River	33	Barker Stream	316R	Farmington	I								M		268	4	B
Kennebec River	3	Sandy River	33	Unnamed Stream	316R	New Sharon	I B								M			0.2	C
Kennebec River	3	Kennebec River	33	Carrabassett Stream	320R	Canaan	I								M		267	11	B
Kennebec River	3	Kennebec River	33	Mill Stream	320R	Norridgewock	I								M			1	B+C
Kennebec River	3	Kennebec River	33	Mill Stream	320R	Norridgewock						I L			M			0.7	B
Kennebec River	3	Messalonskee Stream	33	Fish Brook	322R	Fairfield	I								M		30	7	C
Kennebec River	3	Sebasticook River	33	Thompson Brook	324R	Hartland	I								M		317	7	B
Kennebec River	3	Sebasticook River	33	Brackett Brook	325R	Palmyra	I			I					M		221	2	C

NONPOINT SOURCE POLLUTION ASSESSMENT – MAINE DRAINAGE BASINS – RIVERS AND STREAMS

MAJOR BASIN	CO	SUB-BASIN	CO	SUB-SUB-BASIN (WATERBODY)	WB NO.	TOWN	10	20	30	40	50	60	70	80	TYPE ASSESS	DATA SOURCE	DRAIN AREA	STREAM LENGTH	WATER CLASS
Kennebec River	3	Fifteenmile Stream	33	Mill Stream	327R	Albion	|			|					M		70	2.5	C
Kennebec River	3	Sebasticook River	33	Farnham Brook	329R	Pittsfield	|								M		144	10	C
Kennebec River	3	Sebasticook River	33	12-Mile Brook	329R	Clinton	|								M			7	C
Kennebec River	3	Sebasticook River	33	Unnamed Stream	329R	Benton	|								M			2	C
Kennebec River	3	E. Br. Sebasticook River	33	Martin Stream	325R	Newport, Plymouth	|								E	DIF&W		24	
Kennebec River	3	E. Br. Sebasticook River	33	Twentyfivemile Stream	326R	Burnham, Unity	|			|					E	DIF&W		10	
Kennebec River	3	E. Br. Sebasticook River	33	China Lake Outlet	328R	Vassalboro	|			|					E	DIF&W		7	
Kennebec River	3	E. Br. Sebasticook River	33	Sevenmile Stream			|			|					E	DIF&W		7	
Kennebec River	3	E. Br. Sebasticook River	33	Togus Stream	335R	Chelsea	|			|					E	DIF&W		3	
Kennebec River	3	Kennebec River	33	Vaughn Brook	333R	Hallowell	|								M		356	5	B
Kennebec River	3	Cobbosseecontee Stream	33	Mud Mills Stream	334R	Monmouth	|								M		217	5	B
Kennebec River	3	Cobbosseecontee Stream	33	Potters Brook	334R	Litchfield	|								M			2.5	B
Kennebec River	3	Cobbosseecontee Stream	33	Tingley Brook	334R	Readfield	|	|							M			2	C
Kennebec River	3	Cobbosseecontee Stream	33	Jock Stream	334R	Wales, Monmouth	|			|					M	DIF&W		7	
Kennebec River	3	Cobbosseecontee Stream	33	Jug Stream	334R	Monmouth	|			|					E	DIF&W		1	
Kennebec River	3	Kennebec River	33	Kimball Brook	335R	Pittston	|								M		141	3	B
SUB-TOTAL, BASIN #3																		240.9	
Androscoggin River	4			Kendall Brook	406R	Bethel			|	|					E	OCSWCD		6	B
Androscoggin River	4			Mill Brook	406R	Bethel			|						E	Munic.		7	B
Androscoggin River	4			Sunday River	406R	Newry								|	E	OCSWCD		3	B
Androscoggin River	4			Sparrow Brook	410R	Canton		|		|					E	Lake Ass.		4	B
Androscoggin River	4			Thompson Brook	410R	Canton		|							E	Lake Ass.		4	
Androscoggin River	4	Little Androscoggin River	42	Main Stream	414R	So. Paris			|	|					E	OCSWCD		4	B+C
Androscoggin River	3	Androscoggin River	42	Sabattus River	418R	Sabattus	|			|					E	DIF&W		28	B+C
Androscoggin River	4	Androscoggin River	42	Main Stream	422R	Canton	|								E	OCSWCD		9	C
Androscoggin River	4	Androscoggin River	42	Penley Brook	333R	Auburn				|					M		81	0.7	C
Androscoggin River	4	Little Androscoggin River	42	Morgan Brook	415R	Minot	|								M		102	2.3	B
Androscoggin River	4	Little Androscoggin River	42	Abagadassett River	420R	Richmond	|								M			9	B
SUB-TOTAL, BASIN #4																		77	
Tidewater East	5	Pleasant River	52	Pleasant River	511R	T18, MD	|								E	DIF&W		13	
Tidewater East	5	Machias River	52	Mopang Stream	510R	T24,T25 MD	|								E	DIF&W		14	
Tidewater East	5	Machias River	52	Old Stream	510R	T31 MD, Wesley	|	|							E	DIF&W		8	
Tidewater East	5	Machias River	52	Entire Stream System	510R	Wesley, Northfld,T25	|	|		|					E	DIF&W		8	B
Tidewater East	5	Harrington River	52	Trout Brook	513R	Columbia									E	DIF&W		9	
Tidewater East	5		52	McCoslin Stream	520R	Penobscot	|								E	HCSWCD		5	B
Tidewater East	5	St. Croix River	51	Grand Lake Stream	502R	T27 ED			|	|					E	DIF&W		2	A+B
Tidewater East	5		52	Carleton Stream	520R	Blue Hill					|				M		120	4	C
Tidewater East	5		52	Passagassawakeag R.	521R	Belfast, Waldo	|	|		|					E	WCSWCD		10	
Tidewater East	5		52	Warren Brook	521R	Belfast	|								M		202	2	B
Tidewater East	5	Medomak River	52	Medomak River	525R	Union,Liberty,Wash.	|								M			12	B
SUB-TOTAL, BASIN #5																		87	

NONPOINT SOURCE POLLUTION ASSESSMENT - MAINE DRAINAGE BASINS - RIVERS AND STREAMS

MAJOR BASIN	CO	SUB-BASIN	CO	SUB-SUB-BASIN (WATERBODY)	WB NO.	TOWN	10	20	30	40	50	60	70	80	TYPE ASSESS	DATA SOURCE	DRAIN AREA	STREAM LENGTH	WATER CLASS
Tidewater West	6		61	Frost Gully Brook	602R	Freeport				I					M			3	A
Tidewater West	6	Royal River	61	Chandler River	603R	N.Yarmouth/Pownal	I								M			13	B
Tidewater West	6		61	Unnamed Brook	603R	N.Yarmouth/ Yarmouth	I								M			2	C
Tidewater West	6	Presumpscot River	61	Songo River	605R	Naples				I					E	Munic.		1	B
Tidewater West	6	Presumpscot River	61	Black Brook	607R	Windham	I								M		201	5	B
Tidewater West	6	Presumpscot River	61	Colley Wright Brook	607R	Windham	I								M			5	B
Tidewater West	6	Presumpscot River	61	E.Br. Piscataquis River	607R	Falmouth	I								M			10	B
Tidewater West	6	Presumpscot River	61	Hobbs Brook	607R	Cumberland	I								M			1.5	B
Tidewater West	6	Presumpscot River	61	Inkhorn Brook	607R	Westbrook	I								M			4	B
Tidewater West	6	Presumpscot River	61	Mosher Brook	607R	Gorham	I								M			2	B
Tidewater West	6	Presumpscot River	61	Otter Brook	607R	Windham	I								M			2	B
Tidewater West	6	Royal River	61	Main Stem	603R	New Gloucester	I				I				E	DIF&W	143	6	B+C
Tidewater West	6	Royal River	61	Chandler River	603R	N. Yarmouth, Pownal	I								M			13	B
Tidewater West	6			Mare Brook	602R	Brunswick N.A.S.				I					E	DIF&W		2	
Tidewater West	6	Presumpscot River	61	Pleasant River	607R	Gray, Windham	I								E	DIF&W	201	8	B+C
Tidewater West	6	Presumpscot River	61	Main Stem below S. Windl	607R	Windham, Gorham				I					E	DIF&W		12	B
Tidewater West	6	Presumpscot River	61	Thayer Brook	607R	Gray	I								M			3	B
Tidewater West	6		61	Capisic Brook	610R	Portland				I					M			3	C
Tidewater West	6		61	Clark Brook	610R	Westbrook				I					M			1	C
Tidewater West	6		61	Long Creek	610R	S.Portland,Westbrook				I					M			3	C
Tidewater West	6		61	Red Brook	610R	Scarborough				I					M			3	B
Tidewater West	6		61	Stroudwater River	610R	Gorham	I		I	I					M			4	B
Tidewater West	6		61	Alewife Brook	611R	Cape Elizabeth	I								M			1	A
Tidewater West	6		61	Phillips Brook	611R	Scarborough				I					M			1.5	C
Tidewater West	6	Saco River	62	Main Stem	613R	Fryeburg	I		I	I					E	DIF&W		2	C
Tidewater West	6	Saco River	62	Wards Brook	613R	Fryeburg								I	M		824	1.5	C
Tidewater West	6	Saco River	62	Cooks Brook	616R	Waterboro						I M			M		150	1.5	B
Tidewater West	6	Saco River	62	Deep Brook	616R	Saco	I								M			2.5	C
Tidewater West	6	Saco River	62	Swan Pond Brook	616R	Biddeford			I	I					E	DIF&W		12	B
Tidewater West	6			Kennebunk River	622R	Kennebunk			I	I					E	YCSWCD		12	B
Tidewater West	6	Great Works River	63	Main Stem	625R	Sanford			I	I					E	DIF&W	87	2	B
Tidewater West	6	Great Works River	63	Adams Brook	625R	Berwick	I								M			1.5	B
Tidewater West	6	Great Works River	63	Lovers Brook	625R	South Berwick	I								M			2	B
SUB-TOTAL, BASIN #6																		146	
Estuarine & Marine	7			Scarborough R. Est.	700	Scarborough	I			I					E	Munic.			SB
SUB-TOTAL, BASIN #7																			

NONPOINT SOURCE POLLUTION ASSESSMENT – MAINE DRAINAGE BASINS – RIVERS AND STREAMS

MAJOR BASIN	CO	SUB-BASIN	CO	SUB-SUB-BASIN (WATERBODY)	WB NO.	TOWN	10	20	30	40	50	60	70	80	TYPE ASSESS	DATA SOURCE	DRAIN AREA	STREAM LENGTH	WATER CLASS
Tidewater East	5			St. George River	523R		T	T		T					E	DIF&W		24	
Tidewater East	5			Sheepscot River						T					E	DIF&W		8	
Tidewater East	5			Damariscotta River						T					E	DIF&W		4	
Tidewater East	5			Pemaquid River						T					E	DIF&W		1	
Tidewater East	5			Ducktrap River						T					E	DIF&W		7	
Tidewater East	5			Megunticook River						T					E	DIF&W		3	
Tidewater East	5			Goose River			T			T					E	DIF&W		4	
SUB-TOTAL, THREATENED RIVERS & STREAMS																		51	

EXPLANATION OF TERMS

TYPE ASSESSMENT

E = Evaluated (Status based on professional judgment)

M = Monitored (Status based on data from sampling)

IMPAIRMENT STATUS

I = Impaired (Does not meet water classification)

T = Threatened (Meets classification, but threatened with non-attainment if remedial action not taken)

SUMMARY, IMPAIRED STATE RIVERS & STRE/

BASIN #	EVALUATED WATERS	MONITORED WATERS
1	302	4
2	85	25
3	229	61.9
4	65	12
5	72	15.4
6	70	76
	823	194.3 MILES

TOTAL IMPAIRED WATI 1017.3 MILES

CATEGORIES AND SUBCATEGORIES OF NONPOINT SOURCE POLLUTION

10 – AGRICULTURE	A – CROPLAND, B – ANIMAL WASTES
20 – SILVICULTURE	
30 – CONSTRUCTION	D – HIGHWAYS, BRIDGES, & ROADS, E – LAND DEVELOPMENT
40 – URBAN LAND	G – STORMWATER SEWERS, H – COMBINED SEWERS, I – RUNOFF, J – DRYWELLS AND BASINS
50 – RESOURCE EXTRACTION	
60 – LAND DISPOSAL	K – ORGANIC WASTES, L – LANDFILLS, M – HAZARDOUS WASTE AREAS
70 – HYDROLOGIC MOD.	
80 – OTHER	O – ATMOSPHERIC DEPOSITION, P – UNDERGROUND STORAGE TANKS, Q – IN-PLACE DEPOSITS, R – SNOW DUMPS, S – SAND/SALT PILES

4.3.2 Lakes and Ponds

Maine has a vast number of lakes and ponds (5,779) comprising 994,560 acres. All but a small percentage of these were formed as a result of glacial action during the last ice age. A Volunteer Monitoring Program is used to regularly gather water quality data to track the status of 250 lakes in the state.

The "trophic state" of a lake is a principal indicator of lake water quality. Trophic State is a measure of the concentration of nutrients and subsequent density of living organisms in a waterbody and can be approximated by measuring the the transparency of the water. As nutrient levels increase, populations of primary producers (algae and certain macrophytes) increase and transparency decreases.

The majority of lakes in the Volunteer Monitoring Program (assumed to be representative of those Maine lakes with residential development in the watershed) have average transparencies between 4.5 and 7 meters. 31 of the 5,779 lakes and ponds in Maine support sustained and repeated algal blooms.

Monitoring data from 1982 through 1987 on approximately 250 lakes indicates stable water quality for all but a handful of lakes. Six lakes show a trend of improving quality due to restoration projects. Three lakes showed signs of deterioration for the first time during this period. For one of these three deteriorating lakes (China Lake), the trend was to more intense and sustained blooms, due to phosphorus pollution. For the other two deteriorating lakes, green algal blooms were documented for the first time. It is not apparent whether these latter two blooms were a one-time phenomenon or a trend of deteriorating water quality.

At the present time, NPS problems affecting lakes and ponds are better understood than are NPS problems affecting the State's other types of water resources. However, given the use classification standards for lakes and ponds (GPA waterbodies), which requires all lakes to have a stable or decreasing trophic state and to be free of culturally induced algal blooms, impairment of lake resources can be looked at in several ways. The most obvious level of impairment includes lakes that are clearly currently violating this standard, that is, lakes that have a documented current trend of increasing trophic state or that currently support culturally induced algal blooms. As presented in Table 5, there are 33 lakes and ponds in Maine which, because of NPS pollution, fall into this category. Their combined area of 32,984 acres represents 3.3% of the total surface area of lakes and ponds in Maine. There are one lake and one pond in Maine not attaining their GPA classification due to point source discharges. Their combined size of 505 acres represents just 1.5% of all GPA waters not meeting their classification. Further, these two water bodies are close to meeting their GPA classification due to improvements in wastewater treatment.

Impairment can and should also be viewed from a more rigorous perspective as well. Since nutrient input from the watershed determines the trophic state of a lake, and land use in the watershed determines nutrient loading, it follows that any uses of the watershed that generate Nonpoint Source nutrient levels greater than levels from forested-only watersheds will, by definition, cause some elevation of trophic state over natural background levels. The level of such NPS-derived impairment is a function of the density and intensity of non-forest land use in the watershed as well as the lake's inherent sensitivity to such inputs. Therefore, by far the majority of lakes in the parts of the state with the highest density of agricultural and residential land use, e.g., York, Cumberland, Southern Oxford, Androscoggin, Kennebec, Knox, Lincoln, Waldo, Southern Penobscot, and Eastern Aroostook Counties, have trophic states which have been elevated over natural background levels at some point in the past, and hence could be considered impaired by NPS pollution.

Though in most cases this impairment cannot be clearly documented because of the lack of background data prior to disturbance of the watershed, it is clearly the case. Fortunately, the level of impairment from historic and recent NPS pollutant loadings in most of Maine's lakes, though significant, has not reached the point of severe use impairment. With the exception of the 35 lakes already discussed, all Maine lakes support swimming and fishing, although coldwater fish habitats have no doubt been impaired in many lakes.

Given the current suitability of nearly all Maine lakes despite historic impairment, the more important question becomes: which lakes are most immediately threatened with further significant impairment from Nonpoint Source pollution? Lakes and ponds which are threatened by NPS pollution represent a much larger proportion of Maine's waterbodies. Table 5 displays the Vulnerability Index, an objective ranking, by major basin, of the most threatened lakes and ponds in the state. These lakes and ponds are believed to be in danger of deterioriating if remedial steps are not taken to prevent the acceleration of their trophic states. It is estimated that 6 additional lakes will eutrophy in the next 10-15 years because of Nonpoint Source pollution.

The preparers of this report wish to acknowledge the input from the following who responded to requests for information regarding impaired and threatened lakes:

- the Regional Fisheries Biologists of the ME Department of Inland Fisheries & Wildlife
- Soil & Water Conservation Districts
- Municipal Officials

Their contributions are greatly appreciated. The 37 lakes identified by these groups are contained in a table that is available upon request from ME DEP/ Bureau of Water Quality Control/ Division of Environmental Evaluation and Lake Studies. These lakes were not printed in this report because it was felt that to do so would divert attention away from the fact that all lakes in watersheds with agriculture, forestry, and development activities are threatened with degrading water quality. The lakes that are not threatened at this time constitute a short list when compared with the thosands that are threatened.

10. (MAP)

Lakes; NPS Problems

TABLENONPOINT SOURCE POLLUTION ASSESSMENT – MAINE DRAINAGE BASINS – LAKES AND PONDS

MAJOR BASIN	CO	SUB-BASIN	CO	SUB-SUB-BASIN (WATERBODY)	WB NO	TOWN	10	20	30	40	50	60	70	80	TYPE ASSESS	DATA SOURCE	DRAIN AREA	SURFACE AREA	WATER CLASS
St. John's River	1	Allagash River	12	Long Lake	123L	St. Agatha	I								M			6000	GPA
St. John's River	1	Allagash River	12	Cross Lake	124L	T16	I								M			2515	GPA
St. John's River	1	Fish River	13	Black Lake	124L	Ft. Kent	I								M			51	GPA
St. John's River	1	Fish River	13	Daigle Pond	124L	Daigle	I								M			36	GPA
St. John's River	1	Presque Isle Stream	14	Hanson Brook Pond	140L	Presque Isle	I								M			118	GPA
St. John's River	1	Aroostook River	14	Monson Pond	143L	Ft. Fairfield	I								M			160	GPA
St. John's River	1	Aroostook River	14	Fischer Lake	143L	Ft. Fairfield	I								M			5	GPA
SUB-TOTAL, BASIN #1																		8885 acres	
Penobscot River	2	Souadabscook Stream	25	Etna Pond	225L	Stetson	I								M			361	GPA
Penobscot River	2	Souadabscook Stream	25	Hammond Pond	225L	Hampden	I								M			96	GPA
Penobscot River	2	Souadabscook Stream	14	Hermon Pond	225L	Hermon	I								M			461	GPA
SUB-TOTAL, BASIN #2																		918 acres	
Kennebec River	3	Cobbosseecontee Stream	33	Annabessacook Lake	334L	Monmouth/Winthrop	I								M			1420	GPA
Kennebec River	3	Cobbosseecontee Stream	33	Cobbosseecontee Lake	334L	Litchfield	I								M			5543	GPA
Kennebec River	3	Cobbosseecontee Stream	33	Pleasant Pond	334L	Litchfield	I								M			746	GPA
Kennebec River	3	Cobbosseecontee Stream	33	Upper Narrows Pond	334L	Winthrop			IE						M			279	GPA
Kennebec River	3	Kennebec River	33	Togus Pond	335L	Augusta			IE						M			660	GPA
Kennebec River	3	Kennebec River	33	Three Mile Pond	333L	Vassalboro	I								M			1162	GPA
Kennebec River	3	Kennebec River	33	Weber Pond	333L	Vassalboro	I								M			1201	GPA
Kennebec River	3	E. Br. Sebasticook River	32	Sebasticook Lake	325L	Newport	I								M			4288	GPA
Kennebec River	3	E. Br. Sebasticook River	32	Half Moon Pond	325L	St. Albans	I								M			36	GPA
Kennebec River	3	China Lake Outlet & Tribs.	32	China Lake	328L	China	I		IE						M			3845	GPA
Kennebec River	3	Messalonski Stream	32	Salmon Lake	321L	Belgrade	I								M			666	GPA
Kennebec River	3	Fifteenmile Stream	32	Lovejoy Pond	327L	Albion	I								M			324	GPA
Kennebec River	3	Moosehead Lake	31	Fitzgerald Pond	303L	Big Squaw						IM			M			550	GPA
SUB-TOTAL, BASIN #3																		20720 acres	
Androscoggin River	4	Sabattus River	41	Sabattus Pond	418L	Greene	I								M			1962	GPA
SUB-TOTAL, BASIN #4																		1962 acres	
Tidewater East	5		52	Lilly Pond	522L	Rockport						IL			M			29	GPA
Tidewater East	5		52	Chickawokie Pond	522L	Rockland/Rockport	I		IE						M			352	GPA
SUB-TOTAL, BASIN #5																		381 acres	
Tidewater West	6	Salmon Falls River	63	Spaulding Pond	630L	Lebanon			IE			IL			M			118	GPA
SUB-TOTAL, BASIN #6																		118 acres	

THREATENED LAKES AND PONDS

TABLE NONPOINT SOURCE POLLUTION ASSESSMENT - MAINE DRAINAGE BASINS - LAKES AND PONDS

MAJOR BASIN	CO	SUB-BASIN	CO	SUB-SUB-BASIN (WATERBODY)	WB NO	TOWN	10	20	30	40	50	60	70	80	TYPE ASSESS	DATA SOURCE	DRAIN AREA	SURFACE AREA	WATER CLASS
St. John River	1	Little Madawaska River	14	Madawaska Lake	145L	Stockholm	T								M			1526	GPA
Penobscot River	2	Penobscot , minor tribs.	25	Caribou Pond	220L	Lincoln	T								M			825	GPA
Penobscot River	2	Penobscot , minor tribs.	25	Long Pond	220L	Lincoln	T								M			523	GPA
Kennebec River	3	Messalonskee Stream	32	East Pond	321L	Oakland	T								M			1705	GPA
Tidewater West	5		53	Havener Pond	524L	Waldoboro	T								M			83	GPA
Tidewater East	6	Royal River	61	Notched Pond	603L	Raymond	T								M			77	GPA
SUB-TOTAL, Threatened Lakes, All Basins																		4739	acres
SUB-TOTAL, Threatened Lakes, from Vulnerability Index																		47840	acres
TOTAL, Threatened Lakes																		52579	acres

IMPAIRMENT STATUS CODES
I = Impaired
T = Threatened

TYPE ASSESSMENT
M = Monitored (Status based on sampling data)
E = Evaluated (Status based on professional judgment)

CATEGORIES AND SUBCATEGORIES OF NONPOINT SOURCE POLLUTION

10 - AGRICULTURE
20 - SILVICULTURE
30 - CONSTRUCTION
40 - URBAN RUNOFF
50 - RESOURCE EXTRACTION
60 - WASTE DISPOSAL
70 - HYDROLOGIC MOD.
80 - OTHER

A - CROPLAND, B - ANIMAL WASTES

D - HIGHWAYS, BRIDGES, & ROADS, E - LAND DEVELOPMENT
G - STORMWATER SEWERS, H - COMBINED SEWERS, I - RUNOFF, J - DRYWELLS AND BASINS

K - ORGANIC WASTES, L - LANDFILLS, M - HAZARDOUS WASTE AREAS

O - ATMOSPHERIC DEPOSITION, P - UNDERGROUND STORAGE TANKS,
Q - IN-PLACE DEPOSITS, R - SNOW DUMPS, S - SAND/SALT PILES

SUMMARY, IMPAIRED LAKES & PONDS

BASIN #	AREA
1	8885
2	918
3	20720
4	1962
5	381
6	118
TOTAL	32984 ACRES

Table 5. LAKE VULNERABILITY INDEX

Lakes and Ponds Threatened With Nonattainment of Water Quality Standards Due to Nonpoint Source Pollution.

Lake and Pond Vulnerabilities as of May 1, 1988 have been assessed by the Division of Environmental Evaluation and Lake Studies of the DEP's Bureau of Water Quality Control. This index is a predictive model which equates a lake or pond's hydrologic characteristics and rate of watershed development (from 1984 to 1986) with how long it will take for phosphorus concentrations in the lake or pond to increase by 1 part per billion (ppb). The major limitation of this model is that the rates and patterns of development in lake watersheds may be quite different over the next 10 or 50 years then they were from 1984 to 1986. Another significant limitation on its validity is that the applicability of the phosphorus input-output model used may vary from lake to lake. Depending upon a lake or pond's current water quality status, a 1 ppb increase in phosphorus level may or may not cause a noticeable decline in the lake's water quality. For extremely vulnerable lakes and ponds, a 1 ppb phosphorus increase is predicted to occur within 10 years. For Highly Vulnerable Lakes and Ponds, a 1 ppb increase in phosphorus is predicted to occur within 50 years. On a Statewide basis, 0.7% of the surface area of Maine's lakes and ponds fall into the Extremely Vulnerable category and 11.2% into the Highly Vulnerable category.

Often a lake will have distinct basins with varying levels of vulnerability. To make this distinction among lake basins, abbreviations (B#1), (B#2), etc. are used in this index.

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ST. JOHN RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS

Bennett Lake	Easton	6 hectares
Big Greenland Lake	Danforth	54 hectares
Black Lake	Fort Kent	18 hectares
County Road Lake	New Limerick	9 hectares
Easton Pond	Easton	4 hectares
Fischer Lake	Fairfield	2 hectares
Germain Lake	Madawaska	40 hectares
Glancy Lake	New Limerick	10 hectares
Gould Pond	New Limerick	20 hectares
Hannigan Pond	New Limerick	3 hectares
Lambert Pond	New Limerick	3 hectares
Lindsay Pond	Easton	4 hectares
Monson Pond	Fort Fairfield	37 hectares
TOTAL		210 hectares

Table 5 (cont'd.) LAKE VULNERABILITY INDEX

PENOBSCOT RIVER BASIN

EXTREMELY VULNERABLE LAKES AND PONDS

George Pond	Hermon	18 hectares
Tracy Pond	Hermon	19 hectares
TOTAL	37 hectares	

****

PENOBSCOT RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS

Ben Annis Pond	Hermon	15 hectares
Branns Mill Pond	Dover-Foxcroft	110 hectares
Cambolasse Pond	Lincoln	86 hectares
Center Pond	Lincoln	82 hectares
Chemo Pond	Eddington	469 hectares
Crooked Pond	Lincoln	90 hectares
Davis Pond	Holden	156 hectares
Dow Pond	Sebec	6 hectares
Egg Caribou Long Pond	Lincoln	337 hectares
Folsom Pond	Lincoln	153 hectares
Garland Pond	Sebec	10 hectares
Garland Pond	Garland	35 hectares
Green Pond	Lee	48 hectares
Hammond Pond	Hampden	39 hectares
Hermon Pond	Hermon	179 hectares
Holbrook Pond	Holden	123 hectares
Holland Pond	Alton	33 hectares
House Pond	Lee	4 hectares
Jerry Pond	Millinocket	27 hectares
Little Madagascal Pd.	T 03 R01 NBP	15 hectares
Little Pushaw Pond	Hudson	165 hectares
Marr Pond	Sangerville	34 hectares
Mattekeunk Pond	Lee	216 hectares
Mattanawcook Pond	Lincoln	331 hectares
Mud Pond	Linneus	7 hectares
Patten Pond	Hampden	18 hectares
Pickerel Pond	Alton	31 hectares
Pug Pond	Alton	4 hectares
Pushaw Lake	Orono	2046 hectares
Snap Pond	Lincoln	78 hectares
Swetts Pond	Orrington	40 hectares
Thurston Pond	Bucksport	59 hectares

Table 5 (cont'd). LAKE VULNERABILITY INDEX

PENOBSCOT RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS (cont'd)

Upper Cold Stream Pd.	Lincoln	72 hectares
Upper Pond	Lincoln	297 hectares
Weir Pond	Lee	21 hectares
West Garland Pond	Garland	12 hectares
Williams Pond	Bucksport	31 hectares
TOTAL		5,479 hectares

****

KENNEBEC RIVER BASIN

EXTREMELY VULNERABLE LAKES AND PONDS

Anderson Pond	Augusta	8 hectares
Austin Pond	Bald Mtn. TWP T2R3	264 hectares
Berry Pond	Winthrop	68 hectares
Dam Pond	Augusta	39 hectares
Greely Pond	Augusta	19 hectares
Hutchinson Pond	Manchester	37 hectares
Jamies Pond	Manchester	38 hectares
Lily Pond	Bath	5 hectares
Little Togus Pond	Augusta	15 hectares
Pattee Pond	Winslow	202 hectares
Threecornered Pond	Augusta	72 hectares
Togus Pond	Augusta	260 hectares
Tolman Pond	Augusta	23 hectares
TOTAL		1,050 hectares

****

KENNEBEC RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS

Annabessacook Lake	Winthrop	563 hectares
Ballard Pond	Farmington	3 hectares
Beech Pond	Palermo	24 hectares
Branch Pond	China	124 hectares
Buker Pond	Litchfield	31 hectares
Butler Pond	Lexington T	10 hectares
Center Pond	Phippsburg	31 hectares
China Lake	China	1584 hectares
Chisholm Pond	Palermo	17 hectares
Cobbosseecontee Lake	Winthrop	2120 hectares
Cochnewagon	Monmouth	156 hectares
Colby Pond	Liberty	11 hectares

Table 5 (cont'd) LAKE VULNERABILITY INDEX

KENNEBEC RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS(Cont'd)

Desert Pond	Mount Vernon	9 hectares
Dexter Pond	Winthrop	42 hectares
Dutton Pond	Albion	23 hectares
East Pond	Smithfield	698 hectares
Foster Pond	Palermo	13 hectares
Gardiner Pond	Wiscasset	30 hectares
Gould Pond	Dexter	3 hectares
Ingham	Mount Vernon	17 hectares
Jimmy Pond	Litchfield	19 hectares
Jump Pond	Palermo	13 hectares
Kezar Pond	Winthrop	8 hectares
Lake George	Skowhegan	123 hectares
Lake Wassookeag	Dexter	417 hectares
Lily Pond	Sidney	11 hectares
Little Cobbossee	Winthrop	32 hectares
Little Dyer Pond	Jefferson	40 hectares
Little Mud Pond	Greenville Junction	6 hectares
Lovejoy Pond	Albion	133 hectares
Lower Narrows Pond	Winthrop	84 hectares
Maranacook Lake(B#1)	Winthrop	473 hectares
Maranacook Lake(B#2)	Readfield	241 hectares
McGrath Pond	Oakland	197 hectares
Messalonskee	Sidney	1419 hectares
Moody Pond	Windsor	10 hectares
Moose Pond	Mount Desert	26 hectares
Morrill Pond	Hartland	58 hectares
Mosher Pond	Fayette	29 hectares
Mud Pond	Harmony	5 hectares
Mud Pond	Windsor	23 hectares
Nakomis Pond	Palmyra	80 hectares
Nehumleag Pond	Pittston	73 hectares
Nequasset Lake	Woolwich	172 hectares
Oakes Pond	Skowhegan	35 hectares
Pease Pond	Wilton	44 hectares
Pleasant Pond	Richmond	303 hectares
Puffer Pond	Dexter	36 hectares
Roderique Pond	Rockwood Strip	15 hectares
Saban Pond	Palermo	5 hectares
Salmon Lake	Oakland	270 hectares
Sand Pond	Litchfield	106 hectares
Savade Pond	Windsor	22 hectares
Sewall Pond	Arrowsic	18 hectares
Shed Pond	Readfield	19 hectares
Sherman Lake	Newcastle	86 hectares
Spectacle Pond	Augusta	55 hectares
Stafford Pond	Hartland	50 hectares
Stratton Brook Pond	Wyman TWP	13 hectares

Table 5 (cont'd.). LAKE VULNERABILITY INDEX

KENNEBEC RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS(Cont'd)

Three Mile Pond	China	458 hectares
Tinkham Pond	Chelsea	6 hectares
Torsey Lake	Readfield	230 hectares
Tufts Pond	Kingfield	21 hectares
Turner Pond	Palermo	79 hectares
Upper Narrows Pond	Winthrop	90 hectares
Ward Pond	Sidney	21 hectares
Watson Pond	Rome	27 hectares
Webber Pond	Vassalboro	485 hectares
Welhern Pond	Eustis	5 hectares
Wesserunsett Lake	Madison	572 hectares
Whittier Pond	Rome	9 hectares
Wilson Pond	Wayne	223 hectares
Woodbury Pond	Litchfield	176 hectares

TOTAL 12,680 hectares

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ANDROSCOGGIN RIVER BASIN

EXTREMELY VULNERABLE LAKES AND PONDS

Little Sabattus Pond	Greene	10 hectares
Loon Pond	Webster Plt	24 hectares
No Name Pond	Lewiston	58 hectares
Taylor Pond	Auburn	259 hectares

TOTAL 351 hectares

****

ANDROSCOGGIN RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS

Allen Pond	Greene	76 hectares
Androscoggin Lake	Leeds	1616 hectares
Bartlett Pond	Livermore	11 hectares
Brettuns Pond	Livermore	62 hectares
Caesar Pond	Bowdoin	20 hectares
Crystal Pond	Turner	14 hectares
Green Pond	Oxford	16 hectares
Hales Pond	Fayette	29 hectares
Hogan Pond	Oxford	66 hectares

Table 5 (cont'd). LAKE VULNERABILITY INDEX

ANDROSCOGGIN RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS (cont'd.)

Howard Pond	Hanover	52 hectares
Labrador Pond	Sumner	42 hectares
Lake Auburn	Auburn	897 hectares
Little Labrador Pond	Sumner	6 hectares
Little Penneesseewas	Norway	39 hectares
Little Wilson Pond	Turner	44 hectares
Lower Range Pond	Poland	118 hectares
Marshall Pond	Oxford	57 hectares
Middle Range Pond	Poland	156 hectares
Moose Pond	Paris	35 hectares
Moose Pond	Otisfield	62 hectares
Nelson Pond	Livermore	5 hectares
North Pond	Norway	67 hectares
Number 9 Pond	Livermore	82 hectares
Pennesseewassee Lake	Norway	384 hectares
Pleasant Pond	Turner	77 hectares
Round Pond	Livermore	64 hectares
Sabattus Pond	Webster Plt	796 hectares
Sand Pond	Norway	55 hectares
Saturday Pond	Otisfield	69 hectares
Thompson Lake	Oxford	1710 hectares
Tripp Pond	Poland	296 hectares
Upper Range Pond	Poland	136 hectares
Whitney Pond	Oxford	65 hectares
Worthly Pond	Poland	20 hectares
TOTAL		7,244 hectares

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PRESUMPSCOT RIVER BASIN

EXTREMELY VULNERABLE LAKES AND PONDS

Cold Rain Pond	Naples	15 hectares
Forest Lake	Windham	82 hectares
Highland Lake	Windham	252 hectares
Lilly Pond	New Gloucester	9 hectares
Little Duck Pond	Windham	13 hectares
Little Rattlesnake Pond	Raymond	140 hectares
Little Sebago Lake	Windham	78 hectares
Lower Mud Pond	Windham	2 hectares
Nubble Pond	Raymond	8 hectares
Owl Pond	Casco	4 hectares
Pettingill Pond	Windham	15 hectares
Upper Mud Pond	Windham	1 hectare
TOTAL		619 hectares

PRESUMPSCOT RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS

Adams Pond	Bridgton	17 hectares
Bay of Naples Lake	Naples	297 hectares
Beaver Pond	Bridgton	28 hectares
Coffee Pond	Casco	41 hectares
Collins Pond	Windham	15 hectares
Crystal Lake	Harrison	174 hectares
Crystal Pond	Gray	76 hectares
Dumpling Pond	Casco	11 hectares
Highland Lake	Bridgton	524 hectares
Holt Pond	Bridgton	12 hectares
Ingalls Pond	Bridgton	55 hectares
Island Pond	Waterford	42 hectares
Little Sebago Lake(B#2)	Windham	552 hectares
Little Sebago Lake(B#4)	Windham	125 hectares
Long Lake	Bridgton	2097 hectares
Notched Pond	Raymond	29 hectares
Otter Pond	Bridgton	35 hectares
Panther Pond	Raymond	571 hectares
Parker Pond	Casco	64 hectares
Peabody Pond	Sebago	284 hectares
Pleasant Lake	Otisfield	531 hectares
Rattlesnake Pond	Raymond	290 hectares
Sabathday Pond	New Gloucester	134 hectares
Thomas Pond	Casco	201 hectares
Trickey Pond	Naples	122 hectares
Wood Pond	Bridgton	183 hectares
TOTAL		6,510 hectares

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SACO RIVER BASIN

EXTREMELY VULNERABLE LAKES AND PONDS

Bonny Eagle Pond	Buxton	82 hectares
Killick Pond	Hollis Center	20 hectares
Little Watchic Pond	Standish	16 hectares
Rich Mill Pond	Standish	30 hectares
TOTAL	148 hectares	

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Table 5 (cont'd). LAKE VULNERABILITY INDEX

SACO RIVER BASIN

HIGHLY VULNERABLE LAKES AND PONDS

Adams Pond	Newfield	82 hectares
Balch Pond	Newfield	210 hectares
Bartlett Pond	Waterboro	10 hectares
Bickford Pond	Porter	83 hectares
Black Pond	Porter	18 hectares
Boyd Pond	Limington	10 hectares
Burnt Meadow Pond	Brownfield	27 hectares
Chapman Pond	Porter	4 hectares
Clemons Pond	Hiram	34 hectares
Colcord Pond	Porter	89 hectares
Doles Pond	Limington	8 hectares
Farrington Pond	Lovell	23 hectares
Holland Lake	Limerick	72 hectares
Horne Pond	Limington	53 hectares
Ingalls Pond	Baldwin	10 hectares
Jaybird Pond	Porter	3 hectares
Little Clemons Pond	Hiram	12 hectares
Little Ossippee Pond	Waterboro	182 hectares
Mine Pond	Porter	20 hectares
Moose Pond (B#1)	Bridgton	131 hectares
Moose Pond (B#2)	Bridgton	345 hectares
Mud Pond	Newfield	4 hectares
Parker Pond	Lyman	9 hectares
Pequawket Pond	Brownfield	33 hectares
Pickerel Pond	Limerick	20 hectares
Pinkham Pond	Newfield	18 hectares
Plain Pond	Porter	6 hectares
Poverty Pond	Newfield	60 hectares
Round Pond	Newfield	1 hectare
Sand Pond	Baldwin	21 hectares
Smarts Pond	Newfield	5 hectares
Southeast Pond	Hiram	61 hectares
Spectacle Pond (B#1)	Porter	16 hectare
Spectacle Pond (B#2)	Porter	14 hectares
Stanley Pond	Porter	55 hectares
Symmes Pond	Newfield	12 hectares
Trafton Pond	Porter	23 hectares
Turner Pond	Newfield	14 hectares
Unnamed Pond	Limington	10 hectares
Wards Pond	Limington	17 hectares
Watchic Pond	Standish	176 hectares
TOTAL	2,001 hectares	

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Table 5 (cont'd). LAKE VULNERABILITY INDEX

MINOR COASTAL BASINS

EXTREMELY VULNERABLE LAKES AND PONDS

Adams Pond	Boothbay	28 hectares
Bauneg Beg Pond	Sanford	76 hectares
Beaver Dam Pond	Berwick	4 hectares
Brimstone Pond	Arundel	4 hectares
Cox Pond	South Berwick	3 hectares
Ell Pond	Sanford	13 hectares
Estes Lake	Sanford	143 hectares
Grassy Pond	Rockport	5 hectares
Hosmer Pond	Camden	22 hectares
Houghton Pond	West Bath	5 hectares
Howard Pond	St. George	5 hectares
Knickerbocker Pond	Boothbay	38 hectares
Knights Pond	South Berwick	20 hectares
Leighs Mill Pond	South Berwick	16 hectares
Scituate Pond	York	17 hectares
Warren Pond	South Berwick	10 hectares
Wiley Pond	Boothbay	5 hectares
York Pond	Eliot	19 hectares
TOTAL		433 hectares

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MINOR COASTAL BASINS

HIGHLY VULNERABLE LAKES AND PONDS

Alewife Pond	Arundel	16 hectares
Aunt Betty Pond	Bar Harbor	12 hectares
Birch Harbor Pond	Winter Harbor	6 hectares
Biscay Pond	Damariscotta	145 hectares
Boyd Pond	Bristol	23 hectares
Branch Lake	Ellsworth	1094 hectares
Bubble Pond	Bar Harbor	13 hectares
Bunganut Pond	Lyman	116 hectares
Burntland Pond	Stonington	9 hectares
Cain Pond	Searsport	13 hectares
Cargill Pond	Liberty	23 hectares
Chickawaukie	Rockport	137 hectares
Chicken Mill Pond	Gouldsboro	5 hectares
Coleman Pond	Lincolnville	82 hectares
Crawford Pond	Warren	232 hectares
Crystal Pond	Washington	40 hectares
Damariscotta Lake	Nobleboro	1752 hectares
Duckpuddle Pond	Waldoboro	98 hectares
Eagle Lake	Bar Harbor	177 hectares
Echo Lake	Mount Desert	92 hectares

Table 5 (cont'd). LAKE VULNERABILITY INDEX

MINOR COASTAL BASINS

HIGHLY VULNERABLE LAKES AND PONDS(Cont'd)

Ellis Pond	Brooks	34 hectares
Fish Pond	Hope	52 hectares
Forbes Pond	Gouldsboro	81 hectares
Forest Pond	Friendship	3 hectares
Fourth Pond	Blue Hill	16 hectares
Fresh Pond	North Haven	35 hectares
Goose Pond	Swans Island	5 hectares
Granny Kent Pond	Shapleigh	20 hectares
Hansen Pond	Acton	10 hectares
Hastings Pond	Bristol	4 hectares
Havener Pond	Waldoboro	32 hectares
Hobbs Pond	Hope	106 hectares
Hodgdon Pond	Tremont	17 hectares
Iron Pond	Washington	6 hectares
Isinglass Pond	Waterboro	12 hectares
Jones Pond	Gouldsboro	183 hectares
Jordan Pond	Mount Desert	72 hectares
Kalers Pond	Waldoboro	29 hectares
Kennebunk Pond	Lyman	80 hectares
Knight Pond	Northport	44 hectares
Lake Wood	Bar Harbor	6 hectares
Levenseller Pond	Searsmont	15 hectares
Lilly Pond	Rockport	12 hectares
Lily Pond	Deer Isle	10 hectares
Lily Pond	Edgecomb	23 hectares
Little Medomak Pond	Waldoboro	30 hectares
Little Ossippee Flow	Waterboro	163 hectares
Little Pond	Damariscotta	28 hectares
Little Poverty Pond	Shapleigh	6 hectares
Little Round Pond	Mount Desert	6 hectares
Long Pond	Mount Desert	304 hectares
Long Pond	Mount Desert	12 hectares
Loon Lake	Acton	35 hectares
Lower Breakneck	Bar Harbor	2 hectares
Lower Hadlock Pond	Mount Desert	13 hectares
Lower Mason Pond	Belfast	13 hectares
Lower Patten Pond	Ellsworth	370 hectares
Lowry Pond	Searsmont	31 hectares
Maces Pond	Rockport	12 hectares
Marsfield Pond	Hope	11 hectares
McCurdy Pond	Bremen	83 hectares
Medomak Pond	Waldoboro	92 hectares
Meetinghouse Pond	Phippsburg	3 hectares
Megunticook Lake(B#1)	Lincolnville	339 hectares
Megunticook Lake(B#2)	Lincolville	126 hectares
Middle Branch Pond	Alfred	17 hectares
Mill Pond	Appleton	14 hectares

Table 5 (cont'd). LAKE VULNERABILITY INDEX

MINOR COASTAL BASINS

HIGHLY VULNERABLE LAKES AND PONDS(Cont'd)

Milton Pond	Lebanon	90 hectares
Mirror Lake	Rockport	44 hectares
Moody Pond	Lincolnville	26 hectares
Moose Pond	Acton	10 hectares
Mousam Lake(B#1)	Shapleigh	260 hectares
Mousam Lake(B#2)	Shapleigh	89 hectares
Northeast Pond	Lebanon	317 hectares
Northwest Pond	Waterboro	14 hectares
Norton Pond	Lincolville	41 hectares
Noyes Pond	Blue Hill	8 hectares
Paradise Pond	Damariscotta	60 hectares
Passawaukeag Lake	Brooks	46 hectares
Pemaquid Pond	Waldoboro	583 hectares
Pitcher Pond	Northport	146 hectares
Roberts Pond	Lyman	85 hectares
Rocky Pond	Orland	63 hectares
Rocky Pond	Rockport	5 hectares
Ross Pond	Bristol	7 hectares
Round Pond	Mount Desert	17 hectares
Round Pond	Lyman	1 hectare
Round Pond	Union	98 hectares
Seal Cove Pond	Tremont	96 hectares
Sennebec Pond	Union	215 hectares
Seven Tree Pond	Warren	212 hectares
Shaker Pond	Alfred	35 hectares
Shapleigh Lake	Shapleigh	32 hectares
Sidensparker Pond	Waldoboro	59 hectares
Silver Lake	Phippsburg	5 hectares
Somes Pond	Mount Desert	36 hectares
South Pond	Warren	212 hectares
Spaulding Pond	Lebanon	44 hectares
Sprague Pond	Phippsburg	3 hectares
Spring Pond	Washington	7 hectares
Square Pond	Acton	340 hectares
Stevens Pond	Liberty	114 hectares
Swan Pond	Lyman	52 hectares
Swan Pond	Acton	4 hectares
The Tarn	Bar Harbor	7 hectares
Tilden Pond	Belmont	140 hectares
Torrey Pond	Deer Isle	9 hectares
Town House Pond	Lebanon	42 hectares
Trues Pond	Montville	64 hectares
Upper Breakneck	Bar Harbor	2 hectares
Upper Hadlock Pond	Mount Desert	15 hectares
Upper Mason Pond	Belfast	31 hectares
Upper Patten Pond	Ellsworth	142 hectares
Washington Pond	Washington	226 hectares

Table 5 (cont'd). LAKE VULNERABILITY INDEX

MINOR COASTAL BASINS

HIGHLY VULNERABLE LAKES AND PONDS(Cont'd)

Wattuh Lake	Phippsburg	10 hectares
Webber Pond	Bremen	93 hectares
Wilson Lake	Acton	119 hectares
Witch Hole Pond	Bar Harbor	9 hectares
TOTAL		11,078 hectares

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ALL BASINS

Extremely Vulnerable Lakes and Ponds - 2,638 hectares (5,518 acres; 0.7% total lake and pond acreage in Maine)

Highly Vulnerable Lakes and Ponds - 45,202 hectares (111,694 acres ; 11.2% of total lake and pond acreage in Maine

4.3.3 Estuarine and Marine Waters

In Maine, where demand on waterfront land is increasing, the cumulative effect of small nonpoint sources is apparent. Moreover, sources affecting coastal waters are not limited to adjacent areas. Rain and meltwater runoff from about 25,000 square miles of Maine's landscape washes into Maine's coastal waters. From as far away as Smyrna Mills and Jackman, materials wash off the land and run to estuaries and ocean waters. Pesticides, fertilizers, and soils wash off agricultural, forestry, and residential lands every time it rains. Heavy metals, petroleum hydrocarbons, and PAHs from automobile exhausts and power plant emissions drop back to the surface to be washed downstream to estuaries. Household chemicals and industrial hazardous wastes spilled on the ground move downhill with water.

Licensed discharges do not account for the high levels of heavy metal contamination found in Boothbay Harbor and Cape Rosier sediments and marine life. Nor do licensed discharges explain the metals, petroleum hydrocarbons, and PAHs found in Casco and Penobscot Bays. In Cape Rosier, runoff and leachate from an abandoned mine's waste-tailings pond are responsible. In Casco Bay and Penobscot Bay, we suspect a combination of urban runoff contaminated with heavy metals and combustion byproducts as well as runoff and spills from oil handling activities. (See map next page for NPS study areas).

Contamination of marine sediments by heavy metals and organic chemicals seems to be the most significant threat to estuarine and marine waters of Maine. However, much more research is needed to assess the relationship of ambient water quality to contaminated sediments as well as the impact of contaminated sediments on the biological community in estuarine and marine waters.

Based on information already available from the National Oceanic and Atmospheric Administration (NOAA) the National Maine Fisheries Service, the Army Corps of Engineers and the Maine Department of Environmental Protection, it is clear that nonpoint source pollution, and more specifically urban stormwater runoff, is a likely source of contamination in nearshore waters. Elevated levels of lead, hydrocarbons, and zinc, all associated with urban runoff, have been found in non-industrialized (Boothbay Harbor) as well as industrialized (Portland Harbor) areas of the Maine coast. Licensed discharges to these waters do not explain the level of contamination suggesting that uncontrolled sources such as nonpoint sources need further investigation.

A workplan to assess threats to estuarine and marine waters has been produced in a March, 1989, report to the Maine Legislature and contains a large nonpoint source pollution assessment component. Specific NPS pollution assessment needs for estuarine and marine waters will be discussed in the State of Maine Nonpoint Source Pollution Management Program.

13. (MAPS)

Marine Waters; NPS Problems

4.3.4 Groundwater

Virtually all groundwater in the 11% of Maine which is not forested is threatened with contamination, and therefore, with nonattainment of its single designated use: public drinking water supply. Although progress is being made in reducing pollutant loadings from nonpoint sources such as sand/salt piles, leaking underground storage tanks and landfills, pollutants already discharged to groundwater will cause increasingly larger zones of nonattainment due to plume dispersion and migration. There is little doubt that additional contaminant plumes will also be created in the years ahead. Specific NPS pollution assessment needs for groundwater will be discussed in the State of Maine Nonpoint Source Pollution Management Program.

During the past ten years, many wells in Maine have been abandoned due to contamination from nonpoint source pollution. These contaminated wells should be viewed as the "tip of the iceburg" in assessing the extent of groundwater made undrinkable by NPS pollution. Based on present knowledge of nonpoint sources affecting groundwater, it is safe to assume that there are thousands of NPS pollution sites in Maine with unpotable groundwater. A State Groundwater Management Strategy has been developed to deal with the alarming degradation of this critical resource. Preventive rather than reactive measures form the basis of this strategy because of the fact that once groundwater is polluted, an indeterminable amount of time may be required for natural processes to restore the groundwater to drinkable quality. The susceptibility of the resource to degradation can be illustrated by the fact that one gallon of gasoline has the potential to make one million gallons of groundwater unfit for human consumption.

Major impediments to the formulation of policy for the protection of groundwater are (1) a lack of knowledge as to the extent of the problem and (2) the unknown relative impact of the various types of nonpoint sources. Many known sites of groundwater contamination are listed in Appendix III, but that inventory only indicates occurrences. It does not assess the volume of water or area of aquifer surface affected. See Map for incedents of groundwater contamination.

Experiments have shown the average nitrate levels of septic system effluent at the bottoms of leach fields. However, there currently is no correlation between these levels and the levels of nitrates in aquifers that are located below or downgradient. Extensive research is required to determine whether the approximately 230,000 septic systems in the State pose a significant long-term threat to groundwater supplies. It is in densely settled, largely unsewered counties like Sagadahoc and York that the greatest potential for cumulative impacts exist. However, groundwater in densely settled, unsewered areas of all counties are susceptible to contamination from septic systems.

Hazardous substances do not comprise a large percentage of the total groundwater problem, but because of the extreme health hazards that they present, they will continue to be allocated a large portion of groundwater protection resources. The DEP has received over 350 reports of potential hazardous substance sites with 170 of these seeming credible enough as to require additional site investigation.

There are 42 sites in Maine where hazardous substances are known to have caused groundwater contamination. There are six sites that have been designated as Superfund sites. These include the Winthrop landfill, the McKin disposal site in Gray, O'Connor's Salvage Yard in Augusta, the Saco Tannery Pits, Pinette's Salvage Yard in Washburn, and the Brunswick Naval Air Station. The Saco Landfill and the Union Chemical Site have been proposed as Superfund sites, but have not yet been officially designated as such. Smith's Junkyard (dam site) in Meddybemps is under consideration for inclusion as a Superfund site and is currently being scored.

Cumberland County ranks highest in the relative extent of its groundwater problems due to hazardous substances because of the presence there of two very extensive contamination areas - the Brunswick Naval Air Station and the McKin site in Gray.

Landfills are a significant problem in the State but leaking underground storage tanks (LUST) are estimated to have polluted eight times as much groundwater. An alarming aspect of pollution by underground tanks is the fact that there are an estimated 6,500 sites in the State that have been polluted by leaking tanks while only about 1,000 of these sites have yet been discovered. At 155 of these sites, a total of over 200 private wells have been polluted.

Uncovered sand-salt storage areas, although estimated to be polluting only a quarter of the area that sand-salt spreading does, are a much more serious problem. Each sand-salt storage site is estimated to pollute an average of 10 acres of groundwater. The concentrations of salt in groundwater associated with these sites is usually much higher than along road sides. The salinity of groundwater polluted by uncovered sand-salt piles sometimes exceeds that of sea water.

Lagoons used for wastewater treatment were estimated to be the least significant of the sources studied. One factor which minimizes the extent of contamination from lagoons is that they are usually located next to large water bodies which are groundwater discharge areas. Major lagoon sites number only 36 in the State with about 90% of the lagoons having linings which minimize discharges to groundwater.

12. (MAP)

Groundwater; NPS Problems

4.3.5 Wetlands

Assessing water quality problems associated with wetlands is a difficult task and will require further research to fully address this issue. For purposes of this report, the resource base and known point and nonpoint sources of pollution impacting wetland areas are discussed. As noted below, Maine has recently taken legislative and regulatory steps which will aid in future assessment of wetland water quality issues.

Maine is 25% wetlands. These are made up of more than 5,000,000 acres of freshwater wetlands and approximately 160,000 acres of tidal wetlands. A diversity of climatic and physiographic conditions in the state results in a diversity and abundance of wetland types. Forested and shrub swamps are the most abundant, while tidal marshes and beach systems are least abundant. Each has important natural values. Other wetland types in Maine include mudflats and rocky shores, freshwater marshes, bogs and fens, floodplain wetlands and other seasonally flooded flats or basins with wetland vegetation and/or soils.

Wetlands have many natural and cultural values and provide many important functions such as habitat for fish and other animal and plant species; flood control; nutrient retention and sediment trapping; production of timber and other natural resources; and recreation, education and research, and use as natural areas. The "critical edge" or wetland-to-upland transition zone is extremely important for wildlife, providing a buffer protecting the wetland from indirect or secondary impacts, such as nonpoint source pollution.

Historically, 1-2% of Maine's original vegetated wetland acreage has been lost or converted to other uses. There has apparently been a net gain in open water wetland areas, although the extent of this is not well recorded. Some restoration and mitigation projects have resulted in the creation of vegetated coastal and inland wetland areas, but their replacement value for wildlife or other functions is not well known.

When wetlands are altered or destroyed for various kinds of development, maintenance and operating costs are generally higher than wisely developed upland sites. There are more environmental and socioeconomic costs associated with wetland alterations that must be considered, since these costs will inevitably be passed on to the consumer.

Alterations which result in outright wetland loss include filling, dredging and draining. Losses of wetland function and value are far more difficult to measure, but are just as serious and in fact more widespread. Buffer areas adjacent to wetlands are crucial for preserving the integrity of wetland functions and values. The conversion of land use around a wetland can also alter or destroy the natural values or integrity of a wetland.

The filling of wetlands has occurred throughout Maine's history of settlement as these "wastelands" were "improved" for residential and commercial development. Agricultural activities have converted vegetation types, and when located in or near floodplains, may have reduced some natural flood control features. Other wetland values have been lost or reduced, even though the area may still be classified as wetland. Dam construction has created open water habitats while often flooding vegetated wetland types.

Currently, wetland losses are greatest in smaller wetlands in rapidly developing areas of the state, e.g., southern York County, south coastal areas and other high-growth urban areas. Coastal salt marshes are experiencing the greatest threats from fringing development, whereas inland wetlands, especially smaller ones, are being filled. While the values of individual small wetlands may not be great, they are extremely important within a larger landscape context. The cumulative loss of many small wetlands via development activities may be just as severe as the loss of a smaller number of large wetlands when habitat and cultural values are considered.

Inconsistency between state and federal wetland laws, differing definitions, size of wetlands regulated, and exemptions, have complicated matters for developers and regulators alike. Within Maine, different agencies of state government have different mandates, (e.g., DEP regulates activities in wetlands to preserve their functions and MDOT is required to build safe roads for the public, which may include filling wetlands). Nationally, there are similar conflicting mandates, but these are being merged into a more unified policy favoring stronger wetland protection.

Enforcement and implementation of regulatory wetland protection programs varies at all levels - federal, state and local - and are generally outpaced by the current rate of wetland alterations. Many wetland alterations are inadequately regulated, especially developments that encroach upon smaller wetlands. Regulation is ineffective in evaluating how seriously or permanently an alteration impairs wetland functions. It is unknow to what extent certain wetland functions are being lost by the varying degrees of alteration.

Many losses of wetland function and value can be attributed to NPS activities in upland areas immediately adjacent to wetlands, such as housing, industrial development, and landfills. Most regulatory programs deal with the wetland itself and not specific activities on adjacent lands. Regulation may not stop development from occurring near wetlands; however, non-regulatory initiatives (for example, designation, registry, and easements) may provide important opportunities to address problems created by adjacent upland developments.

Acquisition is often the only means to ensure the long-term protection of certain high value wetlands and their component species. Permanent protection is also required for buffer areas around these high priority wetlands. Although the state and private entities have already protected some important wetlands, there are still acquisition needs which have not been met. There is agreement within the conservation community that wetland acquisition is a high priority for Maine. The potential of wetlands as educational resources has scarcely been realized in the state. This fact contributes heavily to the lack of understanding of the biological and cultural importance of these ecosystems.

Pollution may not completely destroy a wetland, but it may seriously impair its quality as habitat or its its ability to perform vital functions. For example, the discharge of wastewater into or over wetlands may have deleterious effects on productivity, pose human health risks, and result in the closure of mudflats to shellfish harvesting. This kind of threat has been and continues to be most serious in coastal areas, even though the direct discharge of wastewater in coastal wetlands and water bodies is now banned, except for existing systems which are grandfathered under the current law.

Excessive pollution discharges in intertidal flats (from CSOs, etc.) have resulted in the closure of large areas along the coast, with significant impacts on shellfish harvesting in those areas. Of approximately 3000 water discharge permits issued by DEP prior to 1986, 95% are coastal overboard discharges and most are located between Bath and Belfast. Individual permits (Board Orders) do record whether a discharge enters a salt marsh or runs directly into the ocean, but this data is not tabulated at present.

Closure of intertidal clam flats to harvesting, as well as subtidal oyster beds and mussel beds, is the province of the Department of Marine Resources. Closures are recorded, but extents or acreages are not, since these areas may differ yearly or seasonally, and are usually determined by the presence of overboard discharge sites adjacent to clam flats. Unacceptable levels of bacteria, pathogenic organisms, other deleterious substances or naturally occurring biotoxins (e.g., red tide) are cause for flat closure. The most recent data tabulated for extent of flat closures in Maine is for 1974 when the percentage of clam flats closed by county ranged from 8% in Washington County to 98% in York County. Total closures were 21% or 9,758 acres out of a total of 46,135 acres of clam flats.

Potentially polluted areas may also be closed because of proximity to known discharge sites and the presumption that wastewater treatment systems are likely to malfunction. However, the new law governing overboard discharges gives DEP authority to enforce the removal of overboard discharges that are causing particular clam flats to be closed. Other potential nonpoint sources of coastal wetland pollution are oil pollution from refineries or heavy metal pollution. However, these risks are low compared with residential pollution sources.

Other land use activities such as the creation of landfills have impacted wetlands, both directly by filling and indirectly by leaching of toxic or hazardous materials from non-contained landfills into adjacent wetlands.

There are many documented cases of hazardous waste disposal in or near wetlands. With this kind of activity, the wetland itself may remain, but its vital functions are often lost or irrevocably degraded. Such effects may require the destruction or filling of the wetland to contain the contaminants or to remove them to a safe disposal site. Maine has six sites on the EPA National Priority List of Hazardous Waste Sites, or "Superfund" sites. Several other sites are designated "Uncontrolled Hazardous Substance Sites" by the Maine DEP,and numerous other potential hazardous waste sites are under investigation.

Of the Superfund sites, two are known to include some wetlands - Saco Tannery Pits and the Winthrop Landfill. Other state-designated or potential sites which have affected wetlands include: the Brunswick Naval Air Station, North Berwick Municipal Garage, Portsmouth Naval Shipyard, Dauphin Dump (Bath), Callahan Mine (Cape Rosier), Southern Maine Finishing (Waterboro) and Main Oil Recycling (Buckfield). In total, at least 25% of known or suspected hazardous waste sites in Maine contain wetlands which have been impacted by these materials, although the total acreage known at present is rather small.

Of the wetland alterations identified as causes of historic wetland loss, many continue to contribute to wetland losses at present. Urban and rural community growth and development has increased dramatically in recent years, especially in southern Maine and in coastal areas. This growth has resulted in wetland losses, much of which is undocumented because of lack of regulatory authority and lack of enforcement. The losses are most frequently occurring in small wetlands, generally under ten acres in size and often viewed as less critical for protection. The cumulative loss of these small, frequently interconnected wetlands is a serious threat that needs to be curtailed.

Pollution continues to threaten and degrade wetlands, especially in coastal areas, but in inland freshwater areas as well. New laws enacted in 1988 are being implemented and within five years may curb some of the destructive trends that have been established. Recent scientific research points to a possible relationship between the prevalence of"red tides" (marine biotixins) and human-induced nutrient enrichment of the ocean. The potential exists for serious long-term impacts resulting from inappropriate disposal of waste materials.

4.3.6 Interstate and International Waters

Maine shares a common border with the State of New Hampshire. Often, waterbodies define these state boundaries and interstate cooperation is necessary to address NPS problems in these areas. Notable areas of concern include:

(L)Balch Pond - Newfield

(L)Great East Lake - Acton

(L)Horn Pond - Acton

(L)Northern Pond - Lebanon

(L)Milton Pond - Lebanon

(L)Spaulding Pond - Lebanon

(R)Salmon River - Bowdoin

(L)Province Lake - Parsonfield

(R)Ossipee River - Porter

(R)Saco River - Fryburg

(L)Lower Kimball Pond - Fryburg

(R)Wild River (to Androscoggin) - Batchelders Grant

(L)Androscoggin - Gilead

(L)Umbagog Lake - Magalloway Plt

(L)Lake/Pond

(R)River

These waterbodies are discussed in the lakes and rivers sections of this document. Maine and New Hampshire are working cooperatively on NPS activities in these watersheds.

International Waters:

St. Croix River

The International Joint Commission (IJC) or the International Advisory Board on Pollution Control is made up of environmental officials from the United States and Canadian governments, as well as representatives from the State of Maine and the provinces of Nova Scotia and New Brunswick. The Board is involved in water management issues within the St. Croix River basin, which covers an area 7230 km^2 straddling the Canadian and United States border between southwestern New Brunswick, and southeastern Maine. Although the Board has focussed primarily on point sources, NPS is a component of current management plans.

Gulf of Maine

The Gulf of Maine is a "sea within a sea" a body of water that extends from Cape Cod Bay to the Bay of Fundy. Its depth, water density, tides, and circulation patterns make the Gulf of Maine one of the world's most productive seas. Today, the Gulf's resources are subject to increasing pressures from coastal development, fishing, energy development, and pollution. Working cooperatively, the State, Provincial, and Federal governments with jurisdiction over the Gulf hope to maintain the health and productivity of its waters.

The Gulf of Maine Initiative

The Gulf of Maine initiative is a cooperative effort being undertaken by the states and provinces that border the Gulf. The initiative seek to increase understanding of the Gulf's resources and to develop action recommendations that can be implemented by the states and provinces.

The highest priority is on protecting and improving the Gulf of Maine's water quality. There is also a shared interest in working cooperatively on related coastal management issues. In support of these efforts, the U.S. National Oceanic and Atmospheric Administration awarded the three New England states funding to pursue two tasks: development of a Gulf of Maine environmental monitoring program and preparation of a report assessing the ecological health of the Gulf.

Environmental Monitoring Program

The purpose of this effort is to develop the framework for an ecosystem-based contaminant monitoring program that will provide resource managers with information to effectively protect public health and the Gulf's marine ecosystem. The Program is being jointly developed by all governmental entities bordering the Gulf, and is expected to be implemented cooperatively.

Gulf of Maine ecosystems report.

The report will bring together existing information on the Gulf's resources and characterize its environmental health. Further, it will provide a focal point for a discussion on the Gulf's research and management.

The GOM Initiative seeks to build on existing programs and research that has already been undertaken in the Gulf region. There are many parties with an interest in the GOM, including governmental agencies on both sides of the border, universities, commercial interests, and research organizations. The GOM initiative seeks to complement these shared interests. For example, the FMG (Bay of Fundy/Gulf of Maine/Georges Bank) project, being directed by Dalhousie University, is producing an excellent informational base which the GOM Initiative will use to assess the status of the Gulf's resources. In Maine, the Association for Research on the Gulf of Maine (ARGO-Maine) unites the marine research community in fostering research on the Gulf.

SECTION 5

STATE, REGIONAL, AND LOCAL AGENCY PROGRAMS FOR CONTROL OF NONPOINT SOURCE POLLUTION

5.1 PROGRAM COORDINATION

The wide variety of activities which produce nonpoint source pollution combined with a vast network of governmental study, regulation and enforcement of the problem requires a coordinated effort that is both interagency and intergovernmental in nature. Maine's NPS Coordinator is located in the NPS Section in the Bureau of Water Quality Control, Maine DEP. At present, the NPS Coordinator's major task is to coordinate the preparation of this report in accordance with the requirements of Section 319 of the Federal Clean Water Act.

To aid in the preparation of this report, the Coordinator formed a broad based working group. The NPS Study Committee has representatives of the Maine Department of Agriculture, Food and Rural Resources; Maine Department of Conservation; Maine Department of Environmental Protection; Maine Department of Human Services; Maine Department of Transportation; Maine Department of Marine Resources; Maine State Planning Office, Maine Soil and Water Conservation Commission; Maine Association of Conservation Districts; Maine Association of Regional Councils; the U.S. Geological Survey, and the USDA Soil Conservation Service and the University of Maine Extension Service. It is hoped that the combined effort of various government agencies, each knowledgeable about its own programs, will enable the State to develop a comprehensive strategy for the control of nonpoint source pollution.

As each agency develops its own programs to deal specifically with nonpoint source controls, it is essential for interagency communication to occur. Many programs can be consolidated where duplication exists or be expanded to include informational seminars or enforcement activities if there is a statewide plan that is carefully orchestrated by the NPS Coordinator and carried out with a spirit of cooperation by each agency. Funding for personnel can often be shared by State, regional and local agencies, to provide both an interagency liaison and a source of financial relief. The intergovernmental personnel agreement (IPA) to be utilized by the DEP and the SCS is one such example. This report, and this section in particular, define the parameters of each governmental agency and highlight their common ground as well.

Once Maine's Nonpoint Source Pollution Assessment and Management Program is approved by the USEPA the NPS Coordinator's responsibilities will be to coordinate implementation of the NPS Management Program and to prepare addendums to the NPS Pollution Assessment and Management Program as more is learned about the nature, extent and causes of NPS pollution. The single most important action Maine can take at this time for the control of nonpoint source pollution is to maintain the quality of existing control programs. Maine already has an extensive body of law relating to the control of nonpoint source pollution (Table 6). A description of the nonpoint source control programs in Maine which have developed as a consequence of this legislation and related program priorities follows.

5.2 STATE AGENCIES

5.2.1 Maine Department of Agriculture, Food and Rural Resources

PURPOSE: The Department of Agriculture, Food and Rural Resources was established to improve agriculture in Maine through the conservation and improvement of the soil and cropland of the State; the development, compilation and dissemination of scientific and practical knowledge; the marketing and promotion of agricultural products; the detection, prevention and eradication of plant and animal diseases; the protection of the consuming public against harmful and unsanitary products and practices; and the sound development of the natural resources of the State.

ORGANIZATION: Although most programs in the Maine Department of Agriculture, Food and Rural Resources are not designed specifically to address nonpoint source pollution, the installation of conservation practices designed to keep soil, pesticides, animal waste, and fertilizer in place, also affect local sources of nonpoint source water pollution. Two of the Department's 23 organizational units, deal specifically with conservation practices and the control of nonpoint source pollution. These units are the State Soil and Water Conservation Commission and the Board of Pesticides Control.

5.2.2 Soil and Water Conservation Commission

PURPOSE: The State Soil and Water Conservation Commission was established to provide for the protection, proper use, maintenance and improvement of the soil, water and related natural resources of the State of Maine. The principal responsibilities of the Commission are to assist Soil and Water Conservation Districts in the preparation and implementation of their locally developed programs; to develop and carry out public works projects for prevention of soil erosion, flood prevention, conservation, development, utilization and disposal of water; to assist in the completion of the National Cooperative Soil Survey; to conduct surveys, investigations, and research as necessary for implementation of other functions.

ORGANIZATION: The Commission consists of eleven members, five of whom serve ex officio: Dean of the college of Life Sciences and Agriculture of the University of Maine, Commissioner of Agriculture, Commissioner of Conservation, Commissioner of Inland Fisheries and Wildlife, and Commissioner of Marine Resources; Department of Environmental Protection and six officio members who are Soil and Water Conservation District Supervisors. Professional staff for the Commission is comprised of an Executive Director and a Soil Scientist.

NONPOINT SOURCE CONTROL PROGRAMS:

Liaison Between State Government and Maine's Soil and Water Conservation Districts

Maine's 16 Soil and Water Conservation Districts are State entities but are not part of State government. The State Soil and Water Conservation Commission provides a critically needed link between the Districts and State government as well as coordination among Districts. The Commission has the power to form and create Districts; to appoint two of the five supervisors managing each district; and to formulate policy for the Districts.

The accomplishments of the Soil and Water Conservation Commission (SWCC) are apparent in the conservation practices applied to the land of more than 11,874 private landowners that are cooperators with Maine's 16 Soil and Water Conservation Districts. During fiscal year 1986, 4,410 groups and individuals applied some form of conservation practices to their land in an effort to control erosion and other soil and water problems. New conservation plans were formulated for 88,352 acres of land, raising the total State acreage covered by conservation plans to 2,010,426 acres.

Interagency Liaison

In 1987 the Commisison and Districts reviewed and evaluated over 522 resource alteration applications submitted to the Department of Environmetnal Protection (DEP), Land Use Regulation Commission (LURC), State Planning Office (SPO) and the Department of Inland Fisheries and Wildlife (DIFW) during the past year. The recommendations porposed by the commissioner and Districts were often included as conditions of approval in the permits granted through these applicaiton. Commisison review involves the following considerations:

1. Soil Suitability
2. Erosion and Sediment Control
3. Relation to Floodplains
4. Stormwater Management and Drainage
5. Protection of Prime Agricultrual Lands where Appropriate.

Challenge Grants

The Challange Grant Program was authorized by the Legislature in 1983 to provide funding to Districts in order to address local problems in soil and water conservation. Districts compete annually for funding from a pool of $100,000. During the past four years, many projects have been funded that have had direct or indirect effects on water quality.

There have been several Challenge Grants dealing with the proper utilization of industrial waste. By using waste products as a soil amendment, not only can the problem of its disposal be solved, but it may be turned into a valuable asset to the land-user.

In 1986, a challenge grant, obtained by the Cumberland County Soil and Water Conservation District, funded Runoff and Erosion Control Guidelines for Highway Crew Leaders, a booklet developed cooperatively by the Town of Falmouth, Maine, the Maine Department of Transportation, the Maine Soil and Water

Conservation Commission, the USDA Soil Conservation Service, and the Threshold to Maine Resources Conservation and Development Area.

There is currently a Challenge Grant to study the treatment of milkroom wastewater through the use of a barkbed filter. This experimental treatment system is being evaluated to determine if it effectively protects water quality. If this demonstration project proves effective and is readily adopted by other dairy farmers, it will be an effective BMP for this nonpoint source of pollutants.

Another Challenge Grant deals with manure sampling. This program determines the fertilizer value of a farmer's animal waste and when coupled with soil testing enables the spreading of manure in proper quantities that can be assimilated by the land. The adoption and use of this program by other farmers would address nonpoint source pollution problems caused by overspreading of animal waste.

Many demonstrations of conservation tillage have been conducted as Challenge Grants statewide. This type of tillage reduces the disturbance of the soil in crop raising and effectively limits the movement of sediment through erosion. As a result of these demonstrations, conservation tillage practices have been adopted by many Maine farmers.

Demonstrations of proper methods of reclaiming gravel pits, constructing and maintaining logging roads, shoreline erosion control, recreational field stabilization and drainage, blueberry land management, riverbank stabilization, and wastewater treatment with peat instead of gravel in coastal areas have all been carried out through the Challenge Grant Program. These practices when adopted by the land-user help to stabilize potential erosion and sedimentation situations.

5.2.3 Board of Pesticides Control

PURPOSE: The Board of Pesticides Control was established to protect the public health and safety and the public interest in the soils, water, forests, wildlife, agricultural and other resources of the State by assuring safe, scientific and proper use of chemical pesticides. The primary responsibilities of the Board are to register all pesticide products to be sold and used in Maine; to examine and license all persons involved in commercial application of pesticides and all dealers and private growers involved in the sale or application of restricted use pesticides; to promulgate regulations regarding pesticide use; to issue permits for limited-use pesticides; investigate use of pest control chemicals; to prosecute violations or initiate license-suspension actions; and to cooperate with other agencies in environmental monitoring and protection.

ORGANIZATION: The Board of Pesticides Control is a quasi-judicial body made up of seven members appointed by the Governor for four-year terms. Qualifications for three of the members are prescribed by statute to include persons knowledgeable about pesticide use in agriculture, forestry and commercial application, while one person must have a medical background and another be either an agronomist or entomologist at the University of Maine. The remaining two public members are selected to represent different economic or geographic areas of the State. The Board is served by a professional staff of eight people.

NONPOINT SOURCE CONTROL PROGRAMS:

<u>Registration</u>

The Board registers all products that may be sold and used within the State. When problems are known or anticipated, additional restrictions may be placed upon the use of the product. In the case of aldicarb contamination of groundwater, the Board has approved a special local needs registration which prohibits Temik use within 500 feet of a well. In addition, future Temik registration is contingent on the manufacturer's continued sampling of wells to show that pesticide residues in groundwater are continuing to decline as a result of changes in product labeling.

Certification and Licensing

Applicators applying restricted use pesticides must be initially examined and licensed. Study materials provided to prospective applicators discuss effects of environmental contamination and these topics are also stressed at ongoing recertification training sessions.

Enforcement

The Board's inspectors routinely conduct use investigations of all types of spray applications. Special emphasis is placed on being sure that spray is not directly applied to public waters, that pesticides do not drift into bodies of water, that anti-siphon devices are installed and that the areas around sprayer fill holes are kept clean.

Returnable Containers

This is a special program to ensure that restricted use containers made of glass, metal or plastic are triple-rinsed and returned for proper disposal. It was implemented after aerial surveillance of farms showed that many containers were being discarded into wet or marshy areas bordering back fields.

Obsolete Pesticide Collection

On three occasions, the Board has collected old pesticides from homeowners, growers and small business and delivered them to a hazardous waste contractor for disposal at out of state facilities. Additional funding was sought so that more of these potential pollutants may be removed from the usually dilapidated buildings in which they currently reside, but funding was denied in 1989.

5.2.4 Maine Department of Economic and Community Develeopment Office of Comprehensive Planning

This new State Office was established in August, 1988. The primary purpose of the Office is to implement landmark State Growth Management Legislation signed by Governor McKernan in June, 1988.

Maine's Growth Management Law requires all of Maine's 494 municipalities to adopt local Growth Management programs (Comprehensive Plans and Zoning Ordinances) that address 10 State goals and regional policies as well as local land use issues. The new Office provides planning grants to the Towns ($2.4 million budgeted for 1988 and 1989), financial support to Regional Councils for local planning assistance ($1.2 million for 1988-89) as well as direct assistance from the new office, including planning guidelines and model ordinances.

The new Office's role in providing Maine towns with assistance in local and lane use planning provides the opportunity to coordinate and improve state agency technical assistance leading to improved local planning and land use ordinances. For example, information on land uses most responsible for non-point source pollution can be provided to towns developing comprehensive plans to insure that these uses are considered in local and land use policy decisions regarding water quality protection. Subsequent assistance regarding best management practices can then be used by these towns in adopting local land use regulations that implement water quality policies in their plan.

The Office also coordinates training programs for planning staff at Maine's 12 Regional Councils involving coastal and floodplain management, subdivision and shoreland zoning review and other high priority issues identified by cooperating state agencies such as the Departments of Environmental Protection, Marine Resources, and Agriculture.

5.2.5 Maine Department of Conservation

PURPOSE: The Department of Conservation was established to preserve, protect and enhance the land and water resources of the State of Maine; to encourage the wise use of the State's scenic, mineral and forest resources; to ensure that coordinated planning for the future allocation of lands for recreational, forest production, mining and other public and private uses is effectively accomplished; and to provide for the effective management of public reserved lands.

ORGANIZATION: Three of the Department's sixteen organizational units deal specifically with the control of nonpoint source pollution. These units are the Land Use Regulation Commission, the Division of Forest Management and Utilization Forest, Management Section and the Maine Geological Survey.

5.2.5.1 Land Use Regulation Commission

PURPOSE: The Maine Land Use Regulation Commission was established in 1969 to serve as the planning and zoning board for the unorganized areas of Maine. It is responsible for promoting the health, safety and general welfare of the people of Maine by planning for the proper use of the resources within its jurisdiction and guiding land use activities to achieve this proper use. The Commission's jurisdiction includes over 10 million acres in the northern and western parts of the State which occur in townships, towns and plantations which would otherwise have no local land use controls. The major responsibilities of the Commission are to prepare a comprehensive land use plan for these areas, to determine the boundaries of areas within the unorganized areas of the State that fall into the various land use districts (zoning); to prepare land use standards for each district; to review applications for development in the unorganized areas of the State; and to carry out an enforcement/compliance program.

ORGANIZATION: The Maine Land Use Regulation Commission is a bureau in the Department of Conservation. The Commission itself is made up of seven citizen members appointed by the Governor. The Commission is served by a professional staff of 17 people.

NONPOINT SOURCE CONTROL PROGRAMS:

Land Management Regulations

Standards are established for forest and agricultural management activities in Protection Districts (e.g., timber harvesting in shoreland areas) and land management roads outside of Protection Districts; permits are required to exceed these standards.

Shoreland Development Regulations

Permits are required for shoreland development. Conditions relating to building setbacks and clearing along the shoreline are incorporated into the permits.

Enforcement

The Commission has an investigative enforcement staff of three persons to respond to complaints within an area equal to approximately one-half of Maine. The number of complaints reported to the agency has been increasing in recent years. As a result, more violations are documented each year than can be investigated and resolved. In addition, compliance surveys throughout the commission's jurisdiction indicate that the number of land use violations occurring of all types is substantially higher than the number of complaints recorded. The commission must rely primarily on voluntary compliance with regulations on forestry, agriculture and other activities.

Aquifer Recharge Areas

Identified aquifer recharge areas are appropriately zoned to protect them. Due to incomplete resource information for the Commission's jurisdiction, only one such recharge area has been identified and protectively zoned.

Research

The Commission has completed two studies of nonpoint source pollution problems from forestry operations. It has also contracted with the University of Maine to prepare an annotated bibliography on "Logging and Sedimentation", and is developing a research agenda for actual field studies to derive meaningful allowable sediment values to be used in regulations.

Education

Publications have been prepared to assist loggers in avoiding nonpoint source problems (Erosion Control on Logging Jobs, in French and English) and training sessions are periodically held for loggers and foresters working for major timber land owners.

5.2.5.2 Division of Forest Management and Utilization, Forest Management Section

PURPOSE: The primary function of the Forest Management Section is to motivate and technically assist forest owners to properly manage their woodlands.

ORGANIZATION: The Division's Forest Management Section employs nine professional staffers who are involved to a limited extent with the control of nonpoint source pollution.

NONPOINT SOURCE CONTROL PROGRAMS:

Technical and Educational Assistance

The eight field foresters of the Forest Management Section provide technical and educational assistance to over 700 private, non-industrial forest owners each year. Included are recommendations for timber harvesting; road layout; timber stand improvement; tree planting; insect, disease and forest fire control; pesticide use; Christmas tree management; fuelwood management and compliance with conservation laws.

Participation in Federal Cost-share Programs

Technical assistance is provided by staff foresters to forest land owners involved in cost-sharing programs through the Federal Agricultural Conservation and Conservation Reserve. These programs are designed to control erosion on marginal farm land by the planting of cover crops, including trees.

5.2.5.3 Maine Geological Survey

PURPOSE: The Maine Geological Survey was established to map, interpret and publish geologic (physical resource) information and provide advisory assistance to the minerals industry and interpretive information for planning and regulatory agencies. The Survey is authorized to direct a program of effective geologic inventory, employing professional geologists for mapping purposes; to support an active minerals industry; to publish and sell geologic literature; to provide geologic information to the public, industries and State agencies; to cooperate with other State and Federal agencies; and to manage the work of the Mapping Advisory Committee.

ORGANIZATION: The Maine Geological Survey is composed of five divisions, two of which are involved in hydrogeological research related to protection of groundwater from nonpoint source pollution. These units are the Hydrogeology Division and the Cartography and Publications Division. Sixteen professional staff members are employed by the Maine Geological Survey.

NONPOINT SOURCE CONTROL PROGRAMS:

Hydrogeology Division

This Division inventories ground and surface water conditions, with emphasis on groundwater supply and prevention of groundwater pollution. Studies are conducted by the Division in cooperation with the U.S. Geological Survey and the Maine Department of Environmental Protection. Water well records are obtained on a voluntary basis from drillers throughout the State. Maps depicting groundwater flow, yield and depth have been prepared for sand and gravel aquifers in the inhabited portions of the State. The Division has completed a study of yield and water quality of significant aquifers in southern, central and eastern Maine. The mapping is now in progress for Aroostook County. The study includes evaluation of land use over aquifers and its effects on groundwater quality. Use of the sand and gravel aquifer map series continues to be widespread. With funding provided by the Maine Legislature, the Hydrogeology Division, in cooperation with other State agencies and the U.S. Geological Survey, planned and carried out a study of pesticides in groundwater in Maine. The first two years of work have been completed, published, and are discussed in Appendix III of this report.

Cartography and Publications Division

This Division prepares and publishes the results of the Survey's geologic field investigations and research projects. The series of maps this division has published on significant sand and gravel aquifers has been very useful in the control of NPS pollution of groundwater.

5.2.6 Department of Environmental Protection

PURPOSE: The Department of Environmental Protection is charged by statute with the protection and improvement of the quality of our natural environment and the resources which constitute it, and the enhancement of the public's opportunity to enjoy the environment by directing growth and development which preserves an ecologically sound and aesthetically pleasing environment. The Department advocates programs and regulatory decisions that contribute to the achievement of this goal.

The Department, through authority vested in the Commissioner and the Board of Environmental Protection, exercises the police powers of the state to prevent the pollution of the natural environment. It recommends to the Legislature measures for elimination of environmental pollution; grant licenses, and initiates enforcement actions. Its staff negotiates agreements with Federal, State and municipal agencies, administers laws relating to the environment and exercises whatever other duties that may be delegated by the Board.

ORGANIZATION: The Department of Environmental Protection is descended from the Sanitary Water Board, created in 1941, to recommend means of eliminating water pollution. In 1951, it was renamed the Water Improvement Commission. The Commission was renamed the Water and Air Environmental Improvement Commission in 1967 when its duties were expanded to include air pollution.

On July 1, 1972, the Commission became the Board of Environmental Protection (BEP) and a new Department of Environmental Protection (DEP) was created, consisting of the Bureaus of Air Quality Control, Land Quality Control and Water Quality Control. A Bureau of Oil and Hazardous Materials Control was added in 1980 and a Bureau of Administration was added in 1987. The Board consists of ten members appointed by the Governor. In addition to the Department's main office in Augusta, regional offices are maintained in Bangor, Presque Isle and Portland.

5.2.6.1 Bureau of Water Quality Control

PURPOSE: The Bureau of Water Quality Control is responsible for reviewing the quality of Maine's waterways and reporting their best uses and recommended classifications to the Board of Environmental Protection. The Bureau's primary operative functions are to protect and improve the State's waters and ensure that their classifications are attained. Many of the activities of the Bureau are mandated by Federal laws and are funded through the Federal Clean Water Act. Federal funds for fiscal year 1987 included approximately $1.8 million of program grant funds to aid the Bureau in carrying out its responsibilities under both State and Federal laws.

ORGANIZATION: The Bureau of Water Quality Control has five divisions, the Division of Environmental Evaluation and Lake Studies, the Division of Licensing and Enforcement, the Division of Municipal Services, The Division of Operation and Maintenance and the Division of the Presque Isle Regional Office. The Bureau also has a Planning, Information and Grants Unit.

NONPOINT SOURCE CONTROL PROGRAMS:

State Coordinator for Control of Nonpoint Source Pollution

As can be seen in this section on Current State and Local Programs for

Control of Nonpoint Source Pollution, any effective NPS Management Program must be both interagency and intergovernmental in nature. At this time, this position's major task is to coordinate the preparation and implementation of Maine's Nonpoint Source Assessment and Management Program. Once the Nonpoint Source Assessment and Management Program is approved by EPA, the NPS Coordinator's responsibilities will be twofold: (1) to coordinate implementation of the NPS Management Program and (2) to prepare addenda to the NPS Assessment and Management Program as more is learned about the nature, extent and causes of NPS pollution as well as the effectiveness of present and proposed Best Management Practices.

Maine Clean Lakes Program

The Bureau of Water Quality Control's Division of Environmental Evaluation and Lake Studies conducts an extensive program to protect and improve the quality of Maine's lakes and ponds. Eight professional staff members are presently assigned to this program. The Maine Clean Lakes Program's principal strategy is to maintain current water quality conditions in lakes and ponds presently attaining their classification. The most serious threat to lake quality presently comes from increasing rates of residential and commercial development in the watersheds of lakes, though agriculture frequently continues to be a major nonpoint source of lake and pond pollution. The overall strategy to protect and improve the water quality of Maine lakes involves five objectives:

(1) To identify which lakes are most at risk to future water quality degradation. The tools used to identify potential problems include the Maine Vulnerability Index which predicts impacts from increasing development, the Volunteer Monitoring Program which identifies water quality trends, and the Lake Benthic Invertebrate Index which is sensitive to

subtle differences in water quality. Approximately 150 lakes, and a comparable number of volunteers, are involved in the Volunteer Monitoring Program. More than 75 lakes have been analyzed to date for the Lake Benthic Invertebrate Index. The Vulnerability Index covers over 1,400 Maine lakes. The information and data gathered from these sources is then linked to other information (ie. municipal population growth rates, land-use patterns, and relative value of the water resource to the locality) and used to develop management programs to reduce NPS pollution which impacts lake water quality.

(2) To promote watershed management programs, land use policies and performance standards which minimize the discharge of pollutants to lakes and ponds. This is accomplished by providing technical reviews for the DEP permitting process and through the newly created Technical Assistance Unit which, in cooperation with regional planning agencies, is encouraging the adoption of revised comprehensive plans, performance standards and ordinances by municipalities in order to meet the goals of State water quality standards. Performance standards and model ordinances are now being developed for control of phosphorus runoff, a major NPS pollution problem for Maine lakes. This preventative approach promises to be more effective and less costly than the reactive efforts of the past.

The Maine Clean Lakes Program (MCLP) is currently working on a Maine Lakes Diagnostic Protection Project, under a 314 grant and local/state funding, for the purpose of developing a long-term (50 year) land use management plan for the Long Lake (Cumberland County) watershed that will permit growth but minimize harmful effects to water quality. This is a pilot project for Statewide Lake Protection.

The MCLP and the St. Johh Valley Soil and Water Conservation District have constructed two marshland-wetpond system to treat agricultural runoff in the watershed of Long Lake in Aroostook County. The University of Maine and the MCLP will be monitoring system efficiency in removing nutrients and assessing design criteria to maximize the performance of systems to be built in 30-50 priority watersheds. The project is a joint local/state/federal effort and may include federal and state cost-share dollars for construction of control structures.

In addition, the MCLP cooperates with the USDA's Soil Conservation Service, the Agriculture Stabilization and Conservation Service, the Maine Soil and Water Conservation Districts, Maine's Land Use Regulation Commission, the Maine Department of Transportation and municipal road commissioners, in order to reduce nonpoint source pollution due to a broad range of sources.

(3) To develop a broad base of support for lake protection. This is accomplished through education programs for schools, land users, policy makers, regulators and for the general public. The MCLP currently has an information and education initiative underway which includes: (a) the development of informational brochures on a wide range of related topics including phosphorus runoff and its affect on lake water quality, land use management practices and lake ecology; (b) education projects and contests for school children; and (c) informational displays on the Maine Clean Lakes Program.

Although the water quality of lakes is of concern to the great majority of Maine people, most are unaware of how their actions impact lakes. For this reason, the information and education component of the MCLP program is considered important to both long term NPS control and a comprehensive lake protection strategy.

(4) To restore the water quality of problem lakes. Maine has had restoration projects on 12 lakes, eight of which were supported by the Clean Water

Act's Section 314 grants. Two additional lake restoration projects (Webber Pond and Threemile Pond) supported by the 314 program are currently underway. It is anticipated that three more restoration projects (China Lake, Chickawaukie Lake and Cross Lake), will begin when new 314 funds become available.

The MCLP considers implementaion of Best Management Practices and consequent reductions of NPS pollutant loading to lakes as being critical to any restoration project. Without control of the pollutants (such as phosphorus and suspended solids) which reduce water quality, the long term viability of costly restoration projects is compromised.

(5) To coordinate lake-related policies and programs within DEP as well as with other agencies and to be a technical resource for policy makers at the local, state and federal levels. Through research, monitoring, and development of performance standards, as well as by offering restoration and technical assistance program. The Maine Clean Lakes Program is an integral component of Maine's Nonpoint Source Management Program.

<u>Sand-Salt Pile Management</u>

Public Law #479, enacted in 1985, mandated that all sand-salt piles be covered by 1996 to prevent the generation of salty leachate from them. Exceptions are allowed if the piles are to be located adjacent to water bodies of such size or quality that the classification of that water body would not be violated by the discharge of salty leachate.

About 25 towns have gone ahead on their own with the covering of sand-salt piles, and the DOT has initiated a program to evaluate the cost, utility, and ease of construction of different types of buildings at several of their high priority sites. Funding for these and future buildings will be forthcoming from a bond issue passed by the electorate in November of 1987.

Future activities at the State level are chiefly concerned with the construction of sand-salt storage buildings. The DOT is preparing generic specifications for the buildings, while the DEP Bureau of Water Quality Control is preparing siting criteria.

Technical Assistance to Municipalities

Three geologist positions in the DEP Bureau of Water Quality Control offer technical assistance services to municipalities for groundwater-related non-point source pollution problems. The purpose of this program is to assist town planning boards in assessing the potential groundwater impacts of development proposals submitted to them.

Assistance can be handled either in-house, or from 1986-1989, referred to a private consultant on retainer to the program as a result of an appropriation from the Maine Legislature. Funding of the referral program was withdrawn in 1989.

About 25 projects have been served by the program since its inception in June of 1986. Projects vary greatly in complexity and style. Some examples are as follows:

(1) Helping a town to plan a groundwater monitoring system,

(2) Assessing the impact of car wash wastes discharged to a septic system,

(3) Helping a town develop a plan to deal with salt water intrusion, and

(4) Working with a Regional Planning Commission to write model ordinances making the assessment of septic waste impacts on groundwater more straightforward.

The program has been advertised in the Maine Townsman and copies of that article have been sent to all planning boards in the State. In addition, the DEP staff is beginning work on a handbook of guidelines for groundwater review. It will help planning boards when they are faced with a new type of development proposal.

Water Quality Management Planning Grants

The Clean Water Act Amendments of 1987 provide for a passthrough to regional planning organizations of 40% of 205 (j)(1) grant monies received by Maine for water quality management planning. The Bureau of Water Quality Control and the Maine Association of Regional Councils have agreed that planning activities related to the control of nonpoint source pollution should be funded with the pass-through grants. A competitive grant process is currently underway which will result in additional planning for the control of nonpoint source pollution in Maine.

Atmospheric Deposition

The Bureau of Water Quality Control conducts an ongoing program to evaluate the aquatic effects of acidic atmospheric deposition. There are currently three major components to this program:

(1)The High Elevation Lake Monitoring (HELM) project sampled all 90 lakes in Maine above 600 meters elevation in 1986 and 1987. At least one summer sample and one fall overturn "index" period sample, were taken. The HELM study was designed to complement the statistically-based Eastern Lakes Study (ELS) in Maine, by sampling the lakes assumed to be the most sensitive to acidic precipitation. More than 10% of the group was acidic in 1986-87, compared to less than 1% for ELS sites.

(2)The Aquifer Lakes Study project identified and sampled a majority of the lakes in Maine that are on, or hydrologically associated with, aquifers. All of the lakes are "seepage-input" lakes, although some have outlets and are therefore not defined classically as "seepage" lakes. Sampling was conducted in 1986 and 1987, and included at least one fall "index" sample for each lake, for comparability to the EPA Eastern Lake Survey. These lakes are often of the "mounded-seepage" type, and are the most dilute lakes in Maine. Nearly one quarter of the approximately 140 such lakes in the study are acidic.

(3)The Tunk Mountain Watershed Project is the EPA funded site for the Long Term Monitoring Program in Maine. The project is operated by the University of Maine, in co-operation with the Maine DEP. The site includes five lakes in an approximately 400 hectare watershed. Two lakes are circumneutral, two are approximately pH 6.0, and one is acidic. Water quality chemical records exist on a monthly to seasonal sampling schedule since May, 1982.

Enforcement

Inspectors in all divisions of the Bureau of Water Quality Control routinely conduct investigations in response to citizen reports on NPS pollution. The Bureau resolves problems at the lowest level which is appropriate to maximize the spirit of cooperation between the Bureau and the regulated community.

Underground Injection Control (UIC) Program

The Underground Injection Control (UIC Program was established by the federal Safe Drinking Water Act. The UIC Program regulates the subsurface discharge of pollutants in order to protect underground sources of drinking water. In Maine, the Department of Environmental Protection (DEP) administers the UIC Program, with support from the U.S. Environmental Protection Agency (EPA). The Maine UIC Program has been in effect since 1983, when the Board of Environmental Protection adopted regulations to control the subsurface discharge of pollutants by well injection.

The UIC regulations identify five types of injection wells. The term "well" is applied loosely and is basically a specialized form of subsurface wastewater disposal. Cesspools, septic systems, wells, pits, ponds, and lagoons are considered injection wells, and are subject to the UIC regulations if used for the discharge of pollutants. Unauthorized injections resulting from unsewered floor drains, abandoned wells, and heat pumps are currently being identified.

5.2.6.2 Bureau of Oil and Hazardous Materials Control

PURPOSE: This Bureau administers the State's oil and hazardous materials control programs, which include the following areas of responsibility:

(1) Emergency response for oil and hazardous materials spills,

(2) Regulation of all underground oil storage facilities,

(3) Licensing and inspection of hazardous waste facilities and transporters,

(4) Licensing and inspection of oil terminals,

(5) Investigation and clean-up of all uncontrolled hazardous substances sites,

(6) Enforcement of all oil and hazardous materials control laws, and

(7) Management of the Maine Coastal and Inland Surface Oil Clean-Up Fund, the Ground Water Oil Clean-Up Fund, the Hazardous Waste Fund and the Uncontrolled Hazardous Waste Site and Underground Oil Tanks Bonds.

In addition, this Bureau provides staff support to the Advisory Commission on Radioactive Waste and the Board of Underground Oil Storage Tank Installers.

ORGANIZATION: In 1980 tthe Bureau was created by combining the Bureau of Water Quality Control's Division of Oil Conveyance Services and the Bureau of Land Quality Control's Hazardous Waste Unit. The Bureau has three divisions, the Division of Response Services, the Division of Licensing and Enforcement and the Division of Remedial Planning and Technical Services.

Division of Licensing and Enforcement

The Division maintains continuous oversight of the State's hazardous waste and waste oil facilities through the licensing, enforcement, and cleanup of sites.

The Division licenses over 100 hazardous waste and waste oil transporters. The Division maintains a close working relationship with its State Police counterpart to ensure compliance with State laws and rules by those who transport hazardous waste and waste oil in Maine.

The Division enforces the laws and rules administered by the Bureau and conducts inspections of hazardous waste, waste oil facilities, and underground oil storage facilities. The Division is responsible for the development and revision of hazardous waste and waste oil programs.

The Division conducts the cleanup of uncontrolled hazardous substance sites. Activities conducted at uncontrolled sites include preliminary assessments, investigations, remedial planning for cleanup, and remedial action. Sometimes circumstances require accelerated remedial measures at uncontrolled hazardous substance sites. This can result in the Division contracting for the removal of wastes from the site and the implementation of emergency measures to protect the public health. The Division acts as the coordinating agency between the USEPA and communities involved in uncontrolled sites. This program is an on-going high priority effort to eliminate or reduce any danger posed by these uncontrolled sites to citizens of the State. To assess the effectiveness of uncontrolled hazardous waste site cleanups and the design and operational features of licensed facilities and closed facilities, the Division conducts a program of groundwater monitoring.

Division of Response Services

This division performs a critical function in Maine's nonpoint source control program. By provision of emergency response to incidents of oil or hazardous material spills allows prompt cleanup to be initiated. In some cases, removal of contaminated soil is necessary to prevent water pollution. This division responds to nearly 1000 reports of spills each year. Integral to the division's ability to respond to potentially life-threatening situations, comprehensive employee training is an ongoing activity. The division also sponsors a limited research program to improve procedures and cleanup techniques.

Division of Remedial Planning and Technical Services

A major function of this division is to provide technical support to groundwater cleanup projects at uncontrolled hazardous waste sites and sites of underground tank leaks. For the State's highest priority sites with leaking underground storage tanks, the division plans and initiates cleanups. The division also reviews license applications for facilities where hazardous waste is stored prior to transport to a treatment or disposal facility. The division provides technical support to the Maine Radioactive Waste Commission and the Board of Underground Oil Storage Tank Installers and also develops regulatory programs for underground oil and hazardous material substance tanks.

Board of Underground Oil Storage Tank Installers

The Board of Underground Tank Installers was established to safeguard the public health, safety and welfare; to protect the public from incompetent and unauthorized persons who might otherwise make faulty installations of underground tanks; and to assure the availability of underground oil storage tank installations of high quality to persons in need of these services. The Board of Underground Oil Storage Tank Installers has established installation and certification procedures. Examinations are held which have resulted in the certification of over 240 tank installers. In addition, the Board conducts informational workshops throughout the state in conjunction with the Department of Environmental Protection.

5.2.6.3 Bureau of Land Quality Control

PURPOSE: The Bureau of Land Quality Control administers five laws designed to protect and improve the quality of Maine's natural environment and resources. The laws include: The Site Location of Development Act; the Natural Resources Protection Act; the Maine Waterway Development and Conservation Act; the Maine Dam Inspection, Registration, and Abandonment Act; and the Mandatory Shoreland Zoning Act (administered jointly with the Land Use Regulation Commission).

ORGANIZATION: The Bureau has three divisions, the Division of Site Location; the Division of Enforcement and Field Services; and the Division of Natural Resources. A five person Secretarial Unit provides clerical services to the entire Bureau.

NONPOINT SOURCE CONTROL PROGRAMS:

Division of Site Location

This division reviews and processes permit applications under the Site Location of Development Act. At the conclusion of the application review process, the Division prepares written findings and presents the findings to the Commissioner or the Board of Environmental Protection for final action. The Division also conducts inspections to insure compliance with Site Location permits.

Limitations to the Site Location or Development Act, which will be addressed in the NPS Management Plan, include:

1.The BLQC estimates it would require twice as much staff and adequate computerization to be able to review development proposals in the reasonable amount of time expected by the public.

2.Only 20% of new development is State reviewed. Municipal review is admittedly often inadequate. Increased State review or anincrease in municipal capacbilities is necessary.

Division of Enforcement & Field Services

This division investigates alleged violations of DEP-administered laws and follows up with enforcement action where appropriate. As the Land Bureau representatives in the field, the enforcement staff also assists with application procedures, explains laws and regulations and serves as a general environmental information resource for the general public.

Division of Natural Resources

This Division reviews and processes permit applications under the Natural Resouroces Protection Act and under the Maine Waterway Development and Conservation Act. The Division also includes the Shoreland Zoning Unit and the Dams Unit.

The Shoreland Zoning Unit is responsible for the oversight and administration of the Mandatory Shoreland Zoning Act and provides assistance to municipalities on shoreland zoning issues.

5.2.6.4 Bureau of Solid Waste Management

PURPOSE: The purpose of the Bureau of Solid Waste Management is to manage disposal of solid waste in an ecologically sound manner which minimizes adverse impact on Maine's environment.

ORGANIZATION: Three divisions compose the Bureau of Solid Waste Management: the Division of Licensing and Enforcement, the Division of Technical Services and the Division of Municipal and Operational Services.

NONPOINT SOURCE CONTROL PROGRAMS:

Licensing and Enforcement

The Bureau licenses landfilling and land spreading of solid waste and enforces conformance with license conditions.

Solid Waste Facility Siting

As mandated by the Legislature in 1987, new landfills must demonstrate that they are necessary to meet the demand for solid waste disposal facilities and that the waste they receive has been reduced through recycling and source reduction programs. Careful consideration will be given to the geology of the proposed area and the engineering of a proposed facility in accordance with LD 836, An Act to Establish a Comprehensive Groundwater Protection Plan.

Remediation and Closure of Existing Landfills

The Bureau plans to begin an immediate assessment of the 160 municipal facilities in Maine which are now contaminating groundwater. This program will evaluate the risk each site poses to the public and the environment, prioritize each landfill, develop a closure plan, and provide funding for closures. Some of the required landfill closures will be conducted by the Division of Technical Services.

Recycling

The Bureau is a cooperator with the State Development Office, regional councils and municipalities in the establishment of recycling and source reduction programs.

Technical Assistance

The Bureau provides technical assistance to municipalities on the disposal of "difficult" wastes such as stumps, tires and whitegoods.

Asbestos Management

The Bureau administers a program for the safe removal, transport and disposal of asbestos fibers.

Sludge Management

The goal of this program is to encourage the utilization of sludges and residual wastes, such as municipal treatment plant sludge, wood ash, fish waste and fish scales, through methods such as landspreading and composting, while safe-guarding the environment and public health. Approximately sixty percent of the wastewater treatment facilities in Maine have established sludge utilization programs with landowners. Approximately ten percent of Maine's wastewater treatment facilities have sludge composting programs.

Sludges which do not meet the criteria for landspreading or composting under the present "Rules for Land Application of Sludge and Residuals, Chapter 567," must be disposed of in accordance with the current Solid Waste Regulations. The majority of sludge which is not landspread or composted, is buried in approved landfills. Any sludge which is classified as hazardous is shapped out of state to approved hazardous substance disposal facilities.

5.2.6.5 Bureau of Air Quality Control

PURPOSE: The Air Quality Control Bureau exists to carry out Maine air pollution law and the Federal Clean Air Act Amendments of 1977.

ORGANIZATION: Three divisions compose the Air Quality Control Bureau: the

Division of Air Quality Services, the Division of Technical Services, and the Division of Licensing and Enforcement.

NONPOINT SOURCE CONTROL PROGRAMS:

Through its licensing, inspection and enforcement programs, the Bureau of Air Quality Control seeks to minimize the discharge of pollutants to Maine's air. These activities also serve to minimize the nonpoint source pollution of Maine's waters through atmospheric deposition from in-state sources. The bureau's participation in the National Acid Precipitation Program with its requirements for inventory of pollution sources is important for control of in-state sources. To evaluate the impact of long-range air pollution transport, the bureau participates in the National Atmospheric Deposition Program. This program monitors atmospheric deposition at three sites in Maine. All sites are monitored for pH and sulfate deposition. One site is also monitored for deposition of trace metals.

5.2.7 Department of Human Services, Division of Health Engineering

PURPOSE: The Division of Health Engineering serves the State's resident and visitor population through a regulatory program which seeks to minimize environmental health hazards related to drinking water, bathing waters, food and radiation.

ORGANIZATION: Two of the division's five units, the drinking water program and the wastewater and plumbing control program, deal specifically with the control of nonpoint source pollution.

NONPOINT SOURCE CONTROL PROGRAMS:

Drinking Water Program

The Drinking Water Program provides surveillance of water quality and renders technical assistance to Maine's public water utilities. In 1976, the Department of Human Services accepted primacy for regulating community and non-community water supplies, as defined in the Federal Safe Drinking Water Act of 1974. Rules were adopted for the first time in 1977, and more frequent sampling of many additional water supplies is now required. The program's focus is primarily on water available to the general public for consumption. A secondary role is the interpretation of water analyses for the private sector.

In the public sector, the Drinking Water Program staff monitors the water quality of approximately 400 community supplies which serve residential users, and approximately 2,500 non-community supplies which serve transient populations throughout the year. The Drinking Water Program is also responsible for overseeing local programs to protect both groundwater and surface water public water supplies from nonpoint pollution sources in their watersheds.

New surface water supplies must include plans for the protection of their watershed and the identification and location of all potential sources of nonpoint source pollution which could impact the quality of the water supply. These include but are not limited to sanitary landfills, dumps, oil storage facilities, chemical storage facilities, septage disposal areas, spray irrigation areas, farming operations which utilize large amounts of pesticides, all enterprises which require hazardous waste permits, major industries, highway commonly used in the transport of hazardous materials, and any appropriate zoning delineations.

Areas within 200 feet of the intake of a surface water supply must be land-use restricted by means of deed, easement, or other legal document. A sanitary survey of the watershed is conducted at reasonable intervals to monitor potential threats to the water supply.

For groundwater sources, the local water utility is charged with the responsibility of determining the appropriate protection zone, based on the well's cone of influence and aquifer recharge area. The utility must then control the land uses within that area. In the case of a bedrock well, the protection zone shall be no less than a three hundred (300) foot radius with the well at the center of the circle.

Initial development of the State's Wellhead Protection Program as authorized by the 1986 Amendments to the Safe Drinking Water Act (SWDA) is currently underway. This effort is designed to further protect wellhead areas supplying public water supply systems from contaminants that may have any adverse effect on human health. The Groundwater Standing Committee, currently has lead agency responsibility for the development phase of the Wellhead Protection Program. The Department of Human Services' Drinking Water Program will assume lead agency status beginning with the implementation phase in fiscal year 1989.

Wastewater and Plumbing Control Program

The Wastewater and Plumbing Control Program dates back to 1933 with the adoption of the first plumbing code for interior plumbing. Septic tanks, cesspools, and direct discharges were first addressed in the Maine Plumbing Code in 1941. Today, under legislation adopted in 1973, the program promulgates rules to establish minimum statewide standards for subsurface wastewater disposal and internal plumbing; assists each town in Maine to administer a municipal plumbing control program providing technical assistance and record-keeping services; and reviews all subsurface wastewater disposal systems designed to treat more than 2,000 gallons of wastewater per day. All municipal plumbing inspectors are examined and certified under program auspices. The program staff also examines and licenses professionals who design subsurface wastewater disposal systems. In cooperation with the Plumber's Examining Board and municipal plumbing inspectors, the staff is responsible for assuring that all plumbing and subsurface wastewater disposal systems in Maine do not create a public health, safety, or environmental hazard.

5.2.8 Maine Department of Transportation

PURPOSE: The Department of Transportation (DOT) was established to plan and develop adequate, safe and efficient transportation facilities and services which will contribute to the economic growth of the State of Maine and the well-being of its people. Maine has 22,000 miles of public roadway, of which the DOT is responsible for about 8,700 miles. The DOT maintains 2,800 out of 4,735 public bridges.

ORGANIZATION: Units of two of the Department's five bureaus deal specifically with the control of nonpoint source pollution. These Bureaus are the Bureau of Project Development and the Bureau of Maintenance and Operations.

5.2.8.1 Bureau of Project Development

PURPOSE: The primary responsibility of the Bureau of Project Development is to develop the Department's capital improvement projects, once funding has been approved, through to construction completion. Certain Divisions within the Bureau; primarily Location and Environment, Technical Services, and Right-of-Way also serve the Department and the public in non-project-related activities according to their particular expertise.

ORGANIZATION: Four of the bureau's six divisions deal specifically with the control of nonpoint source pollution. These are the Divisions of Location and Environment, Design, Construction and Technical Services. Each serves the major goals and responsibilities of the Bureau with some activities directly in support of the other Project Development Divisions. Also, demands are placed upon these divisions for services by other units of the Department, other State agencies and the public.

NONPOINT SOURCE CONTROL PROGRAMS:

Construction Division

This division is responsible for constructing projects as they are developed including appropriate measures to minimize adverse environmental effects. This responsibility includes avoidance of excessive erosion and siltation, damage to adjacent property, and the reestablishment of vegetation in disturbed areas.

Design Division

This division is responsible for the actual design of highway and bridge projects. The Design Office Engineer is responsible for specifications, permits, contracts, and project bid advertisements. The DOT's Standard Specifications and Standard Detail Plan Sheets address routine environmental concerns. Special conditions are added, when necessary, to address special environmental situations. Designers review available documentation of all identified environmental issues and concerns related to the project. The Location and Environment Division advises the Design Division in regard to environmental resources and associated concerns. The Design Division then addresses these issues and obtains necessary Federal and State permits. Projects that require Great Pond, Stream Alteration, or Wetland permits from the Maine Department of Environmental Protection are reviewed for their potential effects on water quality and receive a Water Quality Certification as part of the same permit application process.

Location and Environment Division

This division is responsible for conducting field surveys, location and environmental studies, air quality and noise analyses, well claims, landscape design, and providing information required by other divisions for the project development process. Specifically, the Environmental Services Section is responsible for evaluation of potential environmental impacts, for developing recommendations concerning environmental protection and mitigation measures, as well as for environmental monitoring when appropriate.

The Environmental Services Section collects data and makes recommendations on surface and groundwater quality, site setting, drainage patterns, vegetation damage, development trends, possible sources of water contaminants, aesthetic impacts, condition of salt storage buildings, land use conflicts and erosion and sedimentation. The Well Claims Group supports transportation, investment and maintenance programs by investigating claims of damage to private water supplies. In the past four years, the Department has received 50 claims alleging salt contamination. About half of these claims were found valid and the homeowners were compensated for their loss. The Department continues to monitor ground and surface water at many of the maintenance lots where problems have occurred or are suspected. In addition, the Well Claims Groups is responsible for monitoring surface waters that may be affected by highway construction activities.

The Landscape Architective Group has a shared management role with the Bureau of Maintenance and Operations for the Department's vegetation management program. This involves a targeted chemical spray program which advocates the application of a cost effective and safe dilute spray mix (a maximum of 1/5 gallon of herbicide applied per roadside mile; one of the lowest herbicide application rates in the U.S.) applied selectively to specific roadside plants. Special emphasis is placed on being sure that spray is not directly applied to public waters and that pesticides do not drift into bodies of water.

Additionally, the Landscape Architective Group makes project loaming and seeding recommendations, designs and inspects landscape plantings, conducts agronomic research, provides erosion control training and reviews erosion and sedimentation specifications and plans for the Department.

Technical Services Division

The Technical Services Division is responsible for providing support services to the operating divisions of the Department. The primary services are research and development, geotechnical investigations and design, field and laboratory testing, and technology transfer activities. The Division investigates and evaluates new products and procedures and has the responsibility of introducing innovative techniques to the operations of the Department. The seven different sections of the Division conduct research studies, perform field, physical and chemical laboratory testing of various materials including hazardous materials and waste. They also provide geotechnical services, drainage studies, acceptance control and quality assurance services for practically all products used in constructing projects for the Department. It also conducts problem solving and research studies including studies relating to environmental issues such as the pilot study on "Soil and Water Monitoring of Herbicide Residues", "Evaluation of Both Traffic and Bridge Paints" to provide enhanced environmental features, and the "Determination of Levels of Free Cyanide in Surface and in Ground Waters Affected by DOT Salt Storage Facilities".

5.2.8.2 Bureau of Maintenance and Operations

PURPOSE: The responsibilities of the Bureau of Maintenance and Operations are the summer maintenance of 15,931 lane miles of State and State-aid highways, the winter maintenance of 8,527 lane miles of State highways, the maintenance of 2,800 bridges on State, State-aid and town highways; the coordination of the State-aid highway construction program; the maintenance and installation of traffic control devices and State and State-aid highways; the management of an equipment fleet for the Department of Transportation; the management of the Overlimit Permit Statute; the management of the Department's communication system and the maintenance of safety rest areas.

ORGANIZATION: Three of the bureau's four divisions deal specifically with the control of nonpoint source pollution. These are the Division of Highway Maintenance, the Division of Bridge Maintenance, and the Division of Traffic Engineering.

NONPOINT SOURCE CONTROL PROGRAMS:

The bureau's maintenance forces monitor all State-maintained highways for flooding or erosion problems. Any required corrective action is usually performed as a maintenance activity, but may be included in a subsequent construction project.

Bridge Maintenance Division

This division is responsible for the maintenance and operation of approximately 2,800 bridges. Routine maintenance includes the removal of winter sand, bridge flushing, touch-up painting, steel and concrete repair, and channel maintenance. Measures have been implemented on sensitive painting projects to control atmospheric and aquatic deposition of silica, paint, and solvents. Major bridge repair or replacement efforts involve the implementation and maintenance of appropriate soil erosion and sedimentation controls.

Highway Maintenance Division

This division is responsible for summer maintenance, winter maintenance, and safety rest area programs. Road resurfacing is this division's major summer maintenance activity. Roadside summer maintenance activities such as ditching involve the implementation of appropriate soil erosion and sedimentation control devices and methods. The Department's roadside vegetation management program includes annually applying EPA-approved herbicides to over 11,000 roadside miles. The quality elements of the spray program include: no-spray agreements, public notification, chemical risk assessments, employee health monitoring, buffer zones, identification of environmentally sensitive areas, applicator training and monitoring, and low dose application of herbicides. During the past nine years, spray complaints have declined from a high of 20 complaints per day to two per month.

For winter maintenance, approximately 3600 centerline miles of highways were plowed and sanded by State forces. Approximately 40,000-60,000 tons of pure salt are used by the DOT annually. A portion of this is applied to the highways as pure salt and the rest is used to prepare approximately 400,000 cubic yards of sand-salt mixture (80-120 pounds pure salt per cubic yard sand). In order to limit salt runoff, pure salt is often stored in salt sheds or in sand-salt piles that are being covered as money is made available. The Department has initiated a prioritized program to evaluate the cost, utility, and ease of construction of different types of sand-salt storage buildings at all of the various DOT sites. In addition, the Department is preparing generic specifications for the construction of sand-salt storage buildings by local communities. Funding of these future buildings will be forthcoming from a bond issue passed by the voters in November 1987.

The Highway Maintenance Division and the Motor Transport Service are presently in a joint effort to test and/or replace approximately 550 underground fuel storage tanks to comply with recent regulations governing the underground storage of petroleum products.

Traffic Engineering Division

This division designs, installs, and maintains traffic control devices. As such, this division is responsible for the proper storage, use, and application of paints and solvents.

5.2.9 Maine State Planning Office

PURPOSE: The State Planning Office was established to strengthen the planning and management capability at all levels of government by assisting in identifying current problems and opportunities, providing guidance for economic, social and physical development of the State, providing a framework for and assisting regional and metropolitan planning, and reviewing and coordinating federal, State, regional and local planning activities.

Responsibilities of the State Planning Office include providing assistance to the Governor and the Legislature in identifying long-range goals and policies for the State and coordinating the preparation and revision of towns' comprehensive plans as required by the Growth Management Law.

ORGANIZATION: The State Planning Office was established by statute in 1968 as an agency of the Executive Department. The office's present internal organization was established administratively in 1987 and consists of three divisions: Natural Resources Policy, Economics and Management.

NONPOINT SOURCE CONTROL PROGRAMS

Land and Water Resources Council

The State Planning Office's efforts to control nonpoint source pollution are coordinated by the Land and Water Resources Council. The fundamental task of the Council is to advise the Governor, the Legislature, and State agencies in the formulation of policies to direct the planning for management of Maine's land and water resources to achieve State environmental, economic, and social goals. The current council membership is twelve: the Commissioners of the Departments of Conservation, Environmental Protection, Marine Resources, Inland Fisheries and Wildlife, agriculture, Human Services, and Transportation, the Directors of the State Planning Office, the State Development Office, and the Office of Energy Resources, the Maine Association of Regional Councils, and the Vice-President for President for Research and Public Service of the University of Maine.

State, Federal, Regional and Local agencies and private organizations are invited to interact and cooperate with the council in fulfilling its mission. Representatives from the United States Geological Survey, the Legislative Office of Policy and Legal Analysis, and the Natural Resources Council of Maine participate regularly. The current work program of the Land and Water Resources Council includes the following activities:

Growth Management

Economic growth is necessarily accompanied by land development -residential, commercial, and industrial. There is a growing consensus that the pace of growth has outstripped the capacity of our State and local laws and institutions to effectively manage this development to assure the health, safety and welfare of the public. The cumulative impact of incremental development, including impact on surface water and groundwater, seems to be inadequately addressed by our current State laws. Local resources and existing local ordinances are also inadequate. The problem is most acute in York and Cumberland Counties and along the coast. In total, this rapid growth is impacting the State's valuable natural resources and changing the character of the State. In some cases such changes negatively affect the very quality of life that draws people and businesses to the State.

In 1986, the Council funded a State Planning Office study on the cumulative impact of growth. The study was completed in September 1986, and resulted in a State Growth Management Proposal. This proposal is still being studied by the Executive Department and the Maine Legislature with the goal of developing statutory remedies for the cumulative impacts of growth.

Groundwater

Issues of land use controls for groundwater protection are clearly limited to the larger growth management issue. Because the programs and activities of many Council agencies involve groundwater - either through impacts, such as the activities of the Department of Transportation and the Department of Agriculture Food and Rural Resources, or through regulations such as at the Department of Environmental Protection and the Department of Human Services -it is a natural issue for Council attention. Groundwater has been a focus of the Council's committee and coordination efforts for the past six years and has become a high priority for the people of the State, many of whom rely on groundwater for drinking water supplies.

In 1985, a State Groundwater Coordinator was hired to staff the Council's Groundwater Standing Committee, which is charged with implementing State groundwater policy through the State Groundwater Management Strategy. The Groundwater Standing Committee represents the State Planning Office, the Departments of Environmental Protection, Conservation, Human Services, Agriculture, and Transportation, the University of Maine Environmental Studies Center, and the Maine Association of Regional Councils. The Groundwater Standing Committee tasks include:

(1) Assessing priorities in the groundwater management program,

(2) Assuring the cost-effective allocation of funding and staffing resources within State agencies involved in groundwater management, and

(3) Advising the Governor, the Legislature, and State agencies on sound groundwater protection and management policies and programs.

The Groundwater Standing Committee meets at least quarterly to address proposals and new developments and to provide direction for the groundwater management effort. The day-to-day activities of the Committee are carried out by the State Groundwater Coordinator. The Coordinator assists in the implementation of groundwater programs and ensures program coordination among State agencies. He/she provides a statewide focus for communication and education efforts for a rapidly increasing number of organizations and citizens seeking information and assistance regarding groundwater issues. The Coordinator also tracks Federal groundwater legislation and programs and provides a consistent State voice in Federal decision-making procedures.

Implementation of the Sole Source Aquifer Designation Program which is under the direction of SPO, provides municipalities with the opportunity to assess and designate groundwater areas with a high risk of contamination and high value. Three island communities have been designated to date.

Data Management

Natural resources data management has been a Council concern since its formation. The Executive Orders establishing the Council charge it to "define information needs, standards, and relative priorities for data collection, and investigate the increased use of data processing systems to expedite information storage and retrieval."

Since the original Executive Order was issued, the Council has sponsored several data management studies. Computerization and data gathering have grown at a rapid pace among the natural resources agencies; however, in this age of information, the State's natural resources data management capability remains woefully inadequately.

In the past year the Council's Data Management Committee has contracted for data management studies in the Natural Areas Management and the Groundwater Management programs. These studies will serve as guides for data management programs in other natural resources areas. The Groundwater Data Management Study is a three-phase project. The first phase has identified the State's current capabilities and current and anticipated needs. The second phase has identified feasible data management systems that would address these needs. The third phase will involve system selection, financing, and implementation and is being undertaken by individual state agencies based on Standards accepted by the Grondwater Standing Committee.

5.2.10 University of Maine Cooperative Extension Service

PURPOSE: The primary function of the University of Maine Cooperative Extension Service is to educate, motivate and technically assist landowners in the State on proper management of their property.

ORGANIZATION: The Extension Service's head office is in Orono, with branch offices in every county. A staff member of the Orono office has been appointed statewide water quality specialist to coordinate programs in each county office.

NONPOINT SOURCE CONTROL PROGRAMS:

Educational and Technical Assistance

The Extension Service is the first resource many landowners choose in requesting specific information on land use practices. The direct link the Extension Service has to the research being done at the University allows them the opportunity to provide current information on best management practices for almost any commercial activity in the State. The primary focus has been on education and technical assistance in the agricultural sector in past years. Pesticide selection, crop management systems to minimize nutrient movement, cropping pattern recommendations and rate and timing programs for manure spreading are the normal NPS related activities of Extension.

5.3 REGIONAL AGENCIES

5.3.1 Regional Planning Organizations

PURPOSE: Regional Planning Organizations in Maine have various types of names (e.g. Councils of Governments or Regional Planning Commissions), but are collectively known as Regional Councils. Maine's Regional Councils have been established to:

(1)Provide technical assistance for municipal planning projects including the preparation of draft ordinances,

(2)Provide a forum for local officials to exchange ideas, express views, and work with State and Federal officials to improve intergovernmental responsibilities and set priorities for public investments,

(3)Provide assistance to local officials in understanding and implementing state programs, and

(4)Assist State and local governments in identifying effective services to local governments.

ORGANIZATION: The State of Maine presently has ten Regional Councils. These organizations provide planning assistance to 369 of the 491 municipalities in the State. The full time staff employed by Maine's Regional Councils range from four to 32. The 10 organizations in the State that are designated Regional Councils are:

*Androscoggin Valley Council of Governments

*Eastern Mid-Coast Planning Commission

*Greater Portland Council of Governments

*Hancock County Regional Planning Commission

*North Kennebec Regional Planning Commission

*Northern Maine Regional Planning Commission

*Penobscot Valley Council of Governments

*Southern Kennebec Planning & Development Council

*Southern Maine Regional Planning Commission

*Washington County Regional Planning Commission

NONPOINT SOURCE CONTROL PROGRAMS:

Technical Assistance

The Regional Councils have offered technical assistance through a variety of projects. This was accomplished in one Region through a project that produced 44 maps for member towns that depicted the location of known threats to groundwater and surface water (eg. underground storage tanks, sand-salt piles, land fills, hazardous waste activities etc.)

Another example of technical assistance is the development of "Best Management Practices to Minimize Discharges of Pollutants on Construction Sites" which is presently being done by another Regional Council. This will be a technical reference for contractors and town officials.

Advisory Activities

Regional Councils have recently worked to advise municipalities on planning for control of nonpoint source pollution including draft ordinance preparation. The Regional Councils work closely with their respective Water Quality Advisory Committee which were established in the last few years through a cooperative effort between the Regional Councils and the Maine Department of Environmental Protection.

Two of the State Regional Councils have also created a "Technical Advisory Committee" to bring various local and regional expertise into the water quality improvement process.

Recently a Regional Council produced a handbook ("Protection for Private Wells") to be used as an advisory planning tool for ordinance development purposes. The demand for this booklet appears to be very widespread and many positive comments have been articulated.

Educational Activities

One long-term project that a Regional Council has undertaken has proceeded to an educational phase. The project deals with aquifer protection and involved an extensive data gathering process. In the last few months the Regional Council, in cooperation with the Maine Department of Environmental Protection completed an impressive educational program at schools, town meetings, and workshops.

A management plan for lake watersheds is being developed by another Regional Council. This may be used in other areas of the State as a model and a educational tool for local watershed ordinance development. This same Regional Council has produced a pamphlet ("For Your Lakes Sake") to be distributed to interested groups and individuals.

5.3.2 Resource Conservation and Development Areas

PURPOSE: The Resource Conservation and Development (RC&D) program was authorized through Congress and is administered through USDA. It was created on the assumption that local citizens working together, primarily in rural areas, with consolidated assistance provided by USDA, could develop and carry out an action oriented plan for the economic, social and environmental betterment of their communities. Its purpose is to help rural areas make better use of their own resources.

ORGANIZATION: There are four RC & D areas in Maine. Each maintains a central headquarters staffed by a USDA professional RC & D coordinator. Members of the area council are selected by sponsoring organizations such as Soil and Water Conservation Districts, County Commissioners, and Regional Planning Commissions. Approximately thirty volunteers serve as council members for a one-year term during which monthly meetings take place.

The four RC & D areas in Maine are:

*Threshold to Maine - Authorized in 1970 and covering York, Cumberland and Oxford Counties

*Time and Tide - Authorized in 1974 and covering mid-coast Maine

*St. John & Aroostook - Authorized in 1966 and covering northernmost Maine

*Down East - Authorized in 1976 and covering Hancock and Washington Counties

NONPOINT SOURCE CONTROL PROGRAMS:

The RC&Ds have formed several committees which serve as a liaison between State agencies and local citizens. Those committees specifically dealing with nonpoint sources of pollution are: the Forestry Advisory Committee, made up of private land owners, commercial woodcutters, professional foresters and industrial foresters; the Agricultural Advisory Committee and the Land Use Advisory Committee. Projects of these committees have included the identification of Town Demonstration Projects to promote wise management of town forests and technical assistance to insure the proper closing of dumps in Paris, Buckfield and Greenwood.

A coordinated effort on the part of all four RC&Ds resulted in the development of a book entitled, "Runoff and Erosion Control Guidelines for Highway Crew Leaders." The handbook, illustrating proper runoff and erosion control measures along highways, was distributed statewide.

5.3.3 Soil and Water Conservation Districts

PURPOSE: Maine's 16 Soil and Water Conservation Districts (SWCD'S) were established to provide for the protection, proper use, maintenance and improvement of the soil, water and related resources of the State of Maine. The Districts identify soil and water conservation problems, develop programs to solve them, and enlist and coordinate help from all public and private sources in carrying out programs to solve problems.

ORGANIZATION: Soil and Water Conservation Districts are legal subdivisions of State government, responsible under State law for conservation work within their boundaries just as townships and counties are responsible for roads or school districts are responsible for education. Maine's 16 Soil and Water Conservation Districts cover virtually all of the privately-owned land in Maine, except for portions of Maine's unorganized territory. District boundaries are usually drawn along county lines. One county, Aroostook, has three Districts, while two Districts include two counties. Maine's 16 Soil and Water Conservation Districts are:

* Androscoggin Valley SWCD
* Central Aroostook SWCD
* Cumberland County SWCD
* Franklin County SWCD
* Hancock County SWCD
* Kennebec County SWCD
* Knox-Lincoln County SWCD
* Oxford County SWCD
* Penobscot County SWCD
* Piscataquis County SWCD
* St. John Valley SWCD
* Somerset County SWCD
* Southern Aroostook SWCD
* Waldo County SWCD
* Washington County SWCD
* York County SWCD

Each of Maine's 16 Soil and Water Conservation Districts is managed by five local citizens who know area problems. These five members are the governing body and are called the Board of Supervisors. Three are elected by cooperators within the District and two are appointed by the State Soil and Water Conservation Commission.

NONPOINT SOURCE CONTROL PROGRAMS:

The working arrangements that SWCD's have with Federal and State agencies, institutions, groups, and private landowners provide a mechanism to achieve land and water quality goals. Maine's Soil and Water Conservation Districts share the recent concerns of environmental agencies about reducing water pollutants from agricultural enterprises.

The responsibilities of each SWCD's Board of Supervisors are to plan and direct the program, obtain assistance, coordinate the help of government agencies, assign priorities to resource development tasks, and serve as a community clearinghouse for information and services.

District Supervisors inventory resource needs and problems and, using public and private assistance, analyze agricultural, economic, and other trends. This inventory forms the basis for a long-range plan of action that records the facts about local resources and outlines what must be done to correct problems and develop resources for wider and better use.

To meet these goals, Districts work in two ways: they provide technical assistance to individual landowners in planning and installing scientific land use and treatment systems and they initiate and carry out project type programs as required. Districts also participate actively in group projects and regional resource development programs that benefit citizens in widespread areas. These include watershed projects, economic development projects, river basin development, comprehensive planning and environmental improvement programs.

These programs are important because through demonstration and subtle persuasion they encourage land-users to adopt best management practices (BMP's). The major problems dealt with in almost all of Maine's SWCD programs are sedimentation, erosion, and animal waste management.

Soil and Water Conservation Districts, in addition to their own resources, rely on the personnel and facilities of the USDA Soil Conservation Service. Several other Federal agencies provide services, including resource-oriented agencies of the United States, such as those in the Departments of Agriculture and the Interior.

Districts have entered into written memorandums of understanding with individual landowners and cooperating State and Federal agencies. These documents spell out goals, working relationships, and how each partner will function. Basically, SWCD assistance in conserving or developing soil and water or related resources is based on the following major elements.

Public Information and Education Assistance

Informing and educating the public about resource management through the media, schools, civic forums, and other organizations.

Inventory and Evaluation Assistance Providing basic inventory data, such as soil surveys, hydrologic data, vegetative information, and other technical data and interpretations and evaluations of these data.

Planning Assistance

Providing technical assistance to land users in determining alternative land uses and treatment needs and assisting in development of a conservation plan reflecting the specific land use and treatment decisions.

Application Assistance

Providing technical assistance to cooperating land users to help them install planned conservation practices which include engineering and vegetative measures. Assistance may include site investigations, designs and specifications, construction plans, layout of practices, and supervision of installation.

5.4 LOCAL AGENCIES

5.4.1 Municipal Planning Boards

PURPOSE: A planning board may be created by a town city or plantation through its legislative body (i.e. town meeting or city council). The primary function is to undertake planning tasks which would otherwise be the responsibility of the municipality's principal officers.

ORGANIZATION: Maine's Municipal Planning Boards are established at the option of the municipality. About 400 of Maine's 491 municipalities currently have active planning boards. The boards consist of five to twelve members who are either elected or appointed.

NONPOINT SOURCE CONTROL PROGRAMS

Actions range from review of subdivisions, commercial and industrial construction, erosion control plans and chemical storage, to implementation of zoning, inspection, land acquisition, and other protection programs. As planning boards expand their activities, demands for technical assistance from State, regional and private consultants also grows. The roles of all those involved are evolving and far from clear at present.

Specific laws apply to review and regulation of subdivisions (30 MRSA, Sec. 4956), the development of comprehensive plans (30 MRSA, Sec. 4961) and zoning ordinances (30 MRSA, Sec. 4962). Many planning boards are only now beginning to realize what potential functions they may provide. This realization has led to a wide diversity in planning board attempts to control water pollution across the State. Some planning boards do no more than hope that the State's water protection programs will protect their resources. Many now conduct a much more active and in-depth review of actions potentially dangerous to their

Limitations to be addressed in NPS Management Plan:

1) Limited knowledge of NPS issues/concerns (ie, survey resources)

2) Limited guidance from state DECD efforts improve this)

3) Inadequate or unclear ordinances and comprehensive plans.

5.4.2 Municipal Code Enforcement Officers

PURPOSE: Code enforcement officers are appointed by municipalities to enforce municipal ordinances.

ORGANIZATION: Most towns in Maine employ one person, often on a part-time basis, to perform the duties of Code Enforcement Officer (CEO). In some towns, the CEO is aided by a Licensed Plumbing Inspector and/or Assistant CEO. In Maine's cities, a CEO may supervise the activities of a number of specialists (e.g. Electrical Inspector). Two programs that control nonpoint sources of pollution - septic system permitting and shoreland zoning - are generally administered by local code enforcement officers. Septic system permitting is explained in detail in the Maine Department of Human Services, Division of Health Engineering section.

NONPOINT SOURCE CONTROL PROGRAMS:

Shoreland Zoning

A shoreland zoning program specifying minimum performance standards is mandated by the State and administered by 143 communities. The remainder of Maine's 491 municipalities administer self-designed shoreland zoning ordinances which are as strict or stricter than the State-designed program. The purposes of shoreland zoning are to further the maintenance of safe and healthful conditions; to prevent and control water pollution; protect spawning grounds, aquatic life, bird and other wildlife habitat; control building sites, placement of structures and land uses; and conserve shore cover and visual aesthetics.

Base shoreland zoning provides for construction setback and clearing and filling restrictions within 250 feet of certain bodies of water. Although pre-existing, non-conforming uses are allowed to remain no expansion or replacement is allowed without a permit. Many communities have expanded their shoreland zoning ordinance to address septic systems, surface water runoff, density of development, and other water quality concerns in a comprehensive manner.

Some Maine towns have extended the water protection concept embodied in shoreland zoning to other parts or the whole town. Protection regulations regarding chemical storage, underground tank siting, and other potential sources of contamination may be addressed in this way. Most often, it is the Code Enforcement Officer and/or planning board who oversee these efforts in the community.

Limitations to be addressed in NPS Management Plan

1) Limited or no training in many water quality areas.
2) Insufficient time and/or money to prosecute violations.
3) Inadequate or unclear ordinances.
4) Poor communication between State DEP and local enforcement.

5.4.3 Municipal Conservation Commissions

PURPOSE: A conservation commission is a municipal advisory board which may be created by a town, city or plantation through its legislative body (i.e. town meeting or city council). The commission has certain statutory duties, but it may also undertake a variety of other environmental, recreational and land use planning functions. Some have called conservation commissions "the environmental conscience of the community".

ORGANIZATION: Maine's Municipal Conservation Commissions are established at the option of the municipality. About 130 of Maine's 491 municipalities currently have active conservation commissions. The commissions consist of three to seven members appointed by the municipal officers.

NONPOINT SOURCE CONTROL PROGRAMS:

Surface Water Protection

A Conservation Commission member's involvement in nonpoint source control may be as simple as calling the Municipal Code Enforcement Officer's attention to what he or she believes is unacceptable erosion on a construction site. One Conservation Commission in Maine recently conducted a water quality monitoring project to identify sources of soil erosion which were muddying an otherwise scenic river.

Groundwater Protection

The Maine Association of Conservation Commissions (MACC) believes that groundwater protection is one of the most pressing environmental and public health concerns facing the state. Discoveries of polluted groundwater supplies are growing at an alarming rate, as is the realization that a wide diversity of pollutants are involved. Heightened concern has led to a growing awareness that Maine and much of the nation lacks the data to determine what groundwater is polluted or at risk of becoming polluted. This lack of information frustrates preventative action.

MACC has addressed this information gap and assisted the State in confronting groundwater contamination in a comprehensive and directed manner. A program has been implemented to increase public awareness on groundwater protection through education and provision of technical assistance to selected municipalities to support municipal inventories of existing and potential threats to groundwater supplies. The inventories focus primarily on the identification of abandoned underground fuel tanks and potential sources of hazardous waste contamination.

The project represents the third phase of MACC's groundwater protection effort. The first phase was the publication of several educational booklets and articles and a series of seminars conducted in the early 1980's.
The second phase, financed by the Fund for New England, was the preparation of a handbook entitled "Groundwater Quality: A Handbook for Community Action". This publication outlines a process by which a community can conduct an inventory of sites to identify those that may contain substances that threaten groundwater quality. In the third phase, MACC used its handbook to encourage and guide detection and prevention activities at the local level.

5.5 NEW INITIATIVES

5.5.1 Program Coordination

The Maine Department of Environmental Protection (DEP) has established a Nonpoint-Source Pollution Control Section within the Bureau of Water Quality Control. A full time NPS Coordinator is responsible for program activities. The Maine DEP has entered into a two (2) year Interagency Personnel Agreement (IPA) with the USDA Soil Conservation Service (SCS) to provide a full-time GS-12 position to assist with program development and liaison with USDA agencies and programs. In addition, two Environmental Specialist (ES III) positions are assigned NPS related tasks equivalent to one and one-half (1.5) positions. The Nonpoint-Source Advisory Committee will continue to provide input and guidance during program implementation (See Appendix ? for list of Committee members). The Committee will be involved in BMP development and review, NPS-related public meetings /hearings, interagency letters of agreement, as well as overall program coordination.

5.5.2 Information and Education

There is a tremendous need for new initiatives in information and education for NPS control. Nonpoint-Source controls are everyone's responsibility. Landusers, the general public, and government agencies all need to increase their awareness of NPS problems and controls in order for Maine's NPS program to be a success. Information sharing, technology transfer and direct technical assistance will be all important tools for helping solve the state's NPS problems. Public education for prevention of nonpoint source pollution will be an important part of Maine's NPS Management Plan.

5.5.3 Enforcement

Enforcement programs will play a role in management of NPS pollution in Maine. Although Maine has made substantial progress in this area in the, new initiatives will be required to fully address issues identified in this Assessment Report. In addition to local ordinance and enforcement support, Maine's NPS Management Plan will outline a schedule for review of MSRA 38, which contains state environmental regulations, and the development of state soil erosion and sedimentation control and stormwater management programs.

5.5.4 Incentives

Use of programs which provide incentives for landusers who implement BMP's, without the land user realizing any direct benefit for themselves, will be dependent on the availability of appropriate funding. Traditional sources of funding, such as that provided by the USDA Agricultural and Stabilization Service to farmers and state tax incentives for forestry, will be utilized to the greatest extent possible. Possible state roles will be further reviewed as the NPS program is developed.

5.5.6 Program Evaluation

The evaluation of Maine's NPS program will be based largely on the state's ability to meet the implementation schedule set forth in the NPS Management Plan, and on the ability to document water quality improvement in NPS-impaired waters over time. Lay and professional monitoring will be critical to documenting the effectiveness of individual BMP's and the program as a whole. Follow-up public surveys and meetings, as well as input from professional field personnel will be utilized throughout program implementation and evaluation. The Management Plan details the state schedule for evaluating the NPS program.

SECTION 6

PROCESS FOR IDENTIFICATION OF BEST MANAGEMENT PRACTICES AND ASSOCIATED PERFORMANCE STANDARDS FOR CONTROL OF NONPOINT SOURCE POLLUTION

GOALS

The identification of Best Management Practices (BMPs) and associated performance standards has two principal goals:

(1) To specify minimum standards of performance for activities which generate nonpoint source water pollution. These minimum standards are oriented towards general protection and improvement of the State's waters. These minimum standards will have statewide applicability except in especially sensitive or vulnerable watersheds or areas where application of the minimum standards would result in a violation of Maine's Water Classification Program.

(2) To specify supplemental standards of performance to be applied in especially sensitive or vulnerable watersheds or areas where application of the minimum standards would result in a violation of Maine's Water Classification Program.

PROCEDURES

The procedures for identification of BMPs are to incorporate them into Maine's Nonpoint Source Pollution Assessment and Management Program in accordance with the requirements of Section 319 of the Clean Water Act and such additional requirements which are in the best interests of the people of Maine. These requirements include the following:

(1) BMPs shall be identified after consultation, where appropriate, with State agencies, municipalities, Councils of Government, Soil and Water Conservation Districts, interested groups representing commercial activi-

ties, citizen groups, individuals, and Federal and Interstate water pollution control agencies.

(2) Public notice of the availability of copies of any proposed BMPs shall be published by the Department of Environmental Protection, Bureau of Water Quality Control at least 30 days prior to a public hearing on the proposal.

(3) The Department of Environmental Protection, Bureau of Water Quality Control, shall hold a public hearing or hearings to obtain comments on any proposed BMPs from all interested parties.

(4) Approval by the the U.S. Environmental Protection Agency of any proposed BMPs.

Once the BMPs contained in the Maine Nonpoint Source Pollution Assessment and Management Program are approved by the U.S. Environmental Protection Agency, subsequent proposals to change BMPs shall also be subject to the aforementioned requirements and shall be treated as addenda to the Maine Nonpoint Source Assessment and Management Program.

The State of Maine has opted to establish two levels of requirements for control of NPS pollution - the BMPs and their associated Performance Standards. The BMPs included in Maine's NPS Pollution Management Program are intended to be generalized rather than site-specific; providing information on the goals and technical basis of NPS control. The BMPs are expected to change little over time, so only those practices which have been proven to be clearly necessary for water quality protection are identified as BMPs. To fully implement the goals of Maine's NPS Pollution Management Program, it is necessary to complement the BMPs with a series of publications which specify performance standards for NPS pollution control for all major types of activities generating NPS water pollution. These performance standards can be expected to change over time as more is learned about the efficacy of practices for NPS control, as technology for NPS control advances, and as the list of especially sensitive or vulnerable watersheds or areas changes.

Maine's BMPs will be published in 1990 for the use of state agencies, municipal governments, and others. The BMPs will constitute one section of a handbook which also describes pre-permitting and post-permitting evaluation of potential pollution sources.

LIST OF REFERENCES

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Maine Wetlands Conservation Priority Plan.

State of Maine 1988 Water Quality Assessment 304(b) report for Clean Water Act, Maine DEP.

State Nonpoint Source Agricultural Pollution (SNAP) Report. USDA, Soil Conservation Service, Orono, Maine 1987.

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APPENDICES

APPENDIX A. MAINE'S WATER CLASSIFICATION PROGRAM

Maine's water quality classification program is the primary criterion for determining whether current water quality conditions are acceptable or whether additional nonpoint source pollution control measures are needed on a particular water body. Each classification establishes uses for which a water body must be suitable. For surface waters, the classifications also provide numerical or narrative standards for dissolved oxygen, bacteria and aquatic life. Nonattainment of these standards is the most conclusive evidence that water quality classification is being violated.

The water quality classification program also contains a general provision that prohibits "Discharge of pollutants to waters of the State which imparts color, taste, turbidity, toxicity, radioactivity or other properties which cause those waters to be unsuitable for their designated uses." Determining whether a water body is unsuitable for its designated uses is a subjective task since different people will have different opinions on what constitutes suitability. Examples of what may constitute unsuitability for designated uses include the following:

(1) Reduced water transparency due to excessive growth of algae.

(2) Soil erosion from a logging operation which causes a brook to be muddy may impact a downstream residence which uses the brook for a drinking water supply,

(3) Soil erosion from large-scale development which causes a river to be muddy in the spring may transform previous opportunities for white-water canoeing into brown-water canoeing to the dismay of some potential boaters, and

(4) Agricultural activities may generate nonpoint source pollution which some people consider to be impairing the habitat in a favorite trout stream.

Due to the sensitivity of benthic macroinvertabrates to habitat changes causes by NPS pollutants such as suspended solids, nutrients and pesticides, Maine's water quality standards for aquatic life are probably more sensitive to nonpoint source pollution than the standards for dissolved oxygen or bacteria. However, evaluation of the effects of nonpoint source pollution on aquatic life is just starting in Maine and little information on the biological water quality standards is available for this report.

Unlike most other states which have bacteria standards based on fecal coliform levels, Maine has bacteria standards based on E. coli or enterocci of human origin. The discharge of fecal coliform bacteria from the manure of domestic animals seems to be the most widespread and easily documented form of nonpoint source pollution. While such a discharge would violate water quality standards in most states, it would not violate Maine's health effects-based bacteria standards. Problems with bacteria levels in Maine's surface waters are largely due to licensed point source discharges: municipal treatment plants, combined sewer overflows and residential/commercial overboard discharge systems. Unlicensed straight-pipe discharges are another type of point source discharge which causes bacteria problems. Malfunctioning septic systems are a significant nonpoint source of bacteria, especially in coastal areas, but it is virtually impossible to determine the extent to which malfunctioning septic systems contribute to closure of shellfish harvesting areas.

The Maine Department of Environmental Protection has conducted two special studies on the Saco River which is intensively utilized for canoeing and overnight camping in areas without toilet facilities. Analysis of the data indicated that there is no observable difference in bacteria levels in the upper Saco River and bacteria levels which would be expected to occur naturally.

Some small brooks and streams have low dissolved oxygen levels which violate water quality standards due to nonpoint source pollution. Analysis of existing data, however, indicates that no major rivers in Maine have dissolved oxygen levels which do not attain their classification due to nonpoint source pollution. Often, marshes and bogs cause low dissolved oxygen levels in brooks and streams but these natural conditions do not constitute a violation of dissolved oxygen standards. Where marshes and farms occupy the same watershed, great care must be taken in assessing the cause of low dissolved oxygen levels.

Maine's GW-A groundwater classification requires groundwater to be of such quality that it can be used for public water supplies. The numerical standards used to assess potability are those of the Federal Safe Drinking Water Act. Although Class GW-B does not require that groundwater be suitable for drinking water supply, no groundwater in Maine has been classified as GW-B. Thus, any groundwater in Maine which is not suitable for public water supply due to pollution from human activities is not attaining its classification.

The classifications, designated uses, water quality standards and some associated requirements of Maine's Water Classification Program are as follows:

38 MRSA, Section 465. Standards for classification of fresh surface waters

The board shall have four standards for the classification of fresh surface waters which are not classified as great ponds:

1. <u>Class AA waters.</u> Class AA shall be the highest classification and shall be applied to waters which are outstanding natural resources and which should be preserved because of their ecological, social, scenic or recreational importance.

A. Class AA waters shall be of such quality that they are suitable for the designated uses of drinking water after disinfection, fishing, recreation in and on the water and navigation and as habitat for fish and other aquatic life. The habitat shall be characterized as free flowing and natural.

B. The aquatic life, dissolved oxygen and bacteria content of Class AA waters shall be as naturally occurs.

C. There shall be no direct discharge of pollutants to Class AA waters.

2. <u>Class A waters.</u> Class A shall be the 2nd highest classification.

A. Class A waters shall be of such quality that they are suitable for the designated uses of drinking water after disinfection; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as natural.

B. The dissolved oxygen content of Class A waters shall be not less than 7 parts per million or 75% of saturation, whichever is higher. The aquatic life and bacteria content of Class A waters shall be as naturally occurs.

C. Direct discharges to these waters licensed after January 1, 1986, shall be permitted only if, in addition to satisfying all the requirements of this article, the discharged effluent will be equal to or better than the existing water quality of the receiving waters. Prior to issuing a discharge license, the board shall require the applicant to objectively demonstrate to the board's satisfaction that the discharge is necessary and that there are no other reasonable alternatives available. Discharges into waters of this classification which were licensed prior to January 1, 1986, shall be allowed to continue only until practical alternatives exist. There shall be no deposits of any material on the banks of these waters in any manner so that transfer of pollutants into the waters is likely.

3. Class B waters. Class B shall be the 3rd highest classification.

A. Class B waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as unimpaired.

B. The dissolved oxygen content of Class B waters shall be not less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration shall not be less than 9.5 parts per million and the 1-day minimum dissolved oxygen concentration shall not be less than 8.0 parts per million in identified fish spawning areas. Between May 15th and September 30th, the number of Escherichia coli bacteria of human origin in these waters may not exceed a geometric mean of 64 per 100 milliliters or an instantaneous level of 427 per 100 milliliters.

C. Discharges to Class B waters shall not cause adverse impact to aquatic life in that the receiving waters shall be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community.

4. Class C waters. Class C shall be the 4th highest classification.

A. Class C waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as a habitat for fish and other aquatic life.

B. The dissolved oxygen content of Class C water shall be not less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg incubation and survival of early life stages, that water quality sufficient for these purposes shall be maintained. Between May 15th and September 30th, the number of Escherichia coli bacteria of human origin in these waters may not exceed a geometric mean of 142 per 100 milliliters or an instantaneous level of 949 per 100 milliliters. The department shall promulgate rules governing the procedure for designation of spawning areas. Those rules shall include provision for periodic review of designated spawning areas and consultation with affected persons prior to designation of a stretch of water as a spawning area.

C. Discharges to Class C waters may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

38 MRSA, Section 465-A. Standards for classification of lakes and ponds.

The board shall have one standard for the classification of great ponds and natural lakes and ponds less than 10 acres in size. Impoundments of rivers that are defined as great ponds pursuant to section 392 shall be classified as GPA or as specifically provided in section 467 and 468.

1. <u>Class GPA waters.</u> Class GPA shall be the sole classification of great ponds and natural ponds and lakes less than 10 acres in size.

A. Class GPA waters shall be of such quality that they are suitable for the designated uses of drinking water after disinfection, recreation in and on the water, fishing, industrial process and cooling water supply, hydroelectric power generation and navigation and as habitat for fish and other aquatic life. The habitat shall be characterized as natural.

B. Class GPA waters shall be described by their trophic state based on measures of the chlorophyll "a" content, Secchi disk transparency, total phosphorus content and other appropriate criteria. Class GPA waters shall have a stable or decreasing trophic state, subject only to natural fluctuations and shall be free of culturally induced algal blooms which impair their use and enjoyment. The number of Escherichia coli bacteria of human origin in these waters may not exceed a geometric mean of 29 per 100 milliliters or an instantaneous level of 194 per 100 milliliters.

C. There shall be no new direct discharge of pollutants into Class GPA waters. Aquatic pesticide treatments or chemical treatments for the purpose of restoring water quality approved by the board shall be exempt from the no-discharge provision. Discharges into these waters which were licensed prior to January 1, 1986, shall be allowed to continue only until practical alternatives exist. No materials may be placed on or removed from the shores or banks of a Class GPA water body in such a manner that materials may fall or be washed into the water or that contaminated drainage therefrom may flow or leach into those waters, except as permitted pursuant to section 391. No change of land use in the watershed of a Class GPA water body may, by itself or in combination with other activities, cause water quality degradation which would impair the characteristics and designated uses of downstream GPA waters or cause an increase in the trophic state of those GPA waters.

38 MRSA Section 465-B. Standards for classification of estuarine and marine waters.

The board shall have three standards for the classification of estuarine and marine waters.

1. <u>Class SA waters.</u> Class SA shall be the highest classification and shall be applied to waters which are outstanding natural resources and which should be preserved because of their ecological, social, scenic, economic or recreational importance.

A. Class SA waters shall be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish and navigation and as habitat for fish and other estuarine and marine life. The habitat shall be characterized as free-flowing and natural.

B. The estuarine and marine life, dissolved oxygen and bacteria content of Class SA waters shall be as naturally occurs.

C. There shall be no direct discharge of pollutants to Class SA waters.

2. <u>Class SB waters.</u> Class SB waters shall be the 2nd highest classification.

A. Class SB waters shall be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation and navigation and as a habitat for fish and other estuarine and marine life. The habitat shall be characterized as unimpaired.

B. The dissolved oxygen content of Class SB waters shall be not less than 85% of saturation. Between May 15th and September 30th, the numbers of enterococcus bacteria of human origin in these waters may not exceed a geometric mean of 8 per 100 milliliters or an instantaneous level of 54 per 100 milliliters. The numbers of total coliform bacteria or other specified indicator organisms in samples representative of the waters in shellfish harvesting areas may not exceed the criteria recommended under the National Shellfish Sanitation Program Manual of Operations, Part I, Sanitation of Shellfish Growing Areas, United States Department of Food and Drug Administration.

C. Discharges to Class SB waters shall not cause adverse impact to estuarine and marine life in that the receiving waters shall be of sufficient quality to support all estuarine and marine species indigenous to the receiving water without detrimental changes in the resident biological community. There shall be no new discharge to Class SB waters which would cause closure of open shellfish areas by the Department of Marine Resources.

3. Class SC waters. Class SC waters shall be the 3rd highest classification.

A. Class SC waters shall be of such quality that they are suitable for recreation in and on the water, fishing, aquaculture, propagation and restricted harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation and navigation and as a habitat for fish and other estuarine and marine life.

B. The dissolved oxygen content of Class SC waters shall be not less than 70% of saturation. Between May 15th and September 30th, the numbers of enterococcus bacteria of human origin in these waters may not exceed a geometric mean of 14 per 100 milliliters or an instantaneous level of 94 per 100 milliliters. The numbers of total coliform bacteria or other specified indicator organisms in samples representative of the waters in restricted shellfish harvesting areas may not exceed the criteria recommended under the National Shellfish Sanitation Program Manual of Operations, Part I, Sanitation of Shellfish Growing Areas, United States Food and Drug Administration.

C. Discharges to Class SC waters may cause some changes to estuarine and marine life provided that the receiving waters are of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

38 MRSA, Section 465-C. Standards of classification of ground water.
The board shall have two standards for the classification of ground water:

1. Class GW-A. Class GW-A shall be the highest classification and shall be of such quality that it can be used for public water supplies. These waters shall be free of radioactive matter or any matter that imparts color, turbidity, taste or odor which would impair usage of these waters, other than that occurring from natural phenomena.

2. Class GW-B. Class GW-B, the 2nd highest classification, shall be suitable for all usages other than public water supplies.

APPENDIX B. METHODOLOGY USED FOR THE ESTIMATION OF THE EXTENT OF GROUNDWATER IN MAINE NOT ATTAINING WATER QUALITY STANDARDS.

Maine's GW-A groundwater classification includes a standard which requires groundwater to be of such quality that it can be used for public water supplies. The numerical standards used to assess potability are those of the Federal Safe Drinking Water Act. Although Class GW-B does not require that groundwater be suitable for drinking water supply, no groundwater in Maine has been classified as GW-B. Thus, any groundwater in Maine which is not suitable for public water supply due to pollution from human activities is not attaining its classification.

During the two years since Maine's 1986 Water Quality Assessment was made, some limited advances have been made in understanding the nature of groundwater contamination in Maine. Most notable are (1) the registrations of underground storage tanks and sand-salt storage sites which are now available, (2) investigations of contamination plumes from those sources and (3) continuing studies on the impact of agriculture on groundwater quality.

It cannot be overly emphasized that this 1988 assessment, although an improvement over that done in 1986, is an inexact estimation of the extent of groundwater contamination in Maine. The purpose of this appendix is to describe some of the difficulties inherent in such an assessment and to document the assumptions which made for the assessment. The major difficulty in assessing groundwater quality is inaccessability. By comparison, a person monitoring surface waters needs only to drive to a bridge or use a boat to get to the desired sampling site. Once there, samples can be collected with ease from any point in the water column. Conversely, knowledge of groundwater quality is derived largely from existing private wells. When dealing with contaminated domestic wells, there are two major problems inherent in estimating the extent of groundwater contamination: (1) there are usually too few existing wells and (2) those wells available for monitoring are not usually positioned at the optimum locations and depths to accurately define the spatial boundaries of contaminant plumes. Compounding the difficulty of assessment is the present difficulty of retrieving existing data on domestic water supplies. Groundwater monitoring wells in Maine installed specifically for assessment purposes number less than 1200 with the majority of these clustered around known contamination sites.

One major assumption used in this assessment is that the unpotable area around a pollution source is defined as that area where if monitoring wells were installed, a majority of those sampled at some depth in each portion of the area would yield unpotable water. This assumption was necessary to account for perched contaminant plumes as well as the channelized, erratic nature of contaminant plumes in bedrock aquifers.

Another major assumption is that average plume sizes for a particular pollution source can be developed to assess the statewide extent of groundwater pollution, including sites where pollution is present but has not yet been detected. Groundwater pollution is a highly site-specific phenomenon. Surficial geology, bedrock geology, hydrogeologic conditions, type of pollutants, concentration of pollutants and duration of pollutant discharge are the principal factors affecting the extent of contaminant plumes. Even at those few hazardous substance sites in Maine where intensive studies have been done, the influence of these factors on plume extent are not well understood.

While acknowledging the limitations inherent in this assessments, the potential benefits it can provide (for long-range planning and identifying regional differences) justify it. Subsequent assessments will be based on increased understanding of the nature of groundwater pollution as well as an improved data base. Assumptions made for the extent of contamination associated with each type of pollution source are as follows:

Agricultural Areas - A recent study (Neil et al, 1987) found that 27% of domestic wells adjacent to and downgradient of fields used for row crops contained nitrate levels above drinking water standards (10 ppm). This study was based on sampling 70 wells, most of them in Aroostook County and should be regarded as a preliminary assessment of groundwater pollution associated with agriculture. The major limitation of this study is that it attempted no analysis of the extent of contamination plumes associated with particular fields. Without substantial expenditures devoted to a program of monitoring and assessment it is unlikely that the accuracy of this preliminary assessment can be improved. Although it seems likely that this assessment of agricultural areas is subject to more error than are the assessments for pollution due to other nonpoint sources, a statistic of 27% of the State's area devoted to cultivation of row crops has been used as an estimate of groundwater nonattainment due to agriculture. This does not account for regional differences in geology and agricultural practices or for the added dilution area which would be required for attenuation of nitrate levels above 10 ppm.

Landfills - Unpotable groundwater is assumed to underlie an area twice that which is filled with solid waste.

Leaking Underground Storage Tanks - The estimated total number of leaking underground storage tanks is based on both the number of tanks and tank sites registered. This statistic was adjusted by county to account for the following assumptions:

(1)Only 75% of all tanks are registered with all the unregistered tanks being 1-tank rather than multiple-tank sites.

(2)Of the tank sites registered since 1986, 10% have been discontinued or had their tanks replaced with ones of improved design.

(3)The USEPA estimate of a 30% failure rate for older types of tanks is applicable to tank sites in Maine.

(4)Plume size - DEP staff estimates the size of plumes associated with known leaks from underground storage tanks to range from 1.4 to 11.5 acres with most of the plumes tending to be in the low end of the range. Splitting the range 2/3 towards the low end yields an average plume size of 5 acres.

Sand-Salt Piles - An assessment of the extent of groundwater contamination at 41 uncovered sand-salt storage areas (Locke, 1988) used terrain conductivity, well water samples, etc. to estimate the extent of contamination plumes. The average plume size of 10 acres was used to estimate the extent of unpotable groundwater at the 659 sites not assessed. The assessment of contamination due to sand-salt piles may be the most accurate of any nonpoint sources estimated in this report but is still uncertain in its statistical validity.

Septic Systems - The number of unsewered year-round households in each county was estimated by dividing the unsewered population by Maine's average rural household size (2.53). This statistic was used for the estimated number of septic systems. Corrections were not made for population increases since 1984, septic systems in seasonal dwellings, commercial septic systems, homes without plumbing and homes discharging to surface waters. The average zone where groundwater was unpotable (primarily due to nitrate levels prior to dilution) was estimated at 0.25 acre per septic system. This is equal to a nonattainment zone extending 36 feet beyond the edges of a typical 20 x 45 foot leach field. Typical leach fields in Maine, however, are usually built into sloped ground where the area of unpotable groundwater beneath them would extend further from the edge of the field on the downslope side than on the upslope side.

Hazardous Substances - Where site-specific estimates derived from intensive studies could not be obtained, an estimated nonattainment zone of 10 acres per suspected site was used.

Roadsides - Groundwater contamination (even if chloride levels above 250 mg/l occur only seasonally) due to road salting seems to be linked to poor roadside drainage. An estimated nonattainment zone 50 feet in width has been applied to 20% of the centerline miles of State and Locally maintained year-round roads.

Wastewater Lagoons - Unpotable groundwater is assumed to underline an area twice that of the lagoon's surface area.

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Neil, C.D., Williams, J.S. & Weddle, T.K. (1987) Second Annual Report - Pesticides in Ground Water Study. Maine Geological Survey Open File Report 87-20.

Appendix III. Areas in Maine Overlying Groundwater Not Attaining Water Quality Standards Due to Nonpoint Source Pollution.

ABBREVIATIONS USED: AC=Acres; CY=Cubic Yards; EST=Estimated; HZSS=Hazardous Substance Site; I=Island; LAT=Latitude; LONG=Longitude; LUST=Leaking Underground Storage Tanks; MW=Monitoring Well; POLD=Polluted; POLN=Pollution; PW=Private Well; PWS=Public Water Supply; SWLF=Solid Waste Land Fill; THND=Threatened; UPSP=Uncovered Pure Salt Pile; USSP=Uncovered Sand-Salt Pile & WWTL=Waste Water Treatment Lagoon.

COUNTY	TOWN	TYPE	ID #	YEAR POLN BEGAN	YEAR POLN STOP	LAT	LONG	REMARKS
Androscoggin	Auburn	USSP	1	1955	--			2500 CY
Androscoggin	Auburn	USSP	2	1972	--			300 CY
Androscoggin	Auburn	HZSS	1	--	--			Manufacturing; phenol
Androscoggin	Auburn	SWLF	1	--	--	440727	0701418	Filled area is 5-10 AC
Androscoggin	Danville	USSP	3	1961	--			1200 CY
Androscoggin	Durham	USSP	4	1978	--			?
Androscoggin	Durham	SWLF	2	--	--	435748	0700653	Filled area is 1-5 AC
Androscoggin	Greene	USSP	5	1970	--			?
Androscoggin	Greene	USSP	6	1962	--			1600 CY
Androscoggin	Greene	LUST	1	--	--			A-55-85; 1 PW POLD
Androscoggin	Greene	SWLF	3	--	--	441248	0700832	Filled area is 5-10 AC
Androscoggin	Leeds	USSP	7	1948	--			3500 CY
Androscoggin	Leeds	SWLF	4	--	--	441926	0700744	Filled area is 1-5 AC
Androscoggin	Lewiston	USSP	8	1945	--			20000 CY
Androscoggin	Lewiston	SWLF	5	--	--	440248	0701058	Filled area is >10 AC
Androscoggin	Lisbon	USSP	9	1968	--			8000 CY
Androscoggin	Lisbon	LUST	2	--	--			P-514-86; 1 PW POLD
Androscoggin	Lisbon	HZSS	2	--	--			Manufacturing; solvents & oil
Androscoggin	Lisbon	SWLF	6	--	--	440114	0700749	Filled area is >10 AC
Androscoggin	Lisbon	SWLF	7	--	--	440023	0700213	Filled area is 2 AC
Androscoggin	Livermore	USSP	10	1955	--			2400
Androscoggin	Livermore	SWLF	8	--	--	442219	0701515	Filled area is 1-5 AC
Androscoggin	Livermore Falls	USSP	11	1950	--			2500
Androscoggin	Livermore Falls	LUST	3	--	--			A-137-85; 1 PW POLD
Androscoggin	Livermore Falls	SWLF	9	--	--	442547	0700934	Filled area is 1-5 AC
Androscoggin	Mechanic Falls	USSP	12	1973	--			2000 CY; Near Androscoggin R.
Androscoggin	Mechanic Falls	SWLF	10	--	--	440552	0702209	Filled area is 2 AC
Androscoggin	Minot	USSP	13	1982	1985			3000 CY
Androscoggin	Minot	USSP	14	1985	--			3000 CY
Androscoggin	Poland	USSP	15	1968	--			3000 CY; 1 PW POLD, 1 THND
Androscoggin	Poland	USSP	16	<1960	--			5000 CY
Androscoggin	Poland	SWLF	11	--	--	440404	0702443	Filled area is <1 AC
Androscoggin	Sabattus	USSP	17	?	--			3000 CY; PWS THND
Androscoggin	Sabattus	USSP	18	1965	--			300 CY
Androscoggin	Sabattus	SWLF	12	--	--	440248	0700509	Filled area is 1-5 AC
Androscoggin	Turner	USSP	19	1956	--			2800 CY; 5 PW POLD, 2 THND
Androscoggin	Turner	USSP	20	1975	--			4300 CY
Androscoggin	Turner	HZSS	3	--	--			Manufacturing; solvents & phenols
Androscoggin	Turner	SWLF	13	--	--	441531	0701629	Filled area is 1-5 AC
Androscoggin	Turner	SWLF	14	--	--	441400	0701551	Filled area is 2 AC
Androscoggin	Wales	USSP	21	1972	--			2500 CY
Aroostook	Allagash	USSP	22	1980	--			1500 CY
Aroostook	Allagash	SWLF	15	--	--	470433	0690409	Filled area is <1 AC
Aroostook	Amity	USSP	23	1965	--			3000 CY
Aroostook	Amity	USSP	24	1960	--			600 CY
Aroostook	Amity	SWLF	16	--	--	455707	0674926	Filled area is <1 AC
Aroostook	Ashland	USSP	25	1978	--			2000 CY
Aroostook	Ashland	USSP	26	1967	--			9000 CY
Aroostook	Ashland	USSP	27	1978	--			450 CY
Aroostook	Ashland	LUST	4	--	--			I-5-85; 1 PW POLD
Aroostook	Ashland	LUST	5	--	--			I-68-86; 1 PW POLD
Aroostook	Ashland	WWTL	1	1965	--			3 WWTL's; 9.5 AC
Aroostook	Ashland	SWLF	17	--	--			Filled area is 1-5 AC
Aroostook	Benedicta	USSP	28	1974	--			750 CY
Aroostook	Benedicta	USSP	29	?	--			?
Aroostook	Blaine	USSP	30	1950	--			1500 CY
Aroostook	Blaine	LUST	6	--	--			B-3-83; 1 PW POLD
Aroostook	Blaine	LUST	7	--	--			I-137-86; 1 PW POLD, 3 PW THND
Aroostook	Bridgewater	USSP	31	1955	--			1500 CY

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Aroostook	Bridgewater	SWLF	18	--	--	462743	0675035	Filled area is 5-10 AC
Aroostook	Caribou	USSP	32	1967	--			9000 CY
Aroostook	Caribou	USSP	33	1930	--			4500 CY
Aroostook	Caribou	LUST	8	--	--			B-130-82; 2 PW POLD
Aroostook	Caribou	WWTL	2	1983	--			3 WWTL's; 13.0 AC
Aroostook	Caribou	SWLF	19	--	1980	465449	0680246	Filled area is 5 AC
Aroostook	Caribou	SWLF	20	--	--	465431	0680246	Filled area is 2 AC
Aroostook	Cary Plt	USSP	34	1979	--			600 CY
Aroostook	Cary Plt	LUST	9	--	--			B-486-86; 1 PW POLD
Aroostook	Caswell	USSP	35	1983	--			30 CY
Aroostook	Connor Twp.	SWLF	21	--	--	465814	0675853	Filled area is <1 AC
Aroostook	Crystal	USSP	36	1964	--			5000 CY
Aroostook	Crystal	USSP	37	?	--			2500 CY
Aroostook	Crystal	USSP	38	?	--			200 CY
Aroostook	Dyer Brook	USSP	39	1965	--			200 CY
Aroostook	E. Plantation	USSP	40	1982	--			375 CY
Aroostook	Eagle Lake	USSP	41	1978	--			1550 CY; Site has 2 USSP
Aroostook	Eagle Lake	WWTL	3	--	--			4 WWTL's; 9.41 AC
Aroostook	Eagle Lake	SWLF	22	--	--	470226	0683652	Filled area is 1-5 AC
Aroostook	Easton	USSP	42	1985	--			?
Aroostook	Easton	USSP	43	?	--			?
Aroostook	Easton	LUST	10	--	--			B-18-83; 2 PW POLD
Aroostook	Easton	LUST	11	--	--			B-54-84; 1 PW POLD
Aroostook	Easton	LUST	12	--	--			I-30-84; 3 PW POLD
Aroostook	Easton	LUST	13	--	--			I-63-86; 2 PW POLD, 4 PW THND
Aroostook	Easton	HZSS	4	--	--			Pesticides Storage; pesticides; 4 MW POLD
Aroostook	Easton	SWLF	23	--	--	463927	0675204	Filled area is 1-5 AC
Aroostook	Fort Fairfield	USSP	44	1926	--			3000 CY
Aroostook	Fort Fairfield	USSP	45	1967	--			4500 CY
Aroostook	Fort Fairfield	SWLF	24	--	--	465146	0675431	Filled area is 15 AC
Aroostook	Fort Fairfield	SWLF	25	--	--	464927	0675319	Filled area is 2 AC
Aroostook	Fort Kent	USSP	46	?	--			?
Aroostook	Fort Kent	USSP	47	1968	--			8000 CY
Aroostook	Fort Kent	USSP	48	1964	--			2000 CY
Aroostook	Fort Kent	SWLF	26	--	--	471426	0683222	Filled area is 1-5 AC
Aroostook	Frenchville	USSP	49	1964	--			3500 CY
Aroostook	Frenchville	USSP	50	1965	--			1800 CY
Aroostook	Frenchville	SWLF	27	--	1981	471652	0682030	Filled area is 3 AC
Aroostook	Glenwood Plt	USSP	51	?	--			32 CY
Aroostook	Grand Isle	USSP	52	1950	--			2000 CY
Aroostook	Grand Isle	USSP	53	1975	--			1000 CY
Aroostook	Grand Isle	SWLF	28	--	--	471749	0680928	Filled area is <1 AC
Aroostook	Hammond	USSP	54	1958	--			400 CY
Aroostook	Haynesville	USSP	55	?	--			0
Aroostook	Haynesville	LUST	14	--	--			B-104-80; 1 PW POLD
Aroostook	Haynesville	SWLF	29	--	--	454932	0675841	Filled area is 1-5 AC
Aroostook	Hodgdon	USSP	56	?	--			800 CY
Aroostook	Hodgdon	USSP	57	1985	--			2000 CY
Aroostook	Hodgdon	LUST	15	--	--			I-136-86; 5 PW POLD, 3 PW THND
Aroostook	Houlton	USSP	58	1953	--			11500 CY; Site has 2 USSP
Aroostook	Houlton	LUST	16	--	--			I-18-84; 2 PW POLD
Aroostook	Houlton	WWTL	4	--	--			1 WWTL; 0.69 AC
Aroostook	Houlton	SWLF	30	--	--	460740	0675126	Filled area is >10 AC
Aroostook	Island Falls	USSP	59	1968	--			900 CY
Aroostook	Island Falls	SWLF	31	--	--	460112	0681648	Filled area is 1-5 AC
Aroostook	Limestone	USSP	60	1955	--			2000 CY
Aroostook	Limestone	LUST	17	--	--			I-26-85; 1 PW POLD
Aroostook	Limestone	HZSS	5	--	--	465629	675623	Air Base; solvents & oil
Aroostook	Limestone	SWLF	32	--	1980	465230	0674747	Filled area is 3 AC
Aroostook	Linneus	USSP	61	1964	--			3200 CY
Aroostook	Linneus	USSP	62	1984	--			1400 CY
Aroostook	Linneus	USSP	63	1973	--			300 CY
Aroostook	Littleton	USSP	64	1966	--			4000 CY
Aroostook	Littleton	USSP	65	1965	--			1500 CY
Aroostook	Littleton	LUST	18	--	--			I-10-84; 3 PW POLD
Aroostook	Littleton	LUST	19	--	--			I-155-86; 2 PW POLD, 2 PW THND
Aroostook	Littleton	SWLF	33	--	--	461606	0674813	Filled area is 5-10 AC
Aroostook	Ludlow	USSP	66	?	--			?
Aroostook	Macwahoc	USSP	67	?	--			?
Aroostook	Macwahoc	USSP	68	?	--			?
Aroostook	Macwahoc Plt.	SWLF	34	--	--	453658	0681539	Filled area is <1 AC
Aroostook	Madawaska	USSP	69	?	--			?
Aroostook	Madawaska	USSP	70	?	--			?
Aroostook	Madawaska	USSP	71	?	--			?

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Aroostook	Madawaska	SWLF	35	--	1984	472038	0681754	Filled area is 2 AC
Aroostook	Madawaska	SWLF	36	--	--	471314	0681233	Filled area is 3 AC
Aroostook	Mapleton	USSP	72	?	--			Site has 3 USSP
Aroostook	Mars Hill	USSP	73	?	--			?
Aroostook	Mars Hill	USSP	74	?	--			?
Aroostook	Mars Hill	SWLF	37	--	--	463045	0675130	Filled area is 1-5 AC
Aroostook	Masardis	USSP	75	?	--			?
Aroostook	Masardis	SWLF	38	--	--	462932	0682102	Filled area is <1 AC
Aroostook	Merrill	USSP	76	?	--			?
Aroostook	Monticello	USSP	77	1975	--			1350 CY
Aroostook	Monticello	LUST	20	--	--			B-88-79; 1 PW POLD
Aroostook	Monticello	LUST	21	--	--			I-109-86; 1 PW POLD, 4 PW THND
Aroostook	Monticello	SWLF	39	--	--	461917	0675340	Filled area is 1-5 AC
Aroostook	Nashville Plt	USSP	78	1974	--			300 CY
Aroostook	New Canada	USSP	79	1982	--			500 CY
Aroostook	New Sweden	USSP	80	1976	--			1800 CY; Site has 2 USSP
Aroostook	New Sweden	SWLF	40	--	--	465913	0681008	Filled area is <1 AC
Aroostook	Oakfield	USSP	81	1967	--			8000 CY
Aroostook	Oakfield	USSP	82	1978	--			240 CY
Aroostook	Oakfield	USSP	83	1970	--			1500 CY
Aroostook	Oakfield	SWLF	41	--	--	460438	0680854	Filled area is 1-5 AC
Aroostook	Orient	USSP	84	1960	--			500 CY
Aroostook	Orient	SWLF	42	--	--	455050	0675107	Filled area is 1-5 AC
Aroostook	Oxbow Plt.	USSP	85	1982	--			750 CY
Aroostook	Perham	USSP	86	<1950	--			550 CY
Aroostook	Portage	SWLF	43	--	--	464710	0682834	Filled area is 1-5 AC
Aroostook	Portage Lake	USSP	87	1974	1986			800 CY; Site has 2 USSP
Aroostook	Presque Isle	USSP	88	1968	--			9000 CY
Aroostook	Presque Isle	USSP	89	1962	--			5000 CY
Aroostook	Presque Isle	WWTL	5	--	--			1 WWTL; 2.66 AC
Aroostook	Presque Isle	WWTL	6	--	--			3 WWTL's; 2.98 AC
Aroostook	Presque Isle	SWLF	44	--	--	464059	0680348	Filled area is >10 AC
Aroostook	Reed Plt.	USSP	90	1960	--			550 CY; Site has 2 USSP
Aroostook	Reed Plt.	SWLF	45	--	--	453808	0680448	Filled area is 1-5 AC
Aroostook	Sherman	USSP	91	1967	--			8000 CY
Aroostook	Sherman	USSP	92	1965	--			1300 CY
Aroostook	Sherman	LUST	22	--	--			B-122-85; 1 PW POLD
Aroostook	Sherman	LUST	23	--	--			B-43-82; 1 PWS THND
Aroostook	Sherman	USSP	93	1963	--			1300 CY
Aroostook	Sherman	SWLF	46	--	--	455123	0682246	Filled area is 1-5 AC
Aroostook	Sinclair	SWLF	47	--	--	471152	0682308	Filled area is 1-5 AC
Aroostook	Smyrna	USSP	93	?	--			223 CY
Aroostook	Smyrna	SWLF	48	--	--	460728	0680815	Filled area is 5-10 AC
Aroostook	St. Agatha	USSP	94	1955	--			1400 CY
Aroostook	St. Agatha	SWLF	49	--	--	471416	0682308	Filled area is 5-10 AC
Aroostook	St. Francis	USSP	95	1984	--			100 CY
Aroostook	St. Francis	LUST	24	--	--			I-1-84; 3 PW POLD
Aroostook	St. Francis	SWLF	50	--	--	470944	0685345	Filled area is <1 AC
Aroostook	St. John Plt.	SWLF	51	--	--	471226	0684736	Filled area is 1-5 AC
Aroostook	Stacyville	LUST	25	--	--			B-414-86; 1 PW POLD
Aroostook	Stockholm	USSP	96	1971	--			2500 CY
Aroostook	Stockholm	USSP	97	1985	--			500 CY
Aroostook	Stockholm	SWLF	52	--	--	470414	0680829	Filled area is 1-5 AC
Aroostook	T12R8	USSP	98	1975	--			10 CY
Aroostook	T13R11	USSP	101	1975	--			10 CY
Aroostook	T14-R6	USSP	102	1965	--			2000 CY
Aroostook	T9R8	USSP	103	1983	--			250 CY
Aroostook	Van Buren	USSP	104	1965	--			4500 CY
Aroostook	Van Buren	USSP	105	1968	--			1500 CY
Aroostook	Van Buren	SWLF	53	--	--	471011	0675758	Filled area is 1-5 AC
Aroostook	Wade	USSP	106	1955	--			600 CY
Aroostook	Wallagrass	SWLF	54	--	--	470927	0683510	Filled area is <1 AC
Aroostook	Washburn	USSP	107	1951	--			1000 CY
Aroostook	Washburn	HZSS	6	--	--			Salvage Yard; PCB & solvents, Superfund
Aroostook	Washburn	WWTL	7	--	--			2 WWTL's; 91.83 AC
Aroostook	Washburn	SWLF	55	--	1981	464939	0680921	Filled area is 1-5 AC
Aroostook	Westfield	USSP	108	1945	--			1200 CY
Aroostook	Westfield	SWLF	56	--	--	463448	0675532	Filled area is <1 AC
Aroostook	Weston	USSP	109	1985	--			1000 CY
Aroostook	Winterville Plt.	SWLF	57	--	--	465941	0683610	Filled area is 2 AC
Aroostook	Winterville Plt.	SWLF	58	--	--	465816	0683642	Filled area is 1-5 AC
Aroostook	Woodland	USSP	113	1970	--			800 CY; 1 PW POLD, PWS THND
Aroostook	Woodland	USSP	114	1966	--			3500 CY
Cumberland	Baldwin	LUST	33	--	--			UTE-183-86*; 1 PW POLD, 2 PW THND

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Cumberland	Baldwin	USSP	115	?	--			?
Cumberland	Bridgeton	SWLF	59	--	--	440137	0704205	Filled area is 15 AC
Cumberland	Bridgton	HZSS	7	--	--			Manufacturing; lead
Cumberland	Bridgton	USSP	116	1968	--			3500 CY; 1 PW POLD
Cumberland	Bridgton	USSP	117	1977	--			5000 CY
Cumberland	Brunswick	HZSS	8	--	--			Air Base; solvents, metals & oil ; PWS THND
Cumberland	Brunswick	USSP	118	1955	--			4000 CY
Cumberland	Brunswick	USSP	119	1960	--			300 CY; Near Merrymeeting Bay (tidal)
Cumberland	Brunswick	SWLF	60	--	--	435324	0700145	Filled area is 50 AC
Cumberland	Cape Elizabeth	LUST	26	--	--			P-69-86; 1 PW POLD
Cumberland	Cape Elizabeth	USSP	120	1948	--			3000 CY
Cumberland	Cape Elizabeth	SWLF	61	--	--	433512	0701432	Filled area is 2 AC
Cumberland	Casco	LUST	27	--	--			P-74-79; 1 PW POLD
Cumberland	Casco	USSP	121	1950	--			2200 CY
Cumberland	Casco	SWLF	62	--	--	435913	0703258	Filled area is 15 AC
Cumberland	Cumberland	HZSS	9	--	--	434833	701940	Source Unknown, solvents; 7 PW POLD
Cumberland	Cumberland	USSP	122	?	--			500 CY
Cumberland	Cumberland	USSP	123	?	--			5000 CY
Cumberland	Cumberland	SWLF	64	--	--	434352	0700725	Chebeague I.Filled area is 10 AC
Cumberland	Cumberland	SWLF	63	--	--	434717	0701507	Filled area is 15 AC
Cumberland	Falmouth	USSP	124	1969	--			5000 CY
Cumberland	Falmouth	SWLF	65	--	--	434416	0701248	Filled area is 15 AC
Cumberland	Freeport	LUST	28	--	--			P-186-86; 1 PW POLD
Cumberland	Freeport	USSP	125	1947	--			5500 CY
Cumberland	Freeport	SWLF	66	--	--	435219	0700746	Filled area is 20 AC
Cumberland	Gorham	HZSS	10	--	--			Manufacturing; metals
Cumberland	Gorham	LUST	29	--	--			P-51-85; 1 PW POLD, 1 PW THND
Cumberland	Gorham	USSP	126	1960	--			4000 CY
Cumberland	Gorham	USSP	127	1965	--			3500 CY
Cumberland	Gorham	USSP	128	1985	--			150 CY
Cumberland	Gorham	USSP	129	1984	--			200 CY
Cumberland	Gorham	SWLF	67	--	--	433953	0702414	Filled area is 10 AC
Cumberland	Gray	HZSS	11	--	--	455302	701740	'Recycler'; solvents & metals; 51 PW POLD
Cumberland	Gray	LUST	30	--	--			P-148-79
Cumberland	Gray	USSP	130	1968	--			3500 CY
Cumberland	Gray	USSP	131	1955	--			3500 CY
Cumberland	Gray	USSP	132	1960	--			5500 CY
Cumberland	Gray	SWLF	68	--	--	435353	0702054	Filled area is 15 AC
Cumberland	Harpswell	LUST	31	--	--			P-40-80; 1 PW POLD
Cumberland	Harpswell	LUST	32	--	--			P-501-86; 3 PW POLD, 2 PW THND
Cumberland	Harpswell	USSP	133	1970	--			2000 CY
Cumberland	Harpswell	USSP	134	1980	--			1000 CY
Cumberland	Harpswell	SWLF	69	--	--	434815	0695603	Filled area is 10 AC
Cumberland	Harrison	USSP	135	1957	--			4000 CY; Severe tree kill
Cumberland	Harrison	SWLF	70	--	--	440920	0703654	Filled area is 10 AC
Cumberland	N. Yarmouth	USSP	136	1979	--			3500 CY
Cumberland	Naples	LUST	34	--	--			P-94-86; 1 PW POLD, 2 PW THND
Cumberland	Naples	USSP	137	1970	--			2500 CY
Cumberland	Naples	SWLF	71	--	--			Filled area is 10 AC
Cumberland	New Gloucester	LUST	35	--	--			P-23-86; 2 PW POLD, 2 PW THND
Cumberland	New Gloucester	LUST	36	--	--			P-68-81; 3 PW THND
Cumberland	New Gloucester	USSP	138	1935	--			5000 CY; 2 PW POLD, 11 THND
Cumberland	New Gloucester	USSP	139	?	--			?
Cumberland	New Gloucester	SWLF	72	--	--	435936	0701804	Filled area is 10 AC
Cumberland	North Yarmouth	SWLF	73	--	--	435137	0701224	Filled area is 10 AC
Cumberland	Portland	HZSS	12	--	--	434055	701730	Freight Terminal; solvents
Cumberland	Portland	HZSS	13	--	--			Manufacturing; lead & acids
Cumberland	Portland	LUST	37	--	--			P-511-86; 1 PWS POLD, Cliff Island
Cumberland	Portland	UPSP	145	?	--			50000 CY; On pad near ocean
Cumberland	Portland	USSP	140	1984	--			4 CY
Cumberland	Portland	USSP	141	1980	--			100 CY
Cumberland	Portland	USSP	142	1978	--			250 CY
Cumberland	Portland	USSP	143	1945	--			2000 CY; Near ocean
Cumberland	Portland	USSP	144	1980	--			30 CY; Near ocean
Cumberland	Portland	SWLF	74	--	--	434100	0700954	Long I.; Filled area is 5 AC
Cumberland	Portland	SWLF	75	--	--	434154	0701601	Ocean Ave.; Filled area is 20 AC
Cumberland	Portland	SWLF	76	--	--	433924	0701109	Peaks I.; Filled area is 10 AC
Cumberland	Portland	SWLF	77	--	--	434226	0701920	Riverside; Filled area is 20 AC
Cumberland	Portland	SWLF	78	--	--	434000	0701700	Woodford's Corner
Cumberland	Pownal	USSP	146	1965	--			1000 CY; 3 PW POLD, 5 THND
Cumberland	Raymond	USSP	147	1982	--			2000 CY
Cumberland	Raymond	SWLF	79	--	--	435559	0702453	Filled area is 10 AC
Cumberland	S. Portland	USSP	148	1955	--			3500 CY
Cumberland	S. Portland	USSP	149	1950	--			6000 CY

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Cumberland	Scarborough	LUST	38	--	--			P-289-84; 1 PW POLD, 3 PW THND
Cumberland	Scarborough	USSP	150	1969	--			4000 CY
Cumberland	Scarborough	USSP	151	1980	--			60 CY
Cumberland	Scarborough	USSP	152	1945	--			1500 CY; Near Nonesuch R. (tidal)
Cumberland	Scarborough	USSP	153	?	--			Near Nonesuch R. (tidal)
Cumberland	Scarborough	SWLF	80	--	--	433617	0701802	Filled area is 20 AC
Cumberland	Sebago	LUST	39	--	--			P-182-85; 1 PW POLD, 3 PW THND
Cumberland	Sebago	LUST	40	--	--			P-41-79; 1 PW POLD
Cumberland	Sebago	USSP	154	1949	--			2500 CY
Cumberland	Sebago	SWLF	81	--	--			Filled area is 10 AC
Cumberland	So. Portland	HZSS	14	--	--			Manufacturing; solvents
Cumberland	So. Portland	SWLF	82	--	--	433654	0701721	Filled area is 20 AC
Cumberland	Standish	USSP	155	1960	--			3500 CY
Cumberland	Standish	USSP	156	1976	--			3000 CY
Cumberland	Standish	SWLF	83	--	--	434537	0703252	Filled area is 15 AC
Cumberland	Westbrook	USSP	157	1969	--			4000 CY
Cumberland	Westbrook	USSP	158	1973	--			100 CY
Cumberland	Westbrook	SWLF	84	--	--	433911	0702255	Filled area is 20 AC
Cumberland	Windham	LUST	41	--	--			P-131-86; 2 PW POLD, 1 PW THND
Cumberland	Windham	USSP	159	1960	--			6500 CY; 1 PW POLD
Cumberland	Windham	USSP	160	1980	--			200 CY; Located at landfill site
Cumberland	Windham	SWLF	85	--	--	435135	0702721	Filled area is 15 AC
Cumberland	Yarmouth	USSP	161	1967	--			4500 CY
Cumberland	Yarmouth	USSP	162	<1960	--			3000 CY
Cumberland	Yarmouth	SWLF	86	--	--	434900	0700950	Filled area is 20 AC
Franklin	Avon	USSP	163	1959	--			3000 CY
Franklin	Carrabassett	SWLF	87	--	--	450314	0701221	Filled area is 2 AC
Franklin	Carrabassett Val	WWTL	8	--	--			14.0 AC
Franklin	Carthage	USSP	164	1975	--			1000 CY
Franklin	Carthage	USSP	165	1978	--			70 CY
Franklin	Carthage	SWLF	88	--	--	443715	0702704	Filled area is 1-5 AC
Franklin	Chain of Ponds	USSP	166	1969	--			3500 CY
Franklin	Chesterville	USSP	167	1974	--			3000 CY; Located at old landfill
Franklin	Chesterville	SWLF	89	--	--	443244	0700436	Filled area is 1-5 AC
Franklin	Coburn Gore	SWLF	90	--	--	452240	0704817	Filled area is 1-5 AC
Franklin	Coplin Plt	USSP	168	1985	--			98 CY
Franklin	Dallas	USSP	169	1965	--			7000 CY
Franklin	Eustis	USSP	170	1985	--			Site has 2 USSP
Franklin	Eustis	SWLF	91	--	--	451006	0702521	Filled area is 1-5 AC
Franklin	Fairbanks	USSP	171	1959	--			3500 CY; Near Sandy R.
Franklin	Farmington	USSP	172	1975	--			5000 CY
Franklin	Farmington	USSP	173	1985	--			500 CY; Near Sandy R.
Franklin	Farmington	WWTL	9	1979	--			3 WWTL's; 0.35 AC
Franklin	Farmington	SWLF	92	--	--	443827	0700536	Filled area is 5-10 AC
Franklin	Farmington	SWLF	93	--	--	444154	0700654	Filled area is 2 AC
Franklin	Industry	LUST	42	--	--			A-10-83; 2 PW POLD
Franklin	Industry	USSP	174	1974	--			1250 CY
Franklin	Industry	SWLF	94	--	--	444539	0700029	Filled area is 2 AC
Franklin	Jay	USSP	175	1966	--			7000 CY; Near Androscoggin R.
Franklin	Jay	WWTL	10	1976	--			1 WWTL; 34.0 AC
Franklin	Jay	SWLF	95	--	--	443138	0701355	Filled area is 5-10 AC
Franklin	Kingfield	USSP	176	1962	--			2000 CY
Franklin	Kingfield	USSP	177	1971	--			3500 CY; Near Carrabassett R.
Franklin	Kingfield	USSP	178	1983	--			2000 CY
Franklin	Kingfield	USSP	179	1980	--			4500 CY
Franklin	Kingfield	SWLF	96	--	--	445733	0700719	Filled area is 1-5 AC
Franklin	Madrid	USSP	180	1984	--			1000 CY
Franklin	Madrid	SWLF	97	--	--	445325	0702609	Filled area is 2 AC
Franklin	N. Jay	USSP	181	1964	--			2100 CY
Franklin	New Sharon	USSP	182	1967	--			1500 CY
Franklin	New Sharon	SWLF	98	--	--	443907	0700016	Filled area is 1-5 AC
Franklin	New Vineyard	LUST	43	--	--			A-170-86; 1 PW POLD
Franklin	New Vineyard	USSP	183	?	--			2000 CY; Near Lemon Str.
Franklin	New Vineyard	SWLF	99	--	--	444855	0700653	Filled area is 1-5 AC
Franklin	New Vinyard	LUST	44	--	--			A-10-86; 1 PW POLD, 1 PW THND
Franklin	Phillips	USSP	184	1971	--			4000 CY
Franklin	Phillips	SWLF	100	--	--	445031	0702107	Filled area is 1-5 AC
Franklin	Rangeley	LUST	45	--	--			A-134-85; 1 PW POLD, 1 PW THND
Franklin	Rangeley	USSP	185	1963	--			2500 CY
Franklin	Rangeley	USSP	186	1945	--			3500 CY
Franklin	Rangeley	SWLF	101	--	--	445831	0704357	Filled area is 1-5 AC
Franklin	Rangeley Plt.	USSP	187	1955	--			1000 CY
Franklin	Rangeley Plt.	SWLF	102	--	--	445542	0703953	Filled area is <1 AC
Franklin	Rangley	LUST	46	--	--			P-117-83

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Franklin	Salem	SWLF	103	--	--	445428	0701659	Filled area is 1-5 AC
Franklin	Stratton	LUST	47	--	--			A-77-85; 1 PW THND
Franklin	Strong	USSP	188	1960	--			2000 CY; Near Sandy R.
Franklin	Strong	SWLF	104	--	--	444907	0701344	Filled area is 1-5 AC
Franklin	Temple	USSP	189	1960	--			1400 CY
Franklin	Temple	SWLF	105	--	--	444116	0701317	Filled area is 1-5 AC
Franklin	W. Farmington	USSP	190	1955	--			3000 CY
Franklin	Weld	USSP	191	1975	--			1000 CY
Franklin	Weld	SWLF	106	--	--	444406	0702740	Filled area is 1-5 AC
Franklin	Wilton	USSP	192	1952	--			5500 CY
Franklin	Wilton	SWLF	107	--	--	443540	0701143	Filled area is 1-5 AC
Hancock	Amherst	USSP	193	1979	1987			400 CY; Moved under cover in 1987
Hancock	Aurora	USSP	194	1966	--			?
Hancock	Aurora	USSP	195	1965	--			800 CY
Hancock	Aurora	SWLF	108	--	--	445134	0681729	Filled area is 1-5 AC
Hancock	Bar Harbor	USSP	196	1962	--			2800 CY
Hancock	Bar Harbor	USSP	197	1925	--			5500 CY
Hancock	Blue Hill	HZSS	15	--	--			Manufacturing; lead
Hancock	Blue Hill	LUST	48	--	--			B-146-86; 2 PW POLD, 3 PW THND
Hancock	Blue Hill	LUST	49	--	--			B-226-85; 1 PW THND
Hancock	Blue Hill	USSP	198	1968	--			3500 CY
Hancock	Blue Hill	USSP	199	1973	--			4000 CY
Hancock	Blue Hill	SWLF	109	--	--	442633	0683425	Filled area is 5-10 AC
Hancock	Brooklin	USSP	200	1973	--			1650 CY
Hancock	Brooklin	SWLF	110	--	--	441735	0683358	Filled area is 1-5 AC
Hancock	Brooksville	USSP	201	1966	--			3000 CY
Hancock	Bucksport	USSP	202	1968	--			4400 CY
Hancock	Bucksport	SWLF	111	--	--	443654	0684628	Filled area is 5-10 AC
Hancock	Castine	LUST	50	--	--			B-116-82; 1 PW POLD
Hancock	Castine	USSP	203	1969	--			900 CY; 1 PW POLD, 2 THND
Hancock	Castine	USSP	204	1969	--			1000 CY
Hancock	Castine	SWLF	112	--	--	442523	0684742	Filled area is 1-5 AC
Hancock	Cranberry Isles	USSP	205	?	--			?
Hancock	Dedham	USSP	206	1971	--			1400 CY
Hancock	Dedham	USSP	207	1953	--			460 CY
Hancock	Dedham	USSP	208	1974	--			1000 CY
Hancock	Deer Isle	LUST	51	--	--			B-175-85; 1 PW POLD
Hancock	Deer Isle	LUST	52	--	--			B-487-86; 1 PW THND
Hancock	Deer Isle	LUST	53	--	--			B-530-86; 1 PW POLD
Hancock	Deer Isle	USSP	209	1978	--			3000 CY
Hancock	Deer Isle	SWLF	113	--	--	441412	0683934	Filled area is 1-5 AC
Hancock	Eastbrook	SWLF	114	--	--	444054	0681202	Filled area is 1-5 AC
Hancock	Ellsworth	LUST	54	--	--			B-118-85; 1 PW THND
Hancock	Ellsworth	LUST	55	--	--			B-181-85; 1 PW POLD
Hancock	Ellsworth	USSP	210	1957	--			6000 CY
Hancock	Ellsworth	USSP	211	1952	--			7860 CY
Hancock	Ellsworth	WWTL	11	--	--			0.99 AC
Hancock	Ellsworth	SWLF	115	--	--	443336	0682421	Filled area is >10 AC
Hancock	Franklin	USSP	212	1951	--			3000 CY; 1 PW POLD
Hancock	Franklin	USSP	213	1960	--			1800 CY
Hancock	Franklin	SWLF	116	--	--	443544	0681532	Filled area is 1-5 AC
Hancock	Gouldsboro	USSP	214	1978	--			3350 CY
Hancock	Gouldsboro	USSP	215	1981	--			2000 CY
Hancock	Great Pond	USSP	216	1985	--			100 CY
Hancock	Hancock	USSP	217	1970	--			2500 CY
Hancock	Hancock	SWLF	117	--	--	443251	0681857	Filled area is 1-5 AC
Hancock	Lamoine	USSP	218	1948	--			2000 CY
Hancock	Lamoine	SWLF	118	--	--	442818	0681943	Filled area is 5-10 AC
Hancock	Mariaville	USSP	219	1975	--			1800 CY; Site has 2 USSP
Hancock	Mount Desert	USSP	221	?	--			6000 CY
Hancock	Mount Desert I	WWTL	12	--	--			3 WWTL's; 3.44 AC
Hancock	Orland	LUST	56	--	--			B-86-84; 1 PWS PW THND
Hancock	Orland	USSP	222	1968	--			5280 CY
Hancock	Orland	USSP	222	1983	1987			2000 CY
Hancock	Otis	LUST	57	--	--			B-407-86; 1 PW POLD, 1 PW THND
Hancock	Otis	SWLF	119	--	--	444202	0682609	Filled area is <1 AC
Hancock	Penobscot	LUST	58	--	--			B-80-84; 8 PW POLD, 2 THND;1 MW POLD, 2 THND
Hancock	Penobscot	USSP	223	1950	--			1000 CY
Hancock	Penobscot	SWLF	120	--	--	442846	0684350	Filled area is 1-5 AC
Hancock	Sedgewick	USSP	224	1977	--			1000 CY
Hancock	Sedgwick	USSP	225	1977	--			2200 CY
Hancock	Sedgwick	SWLF	121	--	--	441952	0683930	Filled area is 1-5 AC
Hancock	Sorrento	USSP	226	1977	--			950 CY
Hancock	Sorrento	SWLF	122	--	--	443017	0681120	Filled area is <1 AC

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Hancock	Southwest Harbor	SWLF	123	--	--	441733	682052	Filled area is >10 AC
Hancock	Southwest Hbr	USSP	227	1977	--			800 CY
Hancock	Stonington	USSP	228	1965	--			1600 CY
Hancock	Stonington	SWLF	124	--	--	441041	0684154	Filled area is 1-5 AC
Hancock	Sullivan	USSP	229	1979	--			1500 CY
Hancock	Sullivan	SWLF	125	--	--	443106	0680758	Filled area is 1-5 AC
Hancock	Sullivan	SWLF	126	--	--	443252	0681358	Filled area is 1-5 AC
Hancock	Surry	LUST	59	--	--			B-4-82; 3 PW POLD
Hancock	Surry	USSP	230	1981	--			3000 CY
Hancock	Swan's Island	SWLF	127	--	--	441019	0682725	Filled area is 1-5 AC
Hancock	Swans Island	USSP	231	?	--			200 CY
Hancock	Tremont	LUST	60	--	--			B-21-82; 1 PW POLD
Hancock	Tremont	LUST	61	--	--			B-49-83; 1 PW POLD
Hancock	Tremont	USSP	232	1976	--			1500 CY
Hancock	Tremont	SWLF	128	--	--			Filled area is 1-5 AC
Hancock	Trenton	USSP	233	1985	--			1000 CY
Hancock	Verona	USSP	234	1978	--			800 CY
Hancock	Waltham	USSP	235	?	--			1200 CY; 1 PW POLD
Hancock	Waltham	SWLF	129	--	--	443934	0682126	Filled area is <1 AC
Hancock	Winter Harbor	USSP	236	1945	--			3000 CY
Hancock	Winter Harbor	SWLF	130	--	--	442456	0685129	Filled area is 1-5 AC
Kennebec	Albion	LUST	62	--	--			A-345-86; 2 PW POLD, 4 PW THND
Kennebec	Albion	USSP	237	1976	--			1200 CY
Kennebec	Albion	USSP	238	1981	--			3000 CY
Kennebec	Albion	USSP	239	1967	--			1100 CY
Kennebec	Albion	USSP	240	1960	--			1000 CY
Kennebec	Albion	SWLF	131	--	--	443113	0692543	Filled area is <1 AC
Kennebec	Augusta	HZSS	--	--	--			PCBs Superfund; Salvage Yard
Kennebec	Augusta	USSP	240	1966	--			2500 CY
Kennebec	Augusta	USSP	241	1920	--			3 CY
Kennebec	Augusta	USSP	242	1960	--			12000 CY
Kennebec	Augusta	USSP	243	1973	--			350 CY; Near Kennebec R.
Kennebec	Augusta	SWLF	132	--	--	442531	0693148	Filled area is >10 AC
Kennebec	Belgrade	USSP	244	1970	--			4500 CY
Kennebec	Belgrade	USSP	245	?	--			3000 CY
Kennebec	Belgrade	SWLF	133	--	--	442821	0695301	Filled area is 1-5 AC
Kennebec	Belgrade	SWLF	134	--	--	443043	0695150	Filled area is 2 AC
Kennebec	Benton	USSP	246	1950	--			2000 CY; Near Sebasticook R.
Kennebec	Chelsea	LUST	63	--	--			A-15-83; 2 PW POLD
Kennebec	Chelsea	USSP	247	1972	--			144 CY
Kennebec	Chelsea	USSP	248	1972	--			1600 CY; Covered in 1987
Kennebec	Chelsea	SWLF	135	--	--	441437	0694225	Filled area is 2 AC
Kennebec	China	LUST	64	--	--			A-293-86; 1 PW POLD, 1 PW THND
Kennebec	China	USSP	249	1970	--			3000 CY
Kennebec	China	SWLF	136	--	--	442531	0693148	Filled area is 1-5 AC
Kennebec	Clinton	WWTL	13	1987	--			AC 3 WWTL's; 25.0 AC
Kennebec	Clinton	SWLF	137	--	--	443751	0693023	Filled area is 1-5 AC
Kennebec	Fairfield	LUST	65	--	--			B-53-82; 1 PW POLD
Kennebec	Farmingdale	USSP	250	1977	--			>300 CY; Near Kennebec R.
Kennebec	Farmingdale	USSP	251	?	--			?
Kennebec	Fayette	USSP	252	1978	--			2500 CY
Kennebec	Gardiner	USSP	253	1969	--			5000 CY
Kennebec	Hallowell	USSP	254	1966	--			2500 CY; Near Kennebec R.
Kennebec	Hallowell	SWLF	138	--	--	441753	0694902	Filled area is 2 AC
Kennebec	Litchfield	USSP	255	1955	--			2500 CY; 1 PW POLD, 1 THND
Kennebec	Litchfield	USSP	256	1972	--			3500 CY
Kennebec	Litchfield	SWLF	139	--	--	440948	0695638	Filled area is 5-10 AC
Kennebec	Manchester	USSP	257	1956	--			2000 CY
Kennebec	Monmouth	LUST	66	--	--			A-189-86; 1 PW POLD, 2 PW THND
Kennebec	Monmouth	LUST	67	--	--			A-7-86; 1 PW POLD
Kennebec	Monmouth	USSP	258	1950	--			4000 CY
Kennebec	Monmouth	SWLF	140	--	--	441431	0700112	Filled area is 1-5 AC
Kennebec	Mount Vernon	SWLF	141	--	--	442949	0695832	Filled area is <1 AC
Kennebec	Mt. Vernon	USSP	259	1979	--			2000 CY; 1 PW POLD
Kennebec	Mt. Vernon	WWTL	14	--	--			AC 1 WWTL; 0.08 AC
Kennebec	Oakland	LUST	68	--	--			A-176-84; 3 PW POLD
Kennebec	Oakland	USSP	260	1945	--			240 CY
Kennebec	Oakland	USSP	261	1976	--			5000 CY; Near Messalonskee Str.
Kennebec	Oakland	SWLF	142	--	--	443231	0694544	Filled area is 1-5 AC
Kennebec	Pittston	LUST	69	--	--			P-43-80; 1 PW POLD
Kennebec	Pittston	USSP	262	1975	1987			3500 CY
Kennebec	Pittston	SWLF	143	--	--	440946	0694454	Filled area is 5-10 AC
Kennebec	Randolph	USSP	263	1966	--			3500 CY
Kennebec	Readfield	LUST	70	--	--			A-121-83; 1 PW POLD

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Kennebec	Readfield	LUST	71	--	--			P-136-81 & A-33-84;9PWPOLD,1 THND; 2 MW POLD
Kennebec	Readfield	USSP	264	1976	--			2000 CY
Kennebec	Readfield	SWLF	144	--	--	442256	0695610	Filled area is 1-5 AC
Kennebec	Richmond	LUST	72	--	--			A-23-83; 1 PW POLD, 2 PW THND
Kennebec	Rome	USSP	265	1975	--			2500 CY; 1 PW POLD
Kennebec	Rome	SWLF	145	--	--	443557	0695401	Filled area is 2 AC
Kennebec	S. China	LUST	73	--	--			A-171-85; 4 PW POLD, 2 PW THND
Kennebec	S. China	USSP	266	1968	--			5000 CY
Kennebec	Sidney	USSP	267	1960	--			5000 CY
Kennebec	Sidney	USSP	268	1969	--			3500 CY
Kennebec	Sidney	SWLF	146	--	--	442742	0694514	Filled area is 1-5 AC
Kennebec	Vassalboro	LUST	74	--	--			A-51-86; 1 PW POLD, 1 PW THND
Kennebec	Vassalboro	USSP	269	1960	--			1500 CY
Kennebec	Vassalboro	USSP	270	1970	--			3000 CY
Kennebec	Vassalboro	SWLF	147	--	--	442746	0693615	Filled area is 1-5 AC
Kennebec	Vienna	USSP	271	1952	--			400 CY
Kennebec	Vienna	SWLF	148	--	--	443511	0700145	Filled area is 2 AC
Kennebec	Vienna	SWLF	149	--	--	443342	0700157	Filled area is 1-5 AC
Kennebec	Waterville	USSP	272	1955	--			2000 CY
Kennebec	Waterville	SWLF	150	--	--	443122	0694215	Filled area is >10 AC
Kennebec	Wayne	USSP	273	1980	--			1500 CY
Kennebec	Wayne	SWLF	151	--	--	441943	0700214	Filled area is 1-5 AC
Kennebec	West Gardiner	USSP	274	1968	--			5000 CY; 3 PW POLD by USSP 274 & 275
Kennebec	West Gardiner	USSP	275	1955	--			2000 CY; 3 PW POLD by USSP 274 & 275
Kennebec	West Gardiner	USSP	276	1966	--			3500 CY
Kennebec	Windsor	USSP	277	1970	--			2000 CY
Kennebec	Windsor	SWLF	152	--	--	441659	0693537	Filled area is 1-5 AC
Kennebec	Winslow	HZSS	16	--	--			Manufacturing; solvents
Kennebec	Winslow	USSP	278	1980	--			5000 CY; 7 PW POLD
Kennebec	Winslow	SWLF	153	--	--	443004	0693543	Filled area is 2 AC
Kennebec	Winthrop	HZSS	17	--	--	441632	695919	Landfill; solvents; Superfund; 1 PW POLD
Kennebec	Winthrop	USSP	279	1957	--			6000 CY; PWS THND
Kennebec	Winthrop	USSP	280	1956	--			4500 CY
Kennebec	Winthrop	SWLF	154	--	--	441632	0695919	Savage Site, Filled area is 1-5 AC
Knox	Appleton	USSP	281	<1970	--			1200 CY
Knox	Appleton	SWLF	155	--	--	441642	0691500	Filled area is 1-5 AC
Knox	Camden	USSP	282	1972	--			2500 CY
Knox	Camden	USSP	283	1969	--			3800 CY
Knox	Cushing	USSP	284	1974	--			1000 CY
Knox	Friendship	LUST	75	--	--			A-151-84; 12 PW POLD, 27 PW THND
Knox	Friendship	LUST	76	--	--			A-472-86; 1 PW POLD
Knox	Friendship	USSP	285	1950	--			500 CY
Knox	Friendship	SWLF	156	--	--	440147	0691701	Filled area is 1-5 AC
Knox	Hope	USSP	286	1975	--			1500 CY
Knox	N. Haven	USSP	287	?	--			300 CY
Knox	North Haven	SWLF	157	--	--			Filled area is <1 AC
Knox	Owl's Head	LUST	77	--	--			A-280-86; 1 PW POLD, 1 PW THND
Knox	Owls Head	USSP	291	1980	--			1150 CY
Knox	Rockland	HZSS	18	--	--			Manufacturing; metals
Knox	Rockland	LUST	78	--	--			A-146-85; 1 House Exploded;5 MW POLD &5 THND
Knox	Rockland	LUST	79	--	--			A-451-86; 1 PW POLD, 3 PW THND
Knox	Rockland	USSP	292	1960	--			1800 CY
Knox	Rockland	SWLF	158	--	--	440528	0690808	Filled area is 5-10 AC
Knox	Rockport	USSP	293	1971	--			3000 CY
Knox	Rockport	USSP	294	1950	1986			2500 CY; Moved to covered site in 1986
Knox	Rockport	SWLF	159	--	--	441152	0690405	Filled area is 5 AC
Knox	S Thomaston	LUST	80	--	--			A-71-86; 1 PW POLD, 1 PW THND
Knox	South Hope	HZSS	19	--	--			'Recycler'; solvents; 1 PW POLD
Knox	South Thomaston	USSP	295	1985	--			1500 CY
Knox	St. George	USSP	296	?	--			1000 CY
Knox	St. George	USSP	297	1960	--			1000 CY
Knox	St. George	SWLF	160	--	--	435819	0691339	Filled area is 1-5 AC
Knox	Thomaston	HZSS	20	--	--			Manufacturing; solvents
Knox	Thomaston	USSP	298	1970	--			1500 CY
Knox	Union	USSP	299	1966	--			2500 CY
Knox	Union	SWLF	161	--	--	441308	0692024	Filled area is 1-5 AC
Knox	Vinalhaven	USSP	301	1985	--			200 CY; Near ocean
Knox	Vinalhaven	SWLF	162	--	--	440413	0684833	Filled area is 1-5 AC
Knox	Warren	LUST	81	--	--			A-38-86; 1 PW POLD, 1 PW THND
Knox	Warren	LUST	82	--	--			A-39-86; 1 PW POLD
Knox	Warren	USSP	302	1975	--			3500 CY
Knox	Warren	SWLF	163	--	--	440937	0691804	Filled area is 5-10 AC
Knox	Warren	SWLF	164	--	--	440946	0691054	Filled area is 2 AC
Knox	Washington	USSP	303	1962	--			5000 CY; 3 PW POLD, 3 THND

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Knox	Washington	USSP	304	1977	--			2000 CY
Knox	Washington	SWLF	165	--	--	441546	0692415	Filled area is <1 AC
Lincoln	Alna	USSP	305	<1974	1985			2500 CY; 1 PW POLD, 3 THND covered in 1985
Lincoln	Alna	SWLF	166	--	--	440511	0693824	Filled area is 1-5 AC
Lincoln	Boothbay	LUST	83	--	--			A-167-84; 1 PW POLD, 1 PW THND
Lincoln	Boothbay	LUST	84	--	--			A-73-84; 4 PW POLD, 2 PW THND
Lincoln	Boothbay	USSP	306	1979	--			1400 CY
Lincoln	Boothbay	WWTL	15	--	--			AC 1 WWTL; 0.34 AC
Lincoln	Boothbay	SWLF	167	--	--	435252	0693650	Filled area is 1-5 AC
Lincoln	Boothbay Harbor	USSP	307	1965	--			1000 CY
Lincoln	Bremen	USSP	308	1971	--			1000 CY
Lincoln	Bristol	USSP	309	1981	--			3000 CY
Lincoln	Bristol	SWLF	168	--	--	435415	0692947	Filled area is 1-5 AC
Lincoln	Damariscotta	USSP	310	1975	--			1300 CY
Lincoln	Damariscotta	WWTL	16	1987	--			AC 3 WWTL's; 2.30 AC
Lincoln	Damariscotta	WWTL	17	--	--			AC 1.72 AC
Lincoln	Damariscotta	SWLF	169	--	--	440218	0692915	Filled area is 1-5 AC
Lincoln	Dresden	USSP	311	1976	--			3000 CY; 1 PW POLD, 3 THND
Lincoln	Edgecomb	LUST	85	--	--			A-208-85; 1 PWS POLD
Lincoln	Edgecomb	USSP	312	1960	--			7500 CY; Near ocean
Lincoln	Jefferson	USSP	313	1958	--			4000 CY; Site has 2 USSP
Lincoln	Jefferson	SWLF	170	--	--	441154	0693106	Filled area is 1-5 AC
Lincoln	Newcastle	USSP	314	1966	--			2000 CY
Lincoln	Newcastle	SWLF	171	--	--	440458	0693345	Filled area is 5-10 AC
Lincoln	Nobleboro	USSP	315	1984	--			1200 CY
Lincoln	Nobleboro	USSP	316	1986	--			1300 CY
Lincoln	Nobleboro	SWLF	172	--	--	440442	0693006	Filled area is 1-5 AC
Lincoln	S. Bristol	LUST	86	--	--			A-331-86; 1 PW POLD, 4 PW THND
Lincoln	Somerville	LUST	87	--	--			B-145-82; 1 PW POLD
Lincoln	Somerville	USSP	317	1940	--			1000 CY
Lincoln	Somerville Plt.	SWLF	173	--	--	441501	0692645	Filled area is <1 AC
Lincoln	South Bristol	USSP	318	1946	--			2000 CY
Lincoln	Southport	USSP	319	?	--			500 CY; 1 PW POLD
Lincoln	Waldoboro	HZSS	21	--	--	440505	692235	Manufacturing; solvents & metals; PWS THND
Lincoln	Waldoboro	LUST	88	--	--			A-14-83; 2 PW POLD
Lincoln	Waldoboro	LUST	89	--	--			A-3-83; 1 PW POLD, 1 PW THND
Lincoln	Waldoboro	USSP	321	1977	--			3500 CY
Lincoln	Waldoboro	USSP	322	1975	--			3000 CY
Lincoln	Waldoboro	USSP	323	1961	--			240 CY
Lincoln	Waldoboro	SWLF	174	--	--	440817	0692613	Filled area is 5-10 AC
Lincoln	Waldoboro	SWLF	175	--	--	440600	0692138	Filled area is 2 AC
Lincoln	Westport	USSP	324	1981	--			2000 CY
Lincoln	Westport	USSP	325	?	--			?
Lincoln	Whitefield	USSP	326	1985	--			3500 CY
Lincoln	Whitefield	SWLF	176	--	1982	441438	0693442	Filled area is <1 AC
Lincoln	Wiscasset	LUST	90	--	--			A-135-85; 1 PW POLD
Lincoln	Wiscasset	USSP	327	1950	--			4500 CY
Lincoln	Wiscasset	SWLF	177	--	--	440206	0694011	Filled area is 5-10 AC
Oxford	Andover	USSP	328	1975	--			2200 CY
Oxford	Andover	SWLF	178	--	--	443700	0704452	Filled area is 1-5 AC
Oxford	Bethel	USSP	329	1965	--			5000 CY
Oxford	Bethel	USSP	330	1956	--			1300 CY
Oxford	Bethel	SWLF	179	--	--	442851	0704733	Filled area is 15 AC
Oxford	Brownfield	USSP	331	?	--			1200 CY
Oxford	Brownfield	SWLF	180	--	--	435521	0705141	Filled area is 10 AC
Oxford	Buckfield	HZSS	22	--	--			'Recycler'; solvents & oil; 1 PW POLD
Oxford	Buckfield	USSP	332	1984	--			3000 CY
Oxford	Buckfield	SWLF	181	--	--	441833	0702144	Filled area is 1-5 AC
Oxford	Byron	SWLF	182	--	--	444329	0703818	Filled area is 2 AC
Oxford	Canton	USSP	333	1960	--			2600 CY
Oxford	Canton	USSP	334	1950	--			2500 CY
Oxford	Canton	WWTL	18	1985	--			4 WWTL's; 6.70 AC
Oxford	Canton	SWLF	183	--	--	442712	0701729	Filled area is 1-5 AC
Oxford	Denmark	USSP	335	1955	--			2000 CY
Oxford	Denmark	SWLF	184	--	--	435927	0704629	Filled area is 10 AC
Oxford	Dixfield	USSP	336	1966	--			3100 CY
Oxford	Dixfield	USSP	337	1980	--			2300 CY
Oxford	Fryeburg	USSP	339	1962	--			3000 CY
Oxford	Fryeburg	USSP	340	1940	--			15000 CY
Oxford	Fryeburg	SWLF	185	--	--	440343	705649	Filled area is 10 AC
Oxford	Gilead	USSP	341	1954	--			1000 CY
Oxford	Gilead	SWLF	186	--	--	442342	0705815	Filled area is 10 AC
Oxford	Greenwood	USSP	342	1981	--			3000 CY
Oxford	Greenwood	USSP	343	1967	--			14 CY

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Oxford	Greenwood	SWLF	187	--	--	442351	0704134	Filled area is 10 AC
Oxford	Hartford	USSP	344	1983	--			?
Oxford	Hartford	SWLF	188	--	--			Filled area is 1-5 AC
Oxford	Hebron	USSP	345	1965	--			2300 CY
Oxford	Hebron	SWLF	189	--	--	441357	0702234	Filled area is 2 AC
Oxford	Hebron Academy	SWLF	190	--	--	441158	0702603	Filled area is 2 AC
Oxford	Hiram	USSP	338	1967	--			3800 CY
Oxford	Hiram	USSP	346	<1970	--			3800 CY; Site has 2 USSP
Oxford	Lincoln Plt.	SWLF	191	--	--	445502	0705648	Filled area is <1 AC
Oxford	Lovell	USSP	347	1970	--			945 CY
Oxford	Lovell	SWLF	192	--	--	440815	0705306	Filled area is 2 AC
Oxford	Magalloway	SWLF	193	--	--	445108	710140	Filled area is 2 AC
Oxford	Mexico	USSP	348	1969	--			5000 CY; Near Swift R.
Oxford	Mexico	USSP	349	?	--			?
Oxford	Mexico/Rumford	SWLF	194	--	--	443604	0703207	Filled area is 2 AC
Oxford	N. Lovell	USSP	350	1960	--			2300 CY
Oxford	North Waterford	USSP	351	1958	--			2000 CY
Oxford	Norway	LUST	91	--	--			P-515-86; 1 PW POLD
Oxford	Norway	USSP	352	1946	--			500 CY; Site has 2 USSP
Oxford	Norway	WWTL	19	1965	--			2 WWTL's; 9.87 AC
Oxford	Norway	SWLF	195	--	--	441216	0703147	Filled area is 15 AC
Oxford	Otisfield	USSP	353	<1965	--			1750 CY
Oxford	Otisfield	USSP	354	1980	--			1750 CY
Oxford	Oxford	LUST	92	--	--			P-168-82; 2 PW THND
Oxford	Oxford	LUST	93	--	--			P-366-86; 1 PW POLD, 1 PW THND
Oxford	Oxford	USSP	355	1955	--			3500 CY
Oxford	Oxford	SWLF	196	--	--	440858	0703004	Filled area is 10 AC
Oxford	Paris	USSP	356	1957	--			4000 CY
Oxford	Paris	SWLF	198	--	--			Filled area is 20 AC
Oxford	Paris	SWLF	197	--	--	441447	0703121	Filled area is 15 AC
Oxford	Parkertown	SWLF	199	--	--	450037	0705932	Filled area is 2 AC
Oxford	Peru	USSP	357	1970	--			3500 CY
Oxford	Peru	SWLF	200	--	--	442848	0702321	Filled area is 2 AC
Oxford	Porter	SWLF	201	--	--	435125	705718	Filled area is 2 AC
Oxford	Roxbury	USSP	358	1983	--			1500 CY
Oxford	Roxbury	SWLF	202	--	--	443748	0703858	Filled area is 2 AC
Oxford	Rumford	USSP	359	1962	--			1500 CY
Oxford	Rumford	USSP	360	1973	--			6000 CY
Oxford	Rumford	WWTL	20	1976	--			2 WWTL's; 2.69 AC
Oxford	S. Paris	USSP	361	1968	--			3700 CY
Oxford	Stoneham	USSP	362	1951	--			900 CY
Oxford	Stow	USSP	363	1984	--			1000 CY
Oxford	Sumner	USSP	364	1983	--			3500 CY
Oxford	Sumner	USSP	365	?	1983			CY Abandoned USSP
Oxford	Sweden	USSP	366	1980	--			1400 CY
Oxford	Upton	USSP	367	1965	--			800 CY; 1 PW POLD
Oxford	Upton	SWLF	203	--	--	444129	0705837	Filled area is 5 AC
Oxford	Upton	SWLF	204	--	--	444127	0705858	Filled area is <1 AC
Oxford	Waterford	USSP	368	1965	--			2100 CY; 1 PW POLD, 1 THND
Oxford	Waterford	SWLF	205	--	--	440854	0704316	Filled area is 10 AC
Oxford	West Paris	USSP	369	1967	--			3000 CY
Oxford	West Paris	SWLF	206	--	--	441925	0703346	Filled area is 10 AC
Oxford	West Peru	SWLF	207	--	--	443101	0702729	Filled area is 2 AC
Oxford	Wilson's Mills	USSP	370	1971	--			2500 CY
Oxford	Woodstock	USSP	371	1930	--			3000 CY
Oxford	Woodstock	SWLF	208	--	--	442435	0703827	Filled area is 10 AC
Penobscot	Alton	USSP	372	1985	--			1000 CY
Penobscot	Alton	USSP	373	1965	--			2500 CY
Penobscot	Argyle	USSP	374	1985	--			1200 CY
Penobscot	Bangor	LUST	94	--	--			B-76-81; 1 PW POLD
Penobscot	Bangor	USSP	375	?	--			?
Penobscot	Bangor	USSP	376	1963	--			9900 CY; Site has 2 USSP
Penobscot	Bangor	USSP	377	1978	--			4000 CY
Penobscot	Bangor	SWLF	209	--	--	445137	0684419	Filled area is 5-10 AC
Penobscot	Bradford	USSP	378	1973	--			5000 CY
Penobscot	Bradford	SWLF	210	--	--	450601	0685512	Filled area is 1-5 AC
Penobscot	Bradley	USSP	379	1984	--			1100 CY
Penobscot	Bradley	USSP	380	1970	--			1200 CY
Penobscot	Brewer	USSP	381	1940	--			2500 CY
Penobscot	Brewer	USSP	382	1954	--			300 CY
Penobscot	Brewer	SWLF	211	--	--	444556	0684520	Filled area is >10 AC
Penobscot	Burlington	USSP	383	1970	--			?
Penobscot	Burlington	SWLF	212	--	--	451231	0682608	Filled area is 1-5 AC
Penobscot	Carmel	USSP	384	1955	--			3500 CY

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Penobscot	Carmel	USSP	385	1955	--			2500 CY
Penobscot	Carmel	USSP	386	?	--			3000 CY
Penobscot	Carmel	SWLF	213	--	1976	444831	0690411	Filled area is <1 AC
Penobscot	Charleston	LUST	95	--	--			B-171-84;2 PW POLD, 1 THND;3 MW POLD, 1 THND
Penobscot	Charleston	USSP	387	1963	--			?
Penobscot	Charleston	USSP	388	<1965	--			1500 CY
Penobscot	Charleston	SWLF	214	--	--	450431	0690413	Filled area is 1-5 AC
Penobscot	Chester	USSP	389	1981	--			1600 CY
Penobscot	Chester	SWLF	215	--	--	452413	0683126	Filled area is 1-5 AC
Penobscot	Clifton	USSP	390	1985	--			700 CY
Penobscot	Corinna	HZSS	23	--	--			Source Unknown; solvents; 6 PW POLD
Penobscot	Corinna	LUST	96	--	--			B-251-86; 1 PW POLD
Penobscot	Corinna	USSP	391	1960	--			3500 CY
Penobscot	Corinna	SWLF	216	--	--	445845	0691337	Filled area is 1-5 AC
Penobscot	Corinth	LUST	97	--	--			B-4-85; 1 PW POLD
Penobscot	Corinth	USSP	392	1976	--			800 CY
Penobscot	Corinth	USSP	393	1966	--			3000 CY
Penobscot	Corinth	SWLF	217	--	--	445802	0690000	Filled area is 1-5 AC
Penobscot	Dexter	HZSS	24	--	--			Manufacturing; solvents & metals; 5 MW POLD
Penobscot	Dexter	LUST	98	--	--			B-168-86; 1 PW POLD, 1 PW THND
Penobscot	Dexter	LUST	99	--	--			B-87-81; 1 PW POLD, 1 PW THND
Penobscot	Dexter	USSP	394	1967	--			?
Penobscot	Dexter	USSP	395	1964	--			3000 CY
Penobscot	Dexter	WWTL	21	1987	--			5 WWTL's; 14.2 AC
Penobscot	Dexter	SWLF	218	--	--	450115	0691610	Filled area is 5-10 AC
Penobscot	Dixmont	LUST	100	--	--			B-406-86; 1 PW POLD, 1 PW THND
Penobscot	Dixmont	USSP	396	?	--			1500 CY; 2 PW POLD
Penobscot	Dixmont	USSP	397	1980	--			200 CY
Penobscot	Dixmont	SWLF	219	--	--	444220	0691032	Filled area is 1-5 AC
Penobscot	Drew Pltn.	USSP	398	1962	--			400 CY
Penobscot	E. Millinocket	USSP	400	1971	--			2000 CY
Penobscot	E. Millinocket	USSP	401	1985	--			840 CY
Penobscot	East Millinocket	WWTL	22	1976	--			2 WWTL's; 27.0 AC
Penobscot	East Millinocket	SWLF	220	--	--	453756	0683507	Filled area is 1-5 AC
Penobscot	Eddington	LUST	101	--	--			B-239-85; 1 PW POLD, 1 PW THND
Penobscot	Eddington	USSP	402	1966	--			2500 CY
Penobscot	Eddington	USSP	403	?	--			?
Penobscot	Enfield	USSP	404	1966	--			11000 CY; 2 PW POLD, 9 THND
Penobscot	Enfield	USSP	405	?	--			2000 CY
Penobscot	Enfield	SWLF	221	--	--	451445	0683506	Filled area is 1-5 AC
Penobscot	Etna	LUST	102	--	--			B-103-85; 2 PW THND
Penobscot	Etna	USSP	406	?	--			?
Penobscot	Exeter	USSP	407	1970	--			3200 CY
Penobscot	Exeter	SWLF	222	--	--	445825	0691054	Filled area is 1-5 AC
Penobscot	Garland	USSP	407	1940	--			3000 CY
Penobscot	Garland	SWLF	223	--	--	450318	0690944	Filled area is 1-5 AC
Penobscot	Glenburn	USSP	409	1980	--			1000 CY
Penobscot	Glenburn	USSP	410	1972	--			2000 CY; 2 PW POLD, 9 THND; Covered in 1987
Penobscot	Glenburn	SWLF	224	--	--	445631	0685055	Filled area is 1-5 AC
Penobscot	Greenbush	USSP	411	1985	--			2200 CY
Penobscot	Greenbush	USSP	412	?	--			?
Penobscot	Greenbush	SWLF	225	--	--	450651	0683429	Filled area is 1-5 AC
Penobscot	Greenfield	LUST	103	--	--			B-153-86; 1 PW POLD, 4 PW THND
Penobscot	Greenfield	SWLF	226	--	--	450221	0682854	Filled area is <1 AC
Penobscot	Grindstone	USSP	413	1978	--			2000 CY
Penobscot	Hampden	LUST	104	--	--			B-149-85; 1 PW THND
Penobscot	Hampden	USSP	414	1960	--			3500 CY; 1 PW POLD, 2 THND; Covered in 1988
Penobscot	Hampden	SWLF	245	--	--	444607	685158	Filled area is >10 AC
Penobscot	Hermon	USSP	415	1945	--			3250 CY; Moved under cover in 1987
Penobscot	Hermon	SWLF	227	--	--			Filled area is 1-5 AC
Penobscot	Holden	USSP	416	1982	--			3600 CY
Penobscot	Howland	USSP	417	1985	--			800 CY
Penobscot	Howland	USSP	418	1952	--			1600 CY
Penobscot	Howland	SWLF	228	--	--	451405	0684238	Filled area is 5-10 AC
Penobscot	Hudson	USSP	419	1975	--			2000 CY
Penobscot	Hudson	SWLF	229	--	--	445935	0685818	Filled area is 1-5 AC
Penobscot	Indian 3 Twp	USSP	420	1974	--			400 CY
Penobscot	Kenduskeag	LUST	105	--	--			B-129-80; 3 PW POLD,2 THND; 2 MW POLD,3 POLD
Penobscot	Kenduskeag	LUST	106	--	--			B-32-86; 3 PW POLD, 3 PW THND
Penobscot	Kenduskeag	LUST	107	--	--			B-7-83; 1 PWS THND
Penobscot	Kenduskeag	USSP	421	1951	--			3000 CY
Penobscot	Kenduskeag	USSP	422	1960	--			1600 CY
Penobscot	Kenduskeag	SWLF	230	--	--	445355	0685654	Filled area is 1-5 AC
Penobscot	Lagrange	LUST	108	--	--			B-345-86; 3 PW POLD, 2 PW & 1 PWS THND

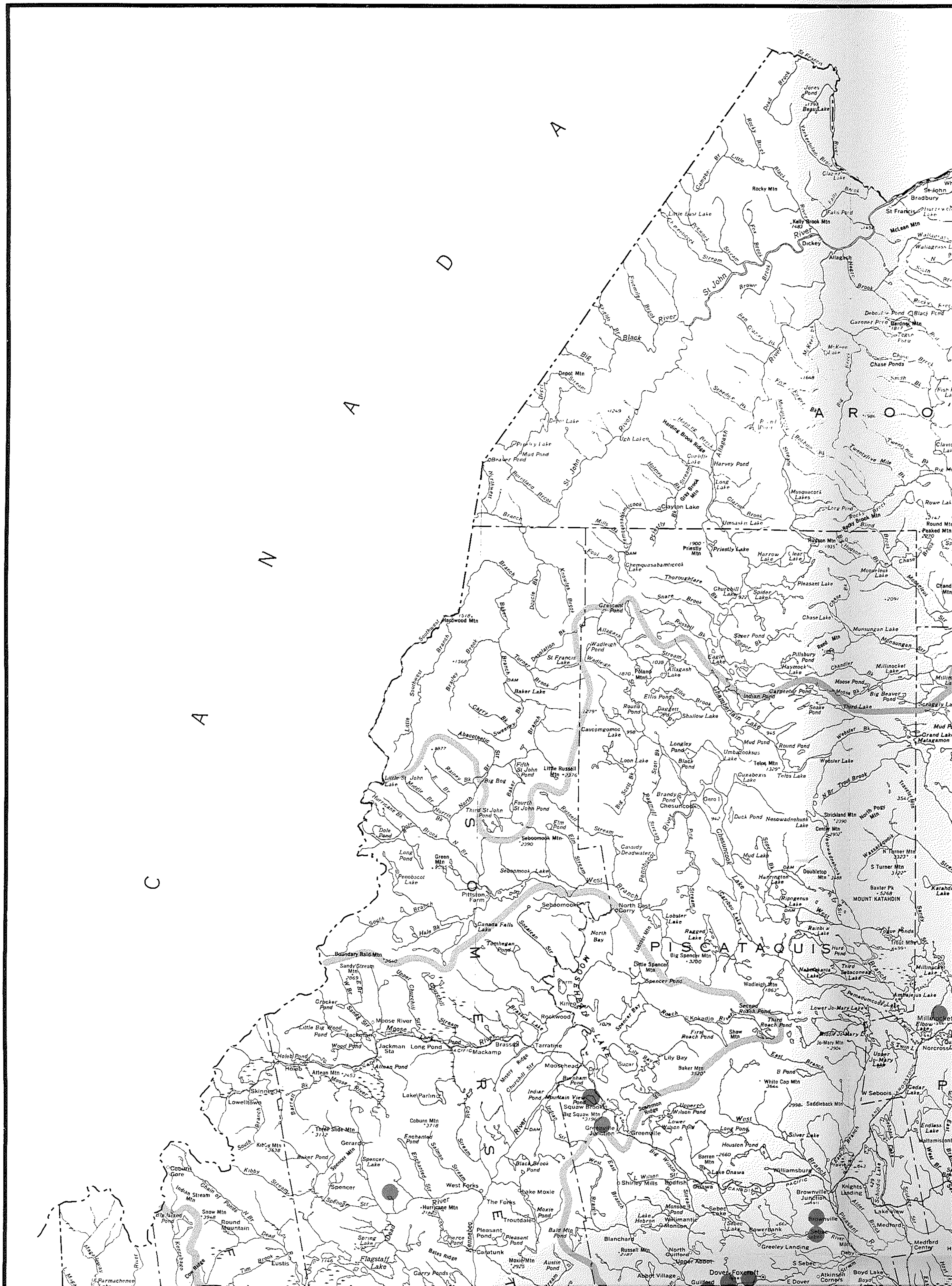
COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Penobscot	Lagrange	USSP	423	1960	--			2500 CY
Penobscot	LaGrange	USSP	424	1975	--			?
Penobscot	Lagrange	SWLF	231	--	--	451035	0685110	Filled area is 1-5 AC
Penobscot	Lee	LUST	109	--	--			B-112-82; 4 PW POLD, 3 PW THND; 10 MW POLD
Penobscot	Lee	USSP	425	1984	--			1000 CY
Penobscot	Lee	SWLF	232	--	--	452140	0681734	Filled area is 1-5 AC
Penobscot	Levant	LUST	110	--	--			B-99-84; 1 PW POLD, 2 PW THND
Penobscot	Levant	USSP	426	1952	--			2750 CY; 1 PW POLD, 2 THND; Covered in 1988
Penobscot	Levant	SWLF	248	--	--	445400	0690155	Filled area is 1-5 AC
Penobscot	Lincoln	USSP	427	1984	--			6000 CY; Site has 2 USSP
Penobscot	Lincoln	USSP	428	?	--			400 CY
Penobscot	Lincoln	USSP	429	?	--			200 CY
Penobscot	Lincoln	WWTL	23	1976	--			1 WWTL; 1.65 AC
Penobscot	Lincoln	SWLF	233	--	--	452206	0683210	Filled area is 1-5 AC
Penobscot	Long A	USSP	430	1968	--			?
Penobscot	Lowell	USSP	431	1962	--			800 CY
Penobscot	Mattawamkeag	SWLF	234	--	--	453058	0682041	Filled area is 1-5 AC
Penobscot	Maxfield	USSP	432	?	--			?
Penobscot	Medway	LUST	111	--	--			B-220-84; 1 PW POLD
Penobscot	Medway	USSP	433	?	--			?
Penobscot	Medway	USSP	434	?	--			?
Penobscot	Medway	SWLF	235	--	1978	453706	0683212	Filled area is 1-5 AC
Penobscot	Milford	USSP	435	?	--			?
Penobscot	Milford	SWLF	236	--	--	445637	0683405	Filled area is 1-5 AC
Penobscot	Millinocket	LUST	112	--	--			B-203-83; 1 PW POLD, 2 PW THND
Penobscot	Millinocket	USSP	436	?	--			Site has 2 USSP
Penobscot	Millinocket	USSP	437	?	--			?
Penobscot	Millinocket	WWTL	24	1973	--			3 WWTL's; 4.36 AC
Penobscot	Millinocket	WWTL	25	1976	--			1 WWTL; 6.0 AC
Penobscot	Millinocket	SWLF	237	--	--	454030	0684336	Filled area is 7 AC
Penobscot	Mt. Chase	USSP	438	1984	--			1200 CY; 1 PW POLD, 4 THND
Penobscot	Mt. Chase	USSP	439	?	--			?
Penobscot	Mt. Chase Plt.	SWLF	238	--	--	460525	0683253	Filled area is 1 AC
Penobscot	Newburgh	LUST	113	--	--			B-238-85; 1 PW POLD
Penobscot	Newburgh	USSP	440	1985	--			1400 CY
Penobscot	Newport	USSP	441	1981	--			120 CY
Penobscot	Newport	USSP	442	1978	--			2000 CY
Penobscot	Newport	SWLF	239	--	--	444914	0691633	Filled area is 5-10 AC
Penobscot	Old Town	LUST	114	--	--			B-537-86; 1 PW POLD, 2 PW THND
Penobscot	Old Town	USSP	443	1969	--			5000 CY
Penobscot	Old Town	USSP	444	1980	--			14 CY
Penobscot	Old Town	USSP	445	1970	--			100 CY
Penobscot	Old Town	USSP	446	1970	--			100 CY
Penobscot	Old Town	WWTL	26	1976	--			1 WWTL; 11.0 AC
Penobscot	Old Town	SWLF	240	--	--	444941	0684142	Filled area is 5-10 AC
Penobscot	Orono	LUST	115	--	--			B-198-84; 1 PWS THND
Penobscot	Orono	LUST	116	--	--			B-264-85; 1 PW THND
Penobscot	Orono	LUST	117	--	--			B-332-86; 1 PW POLD, 3 PW THND
Penobscot	Orono	USSP	447	1966	--			3500 CY
Penobscot	Orono	USSP	448	?	--			?
Penobscot	Orono	SWLF	241	--	--	445408	0684332	Filled area is 1-5 AC
Penobscot	Orrington	LUST	118	--	--			B-155-85; 4 PW THND
Penobscot	Orrington	USSP	449	<1975	--			2000 CY
Penobscot	Pasasadumkeag	SWLF	242	--	--	451207	0683552	Filled area is <1 AC
Penobscot	Passadumkeag	USSP	450	1980	--			700 CY; 1 PW POLD, 1 THND
Penobscot	Patten	USSP	451	1960	--			1450 CY
Penobscot	Patten	USSP	452	1971	--			2500 CY
Penobscot	Patten	SWLF	243	--	--	455934	0682602	Filled area is >10 AC
Penobscot	Plymouth	HZSS	25	--	--			Source Unknown; solvents & oil
Penobscot	Plymouth	LUST	119	--	--			B-497-86; 1 PW POLD, 9 PW THND
Penobscot	Plymouth	USSP	453	1963	--			8000 CY
Penobscot	Plymouth	USSP	454	1982	--			1550 CY
Penobscot	Plymouth	SWLF	244	--	--	444516	0691200	Filled area is 1 AC
Penobscot	Prentiss Plt.	USSP	455	1980	--			1900 CY
Penobscot	Springfield	USSP	456	1984	--			1000 CY; 1 PW POLD
Penobscot	Springfield	USSP	457	1968	--			4500 CY
Penobscot	Springfield	USSP	458	1984	--			500 CY
Penobscot	Springfield	SWLF	246	--	--	452632	0680702	Filled area is 1-5 AC
Penobscot	Stetson	USSP	459	1973	--			1898 CY
Penobscot	Stillwater	USSP	460	1980	--			500 CY
Penobscot	Veazie	USSP	461	<1945	--			640 CY; Site has 2 USSP
Penobscot	Veazie	SWLF	249	--	--	444941	0684206	Filled area is <1 AC
Penobscot	Webster Plt	USSP	462	1971	--			450 CY
Penobscot	Winn	LUST	120	--	--			B-508-86; 1 PW POLD

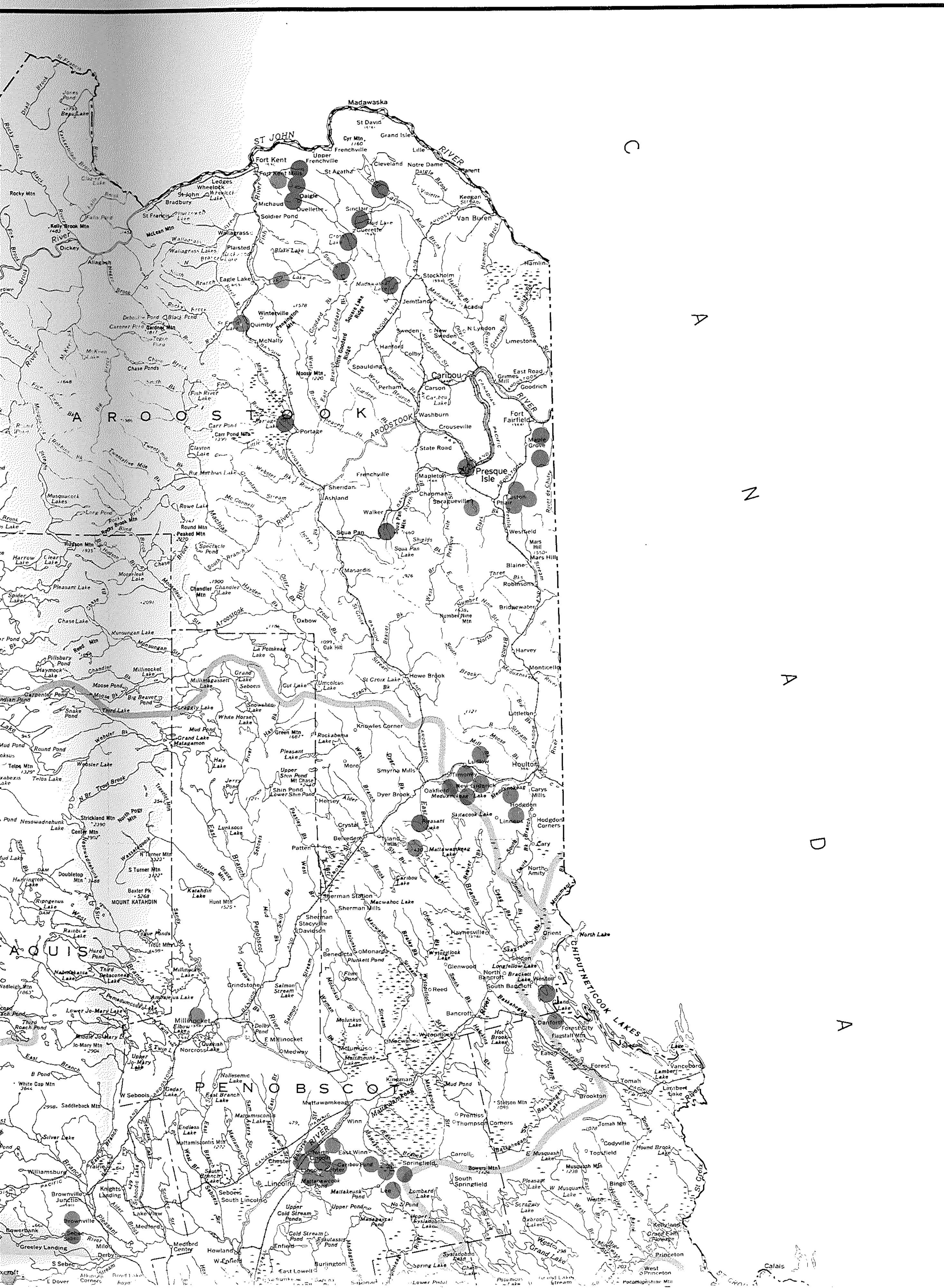
COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Penobscot	Winn	USSP	463	1963	--			6000 CY
Penobscot	Winn	SWLF	250	--	--			Filled area is 1-5 AC
Penobscot	Woodville	USSP	464	1978	--			1500 CY
Piscataquis	Abbot	USSP	465	1974	--			1300 CY
Piscataquis	Abbot	SWLF	251	--	--	451130	0692655	Filled area is 1-5 AC
Piscataquis	Atkinson	USSP	466	1965	--			1000 CY
Piscataquis	Bowerbank	USSP	467	1960	--			?
Piscataquis	Bowerbank	SWLF	252	--	--	451629	0691236	Filled area is 1-5 AC
Piscataquis	Brownville	USSP	468	1961	--			600 CY
Piscataquis	Brownville	USSP	469	1962	--			4000 CY
Piscataquis	Brownville	SWLF	254	--	1973	451802	0690131	Filled area is 2 AC
Piscataquis	Brownville Jct.	SWLF	253	--	1973	452058	0690259	Filled area is <1 AC
Piscataquis	Burbank Twp	USSP	470	1974	--			3500 CY
Piscataquis	Dover Foxcroft	USSP	471	1980	--			2000 CY
Piscataquis	Dover-Foxcroft	HZSS	26	--	--	451057	691300	Manufacturing; metals
Piscataquis	Dover-Foxcroft	LUST	121	--	--			B-265-85; 1 PW THND
Piscataquis	Dover-Foxcroft	SWLF	255	--	--	451206	0691220	Filled area is 5-10 AC
Piscataquis	Elliotsville Plt	USSP	472	1981	--			675 CY
Piscataquis	Greenville	USSP	473	1980	--			1500 CY
Piscataquis	Greenville	USSP	474	1960	--			2800 CY
Piscataquis	Greenville	WWTL	27	1979	--			5 WWTL's; 1.86 AC
Piscataquis	Greenville	SWLF	256	--	--	452846	0693333	Filled area is 1-5 AC
Piscataquis	Guilford	USSP	475	1961	--			4500 CY
Piscataquis	Guilford	USSP	476	1969	--			1200 CY
Piscataquis	Guilford	USSP	477	1968	--			1800 CY
Piscataquis	Guilford	WWTL	28	1988	--			4 WWTL's; 9.6 AC
Piscataquis	Hartford's Point	LUST	122	--	--			B-139-85; 1 PW THND
Piscataquis	Lakeview Plt.	SWLF	257	--	--	451914	0685526	Filled area is 1-5 AC
Piscataquis	Lily Bay Twp.	SWLF	258	--	--	453343	0693240	Filled area is 1-5 AC
Piscataquis	Milo	USSP	478	?	--			?
Piscataquis	Milo	USSP	479	?	--			?
Piscataquis	Milo	SWLF	259	--	--	451632	0685927	Filled area is 1-5 AC
Piscataquis	Monson	USSP	480	1964	--			2500 CY
Piscataquis	Monson	SWLF	260	--	--	451737	0692947	Filled area is 1-5 AC
Piscataquis	Parkman	USSP	481	1963	--			1185 CY
Piscataquis	Parkman	SWLF	261	--	1979	450913	0692326	Filled area is 1 AC
Piscataquis	Sangerville	LUST	123	--	--			B-143-86; 1 PW POLD
Piscataquis	Sangerville	USSP	482	1975	--			2500 CY
Piscataquis	Sangerville	USSP	483	?	--			?
Piscataquis	Sangerville	SWLF	262	--	--	450837	0692041	Filled area is 1-5 AC
Piscataquis	Sebec	USSP	484	1975	--			1000 CY
Piscataquis	Sebec	SWLF	263	--	--	451643	0690546	Filled area is 1-5 AC
Piscataquis	Shirley	USSP	485	1970	--			4000 CY
Piscataquis	Shirley	USSP	486	1970	--			300 CY
Piscataquis	Shirley	SWLF	264	--	--	452212	0693622	Filled area is <1 AC
Piscataquis	T-AR12	USSP	487	1985	--			1500 CY
Piscataquis	T2R10-Abol	USSP	488	1974	--			3850 CY
Piscataquis	T2R10-Horserace	USSP	489	1974	--			2000 CY; Near West Branch Penobscot R.
Piscataquis	T3R14	USSP	490	1974	--			400 CY
Piscataquis	T4R11	USSP	491	1974	--			2000 CY
Piscataquis	T5R11	USSP	492	1974	--			200 CY
Piscataquis	Wellington	USSP	493	?	--			?
Piscataquis	Wellington	USSP	494	?	--			1000 CY
Piscataquis	Willimantic	SWLF	265	--	--	451757	0692250	Filled area is 1-5 AC
Piscataquis	Willimantic	SWLF	266	--	--	451826	0692301	Filled area is 2 AC
Sagadahoc	Bath	USSP	495	1965	--			3000 CY
Sagahahoc	Bath	HZSS	27	--	--			Landfill; solvents & metals; 11 PW POLD
Sagahahoc	Bath	HZSS	28	--	--			Manufacturing; phenols
Sagadahoc	Bath	SWLF	267	--	--	435624	0694932	Filled area is 35 AC
Sagadahoc	Bowdoin	USSP	496	1974	--			1372 CY
Sagadahoc	Bowdoinham	LUST	124	--	--			P-211-84; 1 PW POLD, 1 PW THND
Sagadahoc	Bowdoinham	USSP	497	<1960	--			2000 CY; Near Cathance R. (tidal)
Sagadahoc	Bowdoinham	SWLF	268	--	--	440138	0695257	Filled area is 1-5 AC
Sagadahoc	Georgetown	USSP	498	1977	--			1000 CY
Sagadahoc	Georgetown	SWLF	269	--	--	434802	0694521	Filled area is 5 AC
Sagadahoc	Phippsburg	LUST	125	--	--			P-34-86; 1 PW POLD
Sagadahoc	Phippsburg	LUST	126	--	--			P-384-86; 1 PW POLD, 3 PW THND
Sagadahoc	Phippsburg	LUST	127	--	--			P-517-86; 2 PW POLD, 2 PW THND
Sagadahoc	Phippsburg	USSP	499	?	--			1600 CY
Sagadahoc	Phippsburg	SWLF	270	--	--	434720	0694930	Filled area is 5 AC
Sagadahoc	Richmond	USSP	500	1956	--			6000 CY
Sagadahoc	Richmond	USSP	501	1983	--			3800 CY
Sagadahoc	Richmond	SWLF	271	--	--	440602	0694758	Filled area is 1-5 AC
Sagadahoc	Topsham	USSP	502	1971	--			6000 CY

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Sagadahoc	Topsham	USSP	503	1927	--			2500 CY
Sagadahoc	Topsham	SWLF	272	--	--	435606	0695520	Filled area is 15 AC
Sagadahoc	W. Bath	USSP	504	1970	--			1700 CY
Sagadahoc	Woolwich	USSP	505	1982	--			1500 CY
Sagadahoc	Woolwich	USSP	506	1982	--			500 CY
Sagadahoc	Woolwich	USSP	507	1979	--			500 CY
Sagadahoc	Woolwich	SWLF	273	--	--	435551	0694808	Filled area is 15 AC
Somerset	Anson	USSP	508	1960	--			1500 CY
Somerset	Anson	SWLF	274	--	--	445040	0695203	Filled area is 1-5 AC
Somerset	Anson-Madison	WWTL	29	1975	--			AC 2 WWTL's; 8.0 AC
Somerset	Athens	LUST	128	--	--			B-176-85; 1 PW POLD
Somerset	Athens	USSP	509	1946	--			1100 CY
Somerset	Athens	USSP	511	1961	--			3000 CY
Somerset	Athens	SWLF	275	--	--	445757	0693810	Filled area is 1-5 AC
Somerset	Big Six Twp	USSP	511	1981	--			250 CY
Somerset	Bingham	USSP	512	1975	--			3000 CY; Site has 2 USSP
Somerset	Bradford	LUST	129	--	--			B-123-82; 1 PW POLD
Somerset	Brighton	USSP	513	1976	--			2000 CY
Somerset	Brighton Plt.	SWLF	276	--	--	450242	0694107	Filled area is <1 AC
Somerset	Brighton Plt.	SWLF	277	--	--	450225	0694127	Filled area is 2 AC
Somerset	Cambridge	LUST	130	--	--			B-5-86; 1 PW POLD, 1 PW THND
Somerset	Cambridge	LUST	131	--	--			B-6-86; 1 PW POLD
Somerset	Cambridge	USSP	514	1984	--			600 CY
Somerset	Cambridge	SWLF	278	--	--	450214	0692803	Filled area is 1-5 AC
Somerset	Canaan	USSP	515	1965	--			2000 CY
Somerset	Canaan	USSP	516	1975	--			2000 CY
Somerset	Canaan	USSP	517	?	--			Near Twelvemile Bk.
Somerset	Canaan	SWLF	279	--	--	444952	0693601	Filled area is 2 AC
Somerset	Concord Twp./Bin	SWLF	280	--	--	450106	0695203	Filled area is 1-5 AC
Somerset	Cornville	USSP	518	1983	--			2062 CY
Somerset	Cornville	SWLF	281	--	--	444959	0693919	Filled area is 1-5 AC
Somerset	Detroit	USSP	519	1945	--			1100 CY
Somerset	Dixfield	SWLF	282	--	--	443147	0702420	Filled area is 2 AC
Somerset	Dole Brook Twp.	USSP	520	1974	--			250 CY
Somerset	Embden	USSP	521	?	--			2000 CY
Somerset	Fairfield	USSP	522	1966	--			11000 CY
Somerset	Fairfield	USSP	523	?	--			?
Somerset	Fairfield	SWLF	283	--	--	443554	0693610	Filled area is >10 AC
Somerset	Harmony	USSP	524	1981	--			1650 CY
Somerset	Harmony	SWLF	284	--	--	445958	0693422	Filled area is <1 AC
Somerset	Harmony	SWLF	285	--	--	445908	0693328	Filled area is 2 AC
Somerset	Hartland	USSP	525	1939	--			1000 CY
Somerset	Hartland	SWLF	286	--	--	445329	0692848	Filled area is 1-5 AC
Somerset	Highland Plt	USSP	526	1985	--			750 CY
Somerset	Highland Plt.	SWLF	287	--	--	450314	0700441	Filled area is <1 AC
Somerset	Jackman	USSP	527	1964	--			4500 CY
Somerset	Jackman	USSP	528	1969	--			400 CY
Somerset	Jackman	SWLF	288	--	--	453836	0701346	Filled area is 1-5 AC
Somerset	Madison	USSP	529	?	--			?
Somerset	Madison	SWLF	289	--	--	444550	0695244	Filled area is 2 AC
Somerset	Mayfield Twp.	USSP	530	?	--			?
Somerset	Mercer	USSP	531	?	--			?
Somerset	Mercer	USSP	532	?	--			?
Somerset	Mercer	SWLF	290	--	--	444157	0695544	Filled area is 1-5 AC
Somerset	Moscow	USSP	533	1979	--			?
Somerset	Moscow	USSP	534	1968	--			?
Somerset	New Portland	SWLF	291	--	--	445426	0700312	Filled area is 2 AC
Somerset	Norridgewock	LUST	132	--	--			A-427-86; 1 PW POLD, 1 PW THND
Somerset	Norridgewock	USSP	535	<1965	--			?
Somerset	Norridgewock	SWLF	292	--	--	444314	0694856	Filled area is 15 AC
Somerset	North Anson	USSP	536	1965	--			1200 CY
Somerset	Palmyra	USSP	537	1978	--			600 CY
Somerset	Parlin Pond	SWLF	293	--	--	453118	0700545	Filled area is 2 AC
Somerset	Pittsfield	HZSS	29	--	--			Manufacturing; solvents
Somerset	Pittsfield	USSP	538	1964	--			5500 CY
Somerset	Pittsfield	USSP	539	1967	--			2000 CY
Somerset	Pittsfield	WWTL	30	1978	--			AC 2 WWTL's; 68.87 AC
Somerset	Pittsfield	SWLF	294	--	--	444553	0692125	Filled area is 1-5 AC
Somerset	Pleas.Ridge Plt	USSP	540	1940	--			1450 CY
Somerset	Pleasant Ridge P	SWLF	295	--	--	450403	0695628	Filled area is <1 AC
Somerset	Ripley	USSP	541	1962	--			1600 CY
Somerset	Rockwood	USSP	542	1967	--			2000 CY; 2PW POLD, 9 THND; Covered in 1985
Somerset	Rockwood	USSP	543	1985	--			100 CY; Covered in 1985
Somerset	Rockwood Strip	SWLF	296	--	--	453904	0694534	Filled area is 1-5 AC

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Somerset	Skowhegan	LUST	133	--	--			B-5-82; 1 PW POLD
Somerset	Skowhegan	USSP	544	<1950	--			5000 CY
Somerset	Skowhegan	USSP	545	1983	--			3000 CY
Somerset	Skowhegan	WWTL	31	1976	--			AC 3 WWTL's; 23.1 AC
Somerset	Skowhegan	SWLF	297	--	--	444759	0694308	Filled area is 5-10 AC
Somerset	Smithfield	USSP	546	1960	--			2500 CY; 1 PW POLD
Somerset	Smithfield	SWLF	298	--	--	443957	0694956	Filled area is <1 AC
Somerset	Solon	USSP	547	1967	--			4000 CY
Somerset	Solon	USSP	548	1962	--			1000 CY
Somerset	Solon	SWLF	299	--	--	445442	0695052	Filled area is 1-5 AC
Somerset	St. Albans	USSP	549	1950	--			2500 CY
Somerset	St. Albans	SWLF	300	--	--	445416	0692451	Filled area is 1-5 AC
Somerset	Starks	LUST	134	--	--			A-152-85; 2 PW POLD
Somerset	Starks	USSP	550	1965	--			2000 CY
Somerset	Starks	SWLF	301	--	--	444438	0695756	Filled area is 1-5 AC
Somerset	T2 R7	USSP	551	1985	--			2000 CY
Somerset	T2R6	USSP	552	1977	--			4000 CY
Somerset	T4R18	USSP	553	1974	--			3750 CY; Near North Branch Penobscot R.
Somerset	T5R17	USSP	554	1979	--			1500 CY
Somerset	T6 R17 WELS	LUST	135	--	--			B-2-86; 1 PW THND
Somerset	The Forks	SWLF	302	--	--	452025	0695736	Filled area is 1-5 AC
Somerset	West Forks	LUST	136	--	--			B-263-86 & B-463-86; 3PW&1PWS POLD,10 PW THN
Somerset	West Forks	USSP	555	1964	--			3000 CY
Waldo	Belfast	LUST	137	--	--			B-131-85; 1 PW THND
Waldo	Belfast	LUST	138	--	--			B-134-85; 1 PW THND
Waldo	Belfast	LUST	139	--	--			B-59-80; 2 PW POLD
Waldo	Belfast	USSP	556	1965	--			2000 CY
Waldo	Belfast	SWLF	303	--	--	442511	0690406	Filled area is 5-10 AC
Waldo	Belmont	USSP	557	?	--			1500 CY
Waldo	Brooks	LUST	140	--	--			B-25-85; 5 PW POLD, 3 PW THND
Waldo	Brooks	USSP	558	1956	--			3000 CY
Waldo	Brooks	USSP	559	1964	--			1500 CY
Waldo	Brooks	SWLF	304	--	--	443316	0690600	Filled area is 1-5 AC
Waldo	Frankfort	USSP	560	1974	--			2000 CY
Waldo	Freedom	LUST	141	--	--			A-130-84; 1 PW THND
Waldo	Freedom	USSP	561	1978	--			1400 CY
Waldo	Freedom	SWLF	305	--	--	442956	0691914	Filled area is 1-5 AC
Waldo	Islesboro	USSP	562	1976	--			2800 CY
Waldo	Islesboro	SWLF	306	--	--	442239	0685231	Filled area is 1-5 AC
Waldo	Jackson	USSP	563	?	--			1500 CY
Waldo	Knox	USSP	564	1959	--			3000 CY; 2 PW POLD, 1 PWS THND
Waldo	Knox	USSP	565	1983	--			1500 CY
Waldo	Liberty	USSP	566	?	--			1200 CY
Waldo	Liberty	SWLF	307	--	--	442333	0692256	Filled area is 1-5 AC
Waldo	Lincolnville	USSP	567	1970	--			2750 CY; 1 PW POLD, 1 PWS THND
Waldo	Monroe	USSP	568	1965	--			3000 CY
Waldo	Monroe	SWLF	308	--	--	443712	0690036	Filled area is 1-5 AC
Waldo	Montville	USSP	569	1985	--			2500 CY
Waldo	Montville	USSP	570	1972	--			3500 CY; 2 PW POLD; Covered in 1985
Waldo	Montville	SWLF	309	--	--	442525	0691957	Filled area is 1-5 AC
Waldo	Morrill	USSP	571	1966	--			800 CY
Waldo	Northport	LUST	142	--	--			A-91-84; 1 PW POLD
Waldo	Northport	USSP	572	1938	--			3500 CY
Waldo	Northport	USSP	573	1960	--			700 CY
Waldo	Northport	SWLF	310	--	--	441935	0685847	Filled area is 2 AC
Waldo	Palermo	USSP	574	1978	--			1800 CY
Waldo	Prospect	USSP	575	1965	--			1800 CY; 1 PW POLD, 1 THND
Waldo	Prospect	SWLF	311	--	--	443257	0685241	Filled area is <1 AC
Waldo	Searsmont	LUST	143	--	--			A-416-86; 2 PW POLD
Waldo	Searsmont	USSP	576	1982	--			2000 CY
Waldo	Searsmont	SWLF	312	--	--	442129	0690803	Filled area is 1-5 AC
Waldo	Searsport	UPSP	579	?	--			On pad next to ocean
Waldo	Searsport	USSP	577	1961	--			3500 CY
Waldo	Searsport	USSP	578	1978	--			2000 CY
Waldo	Searsport	SWLF	313	--	--	442716	0685738	Filled area is 5-10 AC
Waldo	Stockton Springs	USSP	580	1948	--			2400 CY
Waldo	Swanville	LUST	144	--	--			B-85-82; 2 PW POLD, 1 PW THND
Waldo	Swanville	USSP	581	<1960	--			2000 CY
Waldo	Swanville	SWLF	314	--	--	442915	0690025	Filled area is 1-5 AC
Waldo	Thorndike	USSP	582	1964	--			3000 CY
Waldo	Troy	USSP	583	1971	--			1500 CY
Waldo	Unity	USSP	584	1955	--			2000 CY
Waldo	Unity	USSP	585	1950	--			1500 CY
Waldo	Unity	WWTL	32	1974	--			AC 2 WWTL's; 1.50 AC

COUNTY	TOWN	TYPE	ID #	BEGAN	STOP	LAT	LONG	REMARKS
Waldo	Unity	SWLF	315	--	--	443512	0691726	Filled area is 1-5 AC
Waldo	Waldo	USSP	586	?	--			1000 CY
Waldo	Waldo	SWLF	316	--	--	442750	0690850	Filled area is 1-5 AC
Waldo	Winterport	USSP	587	1976	--			6000 CY
Waldo	Winterport	USSP	588	1953	--			2000 CY
Waldo	Winterport	SWLF	317	--	--	443759	0685222	Filled area is 1-5 AC


C A N A D A
A R O O
P I S C A T A Q U I S
S O M E R S E T
MOUNT KATAHDIN
Baxter Pk
St Francis
Allagash
Dickey
St John
Chamberlain Lake
Chesuncook
Moosehead Lake
Greenville
Greenville Junction
Rockwood
Kineo
Jackman Sta
Jackman
Moose River
Long Pond
Mackamp
Tarratine
Lily Bay
Seboomook
Pittston Farm
Canada Falls Lake
Boundary Bald Mtn
Big Spencer Mtn
Spencer Pond
Telos Lake
Munsungan Lake
Millinocket
Brownville
Brownville Junction
Williamsburg
Monson
Shirley Mills
Blanchard
Dover-Foxcroft
Abbot Village
Guilford
Sebec Lake
Coburn Gore
The Forks
West Forks
Flagstaff Lake
Eustis
Caratunk
Bingham


C A N A D A
A R O O S T O O K
P E N O B S C O T
AQUIS
ST JOHN RIVER
Madawaska
St David
Grand Isle
Frenchville
Upper Frenchville
Fort Kent
Fort Kent Mills
St Agatha
Cleveland
Notre Dame
Van Buren
Keegan
Wallagrass
Eagle Lake
Soldier Pond
Michaud
Daigle
Sinclair
Stockholm
Jemtland
Acadia
Hamlin
Limestone
New Sweden
Caribou
Washburn
Fort Fairfield
Maple Grove
Crouseville
Presque Isle
Easton
Mapleton
Ashland
Portage
Squa Pan
Masardis
Mars Hill
Blaine
Bridgewater
Oxbow
Monticello
Littleton
Houlton
Ludlow
New Limerick
Oakfield
Smyrna Mills
Dyer Brook
Patten
Linneus
Hodgdon
Cary
Sherman Station
Sherman Mills
Haynesville
Weston
Danforth
Millinocket
Mattawamkeag
Winn
Chester
Lincoln
Springfield
Brownville
Brownville Junction
Greeley Landing
Medford Center
Howland
Calais
Princeton
Vanceboro
CHIPUTNETICOOK LAKES
Grand Lake
Brooktom
Baxter Pk
MOUNT KATAHDIN
Pemadumcook Lake
Moosehead

Department of Environmental Protection
State of Maine

IMPACTS OF NON-POINT POLLUTION ON DESIGNATED USES OF LAKES
June 1989

10 0 10 20 30 40 Mi.

EXPLANATION

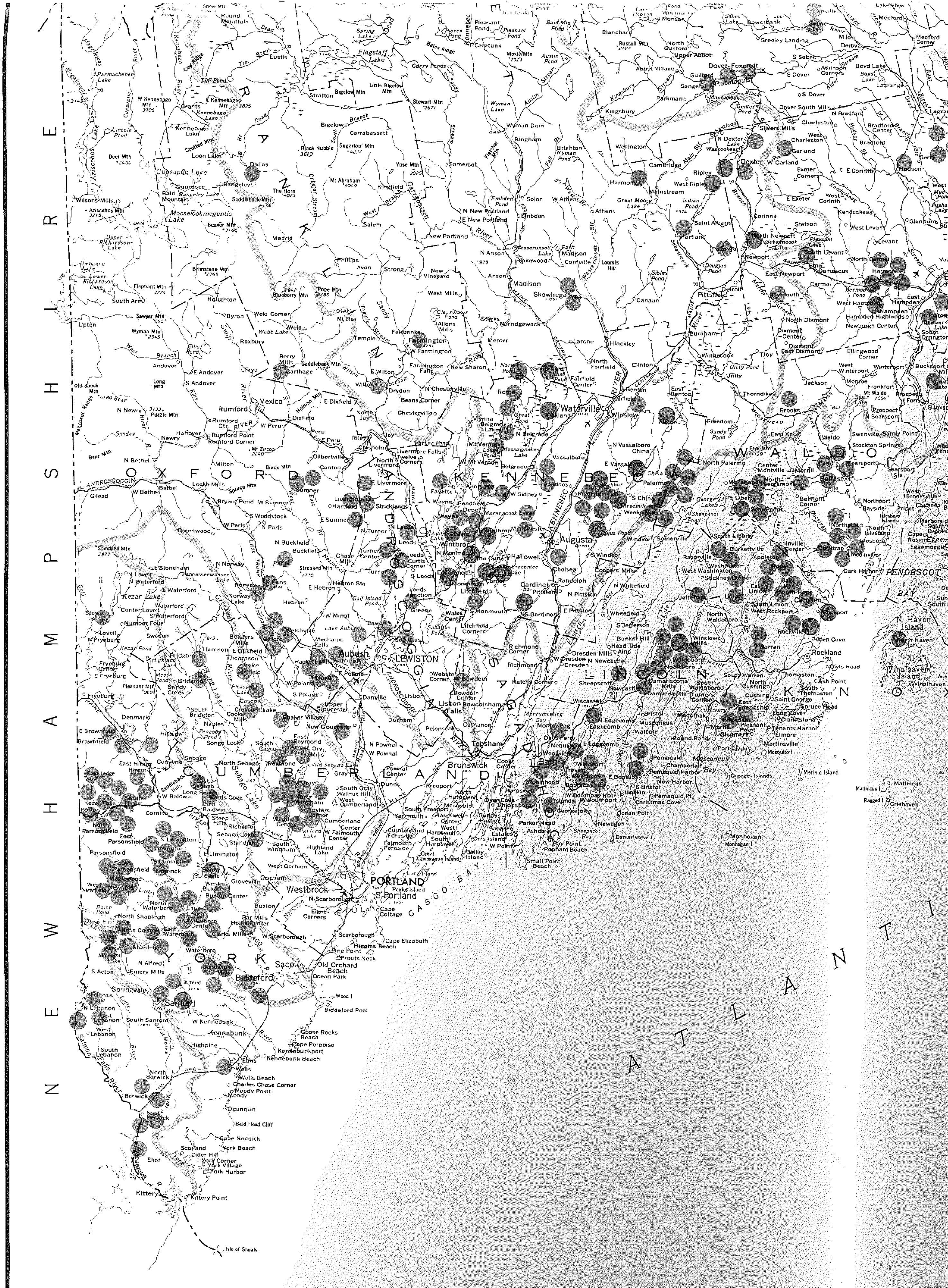
- One or more designated uses not supported
- Designated uses supported but threatened

NOTES: All other lakes are assumed or known to support designated use.

Maps developed from monitoring data, public input, agency information and other available data. Maps are meant for general planning purposes only.

Cartography by Susan S. Tolman
Base from U.S. Geological Survey

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1976
MAINE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Y O R K
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W A L D O
A T L A N T I
PORTLAND
LEWISTON
Auburn
Augusta
Waterville
Brunswick
Bath
Biddeford
Saco
Sanford
Westbrook
Gardiner
Hallowell
Skowhegan
Farmington
Rumford
Belfast
Rockland
Camden
Kittery
GASCO BAY
PENOBSCOT BAY
ANDROSCOGGIN
Sebago Lake
Flagstaff Lake
Dover-Foxcroft
Monhegan

C A N A D A
A R O O
P I S C A T A Q U I S
S O M E R S E T
MOOSEHEAD LAKE
St John River
Chamberlain Lake
Chesuncook Lake
MOUNT KATAHDIN
Seboomook Lake
Jackman
Greenville
Rockwood
Kineo
Dover-Foxcroft
Monson
Brownville Junction
Millinocket
Allagash
Dickey
St Francis
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The Forks
Eustis
Flagstaff Lake
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Moosehead
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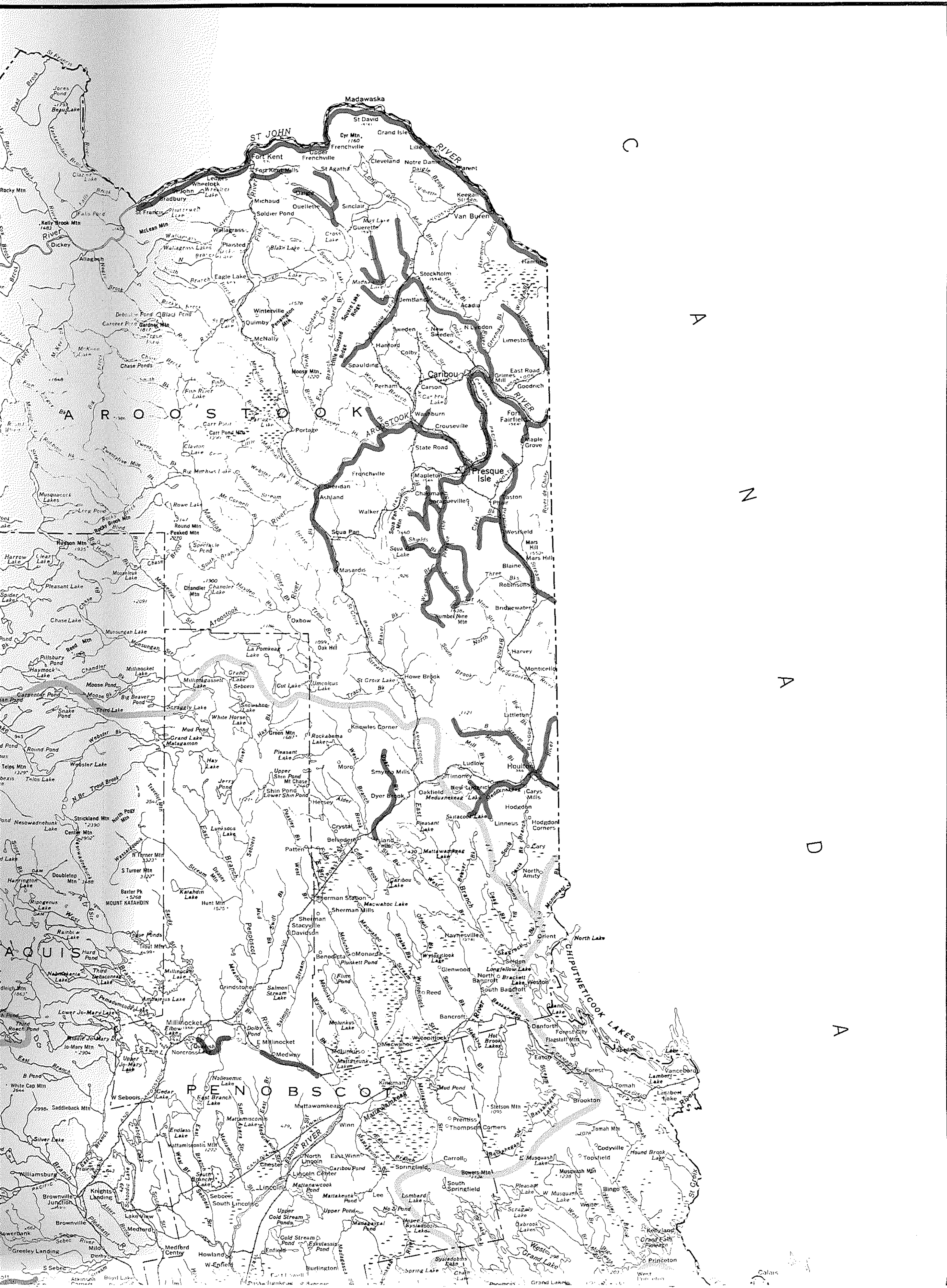
Umbazooksus Lake
Churchill Lake
Munsungan Lake


CANADA
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PENOBSCOT
ST JOHN RIVER
AROOSTOOK RIVER
CHIPUTNETICOOK LAKES
Madawaska
Fort Kent
Frenchville
Van Buren
Caribou
Presque Isle
Washburn
Ashland
Masardis
Fort Fairfield
Mars Hill
Houlton
Patten
Sherman Station
Danforth
Millinocket
Medway
Mattawamkeag
Lincoln
Brownville Junction
Brownville
Milo
Howland
Medford
Princeton
Vanceboro
Sherman Mills
Island Falls
Oakfield
Dyer Brook
Smyrna Mills
Limestone
Stockholm
Portage
Allagash
Dickey
St Francis
Eagle Lake
Wallagrass
Monticello
Bridgewater
Blaine
Easton
Mapleton
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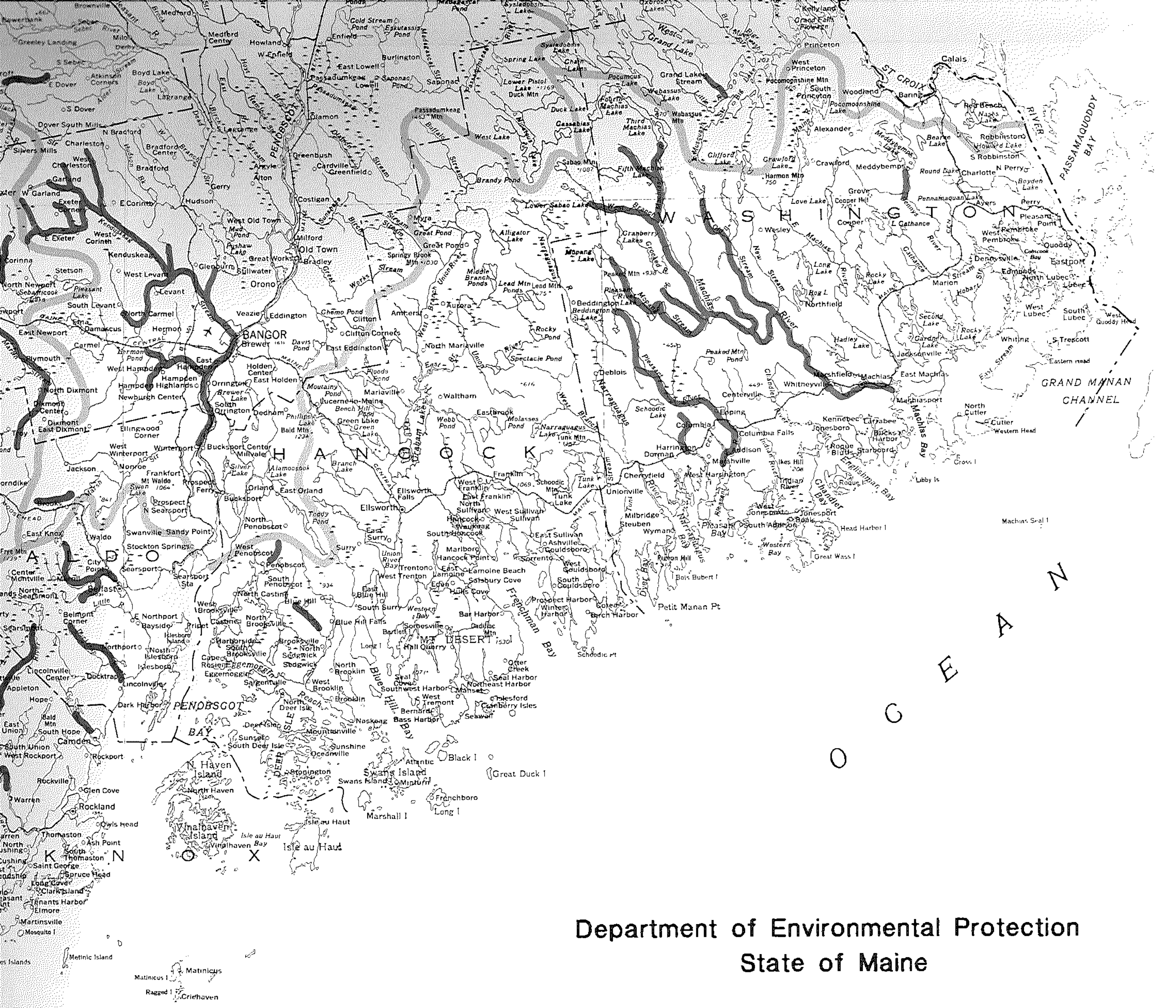
Linneus
Weston
Bancroft
Kingman
Winn
Chester
Springfield
Enfield
Burlington
Lee
MOUNT KATAHDIN



Department of Environmental Protection
State of Maine

IMPACTS OF NON-POINT POLLUTION ON DESIGNATED USES OF RIVERS
June 1989

10 0 10 20 30 40 Mi

EXPLANATION

One or more designated uses not supported

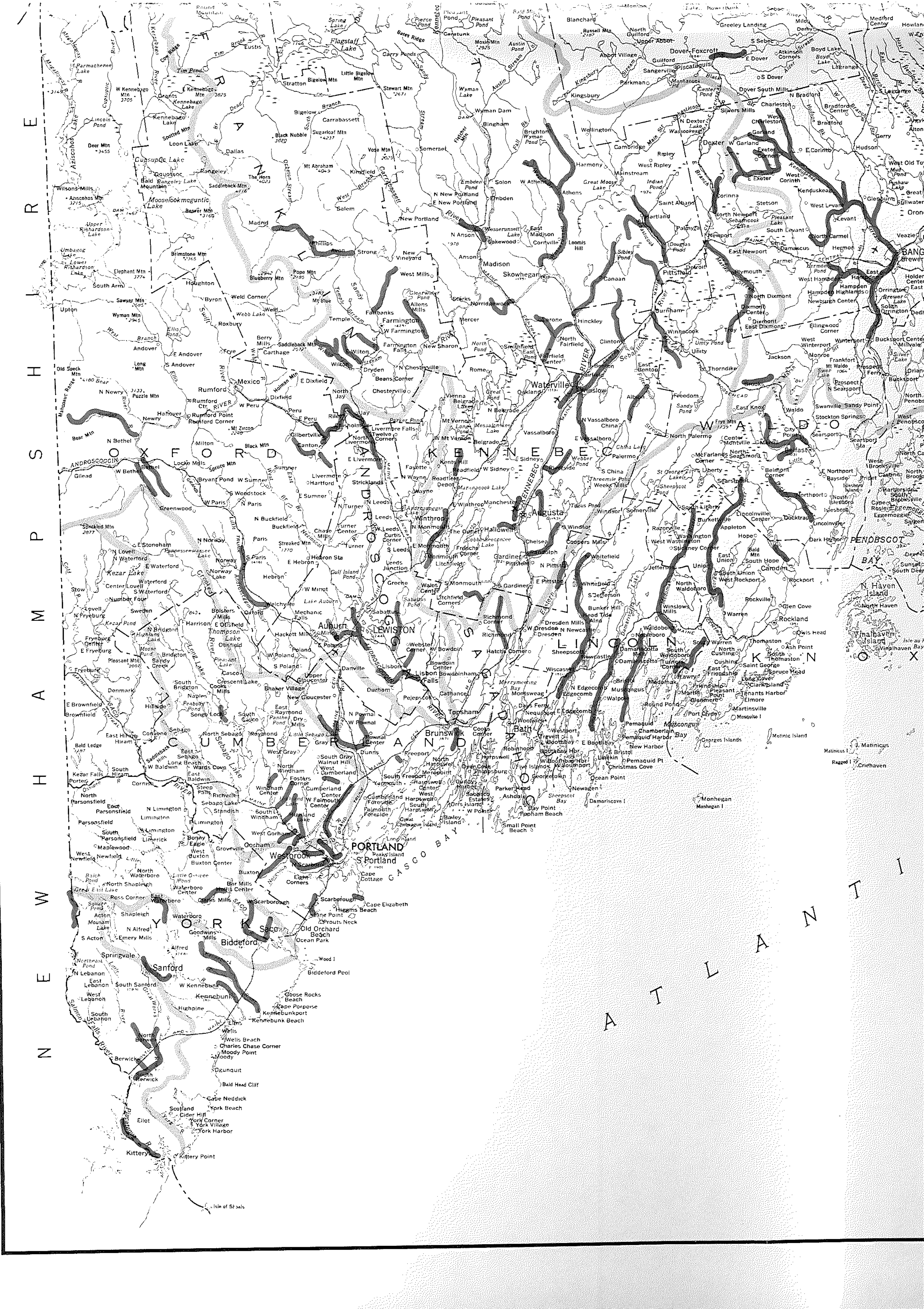
Designated uses supported but threatened

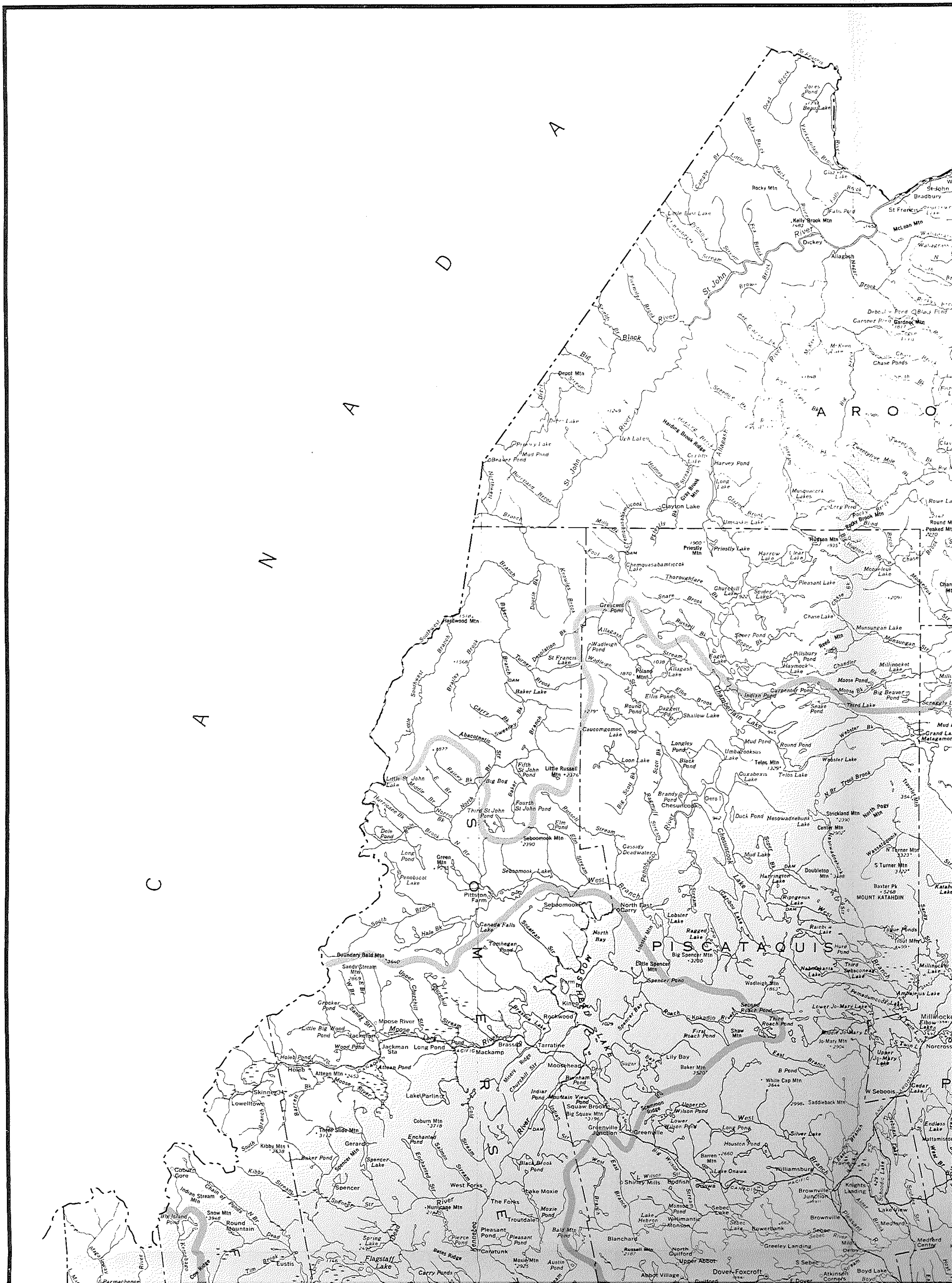
NOTES: All other rivers assumed or known to support designated use.

Maps developed from monitoring data, public input, agency information and other available data. Maps are meant for general planning purposes only.

Cartography by Susan S. Tolman
Base from U.S. Geological Survey

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1976
MAINE


NEW HAMPSHIRE
FRANKLIN
OXFORD
ANDROSCOGGIN
KENNEBEC
SAGADAHOC
LINCOLN
KNOX
WALDO
CUMBERLAND
YORK
ATLANTIC
PORTLAND
LEWISTON
Auburn
Augusta
Waterville
Brunswick
Bath
Biddeford
Saco
Sanford
Kennebunk
Kittery
Rumford
Farmington
Skowhegan
Belfast
Camden
Rockland
Dover-Foxcroft
Dexter
Pittsfield
Westbrook
Gardiner
Hallowell
Winthrop
Norway
Bethel
Bridgton
Wiscasset
Damariscotta
Waldoboro
Thomaston
Searsport
Bucksport
Guilford
Madison
Wilton
Mexico
Old Orchard Beach
Kennebunkport
Ogunquit
York Harbor
Boothbay Harbor
Topsham
Lisbon Falls
Gorham
Freeport
Yarmouth
Sebago Lake
Rangeley Lake
Flagstaff Lake
Mooselookmeguntic Lake
Kezar Lake
CASCO BAY
PENOBSCOT BAY
Monhegan
Matinicus
Vinalhaven Island
Isle of Shoals



C A N A D A
A R O O
P I S C A T A Q U I S
S O M E R S E
St Francis
Jones Pond
Beau Lake
St John
Bradbury
McLean Mtn
Kelly Brook Mtn
Dickey
Allagash
Rocky Mtn
Little East Lake
St John River
Black River
Big Black
Depot Mtn
Chase Ponds
Harvey Pond
Clayton Lake
Umsaskis Lake
Musquacook Lakes
Rocky Brook Mtn
Round Mtn
Peaked Mtn
Priestly Mtn
Priestly Lake
Hudson Mtn
Harrow Lake
Clear Lake
Chemquasabamticook Lake
Thoroughfare
Churchill Lake
Spider Lake
Pleasant Lake
Snare Brook
Crescent Pond
Chase Lake
Munsungan Lake
Hardwood Mtn
Desolation
St Francis Lake
Wadleigh Pond
Allagash Lake
Allagash Stream
Eagle Lake
Pillsbury Pond
Haymock Lake
Reed Mtn
Chandler
Millinocket Lake
Moose Pond
Big Beaver Pond
Indian Pond
Carpenter Pond
Snake Pond
Third Lake
Baker Lake
Ellis Ponds
Shallow Lake
Chamberlain Lake
Caucomgomoc Lake
Mud Pond
Round Pond
Telos Mtn
Telos Lake
Webster Lake
Webster Bk
Grand Lake Matagamon
Little St John Lake
Big Bog
Fifth St John Pond
Little Russell Mtn
Fourth St John Pond
Third St John Pond
Loon Lake
Black Pond
Longley Pond
Umbazooksus Lake
Cuxabexis Lake
Brandy Pond
Chesuncook
Gero I
Duck Pond
Nesowadnehunk Lake
Strickland Mtn
North Pogy Mtn
Center Mtn
Seboomook Mtn
Dole Pond
Long Pond
Green Mtn
Penobscot Lake
Seboomook Lake
Cassidy Deadwater
Chesuncook Lake
Mud Lake
Harrington Lake
Doubletop Mtn
N Turner Mtn
S Turner Mtn
Baxter Pk
MOUNT KATAHDIN
Ripogenus Lake
Pittston Farm
Seboomook
North East Carry
Lobster Lake
Ragged Lake
Rainbow Lake
Canada Falls Lake
Socatean Str
Toothegan Pond
North Bay
Big Spencer Mtn
Little Spencer Mtn
Spencer Pond
Boundary Bald Mtn
Sandy Stream Mtn
Third Debsconeag Lake
Wadleigh Mtn
Pemadumcook Lake
Ambajejus Lake
Millinocket
Crocker Pond
Kineo
Rockwood
Moose River
Jackman
Jackman Sta
Long Pond
Mackamp
Brassua
Tarratine
Little Big Wood Pond
Wood Pond
Holeb
Attean Mtn
Attean Pond
MOOSEHEAD LAKE
Spencer Bay
Roach
Kokadjo
First Roach Pond
Second Roach Pond
Third Roach Pond
Shaw Mtn
Lower Jo-Mary Lake
Middle Jo-Mary L
Jo-Mary Mtn
Upper Jo-Mary Lake
Norcross
Elbow Lake
Lily Bay
Baker Mtn
B Pond
White Cap Mtn
Saddleback Mtn
Moosehead
Burnham Pond
Mountain View Pond
Squaw Brook
Big Squaw Mtn
Indian Pond
Lake Parlin
Misery Ridge
Skinner
Lowelltown
Scammon Ridge
Upper Wilson Pond
Lower Wilson Pond
Greenville Junction
Greenville
Long Pond
Houston Pond
Silver Lake
W Seboois
Cedar Lake
Endless Lake
Three Slide Mtn
Gerard
Coburn Mtn
Enchanted Pond
Kibby Mtn
Baker Pond
Spencer Mtn
Spencer Lake
Barren Mtn
Lake Onawa
Williamsburg
Brownville Junction
Knights Landing
Shirley Mills
Bodfish
Onawa
Coburn Gore
Chain of Ponds
Indian Stream Mtn
Snow Mtn
Round Mountain
Spencer
West Forks
Black Brook Pond
Lake Moxie
Moxie Pond
The Forks
Troutdale
Hurricane Mtn
Lake Hebron
Monson Pond
Monson
Willimantic
Sebec Lake
Bowerbank
Brownville
Lake View
Medford
Medford Center
Eustis
Flagstaff Lake
Spring Lake
Pleasant Pond
Pierce Pond
Caratunk
Bald Mtn Pond
Blanchard
Russell Mtn
North Guilford
Upper Abbot
Greeley Landing
Sebec
Milo
Derby
S Sebec
Dover-Foxcroft
Abbot Village
Guilford
Dover
Atkinson Corner
Boyd Lake
Moxie Mtn
Austin Pond
Bates Ridge
Carry Ponds
Parmachenee
Kennebago
Dead River
Tim Brook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PENOBSCOT
AQUIS
ST JOHN
RIVER
AROOSTOOK
CHIPUTNETICOOK LAKES
Madawaska
St David
Grand Isle
Frenchville
Fort Kent
Fort Kent Mills
St Agatha
Cleveland
Notre Dame
Lille
Van Buren
Hamlin
Stockholm
Jemtland
Acadia
New Sweden
Sweden
N Lyndon
Limestone
Caribou
Carson
Perham
Washburn
Crouseville
Fort Fairfield
Maple Grove
Presque Isle
Mapleton
Chapman
Easton
Westfield
Mars Hill
Blaine
Robinsons
Bridgewater
Monticello
Littleton
Houlton
Ludlow
Smyrna Mills
Oakfield
Hodgdon
Linneus
Patten
Sherman Station
Sherman Mills
Stacyville
Benedicta
Glenwood
Reed
Bancroft
Danforth
Forest City
Weston
Orient
Kingman
Mattawamkeag
Winn
Springfield
Lee
Lincoln
Chester
South Lincoln
Howland
Medford
Millinocket
East Millinocket
Medway
Brownville
Brownville Junction
Sebec
Vanceboro
Tomah
Brookton
Codyville
Topsfield
Princeton
West Princeton
Calais
Waite
Eagle Lake
Portage
Ashland
Sheridan
Masardis
Oxbow
Squa Pan
Wallagrass
Soldier Pond
Michaud
Dickey
Allagash
MOUNT KATAHDIN
Grand Lake Matagamon
Chamberlain

Department of Environmental Protection
State of Maine

IMPACTS OF NON-POINT POLLUTION ON DESIGNATED USES OF MARINE WATERS
June 1989

10 0 10 20 30 40 Mi

EXPLANATION

One or more designated uses not supported

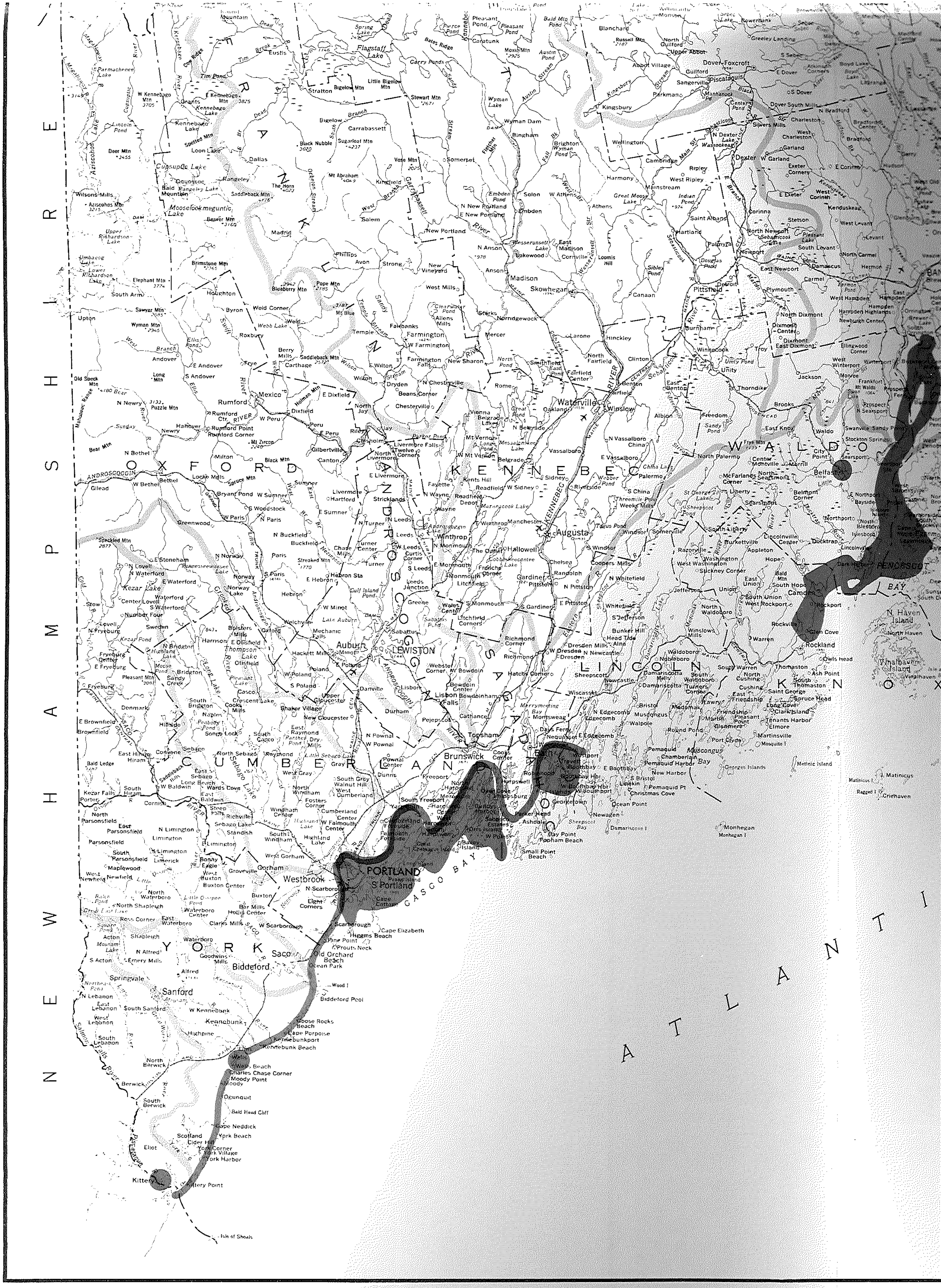
Designated uses supported but threatened

NOTES: All other marine waters are assumed or known to support designated use.

Maps developed from monitoring data, public input, agency information and other available data. Maps are meant for general planning purposes only.

Cartography by Susan S. Tolman
Base from U.S. Geological Survey

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1976
MAINE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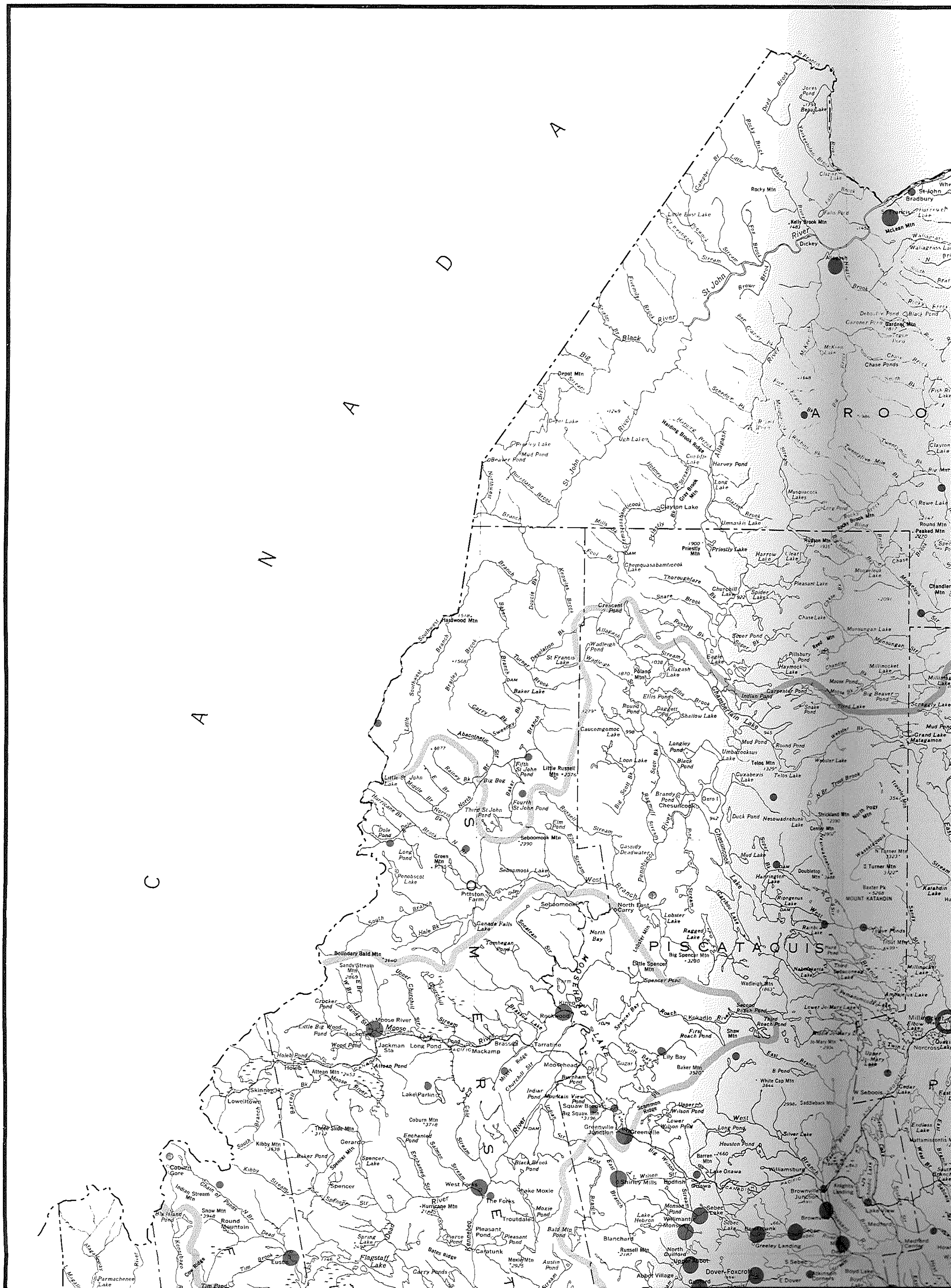
FRANKLIN
OXFORD
KENNEBEC
ANDROSCOGGIN
SAGADAHOC
CUMBERLAND
YORK
LINCOLN
WALDO
KNOX
ATLANTI
CASCO BAY
PORTLAND
LEWISTON
Augusta
Brunswick
Biddeford
Saco
Westbrook
Waterville
Skowhegan
Sanford
Kittery
Belfast
Rockland
Camden
Bath
Auburn
Rumford
Farmington
Gardiner
Kennebunk
Wells
Isle of Shoals


C A N A D A
A R O O
P I S C A T A Q U I S
S O M E R S E T
St Francis
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Rocky Mtn
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Priestly Mtn
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Telos Mtn
Umbazooksus Lake
Mud Pond
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Haymock Lake
Millinocket Lake
Munsungan Lake
Chase Lake
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Seboomook Lake
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Canada Falls Lake
North East Carry
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Boundary Bald Mtn
Moosehead Lake
Kineo
Rockwood
Spencer Bay
Kokadjo
Roach Pond
Lily Bay
Baker Mtn
Moose River
Jackman
Long Pond
Brassua Lake
Mackamp
Tarratine
Moosehead
Holeb
Attean Mtn
Lake Parlin
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Coburn Mtn
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Three Slide Mtn
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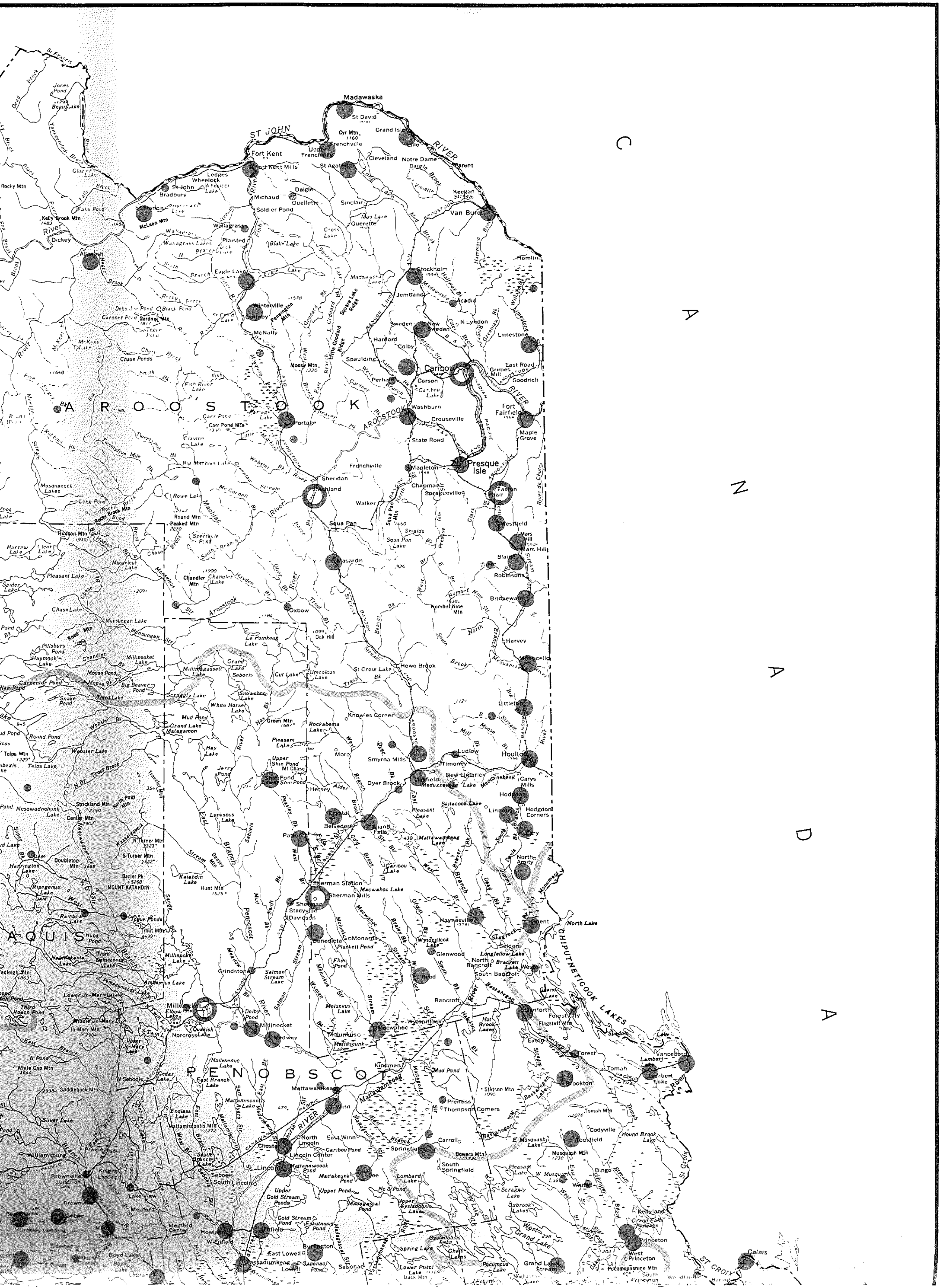
Musquacook Lakes
Chase Ponds
Gardner Mtn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RIVER
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Grand Isle
Frenchville
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Cleveland
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Acadia
New Sweden
Sweden
Limestone
Caribou
Washburn
Crouseville
Fort Fairfield
Maple Grove
State Road
Presque Isle
Mapleton
Easton
Sheridan
Ashland
Walker
Squa Pan
Westfield
Mars Hill
Blaine
Robinsons
Bridgewater
Masardis
Oxbow
Portage
Eagle Lake
Winterville
Quimby
McNally
Soldier Pond
Wallagrass
Plaisted
Allagash
Dickey
Michaud
Daigle
Ouellette
Sinclair
Guerette
Hanford
Colby
Spaulding
Perham
Carson
Frenchville
Chapman
Sprague Ville
Monticello
Littleton
Knowles Corner
Houlton
Ludlow
Smyrna Mills
Dyer Brook
Oakfield
New Limerick
Hodgdon
Linneus
Cary
North Amity
Hersey
Crystal
Island Falls
Patten
Sherman Station
Sherman Mills
Stacyville
Davidson
Benedicta
Haynesville
Glenwood
Reed
Bancroft
Danforth
Forest City
Weston
Wytopitlock
Macwahoc
Molunkus
Kingman
Mattawamkeag
Winn
Chester
Lincoln
Lincoln Center
Springfield
Carroll
Prentiss
Topsfield
Codyville
Vanceboro
Lambert Lake
Brookton
Tomah
Forest
Princeton
Calais
Millinocket
East Millinocket
Medway
Grindstone
Norcross
Howland
Enfield
Passadumkeag
Lowell
Burlington
Brownville
Brownville Jct
Milo
Medford
Lake View
Williamsburg
CHIPUTNETICOOK LAKES
AROOSTOOK
PENOBSCOT
MOUNT KATAHDIN
Baxter Pk 5268
Chase Lake
Munsungan Lake
Millinocket Lake
Grand Lake Seboeis
Scraggly Lake
Mattawamkeag
Grand Lake Stream
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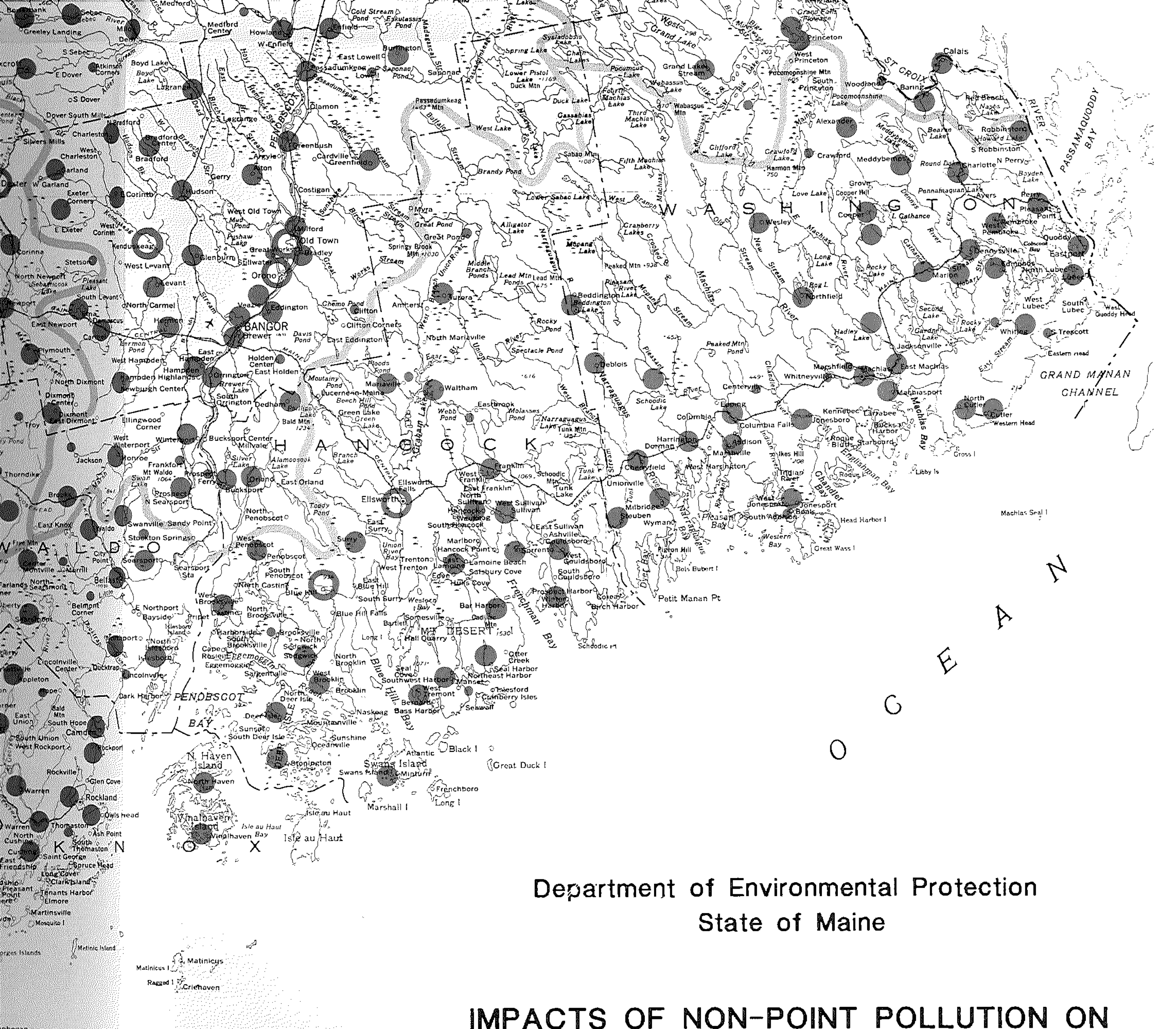


Department of Environmental Protection
State of Maine

IMPACTS OF NON-POINT POLLUTION ON DESIGNATED USES OF GROUND WATER
June 1989

EXPLANATION

One or more designated uses not supported

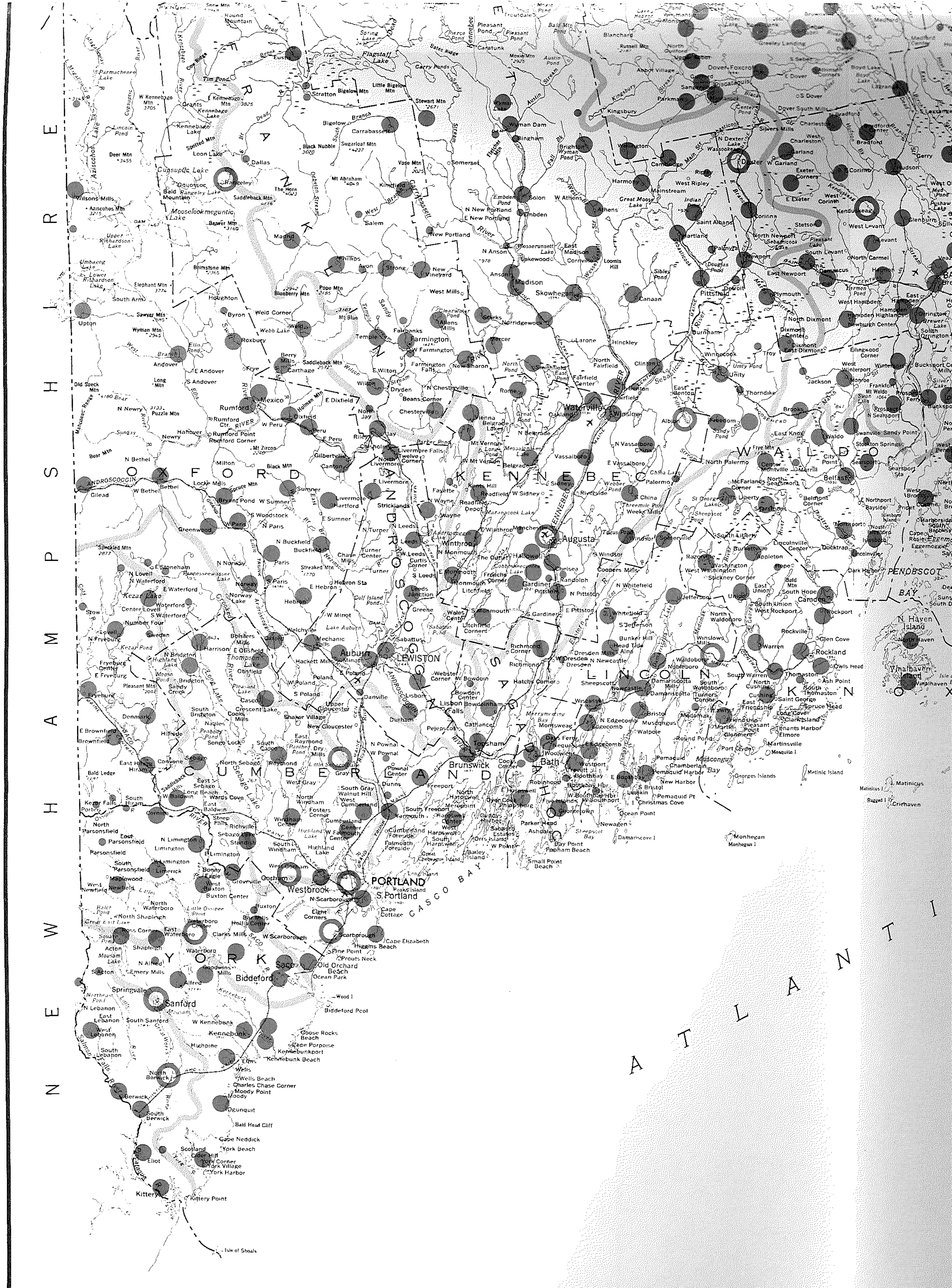
One site — 2-5 sites
6 or more sites — x

NOTES: All other ground water is assumed or known to support designated use.

Maps developed from monitoring data, public input, agency information and other available data. Maps are meant for general planning purposes only.

Cartography by Susan S. Tolman
Base from U.S. Geological Survey

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1976
MAINE



NEW HAMPSHIRE
FRANKLIN
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KENNEBEC
CUMBERLAND
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WALDO
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YORK
PENOBSCOT BAY
CASCO BAY
ATLANTIC
PORTLAND
LEWISTON
Augusta
Waterville
Brunswick
Bath
Biddeford
Saco
Sanford
Kittery
Skowhegan
Farmington
Rumford
Auburn
Westbrook
Gardiner
Belfast
Rockland
Camden
Dexter
Pittsfield
Madison
Rangeley
Wilsons Mills
Upton
Andover
Mexico
Norway
Paris
Bridgton
Fryeburg
Cornish
Kennebunk
Wells
Ogunquit
York Harbor
Eliot
South Berwick
North Berwick
Old Orchard Beach
Scarborough
Cape Elizabeth
Gorham
Windham
Gray
Freeport
Yarmouth
Boothbay Harbor
Wiscasset
Damariscotta
Waldoboro
Thomaston
Warren
Vinalhaven
North Haven
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Kennebec River