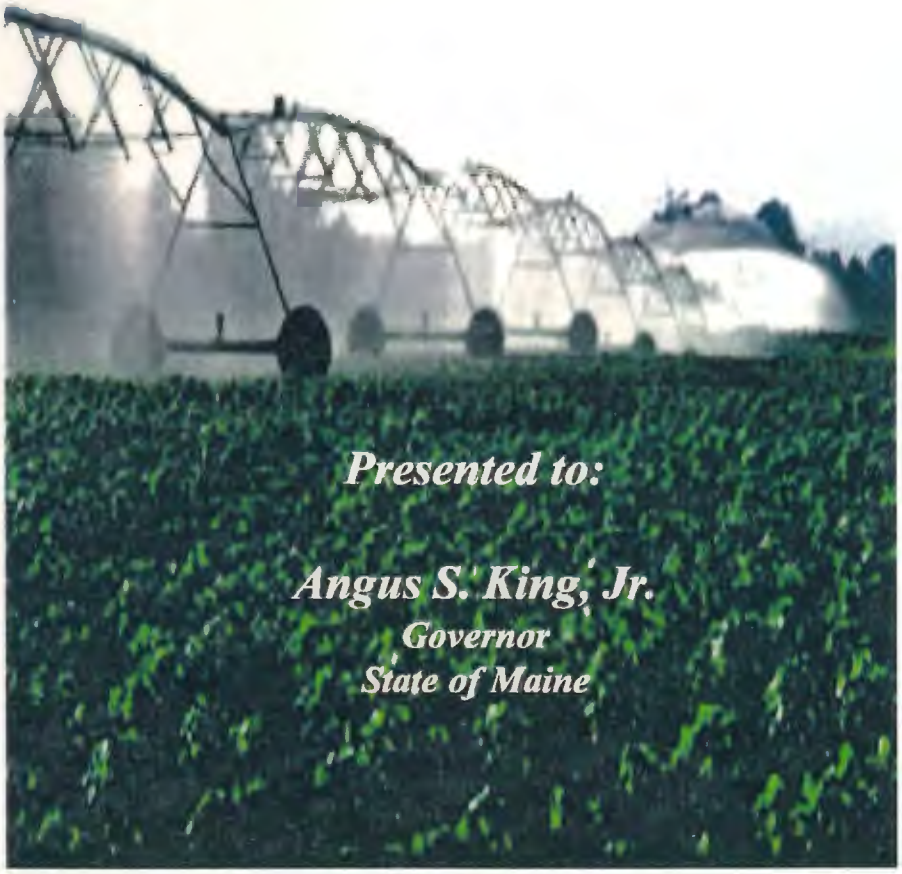
Blueprint for Agricultural Water Resource Management



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Executive Summary

The Goal of Maine's blueprint for agricultural water resources management is to ensure adequate water supplies for all Maine agricultural enterprises that need periodic access to water with sources of water utilized in an environmentally and economically sustainable manner.

Water used by Maine farmers accounts for only 4% of the available water that is used in Maine, versus 66% for industrial and 18% for domestic use. Only 11% of farms in Maine are currently irrigating and less than 5% of Maine's 403,000 acres of producing farmland is currently irrigated. However, irrigated acres increased 100% from 1992 to 1997, from approximately 10,000 acres to 22,000 acres.

The potential for irrigation in Maine is expected to increase by 20,000 acres in the next 5 years, based on exploratory survey data collected by the Department. Research has proven that all crops can benefit from supplemental irrigation in Maine. Farmers are finding supplemental irrigation imperative to reduce risk from drought and meet consumer demand for quality and consistency. In Aroostook County, potato processing plants are starting to require some varieties to be irrigated, while in Downeast Maine, blueberry farmers recognize the need for consistent yields in order to maintain markets from year to year. Without irrigation blueberries will see a 30 to 100% yield reduction. Potatoes will risk major losses in 3 out of 10 years whereas other crops, such as strawberries and nursery crops, would be uneconomical to grow at all without a source of adequate water.

Farmers expressed various needs and concerns in accessing water including:

- Need for technical and financial assistance for design and construction of water sources.
- Need for technical assistance in choosing systems and setting up systems utilizing the latest technology.
- Need for better understanding of the permitting processes for pond development and wetland alteration.
- Concern for a clearer, simplified LURC permitting process for water source development.
- Concern for less mitigation in federal and state regulation for wetland alteration for pond and impoundment building.

State agricultural irrigation policy issues include the need for focusing on a solutions-based, non-regulatory approach to accessing water for farming. A new policy would recognize that farmers have limited access to rivers and streams during low flows, and that Maine is blessed with abundant water in spring and during peak storm events throughout the summer. Solutions will include building of other water sources such as impoundments in upper reaches of rivers, dug ponds, and wells to capture and utilize the excess water when available.

State environmental policy recommendations include:

- Add preservation of farming in environmental policy as a high priority public health and welfare issue.
- Support non-regulatory solutions to water withdrawals during low flow periods for protection of aquatic systems.

- Allow for low value wetland impacts with minimal mitigation requirements as a trade-off for ending direct withdrawal from streams in critical low flow periods.

State permitting changes recommended to support irrigation include:

- Streamlining and creating consistency between LURC and DEP permitting for water withdrawals and permitting for wetland alteration. Farmers agree that DEP permitting procedures and standards worked out over the past 5 years are clearer and more practical and predictable.

State technical assistance recommendations include:

- Funding for increased technical assistance from the Department, CES and Conservation Districts for developing farm water management plans; educational programs to better understand the permitting process and understanding and accessing the latest irrigation technology.

State financial assistance recommendations include:

- Funding for development of a Conservation Banking program to provide funds for mitigating wetland alteration for alternative water sources other than direct stream withdrawals.
- Development of a cost share program for alternative water source development including engineering design for environmental benefit, and offset permitting costs.
- Review of the Agricultural Marketing Loan Fund to allow for additional non-capital costs for water resource development.

Agricultural irrigation research recommendations include:

- Survey of total water use needs, by region and commodity, for the next 5 years.
- Low flow studies in critical watersheds where irrigation is likely to continue with direct withdrawals.
- More studies on alternative technologies to increase irrigation efficiency.
- More studies on ways to reduce the need for irrigation through breeding for drought tolerance and for improving water holding capacity of soils.

Federal issues needing resolution include:

- State needs to get changes to allow for more technical assistance from USDA for water source development. The Natural Resources Conservation Service has previously provided that assistance, but is under constraints due to current federal law limiting assistance if wetland alteration is contemplated.
- Clarify the current Clean Water Act agricultural exemption from wetland alteration for irrigation pond development.
- Increasing cost share financial assistance for water source development much like assistance currently provided the western states.
- Explore the possibility of a wetland mitigation banking program.

Blueprint for Agricultural Irrigation in Maine

The Goal of the Blueprint

The Goal of Maine's Blueprint for Agricultural Water Resources Management is to ensure adequate water supplies for all Maine agricultural enterprises that need periodic access to water.

This blueprint is based on the need to preserve agriculture in Maine and reduce the risks associated with weather related drought to the maximum extent practicable and economically feasible for each individual farmer.

The blueprint recognizes the need to protect Maine's other valuable natural resources. The blueprint strives to create a balance between the human need for food and for healthy ecosystems.

Status of Agricultural Irrigation in Maine

Agriculture is an asset to Maine's economy and local communities

Farmers ranked irrigation as one of the most important technologies to keep them in business in the next five years, and as such, support for irrigation will help maintain a healthy agricultural sector in Maine's economy and in Maine's communities. Maine agriculture creates over 1.2 billion dollars of food and fiber products annually, employs 22,000 workers statewide, and provides stewardship of over 1.5 million acres of land and wildlife habitat. In addition, Maine farms provide open space and fresh food for Maine citizens and tourists.

Farms also preserve a lifestyle for over 5,500 Maine families and help communities. Keeping working farms profitable helps prevent sprawl. Of primary importance to the community is the preservation of open space and the buffering of tax increases since farming has been shown to use less town services compared to housing developments. Farming operations help communities in many other ways by providing employment, educational and recreational opportunities, and for tourism attraction.

Agriculture must irrigate in order to reduce risks and remain profitable

The more agriculture is put at risk of not being profitable, the more likely farmers will go out of farming. Weather related factors are the major risk factors. Drought episodes in the last three years have established it as a higher risk than previously thought. Frost, hail and excessive water have also each taken a toll on the quantity and quality of crops grown in Maine. Many farmers interviewed believe the cost to establish irrigation is justified not only for quality and yield response but to protect from partial or total crop failure in a particular year.

In Department surveys, some farmers stated they might go out of business in the next 5 years if they do not adopt irrigation. These facts are supported in Census data. In the past five years Maine gained 34 farms. However, that gain was made from farms that irrigated. Maine lost 114 farms that were not

irrigating whereas Maine gained 148 farms that irrigated some land, and gained 106 farms that irrigated all their cropland. The irrigating farms increased the market value of products sold per farm by an average of $8,318 per farm versus a decline in market value of $2,817 for farms who did not irrigate. (USDA Census of Agriculture, Table10). Irrigation has become a critical factor for keeping farms farming.

Supplemental irrigation critical to meet consumer demand

Supplemental irrigation has, or will become, a necessity for meeting public demand for consistency, quality and quantity of, apples, potatoes, strawberries, vegetables, and wild blueberries. In the potato industry processors are making contracts contingent on the use of supplemental irrigation. In blueberry production, customers depend on a consistent supply of fruit products each year. A year of low crop yields and lack of product could result in loss of long-term contracts with major customers. The same applies to the strawberry, apple and vegetable commodities.

In addition, the consumer demand for garden plants and landscaping is creating a major expansion of the greenhouse and nursery industry. This segment is totally dependent on access to water for survival of plants in greenhouses and in pot culture. The public is also demanding different crops such as alfalfa and timothy hay for high value horse feed; fresh broccoli; and grains for breads and feed. Each new crop will require irrigation to meet consumer demand and expectations.

Status of supplemental irrigation on various cropping systems

The following is a snapshot of where various commodities stand in regard to the use of irrigation. Further information can be found in the appendix 2 and 3.

Potatoes

Maine's **potato** industry has completed an intensive 10-year research effort on irrigation. The results have led to a better understanding of the benefits of supplemental irrigation to the potato crop and the necessity of irrigation for the broccoli crop. Farmers have also begun research on alternative water sources, and are supporting development of low flow studies to determine the limits of withdrawal in critical watersheds. The industry, in conjunction with environmental agencies, has developed a non-regulatory policy on how to deal with low flow issues.

The processing industry understands the value of supplemental irrigation to maintain the quality of selected varieties of potatoes. Industry leaders expect that most processing growers will need to increase their irrigation capacity. Irrigation will assure processors a consistent quality and supply of potatoes.

Maine's potato farms must also compete with other States, such as Idaho. According to the 1997 Census of Agriculture, Maine's Aroostook potato farmers harvested 65,454 acres of potatoes, with only 9.25% or 6,052 acres irrigated. For comparison, in Idaho with 3.3 million acres of harvested cropland, 98% or 3 million acres are irrigated. While potato growers will increase acreage irrigated, the increase will be limited by access to water, access to capital for improvements, and regulatory constraints.

Blueberries

Maine's wild blueberry growers are investing in irrigation, due to the knowledge gained by grower sponsored research and experience showing a 30 to 100% yield reduction without the use of supplemental irrigation during dry periods. Many growers have suffered large yield reductions over the past 4-5 years. Smaller growers surveyed expected to start irrigating or increase irrigated acreage in the next 3 years in order to stay competitive and in business. The growers are starting a long-term, university directed, research project to understand completely the effects and timing of irrigation on yield and quality so that irrigation water management can be fine-tuned.

The development of water sources for the blueberry crop includes the need for reservoirs, impoundments and wells. Development of these sources will eventually eliminate the need for direct withdrawals from rivers and streams during low flow periods. According to local fishermen and wildlife biologists, impoundments built in the last 25-30 years have functioned well for fisheries and open water wildlife habitat, as well as a source for irrigation.

Fruits and Vegetables

Maine's diversified fruit and vegetable industry has experienced serious drought-related losses in the past five years, leading to a number of smaller growers expanding irrigation to reduce that risk factor.

Apple growers have utilized irrigation in limited situations. University research studies in the late 1970's showed that use of irrigation helped more quickly establish a fruiting tree, and also helped with fruit size. Irrigation is critical with the new labor saving, more productive dwarfing rootstocks that have shallow root systems. Irrigation is essential to minimize the risks for new plantings which cost over $10,000 per acre to establish.

In the Vegetable and Strawberry sector irrigation is critical to success. In a recent survey conducted by the Maine Vegetable and Small Fruit Growers Association, 30% of the growers surveyed expressed a need to significantly increase irrigation capacity in the next three years. Strawberry farmers have just begun to experiment with high technology low flow, drip irrigation systems developed in Massachusetts.

Greenhouse and Nursery

Maine's greenhouse and nursery industry is the fastest growing sector of agriculture in Maine, concentrated in the high sprawl growth area in the southern part of the State. During the past 5 years total acres of land under nursery and floriculture crops jumped from 2,257 acres to 8,712 acres. Most of these acres are using irrigation and this sector is fully dependent on municipal, pond, or well water supplies. Many of these enterprises are located in high growth areas of the State where potential conflicts have occurred with water use, water rights, and the ability to utilize wetlands on farms for pond development.

Hay

Southern Maine dairy farmers have an opportunity to produce hay for themselves and for the high value equine industry, thereby maintaining the profitability and viability of the farms in that part of the State. In 1997, 10 farms were irrigating, up from 3 farms in 1992. At least one farmer at the forums stated irrigation was needed to maintain profitability in this market, and expects to substantially increase irrigated acreage to prevent yield reductions of 50% during drought conditions. In addition, with the advent of better seed mixtures to produce higher quality blends, this enterprise has good potential, providing growers can produce high quality forage consistently.

Atlantic Salmon Conservation Plan and Blueberry Irrigation

A special situation has developed in the Downeast region of Maine. The Atlantic Salmon conservation effort has created a need to minimize water withdrawals from the rivers and streams that support Atlantic Salmon in order to help maintain and expand populations. This effort has impacted blueberry growers who utilize those water sources for irrigation. The original State of Maine Salmon Conservation Plan, which gained consensus of agricultural and environmental groups, encouraged a solutions-based approach to the issue (See Appendix 5). The major focus was development of more water storage. The purpose of storing water is to capture spring runoff and peak flows and thereby minimize the direct use of streams during periods of low flow.

Many issues have arisen concerning the development of alternative water sources to help in this effort to support Atlantic salmon. Two of the major issues are where to site the new water sources, and mitigating other wildlife and wetland impacts that may occur. Blueberry growers are willing participants in the need to seek alternative water sources, but they have felt the State has not adequately dealt with, or focused on, a solutions-based approach as originally intended in the plan.

Issues and Recommendations

Issue 1: Lack of clear statewide effort to assist and support farmers to provide access to water sources that balance the needs of farmers with environmental concerns.

In order for farmers to access water, they need to know:

- What to do,
- Who to contact, and
- What standards are being used to regulate new developments.

Growers around the State have been confused by the various agencies' responses and do not know which agency is responsible for what procedure. Conflicting standards and actions being put forward by different agencies in State Government has caused further confusion.

The committee reviewed the current regional policy for Aroostook County farmers (See Appendix 4) which has served the County very well over the past few years. The committee also reviewed the Water Use Management Planning process for the Downeast Rivers. Aspects of that process appear to have worked well for the wild blueberry growers.

A set of statewide guidelines is critical to clarify roles and responsibilities, and establish procedures and guidelines on irrigation matters.

A statewide guideline at a minimum would also address:

1. State and Federal regulatory and technical assistance process for farmers to use for complaint driven conflicts, for extreme drought situations and for new water source development;
2. Establishment of voluntary water withdrawal limits on withdrawals at times of extreme low flow rather than develop new regulations for water withdrawals, which would create more regulatory hoops, more administration, and more cost to growers;
3. A policy statement on wetland mitigation requirements and on the value of impoundments and water storages;
4. Other issues raised concerning procedures, permitting and technical assistance as needed.

The policy would also address how long the guidelines need to be in place and whether the policy becomes a statewide policy or is coupled with a series of regional policies.

Recommendations:

1.1 Convene a state policy coordinating group with farmers to establish state and regional guidelines modeled after the Aroostook Water and Soil Management Board Regional Policy.

A group, headed up by the Department of Agriculture, is needed to work through the policy issues addressed in this blueprint., utilizing as a starting point the Aroostook Policy which was a set of non-regulatory guidelines that were based on a state/farmer team approach to solve issues dealing with water in that region.

1.2 Coordinate State and Federal agencies currently involved in development of a similar set of procedures and policies for Federal assistance under existing Federal regulatory guidelines.

Work is already underway by Federal resource agencies to establish a series of guidelines for farmers to understand federal jurisdiction and procedures regarding water withdrawal and wetland alteration. The State resource agencies have been involved but no central coordination with a single state contact, such as the Department of Agriculture, has been established and needs to be established.

Issue 2: State does not have accurate data on total water use in agriculture.

The data on water use is based on census data and preliminary survey from Department meetings and forums held last fall. The extent of current irrigation and the potential locations and sources for future irrigation will be dependent on accurate identification and locations of existing farms and water use.

Historically, Maine farms were established near rivers and streams, the main thoroughfare for early settlers and the source of the richest soils for planting crops. However, as roads were built and woods converted to fields, such fields were developed increasingly farther from water sources. Not all farmers will be able to irrigate their land, nor will all acreage of crops grown be irrigated in Maine, in part because of this isolation of fields from sources of water.

In addition, due to the fragmented nature of agricultural lands in Southern and Central Maine, many acres of farmland will not have access to water unless the farm is:

1. Near a water source,
2. The farmer can convert low value wetlands, or
3. The farmer can utilize groundwater.

This situation is becoming more critical as prime farmland near rivers, streams, lakes and wetlands is sold and converted to other residential and commercial uses.

In some cases, water sources may be the subject of conflicting uses, especially in urban and recreational areas, necessitating the clarification of water rights and/or the development of alternative water sources. Agriculture in the past has not fared well in these situations.

In the potato and blueberry areas, some farmers may be able to irrigate fields through the establishment of long distance waterlines, especially where single tracts of land are large and contiguous. However, the regulatory burdens of the proposed listing of Atlantic Salmon under the Endangered Species Act may impact the ability of farmers to access water directly from listed rivers and streams during low flow periods.

Recommendations:

2.1. Provide technical and financial support to the Department of Agriculture and Soil and Water Conservation Districts to survey and inventory potential farms requiring new sources of water.

The Committee recommends that a more complete survey be conducted, with the assistance of the Conservation Districts, in order to identify key areas where irrigation will increase, and where pond and impoundments are needed. This data could be updated annually in order to ensure progress is being made to increase irrigation capacity in Maine while minimizing the impact on the water resources. Develop an annual report of irrigation activity and new water resource development to help guide the State in policy development.

Issue 3: Farmers lack knowledge of total water needs and where to get help.

Farmers are conservative by nature, and will not enter into a new venture, new technology or new production system unless the process is known and the economic returns justified. Maine farmers voiced concerns that they do not have good information on which irrigation system designs are best, what new technology exists, and where to get the best information on how to develop effective irrigation water sources. Some farmers may find that alternative technologies, such as certain soil management practices, or high tech low water use irrigation systems may be feasible, but need assurance from local Extension and the University that these practices will work.

As noted above, farmers have expressed concern that technical expertise is now lacking in the agencies that traditionally help farmers with new technology development, primarily some of the county USDA Natural Resources Agencies, Local Soil and Water Conservation Districts and Cooperative Extension. Many growers who are just starting to investigate irrigation have been forced to get information from out of state sources and from equipment vendors alone. Due to the small nature of our irrigation needs relative to other states, the number of private irrigation consultants and supply companies are few and are primarily located in other states. Private consultants have also noted that they are overwhelmed with work, are unable to respond to all requests for technical support, and frequently find that smaller farmers are unable to pay for the services of a technical engineer.

Recommendations:

3.1. Establish a technical assistance/education program for farmers to help develop whole farm water management plans, including strategies to minimize water requirements, to understand and adopt appropriate irrigation technology, and to develop water sources on their farms.

The Committee recommends State and Federal funding for some Conservation Districts, Cooperative Extension and/or USDA-NRCS to provide workshops, directories, and contacts to assist growers in understanding how irrigation or other soil management practices can help their crops and to develop whole farm water management plans. In addition, the state could develop an irrigation team to help farmers with water management plans, locating suitable water sources and help in the permit process.

This will help farmers understand what sources of water can be accessed, and how to utilize the water efficiently, and in environmentally sound ways.

This funding could bring in technical specialists from other universities and private consultants who specialize in irrigation issues. These programs would be ongoing in various regions of the state where irrigation is expected to increase.

Issue 4. Uncertainty with the state permitting process for water withdrawals and pond development

The three areas in Maine law, that have caused some difficulty for farmers wishing to irrigate, have been:

- Department of Environmental Protection (DEP) wetland protection law under the Natural Resources Protection Act,
- Land Use Regulation Commission (LURC) land use law,
- And the currently contemplated use of water quality regulation to establish flows required to protect aquatic resources.

The fear of future regulatory control of surface water beyond the current common law reasonable use doctrine discourages some growers from investing in irrigation. For others, the issue is the cost and time it takes to obtain information and go through the permitting process, especially under the wetlands protection rules and the LURC permitting process for water use. Some farmers are also concerned about the extra expenditures required for mitigating wetland alteration.

Department of Environmental Protection- Natural Resources Protection Act (NRPA)

The Department of Environmental Protection (DEP) has a good, close working relationship with the farming community. Over the past five years DEP has developed a number of good policies and regulations to aid farmers in clearly understanding what is acceptable and not acceptable for

development of irrigation ponds and impoundments. For the most part these laws work well with a few exceptions.

In 1996 the Legislature established an exemption in the NRPA for dug farm ponds that may impact wetlands. This exemption mirrors the federal law and was prudent for small, dugout ponds.

The Legislature also established a performance-based General Permit for developing impoundments of streams. The General Permit has clear standards, eliminates the need for mitigation if standards of construction are met, and identifies a process for determining the need and best location for impoundments. At least two permits have been issued under this permit process.

One area needing clarification is the criteria for distinguishing between low and moderate value wildlife habitat. Currently the standards are not clear to the regulated community. Farmers feel that the decisions seemed to be based on flexible standards that rely on subjective interpretations from field biologists. Since these criteria can make or break a possible suitable location, farmers would like to see better criteria established to make this determination.

Also, the general permit allows for DEP to deny a general permit if DEP field staff do not agree with the findings of alternative sites for impoundments found in a required, prepared Farm Water Management Plan. This sets up a possible problem if the farmer has spent considerable time and expenses of having a consultant develop the plan and alternatives analysis. Farmers would rather see DEP involved earlier in the process.

Department of Environmental Protection- Water Quality Law

The Maine DEP recently started a rulemaking process to establish low flow limits for all Maine rivers and streams through its authority under the Water Quality Law. Maine farmers were quite concerned about this process impacting the current common law principle of reasonable use. It also might arbitrarily establish a prioritization of water rights.

Farmers and the Department of Agriculture saw this as a non-issue as the majority of farmers do not cause harm through their withdrawals. Farmers are concerned that no scientific data exists to confirm a problem exists that needs to be addressed, or that any statewide low flow limits would have a basis in reality.

Currently the DEP has withdrawn the rulemaking. The Land and Water Resources Council (LWRC) has established a committee to review policy regarding low flows and the committee has established a series of fact-finding stakeholder meetings to assess the need for a policy or rule.

Farmers have voiced many concerns about the law impacting water use in the Land Use Regulation Commission (LURC) unorganized territory jurisdiction. Recently, the current LURC director and staff have been working more closely with the agricultural community to expedite permit requests so that the permitting process does not interfere with critical agricultural schedules. LURC has also been working with DEP to determine what, if any, DEP regulations may help LURC create better processes, standards and criteria for permitting withdrawals.

Unlike the organized territories that rely on DEP regulations and common law practice of reasonable use of State waters, LURC regulates all water withdrawals. This includes development of wells, water withdrawals from any water body, and impoundments. The lack of similarity in regulations has led to perceived unequal treatment by the State especially in the Downeast Area where LURC and DEP regulatory authority is in close proximity over similar resources. Farmers believe that the DEP regulatory program has better standards, reasonable exemptions, and clearer processes for permitting.

Another issue facing LURC is that the permitting process for water withdrawals and wetland alteration has been poorly defined in regulation, creating unclear information requirements, standards, and length of time to complete the permit process. LURC has been under additional pressure for permitting water withdrawal since the implementation of the Atlantic Salmon Conservation Plan. This has created further scrutiny, data requirements, and extended the time and cost of permitting. A number of farms in the Downeast area have commended the Director and staff for expediting the review process, but the farms still have concerns about the process itself.

Recommendations:

4.1. Increase education and technical assistance for farmers to understand DEP regulations.

The committee believes the current DEP regulations are practical and clear and do not need review at this time. The Committee recommends educational programs to help farmers understand current regulations and procedures for permitting. These programs could be conducted in conjunction with interested Conservation Districts, Cooperative Extension, or the Department.

4.2. Clarify what constitutes low and moderate value wildlife habitat.

The Committee also recommends that the Department of Inland Fisheries and Wildlife review what constitutes valuable wildlife and fisheries habitat as it relates to the criteria for selection of sites for pond or impoundment development. In addition, the committee recommends IF&W assist farmers in the permitting process to determine the distinction between low and moderate value wildlife habitat.

4.3. Support development of non-regulatory, site specific, solutions to protecting stream flows at low flow periods.

The LWRC has already convened a group to "develop a prioritized set of recommendations to establish sustainable water use policies for Maine's public water resources". The Committee supports the Land and Water Resources Council approach to review policy regarding regulating stream flows. The committee would like to see a policy developed that builds on non-regulatory solutions to problems on a case by case basis, similar to the approach taken in the Aroostook Water and Soil Management Board Low Flow Policy for that region.

4.4. Streamline and create standards for LURC permitting of agricultural water use, modeled after NRPA regulations.

The Committee proposes the development of a LURC exemption for farm ponds for irrigation when utilizing a wetland, similar to DEP NRPA regulations. The committee also suggests adding general permitting requirements similar to the successful DEP laws and regulations for impoundments. This would serve two purposes: 1) making both agencies consistent in dealing with irrigation issues, and 2) providing the consistency and predictability of the process for farmers.

Issue 5. Uncertainty with the Federal wetland permitting process

Farmers have become quite frustrated with the Federal wetlands permitting process under the Clean Water Act. The federal wetland alteration permitting process is cumbersome, uncertain as to outcome and costly for projects with wetland impacts. Farmers have experienced that too many agencies are involved in determining what information must be gathered; the cost of gathering the information is too high; the mitigation process is uncertain and with no standards; and the cost of mitigation is too high.

Farmers believe that the federal government already exempts building of farm ponds through 40 CFR Chapter 1, section 232.3. A 1996 Army Corps policy decision in Washington, D.C. maintained that the exemption could be recaptured. A recent court decision established that the Corps could only regulate "filling" wetlands, further confusing the farm community as to how best to deal with these regulations.

Most recently, Maine farmers have been caught in a Catch-22. The Army Corps of Engineers is hesitant to allow ponds and impoundments off-stream due to the potential for wetland impacts. They would rather see the pipes left in the streams. However, other federal policy for protecting Atlantic Salmon would limit the farmer's ability to withdraw directly out of streams due to the potential impact on Atlantic Salmon habitat. If left unresolved, farmers feel they will be without any options for accessing water resources for irrigation.

Most recently Congressman Baldacci has led a group of Federal Agency heads to deal with this issue. A Federal/State Irrigation Pond Permitting Task Force was developed and is working on identifying issues and processes, and developing solutions.

Recommendations

5.1 Continue to work with the NRCS led Irrigation Pond Permitting Task Force in order to streamline the federal permitting procedures under the Clean Water Act.

The Committee recommends continuing to work with the Congressional Delegation and regional Federal agency staff to develop a streamlined federal permitting process that would:

- Create time limits for making decisions on permit requests.
- Allow a streamlined process with a single federal agency to handle it.
- Allow for no alternative analysis requirement for farmers who have water management plans for their farms.

5.2 Propose a Federal General Permit or other federal vehicle to get recognition to allow wetland alteration for impoundments or ponds as an alternative to direct withdrawal from streams.

The Committee recommends continuing to work with the Congressional Delegation and regional Federal agency staff to come up with solutions allowing use of wetlands for water storage in exchange for making withdrawals of water during critical flow periods for Atlantic Salmon..

Issue 6. Mitigation

Mitigating wetland impacts is a key component to the uncertainty and cost of developing alternative water sources. While the state DEP does not require mitigation for irrigation projects that fall under the exemption or general permit, LURC does require mitigation for wetland impacts. The Federal government requires mitigation for wetland impacts through the Army Corps of Engineers administration of the Clean Water Act. In addition, in order for a farmer to be eligible for USDA services, he must mitigate wetland impacts as well and submit a mitigation plan to the NRCS. Changes are currently being made to combine the two mitigation processes.

Federal and state agencies are working with the farmers to minimize mitigation for ponds built in low value wetlands or for impoundments that meet certain criteria for environmental soundness. This is accomplished through proper siting of the project to minimize wetland impacts.

However, even with minimization, some projects will require mitigation. Farmers have tried to argue, unsuccessfully, that changing the function and values of a wetland without destroying the wetland, as with the development of a pond, should not require mitigation. Farmers have been concerned about how the State and Federal agencies determine the function of a wetland and

decide on the value of that function. While it is possible to understand the function of a wetland through expert consultant study, deciding on the value is somewhat subjective.

Sometimes there is a difference of opinion between the U.S. Fish and Wildlife Service and the Army Corps of Engineers as to the degree of mitigation required. The national standard is 1:1 replacement of functions and values on an acreage basis. Still, the type of mitigation available sometimes does not meet the true replacement value. This then causes confusion for the farmers.

Federal authorities rely on the applicant to provide a mitigation plan but typically a farmer does not understand the process or requirements without costly consultant services. Also, if the Federal authorities do not like the plan, they can reject and delay the process indefinitely but do not feel the necessity to assist.

Farmers are looking for ways to minimize mitigation costs. The cost of mitigating wetland impacts is an additional burden for farmers. Most projects impacting wetlands can carry a heavy burden to find mitigation sites, establish costs to mitigate, and implement the mitigation plan. The state does have a mitigation bank compensation fund, but has not implemented the program due to the inability to get federal approval for the concept.

Recommendations:

6.1 Establish a Federal/State team to assist farmers to minimize mitigation requirements through proper site selection and design of water storages.

The Committee proposes the agencies establish a formal Federal/State Irrigation Team of various agency staff charged with permitting wetlands to work with individual farmers in proper site selection for pond or impoundment development once a formal water management plan is developed for the farm.

6.2 Establish criteria for, and fund a bond to finance a State Irrigation Conservation Banking Program to provide financial assistance to farmers who need to mitigate for wetland impacts.

The Committee recommends that the State establish the criteria and process for developing an irrigation conservation-banking program, similar to a mitigation bank. The program would assist farmers with development of engineering plans to minimize wetland impacts, cost-share environmental improvements as part of a mitigation plan, and establish a "mitigation bank" for exchange of mitigation credits or cash payments for impacts. The Bank program could accept mitigation credits from any source and would allow farmers the opportunity to share mitigation credits.

6.3 Clarify mitigation banking policy and procedures of the Federal government.

The Committee recommends that the State continue negotiations with the federal government on receiving approval for a mitigation-banking program for wetland alterations as part of the Clean Water Act permitting requirements.

Issue 7. Lack of Federal technical assistance and financing to design, construct and manage irrigation systems.

Farmers believe the state and federal government have an obligation to assist in cost-share on development of water sources and permitting, much like the assistance provided large-scale irrigation in the Western U.S. In the past USDA programs helped farmers design ponds, build ponds, construct irrigation mainlines and cost-share erosion control and wildlife enhancement projects. Today, the use of Federal funds, through NRCS, for projects that impact wetlands (such as irrigation ponds) is not prohibited but is conditional on the wetland impacts being mitigated.

Financial assistance through the Environmental Quality Incentives Program (EQIP) may be used for irrigation pond development. However, the program is woefully under funded at this time in Maine. Regarding use of USDA loan program funds, these funds are unavailable if a wetland in altered, regardless of the NRCS participation through EQUIP.

Recommendations:

7.1. Review Federal technical assistance programs and develop recommendations for the Congressional Delegation regarding needed changes to encourage/support agricultural water resource development in Maine.

The Committee recommends presenting the Congressional Delegation with a plan to access federal programs and funding that would support technical assistance for developing irrigation. The Department of Agriculture would be asked to work with the heads of these agencies and other New England states to develop such a plan.

7.2. Support increases in funding for Federal USDA financial assistance programs.

Maine may also benefit from a review of Federal cost share programs from USDA and EPA, especially as they may relate to helping establish irrigation ponds, control erosion and encourage flood control. NRCS technical and financial assistance or USDA -FSA loan and EQUIP programs need to be better funded in Maine.

Issue 8. State financing to design, construct and manage irrigation systems.

The Department of Agriculture already has anticipated the need for more irrigation pond development and equipment purchases and has created a low interest loan program for farmers, the Agricultural Marketing Loan Fund. However, funding is not available to offset certain engineering design, permitting and permit studies that might be required under current regulatory permitting processes.

Recommendations:

8.1. Review existing State loan and grant programs for ways to enhance the ability for farmers to use funds for engineering design and permit studies.

The Committee recommends that the Department of Agriculture work with the Governor's office to review the need for additional funds and legislative rule changes to better meet the needs of irrigators or potential irrigators

Issue 9. Research to improve irrigation efficiency

Research on economics and fine-tuning irrigation practices for specific crops is lacking for some crops, and is under-funded for others. Farmers need this information to make informed decisions on whether to, and how to, irrigate these crops. In addition, research will aid in reducing the impact on the environment by reducing the need to expend capital for large ponds or impoundments that are not necessary. Research funding is needed to:

- Study new technologies for applying water and to maximize water recycling and/or improve the genetic studies on drought tolerance species;
- Fund low flow studies of streams in both Aroostook County and Downeast Maine; and conduct environmental assessments of the low flows on aquatic ecosystems;
- Assist farmers in identifying ways to minimize the need for irrigation through building the organic matter content of the soil, mulching, and use of special drought tolerant species of crops;
- Fund gauging stations in order to get a better handle on flows in rivers.

Recommendations:

9.1. Finance additional water management research for specific crops.

The Committee recommends the Department of Agriculture work with the University of Maine Experiment Station, Cooperative Extension , commodity groups and the environmental community to establish priorities, proposals and costs for establishing research on irrigation.

APPENDIX 1

MEMBERS OF THE IRRIGATION COMMITTEE

Robert W. Spear, Commissioner, Maine Department of Agriculture

Linda Smith Dyer, Deputy Commissioner, Maine Department of Agriculture

Peter Mosher
Director, Office of Natural Resources and Agriculture
Maine Department of Agriculture

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David K. Bell
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Mike Corey
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Tim Hobbs
Director, Central Aroostook Soil and Water Conservation District

Tom Gyger
Apple Farmer, Bridgton, Me

Doug Chipman
President, Maine Vegetable and Small Fruit Growers Association

Dale Rines
Ag Engineers, Gorham

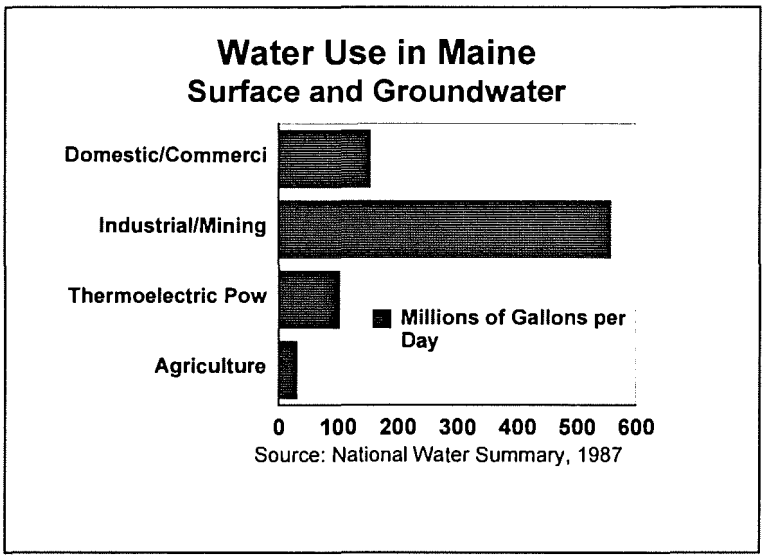
Dean Bradshaw
Bradshaw Cranberry Farm, Dennysville

APPENDIX 2:
CURRENT AND FUTURE IRRIGATION PRACTICES IN MAINE

Current Irrigation Practices in Maine

Agriculture is a small user of water compared to other users in Maine

In the larger picture of total water use in Maine, agriculture's use of water is relatively small. However, the need for high quality, clean water for farming is as important as other vital uses of water for the health and benefit of Maine's people. Maine farmers only use 4% of available water resources versus 85% for industrial, commercial and residential use (See Graph1).



Even though the overall comparative use is small, the need for that water is as important as is the use of a river to accept discharge publicly treated sewerage, for electricity generation, or for recreation. In another comparison, as one farmer remarked, irrigation is as important to maintaining farms as snowmaking is to maintaining the ski industry. Without access to water, the economic risks inherent with the potential for lack of water are great.

Maine agriculture is a small user compared to other state's agricultural sectors

Maine agriculture is also a small user of water compared to other States. According to the 1997 Census of Agriculture, Maine farmers harvested 403,000 acres of cropland, but only 22,000 acres, or less than 5% of the harvested acreage, were irrigated. For comparison, in Idaho, with 3.3 million acres of harvested cropland, 98% or 3 million acres are irrigated using government built reservoirs and canals for water sources. The major reason for the difference is that Maine is blessed with an abundance of rainfall over the year. However, extended dry periods can be experienced during the growing season. Farmers have found it prudent and necessary to supplement natural rainfall during dry periods (with the exception of frost control and greenhouse culture), compared to Idaho where they are totally dependent on water for the survival of agriculture.

All crops in Maine depend on water

Virtually all crops grown in Maine can benefit from irrigation to improve the quality and quantity of food, sod, fiber and hay. Table 1 shows the extent of use, and the high level of technology used to irrigate crops in Maine. In some cases, the positive impact of soil structure improvement coupled with supplemental irrigation on the cropping system is still being worked out.

Table 1: Typical crops and uses of water for plant growth, yield and quality improvement

CROP	ACRES IRRIGATED IN MAINE*1	WATER USE, SUPPLEMENTAL IRRIGATION OR OTHER WATER MANAGEMENT	TECHNOLOGY USED FOR WATER MANAGEMENT
Potatoes	8,634	Used for maintaining quality, sizing and yield increase	Rotations for soil organic matter increase; Center Pivot; Travelers
Blueberries	3,874	Used for frost control, first year flower bud formation, maintain yield potential and maintain quality. Frequent irrigation increases moss growth which increases organic matter buildup in bare spots.	Mowing to improve maintenance of organic pad and reduce herbicide use; Tree windbreaks to reduce evaporation; In ground and above ground pipe and stationary sprinkler heads.
Apples	325	Used for improving stands of young trees, minimizing drought on dwarf trees that have shallow root systems, fruit sizing and minimizing storage diseases.	Low head sprinkler, drip irrigation
Nursery and Greenhouse	7,716	Used for plant survival and growth in pot and bed culture.	Soil amendments. Drip, micro nozzle, overhead sprinkler, and ebb/flow underfoot capillary systems.
Strawberries	225	Used for frost control, berry size, and plant growth and development.	Overhead sprinkler, drip, and black plastic
Vegetables (Includes Broccoli)	5,665	Used for establishment of seedlings, improving quality and yield of many vegetable varieties.	Organic matter buildin; Overhead sprinkler, drip and black plastic
Hay land	958	Used to increase yields and quality of cut hay by 25-50%.	Traveler
Cranberries	269*2	Used for spring and fall frost control, summer growth, harvesting, and winter protection.	In ground sprinkler irrigation, flooding

(*1Source - U.S. Census of Agriculture, 1997, *2 Source - Maine Department of Agriculture)

All Maine counties have farms which irrigate.

All counties in Maine have some irrigated farm acreage. Most irrigation occurs in Aroostook, followed by Washington, Penobscot, York and Oxford County (See Table 2).

Table 2 : Number of Farms and Acreage Irrigated in Maine, By County.*

Maine County	Total Number of Farms	Total Harvested Cropland	Irrigating Farms	Acreage Irrigated	Percent of Farms Irrigating	Percent of Harvested Acres Irrigated
	number	acres	number	acres	percent	percent
Androscoggin	288	17,842	36	784	13%	4.4%
Aroostook	889	143,507	76	11,058	9%	7.7%
Cumberland	455	18,484	107	906	24%	4.9%
Franklin	223	10,604	6	20	3%	0.2%
Hancock	310	6,459	40	195	13%	3.0%
Kennebec	455	34,425	42	365	9%	1.1%
knox	194	7,173	24	102	12%	1.4%
Lincoln	210	7,541	26	92	12%	1.2%
Oxford	358	15,794	43	1,086	12%	6.9%
Penobscot	525	40,029	65	1,592	12%	4.0%
Piscataquis	141	8,179	11	166	8%	2.0%
Sagadahoc	118	5,530	13	66	11%	1.2%
Somerset	431	27,191	22	73	5%	0.3%
Waldo	315	21,460	26	60	8%	0.3%
Washington	399	20,235	39	3,771	10%	18.6%
York	499	18,561	95	1,455	19%	7.8%
Total Maine	5,810	403,014	671	21,791	11.5%	5.4%

(*Source - U.S. Census of Agriculture, 1997)

Table 3: Amount of Irrigation in Aroostook County, by Year.*

	Farms	Farms	Irrigating	in County	in County	on Irrigated Farms
1982	1,253	14	1.12%	385,828	203,750	11,642
1987	1,012	36	3.56%	329,971	187,566	22,518
1992	884	47	5.32%	334,040	189,850	43,768
1997	889	76	8.55%	324,887	187,599	72,045

Year	Irrigated Acreage	Percent of Cropland Irrigated	Increase in Acreage Irrigated	Overall Increase Since 1982	Estimated Amount of Water Used acrefeet
1982	1,066	0.52%			530
1987	2,135	1.14%	100.28%		1,061
1992	4,948	2.61%	131.76%	364.17%	2,460
1997	11,058	5.89%	123.48%	417.94%	5,498

(*Source - U.S. Census of Agriculture, 1997)

The Potential future increase in irrigation in Maine

How many new acres and quantities of water needed?

The State needs to do a complete survey of farmers to accurately determine the future needs of the various commodity sectors. The purpose of the discussion below is to create a buildout parameter to be used for discussion purposes only.

The number of farms and acres irrigated in Maine increased by more than 100% from 1992 to 1997, from approximately 10,000 acres to 22,000 acres. Informal surveys conducted in the fall of 1999, combined with responses from farmers at the forums and the information developed from the Atlantic Salmon Conservation Water Use Plan, provide anecdotal estimates. In the next five years, that estimate could be about 20,000 additional acres irrigated.

The amount of water necessary to meet that hypothetical acreage estimate is also hard to determine. The amount would depend on the size of farm unit needing to be irrigated, type of crop irrigated, and type of system used to irrigate. A hypothetical amount, based on a typical growing season of 10 weeks, with an estimated acre inch per week requirement, would be in the order of 16,667 acre/feet per year. This assumes all water will be utilized from a surface or groundwater source, with no rainfall.

To put that number in perspective, if, hypothetically all the water came from pond development, it would be equivilent to 1,388 acres of additional pond development, assuming a pond is 12 feet deep. Assuming the acreage was spread over 671 existing and additional farm units, it would represent each farmer needing about 2 additional acres of pond for each farm.

In reality, the amount of water will be less than that figure, due to precipitation, and water will be utilized from a variety of sources including wells, rivers, as well as new pond development. The total amount of future water sources developed will also depend on economics.

Future sources of water

With the help of reservoirs and ponds, farmers can capture and conserve the water they need. Of those farmers irrigating from all classes of rivers, streams and lakes, the overriding need is for clean water. Farmers at the forums were interested primarily in pond development and impoundments of small streams and brooks. In addition, new temporary intakes directly into streams, as well as underground wells are anticipated to be developed. Farmers needed to know that they could draw from streams and rivers during high flows and peak flow periods to fill storages.

Future environmental impacts

The major need is for use of low value wetlands and ability to impound smaller streams, intermittent brooks and tributaries. While the Committee is unsure of how many wetlands may be impacted, most agree the conversions will be of low value wetland to open water habitat.

Creation of new water sources for agricultural irrigation can have a net positive effect on the environment due to the increase in open water habitat for water fowl, creation of peripheral wetland wildlife habitat, and reducing flood potential in areas where ponds and impoundments are developed. More study is needed to determine the extent of the positive tradeoffs with irrigation ponds and impoundments.

APPENDIX 3:
AGRICULTURAL CENSUS DATA

Table 8. Land in Farms, Harvested Cropland, and Irrigated Land, by Size of Farm: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

All farms	Farms		Land in farms (acres)		Harvested cropland (acres)		Irrigated land (acres)	
	1997	1992	1997	1992	1997	1992	1997	1992
Land in farms	5 810	5 776	1 211 648	1 258 297	403 014	399 755	21 791	10 241
Farms by size:								
1 to 9 acres	533	465	2 149	1 836	794	699	259	185
10 to 49 acres	1 184	1 024	31 263	28 154	9 182	9 208	561	295
50 to 69 acres	458	465	26 351	26 609	7 547	7 965	185	203
70 to 99 acres	546	526	44 916	43 515	11 275	12 457	237	196
100 to 139 acres	689	676	79 247	77 430	19 874	22 203	596	306
140 to 179 acres	417	507	65 082	79 483	17 680	21 675	497	208
180 to 219 acres	328	370	64 655	72 933	20 509	21 026	377	210
220 to 259 acres	267	282	63 683	67 499	18 868	22 640	359	251
260 to 499 acres	846	861	300 546	302 852	98 784	99 360	1 966	1 859
500 to 999 acres	398	448	267 420	294 576	97 373	99 936	1 953	1 175
1,000 to 1,999 acres	113	120	151 002	159 559	57 670	53 558	3 390	3 613
2,000 acres or more	31	32	115 334	103 851	43 458	29 028	11 411	1 740
5,000 acres or more	6	4	(D)	26 207	(D)	9 151	4 220	1 075
Farms with harvested cropland	4 875	5 141	1 120 563	1 203 173	403 014	399 755	21 762	10 220
Farms by size:								
1 to 9 acres	384	340	1 466	1 295	794	699	259	185
10 to 49 acres	863	806	23 724	22 702	9 182	9 208	537	289
50 to 69 acres	364	397	20 975	22 800	7 547	7 965	185	201
70 to 99 acres	458	477	37 701	39 496	11 275	12 457	237	196
100 to 139 acres	589	609	67 791	69 904	19 874	22 203	596	306
140 to 179 acres	369	473	57 503	74 201	17 680	21 675	497	208
180 to 219 acres	305	354	60 196	69 767	20 509	21 026	372	205
220 to 259 acres	248	273	59 182	65 384	18 868	22 640	359	251
260 to 499 acres	774	822	275 228	288 650	98 784	99 360	1 966	1 851
500 to 999 acres	381	441	256 757	290 288	97 373	99 936	1 953	1 175
1,000 to 1,999 acres	110	117	147 006	154 835	57 670	53 558	3 390	3 613
2,000 acres or more	30	32	113 034	103 851	43 458	29 028	11 411	1 740
5,000 acres or more	6	4	(D)	26 207	(D)	9 151	4 220	1 075
Farms with irrigated land	671	523	173 250	111 548	68 699	36 468	21 791	10 241
Farms by size:								
1 to 9 acres	169	138	609	511	291	228	259	185
10 to 49 acres	159	109	3 980	2 891	919	682	561	295
50 to 69 acres	44	44	2 528	2 534	610	584	185	203
70 to 99 acres	55	38	4 610	3 124	751	431	237	196
100 to 139 acres	58	47	6 789	5 395	1 583	833	596	306
140 to 179 acres	35	30	5 457	4 547	759	910	497	208
180 to 219 acres	22	14	4 377	2 806	1 728	739	377	210
220 to 259 acres	15	12	3 544	2 821	860	947	359	251
260 to 499 acres	45	52	16 488	18 219	5 342	5 442	1 966	1 859
500 to 999 acres	29	12	20 479	8 770	8 609	3 501	1 953	1 175
1,000 to 1,999 acres	24	19	33 295	25 537	15 245	10 302	3 390	3 613
2,000 acres or more	16	8	71 094	34 393	32 002	11 869	11 411	1 740
5,000 acres or more	5	3	39 303	18 022	12 076	5 762	4 220	1 075

Table 9. Irrigation: 1997, 1992, and 1987

[For meaning of abbreviations and symbols, see introductory text]

Farms with irrigation	1997	1992	1987	Farms with irrigation	1997	1992	1987
Farms ..... number..	671	523	359	Irrigated land—Con.			
Proportion of farms ..... percent..	11.5	9.1	5.7	Acres irrigated—Con.			
				200 to 499 acres ..... farms..	17	9	7
				acres..	5 179	2 159	2 058
Irrigated land ..... acres..	21 791	10 241	6 065	500 to 999 acres ..... farms..	5	3	-
Average per farm ..... acres..	32	20	17	acres..	2 750	1 761	-
				1,000 acres or more ..... farms..	3	1	-
				acres..	(D)	(D)	-
Acres irrigated:				Irrigated land use:			
1 to 9 acres ..... farms..	516	422	277	Harvested cropland ..... farms..	660	514	352
acres..	(D)	(D)	547	acres..	21 608	10 108	5 998
10 to 49 acres ..... farms..	90	53	48	Pastureland and other land ..... farms..	24	21	10
acres..	1 924	951	1 106	acres..	183	133	67
50 to 99 acres ..... farms..	20	16	18				
acres..	1 342	1 115	1 088	Land in irrigated farms ..... acres..	173 250	111 548	68 548
100 to 199 acres ..... farms..	20	19	9	Cropland ..... acres..	89 030	50 472	28 423
acres..	2 623	2 360	1 266	Harvested cropland ..... acres..	68 699	36 468	20 176

Table 10. Selected Characteristics of Irrigated and Nonirrigated Farms: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Characteristics	All farms		Irrigated farms				Nonirrigated farms	
			Any land irrigated		All harvested cropland irrigated			
	1997	1992	1997	1992	1997	1992	1997	1992
Farms ..... number..	5 810	5 776	671	523	373	267	5 139	5 253
Land in farms ..... acres..	1 211 648	1 258 297	173 250	111 548	21 612	12 111	1 038 398	1 146 749
Estimated market value of land and buildings[1]:								
Average per farm ..... dollars..	251 074	241 816	307 272	283 643	184 780	170 292	242 202	237 622
Average per acre ..... dollars..	1 190	1 130	1 363	1 351	3 452	3 600	1 160	1 108
Irrigated land ..... acres..	21 791	10 241	21 791	10 241	2 820	1 148	(X)	(X)
Land in farms according to use:								
Total cropland ..... farms..	5 372	5 495	670	522	373	267	4 702	4 973
acres..	539 966	559 424	89 030	50 472	5 192	2 872	450 936	508 952
Harvested cropland ..... farms..	4 875	5 141	667	517	373	267	4 208	4 624
acres..	403 014	399 755	68 699	36 468	2 784	1 133	334 315	363 287
Pastureland, excluding woodland pastured ..... farms..	2 760	2 879	174	147	69	52	2 586	2 732
acres..	93 018	102 594	4 897	4 163	1 042	821	88 121	98 431
Land under Conservation Reserve or Wetlands Reserve Programs ..... farms..	352	251	26	18	4	3	326	233
acres..	22 217	14 221	1 091	1 077	(D)	70	21 126	13 144
Owned and rented land in farms:								
Owned land in farms ..... farms..	5 483	5 507	626	499	346	255	4 857	5 008
acres..	985 902	1 043 230	139 575	91 360	19 756	10 734	846 327	951 870
Rented or leased land in farms ..... farms..	1 981	2 043	219	154	67	37	1 762	1 889
acres..	225 746	215 067	33 675	20 188	1 856	1 377	192 071	194 879
Market value of agricultural products sold ..... $1,000..	438 673	430 324	97 028	66 301	20 349	12 345	341 645	364 023
Average per farm ..... dollars..	75 503	74 502	144 602	126 771	54 555	46 237	66 481	69 298
Crops, including nursery and greenhouse crops ..... farms..	3 899	3 822	651	502	362	260	3 248	3 320
$1,000..	212 229	215 995	93 025	64 519	18 980	11 982	119 204	151 476
Livestock, poultry, and their products ..... farms..	2 425	2 601	135	111	54	41	2 290	2 490
$1,000..	226 444	214 329	4 004	1 782	1 369	363	222 440	212 547
Total farm production expenses[1] ..... $1,000..	347 611	351 076	75 022	46 452	15 440	8 110	272 589	304 623
Average per farm ..... dollars..	59 923	60 824	94 845	88 312	31 704	32 967	54 409	58 068
Livestock and poultry purchased ..... farms..	1 234	1 360	89	62	23	29	1 145	1 298
$1,000..	11 988	18 658	124	89	8	55	11 865	18 569
Feed for livestock and poultry ..... farms..	2 201	2 655	143	110	51	42	2 058	2 545
$1,000..	79 605	70 781	922	627	202	187	78 683	70 154
Seeds, bulbs, plants, and trees ..... farms..	2 076	2 073	566	354	302	170	1 510	1 719
$1,000..	13 757	15 329	5 999	3 788	1 437	879	7 758	11 541
Commercial fertilizer ..... farms..	3 031	3 181	669	426	398	183	2 362	2 755
$1,000..	16 537	18 543	4 672	2 707	417	119	11 865	15 835
Agricultural chemicals ..... farms..	2 346	2 366	545	348	302	141	1 801	2 018
$1,000..	17 435	16 197	6 108	3 081	270	95	11 327	13 116
Petroleum products ..... farms..	5 494	5 435	773	506	472	229	4 721	4 929
$1,000..	14 829	15 276	3 439	2 117	978	514	11 391	13 159
Electricity ..... farms..	3 815	4 051	610	413	365	190	3 205	3 638
$1,000..	10 613	8 763	2 351	878	415	240	8 262	7 884
Hired farm labor ..... farms..	2 472	2 485	436	283	228	116	2 036	2 202
$1,000..	64 285	61 068	23 727	13 630	4 709	2 150	40 559	47 456
Contract labor ..... farms..	645	816	93	103	41	47	552	713
$1,000..	4 161	7 348	693	1 928	289	335	3 468	5 420
Repairs and maintenance ..... farms..	4 827	4 778	720	475	429	209	4 107	4 303
$1,000..	23 988	21 887	5 879	3 339	1 241	460	18 109	18 547
Custom work, machine hire, and rental of machinery and equipment ..... farms..	1 145	1 390	188	156	80	45	957	1 234
$1,000..	4 595	4 975	1 421	1 242	243	54	3 174	3 733
Interest ..... farms..	1 820	2 162	324	266	156	104	1 496	1 896
$1,000..	15 954	14 775	3 291	2 202	713	552	12 663	12 573
Cash rent ..... farms..	941	1 135	128	116	24	11	813	1 019
$1,000..	5 044	5 336	1 536	1 270	166	77	3 508	4 066
Property taxes paid ..... farms..	5 550	5 568	760	494	464	238	4 790	5 074
$1,000..	16 006	13 753	3 087	1 454	1 214	384	12 919	12 299
All other farm production expenses ..... farms..	5 107	5 099	754	499	466	224	4 343	4 600
$1,000..	48 814	58 370	11 775	8 099	3 137	2 009	37 039	50 271
Commodity Credit Corporation loans[2] ..... farms..	12	12	1	1	–	–	11	11
$1,000..	24	69	(D)	(D)	–	–	(D)	(D)
Government payments received ..... farms..	934	999	64	81	14	17	850	918
$1,000..	2 977	3 843	286	338	(D)	21	2 691	3 505
Other farm-related income[1] ..... farms..	1 689	1 789	185	176	79	69	1 504	1 553
$1,000..	10 907	9 462	1 990	1 975	736	563	8 916	7 487
Estimated market value of all machinery and equipment[1] ..... farms..	5 794	5 765	791	526	487	246	5 003	5 239
$1,000..	282 151	263 791	55 331	35 448	14 885	5 965	226 820	228 343
Average per farm ..... dollars..	48 697	45 757	69 951	67 391	30 565	24 246	45 337	43 585
Livestock inventory:								
Cattle and calves ..... farms..	1 921	2 110	75	66	16	13	1 846	2 044
number..	101 695	104 511	2 805	1 513	386	109	98 890	102 998
Milk cows ..... farms..	685	836	20	16	1	1	665	820
number..	40 749	42 737	(D)	492	(D)	(D)	(D)	42 245
Hogs and pigs ..... farms..	341	377	30	28	10	7	311	349
number..	5 977	4 768	(D)	138	209	(D)	(D)	4 630
Sheep and lambs ..... farms..	426	457	46	37	19	17	380	420
number..	10 603	12 541	488	473	192	242	10 115	12 068

[1]Data are based on a sample of farms.
[2]Data for 1992 include CCC loans for rye and honey.

Table 7. Harvested Cropland by Size of Farm and Acres Harvested: 1997 and 1992

(For meaning of abbreviations and symbols, see introductory text)

Farms with harvested cropland	Maine	Androscoggin	Aroostook	Cumberland	Franklin
Farms.....number, 1997..	4 875	243	735	389	180
1992..	5 141	275	833	375	183
acres harvested, 1997..	403 014	17 842	143 507	18 484	10 604
1992..	399 755	19 299	135 858	16 914	10 534
HARVESTED CROPLAND BY SIZE OF FARM					
1997 size of farm:					
1 to 9 acres ..... farms..	384	18	18	59	8
acres harvested..	794	17	68	(D)	(D)
10 to 49 acres ..... farms..	863	39	60	105	21
acres harvested..	9 182	401	987	1 129	224
50 to 69 acres ..... farms..	364	24	32	32	11
acres harvested..	7 547	594	717	876	140
70 to 99 acres ..... farms..	458	19	49	40	30
acres harvested..	11 275	516	1 441	1 054	770
100 to 139 acres..... farms..	589	30	68	45	30
acres harvested..	19 874	860	3 084	1 781	828
140 to 179 acres..... farms..	369	14	46	31	16
acres harvested..	17 680	662	2 941	2 032	767
180 to 219 acres..... farms..	305	20	58	11	13
acres harvested..	20 509	1 203	5 157	892	817
220 to 259 acres..... farms..	248	6	47	14	11
acres harvested..	18 868	611	3 833	1 153	701
260 to 499 acres..... farms..	774	48	181	36	29
acres harvested..	98 784	5 845	30 784	5 916	4 024
500 to 999 acres..... farms..	381	22	115	15	9
acres harvested..	97 373	5 493	37 314	3 498	1 459
1,000 to 1,999 acres ..... farms..	110	5	50	1	2
acres harvested..	57 670	1 640	33 640	(D)	(D)
2,000 acres or more..... farms..	30	-	13	-	-
acres harvested..	43 458	-	23 541	-	-
1992 size of farm:					
1 to 9 acres ..... farms..	340	23	15	81	10
acres harvested..	699	33	59	105	17
10 to 49 acres ..... farms..	806	37	63	76	24
acres harvested..	9 208	390	1 177	828	324
50 to 69 acres ..... farms..	397	28	30	34	10
acres harvested..	7 965	583	1 040	812	248
70 to 99 acres ..... farms..	477	23	53	53	21
acres harvested..	12 457	621	1 833	1 705	444
100 to 139 acres..... farms..	609	27	78	52	31
acres harvested..	22 203	1 113	4 341	1 778	895
140 to 179 acres..... farms..	473	21	92	16	21
acres harvested..	21 675	1 052	5 506	(D)	916
180 to 219 acres..... farms..	354	25	45	24	13
acres harvested..	21 026	1 641	3 526	1 859	759
220 to 259 acres..... farms..	273	13	56	12	9
acres harvested..	22 640	1 197	5 961	1 327	574
260 to 499 acres..... farms..	822	52	191	32	29
acres harvested..	99 360	6 760	28 490	4 485	3 249
500 to 999 acres..... farms..	441	21	141	13	12
acres harvested..	99 936	4 572	38 980	3 102	2 071
1,000 to 1,999 acres ..... farms..	117	4	57	1	2
acres harvested..	53 558	(D)	30 833	(D)	(D)
2,000 acres or more..... farms..	32	1	12	1	1
acres harvested..	29 028	(D)	14 110	(D)	(D)
HARVESTED CROPLAND BY ACRES HARVESTED					
1997 acres harvested:					
1 to 9 acres ..... farms..	1 316	57	92	123	39
acres..	4 377	(D)	358	330	150
10 to 19 acres ..... farms..	725	37	65	74	34
acres..	9 398	488	826	972	434
20 to 29 acres ..... farms..	493	23	42	39	23
acres..	11 193	533	981	868	524
30 to 49 acres ..... farms..	648	23	61	47	21
acres..	23 834	878	3 091	1 718	805
50 to 99 acres ..... farms..	628	45	97	50	28
acres..	42 053	2 734	6 625	3 363	1 773
100 to 199 acres ..... farms..	502	60	121	31	25

Table 8. Irrigation: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Farms with irrigation	Maine	Androscoggin	Aroostook	Cumberland	Franklin
Farms ..... number, 1997	671	36	76	107	6
1992	523	36	47	78	7
Land in irrigated farms ..... acres, 1997	173 250	6 419	72 045	5 062	376
1992	111 548	5 627	43 768	5 131	339
Harvested cropland ..... farms, 1997	667	36	76	104	6
1992	517	36	46	76	7
acres, 1997	68 699	2 426	38 996	1 647	90
1992	36 468	1 625	18 220	1 165	(D)
Other cropland, excluding cropland pastured ..... farms, 1997	242	9	33	30	2
1992	238	14	31	36	4
acres, 1997	17 618	306	5 174	509	(D)
1992	11 257	303	4 070	595	48
Pastureland, excluding woodland pastured ..... farms, 1997	174	16	20	16	2
1992	147	11	9	15	2
acres, 1997	4 897	276	1 755	260	(D)
1992	4 163	358	595	313	(D)
Irrigated land ..... acres, 1997	21 791	784	11 058	906	20
1992	10 241	333	4 948	581	12
Harvested cropland ..... farms, 1997	660	36	75	103	6
1992	514	36	45	76	7
acres, 1997	21 608	784	(D)	874	20
1992	10 108	333	(D)	(D)	12
Pastureland and other land ..... farms, 1997	24	–	2	7	–
1992	21	–	2	2	–
acres, 1997	183	–	(D)	32	–
1992	133	–	(D)	(D)	–
1997 irrigated acres by size of farm:					
1 to 9 acres ..... farms	169	6	4	43	1
acres irrigated	259	6	4	82	(D)
10 to 49 acres ..... farms	159	9	3	33	1
acres irrigated	561	18	5	178	(D)
50 to 69 acres ..... farms	44	3	1	6	2
acres irrigated	185	22	(D)	38	(D)
70 to 99 acres ..... farms	55	1	3	9	–
acres irrigated	237	(D)	5	80	–
100 to 139 acres ..... farms	58	8	7	6	2
acres irrigated	596	46	45	207	(D)
140 to 179 acres ..... farms	35	–	4	3	–
acres irrigated	497	–	122	(D)	–
180 to 219 acres ..... farms	22	2	2	3	–
acres irrigated	377	(D)	(D)	(D)	–
220 to 259 acres ..... farms	15	–	5	2	–
acres irrigated	359	–	(D)	(D)	–
260 to 499 acres ..... farms	45	3	11	2	–
acres irrigated	1 966	(D)	349	(D)	–
500 to 999 acres ..... farms	29	3	13	–	–
acres irrigated	1 953	(D)	1 006	–	–
1,000 to 1,999 acres ..... farms	24	1	13	–	–
acres irrigated	3 390	(D)	2 170	–	–
2,000 acres or more ..... farms	16	–	10	–	–
acres irrigated	11 411	–	6 985	–	–
1992 irrigated acres by size of farm:					
1 to 9 acres ..... farms	138	12	3	27	2
acres irrigated	185	16	3	32	(D)
10 to 49 acres ..... farms	109	4	5	19	2
acres irrigated	295	7	13	96	(D)
50 to 69 acres ..... farms	44	2	1	9	–
acres irrigated	203	(D)	(D)	81	–
70 to 99 acres ..... farms	38	3	4	4	3
acres irrigated	196	(D)	4	39	4
100 to 139 acres ..... farms	47	5	2	11	–
acres irrigated	306	19	(D)	73	–
140 to 179 acres ..... farms	30	1	–	1	–
acres irrigated	208	(D)	–	(D)	–
180 to 219 acres ..... farms	14	2	–	1	–
acres irrigated	210	(D)	–	(D)	–
220 to 259 acres ..... farms	12	–	1	2	–
acres irrigated	251	–	(D)	(D)	–
260 to 499 acres ..... farms	52	5	10	4	–
acres irrigated	1 859	41	969	(D)	–
500 to 999 acres ..... farms	12	1	4	–	–
acres irrigated	1 175	(D)	525	–	–
1,000 to 1,999 acres ..... farms	19	1	12	–	–
acres irrigated	3 613	(D)	2 735	–	–
2,000 acres or more ..... farms	8	–	5	–	–
acres irrigated	1 740	–	665	–	–

Table 8. **Irrigation: 1997 and 1992**—Con.

[For meaning of abbreviations and symbols, see introductory text]

Farms with irrigation	Hancock	Kennebec	Knox	Lincoln	Oxford	Penobscot
Farms ..... number, 1997	40	42	24	26	43	65
1992	31	41	18	13	32	50
Land in irrigated farms ..... acres, 1997	2 790	6 176	2 771	3 174	7 165	15 734
1992	1 806	4 817	1 390	893	5 830	7 922
Harvested cropland ..... farms, 1997	40	42	24	26	43	65
1992	31	41	18	13	32	49
acres, 1997	465	1 384	516	285	2 466	6 231
1992	500	695	359	150	2 392	2 657
Other cropland, excluding cropland pastured ..... farms, 1997	15	13	8	8	9	25
1992	8	16	8	4	14	24
acres, 1997	233	218	143	(D)	199	642
1992	117	127	111	(D)	380	723
Pastureland, excluding woodland pastured ..... farms, 1997	16	15	12	7	10	14
1992	9	9	9	4	16	10
acres, 1997	163	537	311	106	344	241
1992	91	333	121	27	619	307
Irrigated land ..... acres, 1997	195	365	102	92	1 086	1 592
1992	62	195	135	70	695	755
Harvested cropland ..... farms, 1997	40	39	24	26	43	65
1992	31	41	18	13	32	49
acres, 1997	195	(D)	102	(D)	1 086	1 592
1992	(D)	(D)	(D)	70	(D)	(D)
Pastureland and other land ..... farms, 1997	–	4	–	2	–	–
1992	2	2	1	–	1	1
acres, 1997	–	(D)	–	(D)	–	–
1992	(D)	(D)	(D)	–	(D)	(D)
1997 irrigated acres by size of farm:						
1 to 9 acres ..... farms	13	10	7	5	11	21
acres irrigated	17	17	8	6	21	33
10 to 49 acres ..... farms	13	13	6	6	10	18
acres irrigated	67	31	8	6	31	47
50 to 69 acres ..... farms	4	1	2	3	5	1
acres irrigated	(D)	(D)	(D)	5	5	(D)
70 to 99 acres ..... farms	2	4	1	1	2	7
acres irrigated	(D)	(D)	(D)	(D)	(D)	20
100 to 139 acres ..... farms	4	6	3	3	2	4
acres irrigated	(D)	21	(D)	4	(D)	(D)
140 to 179 acres ..... farms	1	1	2	4	2	1
acres irrigated	(D)	(D)	(D)	50	(D)	(D)
180 to 219 acres ..... farms	2	–	–	–	1	2
acres irrigated	(D)	–	–	–	(D)	(D)
220 to 259 acres ..... farms	–	–	–	1	1	–
acres irrigated	–	–	–	(D)	(D)	–
260 to 499 acres ..... farms	–	5	2	1	7	3
acres irrigated	–	28	(D)	(D)	919	22
500 to 999 acres ..... farms	–	–	–	2	–	4
acres irrigated	–	–	–	(D)	–	252
1,000 to 1,999 acres ..... farms	1	2	1	–	2	1
acres irrigated	(D)	(D)	(D)	–	(D)	(D)
2,000 acres or more ..... farms	–	–	–	–	–	1
acres irrigated	–	–	–	–	–	825
1992 irrigated acres by size of farm:						
1 to 9 acres ..... farms	15	11	3	4	6	15
acres irrigated	16	12	(D)	6	11	20
10 to 49 acres ..... farms	3	9	6	4	6	12
acres irrigated	3	14	21	4	11	23
50 to 69 acres ..... farms	1	2	3	1	3	6
acres irrigated	(D)	(D)	9	(D)	3	7
70 to 99 acres ..... farms	1	5	–	–	2	4
acres irrigated	(D)	39	–	–	(D)	4
100 to 139 acres ..... farms	6	4	1	–	1	5
acres irrigated	8	14	(D)	–	(D)	7
140 to 179 acres ..... farms	3	4	3	2	3	5
acres irrigated	9	9	4	(D)	3	(D)
180 to 219 acres ..... farms	2	1	–	2	2	–
acres irrigated	(D)	(D)	–	(D)	(D)	–
220 to 259 acres ..... farms	–	–	1	–	1	–
acres irrigated	–	–	(D)	–	(D)	–
260 to 499 acres ..... farms	–	4	1	–	6	4
acres irrigated	–	19	(D)	–	(D)	(D)
500 to 999 acres ..... farms	–	–	–	–	1	1
acres irrigated	–	–	–	–	(D)	(D)
1,000 to 1,999 acres ..... farms	–	1	–	–	1	1
acres irrigated	–	(D)	–	–	(D)	(D)
2,000 acres or more ..... farms	–	–	–	–	–	–
acres irrigated	–	–	–	–	–	(D)

Table 8. **Irrigation: 1997 and 1992**—Con.

[For meaning of abbreviations and symbols, see introductory text]

Farms with irrigation	Piscataquis	Sagadahoc	Somerset	Waldo	Washington	York
Farms ..... number, 1997	11	13	22	26	39	95
1992	11	14	24	29	21	71
Land in irrigated farms ..... acres, 1997	2 049	925	3 075	3 121	32 200	10 168
1992	2 345	1 536	4 183	3 624	14 317	8 020
Harvested cropland ..... farms, 1997	10	13	22	26	39	95
1992	11	14	24	29	21	69
acres, 1997	429	240	230	752	8 374	4 168
1992	665	288	440	521	(D)	2 549
Other cropland, excluding cropland pastured ..... farms, 1997	6	8	10	6	20	37
1992	3	7	11	12	12	34
acres, 1997	136	73	231	91	9 265	358
1992	49	100	183	207	(D)	733
Pastureland, excluding woodland pastured ..... farms, 1997	5	2	6	6	8	19
1992	5	4	6	13	3	22
acres, 1997	121	(D)	53	275	188	219
1992	203	97	54	548	(D)	383
Irrigated land ..... acres, 1997	166	66	73	60	3 771	1 455
1992	181	173	44	92	959	1 006
Harvested cropland ..... farms, 1997	9	13	22	26	38	95
1992	11	14	24	28	21	63
acres, 1997	(D)	66	73	(D)	3 760	(D)
1992	181	173	(D)	(D)	(D)	959
Pastureland and other land ..... farms, 1997	3	–	–	2	3	1
1992	–	–	2	1	2	5
acres, 1997	(D)	–	–	(D)	11	(D)
1992	–	–	(D)	(D)	(D)	47
1997 irrigated acres by size of farm:						
1 to 9 acres ..... farms	–	2	3	8	8	27
acres irrigated	–	(D)	4	9	9	36
10 to 49 acres ..... farms	1	3	1	7	7	28
acres irrigated	(D)	10	(D)	11	40	106
50 to 69 acres ..... farms	1	2	6	–	3	4
acres irrigated	(D)	(D)	8	–	13	(D)
70 to 99 acres ..... farms	1	4	3	4	5	8
acres irrigated	(D)	(D)	8	11	16	43
100 to 139 acres ..... farms	4	1	2	1	1	4
acres irrigated	(D)	(D)	(D)	(D)	(D)	58
140 to 179 acres ..... farms	1	–	4	2	4	6
acres irrigated	(D)	–	39	(D)	15	49
180 to 219 acres ..... farms	1	–	1	1	1	6
acres irrigated	(D)	–	(D)	(D)	(D)	116
220 to 259 acres ..... farms	1	1	–	–	2	2
acres irrigated	(D)	(D)	–	–	(D)	(D)
260 to 499 acres ..... farms	–	–	1	–	2	8
acres irrigated	–	–	(D)	–	(D)	429
500 to 999 acres ..... farms	1	–	–	3	2	1
acres irrigated	(D)	–	–	11	(D)	(D)
1,000 to 1,999 acres ..... farms	–	–	1	–	1	1
acres irrigated	–	–	(D)	–	(D)	(D)
2,000 acres or more ..... farms	–	–	–	–	3	–
acres irrigated	–	–	–	–	3 600	–
1992 irrigated acres by size of farm:						
1 to 9 acres ..... farms	3	4	3	8	4	18
acres irrigated	5	5	8	8	9	29
10 to 49 acres ..... farms	1	2	7	4	6	19
acres irrigated	(D)	(D)	10	13	20	43
50 to 69 acres ..... farms	2	–	2	3	2	7
acres irrigated	(D)	–	(D)	3	(D)	47
70 to 99 acres ..... farms	–	3	–	3	2	4
acres irrigated	–	(D)	–	(D)	(D)	(D)
100 to 139 acres ..... farms	1	2	4	2	2	3
acres irrigated	(D)	(D)	13	(D)	(D)	8
140 to 179 acres ..... farms	–	1	1	2	–	6
acres irrigated	–	(D)	(D)	(D)	–	23
180 to 219 acres ..... farms	–	–	2	–	–	2
acres irrigated	–	–	(D)	–	–	(D)
220 to 259 acres ..... farms	1	–	–	2	1	3
acres irrigated	(D)	–	–	(D)	(D)	(D)
260 to 499 acres ..... farms	2	1	3	4	1	7
acres irrigated	(D)	(D)	3	46	(D)	137
500 to 999 acres ..... farms	–	1	1	1	1	1
acres irrigated	–	(D)	(D)	(D)	(D)	(D)
1,000 to 1,999 acres ..... farms	1	–	1	–	–	1
acres irrigated	(D)	–	(D)	–	–	(D)
2,000 acres or more ..... farms	–	–	–	–	2	–
acres irrigated	–	–	–	–	(D)	–

Table 25. Miscellaneous Livestock and Animal Specialties—Inventory and Sales: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	Inventory		Sales		
	Farms	Number	Farms	Number	Sales ($1,000)
OTHER LIVESTOCK AND LIVESTOCK PRODUCTS—Con.					
Counties, 1997					
Androscoggin	3	(X)	–	(X)	–
Aroostook	5	(X)	4	(X)	278
Cumberland	4	(X)	–	(X)	–
Hancock	6	(X)	5	(X)	(D)
Kennebec	3	(X)	2	(X)	(D)
Knox	3	(X)	1	(X)	(D)
Lincoln	8	(X)	5	(X)	59
Oxford	8	(X)	6	(X)	15
Penobscot	6	(X)	7	(X)	(D)
Sagadahoc	3	(X)	1	(X)	(D)
Somerset	7	(X)	3	(X)	31
York	12	(X)	6	(X)	(D)
All other counties	5	(X)	7	(X)	97

Table 26. Grains—Corn, Sorghum, Wheat, and Other Small Grains: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
CORN FOR GRAIN OR SEED (BUSHELS)										
State Total										
Maine	49	3 604	(D)	8	(D)	46	2 739	266 755	1	(D)
Counties										
Androscoggin	5	(D)	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
Hancock	3	3	70	2	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
Kennebec	11	542	41 705	2	(D)	7	202	(D)	1	(D)
Lincoln	4	22	1 450	–	–	3	(D)	(D)	–	–
Oxford	8	959	119 448	–	–	4	942	115 726	–	–
Penobscot	5	915	85 265	1	(D)	7	979	79 792	–	–
Somerset	3	475	55 000	–	–	5	136	(D)	–	–
Waldo	3	(D)	(D)	–	–	1	(D)	(D)	–	–
All other counties	7	218	25 506	2	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
WHEAT FOR GRAIN, TOTAL (SEE TEXT) (BUSHELS)										
State Total										
Maine	15	551	32 881	–	–	14	415	13 913	–	–
Counties										
Aroostook	10	535	32 331	–	–	4	(D)	13 440	–	–
All other counties	5	16	550	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
BARLEY FOR GRAIN (BUSHELS)										
State Total										
Maine	195	28 163	1 769 992	–	–	136	12 687	994 445	–	–
Counties										
Aroostook	175	26 766	1 701 510	–	–	121	11 975	949 994	–	–
Penobscot	9	1 154	60 455	–	–	7	461	30 785	–	–
Piscataquis	4	99	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Somerset	3	92	2 312	–	–	–	–	–	–	–
All other counties	4	52	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
BUCKWHEAT (BUSHELS)										
State Total										
Maine	1	(D)	(D)	–	–	3	(D)	(D)	–	–
Counties										
Aroostook	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)

Table 26. Grains—Corn, Sorghum, Wheat, and Other Small Grains: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
CANOLA (POUNDS)										
State Total										
Maine	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Aroostock	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
OATS FOR GRAIN (BUSHELS)										
State Total										
Maine	272	22 364	1 643 127	1	(D)	320	24 277	2 014 920	1	(D)
Counties										
Androscoggin	3	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Aroostock	220	20 644	1 538 268	–	–	264	22 259	1 880 330	1	(D)
Cumberland	3	26	1 192	–	–	4	18	430	–	–
Franklin	3	(D)	624	–	–	–	–	–	–	–
Hancock	6	16	425	1	(D)	4	12	460	–	–
Kennebec	6	140	6 282	–	–	6	(D)	(D)	–	–
Oxford	3	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Penobscot	11	1 057	67 494	–	–	15	1 261	104 280	–	–
Piscataquis	4	(D)	(D)	–	–	3	200	(D)	–	–
Somerset	4	52	1 970	–	–	11	222	7 880	–	–
York	3	13	(D)	–	–	4	14	504	–	–
All other counties	6	36	1 575	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
RYE FOR GRAIN (BUSHELS)										
State Total										
Maine	15	849	23 937	–	–	18	340	11 533	–	–
Counties										
Aroostock	3	84	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Penobscot	3	(D)	347	–	–	6	241	7 937	–	–
York	5	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
All other counties	4	21	874	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
SUNFLOWER SEED (POUNDS)										
State Total										
Maine	3	15	13 500	–	–	(NA)	(NA)	(NA)	(NA)	(NA)

Table 27. Cotton, Tobacco, Soybeans, Dry Beans and Peas, Potatoes, Sugar Crops, and Peanuts: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
SOYBEANS FOR BEANS (BUSHELS)										
State Total										
Maine	18	804	20 993	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Aroostock	14	668	16 533	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
All other counties	4	136	4 460	–	–	(NA)	(NA)	(NA)	(NA)	(NA)

Table 27. Cotton, Tobacco, Soybeans, Dry Beans and Peas, Potatoes, Sugar Crops, and Peanuts: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
DRY EDIBLE BEANS, EXCLUDING DRY LIMAS (CWT)										
State Total										
Maine	61	984	9 839	6	6	85	1 220	15 693	3	(D)
Counties										
Franklin	5	(D)	(D)	–	–	3	(D)	(D)	–	–
Hancock	7	12	111	3	3	8	11	52	1	(D)
Knox	3	(D)	(D)	–	–	7	13	56	–	–
Lincoln	3	3	6	–	–	3	4	8	–	–
Oxford	8	657	(D)	–	–	3	(D)	(D)	–	–
Penobscot	13	180	1 737	–	–	24	299	4 009	1	(D)
Piscataquis	4	(D)	42	–	–	6	33	318	–	–
Somerset	3	5	34	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Waldo	8	31	200	–	–	9	42	306	–	–
York	3	7	81	2	(D)	6	(D)	(D)	1	(D)
All other counties	4	4	19	1	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
POTATOES, EXCLUDING SWEETPOTATOES (CWT)										
State Total										
Maine	586	73 085	19 490 474	100	8 634	770	87 650	25 008 230	59	5 562
Counties										
Androscoggin	12	196	50 070	4	144	19	194	56 300	7	(D)
Aroostook	416	65 454	17 468 682	45	6 052	591	79 938	23 029 776	26	3 466
Cumberland	9	(D)	(D)	4	14	7	(D)	22 160	3	(D)
Franklin	5	22	(D)	1	(D)	9	59	6 933	–	–
Hancock	12	11	1 590	2	(D)	12	6	1 010	3	1
Kennebec	14	9	1 406	3	3	9	15	1 386	–	–
Knox	4	(D)	(D)	1	(D)	8	65	11 259	1	(D)
Lincoln	8	7	1 425	2	(D)	4	(D)	(D)	1	(D)
Oxford	18	1 919	545 626	8	467	17	1 712	509 146	5	460
Penobscot	34	4 007	1 035 188	13	1 347	41	4 086	1 022 004	4	650
Piscataquis	12	444	99 574	4	(D)	13	608	132 830	2	(D)
Sagadahoc	3	(D)	(D)	1	(D)	2	(D)	(D)	–	–
Somerset	4	(D)	(D)	–	–	5	12	1 885	–	–
Waldo	9	16	3 304	–	–	8	40	7 150	3	(D)
Washington	11	28	6 998	4	4	8	11	1 726	1	(D)
York	15	(D)	(D)	8	(D)	17	(D)	(D)	3	(D)

Table 28. Field Seeds, Grass Seeds, Hay, Forage, and Silage: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
FIELD SEED AND GRASS SEED CROPS										
State Total										
Maine	4	(D)	(X)	–	–	(NA)	(NA)	(X)	(NA)	(NA)
RYEGRASS SEED (POUNDS)										
State Total										
Maine	3	9	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
TIMOTHY SEED (POUNDS)										
State Total										
Maine	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Aroostook	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)

Table 28. Field Seeds, Grass Seeds, Hay, Forage, and Silage: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
HAY—ALFALFA, OTHER TAME, SMALL GRAIN, WILD, GRASS SILAGE, GREEN CHOP, ETC. (SEE TEXT) (TONS, DRY)										
State Total										
Maine	2 810	214 005	332 039	26	958	3 119	214 129	332 197	18	160
Counties										
Androscoggin	172	13 759	24 589	–	–	213	14 949	26 464	3	44
Aroostock	270	21 795	32 927	3	(D)	279	16 302	22 528	–	–
Cumberland	248	17 075	24 976	4	30	242	14 524	24 631	–	–
Franklin	141	9 882	16 326	–	–	143	9 228	14 208	–	–
Hancock	76	2 122	2 530	3	6	80	2 907	3 218	2	(D)
Kennebec	282	30 484	43 024	3	(D)	338	31 546	55 323	3	(D)
Knox	87	5 150	5 848	2	(D)	105	5 732	9 361	–	–
Lincoln	103	6 409	10 672	–	–	128	6 362	8 951	1	(D)
Oxford	193	9 964	15 204	–	–	200	9 276	14 196	–	–
Penobscot	293	25 283	41 288	3	(D)	313	28 199	37 331	–	–
Piscataquis	69	5 681	9 576	–	–	98	6 437	11 443	–	–
Sagadahoc	69	5 526	10 236	–	–	74	5 110	8 732	1	(D)
Somerset	275	24 018	37 808	3	(D)	305	28 785	39 545	1	(D)
Waldo	197	18 784	30 336	–	–	223	17 658	30 191	2	(D)
Washington	69	2 899	3 184	1	(D)	83	2 762	3 423	–	–
York	266	15 174	23 515	4	55	295	14 352	22 652	5	9
ALFALFA HAY (TONS, DRY)										
State Total										
Maine	243	10 459	20 116	4	(D)	774	34 582	57 802	5	19
Counties										
Androscoggin	12	(D)	(D)	–	–	63	2 098	3 800	1	(D)
Aroostock	16	2 010	2 938	1	(D)	56	2 103	3 165	–	–
Cumberland	24	(D)	(D)	–	–	61	2 825	5 956	–	–
Franklin	9	(D)	(D)	–	–	41	1 622	2 384	–	–
Hancock	12	(D)	(D)	1	(D)	25	(D)	651	–	–
Kennebec	25	1 354	2 053	–	–	81	5 308	8 454	1	(D)
Knox	3	(D)	(D)	–	–	24	580	1 175	–	–
Lincoln	11	271	841	–	–	26	548	974	–	–
Oxford	11	(D)	(D)	–	–	47	1 674	2 328	–	–
Penobscot	28	1 050	3 058	–	–	73	4 373	6 042	–	–
Piscataquis	8	(D)	(D)	–	–	26	1 414	(D)	–	–
Sagadahoc	4	(D)	(D)	–	–	19	547	723	–	–
Somerset	28	897	1 903	–	–	81	4 609	7 425	–	–
Waldo	16	1 058	2 778	–	–	57	3 831	7 819	1	(D)
Washington	4	39	82	1	(D)	16	(D)	(D)	–	–
York	32	938	1 637	1	(D)	78	2 140	3 124	2	(D)
SMALL GRAIN HAY (TONS, DRY)										
State Total										
Maine	85	3 886	5 334	1	(D)	87	1 993	3 317	1	(D)
Counties										
Androscoggin	4	(D)	(D)	–	–	7	73	133	–	–
Aroostock	16	1 614	2 112	–	–	23	507	601	–	–
Kennebec	7	206	132	1	(D)	7	340	600	–	–
Lincoln	5	202	349	–	–	–	–	–	–	–
Penobscot	7	157	153	–	–	7	192	253	–	–
Piscataquis	3	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Somerset	6	133	251	–	–	8	284	783	–	–
Waldo	6	87	145	–	–	6	68	112	1	(D)
York	20	578	878	–	–	11	122	135	–	–
All other counties	11	624	786	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
TAME HAY OTHER THAN ALFALFA, SMALL GRAIN, AND WILD HAY (SEE TEXT) (TONS, DRY)										
State Total										
Maine	2 005	119 468	187 105	12	177	1 940	117 143	177 301	7	73

Table 28. Field Seeds, Grass Seeds, Hay, Forage, and Silage: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
TAME HAY OTHER THAN ALFALFA, SMALL GRAIN, AND WILD HAY (SEE TEXT) (TONS, DRY)—Con.										
Counties										
Androscoggin	125	8 189	14 188	–	–	129	8 045	13 531	1	(D)
Aroostook	204	12 975	20 645	2	(D)	183	9 752	13 649	–	–
Cumberland	187	11 370	16 802	2	(D)	160	8 486	13 532	–	–
Franklin	105	5 905	9 990	–	–	97	5 880	9 085	–	–
Hancock	44	1 255	1 474	–	–	40	1 575	2 027	–	–
Kennebec	200	14 609	19 541	2	(D)	209	14 898	24 590	1	(D)
Knox	54	2 592	2 870	1	(D)	58	2 905	5 334	–	–
Lincoln	68	3 083	4 761	–	–	78	3 785	5 474	1	(D)
Oxford	148	7 259	11 828	–	–	112	5 412	8 699	–	–
Penobscot	207	12 355	18 141	2	(D)	196	14 608	19 815	–	–
Piscataquis	49	2 377	3 509	–	–	58	2 726	3 943	–	–
Sagadahoc	55	3 841	7 883	–	–	53	3 587	5 878	1	(D)
Somerset	178	11 976	19 991	–	–	187	15 155	18 861	1	(D)
Waldo	145	10 501	17 871	–	–	136	9 248	15 341	1	(D)
Washington	39	1 926	2 175	–	–	49	1 646	2 136	–	–
York	197	9 255	15 436	3	(D)	195	9 435	15 406	1	(D)
WILD HAY (TONS, DRY)										
State Total										
Maine	667	28 934	33 129	10	45	593	21 166	24 293	3	(D)
Counties										
Androscoggin	35	940	1 230	–	–	39	1 064	1 112	–	–
Aroostook	42	1 889	2 561	–	–	43	1 591	1 841	–	–
Cumberland	65	2 143	2 967	2	(D)	42	1 604	2 308	–	–
Franklin	27	1 015	1 372	–	–	17	418	446	–	–
Hancock	27	555	638	2	(D)	23	715	401	2	(D)
Kennebec	72	5 696	5 895	–	–	70	3 085	3 502	1	(D)
Knox	33	1 537	1 822	1	(D)	40	1 409	1 803	–	–
Lincoln	39	2 103	2 734	–	–	37	1 337	1 309	–	–
Oxford	37	1 123	1 120	–	–	44	1 132	1 308	–	–
Penobscot	60	2 399	2 705	1	(D)	57	1 991	2 238	–	–
Piscataquis	13	493	533	–	–	16	1 110	1 848	–	–
Sagadahoc	17	525	699	–	–	9	306	399	–	–
Somerset	77	3 919	4 498	3	(D)	47	2 212	2 431	–	–
Waldo	38	1 828	1 545	–	–	39	1 366	1 312	–	–
Washington	28	826	786	–	–	18	499	629	–	–
York	57	1 943	2 024	1	(D)	52	1 327	1 406	–	–
GRASS SILAGE, HAYLAGE, AND GREEN CHOP HAY (TONS, GREEN)										
State Total										
Maine	482	51 258	259 069	1	(D)	430	39 245	208 447	3	14
Counties										
Androscoggin	40	3 962	24 015	–	–	41	3 669	23 661	1	(D)
Aroostook	31	3 307	14 010	–	–	35	2 349	9 822	–	–
Cumberland	40	2 952	12 095	–	–	23	(D)	(D)	–	–
Franklin	29	2 304	11 883	–	–	19	(D)	(D)	–	–
Kennebec	57	8 619	46 218	1	(D)	63	7 915	54 528	–	–
Knox	13	968	3 282	–	–	13	835	3 138	–	–
Lincoln	13	750	5 960	–	–	12	692	3 582	–	–
Oxford	19	1 205	5 945	–	–	16	1 018	5 477	–	–
Penobscot	70	9 322	51 690	–	–	54	7 035	26 941	–	–
Piscataquis	13	1 815	10 766	–	–	11	(D)	6 774	–	–
Sagadahoc	12	1 083	4 677	–	–	10	(D)	(D)	–	–
Somerset	71	7 093	33 491	–	–	69	6 525	30 128	–	–
Waldo	39	5 310	23 996	–	–	35	3 145	16 822	–	–
Washington	6	108	424	–	–	4	(D)	(D)	–	–
York	29	2 460	10 617	–	–	22	1 328	7 741	2	(D)
CORN FOR SILAGE OR GREEN CHOP (TONS, GREEN)										
State Total										
Maine	332	27 537	447 405	6	(D)	438	28 254	454 228	3	8

Table 28. Field Seeds, Grass Seeds, Hay, Forage, and Silage: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
CORN FOR SILAGE OR GREEN CHOP (TONS, GREEN)—Con.										
Counties										
Androscoggin	41	3 333	62 692	–	–	54	3 321	57 175	–	–
Aroostook	17	827	12 068	–	–	17	1 016	15 295	–	–
Cumberland	13	820	11 735	–	–	22	995	17 694	–	–
Franklin	19	938	15 426	–	–	24	1 284	20 449	–	–
Hancock	6	(D)	(D)	1	(D)	3	(D)	(D)	–	–
Kennebec	47	4 238	66 926	1	(D)	60	4 021	67 015	–	–
Knox	5	136	1 990	–	–	6	91	1 449	–	–
Lincoln	7	180	3 324	1	(D)	7	249	4 720	–	–
Oxford	13	744	12 322	–	–	22	1 297	18 728	1	(D)
Penobscot	55	7 206	110 923	1	(D)	72	6 664	101 650	–	–
Piscataquis	11	1 315	26 021	–	–	14	1 254	20 400	–	–
Sagadahoc	4	167	3 550	–	–	6	250	4 780	–	–
Somerset	47	4 173	68 372	–	–	62	4 485	71 804	–	–
Waldo	30	2 641	41 361	–	–	42	2 415	40 521	–	–
Washington	1	(D)	(D)	1	(D)	3	(D)	(D)	2	(D)
York	16	654	8 757	1	(D)	24	881	12 076	–	–
SORGHUM CUT FOR DRY FORAGE OR HAY (TONS, DRY)										
State Total										
Maine	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Lincoln	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
SORGHUM FOR SILAGE OR GREEN CHOP (TONS, GREEN)										
State Total										
Maine	8	146	967	–	–	10	185	1 130	–	–
Counties										
Aroostook	3	66	(D)	–	–	4	136	960	–	–
All other counties	5	80	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
LAND USED FOR VEGETABLES (SEE TEXT)								
State Total								
Maine	611	11 701	212	5 624	582	10 135	139	2 283
Counties								
Androscoggin	37	468	17	223	43	440	14	75
Aroostook	79	7 356	10	(D)	56	5 897	10	1 363
Cumberland	63	574	34	372	66	814	27	238
Franklin	14	50	3	9	16	48	2	(D)
Hancock	32	95	16	25	27	82	5	7
Kennebec	59	334	9	25	48	321	4	13
Knox	21	207	4	9	22	291	2	(D)
Lincoln	28	318	14	29	27	180	7	20
Oxford	37	313	16	168	38	235	12	35
Penobscot	61	532	20	79	52	362	8	23
Piscataquis	12	68	2	(D)	12	40	3	5
Sagadahoc	15	74	5	44	15	191	5	(D)
Somerset	28	204	9	28	37	191	7	17
Waldo	28	129	6	18	19	124	3	8
Washington	26	83	11	36	22	82	5	15
York	71	896	36	324	82	836	25	245

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
VEGETABLES HARVESTED (SEE TEXT)								
State Total								
Maine	611	11 745	212	5 665	582	10 251	139	2 376
Counties								
Androscoggin	37	465	17	221	43	442	14	76
Aroostook	79	7 360	10	(D)	56	5 903	10	1 362
Cumberland	63	578	34	375	66	816	27	239
Franklin	14	52	3	10	16	46	2	(D)
Hancock	32	99	16	30	27	92	5	8
Kennebec	59	339	9	24	48	321	4	13
Knox	21	208	4	9	22	294	2	(D)
Lincoln	28	318	14	30	27	177	7	19
Oxford	37	315	16	168	38	237	12	32
Penobscot	61	530	20	76	52	364	8	25
Piscataquis	12	68	2	(D)	12	39	3	4
Sagadahoc	15	76	5	47	15	199	5	(D)
Somerset	28	201	9	27	37	190	7	17
Waldo	28	128	6	18	19	125	3	8
Washington	26	87	11	41	22	86	5	15
York	71	922	36	354	82	924	25	334
ASPARAGUS								
State Total								
Maine	30	15	7	4	32	27	11	5
Counties								
Androscoggin	3	(D)	–	–	4	1	1	(D)
Cumberland	3	1	2	(D)	3	(D)	2	(D)
Hancock	3	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)
Oxford	3	2	–	–	(NA)	(NA)	(NA)	(NA)
Waldo	3	(Z)	–	–	(NA)	(NA)	(NA)	(NA)
York	6	3	2	(D)	6	4	3	1
All other counties	9	4	2	(D)	(NA)	(NA)	(NA)	(NA)
SNAP BEANS								
State Total								
Maine	130	109	35	56	171	148	35	42
Counties								
Androscoggin	7	8	2	(D)	14	12	6	6
Aroostook	16	6	1	(D)	10	6	–	–
Cumberland	17	15	11	12	27	23	7	5
Franklin	4	(D)	2	(D)	4	1	–	–
Hancock	7	2	3	1	8	3	1	(D)
Kennebec	18	11	1	(D)	19	17	1	(D)
Knox	6	2	–	–	5	2	1	(D)
Lincoln	8	5	1	(D)	7	1	3	1
Oxford	6	2	2	(D)	12	3	5	1
Penobscot	13	11	3	(D)	19	8	1	(D)
Piscataquis	3	1	1	(D)	–	–	–	–
Sagadahoc	5	1	3	1	5	(D)	2	(D)
Somerset	3	2	–	–	11	6	2	(D)
Waldo	4	(D)	–	–	2	(D)	–	–
Washington	5	4	2	(D)	9	2	4	1
York	8	36	3	(D)	19	38	2	(D)
BEETS								
State Total								
Maine	67	20	24	9	76	53	17	19
Counties								
Cumberland	11	4	8	3	10	11	6	5
Hancock	3	(Z)	–	–	8	3	2	(D)
Kennebec	13	4	2	(D)	11	4	–	–
Knox	3	(Z)	–	–	3	1	–	–
Oxford	5	1	1	(D)	4	1	–	–
Penobscot	15	4	3	1	6	(D)	–	–
Washington	5	3	3	(D)	7	2	2	(D)
All other counties	12	4	7	3	(NA)	(NA)	(NA)	(NA)

Table 29. **Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992**—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
BROCCOLI								
State Total								
Maine	50	* (D)	24	(D)	81	3 219	27	1 361
Counties								
Androscoggin	3	4	3	4	5	3	1	(D)
Aroostook	7	(D)	3	(D)	11	3 184	5	1 350
Cumberland	7	4	6	4	5	(D)	5	(D)
Hancock	6	1	4	1	7	4	2	(D)
Kennebec	5	1	–	–	5	1	1	(D)
Penobscot	7	2	3	1	6	3	–	–
Sagadahoc	3	(Z)	1	(D)	4	3	2	(D)
All other counties	12	82	4	81	(NA)	(NA)	(NA)	(NA)
BRUSSELS SPROUTS								
State Total								
Maine	7	1	2	(D)	13	2	3	(Z)
CHINESE CABBAGE								
State Total								
Maine	6	7	2	(D)	(NA)	(NA)	(NA)	(NA)
HEAD CABBAGE								
State Total								
Maine	56	54	25	24	80	151	23	50
Counties								
Androscoggin	5	24	4	9	10	60	3	6
Aroostook	7	6	1	(D)	8	11	1	(D)
Cumberland	9	12	8	11	7	19	6	18
Kennebec	7	4	–	–	7	2	1	(D)
Knox	3	(D)	–	–	7	15		
Penobscot	5	2	2	(D)	4	1		
Sagadahoc	4	1	2	(D)	5	(D)	2	(D)
Washington	5	2	2	(D)	7	1	4	1
All other counties	11	(D)	6	3	(NA)	(NA)	(NA)	(NA)
CANTALOUPS								
State Total								
Maine	40	23	18	9	35	17	14	8
Counties								
Androscoggin	3	(D)	2	(D)	3	1	3	1
Hancock	3	1	2	(D)	–	–	–	–
Kennebec	8	2	2	(D)	4	1	–	–
Oxford	6	(D)	4	1	3	2	–	–
Penobscot	4	2	2	(D)	4	3	2	(D)
Sagadahoc	3	1	3	1	(NA)	(NA)	(NA)	(NA)
York	6	5	3	(D)	7	6	5	4
All other counties	7	2	–	–	(NA)	(NA)	(NA)	(NA)
CARROTS								
State Total								
Maine	72	30	34	19	96	34	25	12
Counties								
Androscoggin	7	7	3	5	8	4	5	3
Aroostook	6	3	1	(D)	9	4	2	(D)
Cumberland	7	5	6	3	12	9	5	4
Hancock	9	2	5	1	10	2	2	(D)
Kennebec	6	1	1	(D)	8	2	–	–
Oxford	5	1	1	(D)	7	4	1	(D)
Penobscot	10	4	6	3	8	3	–	–
Washington	12	5	7	5	3	1	2	(D)
All other counties	10	2	4	1	(NA)	(NA)	(NA)	(NA)

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
CAULIFLOWER								
State Total								
Maine	21	11	9	4	40	27	10	6
Counties								
Cumberland	4	2	4	2	5	6	3	(D)
Kennebec	5	1	–	–	3	1	–	–
All other counties	12	8	5	2	(NA)	(NA)	(NA)	(NA)
CELERY								
State Total								
Maine	1	(D)	–	–	5	1	1	(D)
Counties								
Androscoggin	1	(D)	–	–	(NA)	(NA)	(NA)	(NA)
CHINESE PEAS								
State Total								
Maine	1	(D)	–	–	(NA)	(NA)	(NA)	(NA)
Counties								
Penobscot	1	(D)	–	–	(NA)	(NA)	(NA)	(NA)
CUCUMBERS AND PICKLES								
State Total								
Maine	185	162	74	76	171	121	41	40
Counties								
Androscoggin	12	14	7	9	20	25	6	5
Aroostook	15	3	2	(D)	11	6	6	3
Cumberland	23	20	14	10	22	12	8	5
Franklin	4	2	2	(D)	5	1	–	–
Hancock	8	2	6	2	4	2	–	–
Kennebec	20	14	4	2	19	12	–	–
Knox	6	(D)	–	–	8	13	1	(D)
Lincoln	7	2	2	(D)	5	2	1	(D)
Oxford	13	5	6	2	9	3	3	(Z)
Penobscot	18	23	4	(D)	16	8	1	(D)
Piscataquis	3	(D)	1	(D)	2	(D)	2	(D)
Sagadahoc	3	1	3	1	3	(D)	1	(D)
Somerset	8	3	2	(D)	8	8	2	(D)
Waldo	8	9	2	(D)	6	7	1	(D)
Washington	9	7	5	4	9	2	1	(D)
York	28	44	14	27	24	18	8	6
EGGPLANT								
State Total								
Maine	12	5	8	5	13	(D)	6	1
Counties								
Cumberland	5	4	5	4	(NA)	(NA)	(NA)	(NA)
All other counties	7	1	3	1	(NA)	(NA)	(NA)	(NA)
GARLIC								
State Total								
Maine	31	8	15	3	(NA)	(NA)	(NA)	(NA)
Counties								
Aroostook	3	(Z)	3	(Z)	(NA)	(NA)	(NA)	(NA)
Cumberland	3	(Z)	1	(D)	(NA)	(NA)	(NA)	(NA)
Hancock	4	1	3	1	(NA)	(NA)	(NA)	(NA)
Kennebec	3	(Z)	–	–	(NA)	(NA)	(NA)	(NA)
Lincoln	4	(D)	2	(D)	(NA)	(NA)	(NA)	(NA)
Waldo	5	2	–	–	(NA)	(NA)	(NA)	(NA)
York	3	1	3	1	(NA)	(NA)	(NA)	(NA)
All other counties	6	(D)	3	1	(NA)	(NA)	(NA)	(NA)

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
HERBS, FRESH CUT (SEE TEXT)								
State Total								
Maine	38	9	20	6	44	11	16	(D)
Counties								
Androscoggin	5	2	3	2	5	(D)	2	(D)
Cumberland	8	2	5	1	8	2	2	(D)
Hancock	6	1	3	1	3	(Z)	1	(D)
Kennebec	3	1	1	(D)	(NA)	(NA)	(NA)	(NA)
Lincoln	3	1	2	(D)	3	(D)	2	(D)
Oxford	4	1	2	(D)	6	(D)	3	(Z)
York	5	1	1	(D)	3	(D)	1	(D)
All other counties	4	1	3	(Z)	(NA)	(NA)	(NA)	(NA)
HONEYDEW MELONS								
State Total								
Maine	3	(Z)	3	(Z)	(NA)	(NA)	(NA)	(NA)
KALE								
State Total								
Maine	4	(Z)	1	(D)	9	11	3	(D)
Counties								
Franklin	1	(D)	–	–	(NA)	(NA)	(NA)	(NA)
Hancock	3	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)
LETTUCE AND ROMAINE								
State Total								
Maine	73	62	42	38	80	72	31	54
Counties								
Androscoggin	3	3	2	(D)	6	2	4	
Cumberland	9	17	7	17	13	16	9	
Hancock	17	21	11	5	11	6	3	
Kennebec	6	1	1	(D)	4	1	–	
Knox	4	4	1	(D)	5	1	1	
Lincoln	5	2	4	2	7	1	4	
Oxford	4	1	3	1	4	3	1	
Somerset	4	(Z)	3	(Z)	(NA)	(NA)	(NA)	
Washington	4	(D)	1	(D)	(NA)	(NA)	(NA)	
York	10	8	7	7	7	1	1	
All other counties	7	(D)	2	(D)	(NA)	(NA)	(NA)	
MUSTARD GREENS								
State Total								
Maine	1	(D)	–	–	5	12	–	
Counties								
Kennebec	1	(D)	–	–	(NA)	(NA)	(NA)	
DRY ONIONS								
State Total								
Maine	42	18	16	4	38	6	9	
Counties								
Cumberland	4	1	2	(D)	8	1	2	
Hancock	4	(Z)	3	(Z)	(NA)	(NA)	(NA)	
Kennebec	8	2	1	(D)	8	2	–	
Knox	5	8	–	–	3	(Z)	1	
Somerset	3	1	2	(D)	(NA)	(NA)	(NA)	
Waldo	3	(D)	–	–	(NA)	(NA)	(NA)	
Washington	3	(Z)	–	–	(NA)	(NA)	(NA)	
All other counties	12	(D)	8	3	(NA)	(NA)		

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
GREEN ONIONS								
State Total								
Maine	15	3	2	(D)	29	4	6	1
Counties								
Kennebec	3	1	–	–	3	1	–	–
All other counties	12	2	2	(D)	(NA)	(NA)	(NA)	(NA)
PARSLEY								
State Total								
Maine	6	1	4	(Z)	12	4	4	(D)
GREEN PEAS, EXCLUDING GREEN COWPEAS								
State Total								
Maine	151	2 057	30	50	159	2 753	33	35
Counties								
Androscoggin	9	6	1	(D)	15	8	7	6
Aroostook	49	1 927	1	(D)	39	2 588	1	(D)
Cumberland	11	14	7	11	12	28	6	12
Franklin	3	(D)	1	(D)	3	(D)	–	–
Hancock	7	2	3	(Z)	6	6	1	(D)
Kennebec	16	17	2	(D)	13	16	–	–
Knox	6	(D)	–	–	5	24	–	–
Lincoln	5	2	1	(D)	5	1	2	(D)
Oxford	3	(D)	3	(D)	10	6	4	1
Penobscot	17	26	1	(D)	19	10	3	3
Piscataquis	5	9	1	(D)	4	7	–	–
Sagadahoc	2	(D)	2	(D)	3	(D)	3	(D)
Somerset	8	4	2	(D)	8	4	2	(D)
Waldo	3	(D)	1	(D)	2	(D)	–	–
Washington	3	(D)	2	(D)	5	(D)	4	1
York	4	11	2	(D)	10	16	–	–
HOT PEPPERS								
State Total								
Maine	14	3	5	2	12	2	4	1
Counties								
Cumberland	4	2	3	(D)	(NA)	(NA)	(NA)	(NA)
Kennebec	4	(Z)	–	–	(NA)	(NA)	(NA)	(NA)
All other counties	6	1	2	(D)	(NA)	(NA)	(NA)	(NA)
SWEET PEPPERS								
State Total								
Maine	66	22	29	10	70	31	23	10
Counties								
Androscoggin	3	(D)	2	(D)	8	4	3	(D)
Cumberland	11	4	8	4	14	12	6	4
Hancock	7	2	5	1	(NA)	(NA)	(NA)	(NA)
Kennebec	8	1	–	–	10	3	1	(D)
Lincoln	5	1	3	1	(NA)	(NA)	(NA)	(NA)
Penobscot	4	2	2	(D)	3	(Z)	–	–
Somerset	4	1	2	(D)	4	2	1	(D)
Washington	3	(Z)	2	(D)	3	(Z)	3	(Z
York	13	7	3	1	13	6	3	(
All other counties	8	(D)	2	(D)	(NA)	(NA)	(NA)	(N

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
PUMPKINS								
State Total								
Maine	220	505	55	122	207	400	34	141
Counties								
Androscoggin	17	55	3	17	19	26	1	(D)
Aroostook	9	20	1	(D)	9	12	1	(D)
Cumberland	24	58	10	29	28	54	8	10
Franklin	5	4	1	(D)	5	(D)	–	–
Hancock	11	12	5	(D)	10	10	3	1
Kennebec	26	35	2	(D)	25	26	2	(D)
Knox	6	6	2	(D)	9	30	–	–
Lincoln	7	19	–	–	5	8	1	(D)
Oxford	16	22	5	5	15	12	4	2
Penobscot	24	57	2	(D)	17	32	2	(D)
Piscataquis	1	(D)	1	(D)	3	(D)	2	(D)
Sagadahoc	6	(D)	2	(D)	6	6	1	(D)
Somerset	12	30	–	–	9	8	3	(D)
Waldo	8	13	1	(D)	6	9	–	–
Washington	5	7	2	(D)	12	12	1	(D)
York	43	165	18	46	29	152	5	(D)
RADISHES								
State Total								
Maine	12	(D)	5	(D)	25	44	8	(D)
Counties								
Hancock	3	1	2	(D)	(NA)	(NA)	(NA)	(NA)
All other counties	9	(D)	3	12	(NA)	(NA)	(NA)	(NA)
RHUBARB								
State Total								
Maine	11	2	5	1	(NA)	(NA)	(NA)	(NA)
Counties								
Cumberland	4	1	3	(D)	(NA)	(NA)	(NA)	(NA)
All other counties	7	1	2	(D)	(NA)	(NA)	(NA)	(NA)
SPINACH								
State Total								
Maine	21	(D)	7	37	34	7	9	2
Counties								
Aroostook	4	(D)	2	(D)	(NA)	(NA)	(NA)	(NA)
Cumberland	4	(D)	3	(D)	(NA)	(NA)	(NA)	(NA)
Kennebec	4	1	–	–	7	2	–	–
Knox	3	1	–	–	(NA)	(NA)	(NA)	(NA)
All other counties	6	2	2	(D)	(NA)	(NA)	(NA)	(NA)
SQUASH								
State Total								
Maine	213	383	71	125	233	441	46	71
Counties								
Androscoggin	13	23	6	4	23	44	4	2
Aroostook	8	8	1	(D)	13	15	1	(D)
Cumberland	20	76	11	64	34	130	9	35
Franklin	7	4	2	(D)	8	3	–	–
Hancock	8	(D)	4	(Z)	8	9	3	1
Kennebec	16	14	1	(D)	20	18	–	–
Knox	6	17	2	(D)	12	34	1	(D)
Lincoln	10	(D)	2	(D)	6	(D)	1	(D)
Oxford	19	20	8	5	16	14	6	2
Penobscot	28	50	8	9	26	48	2	(D)
Piscataquis	4	4	1	(D)	2	(D)	–	–
Sagadahoc	7	7	2	(D)	4	6	1	(D)
Somerset	11	20	4	2	14	8	3	1
Waldo	11	18	1	(D)	7	34	1	(D)
Washington	11	10	5	5	10	5	2	(D)
York	34	71	13	28	30	47	12	2

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
SWEET CORN								
State Total								
Maine	303	2 366	91	671	337	2 400	55	401
Counties								
Androscoggin	18	255	8	140	26	206	6	33
Aroostook	24	44	2	(D)	18	48	2	(D)
Cumberland	32	289	17	177	39	429	8	88
Franklin	9	29	2	(D)	6	23	–	–
Hancock	13	26	6	4	21	32	2	(D)
Kennebec	37	203	6	13	35	191	4	8
Knox	12	110	1	(D)	13	148	2	(D)
Lincoln	11	191	3	(D)	12	119	2	(D)
Oxford	25	142	9	51	21	168	5	19
Penobscot	35	284	8	10	30	205	–	–
Piscataquis	7	43	1	(D)	5	(D)	2	(D)
Sagadahoc	7	32	4	11	8	(D)	2	(D)
Somerset	16	127	2	(D)	29	143	3	(D)
Waldo	9	62	2	(D)	9	55	–	–
Washington	16	17	7	6	15	35	3	1
York	32	512	13	172	50	575	14	177
TOMATOES								
State Total								
Maine	194	115	81	47	188	88	61	28
Counties								
Androscoggin	16	16	8	12	18	10	6	4
Aroostook	6	1	2	(D)	7	2	1	(D)
Cumberland	22	12	11	4	26	13	10	5
Hancock	13	8	8	2	11	4	1	(D)
Kennebec	21	13	4	2	19	7	1	(D)
Knox	6	5	–	–	3	1	–	–
Lincoln	13	3	6	1	10	1	6	1
Oxford	11	3	5	1	16	6	11	3
Penobscot	18	14	4	2	13	7	5	4
Sagadahoc	7	2	3	1	6	1	2	(D)
Somerset	8	4	4	2	13	4	3	(D)
Waldo	6	1	–	–	3	(D)	–	–
Washington	9	4	6	4	4	1	2	(D)
York	35	27	19	17	35	28	11	8
All other counties	3	(Z)	1	(D)	(NA)	(NA)	(NA)	(NA)
TURNIPS								
State Total								
Maine	8	1	3	(Z)	21	21	3	(D)
Counties								
Kennebec	4	1	–	–	(NA)	(NA)	(NA)	(NA)
All other counties	4	(Z)	3	(Z)	(NA)	(NA)	(NA)	(NA)
TURNIP GREENS								
State Total								
Maine	1	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)
Counties								
York	1	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)
MIXED VEGETABLES								
State Total								
Maine	64	201	21	50	45	88	8	15
Counties								
Androscoggin	7	17	4	6	4	13	1	(D)
Cumberland	3	6	1	(D)	4	9	3	8
Franklin	5	4	–	–	(NA)	(NA)	(NA)	(NA)
Hancock	3	4	2	(D)	(NA)	(NA)	(NA)	(NA)
Kennebec	4	(D)	1	(D)	3	10	–	–
Knox	5	21	–	–	–	–	–	–
Lincoln	5	(D)	3	(D)	5	3	1	(D)
Oxford	7	19	4	15	(NA)	(NA)	(NA)	(NA)
Penobscot	6	16	2	(D)	4	17	–	–
Waldo	4	15	1	(D)	4	6	–	–
Washington	5	18	2	(D)	–	–	–	–
York	5	15	1	(D)	13	13	2	(D)
All other counties	5	18	–	–	(NA)	(NA)	(NA)	(NA)

Table 29. Vegetables, Sweet Corn, and Melons Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Harvested		Irrigated		Harvested		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
WATERMELONS								
State Total								
Maine	6	(D)	2	(D)	11	4	4	
OTHER VEGETABLES								
State Total								
Maine	62	100	24	41	30	49	10	19
Counties								
Androscoggin	8	13	2	(D)	(NA)	(NA)	(NA)	(NA)
Cumberland	7	24	4	8	5	10	3	1
Hancock	4	6	1	(D)	(NA)	(NA)	(NA)	(NA)
Kennebec	11	4	2	(D)	4	4	–	–
Knox	4	4	–	–	(NA)	(NA)	(NA)	(NA)
Lincoln	4	7	1	(D)	–	–	–	–
Oxford	4	3	2	(D)	(NA)	(NA)	(NA)	(NA)
Washington	4	(D)	2	(D)	–	–	–	–
York	6	11	6	8	5	2	2	(D)
All other counties	10	(D)	4	13	(NA)	(NA)	(NA)	(NA)

Table 30. Land in Orchards: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Total		Irrigated		Total		Irrigated	
	Farms	Acres	Farms	Acres	Farms	Acres	Farms	Acres
LAND IN ORCHARDS								
State Total								
Maine	334	5 170	37	325	396	6 463	26	
Counties								
Androscoggin	34	1 492	5	(D)	37	1 478	2	
Aroostook	19	62	3	1	21	55	–	
Cumberland	19	292	6	72	23	346	3	
Franklin	16	222	–	–	20	348	–	
Hancock	22	101	1	(D)	19	156	2	
Kennebec	18	665	–	–	27	836	–	
Knox	23	145	2	(D)	18	85	–	
Lincoln	14	117	1	(D)	14	86	–	
Oxford	36	690	4	7	47	1 060	7	
Penobscot	36	296	3	11	39	300	3	
Piscataquis	6	9	–	–	11	19	–	
Sagadahoc	10	42	4	7	13	40	2	
Somerset	18	152	2	(D)	25	167	2	
Waldo	14	102	1	(D)	27	276	–	
Washington	13	54	2	(D)	18	67	1	
York	35	728	3	(D)	37	1 145	4	

Table 31. Fruits and Nuts: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	Total			Trees or vines of nonbearing age		Trees or vines of bearing age		Harvested	
	Farms	Acres	Trees or vines	Farms	Number	Farms	Number	Farms	Pounds
APPLES									
State Total									
Maine ..... 1997..	332	5 117	563 333	204	42 033	303	521 300	248	61 128 647
1992..	388	6 341	531 926	225	68 672	353	463 254	276	75 181 308
Counties, 1997									
Androscoggin	34	1 488	221 052	13	5 850	30	215 202	23	21 854 632
Aroostook.....	19	(D)	4 655	16	1 523	15	3 132	10	70 819
Cumberland.....	19	291	41 444	11	2 699	18	38 745	13	2 399 892
Franklin	16	(D)	12 944	9	1 173	16	11 771	12	2 077 590
Hancock.....	22	98	7 196	16	1 294	20	5 902	17	515 102
Kennebec.....	18	663	51 142	10	2 406	15	48 736	14	9 730 763
Knox	23	142	17 994	9	1 941	23	16 053	19	1 371 526
Lincoln	14	116	5 354	10	421	12	4 933	9	456 670
Oxford	36	677	67 601	19	3 806	35	63 795	27	9 633 732
Penobscot	36	295	27 809	32	5 018	34	22 791	28	2 077 040
Piscataquis	6	9	260	3	70	6	190	6	12 475
Sagadahoc	9	33	2 354	5	281	9	2 073	7	104 900
Somerset	18	148	16 156	14	6 356	16	9 800	15	1 185 449
Waldo.....	14	101	6 361	7	584	13	5 777	12	343 470
Washington	13	52	2 730	11	552	11	2 178	10	209 209
York	35	724	78 281	19	8 059	30	70 222	26	9 085 378
CHERRIES, TOTAL (SEE TEXT)									
State Total									
Maine ..... 1997..	26	6	283	16	120	16	163	12	1 433
1992..	35	23	1 121	20	141	27	980	8	6 690
Counties, 1997									
Androscoggin	3	1	23	3	(D)	1	(D)	–	–
Knox	4	1	25	–	–	4	25	3	110
Oxford	4	1	(D)	2	(D)	3	(D)	3	(D)
All other counties	15	3	(D)	11	(D)	8	35	6	(D)
SWEET CHERRIES									
State Total									
Maine ..... 1997..	17	3	102	11	48	9	54	5	91
1992..	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Counties, 1997									
Oxford	4	(D)	41	2	(D)	3	(D)	2	(D)
All other counties	13	(D)	61	9	(D)	6	(D)	3	(D)
TART CHERRIES									
State Total									
Maine ..... 1997..	21	3	181	9	72	14	109	11	1 342
1992..	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Counties, 1997									
Androscoggin	3	(D)	(D)	2	(D)	1	(D)	–	–
Knox	4	(D)	(D)	–	–	4	(D)	3	(D)
All other counties	14	2	(D)	7	(D)	9	89	8	(D)
GRAPES (SEE TEXT) (FRESH WEIGHT)									
State Total									
Maine ..... 1997..	33	10	3 955	20	2 255	28	1 700	17	1 235
1992..	43	15	8 017	36	840	38	7 177	16	1 217
Counties, 1997									
Cumberland.....	3	(D)	(D)	3	(D)	3	(D)	2	(D)
Knox	5	1	133	2	(D)	5	(D)	3	320
Oxford	3	(Z)	14	1	(D)	2	(D)	1	(D)
Somerset	4	1	(D)	2	(D)	4	(D)	1	(D)
York	4	1	(D)	3	50	3	(D)	2	(D)
All other counties	14	(D)	2 518	9	2 089	11	429	8	782

Table 31. **Fruits and Nuts: 1997 and 1992**—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	Total			Trees or vines of nonbearing age		Trees or vines of bearing age		Harvested	
	Farms	Acres	Trees or vines	Farms	Number	Farms	Number	Farms	Pounds
PEACHES									
State Total									
Maine 1997	20	16	1 125	17	357	15	768	11	3 215
1992	32	27	1 663	16	279	25	1 384	17	11 762
Counties, 1997									
Lincoln	3	1	21	3	(D)	2	(D)	2	(D)
York	4	(D)	61	3	14	4	47	3	250
All other counties	13	(D)	1 043	11	(D)	9	(D)	6	(D)
PEARS									
State Total									
Maine 1997	25	(D)	549	20	181	16	368	11	19 040
1992	51	37	2 170	31	979	40	1 191	26	65 404
Counties, 1997									
Hancock	3	(Z)	20	2	(D)	1	(D)	1	(D)
Knox	3	1	(D)	2	(D)	3	(D)	3	2 390
Oxford	4	(D)	204	3	(D)	4	(D)	4	(D)
York	3	(Z)	14	3	(D)	2	(D)	1	(D)
All other counties	12	3	(D)	10	(D)	6	106	2	(D)
PLUMS AND PRUNES (SEE TEXT) (FRESH WEIGHT)									
State Total									
Maine 1997	19	9	495	14	125	18	370	14	8 791
1992	27	10	601	13	359	17	242	12	2 655
Counties, 1997									
Lincoln	3	1	30	2	(D)	3	(D)	3	50
Oxford	3	(D)	270	2	(D)	3	(D)	3	(D)
All other counties	13	(D)	195	10	43	12	152	8	(D)
FILBERTS AND HAZELNUTS (IN SHELL)									
State Total									
Maine 1997	1	(D)	(D)	1	(D)	1	(D)	-	-
1992	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	NA
Counties, 1997									
York	1	(D)	(D)	1	(D)	1	(D)	-	-

Table 32. Berries Harvested for Sale: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
BERRIES										
State Total										
Maine	820	(D)	(X)	143	(D)	870	23 658	(X)	112	1 298
Counties										
Androscoggin	19	70	(X)	10	(D)	20	49	(X)	4	17
Aroostook	19	(D)	(X)	7	31	10	31	(X)	3	(D)
Cumberland	39	(D)	(X)	23	111	39	(D)	(X)	19	90
Franklin	14	104	(X)	2	(D)	15	(D)	(X)	3	1
Hancock	156	3 541	(X)	8	134	174	(D)	(X)	6	(D)
Kennebec	29	135	(X)	7	25	45	(D)	(X)	12	46
Knox	68	(D)	(X)	7	19	79	(D)	(X)	6	(D)
Lincoln	30	380	(X)	6	11	31	598	(X)	2	(D)
Oxford	28	(D)	(X)	6	(D)	24	292	(X)	4	(D)
Penobscot	30	199	(X)	10	28	32	244	(X)	7	13
Piscataquis	16	195	(X)	2	(D)	10	95	(X)	4	14
Sagadahoc	3	(D)	(X)	2	(D)	5	29	(X)	3	(D)
Somerset	8	(D)	(X)	4	5	10	13	(X)	5	4
Waldo	39	(D)	(X)	2	(D)	59	1 318	(X)	4	(D)
Washington	288	17 195	(X)	24	3 690	282	14 663	(X)	14	(D)
York	34	(D)	(X)	23	72	35	97	(X)	16	60
BLACKBERRIES (POUNDS)										
State Total										
Maine	9	7	7 813	1	(D)	18	20	14 851	5	1
TAME BLUEBERRIES (POUNDS)										
State Total										
Maine	68	319	605 675	24	43	97	882	1 564 462	14	75
Counties										
Androscoggin	7	8	11 249	4	7	7	(D)	6 675	–	–
Aroostook	3	1	(D)	2	(D)	1	(D)	(D)	–	–
Cumberland	8	7	10 900	4	2	10	61	61 978	4	(D)
Franklin	5	12	(D)	–	–	5	13	10 750	2	(D)
Hancock	11	185	406 636	–	–	11	169	351 984	–	–
Oxford	5	5	4 500	1	(D)	1	(D)	(D)	–	–
Washington	5	22	15 420	2	(D)	21	284	794 110	–	–
York	18	46	56 381	10	26	18	56	78 442	7	24
All other counties	6	34	83 375	1	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
WILD BLUEBERRIES (POUNDS)										
State Total										
Maine	569	23 693	70 253 178	23	3 874	589	22 234	71 843 383	22	1 005
Counties										
Cumberland	9	210	329 295	3	(D)	10	182	274 980	2	(D)
Franklin	4	86	(D)	–	–	3	35	(D)	–	–
Hancock	137	3 349	6 844 452	5	133	155	3 969	7 364 402	3	(D)
Kennebec	6	89	190 432	–	–	10	143	237 252	2	(D)
Knox	55	1 519	3 810 752	1	(D)	60	1 229	2 468 843	2	(D)
Lincoln	19	312	850 566	1	(D)	20	507	1 265 076	–	–
Oxford	12	209	551 842	–	–	11	258	184 084	–	–
Penobscot	10	129	272 246	–	–	13	199	332 118	1	(D)
Piscataquis	12	189	340 574	–	–	6	81	216 747	–	–
Waldo	30	442	1 188 021	–	–	44	1 253	2 892 325	–	–
Washington	272	17 131	55 796 129	13	3 655	254	14 371	56 566 262	12	(D)
All other counties	3	27	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
CRANBERRIES (CWT)										
State Total										
Maine	14	40	2 481	13	40	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Washington	8	28	2 002	8	28	(NA)	(NA)	(NA)	(NA)	(NA)
All other counties	6	12	479	5	12	(NA)	(NA)	(NA)	(NA)	(NA)

Table 32. Berries Harvested for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
RASPBERRIES (POUNDS)										
State Total										
Maine	80	68	69 575	32	31	107	116	101 052	30	31
Counties										
Androscoggin	5	8	13 469	4	7	11	7	6 305	–	–
Aroostook	9	6	4 889	4	2	4	(D)	3 830	1	(D)
Cumberland	5	4	4 025	4	4	8	4	3 435	6	3
Hancock	4	(D)	(D)	1	(D)	7	7	6 505	2	(D)
Kennebec	7	5	2 270	2	(D)	15	19	8 416	4	2
Knox	8	5	9 474	2	(D)	9	19	(D)	–	–
Lincoln	4	(D)	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
Oxford	5	3	2 095	1	(D)	6	2	2 440	1	(D)
Penobscot	11	12	6 477	4	2	14	12	7 456	4	4
Waldo	6	4	3 245	1	(D)	10	6	4 579	3	1
Washington	4	(D)	(D)	1	(D)	3	1	(D)	–	–
York	7	7	6 680	5	(D)	12	12	14 000	4	9
All other counties	5	5	8 301	2	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
STRAWBERRIES (POUNDS)										
State Total										
Maine	142	425	1 623 304	75	225	123	406	1 508 695	51	186
Counties										
Androscoggin	13	26	146 300	7	24	11	37	106 567	4	17
Aroostook	13	51	73 706	5	(D)	8	25	18 200	3	(D)
Cumberland	17	39	198 733	13	28	15	44	240 447	8	30
Franklin	4	6	(D)	1	(D)	5	9	(D)	–	–
Hancock	4	(D)	2 850	1	(D)	9	13	51 953	2	(D)
Kennebec	15	38	179 596	4	(D)	13	45	160 060	5	28
Knox	8	43	132 350	4	7	10	53	153 620	4	20
Lincoln	8	40	115 305	4	(D)	5	41	189 972	1	(D)
Oxford	8	16	72 640	5	15	7	14	(D)	3	(D)
Penobscot	10	58	269 053	6	26	7	34	139 300	3	(D)
Piscataquis	3	(D)	(D)	2	(D)	4	14	84 246	4	14
Sagadahoc	2	(D)	(D)	2	(D)	2	(D)	(D)	1	(D)
Somerset	7	10	31 513	4	5	4	(D)	(D)	2	(D)
Waldo	4	20	94 300	1	(D)	4	22	(D)	1	(D)
Washington	7	10	15 835	3	(D)	7	8	18 720	2	(D)
York	19	49	149 810	13	40	12	28	56 620	8	27
OTHER BERRIES (POUNDS)										
State Total										
Maine	1	(D)	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Androscoggin	1	(D)	(D)	1	(D)	(NA)	(NA)	(NA)	(NA)	(NA)

Table 33. Nursery and Greenhouse Crops, Cut Christmas Trees Harvested, Mushrooms, and Sod Grown for Sale: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)
NURSERY AND GREENHOUSE CROPS (SEE TEXT)								
State Total								
Maine	926	3 152 467	7 116	29 852	568	2 729 865	1 597	20 823
Counties								
Androscoggin	41	141 176	123	1 014	37	109 074	81	1 079
Aroostook	86	167 345	1 713	1 886	22	136 614	42	405
Cumberland	115	722 032	637	7 981	63	734 312	202	6 287
Franklin	28	61 170	143	267	15	29 132	41	259
Hancock	71	184 727	476	1 508	40	190 800	31	1 199
Kennebec	68	206 927	369	2 480	51	280 989	37	1 611
Knox	30	171 524	63	769	20	78 034	19	573
Lincoln	41	92 010	224	808	27	70 869	98	699
Oxford	60	378 013	616	2 801	35	147 329	336	2 834
Penobscot	93	290 584	865	2 391	64	249 642	122	1 338
Piscataquis	25	12 150	346	326	12	30 984	(D)	105
Sagadahoc	27	85 974	70	761	16	68 314	54	506
Somerset	45	121 138	224	907	32	115 288	(D)	445
Waldo	48	141 693	338	1 211	27	127 801	42	541
Washington	36	54 436	141	349	16	46 572	7	240
York	112	321 568	769	4 395	69	314 111	344	2 703
NURSERY, FLORICULTURE, VEGETABLE AND FLOWER SEED CROPS, SOD, ETC., GROWN IN THE OPEN, IRRIGATED (SEE TEXT)								
State Total								
Maine	173	(X)	1 350	(X)	112	(X)	419	(X)
Counties								
Androscoggin	4	(X)	(D)	(X)	9	(X)	29	(X)
Aroostook	10	(X)	25	(X)	–	(X)	–	(X)
Cumberland	40	(X)	259	(X)	23	(X)	104	(X)
Hancock	12	(X)	10	(X)	9	(X)	3	(X)
Kennebec	12	(X)	31	(X)	7	(X)	15	(X)
Knox	5	(X)	5	(X)	4	(X)	10	(X)
Lincoln	12	(X)	36	(X)	5	(X)	5	(X)
Oxford	7	(X)	(D)	(X)	3	(X)	(D)	(X)
Penobscot	14	(X)	64	(X)	14	(X)	16	(X)
Sagadahoc	4	(X)	3	(X)	(NA)	(X)	(NA)	(X)
Waldo	10	(X)	21	(X)	7	(X)	13	(X)
Washington	7	(X)	8	(X)	(NA)	(X)	(NA)	(X)
York	32	(X)	465	(X)	20	(X)	55	(X)
All other counties	4	(X)	14	(X)	(NA)	(X)	(NA)	(X)
FLORICULTURE CROPS—BEDDING/GARDEN PLANTS, FOLIAGE, POTTED FLOWERING PLANTS, AND CUT FLOWERS, TOTAL								
State Total								
Maine	504	2 618 133	246	18 000	447	2 335 667	241	13 835
Counties								
Androscoggin	21	118 000	(D)	596	28	101 512	(D)	419
Aroostook	22	137 462	(D)	520	16	126 154	(D)	335
Cumberland	79	691 589	54	5 538	69	641 440	42	5 159
Franklin	14	(D)	(D)	214	13	(D)	(D)	(D)
Hancock	41	165 337	14	1 190	31	177 106	(D)	1 109
Kennebec	35	192 247	25	1 914	39	180 532	14	1 110
Knox	17	147 768	6	550	15	59 234	4	279
Lincoln	19	82 657	11	585	21	66 506	11	552
Oxford	34	101 677	5	492	25	109 760	16	437
Penobscot	56	222 768	11	1 283	57	206 843	(D)	1 059
Piscataquis	7	(D)	4	56	9	27 932	(D)	(D)
Sagadahoc	16	81 382	(D)	666	10	(D)	5	453
Somerset	21	(D)	4	636	25	83 208	1	301
Waldo	29	131 121	17	827	19	118 510	(D)	433
Washington	23	(D)	(D)	320	16	(D)	(D)	227
York	70	305 308	24	2 612	54	301 658	28	1 656

Table 33. Nursery and Greenhouse Crops, Cut Christmas Trees Harvested, Mushrooms, and Sod Grown for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)
BEDDING/GARDEN PLANTS								
State Total								
Maine	442	2 088 135	170	13 918	364	1 700 872	104	9 446
Counties								
Androscoggin	18	108 490	7	520	20	69 644	(D)	276
Aroostook	19	115 302	(D)	430	15	100 474	(D)	248
Cumberland	64	524 329	40	3 986	54	437 073	17	3 239
Franklin	13	(D)	(D)	(D)	10	(D)	(D)	99
Hancock	36	132 439	11	1 023	27	124 820	5	801
Kennebec	29	141 719	20	1 185	25	101 568	4	481
Knox	17	117 436	4	427	14	53 754	2	252
Lincoln	14	57 741	6	443	19	48 906	3	421
Oxford	33	89 131	2	423	19	71 430	(D)	310
Penobscot	53	199 314	(D)	1 145	54	198 803	41	1 052
Piscataquis	7	(D)	(D)	(D)	8	(D)	–	(D)
Sagadahoc	13	54 932	3	538	8	57 894	(D)	(D)
Somerset	19	105 838	3	571	24	73 656	(D)	252
Waldo	25	116 081	15	774	17	89 360	6	306
Washington	22	51 153	5	313	14	35 400	3	187
York	60	226 676	16	1 918	36	185 526	(D)	1 009
CUT FLOWERS AND CUT FLORIST GREENS								
State Total								
Maine	84	90 653	57	728	92	58 128	75	682
Counties								
Aroostook	4	7 500	(D)	40	3	(D)	(D)	(D)
Cumberland	19	(D)	(D)	(D)	18	(D)	21	288
Franklin	3	–	2	4	3	(D)	(D)	13
Hancock	9	(D)	(D)	(D)	4	(D)	4	(D)
Kennebec	3	(D)	(D)	(D)	10	(D)	7	(D)
Knox	3	–	2	(D)	3	(D)	(D)	(D)
Lincoln	8	(D)	(D)	(D)	8	2 000	8	16
Oxford	3	(D)	–	(D)	6	3 250	7	(D)
Penobscot	3	(D)	(D)	(D)	3	–	2	(D)
Sagadahoc	5	(D)	(D)	87	3	(D)	5	(D)
Waldo	5	(D)	2	(D)	4	(D)	2	(D)
York	15	(D)	3	(D)	14	(D)	9	171
All other counties	4	8 160	2	35	(NA)	(NA)	(NA)	(NA)
FOLIAGE PLANTS								
State Total								
Maine	28	61 916	(D)	389	37	95 088	29	730
Counties								
Aroostook	3	5 700	–	15	(NA)	(NA)	(NA)	(NA)
Cumberland	4	(D)	–	(D)	10	(D)	(D)	324
Hancock	3	13 200	–	(D)	3	(D)	–	(D)
Oxford	3	(D)	–	(D)	(NA)	(NA)	(NA)	(NA)
York	4	(D)	–	(D)	5	(D)	(D)	132
All other counties	11	9 899	(D)	118	(NA)	(NA)	(NA)	(NA)
POTTED FLOWERING PLANTS								
State Total								
Maine	104	377 429	(D)	2 965	100	481 579	33	2 977
Counties								
Androscoggin	4	(D)	–	(D)	8	(D)	(D)	126
Aroostook	4	8 960	–	36	3	(D)	–	(D)
Cumberland	17	145 465	(D)	1 374	14	166 350	(D)	317
Franklin	4	21 908	–	(D)	3	(D)	(D)	(D)
Hancock	7	(D)	(D)	58	9	38 601	(D)	228
Kennebec	4	(D)	(D)	(D)	8	70 364	4	545
Knox	5	(D)	–	95	4	(D)	(D)	19
Lincoln	7	23 296	(D)	98	5	11 600	(D)	71
Oxford	11	9 358	2	55	9	35 080	(D)	133
Penobscot	10	14 921	(D)	95	8	(D)	(D)	28
Sagadahoc	6	(D)	1	41	(NA)	(NA)	(NA)	(NA)
Somerset	4	(D)	(D)	21	6	(D)	(D)	37
York	17	40 786	5	290	14	79 030	11	344
All other counties	4	6 566	1	30	(NA)	(NA)	(NA)	(NA)

Table 33. Nursery and Greenhouse Crops, Cut Christmas Trees Harvested, Mushrooms, and Sod Grown for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)
BULBS, CORMS, RHIZOMES, AND TUBERS (DRY)								
State Total								
Maine	12	(D)	11	39	5	–	3	5
CUT CHRISTMAS TREES HARVESTED (SEE TEXT)								
State Total								
Maine	208	(X)	167	2 888	(NA)	(NA)	(NA)	(NA)
Counties								
Androscoggin	3	(X)	(D)	(D)	(NA)	(NA)	(NA)	(NA)
Aroostook	36	(X)	64	1 162	(NA)	(NA)	(NA)	(NA)
Cumberland	17	(X)	7	121	(NA)	(NA)	(NA)	(NA)
Franklin	7	(X)	2	41	(NA)	(NA)	(NA)	(NA)
Hancock	12	(X)	7	122	(NA)	(NA)	(NA)	(NA)
Kennebec	19	(X)	14	212	(NA)	(NA)	(NA)	(NA)
Knox	3	(X)	(Z)	9	(NA)	(NA)	(NA)	(NA)
Lincoln	14	(X)	6	93	(NA)	(NA)	(NA)	(NA)
Oxford	13	(X)	4	82	(NA)	(NA)	(NA)	(NA)
Penobscot	21	(X)	21	359	(NA)	(NA)	(NA)	(NA)
Piscataquis	10	(X)	14	248	(NA)	(NA)	(NA)	(NA)
Sagadahoc	4	(X)	(Z)	8	(NA)	(NA)	(NA)	(NA)
Somerset	16	(X)	4	63	(NA)	(NA)	(NA)	(NA)
Waldo	10	(X)	(D)	(D)	(NA)	(NA)	(NA)	(NA)
Washington	6	(X)	1	17	(NA)	(NA)	(NA)	(NA)
York	17	(X)	7	110	(NA)	(NA)	(NA)	(NA)
MUSHROOMS								
State Total								
Maine	6	7 560	(X)	80	(NA)	(NA)	(X)	(NA)
NURSERY CROPS								
State Total								
Maine	96	291 575	830	4 749	131	165 829	899	5 323
Counties								
Androscoggin	3	(D)	(D)	(D)	7	–	73	(D)
Aroostook	14	(D)	(D)	90	6	–	6	(D)
Cumberland	10	–	56	(D)	17	(D)	153	937
Hancock	5	–	7	35	7	2 544	16	55
Kennebec	7	(D)	11	(D)	14	16 236	(D)	342
Knox	4	(D)	(D)	35	10	(D)	15	131
Lincoln	4	(D)	96	75	6	(D)	(D)	141
Oxford	7	(D)	(D)	(D)	6	(D)	(D)	(D)
Penobscot	6	(D)	60	(D)	16	(D)	73	204
Somerset	6	–	(D)	190	8	(D)	(D)	125
Waldo	8	(D)	47	140	7	(D)	30	83
York	15	(D)	91	1 018	17	(D)	91	593
All other counties	7	1 567	28	27	(NA)	(NA)	(NA)	(NA)
SOD HARVESTED								
State Total								
Maine	6	(X)	790	2 136	(NA)	(X)	(NA)	(NA)
VEGETABLE AND FLOWER SEEDS								
State Total								
Maine	29	(D)	35	158	46	117 162	25	292
Counties								
Cumberland	7	8 825	1	13	(NA)	(NA)	(NA)	(NA)
Kennebec	3	(D)	(D)	(D)	(NA)	(NA)	(NA)	(NA)
Penobscot	4	(D)	–	(D)	(NA)	(NA)	(NA)	(NA)
York	4	7 300	(D)	12	(NA)	(NA)	(NA)	(NA)
All other counties	11	9 530	24	24	(NA)	(NA)	(NA)	(NA)

Table 33. Nursery and Greenhouse Crops, Cut Christmas Trees Harvested, Mushrooms, and Sod Grown for Sale: 1997 and 1992—Con.

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997				1992			
	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)	Farms	Sq. ft. under glass or other protection	Acres in the open	Sales ($1,000)
GREENHOUSE VEGETABLES								
State Total								
Maine	65	147 481	(X)	515	52	107 271	(X)	325
Counties								
Androscoggin	6	17 360	(X)	33	4	4 532	(X)	9
Aroostock	6	17 880	(X)	51	5	(D)	(X)	23
Cumberland	3	(D)	(X)	(D)	(NA)	(NA)	(X)	(NA)
Hancock	9	(D)	(X)	50	5	10 664	(X)	30
Knox	4	21 816	(X)	(D)	5	16 900	(X)	(D)
Oxford	13	15 540	(X)	33	4	5 916	(X)	16
Penobscot	6	15 292	(X)	93	8	22 261	(X)	(D)
Waldo	4	6 600	(X)	8	4	6 715	(X)	16
York	4	(D)	(X)	12	5	4 437	(X)	9
All other counties	10	12 310	(X)	13	(NA)	(NA)	(X)	(NA)
OTHER NURSERY AND GREENHOUSE CROPS								
State Total								
Maine	334	48 093	5 037	1 288	9	(D)	(D)	118
Counties								
Androscoggin	13	(D)	63	(D)	(NA)	(NA)	(NA)	(NA)
Aroostock	58	(D)	1 584	52	(NA)	(NA)	(NA)	(NA)
Cumberland	37	(D)	266	672	(NA)	(NA)	(NA)	(NA)
Franklin	12	–	115	(D)	(NA)	(NA)	(NA)	(NA)
Hancock	21	–	447	(D)	(NA)	(NA)	(NA)	(NA)
Kennebec	27	(D)	306	(D)	(NA)	(NA)	(NA)	(NA)
Knox	7	–	35	(D)	(NA)	(NA)	(NA)	(NA)
Lincoln	17	–	112	(D)	(NA)	(NA)	(NA)	(NA)
Oxford	17	–	155	(D)	(NA)	(NA)	(NA)	(NA)
Penobscot	29	(D)	774	(D)	(NA)	(NA)	(NA)	(NA)
Piscataquis	14	–	321	(D)	(NA)	(NA)	(NA)	(NA)
Sagadahoc	8	(D)	61	(D)	(NA)	(NA)	(NA)	(NA)
Somerset	20	–	149	(Z)	(NA)	(NA)	(NA)	(NA)
Waldo	11	–	261	(D)	(NA)	(NA)	(NA)	(NA)
Washington	13	–	132	(D)	(NA)	(NA)	(NA)	(NA)
York	30	–	255	(D)	(NA)	(NA)	(NA)	(NA)

Table 34. Other Crops: 1997 and 1992

[For meaning of abbreviations and symbols, see introductory text]

Geographic area	1997					1992				
	Harvested			Irrigated		Harvested			Irrigated	
	Farms	Acres	Quantity	Farms	Acres	Farms	Acres	Quantity	Farms	Acres
HERBS, TOTAL (SEE TEXT) (POUNDS)										
State Total										
Maine	39	(D)	(X)	20	6	45	(D)	(X)	16	(D)
Counties										
Androscoggin	5	2	(X)	3	2	(NA)	(NA)	(X)	(NA)	(NA)
Cumberland	8	2	(X)	5	1	(NA)	(NA)	(X)	(NA)	(NA)
Hancock	6	1	(X)	3	1	(NA)	(NA)	(X)	(NA)	(NA)
Kennebec	3	1	(X)	1	(D)	(NA)	(NA)	(X)	(NA)	(NA)
Lincoln	3	1	(X)	2	(D)	(NA)	(NA)	(X)	(NA)	(NA)
Oxford	4	1	(X)	2	(D)	(NA)	(NA)	(X)	(NA)	(NA)
York	5	1	(X)	1	(D)	(NA)	(NA)	(X)	(NA)	(NA)
All other counties	5	(D)	(X)	3	(Z)	(NA)	(NA)	(X)	(NA)	(NA)
HERBS, DRIED (POUNDS)										
State Total										
Maine	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)
Counties										
Somerset	1	(D)	(D)	–	–	(NA)	(NA)	(NA)	(NA)	(NA)

APPENDIX 4:
AROOSTOOK WATER AND SOIL MANAGEMENT BOARD
LOW FLOW POLICY

AROOSTOOK WATER AND SOIL MANAGEMENT BOARD
Policy How To Deal With Low Flow Periods and Irrigating Farmer's and Environmental Concerns In Aroostook County

Adopted by the Board on March 1, 1996.

1. Identification Of Irrigators In Aroostook County

A. The Soil and Water Conservation Districts will conduct an irrigation survey starting in 1995.

Identification of irrigating farmers is critical to determining the extent of water use and the potential future withdrawal trouble spots. Other state conservation districts will be made aware of the need to identify irrigators in their respective areas, and to seek funding for a full statewide survey.

2 Responding To Low Flow Complaints On Existing Farms (Complaint Driven) A team of agencies will respond to low flow complaints in the following manner:

A. For any complaints received, complaints will be channeled to DEP to be logged. DEP will contact code enforcement officers, Conservation District Offices, NRCS, Maine Department of Agriculture and Maine Department of Inland Fisheries and Wildlife representatives.

B. The Conservation Districts will contact all agency representatives to alert them to do the follow-up evaluations. The District will contact the farmer to inform the farmer of the complaint and encourage voluntary participation in this proposed whole farm plan concept.

C. NRCS will, if requested by the farmer, do a preliminary site visit with the farmer to do a farm plan that will include an assessment of water needs for the farm and identify short and long-term solutions for the farmer.

D. The University of Maine Cooperative Extension will evaluate the water use technique and help NRCS evaluate the whole farm for employment of best management practices in the plan.

E. If a stream is involved, contact will be made with USGS to determine if a stream gauge could help assess the stream low flow, if a gauging station is not already available.

F. If a reservoir is an option, all agencies will assess the site to determine wetland jurisdiction for wetland use for reservoir development, including a wetland delineation and a

determination of permit requirements, if any. These assessments will be reported to NRCS and the farmer.

G. Inland Fisheries and Wildlife will start an assessment of impacts on wildlife for the existing situation and report findings to the farmer and NRCS to be incorporated into the whole farm plan. IF&W will, at it's option, conduct appropriate on-site investigations.

H. The Aroostook Water and Soil Management Board and Maine Department of Agriculture will provide policy support and assist in publishing BMP practices for the farm irrigation system. Maine Department of Agriculture will provide overall support and will summarize findings for NRCS, Extension and the Farmer.

3. New Irrigation Developments (Non complaint driven)

The Board recognizes the need to assist farmers in reducing risks by adoption of irrigation. A team of agencies will, if requested, assist farmers in determining how irrigation can be implemented on their farm. Agencies will respond in the following manner:

A. Any request for assistance will be directed to the Conservation Districts initially. The District will contact NRCS, Maine Department of Agriculture, the area DEP Office, Inland Fisheries and Wildlife, and Army Corps of Engineers representatives.

B. The Conservation District and NRCS and Extension, if requested, will work with the farmer to do a whole farm plan assessment of irrigation water needs for the whole farm and identify short and long-term solutions for the farmer.

C. DEP will assess the site for possibility of reservoir development, wetland identification, and identification of other potential users downstream and give the report to NRCS and the Farmer.

D. Inland Fisheries & Wildlife will start an assessment of potential impacts on wildlife and report findings to the farmer and NRCS. IF&W will, at it's option, conduct appropriate wildlife assessments on-site.

E. The Aroostook Water and Soil Management Board and Maine Department of Agriculture will provide overall support and will summarize findings of the above agencies for future reference.

4. Establishment Of A Drawdown Limit For Impacted Rivers and Streams

The Board has determined that maintaining a withdrawal limit that does not impact wildlife and fisheries on all water resources is a long-term goal. Therefore, the Board will:

A. On a site by site basis establish an interim 7Q10 limit or other observed/historical documented low flow natural level while working on development of the whole farm plan.
B. At sites where drawdown is creating damage to fish and wildlife, a phased-in ten year program for implementing site specific ABF withdrawal limits will be implemented.

C. IF&W, along with DEP, USGS, and MSGS will conduct assessments on fish and wildlife impacts at low flows to validate concerns of wildlife specialists and to help establish a final low flow limit on any site where a 10 year limit is being considered.

D. New impoundments shall passively pass the lesser of site specific ABF or inflow.

E. Irrigation withdrawal from Great Ponds, where water levels and outflows can be controlled, shall be limited such that the lesser of site specific ABF or inflow is maintained.

F. During extreme drought conditions (such as in 1995) when minimum flows naturally fall below 7Q10 or other observed/historical documented low flow levels, jurisdictional regulatory agencies will negotiate with growers withdrawing from impacted rivers, streams, Great Ponds, and impoundments on streams and rivers, to establish a rate of application (withdrawal) necessary to sustain plant health.

5. Encourage Wetland Use and Impoundments On Streams As Alternatives To Water Withdrawals From Streams

The Board is concerned that establishing withdrawal limits will eliminate irrigating on some rivers and streams unless other sources of water are available. The Board will work to:

A. Establish state law to allow for use of wetlands in cases where withdrawal limits may impair irrigation and farming.

(1). DEP NRPA exemption already exists for development of irrigation ponds in wetlands and should be continued.

(2). Federal Clean Water Act 404 Exemptions already exist for irrigation ponds for existing operations and should be continued.

(3). No State or Federal exemptions exist for "New" farm developments such as for cranberries. The State will need to investigate changes at the state and federal level.

B. Establish State law to allow for use of impoundments in cases where withdrawal limits may restrict irrigation and farming.

(1). DEP will develop a general permit for impoundments on rivers and streams. The General Permit will also establish BMP's for development of impoundments to minimize impact on downwater fisheries and wildlife.

6. Financing For Reservoir Development

The Board reviewed the costs associated with development of reservoirs and found reservoirs to be expensive alternatives to pumping from streams.

A. The Board will encourage starting a state/federal fund to cost share new impoundments for those farms where a limit on drawdown may apply.

7. Establish Educational Program To Encourage Adoption Of Whole Farm Plans And To Clarify The Low Flow Plan To farmers.

The Board is concerned that establishing this plan alone will not resolve the lack of information transfer to assist growers in identifying suitable options for deciding whether to irrigate or to develop water supplies for existing irrigation systems for their farms.

A. A permitting process, technical assistance and educational plan is recommended to assist farmers.

B. The Board will request that the agencies put together a plan for educating the farm community on the newly created policy and for the use of BMP's for site specific cases of impacts to streams and rivers. The funding of such program should be included in the recommendations.

APPENDIX 5:
ATLANTIC SALMON CONSERVATION PLAN- AGRICULUTRAL WATER USE

G. Agriculture

INTRODUCTION

The National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) have proposed listing the Atlantic Salmon in seven Maine rivers as threatened under the Endangered Species Act (ESA) based on their status review. In these watersheds, agriculture includes a complex list of activities directed at producing crops and animals, or their by-products for human use. A list of the types of agricultural activities and/or products in these watersheds include: dairy farming, hay, silage corn, horse farming, sheep farming, beef cattle, Christmas trees, market vegetables, blueberries, cranberries, landscape and horticultural plants, and peat mining. Farmers use and maintain a wide variety of pieces of equipment appropriate for different tasks. Agricultural production can be grouped into three major categories, listed below along with associated activities:

1. Crop production and animal husbandry: site preparation, tillage, cultivation, manure, nutrient, and pest management, and water use.
2. Harvest and transport: public and farm road construction and maintenance, buildings, storage, fuel storage, and water for wet harvest of cranberries.
3. Processing and marketing: pest management, process water use, treatment, and discharge, waste recycling and disposal, buildings, and transport to market.

In preparing this section of the Conservation Plan, activities that had similar effects on stream hydrology and water quality were grouped. As a result there are three issues addressed in this report; Water Use, Agricultural Practices, and Peat Mining. Within the Water Use section, irrigation and use and disposal of process water are discussed. The Agricultural Practices section includes most of the activities involved with crop production and harvest and transport that may cause nonpoint source pollution. Direct discharge from agricultural processing plants are also included. Peat mining, because the product is used primarily for agriculture, is the third section. It warranted a separate section because the effects on stream hydrology and water quality were very different.

In each section of this portion of the Conservation Plan there is a brief discussion of the approach to estimating threat. None of the activities covered by this portion of the plan are anticipated to cause direct mortality to Atlantic salmon. Some activities do, however, have the potential to drastically affect the quantity and quality of Atlantic salmon habitat. Therefore, the focus is on assessing the threat from agriculture to Atlantic salmon habitat.

Each agricultural activity that could pose a threat to Atlantic Salmon habitat was prioritized by the Agricultural Working Group for each watershed (Tables 1.1-1.7). Specific actions to reduce threats and promote recovery are identified and schedules for implementing these actions are included for each watershed.

The key to creatively and successfully providing for the needs of both agriculture and Atlantic salmon is watershed planning. Actions appropriate for a given watershed will be identified and implemented by watershed-specific steering committees, which include all interested stakeholders. These steering committees will direct Atlantic salmon conservation activities and projects related to agriculture within each watershed. This model can be broadened to include implementing actions for other land use issues in Atlantic salmon watersheds.

Table 1.1. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the Pleasant River watershed.

Watershed: Pleasant River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Water Use	Irrigation	High
	Cranberry culture	Low
Agricultural Practices	Pesticide use (blueberry, cranberry)	Moderate
	Nutrients and sediments	Low
	Wetland alteration	Low
	Oil, fuel, and contaminants	Low
Peat Mining	Proposed mine	Moderate

Table 1.2. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the Narraguagus River watershed.

Watershed: Narraguagus River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Water Use	Irrigation	Moderate
	Process water Volume Temperature	Low
	Land application of process water	Low
Agricultural Practices	Pesticide use (blueberry)	Moderate
	Nutrients and sediments	Low
	Wetlands alteration	Low
	Oil, fuel, and contaminants	Low
Peat Mining	Water quantity	Moderate
	Peat silt	Moderate
	Discharge water quality pH	Moderate

Table 1.3. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the Machias River watershed.

Watershed: Machias River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Water Use	Irrigation	Low
	Process water Volume Temperature	Low
Agricultural Practices	Pesticide use (blueberry)	Moderate
	Nutrients and sediments	Low
	Wetlands alteration	Low
	Oil, fuel, and contaminants	Low

Table 1.4. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the Sheepscot River watershed.

Watershed: Sheepscot River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Agricultural Practices	Pesticide use (corn, Christmas trees)	Low
	Nutrients and sediments	High
	Livestock management	High
	Manure/sludge management	High
	Wetlands alteration	Low
	Oil, fuel, and contaminants	Low

Table 1.5. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the East Machias River watershed.

Watershed: East Machias River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Water Use	Irrigation	Low
Agricultural Practices	Pesticide use	Moderate
	Nutrients and sediments	Low
	Wetlands alteration	Low
	Oil, fuel, and contaminants	Low

Table 1.6. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the Dennys River watershed.

Watershed: Dennys River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Water Use	Irrigation	Low
Agricultural Practices	Pesticide use	Moderate
	Nutrients and sediments	Low
	Wetlands alteration	Low
	Oil, fuel, and contaminants	Low

Table 1.7. Potential threats to Atlantic salmon habitat quantity and quality related to agricultural activities in the Ducktrap River watershed.

Watershed: Ducktrap River		
AGRICULTURAL ACTIVITY	FACTOR POSING A POTENTIAL THREAT TO HABITAT	Issue Priority
Agricultural Practices	Pesticide use	Low
	Nutrients and sediments	Low
	Wetlands alteration	Low
	Oil, fuel, and contaminants	Low

AGRICULTURAL WATER USE

INTRODUCTION

There is potential for water use conflict between agriculture and Atlantic salmon in some Maine rivers . The primary agricultural activities that have the potential to affect water quantity include: berry processing, irrigating blueberry fields, and production of cranberries. There are other minimal uses, such as livestock watering, in the Sheepscot and Ducktrap Rivers. The existing levels of agricultural water use in the seven rivers are not known to have contributed to the current low populations of Atlantic salmon. However, the effects of additional withdrawal based on industry projections of increased water use will be a factor if the needs of Atlantic salmon are not considered in developing and managing water use.

The wild blueberry industry is the primary user of water for agricultural irrigation in the Downeast river watersheds. Maine's new cranberry industry is a minimal user of water, with only a small acreage in production in the seven watersheds. Irrigation is also used by a few small crop farmers. Of the Downeast watersheds, only the Narraguagus and Pleasant River watersheds support significant agricultural water use. Direct water withdrawal for blueberry irrigation occurs in significant volumes only from the Pleasant River, where there are three pump sites. Currently there are only two large agricultural users of water, and this is not expected to increase in the future.

Approximately 6,000 acres of blueberries are irrigated annually. The blueberry industry currently irrigates an estimated 3,600 acres of crop fields and about 2,400 acres of pruned (next year's crop) fields. In 1995, one of the driest summers on record, less than 1,600 acre-feet of water was used for irrigation. This water was applied to pruned fields during June and on cropping fields during July and part of August. Approximately two-thirds more water was applied per acre to cropping fields than to pruned fields. The amount and timing of water used annually varies with the weather and related moisture conditions. The blueberry industry plans to gradually increase production of the irrigated acreage by as much as 100% by the year 2005. This increase in acreage will include approximately 6,000 acres of crop fields and 6,000 acres of pruned fields. It is estimated that the majority of water needed to irrigate this increase in acreage will come from sources other than the ones used today.

Statewide, the cranberry industry produces on 50 to 60 acres and currently uses approximately 100 to 180 acre-feet (33 to 55 million gallons) of water per year. Approximately three acre-feet of water are needed to supply the needs of an acre of cranberry bed per year, after recycling. The Maine cranberry industry expects to increase acreage in production by about 100 acres (in each of) the next five years (Source: D. Bradshaw). This may include a mix of both (2-3 acre) and (15-20 acre) cranberry operations. Total net water needs for the cranberry industry in the Downeast river watersheds is expected to be about 215 to 315 acre-feet per year. Sources

of water are expected to be a combination of direct withdrawal from rivers and streams as well as new impoundments. Groundwater may play a role in some future operations. Water used by cranberry operations is held in ponds and reused as much as possible, to reduce the total amount needed to be withdrawn from natural sources.

There is sufficient annual flow in the river systems to provide water for Atlantic salmon and current and projected agricultural water needs. Therefore, the issue is a water management challenge, <u>not</u> a water shortage problem.

Regulations Pertaining to Water Use

<u>Pump Sites and Withdrawal - (Waters in Unorganized Territories)</u>

The Land Use Regulation Commission (LURC) regulates pumping sites and water withdrawal in the unorganized territories under the provisions of 12 MRSA §685-B,1,C of the Commission's statutes. Areas within 75 feet of minor flowing waters and within 250 feet of major flowing waters are designated (P-SL) Shoreland Protection Subdistrict under the provisions of Section 10.16,I,2 of the Commission's Land Use Districts and Standards. Areas below the normal high water mark of rivers and streams are designated (P-WL) Wetland Protection Subdistricts under the provision of Section 10.16,K,2(a) of the Commission's standards. Alteration of the watertable or water level, water impoundments, and other structures for irrigation projects within a (P-SL) Shoreland Protection Subdistrict or a (P-WL) Wetland Protection Subdistrict require permit approval from the Commission under the provisions of Section 10.16,I,3,b and Section 10.16,K,3,b and c of the Commission's standards.

The Commission has the authority to regulate water withdrawal volumes, timing and rates under the provisions of the Commission's statutory criteria for approval of permit applications, 12 MRSA §685-B,4,C. Under this statutory criterion, the applicant must demonstrate that the proposal will have no undue adverse effect on existing uses and natural resources in the area likely to be affected by the proposal. Furthermore, a proposal for the alteration of the watertable or water level within a (P-WL) Wetland Protection Subdistrict requires a permit by special exception under Section 10.16,K,3,c of the Commission's standards. One of the criteria for a permit by special exception requires that the applicant demonstrate that the proposal can be buffered from other uses and resources within the subdistrict with which it would be incompatible. When reviewing water withdrawal proposals under these statutory and regulatory criteria, the Commission will consider impacts to fisheries resources of the stream or river, and may impose permit conditions on approved proposals to mitigate potential adverse impacts on fisheries resources. Such permit conditions may include restriction on pumping rates, timing and volume of water withdrawn. LURC staff work closely with staff from the Maine Department of Inland Fisheries and Wildlife and the Atlantic Salmon Authority in reviewing irrigation proposals for potential impacts on the fisheries resources of streams and rivers, and to

develop appropriate permit conditions to mitigate potential adverse impacts.

Withdrawal - (Waters in Organized Towns)

Two laws give the state Department of Environmental Protection (DEP) authority to ensure that water withdrawals do not significantly affect aquatic habitat. The laws are the Water Classification Program as referenced above, and the Natural Resources Protection Act (38 MRSA §480-A to 480-X).

The Water Classification law charges that "where high quality waters of the state constitute an outstanding national resource, that water quality must be maintained and protected." Class AA waters are designated as outstanding national resources. Also within the anti-degradation policy of the law, existing in-stream water uses (as designated by the DEP in accordance with established criteria) and the level of water quality necessary to protect those existing uses must be maintained and protected. The seven rivers covered by the Conservation Plan are either AA or A. With "fishing" and "as habitat for fish and aquatic life" both specified as in-stream uses for all water quality classes (AA - C), the standards encompass habitat for all life stages, including spawning and egg incubation, as well as invertebrate food. The aquatic life standards for class AA further specifies that the habitat must be free flowing and natural, while class A standards specify natural habitat. Both classes state that aquatic life must be "as naturally occurs", thus preserving the characteristics of natural habitat. If the Department can show that a water withdrawal(s) has caused a waterbody to have water quality below the applicable water quality standard for its classification, the Department can find the withdrawal to be in violation of the Water Classification law.

The Natural Resources Protection Act prohibits certain activities from occurring without a permit from the Maine DEP if the activity is located in, on, or over any protected natural resource or is located adjacent to and operated in such a manner that material or soil may wash into an open water resource. Protected natural resources include rivers, streams, brooks and great ponds. Regulated activities under the Natural Resources Protection Act include draining or dewatering a protected natural resource. The state has authority under this law to ensure that a river, stream, brook, or great pond is not completely drained by a water withdrawal.

Discharge - (All Waters)

The Protection and Improvement of Waters Act (38 MRSA §461-A et al.) states that "no person may directly or indirectly discharge or cause to be discharged any pollutant without first obtaining a license from the Department (DEP)." The law requires that the Board of Environmental Protection issue a license for a discharge only if it finds that a discharge either by itself or in combination with other discharges will not lower the quality of any classified body of water below such classification. All waters of the state are classified in accordance with the State's Water Classification Program (38 MRSA §464) which establishes water quality standards

for various classifications. River systems have been classified as AA, A, B, or C. Segments of the seven Atlantic Salmon Rivers are generally classified as AA or A waters. These designations provide the highest level of protection the state has for surface waters. The standards for AA waters include; "The habitat shall be as free flowing and natural. The aquatic life, dissolved oxygen, and bacteria content of Class AA waters shall be as naturally occurs."

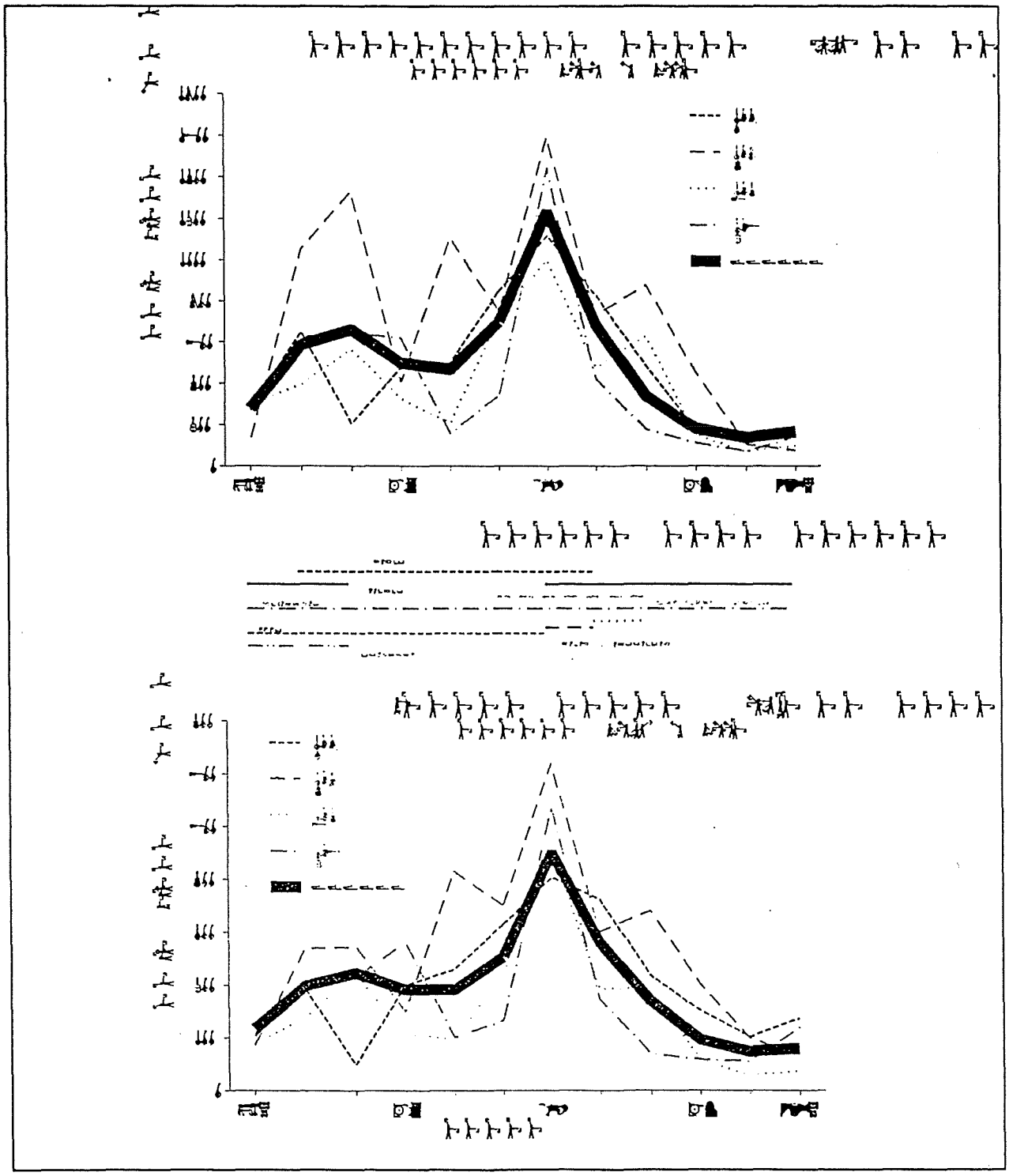
The Atlantic Salmon and Flows in the Downeast Rivers

The pattern of natural annual flows (Figure 1, note heavy line) that Atlantic salmon have experienced in natural rivers over the last 30 to 50 years includes low flows in July, August, and September (Figure 1). Peak spring flows occur in late March and early April and autumn rains cause increasing flows during October and November (Figure 1). The variability in this pattern is represented by the randomly selected annual flows (1990, 1984, 1975, and 1962). Late summer flows reflect groundwater discharge, especially in extreme low flow conditions. The overall pattern is similar for the Dennys and Narraguagus Rivers. Weather patterns are different on these two watersheds. Similar patterns occur in the other rivers, however, the volume of annual discharge will be related to watershed size. In addition, the amount of storage in headwater lakes will affect the rate that spring flows decline and the volume of low summer and fall flows (Table 1).

Each life stage of the Atlantic salmon is adapted to these general patterns of flow. Upstream adult movement occurs throughout the summer. It is episodic, relating to increasing flows and changes in temperature (Shepard 1995). Spawning, which occurs in late October and early November (Beland et al. 1982), is triggered by changes in day-length and temperature and is dependent on adequate flow in spawning areas. Eggs will not survive the winter unless water flows through the gravel are sufficient to bring oxygen, to carry away wastes, and to prevent the eggs from freezing. Emergence of fry from the gravel and downstream dispersal occur from mid-May through early June in Maine (Gustafson-Marjanen 1982, MacKenzie and Moring 1988). These fish are not yet strong swimmers and are dispersed by the prevailing flows. Juveniles are present in the stream at all times of the year. Survival of juvenile salmon is positively related to summer and winter discharges (Gibson 1993), with better survival in years with higher flows during these seasons. This is because discharge determines the amount of available habitat with suitable depth and velocity in the river. Smolt migration occurs during peak spring runoff. Smolts travel downriver to the estuary with the spring floods. Emigration coincides with increasing river temperatures (Fried 1977) and increasing river discharge (Jonsson and Ruud-Hansen 1985). During summer, adults hold in pools and deadwaters, these same deep waters hold kelts (post-spawn fish) in winter.

Table 1. Averages for annual mean, minimum, and maximum discharge, (CFS) based on entire USGS record, for each site.

River	Town	Area	Mean	Min	Max
Narraguagus	Cherryfield	227	495	272	761
Dennys	Dennysville	92.4	193	96	292
Sheepscot	N.Whitefield	145	249	115	427
Machias	Whitneyville	457	931	-	-
E. Machias	no data				
Pleasant	Epping	60.6	140	-	-
Ducktrap	no data				



Approach to Estimating Threat

Irrigation has the potential to cause salmon mortality and reduce habitat. At present, the only potential for Atlantic salmon mortality as a direct result of agricultural water use would be if fish became impinged on pump screens or were drawn into an irrigation system. The likelihood of either occurring has not been assessed. Pumps are not placed directly in juvenile salmon habitat, but in deadwater areas adjacent to juvenile habitat. Irrigation does not occur when smolts are migrating. Although deadwaters are used by adults when irrigation takes place, they would likely avoid the intakes, which are screened to exclude fish (1 cm openings).

By withdrawing water from a river, irrigation has the potential to reduce salmon habitat quality and quantity. Reducing the area of the river (i.e., units 100 m^2) that produces Atlantic salmon would represent a direct loss of habitat. By reducing wetted width, water withdrawal reduces available habitat, temporarily. The loss of habitat is not long-term, the habitat is only lost to production while it is dewatered. However, repeated annual reductions in habitat will constrain the carrying capacity of the habitat. Reducing a given unit's ability to produce Atlantic salmon in the long-term or short-term constitutes loss of habitat (Appendix 1). Although the amount and location of habitat for the species are known for several of the rivers, the data needed to predict changes in habitat area and quality that follow water withdrawals are not available. Thus, estimating threat to habitat for each river will be based on characteristics of the river's annual hydrology and general predictions of the affects of each type of agricultural use on water quantity and habitat.

Evaluating the cumulative effects of agricultural water use will be addressed in the Total Water Use Management Plan for each watershed. In addition, a variety of other activities have the potential to affect hydrology. These include changes in land use (rural and recreational development, peat mining), changes in vegetation (forestry), channel restrictions (bridges on major roads), withdrawals (municipal water supplies and aquaculture). All these activities would have cumulative effects of Atlantic salmon habitat mediated through river and groundwater flows.

PLEASANT RIVER WATERSHED

Description of Irrigation

Interviews of irrigators are being conducted by the Natural Resources Conservation Service (NRCS) to evaluate the current and projected water use for this watershed. Based on interim information the Agricultural Working Group believes there are approximately 16 irrigation sites in the Pleasant River watershed, and at least one impoundment planned in the near future. Irrigation water was pumped from eight of the sites in 1995, the driest summer on record. Four sites on the mainstem accounted for the withdrawal of approximately 800 acre-feet of water. Lakes and kettle-hole ponds made up the rest of the approximately 1,300 acre-feet

used for irrigation in the watershed in 1995. There was no irrigation from groundwater wells. A distinction has been made between groundwater wells and kettle-holes, which may be outlets to groundwater aquifers. However, experience from using kettle-hole ponds for irrigation in Washington County shows that they normally replenish very slowly. Therefore, they are only limited volume storage ponds.

Evaluation of Threat from Irrigation

It's possible that agricultural water use reduced the amount and quality of Atlantic salmon habitat in the Pleasant River in 1995. The extent of this habitat loss is difficult to assess. Hydrologic gaging data are only available for the period 1981 to 1990, when irrigation in the watershed was ongoing (Figure 2).

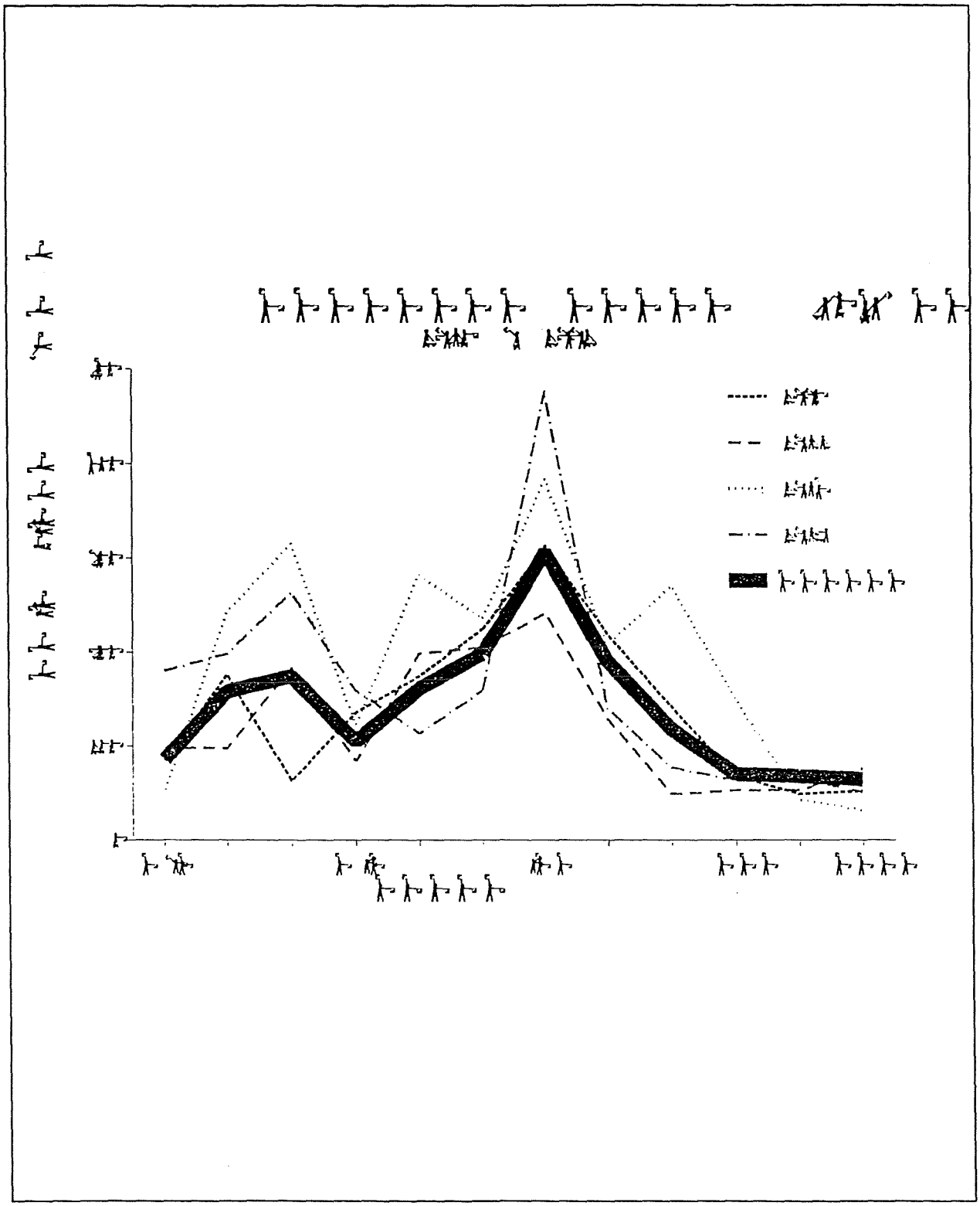
Description of Cranberry Culture Water Use

Cranberry culture relies on water for frost protection, irrigation, and wet harvest. Statewide, the cranberry industry produces on 50 to 60 acres and currently uses approximately 100 to 180 acre-feet of water per year. Approximately three acre-feet of water are needed to supply the needs of an acre of cranberry bed per year, after recycling.

There is one licensed cranberry grower in the Pleasant River watershed with five acres in production (1995). This grower uses about 15 acre-feet of water per year. A new operation is proposed for four acres in the town of Columbia Falls, expected water use; 12 acre-feet per year. At least part of this water comes from the Pleasant River or its tributaries.

Evaluation of Threat from Cranberry Culture Water Use

Cranberry operations include water management ponds to hold the appropriate volumes of water, that is withdrawn from the river in spring. Water is recycled in a series of ponds, thereby water extraction from rivers and streams during critical flow periods for Atlantic salmon is reduced. In addition, permits required by DEP require that the level of the intakes for farms be above aquatic baseflow (ABF). The timing and rate of discharge from



the ponds may affect stream hydrology. Because acreage in cranberry production is small, the potential to affect the hydrology of Atlantic salmon rivers is also low.

NARRAGUAGUS RIVER WATERSHED

Description of Irrigation

Interviews of irrigators are being conducted by NRCS to evaluate the current and projected water use for this watershed. Based on interim information the Agricultural Working Group believes there are approximately 17 active irrigation sites in the Narraguagus River watershed, a number of inactive sites, and at least one planned in the near future. In the Narraguagus River watershed, four sites were on lakes and there was only one site where water was pumped directly from the West Branch of the Narraguagus. Estimated withdrawals from sources in the Narraguagus River watershed were less than 100 acre-feet in 1995, the driest summer on record. Direct withdrawal by pumping water from rivers or streams accounted for about 5 percent of the water used. Great ponds (over 10 acres) and other natural lakes (such as kettle-holes) provided another 20 percent. The balance came from manmade impoundments, on small streams. There was no irrigation from groundwater wells. A distinction has been made between groundwater wells and kettle-holes, which may be outlets to groundwater aquifers. However, experience from using kettle-hole ponds for irrigation in Washington County shows that they normally replenish very slowly. Therefore, they are only limited volume storage ponds.

Evaluation of Threat from Irrigation

The extent that habitat has been affected by irrigation in the Narraguagus watershed is difficult to assess. Direct river withdrawal sites have only been used occasionally in the last several years. However, withdrawal from impounded water will affect low flows if baseflows are not maintained below the impoundment. The size and operation of the impoundments in the Narraguagus River watershed will be part of the data gathering stage of the Total Water Use Management Plan.

Description of Agricultural Process Water Use

The source of water for the berry processing plants in Cherryfield, Maine is an aquifer. The water is used in food processing, washing, and freezing. The volume of agricultural process water discharged to the Narraguagus River is allowed to reach a total of 627,250 gallons per day, a discharge of 0.97 cfs. Of this discharge, up to 100,000 gallons per day is currently allowed by permit to attain a discharge temperature of 26 C (79 F). The total process water discharge rate is approximately 0.19% of the average annual flow and 0.36% of the average minimum flow.

Evaluation of Threat from Agricultural Process Water

Process Water Volume

Current volumes of process water are probably of little consequence to the hydrology of the Narraguagus River, either in removal from groundwater or discharge to the river. The relatively small volume of groundwater used in processing is extracted near the mouth of the river and will likely have no perceived effect on subsurface hydrology or surface water flows. The process water discharge is near the estuary, with little or no likely consequences to river hydrology. Blueberry and cranberry industry sources expect a potential need to increase processing of blueberries by about 25 percent. Therefore, the projected need for sources of high quality water and related discharge volumes should increase in both the near and long-term future. If current groundwater sources are used and discharges are within permitted volumes, the expected changes in agricultural process water use will likely have minimal affect on the hydrology of Atlantic salmon habitat.

Discharge Temperature

The water temperatures in the Narraguagus River in the vicinity of the process water discharges have not been monitored. Therefore, data are needed before it is possible to predict the effect on Atlantic salmon survival. The known volume of processed water which is used for agricultural purposes is allowed to reach a total of 627,250 gallons per day. This is equivalent to a discharge rate of 0.97 cfs in the Narraguagus River at Cherryfield, Maine. Of this discharge, up to 100,000 gallons per day (0.154 cfs) is currently permitted to attain a discharge temperature of 26 degrees C. The total process water discharge rate is approximately 0.19% of the average annual flows (495 cfs) and 0.36% of the average minimum flow.

Description of Land Applied Agricultural Wastewater

There are two permits for spray irrigation of food processing wastewater in the Narraguagus River watershed. These permits are administered by the DEP. One permit is for 114,000 gal/acre/week and the other for 27,000 gal/acre/week. These maximum application rates exceed maximum expected rainfall events for Downeast Maine.

Evaluation of Threat from Land Applied Agricultural Wastewater

Properly permitted and maintained land applications are not likely to have any adverse effect on stream hydrology or Atlantic salmon habitat. They will add to stream flow.

MACHIAS RIVER WATERSHED

Description of Irrigation

There are nine identified irrigation sites in the Machias River watershed. In 1995, the

driest summer on record, less than 200 acre-feet of water were used by the two major blueberry producers. The volume of irrigation water used by smaller growers in this watershed is an unknown. Of the sites identified in initial investigations, many are in the Mopang subdrainage. Mopang Stream has a significant amount of high quality Atlantic salmon habitat (ASA files).

Evaluation of Threat from Irrigation

The Agricultural Working Group has no hydrologic data to estimate the loss of habitat on the Machias River due to irrigation. Gaging on the Machias River by the U.S. Geological Survey (USGS) ended in 1975, and thus would be of little value in trying to assess the effects of current irrigation on Atlantic salmon habitat. The number of units of juvenile habitat identified during low flows seem different for current (1994) and older (1950) surveys. However, once differences in the types of habitat classified as nursery area were reconciled there were only minor differences.

Description of Agricultural Process Water Use

The source of water for the berry processing plant in the town of Machias is an aquifer. The Machias River estuary can currently receive up to 70,000 gallons per day of agricultural process (non-contact) cooling water up to a temperature of 32 C (89 F). This represents 0.01% of the Machias River's average annual flow.

Evaluation of Threat from Agricultural Process Water Use

Discharge Volume

The currently used volume of process water is probably of little consequence to the hydrology of the Machias River, either in its removal from groundwater or its discharge to the river. The relatively small volume of groundwater used in processing is extracted near the mouth of the river and will likely have no perceived effect on surface water flows. The process water discharge is near the estuary, with little or no likely consequences to hydrology. Blueberry and cranberry industry sources expect a potential need to increase processing of blueberries by about 25 percent. Therefore, the projected need for sources of high quality water and related discharge volumes should increase in both the near and long-term future. If current groundwater sources are used and discharges are within permitted volumes, the expected changes in agricultural process water use will likely have minimal affect on the hydrology of Atlantic salmon habitat.

Discharge Temperature

There is the potential for loss of habitat and/or individual Atlantic salmon resulting from

the temperature of the process water discharge in the immediate area of the discharge. The maximum discharge temperature to the Machias, 32 C (89 F), is lethal to both juveniles and adults (Danie et al. 1984). The distribution and extent of elevated water temperatures in the vicinity of discharge are unknown. Therefore, data are needed before predicting the effect on Atlantic salmon habitat is possible. The Machias River can currently receive up to 70,000 gallons per day (0.11 cfs) of agricultural process (non-contact) cooling water up to a temperature of 32 degrees C. This represents 0.01% of the average annual flows (931 cfs) and is diluted by discharge into the tidal basin.

EAST MACHIAS, DENNYS, SHEEPSCOT AND DUCKTRAP RIVER WATERSHEDS

The precise extent of agricultural water use in these watersheds is unknown, because there are no significant water users in any of the watersheds. Blueberry culture is present in all but the Ducktrap watershed.

ACTIONS

What follows is a brief description of the processes that will be used to resolve conflicts between agricultural water uses and Atlantic salmon habitat. Approaches to interim conflict resolution and long-term solutions are discussed. The need and detail for specific activities will vary depending on the watershed. The key to the process is having the agriculture water users, Atlantic salmon biologists, hydrologists, agricultural engineers, and environmental regulators work cooperatively and creatively to solve a complex and dynamic problem.

Interim Action:

WU 1 Agricultural and other human user groups and the Atlantic Salmon Authority, together with other interested parties will work cooperatively, case-by-case, to resolve conflicts that current activities may have with the needs of the Atlantic salmon until long-term assessments and strategies are developed.

State agencies, in cooperation with Federal agencies, agricultural and other human user groups, will work to expand financial and technical assistance which support efforts for using alternative water sources to meet the water needs of agriculture. They will also work to ensure the availability of regulatory or nonregulatory mechanisms to aide in the search for alternative water sources.

Permits issued for construction activities in the watersheds of Atlantic salmon rivers will ensure that appropriate, site-specific flows, for Atlantic salmon will be maintained. The Atlantic Salmon Authority will be invited to attend all preapplication meetings held for projects in the watersheds of the Atlantic salmon rivers.

Complaints received in regard to water use conflicts with Atlantic salmon will be classified as high priority and will be investigated by the DEP and/or the Atlantic Salmon Authority. All parties will work in accordance with this plan to resolve any conflict.

Long-Term Action: Watershed-Specific Total Water Use Management Plans

J 2 Develop specific river basin or hydrologic unit based assessments for each of the seven watersheds for both the hydrologic needs of salmon restoration and agriculture. These assessments should include all land and water uses and concerns relative to salmon (i.e., forestry, development, aquaculture, water quality, etc.).

Priorities recommended: 1) Pleasant River 2) Narraguagus River and 3) Machias River. These are where hydrologic concerns and needs are apparently the highest. However, future plans for agricultural expansion (i.e., cranberries) may change this ranking. Planning on other

rivers should be done as resources permit.

These assessments will require complete hydrologic and biological assessments by tributary, river reach or segment. Details should be sufficient to use appropriate in-stream, flow-based fishery models for salmon. Agricultural needs and goals will need to be fully assessed.

A primary goal of these assessments is to locate and determine the feasibility of providing additional water storage sites, with the potential to be managed for both improvement of Atlantic salmon habitat and agricultural production.

The Natural Resources Conservation Service (NRCS) has been requested to assist the State of Maine and the partners involved in the Atlantic Salmon Task Force in developing "Total Watershed Management Plans." The plans have the purpose of demonstrating that sufficient water resources exist in Atlantic salmon watersheds to provide water for restoration and protection of habitat as well as agricultural uses. Preliminary inventory of the Pleasant and Narraguagus watersheds (NRCS, 1996) has determined that there will be sufficient water for both uses, however, careful management is critical to Atlantic salmon habitat protection.

This planning effort will be the first in the Eastern United States. It will be similar to water resource planning undertaken in the Pacific Northwest. However, water resource issues in the Northwest are more complex than in Maine. In the Northwest agricultural uses are only one part of the total plan, while in the Downeast watersheds, agricultural water use is the single most significant human use. Like the Northwest, the Maine planning process will rely on interdisciplinary and broad based partnerships to effectively protect salmon habitat and agriculture.

The Total Watershed Management Plans will address site-specific needs of Atlantic salmon and blueberry and cranberry production. Water management in the Downeast watersheds will include impoundments for irrigation, mitigation and/or flow augmentation with the goal of removing pumps from unregulated sections of the rivers. The plan may include remote releases from reservoirs for either irrigation or flow augmentation or both.

Develop a Strategy for Funding Short-Term and Long-Term Planning and Implementation

Funding will be needed for detailed hydrologic and biological studies and monitoring. There will be a need for planning and assessments. These activities far exceed the scope and current budget capabilities of state and federal agencies and the agricultural community. This should be a cooperative effort.

Funding

Funding will be needed for detailed hydrologic and biological studies and will be used to plan, design, construct and maintain anticipated water impoundment structures for flow augmentation, habitat improvements, mitigation and monitoring. These activities exceed the current budget capabilities of state agencies and the agricultural community. Potential sources of funding may include Federal sources (i.e., USDA River Basins, etc.), state grants, tax incentives, conservation organizations, and industry contributions.

Short-term funding is needed to respond to existing needs and the immediate demands on water resources, until the results of long-term plans are available to be implemented. Short-term funding will assist state and federal agencies and the agriculture community with technical evaluations necessary for short-term planning.

The long-term plans and budget estimates include other land and water uses and issues, typical of total watershed based river basin or hydrologic unit inventory and evaluations, conducted by the United States Department of Agriculture (USDA), and Natural Resources Conservation Service.

Estimated Costs

June 1996 through 2009 $1.4 - $2.8 million

(Based on an average of $200,000 - $300,000 per watershed for USDA River Basin Planning)

MONITORING

WU 4 Hydrology

The USGS currently operates gaging stations on the Narraguagus, Dennys, and Sheepscot Rivers. There are two gaging sites in the Pleasant River watershed and one on the Machias River where data are no longer gathered. Data from all the stations are very important in monitoring the effects of agricultural water use on hydrology. The USGS should be requested to reactivate the inactive stations.

Funding

USGS operating funds currently covers operation of these gaging stations on the seven rivers. Additional funds need to be allocated to USGS to record data on the remaining four rivers.

WU 5 Temperature

Define the thermal plume associated with direct discharges of wastewater from the berry processing plants on the Narraguagus and Machias Rivers.

Funding

The cost of this monitoring should be shared by ASA and DEP operating budgets.

ALTERNATIVES

The Total Water Use Management Plan approach to resolving conflicts between agricultural water uses and Atlantic salmon habitat, presented in this section of the Conservation Plan, are the result of considering three major alternatives:

1. Eliminate irrigation from all Atlantic salmon watersheds.
2. Continue irrigation as it currently exists, allowing no expansion of irrigation in Atlantic salmon watersheds.
3. Strengthen regulations pertaining to irrigation practices and increase authority to regulate water use in Atlantic salmon rivers.

Given that: 1) There is no evidence that the existing levels of agricultural water use in the seven rivers have contributed significantly to the current low populations of Atlantic salmon, and 2) there is sufficient annual flow in most of the river systems to provide water for Atlantic salmon and current and projected agricultural needs. Then alternatives one and two seem unwarranted, especially in light of the significant impact that they would have on Maine's economy. Therefore, the issue is a water management challenge, not a water shortage problem. That problem cannot be solved in an expedient or cooperative/creative manner through increased regulation, which would likely involve extensive legal battles. Thus, the Agricultural Working Group adopted the approach of cooperatively developing long-term plans to manage water use that provide adequate water for both agriculture and Atlantic salmon.

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APPENDIX 6:
CURRENT STATE REGULATIONS IMPACTING WATER USE IN AGRICULTURE

Introduction

1) Water Classification, NRPA, and Site Law.

   (a) DEP administers the Water Classification Program state-wide. This program classifies surface and groundwater. There are designated uses and minimum standards for each classification. The Water Classification Program is not a permitting law itself, but establishes standards that are used in licensing programs, including wastewater discharge, Site Location of Development (Site Law), and Natural Resources Protection Act (NRPA).
   (b) DEP administers the NRPA in organized areas. The NRPA is an environmental review law focused on minimizing the impacts of projects located in, on, over or adjacent to "protected natural resources".
   (c) DEP administers the Site Law in organized areas, and for two uncommon types of development in LURC jurisdiction. The Site Law is a comprehensive environmental review statute that focuses on minimizing the impacts of a relatively small number of large development projects that may in themselves have a substantial impact on the environment. In effect, the Site Law builds upon the standards in the NRPA, addressing other impacts in addition to those upon natural resources. It provides broad authority to address water quality and quantity issues, and impacts on existing uses such as wells.

2) Land Use Regulation Law.

   (a) LURC administers the Land Use Regulation Law in areas subject to LURC jurisdiction. This law establishes classifications of land use, with allowed types of uses and standards for each classification. It is used to determine whether an activity is an appropriate use within an area. The Land Use Regulation Law is a permitting statute, and addresses impacts on both the natural environment and existing uses.
   (b) LURC also uses the standards under the Land Use Regulation Law to regulate activities requiring a permit under the Natural Resources Protection Act (NRPA).

Reference Material

Land Use Regulation Law

Statutory standards: 38 MRSA 485-A(3). (Excerpts)

3. Land use standards. The commission, acting on principles of sound land use planning and development, shall prepare land use standards prescribing standards for the use of air, lands and waters. Except as provided in this chapter, these standards shall be adopted by the commission in accordance with the procedures set forth in Title 5, chapter 375, subchapter II.

In addition to the purposes set forth in section 681, the land use standards shall:

A. Encourage the most desirable and appropriate use of air, land and water resources consistent with the comprehensive land use plan;

B. Protect public health by reduction of noise, air pollution, water pollution and other environmental intrusions;

C. Protect and preserve significant natural, scenic and historic features where appropriate, beneficial and consistent with the comprehensive land use plan;

D. Advise and assist the Department of Transportation and other concerned agencies in transportation planning and operation;

D-1. Provide for safe and appropriate loading, parking and circulation of land, air and water traffic;

E. Encourage minimal adverse impact of one use upon the use of surrounding areas by setting standards of performance describing desirable and acceptable levels of operation in connection with any use and its relation to surrounding areas, including provisions for the eventual amelioration of existing adverse impact;

F. Reflect a consideration of the availability and capability of the natural resources base, including soils, topography or sufficient healthful water supplies; and

...

4. Land use standards considered as minimum requirements. Land use standards shall be interpreted and applied by the commission as minimum requirements, adopted to reasonably and effectively promote health, safety and general welfare and insure compliance with state plans and policies.

Whenever the requirements of the adopted land use standards are at variance with the requirements of any other lawfully adopted rules, regulations, standards, ordinances, deed restrictions or covenants, the more protective of existing natural, recreation and historic resources shall govern.

Other

Rules include Chapter 10, Land Use Districts and Standards.

Natural Resources Protection Act

Statutory standards: 38 MRSA 480-D (Excerpts)

38 § 480-D. Standards

The department shall grant a permit upon proper application and upon such terms as it considers necessary to fulfill the purposes of this article. The department shall grant a permit when it finds that the applicant has demonstrated that the proposed activity meets the following standards.

1. Existing uses. The activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses.

2. Soil erosion. The activity will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

3. Harm to habitats; fisheries. The activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

In determining whether there is unreasonable harm to significant wildlife habitat, the department may consider proposed mitigation if that mitigation does not diminish in the vicinity of the proposed activity the overall value of significant wildlife habitat and species utilization of the habitat and if there is no specific biological or physical feature unique to the habitat that would be adversely affected by the proposed activity. For purposes of this subsection, "mitigation" means any action taken or not taken to avoid, minimize, rectify, reduce, eliminate or compensate for any actual or potential adverse impact on the significant wildlife habitat, including the following:

A. Avoiding an impact altogether by not taking a certain action or parts of an action;

B. Minimizing an impact by limiting the magnitude, duration or location of an activity or by controlling the timing of an activity;

C. Rectifying an impact by repairing, rehabilitating or restoring the affected environment;

D. Reducing or eliminating an impact over time through preservation and maintenance operations during the life of the project; or

E. Compensating for an impact by replacing the affected significant wildlife habitat.

4. Interfere with natural water flow. The activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.

5. Lower water quality. The activity will not violate any state water quality law, including those governing the classification of the State's waters.

6. Flooding. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

...

8. Outstanding river segments. If the proposed activity is a crossing of any outstanding river segment as identified in section 480-P, the applicant shall demonstrate that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of the river segment.

NRPA, cont.

The NRPA contains a general permit for agricultural irrigation ponds. Rules have also been adopted pursuant to the NRPA that provide specific standards for freshwater wetlands.

38 § 480-Y. Creation of agricultural irrigation ponds

1. General permit. A general permit is required for the alteration of a freshwater, nontidal stream to construct an agricultural irrigation pond. If the provisions of this section are met, an individual permit is not required.

2. Eligibility criteria. The following eligibility criteria must be met.

A. The farm must have an irrigation management plan, referred to in this section as the "irrigation plan." The irrigation plan must identify the total number of irrigated acres on the farm or on a specified management unit, the amount of water needed, the potential sources of water for irrigating the field and the water management practices that will be used to ensure that the amount of water used for crop irrigation will be kept to a minimum. For the purposes of this subsection, "farm" has the same meaning as in Title 17, section 2805.

B. The department must have assessed the affected area as having no significant habitat for fish and wildlife. For the purposes of this section, "significant habitat" means the same as "significant wildlife habitat" in section 480-B, subsection 10; a fish spawning or nursery habitat; a habitat required for migration of fish species to or from a spawning or nursery habitat; or a habitat otherwise supporting a moderate to high population of salmonid species as determined by the Department of Inland Fisheries and Wildlife.

C. The pond may not be located in a wetland containing endangered or threatened plant species as determined pursuant to Title 5, section 13078, subsection 3 or containing a natural community that is imperiled (S2) or critically imperiled (S1) as defined by the Natural Areas Program pursuant to Title 5, section 13076.

D. A site assessment must be conducted by the department prior to the submission of an application. The department may defer a site assessment for a reasonable period when winter conditions prevent the department from properly evaluating the affected area.

3. Standards. The following standards must be met.

A. The pond, dams and outlets must be designed by a professional engineer to United States Natural Resources Conservation Service standards.

B. Dam fill material must be specified by the professional engineer and must be compacted to 95% of standard proctor. Compaction testing must be conducted with tests performed at a minimum of 2 per dam site or one every 100 feet of dam length, whichever is greater.

C. The pond outlet must be designed to passively discharge a minimum flow equal to inflow or the site-specific aquatic base flow, whichever is less, at all times. The site-specific aquatic base flow must be that specified by the department following consultation with the Department of Inland Fisheries and Wildlife, the United States Natural Resources Conservation Service and other qualified advisors during the site assessment.

D. The pond outlet must be designed and maintained to ensure a cold water release by using a method such as a bottom draw and to induce dissolved oxygen by using a method such as a riprap slope to increase water turbulence.

E. An erosion control plan must ensure that siltation or sedimentation downstream of the dam site is kept to a minimum, to the fullest extent practical, during construction, operation and maintenance of the irrigation pond.

F. The landowner shall maintain a permanently vegetated buffer strip that consists of field grasses or woody vegetation 25 feet wide around the pond except where slopes are equal to or greater than 20%, in which case the buffer strip must be 75 feet wide. Unless recommended to be thinned or mowed on an annual basis by the department or the United States Natural Resources Conservation Service, buffer strip vegetation may not be cut. An access road and irrigation pipes may cross through the buffer strip.

G. All instream construction activities must be conducted between July 15th and October 1st of the same year unless the department determines in the site assessment that an earlier start date will not cause a significant adverse impact to fish and wildlife resources.

4. Submissions. The following provisions apply to the submission of applications.

A. An application must be filed with the department and must include the following:

(1) The application cover sheet, as provided by the department;

(2) The United States Geological Survey topographical map with the boundaries of the farm and the pond site clearly marked;

(3) A photograph of the stream at the proposed dam site;

(4) A copy of the irrigation plan for the farm;

(5) Site plans showing existing and proposed topography, stream channel location, existing wetland boundaries, maximum pool elevation, normal pool elevation, dam footprints, outlet location, emergency spillway location, access roads, stockpile locations and buffer strips;

(6) Cross sections through the dam and outlet structure, including proposed maximum pool elevation and normal pool elevation;

(7) A plan to maintain minimum flow downstream, including any calculations used to create the plan;

(8) A complete erosion control plan using practices contained in the "Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices" (1991) unless otherwise approved or required by the department. The erosion control plan must include a narrative with a sequence for implementing the plan, provisions to inspect and maintain erosion controls and a site plan showing locations of control measures. The plan must include provisions for maintaining a dry construction site. These provisions may consist of construction during a no-flow period, a temporary cofferdam or a stream diversion. The erosion control plan must also include provisions for dewatering and disposal of dredged and excavated soil material. The disposal of soil material dredged from the stream must comply with the requirements of the State's solid waste management rules;

(9) Test pit logs and test results from a minimum of 2 test pits dug in the footprint of the dam and results of tests done under the direction of a professional engineer on the dam fill material; and

(10) A copy of the property deed, lease, purchase and sale agreement or other legal document establishing that the applicant has title or right to or interest in the property proposed for pond development.

All design materials used to show that the dam design meets the standards of the general permit must be signed and stamped by a professional engineer. [1995, c. 659, §1 (new).]

B. Following construction and prior to operation of the irrigation pond, the permittee must submit an inspection report by a professional engineer stating that the professional engineer inspected the dam and that it was constructed in conformance with the standards established in subsection 3. The report must specifically include evidence that the proper number of compaction tests were done and proper compaction specifications have been achieved. The inspection report must include a copy of the job diary and information on when inspections were done and what was inspected.

5. Review period. Work may not commence until 30 days after the department has accepted an application for processing.

6. Notification. The department shall notify the applicant in writing within 30 days of acceptance for processing if the department determines that the requirements of this section have not been met. This notification must specifically cite the requirements of this section that have not been met. If the department has not notified the applicant under this section within the specified time period, a general permit is deemed to have been granted.

7. Fees. The department shall assess a fee for review of an application filed pursuant to this section. The fee must be equivalent to the amount assessed for activities requiring an individual permit for stream alterations.

8. Violation. A violation occurs when an activity takes place that is not in compliance with the provisions of this section or the plans submitted with the application. Any deviation from the approved plans must receive prior department approval.

Other: Rules include Chapter 310, Wetlands Protection

38 § 465. Standards for classification of fresh surface waters

The department shall have 4 standards for the classification of fresh surface waters which are not classified as great ponds.

1. Class AA waters. 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. Class A waters. 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, are 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 department shall require the applicant to objectively demonstrate to the department's satisfaction that the discharge is necessary and that there are no other reasonable alternatives available. Discharges into waters of this classification licensed prior to January 1, 1986, are allowed to continue only until practical alternatives exist. There may 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 may 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 must 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 board shall promulgate rules governing the procedure for designation of spawning areas. Those rules must 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 § 465-A. Standards for classification of lakes and ponds

The department 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 480-B are classified as GPA or as specifically provided in sections 467 and 468.

1. Class GPA waters. 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 may 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 department are exempt from the no discharge provision. Discharges into these waters licensed prior to January 1, 1986, are 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 480-C. 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 that would impair the characteristics and designated uses of downstream GPA waters or cause an increase in the trophic state of those GPA waters.

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

The department shall have 3 standards for the classification of estuarine and marine waters.

1. Class SA waters. 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. Class SB waters. 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, hyroelectric power generation and navigation and as habitat for fish and other estuarine and marine life. The habitat shall be characterized as unimpaired.

REVISION NOTE: In subsection 2, paragraph A "hyroelectric" should be "hydroelectric"

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 State Department of Food and Drug Administration.

REVISION NOTE: In subsection 2, paragraph B in the last line: "United State" should be "United States"

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 § 465-C. Standards of classification of ground water

The department shall have 2 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.

Other: Rules adopted address subjects such as sampling and analytical procedures, water quality evaluations, temperature, and identification of fish spawning areas.

Site Location of Development

38 § 484. Standards for development

The department shall approve a development proposal whenever it finds the following.

1. Financial capacity. The developer has the financial capacity and technical ability to develop the project in a manner consistent with state environmental standards and with the provisions of this article. The commissioner may issue a permit under this article that conditions any site alterations upon a developer providing the commissioner with evidence that the developer has been granted a line of credit or a loan by a financial institution authorized to do business in this State as defined in Title 9-B, section 131, subsection 17-A or with evidence of any other form of financial assurance the board determines by rule to be adequate.

3. No adverse effect on the natural environment. The developer has made adequate provision for fitting the development harmoniously into the existing natural environment and that the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities.

A. In making a determination under this subsection, the department may consider the effect of noise from a commercial or industrial development. Noise from a residential development approved under this article may not be regulated under this subsection, and noise generated between the hours of 7 a.m. and 7 p.m. or during daylight hours, whichever is longer, by construction of a development approved under this article may not be regulated under this subsection.

B. In determining whether a developer has made adequate provision for the control of noise generated by a commercial or industrial development, the department shall consider board rules relating to noise and the quantifiable noise standards of the municipality in which the development is located and of any municipality that may be affected by the noise.

C. Nothing in this subsection may be construed to prohibit a municipality from adopting noise regulations stricter than those adopted by the board.

4. Soil types. The proposed development will be built on soil types that are suitable to the nature of the undertaking.

4-A. Storm water management and erosion and sedimentation control. The proposed development, other than a metallic mineral or advanced exploration activity, meets the standards for storm water management in section 420-D and the standard for erosion and sedimentation control in section 420-C. A proposed metallic mineral mining or advanced exploration activity must meet storm water standards in department rules adopted to implement subsections 3 and 7. If exempt under section 420-D, subsection 7, a proposed development must satisfy the applicable storm water quantity standard and, if the development is located in the direct watershed of a lake included in the list adopted pursuant to section 420-D, subsection 3, any applicable storm water quality standards adopted pursuant to section 420-D.

5. Ground water. The proposed development will not pose an unreasonable risk that a discharge to a significant ground water aquifer will occur.

6. Infrastructure. The developer has made adequate provision of utilities, including water supplies, sewerage facilities, solid waste disposal and roadways required for the development and

the development will not have an unreasonable adverse effect on the existing or proposed utilities and roadways in the municipality or area served by those services.

7. Flooding. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

Other

Excerpts from Chapter 375, No Adverse Environmental Effect Standard of the Site Location of Development Law.

8. No Unreasonable Adverse Effect on Ground Water Quantity

A. Preamble. The Board recognizes the importance of maintaining an adequate supply of ground water for drinking purposes. The Board also recognizes that the depletion of ground water resources can result in the intrusion of salt water into potable ground water supplies and can affect the hydrologic characteristics of surface water bodies (peak flows, low flows and water levels) resulting in adverse effects on their assimilative capacity and recreational use, as well as on certain wildlife habitats. Additionally, new wells can cause a lowering of the ground water supply to the point where existing wells run dry, particularly during the late summer and early fall.

B. Scope of Review. In determining whether the proposed development will have an unreasonable adverse effect on ground water quantity, the Board shall consider all relevant evidence to that effect, such as evidence that:

(1) The quantity of water to be taken from ground water sources will not substantially lower the found water table, cause salt water intrusion, cause undesirable changes in ground water flow patterns, or cause unacceptable ground subsidence.

Protection of Wildlife and Fisheries

A. Preamble. The Board recognizes the need to protect wildlife and fisheries by maintaining suitable and sufficient habitat and the susceptibility of certain species to disruption and interference of lifecycles by construction activities.

B. Scope of Review. In determining whether the developer has made adequate provision for the protection of wildlife and fisheries, the Board shall consider all relevant evidence to that effect, such as evidence that:

(1) A buffer strip of sufficient area will be established to provide wildlife with travel lanes between areas of available habitat.

(2) Proposed alterations and activities will not adversely affect wildlife and fisheries lifecycles.

(3) There will be no unreasonable disturbance to:

(a) Important deer wintering areas.

(b) Habitat of any species declared threatened or endangered by the Commissioner, Maine Department of Inland Fisheries and Wildlife or the Director of the U.S. Fish and Wildlife Service.

(c) Nesting sites for bird colonies.

Preservation of Unusual Natural Areas

A. Preamble. The Board recognizes the importance of preserving unusual natural areas for educational and scientific purposes.

B. Definition. As used in this section, "unusual natural area" means any land or water area, usually only a few acres in size, which is undeveloped and which contains natural features of unusual geological, botanical, zoological, ecological, hydrological, other scientific, educational, scenic, or recreational significance. By way of illustration, and not limitation, such are, as may include: rare or exemplary plant communities; individual plant species of unusual interest because of size, species or other reasons; unusual or exemplary bogs; unusually important wildlife habitats, particularly those of rare or endangered species; unusual land forms; fossils and other deposits of importance to geologists; outstanding scenic areas; and others of similar character.

C. Scope of Review. In determining whether a proposed development will have an adverse effect on the preservation of unusual natural areas either on or near the development site, the Board shall consider all relevant evidence to that effect.

DEP ISSUE PROFILE

Agricultural Irrigation Ponds

issued: August 1998 contact: (800) 452-1942

If you are thinking of building an irrigation pond for your farm, the following questions and answers may be helpful to you. If you have additional questions about DEP permits, please call the nearest DEP office. The addresses and telephone numbers are listed at the end of this paper. The information below applies only to IRRIGATION ponds for existing FARMS. DEP requirements are different for ponds serving other purposes.

Do I need a DEP permit to build an irrigation pond?

You may need a permit depending on where the pond will be located. If you can build the irrigation pond in upland or an isolated fresh water wetland, generally, you will not need a permit from the DEP*. However, building a pond in or near (within 100 feet of) a river, stream, or brook will need a permit from DEP. Ponds involving the disturbance of soil near a river, stream, or brook, or the construction of a permanent intake structure into a river, stream, or brook may qualify for the simple Permit-by-rule (PBR) program. Ponds that will be constructed in a stream or brook may qualify for the new Irrigation Pond General Permit program (IPGP). If the project can not meet PBR or IPGP standards, you will need to file for an individual permit under the Natural Resources Protection Act (NRPA).

* Note: If the pond site has "significant wildlife habitat," you will need to file for an individual NRPA permit. That permit may be difficult to obtain because of the potential impacts on the habitat. DEP staff is available to help growers decide what type of permit they will need, if any.

What is Permit-by-Rule?

"Permit-by-rule" is the shortest, simplest permit process that the DEP uses. The DEP has an issue profile sheet that fully discusses the PBR program. Please call the DEP for PBR information if you plan to build a pond near a river, stream, or brook. or put a permanent intake structure into a river, stream, or brook.

What is a General Permit?

The "General Permit" is a simplified permit review process used by the DEP. The IPGP permit application asks for more information than a PBR notice form, but less than an individual permit application. The process is based on "performance standards". Performance standards are specific conditions the landowner agrees to meet when he/she submits an application to the DEP. If the project qualifies (meets the eligibility criteria), the IPGP application may be submitted. If the Department finds that the application is complete and the performance standards for pond construction will be met, the general permit will be issued.

What are the qualifications needed for the IPGP?

For the applicant to qualify for an IPGP, the farm must have an irrigation management plan; the stream can not contain significant habitat for fish, wildlife, or plants; and the DEP must conduct a site assessment.

What is an irrigation management plan?

The "irrigation management plan" is a master plan for water use. The Natural Resources Conservation Service (NRCS), University of Maine Cooperative Extension Service, and the irrigation equipment supplier may be able to provide information needed in this plan. The IPGP requires the following information in the irrigation management plan: the total number of acres to be irrigated, the amount of water needed, the potential sources of water for irrigation, and water practices that will be used to minimize water usage.

What standards do I have to meet to get a IPGP?

In general: the dam must be designed to the Natural Resources Conservation Service standards by a professional engineer; the dam fill material must be specified by the engineer and compacted properly; the outlet must pass a minimum flow; the outlet must pass water from the bottom of the pond; erosion and sedimentation must be minimized; a buffer strip must be maintained around the pond; and construction must occur between July 15 and October 1. For specific requirements, see section 480-Y, "Creation of Agricultural Irrigation Ponds" in the NRPA (statutory handout available from DEP).

How do I apply for an IPGP?

First, you should prepare an irrigation management plan. Second, you should contact the DEP or the County SWCD District Conservationist about setting up a site assessment. Third, following a successful site assessment, you complete the IPGP application form. Copies of the IPGP application form are available at all DEP offices. You will need a professional engineer to help with parts of the form. The NRCS may be able to help. Otherwise, you will have to contact a private engineer. Once the application is complete, send it to the nearest DEP office for processing along with a check for the current fee made payable to Treasurer, State of Maine. Fees must accompany each application when submitted.

How long will it take to get a general permit?

It will take a maximum of 45 days. The DEP will use up to 15 days to make sure the application is complete, and 30 days to make sure the standards for the general permit will be met.

What if I need an individual permit?

The DEP recommends that anyone planning to complete the individual permit application contact the nearest DEP office and set up a pre-application meeting. A staff person can assist you with the requirements of this permit process.

Will I also need a permit from the local and federal governments?

Yes, you may need both. Please contact your local Code Enforcement Officer, and the U.S. Army Corps of Engineers for more information about their programs. These other government agencies may be available to attend the site assessment. Requirements of the local and federal governments can be discussed at that time.

For more information:

DEP Southern Maine Regional Office: 312 Canco Road, Portland, 822-6300
DEP Eastern Maine Regional Office: 106 Hogan Road, Bangor, 941-4570
DEP: Northern Maine Regional Office: 1235 Central Drive, Presque Isle, 764-0477
DEP Augusta: Ray Building, Hospital Street, 287-2111

these protected natural resource. It may be possible to obtain a permit by rule for a farm pond adjacent to these resources if the edge of the pond is greater than 25 feet from the resource. A permit by rule, if applicable, can be obtained within fourteen days. If work must be conducted in a waterway, excavation is preferred to building a dam due to water quality and fisheries concerns. It is DEP's current policy to deny a proposal which would require damming of, or excavation in, a stream if the stream supports fisheries.

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Natural Resources Protection Act

38 M.R.S.A. §§ 480-A to 480-Z

STATUTE

Bureau of Land and Water Quality
No. DEPLW-2-D98

REVISED: June 30, 1998

Ancillary culverting activities, including excavation and filling, are included in this exemption. A person repairing, replacing or maintaining an existing culvert under this subsection shall ensure that erosion control measures are taken to prevent sedimentation of the water and that the crossing does not block fish passage in the water course.

2-B. Floating docks. Replacement of a floating dock with another floating dock if the dimensions of the replacement dock do not exceed those of the dock being replaced and the configuration of the replacement dock is the same as the dock being replaced. In any action brought by the department against a person claiming an exemption under this subsection, the burden is on that person to demonstrate that the replacement dock satisfies the requirements of this subsection;

3. Peat mining. Repealed. Laws 1995, ch. 700, § 1.[5]

4. Interstate pipelines. Alteration of freshwater wetlands associated with the construction, operation, maintenance or repair of an interstate pipeline, subject to article 6, where applicable;

5. Gold panning. Notwithstanding section 480-C, a permit shall not be required for panning gold, provided that stream banks are not disturbed and no unlicensed discharge is created;

6. Agricultural activities. Subject to other provisions of this article that govern other protected natural resources, altering a freshwater wetland for the purpose of normal farming activities such as clearing of vegetation for agricultural purposes if the land topography is not altered, plowing, seeding, cultivating, minor drainage and harvesting, construction or maintenance of farm or livestock ponds or irrigation ditches, maintenance of drainage ditches and construction or maintenance of farm roads;[6]

7. Forestry. Repealed. Laws 1989, c. 838, § 5.

7-A. Forestry. Forest management activities, including associated road construction or maintenance, in or adjacent to an existing forested wetland, or a harvested forested wetland, as long as:

A. (TEXT EFFECTIVE UNTIL CONTINGENCY: See CMR 1995, c. 1, @20) The activity results in a forest stand that meets the minimum stocking requirements in rules adopted pursuant to Title 12, section 8869. This requirement takes effect when those rules are adopted;

A. (TEXT EFFECTIVE ON CONTINGENCY: See CMR 1995, c. 1, @20) The activity results in a forest stand that meets the minimum stocking requirements in rules adopted pursuant to Title 12, section 8869-A. This requirement takes effect when those rules are adopted;

B. The activity meets permit by rule standards in rules adopted pursuant to this article, for any road crossing of a river, stream or brook, or for any soil disturbance adjacent to a great pond,

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[5]Repeal effective effective July 4, 1996. A transition provision was also enacted. It read:
"**Transition provisions.** A peat mine licensed pursuant to the Maine Revised Statutes, Title 38, chapter 13, subchapter I, article 6 prior to the effective date of this Act is also considered licensed pursuant to Title 38, chapter 3, subchapter I, article 5-A, as of the effective date of this Act." Laws 1995, ch. 700, § 1 (effective July 4, 1996).

[6]See footnote 9.

§ 480-Y. Creation of agricultural irrigation ponds[10]

1. General permit. A general permit is required for the alteration of a freshwater, nontidal stream to construct an agricultural irrigation pond. If the provisions of this section are met, an individual permit is not required.

2. Eligibility criteria. The following eligibility criteria must be met.

A. The farm must have an irrigation management plan, referred to in this section as the "irrigation plan." The irrigation plan must identify the total number of irrigated acres on the farm or on a specified management unit, the amount of water needed, the potential sources of water for irrigating the field and the water management practices that will be used to ensure that the amount of water used for crop irrigation will be kept to a minimum. For the purposes of this subsection, "farm" has the same meaning as in Title 17, section 2805.

B. The department must have assessed the affected area as having no significant habitat for fish and wildlife. For the purposes of this section, "significant habitat" means the same as "significant wildlife habitat" in section 480-B, subsection 10; a fish spawning or nursery habitat; a habitat required for migration of fish species to or from a spawning or nursery habitat; or a habitat otherwise supporting a moderate to high population of salmonid species as determined by the Department of Inland Fisheries and Wildlife.

C. The pond may not be located in a wetland containing endangered or threatened plant species as determined pursuant to Title 5, section 13078, subsection 3 or containing a natural community that is imperiled (S2) or critically imperiled (S1) as defined by the Natural Areas Program pursuant to Title 5, section 13076.

D. A site assessment must be conducted by the department prior to the submission of an application. The department may defer a site assessment for a reasonable period when winter conditions prevent the department from properly evaluating the affected area.

3. Standards. The following standards must be met.

A. The pond, dams and outlets must be designed by a professional engineer to United States Natural Resources Conservation Service standards.

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[10]Section effective April 10, 1996 (Laws 1995, ch. 659, § 1). The Department is required report to the Legislature concerning the effectiveness of this general permit.

"**Evaluation period.** The Department of Environmental Protection shall monitor the effectiveness of the general permit established by the Maine Revised Statutes, Title 38, section 480-Y from the effective date of this Act until October 1, 1997. The department shall provide an interim report by February 1, 1997 and a final report by January 1, 1998 to the joint standing committee of the Legislature having jurisdiction over natural resource matters. The reports must include information on the number of applications submitted for review and an assessment of the overall effectiveness of the general permit in terms of administrative efficiency and equivalent or enhanced protection of the natural resources affected. The reports must include recommendations on any necessary statutory changes." Laws 1995, ch. 659, § 3.

B. Dam fill material must be specified by the professional engineer and must be compacted to 95% of standard proctor. Compaction testing must be conducted with tests performed at a minimum of 2 per dam site or one every 100 feet of dam length, whichever is greater.

C. The pond outlet must be designed to passively discharge a minimum flow equal to inflow or the site-specific aquatic base flow, whichever is less, at all times. The site-specific aquatic base flow must be that specified by the department following consultation with the Department of Inland Fisheries and Wildlife, the United States Natural Resources Conservation Service and other qualified advisors during the site assessment.

D. The pond outlet must be designed and maintained to ensure a cold water release by using a method such as a bottom draw and to induce dissolved oxygen by using a method such as a riprap slope to increase water turbulence.

E. An erosion control plan must ensure that siltation or sedimentation downstream of the dam site is kept to a minimum, to the fullest extent practical, during construction, operation and maintenance of the irrigation pond.

F. The landowner shall maintain a permanently vegetated buffer strip that consists of field grasses or woody vegetation 25 feet wide around the pond except where slopes are equal to or greater than 20%, in which case the buffer strip must be 75 feet wide. Unless recommended to be thinned or mowed on an annual basis by the department or the United States Natural Resources Conservation Service, buffer strip vegetation may not be cut. An access road and irrigation pipes may cross through the buffer strip.

G. All instream construction activities must be conducted between July 15th and October 1st of the same year unless the department determines in the site assessment that an earlier start date will not cause a significant adverse impact to fish and wildlife resources.

4. Submissions. The following provisions apply to the submission of applications.

A. An application must be filed with the department and must include the following:

(1) The application cover sheet, as provided by the department;

(2) The United States Geological Survey topographical map with the boundaries of the farm and the pond site clearly marked;

(3) A photograph of the stream at the proposed dam site;

(4) A copy of the irrigation plan for the farm;

(5) Site plans showing existing and proposed topography, stream channel location, existing wetland boundaries, maximum pool elevation, normal pool elevation, dam footprints, outlet location, emergency spillway location, access roads, stockpile locations and buffer strips;

(6) Cross sections through the dam and outlet structure, including proposed maximum pool elevation and normal pool elevation;

(7) A plan to maintain minimum flow downstream, including any calculations used to create the plan;

(8) A complete erosion control plan using practices contained in the "Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices" (1991) unless otherwise approved or required by the department. The erosion control plan must include a narrative with a sequence for implementing the plan, provisions to inspect and maintain erosion controls and a site plan showing locations of control measures. The plan must include provisions for maintaining a dry construction site. These provisions may consist of construction during a no-flow period, a temporary cofferdam or a stream diversion. The erosion control plan must also include provisions for dewatering and disposal of dredged and excavated soil material. The disposal of soil material dredged from the stream must comply with the requirements of the State's solid waste management rules;

(9) Test pit logs and test results from a minimum of 2 test pits dug in the footprint of the dam and results of tests done under the direction of a professional engineer on the dam fill material; and

(10) A copy of the property deed, lease, purchase and sale agreement or other legal document establishing that the applicant has title or right to or interest in the property proposed for pond development.

All design materials used to show that the dam design meets the standards of the general permit must be signed and stamped by a professional engineer.

B. Following construction and prior to operation of the irrigation pond, the permittee must submit an inspection report by a professional engineer stating that the professional engineer inspected the dam and that it was constructed in conformance with the standards established in subsection 3. The report must specifically include evidence that the proper number of compaction tests were done and proper compaction specifications have been achieved. The inspection report must include a copy of the job diary and information on when inspections were done and what was inspected.

5. Review period. Work may not commence until 30 days after the department has accepted an application for processing.

6. Notification. The department shall notify the applicant in writing within 30 days of acceptance for processing if the department determines that the requirements of this section have not been met. This notification must specifically cite the requirements of this section that have not been met. If the department has not notified the applicant under this section within the specified time period, a general permit is deemed to have been granted.

7. Fees. The department shall assess a fee for review of an application filed pursuant to this section. The fee must be equivalent to the amount assessed for activities requiring an individual permit for stream alterations.

8. Violation. A violation occurs when an activity takes place that is not in compliance with the provisions of this section or the plans submitted with the application. Any deviation from the approved plans must receive prior department approval.

§ 480-Z. Compensation

The department may establish a program providing for compensation of unavoidable freshwater or coastal wetland losses due to a proposed activity. Compensation must include the restoration, enhancement, creation or preservation of wetlands that have functions or values similar to the wetlands impacted by the activity, unless otherwise approved by the department. Preservation may include protection of uplands adjacent to wetlands.

The department may require that compensation include the design, implementation and maintenance of a compensation project or, in lieu of such a project, may allow the applicant to purchase credits from a mitigation bank or to pay a compensation fee. If compensation is required, the completion and maintenance of a project, purchase of credits or payment of a compensation fee must be a condition of the permit.

The department shall identify an appropriate project, or determine the amount of credits or compensation fee, based upon the compensation that would be necessary to restore, enhance, create or preserve wetlands with functions or values similar to the wetlands impacted by the activity. However, the department may allow the applicant to conduct a project of equivalent value, or allow the purchase of credits or payment of a compensation fee of equivalent value, to be used for the purpose of restoring, enhancing, creating or preserving other wetland functions or values that are environmentally preferable to the functions and values impacted by the activity, as determined by the department. The loss of functions or values of a coastal wetland may not be compensated for by the restoration, enhancement, creation or preservation of freshwater wetland functions or values.

A project undertaken pursuant to this section must be approved by the department. The department shall base its approval of a compensation project on the wetland management priorities identified by the department for the watershed in which the project is located. The deaprtment may not approve a compenstation project until the applicant has complied with all other applicable provisions of this article and all applicable rules adopted by the department pursuant to this article.

1. Location of project. A compensation project must be located on or adjacent to the project site, unless otherwise approved by the department. A compensation project must be located in the same watershed as the wetlands affected by the activity unless the department determines, based on regional hydrological or ecological priorities, that there is a scientific justification for locating the compensation project outside of the same watershed.

2. Approval of mitigation bank. A mitigation bank from which any credits are purchased must be approved by the department consistent with all applicable federal rules and regulations.

3. Compensation fee program.[11] The department shall develop a compensation fee program in consultation with the State Planning Office, The United States Army Corps of Engineers and state

[11]This section, effective September 19, 1997, is affected by an implementation provision (PL 1997, ch. 101, § 2) that provides:

and federal resource agencies, including the United States Fish and Wildlife Service and the United States Environmental Protection Agency.

A. The program must include, at a minimum, the following:

(1) Identification of wetland management priorities on a watershed basis;

(2) Identification of the types of wetland losses eligible for compensation under this subsection;

(3) Standards for compensation fee projects;

(4) Calculation of compensation fees based on the functions and values of the affected wetlands and the cost of compensation, taking into account the potential higher cost of compensation when a project is implemented at a later date; and

(5) Methods to evaluate the long-term effectiveness of compensation fee projects implemented under this subsection in meeting the wetland management priorities identified pursuant to subparagraph (1).

B. Any compensation fee must be paid into a wetlands compensation fund established by the department or to an organization authorized by the department as provided in subparagraphs (1) and (2). A compensation project funded in whole or in part from compensation fees must be approved by the department.

(1) The department may establish a wetlands compensation fund for the purpose of receiving compensation fees, grants and other related income. The wetlands compensation fund must be a fund dedicated to payment of costs and related expenses of wetland restoration, enhancement, preservation and creation projects. The department may make payments from the fund consistent with the purpose of the fund. Income received under this subsection must be deposited with the State Treasurer to the credit of the wetlands compensation fund and may be invested as provided by law. Interest on these investments must be credited to the wetlands compensation fund.

(2) The department may enter into an enforceable, written agreement with a public, quasi-public or private, nonprofit organization dedicated to the protection of wetlands and other natural areas for the purposes of receiving compensation fees, administering the wetlands compensation fund and ensuring that compensation projects are implemented consistent with the wetland management priorities identified by the department for the watershed in which the project is located. If compensation fees are provided to an authorized organization, the organization shall maintain records of expenditures and provide an annual summary report to the department. If the

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Sec. 2. Implementation. The Department of Environmental Protection may not approve a compensation project funded in whole or in part from compensation fees until the compensation fee program developed pursuant to the Maine Revised Statutes, Title 38, section 480-Z, subsection 3 has been agreed to by the United States Army Corps of Engineers, the United States Fish and Wildlife Service and the United States Environmental Protection Agency.

authorized agency is a state agency other than the department, the agency shall establish a fund meeting the requirements specified in subparagraph (1). If the organization does not perform in accordance with this subsection or with the requirements of the written agreement, the department may revoke the organization's authority to conduct activities in accordance with this subsection. If an organization's authorization is revoked, any funds remaining in the wetlands compensation fund must be provided to the department.

Rules adopted pursuant to this subsection are routine technical rules under Title 5, chapter 375, subchapter II-A.

4. Relationship to other provisions. The purchase of credits from a mitigation bank or the payment of a compensation fee in no way relieves the applicant of the requirement to complay with any other provision of this article, including, but not limited to, the requirement to avoid or minimize effects on wetlands and water quality to the greatest extent practicable under section 480-X.

5. Report; evaluation. The department shall submit a report annually by February 1st to the joint standing committee of the Legislature having jurisdiction over natural resources matters regarding the wetlands compensation program. The report must include information on the amount and type of wetlands altered, the associated impact on wetland functions and values and the compensation required by the department. The information must be provided for each of the following categories: compensation projects implemented by the applicant, compensation authorized by the purchase of credits from a mitigation bank, compensation authorized by payment of compensation fees and wetland alterations for which compensation was not required.

By January 1, 2001, the department shall submit to the joint standing committee of the Legislature having jurisdiction over natural resources matters an evaluation of the effectiveness and efficiency of the compensation program developed under this section, including the amount and type of wetlands altered, the effect on wetland functions and values, an assessment of the relative environmental benefit of each compensation option, an assessment of whether coastal wetlands should be included in the program, an assessment of the requirement that the compensation project be located in the same watershed as the affected wetland and a comparison of the compensation program developed under this section with compensation prior to the effective date of this section. The department may include recommendations for extending the program and any suggested statutory changes.

6. Repeal. This section is repealed October 15, 2001. The repeal of this section does not affect any valid permits, compensation projects, credits and compensation funds issued, implemented, purchased or established pursuant to this section.

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

SITE LOCATION OF DEVELOPMENT

38 M.R.S.A. §§ 481-490

STATUTE

Bureau of Land and Water Quality
No. DEPLW-3-D98

REVISED: July 9, 1998

mining or advanced exploration activity or an oil terminal facility, is exempt from the requirements of this article. For developments within the commission's jurisdiction, the Director of the Maine Land Use Regulation Commission may request and obtain technical assistance and recommendations from the department. The commissioner shall respond to the requests in a timely manner. The recommendations of the department must be considered by the Maine Land Use Regulation Commission in acting upon a development application.

10. Roads and railroad tracks. A structure consisting only of a road or a road together with the structure area within a residential lot, as described in subsection 17 is exempt from the requirements of this article. Railroad tracks other than tracks within yards or stations are exempt from review under this article.[13]

11.[14] Farm and fire ponds. A pond that is used for irrigation of field crops, water storage for cranberry operations or fire protection determined to be necessary in that location by the municipal fire department is exempt from review under this article. This provision does not provide an exemption for mining or advanced exploration activity or excavation for borrow, clay, topsoil or silt.

12. Structures within permitted commercial and industrial subdivisions. A person may construct or cause to be constructed, or operate or cause to be operated, a structure on a lot in a commercial or industrial subdivision approved pursuant to this article without obtaining approval under this article for that structure, as long as all terms and conditions of the subdivision permit are met. This subsection applies to commercial or industrial subdivisions approved pursuant to this article on or after the effective date of this subsection.

13. Research and aquaculture leases. Activities regulated by the Department of Marine Resources under Title 12, section 6072 are exempt from the requirements of this article.

14. Developments within designated growth areas. The following provisions apply to developments within a designated growth area.

A. A development is exempt from review under traffic movement, flood plain, noise and infrastructure standards under section 484 if that development is located entirely within:

(1) A municipality that has adopted a local growth management program that the State Planning Office has certified under Title 30-A, section 4348; and

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[12]A permit issued by the department for a development within unorganized territory, other than a permit for a metallic mineral mining or advanced exploration activity, may be modified by the Maine Land Use Regulation Commission (LURC). The modification of a permit for a metallic mineral mining or advanced exploration activity requires approval by both the department and LURC. See Laws 1993, ch. 383, §42.

[13]Laws 1995, ch. 493, § 21 (effective July 3, 1995) (in part): "Those sections of this Act that amend Title 38, section 488, subsection 10 and enact Title 38, section 488, subsection 17 apply retroactively to any residential subdivision approved by the Environmental Improvement Commission, the Commissioner of Environmental Protection, the Board of Environmental Protection, the Department of Environmental Protection, the Maine Land Use Regulation Commission or any municipal planning board on or after May 9, 1970."

[14]⇒38 MRSA 488(11) as amended by PL 1995, c. 659, § 2 and c. 700, § 8 was repealed and the text shown was enacted in its place, effective September 19, 1997. This change applies retroactively to April 10, 1996. See PL 1997, c. 502, §§ 10 and 18.

LURC

10.02 DEFINITIONS

The following definitions apply to the following terms as they appear in this Chapter, the other Chapters of the Commission's Rules and Regulations and the Commission's Statute (12 M.R.S.A., Chapter 206-A):

1. Accessory Use or Accessory Structure:
   "A use or structure subordinate to a permitted or conditional use or structure and customarily incidental to the permitted or conditional use of the structure." 12 M.R.S.A., Section 682.

2. Agricultural Management Activities:
   Land clearing, tilling, fertilizing, including spreading and disposal of manure, liming, planting, pesticide application, harvesting or cultivating crops, pasturing of livestock and other similar or related activities, but not the construction, creation or maintenance of land management roads, nor the land application of septage, sludge and other residuals and related storage and composting activities.

3. Body of Standing Water:
   A body of surface water that has no perceptible flow and is substantially permanent in nature. Such bodies of water are commonly referred to as man–made or natural lakes or ponds.

4. Building:
   "Any structure having a roof or partial roof supported by columns or walls used or intended to be used for the shelter or enclosure of persons, animals or objects regardless of the materials of which it is constructed." 12 M.R.S.A., Section 682. The Commission finds that temporary camping tents constructed of cloth or similar materials do not comprise buildings as so defined.

5. Bulk Sampling of Mineral Deposits:
   The removal of samples of mineral deposits for the purpose of testing to determine the feasibility, method or manner of extraction and/or processing of minerals. Such testing may include metallurgical analyses, milling or grinding tests and/or pilot plant and processing tests. Methods of bulk sampling may include, but not be limited to drilling and boring, the digging of shafts and tunnels, or the digging of pits and trenches.

6. Campground:
   Any area, other than a camp site, designed for transient occupancy by camping in tents, camp trailers, travel trailers, motor homes or similar facility designed for temporary shelter.

7. Camp Site:
   Any area designed for transient occupancy by camping primarily in tents or lean–tos; under this definition, no camp site shall be designed to accommodate more than 30 overnight visitors and permanent structures shall be limited to privies, fireplaces, picnic tables (with or without roofs), lean–tos and water pumps.

8. Capacity Expansions of Utility Facilities:
   The addition of new telephone or electric wires or similar equipment to existing electric or telephone transmission and distribution poles for the purpose of increasing the capacity thereof.

9. Cluster Development:
   A compact form of development that results in buildings being located in a group such that a significant amount of open space is preserved.

10. Coastal Nesting Island:
    An island used for nesting by sea birds during their breeding period.

The designated D–CI Subdistrict boundary shall include all those areas described in (1) through (7) above, as well as adjoining areas directly related to, and necessary for, the conduct of those activities.

b. Sites wholly within 1,000 feet of those areas identified in Subsection 2, a, above subject to and in accordance with the following conditions:

(1) Prior to the deadline, established pursuant to Section 5.19 of Chapter V of the Commission's Rules and Regulations, for the filing of written statements following the close of the public hearings on the adoption of district boundaries for the block in which such site is located, the owner or lessee of such site shall have submitted to the Commission a reasonable plan or proposal for development on the land of such owner or lessee which is consistent with the purposes of this subdistrict together with a map showing the boundary lines of such proposed development sufficient to locate the same on an official district map;

(2) No Development Subdistrict extended or created pursuant to this Subsection 2, b shall extend into any area which would otherwise be placed in a Protection Subdistrict, other than a P–SL or P–GP Protection Subdistrict; and

(3) Inclusion of any site in a Development Subdistrict pursuant to this Subsection 2, b shall not be construed as either constituting the Commission's approval of such plan or proposal or releasing such owner or lessee from the requirements of demonstrating the suitability of such site for development in accordance with 12 M.R.S.A., Section 685–B, Subsection 4 and the Commission's Rules and Regulations relating thereto.

c. Areas which the Commission determines meet the criteria for redistricting to this Subdistrict, pursuant to Section 10.08 hereof, are proposed for development which is consistent with the purposes of this subdistrict, and are suitable for the development activities proposed when measured against the standards of 12 M.R.S.A., Section 685–B, Subsection 4 and the Commission's Rules and Regulations relating thereto. Where such an area is not adjacent to a D–CI Development Subdistrict and redistricted for the purpose of allowing for commercial mineral extraction, once such operations are complete the D–CI Development Subdistrict designation shall automatically revert to the prior Subdistrict designation.

3. Land Use Standards

a. Uses Allowed Without a Permit

The following uses shall be allowed without a permit from the Commission within D–CI Development Subdistricts subject to the applicable requirements set forth in Section 10.17 of this Chapter.

(1) Primitive recreational uses, including fishing, hiking, wildlife study and photography, wild crop harvesting, horseback riding, tent and shelter camping, canoe portaging, cross country skiing, and snowshoeing but not including hunting and trapping;
(2) Non–permanent docking and mooring structures;
(3) Motorized vehicular traffic on roads and trails, and snowmobiling;
(4) Wildlife and fishery management practices;
(5) Trails, provided they are constructed and maintained so as to reasonably avoid sedimentation of water bodies:
(6) Level A mineral exploration activities, excluding associated access ways;
(7) Level A road projects;
(8) Surveying and other resource analysis;
(9) Agricultural management activities;
(10) Forest management activities, except for timber harvesting;
(11) Service drops; and buildings or structures necessary for the furnishing of public utility services, provided they contain not more than 500 square feet of floor area, are less than 20 feet in height, and are not supplied with water. Wire and pipe line extensions which do not meet the definition of service drops shall require a permit;

(12) Water crossings of minor flowing waters;
(13) Signs;
(14) Emergency operations conducted for the public health, safety or general welfare, such as resource protection, law enforcement, and search and rescue operations;
(15) New and expanded accessory structures to any legally existing, conforming, non–single–family residential uses, provided that these new or expanded structures contain not more than a total of 500 square feet of gross floor area, are not supplied with water, neither use nor produce any hazardous or toxic materials or substances, and do not add new activities not currently being conducted at the facility; and
(16) Filling and grading.

b. Uses Requiring a Permit

The following uses may be allowed within D–CI Development Subdistricts upon issuance of a permit from the Commission pursuant to 12 M.R.S.A., Section 685–B, subject to the applicable requirements set forth in Secton 10.17, of this Chapter and, where within 250 feet of certain lakes, subject to the applicable requirements of Section 10.14, A, 3, e and f below:

(1) Agricultural management activities which do not comply with standards established for such activities in Section 10.17, A, of this Chapter;
(2) Timber harvesting;
(3) Land management roads;
(4) Water crossings of minor flowing waters which are not in conformance with the standards for such activities in Section 10.17, A, of this Chapter, and water crossings of standing waters and of major flowing waters;
(5) Any commercial and industrial uses and subdivisions for uses permitted in this Subdistrict;
(6) Commercial sporting camps;
(7) Utility facilities, excluding service drops;
(8) Level B and C road projects, except for water crossings as provided for in 10.14, A, 3, a;
(9) Shoreland alterations, including marinas, permanent docking facilities and boat ramps and ways, but excluding water crossings of minor flowing waters;
(10) Water impoundments;
(11) Filling and grading, except as provided in 10.14, A, 3, a, and draining, dredging and alteration of the water table or water level for other than mineral extraction;
(12) Access ways for Level A mineral exploration activities, and Level A mineral exploration activities which are not in conformance with the standards for such activities in Section 10.17, A;
(13) Level B mineral exploration activities;
(14) Mineral extraction;
(15) Solid waste disposal;
(16) Land application of septage, sludge and other residuals, and related storage and composting activities and structures;
(17) Other structures, uses or services that are essential to the uses listed in Section 10.14, A, 3, a, and b; and
(18) Other structures, uses, or services which the Commission determines are consistent with the purposes of this Subdistrict and of the Comprehensive Land Use Plan and are not detrimental to the resources and uses they protect.

c. Prohibited Uses

All uses not expressedly allowed, with or without a permit, shall be prohibited in D–CI Development Subdistricts.

d. Water Quality Limiting Lakes

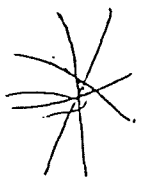
For information relative to water quality limiting lakes see Section 10.16, D, 3, e.

LURC

10.02 DEFINITIONS

The following definitions apply to the following terms as they appear in this Chapter, the other Chapters of the Commission's Rules and Regulations and the Commission's Statute (12 M.R.S.A., Chapter 206-A):

1. Accessory Use or Accessory Structure:
   "A use or structure subordinate to a permitted or conditional use or structure and customarily incidental to the permitted or conditional use of the structure." 12 M.R.S.A., Section 682.



2. Agricultural Management Activities:
   Land clearing, tilling, fertilizing, including spreading and disposal of manure, liming, planting, pesticide application, harvesting or cultivating crops, pasturing of livestock and other similar or related activities, but not the construction, creation or maintenance of land management roads, nor the land application of septage, sludge and other residuals and related storage and composting activities.

3. Body of Standing Water:
   A body of surface water that has no perceptible flow and is substantially permanent in nature. Such bodies of water are commonly referred to as man-made or natural lakes or ponds.

4. Building:
   "Any structure having a roof or partial roof supported by columns or walls used or intended to be used for the shelter or enclosure of persons, animals or objects regardless of the materials of which it is constructed." 12 M.R.S.A., Section 682. The Commission finds that temporary camping tents constructed of cloth or similar materials do not comprise buildings as so defined.

5. Bulk Sampling of Mineral Deposits:
   The removal of samples of mineral deposits for the purpose of testing to determine the feasibility, method or manner of extraction and/or processing of minerals. Such testing may include metallurgical analyses, milling or grinding tests and/or pilot plant and processing tests. Methods of bulk sampling may include, but not be limited to drilling and boring, the digging of shafts and tunnels, or the digging of pits and trenches.

6. Campground:
   Any area, other than a camp site, designed for transient occupancy by camping in tents, camp trailers, travel trailers, motor homes or similar facility designed for temporary shelter.

7. Camp Site:
   Any area designed for transient occupancy by camping primarily in tents or lean-tos; under this definition, no camp site shall be designed to accommodate more than 30 overnight visitors and permanent structures shall be limited to privies, fireplaces, picnic tables (with or without roofs), lean-tos and water pumps.

8. Capacity Expansions of Utility Facilities:
   The addition of new telephone or electric wires or similar equipment to existing electric or telephone transmission and distribution poles for the purpose of increasing the capacity thereof.

9. Cluster Development:
   A compact form of development that results in buildings being located in a group such that a significant amount of open space is preserved.

10. Coastal Nesting Island:
    An island used for nesting by sea birds during their breeding period.

The designated D–CI Subdistrict boundary shall include all those areas described in (1) through (7) above, as well as adjoining areas directly related to, and necessary for, the conduct of those activities.

b. Sites wholly within 1,000 feet of those areas identified in Subsection 2, a, above subject to and in accordance with the following conditions:

(1) Prior to the deadline, established pursuant to Section 5.19 of Chapter V of the Commission's Rules and Regulations, for the filing of written statements following the close of the public hearings on the adoption of district boundaries for the block in which such site is located, the owner or lessee of such site shall have submitted to the Commission a reasonable plan or proposal for development on the land of such owner or lessee which is consistent with the purposes of this subdistrict together with a map showing the boundary lines of such proposed development sufficient to locate the same on an official district map;

(2) No Development Subdistrict extended or created pursuant to this Subsection 2, b shall extend into any area which would otherwise be placed in a Protection Subdistrict, other than a P–SL or P–GP Protection Subdistrict; and

(3) Inclusion of any site in a Development Subdistrict pursuant to this Subsection 2, b shall not be construed as either constituting the Commission's approval of such plan or proposal or releasing such owner or lessee from the requirements of demonstrating the suitability of such site for development in accordance with 12 M.R.S.A., Section 685–B, Subsection 4 and the Commission's Rules and Regulations relating thereto.

c. Areas which the Commission determines meet the criteria for redistricting to this Subdistrict, pursuant to Section 10.08 hereof, are proposed for development which is consistent with the purposes of this subdistrict, and are suitable for the development activities proposed when measured against the standards of 12 M.R.S.A., Section 685–B, Subsection 4 and the Commission's Rules and Regulations relating thereto. Where such an area is not adjacent to a D–CI Development Subdistrict and redistricted for the purpose of allowing for commercial mineral extraction, once such operations are complete the D–CI Development Subdistrict designation shall automatically revert to the prior Subdistrict designation.

3. Land Use Standards

a. Uses Allowed Without a Permit

The following uses shall be allowed without a permit from the Commission within D–CI Development Subdistricts subject to the applicable requirements set forth in Section 10.17 of this Chapter.

(1) Primitive recreational uses, including fishing, hiking, wildlife study and photography, wild crop harvesting, horseback riding, tent and shelter camping, canoe portaging, cross country skiing, and snowshoeing but not including hunting and trapping;
(2) Non–permanent docking and mooring structures;
(3) Motorized vehicular traffic on roads and trails, and snowmobiling;
(4) Wildlife and fishery management practices;
(5) Trails, provided they are constructed and maintained so as to reasonably avoid sedimentation of water bodies:
(6) Level A mineral exploration activities, excluding associated access ways;
(7) Level A road projects;
(8) Surveying and other resource analysis;
(9) Agricultural management activities;
(10) Forest management activities, except for timber harvesting;
(11) Service drops; and buildings or structures necessary for the furnishing of public utility services, provided they contain not more than 500 square feet of floor area, are less than 20 feet in height, and are not supplied with water. Wire and pipe line extensions which do not meet the definition of service drops shall require a permit;

(12) Water crossings of minor flowing waters;
(13) Signs;
(14) Emergency operations conducted for the public health, safety or general welfare, such as resource protection, law enforcement, and search and rescue operations;
(15) New and expanded accessory structures to any legally existing, conforming, non–single–family residential uses, provided that these new or expanded structures contain not more than a total of 500 square feet of gross floor area, are not supplied with water, neither use nor produce any hazardous or toxic materials or substances, and do not add new activities not currently being conducted at the facility; and
(16) Filling and grading.

b. Uses Requiring a Permit

The following uses may be allowed within D–CI Development Subdistricts upon issuance of a permit from the Commission pursuant to 12 M.R.S.A., Section 685–B, subject to the applicable requirements set forth in Secton 10.17, of this Chapter and, where within 250 feet of certain lakes, subject to the applicable requirements of Section 10.14, A, 3, e and f below:

(1) Agricultural management activities which do not comply with standards established for such activities in Section 10.17, A, of this Chapter;
(2) Timber harvesting;
(3) Land management roads;
(4) Water crossings of minor flowing waters which are not in conformance with the standards for such activities in Section 10.17, A, of this Chapter, and water crossings of standing waters and of major flowing waters;
(5) Any commercial and industrial uses and subdivisions for uses permitted in this Subdistrict;
(6) Commercial sporting camps;
(7) Utility facilities, excluding service drops;
(8) Level B and C road projects, except for water crossings as provided for in 10.14, A, 3, a;
(9) Shoreland alterations, including marinas, permanent docking facilities and boat ramps and ways, but excluding water crossings of minor flowing waters;
(10) Water impoundments;
(11) Filling and grading, except as provided in 10.14, A, 3, a, and draining, dredging and alteration of the water table or water level for other than mineral extraction;
(12) Access ways for Level A mineral exploration activities, and Level A mineral exploration activities which are not in conformance with the standards for such activities in Section 10.17, A;
(13) Level B mineral exploration activities;
(14) Mineral extraction;
(15) Solid waste disposal;
(16) Land application of septage, sludge and other residuals, and related storage and composting activities and structures;
(17) Other structures, uses or services that are essential to the uses listed in Section 10.14, A, 3, a, and b; and
(18) Other structures, uses, or services which the Commission determines are consistent with the purposes of this Subdistrict and of the Comprehensive Land Use Plan and are not detrimental to the resources and uses they protect.

c. Prohibited Uses

All uses not expressedly allowed, with or without a permit, shall be prohibited in D–CI Development Subdistricts.

d. Water Quality Limiting Lakes

For information relative to water quality limiting lakes see Section 10.16, D, 3, e.

STATE OF MAINE
DEPARTMENT OF CONSERVATION
22 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0022

ANGUS S. KING, JR.
GOVERNOR

RONALD B. LOVAGLIO
COMMISSIONER

MAINE LAND USE REGULATION COMMISSION
WETLAND SUPPLEMENT

*Complete this supplement **only** if your project will:*

*(1) involve any alteration below the normal high water mark of a stream, lake, or tidal water; or in a mapped P-WL Subdistrict; **or***

(2) alter an acre (43,560 square feet) or more of any land area.

THE FOLLOWING INFORMATION IS ATTACHED FOR YOUR GUIDANCE:

- Instructions for Completing the Wetland Supplement
- Wetland Supplement Form

PLEASE READ ALL INSTRUCTIONS AND THE FORM BEFORE PROCEEDING

LURC 6/98

MAINE LAND USE REGULATION COMMISSION
JOHN S. WILLIAMS, DIRECTOR

PHONE: (207) 287-2631
TOLL FREE: (800) 452-8711
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PART II: REQUIRED SUBMISSIONS — The questions in Part II of the supplement apply only to applications requiring Tier 2 or 3 review. Various submissions must accompany applications depending upon the level of review required. Please read the following instructions carefully. If you have questions about this portion of the Wetland Supplement, please refer to Section 10.17, B, 7, Wetland Alterations, of Chapter 10 (excerpts are attached on page 6 of these instructions). If you still have questions after reading the rules, please contact the LURC office. A pre-application meeting with LURC staff is strongly recommended if your application requires compensation and/or Tier 3 review.

6. Alternatives Analysis. An alternatives analysis is required for all Tier 2 and Tier 3 applications. If your proposed activity requires Tier 2 or Tier 3 review, please check the box and attach the analysis.

An alternatives analysis is a report that analyzes whether a practical alternative to the alteration exists. The report must address the project purpose and need, and state why the project cannot be completed by:

- Utilizing, managing or expanding one or more other sites that would avoid the wetland impact;
- Reducing the size, scope, configuration or density of the project as proposed, thereby avoiding or reducing the wetland impact; or
- Developing alternative project designs, such as cluster development, that avoid or lessen the wetland impact.

7. Wetland Delineation. Wetland delineation is required for alterations of 15,000 sq. ft. or more of P-WL1, P-WL2 or P-WL3 wetlands and alterations of an acre or more of overall land area. If the proposed activity requires on-site wetland delineation, please check the box and attach the delineation report.

The wetland delineation report must be prepared by a qualified professional and must contain the following:

- A plan at the scale of a minimum of 1 inch equals 100 feet, showing two-foot contour intervals, existing wetland boundaries, the area of the wetland to be altered, project location and dimensions, and wetland classification(s). All components of the project impacting the wetland or other protected natural resources must be included;
- A description of existing wetland characteristics including hydrology, water depths, soils, vegetation, and fauna;
- Current photographs of the wetland to be altered showing its characteristics. Photographs may be taken from the air or the ground but should be taken during the growing season; and
- A description of the methods used to delineate the wetland boundaries, and a copy of data sheets completed during the delineation. Please note that wetland delineations must be performed using the 1987 Corps of Engineers Wetland Delineation Manual, or its successor unless otherwise approved by LURC and the Corps.

7. Functional Assessment. Generally, functional assessments are required for proposed activities that will alter 500 or more sq. ft. of a P-WL1 wetland or 20,000 or more sq. ft. of a P-WL2 or P-WL3 wetland. If a functional assessment is required for your proposed activity, please check the box and attach the assessment.

(7) Implementation: Proposed implementation and management procedures for the compensation work, including a schedule for implementing the compensation work;

(8) Monitoring: A description of the plans for monitoring the compensation work, including identifying criteria which will be used to determine if mid-course corrections are required, a description of proposed remediation measures, and a schedule for implementation;

(9) Technical capacity: A demonstration of sufficient scientific expertise to carry out the proposed compensation work;

(10) Financial capacity: A demonstration of sufficient financial resources to complete the proposed compensation work, including subsequent monitoring and corrective actions; and

(11) Legal restrictions: Documentation of a deed covenant and restriction or conservation easement to be conveyed to a qualified holder for protection of the compensation area. This documentation must:
   (a) Provide for maintenance of the area as a wetland and/or buffer in perpetuity,
   (b) Authorize the Department of Conservation as an enforcing agent, and
   (c) Include the requirement that any future alterations in, on or over the compensation area be approved by the Commission.

B. **Preservation of wetlands or adjacent uplands:** Applications which propose preservation of wetlands or adjacent uplands must include a plan for the compensation work which includes:

(1) Location: A location map of the preservation site;

(2) Legal description: A legal description of the property to be preserved;

(3) Site description: A description of the preservation site including existing vegetation, sources of water, functions and values, existing uses, and potential threats to the functions and values of the site;

(4) Legal restriction: Documentation of a deed covenant and restriction or conservation easement which protects the property as a conservation area in perpetuity, and authorizes the Department of Conservation to act as an enforcing agent. Compensation areas may be deeded to local or state conservation groups or agencies, but any land management practices must be approved by the Commission.

10.17, B. 7. WETLAND ALTERATIONS

Section 10.17, B, 7, a, (2): Selected provisions covering DELINEATION

a. Procedural Requirements
   (2) Area of Project Alteration *(page 119 of Chapter 10)*

   (a) If a proposed activity requires a permit and will alter 15,000 or more square feet of wetland area, or 1 acre or more of overall land area, the applicant must delineate on the ground and in a site plan all wetlands within the general project area using methods described in the "Corps of Engineers Wetlands Delineation Manual" (1987).

   (c) In determining the area of wetland alteration or overall land alteration, all components of a proposed activity, including all phases of a multiphased project, are treated together as constituting one single and complete project.

Section 10.17, B, 7, a, (2) and b, (5): COMPENSATION AND FUNCTIONAL ASSESSMENTS

a. Procedural Requirements
   (2) Area of Project Alteration *(page 119 of Chapter 10)*

   (b) If a proposed activity requires a permit and will alter 500 or more square feet of a P-WL1 wetland or 20,000 or more square feet of a P-WL2 or P-WL3 wetland, the Commission may require, as a condition of approval, mitigation, including compensation, as provided in the Commission's General Land Use Standards in Section 10.17, B, 7, b.

b. General Land Use Standards
   (5) Compensation *(pages 120-121 of Chapter 10)*

   Compensation is the off-setting of a lost wetland function with a function of equal or greater value. The goal of compensation is to achieve no net loss of wetland functions and values.

   (a) For projects requiring Tier 2 or Tier 3 review, the Commission may require compensation when it determines that a wetland alteration will cause a wetland function or functions to be lost or degraded as identified by an assessment of wetland functions and values in accordance with application requirements or by the Commission's evaluation of the project.

   (b) The Commission may waive the requirement for a functional assessment, compensation, or both. The Commission may waive the requirement for a functional assessment if it already possesses the information necessary to determine the functions of the area proposed to be altered. The Commission may waive the requirement for compensation if it determines that any impact to wetland functions and values from the activity will be insignificant.

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COMMISSIONER

MAINE LAND USE REGULATION COMMISSION
WETLAND SUPPLEMENT

PART I: WETLAND TYPE/LEVEL OF REVIEW — Responses to the following questions determine the required level of review (Tier 1, Tier 2 or Tier 3) for proposed activities.

Name of applicant: _____ Location of property: _____

1. Type of mapped P-WL Subdistrict or delineated wetland that will be altered (check all that apply):
   - _____ P-WL1* Wetlands of special significance
   - _____ P-WL2* Scrub shrub wetlands
   - _____ P-WL3* Forested wetlands
   - _____ P-WL Unspecified until LURC land use guidance maps are revised

   *The description of the P-WL subdistricts is on page 5 of the instructions for this supplement.

2. Total amount of wetland alteration (mapped P-WL or delineated):
   _____ less than 4,300 sq. ft. _____ 15,000 - 19,999 sq. ft.
   _____ 4,300 - 14,999 sq. ft. _____ 20,000 - 43,559 sq. ft. _____ 43,560 or more sq. ft.

   Breakdown by resource, if applicable: _____ sq. ft. of coastal or freshwater wetland
   _____ sq. ft. of lake bottom
   _____ sq. ft. of river, stream or brook bottom

3. Previous wetland alteration? _____ Yes _____ No If the answer is YES, please indicate the date, purpose and extent of previous alterations. Include permit numbers, if any: _____

4. The boundaries of the P-WL Subdistrict along with the areas of alteration must be clearly shown on your SITE PLAN. Proposed areas of wetland fill or other alteration, as well as proposed clearing, grading, or filling on the site should be shaded, cross-hatched, or otherwise indicated. The site plan must be legible and drawn to a scale that allows clear measurement of distances.

5. Based upon the above information, indicate the level of review:
   - _____ Tier 1 – alteration of 4,300 - 15,000 sq. ft. of a P-WL2 or P-WL3 wetland.
   - _____ Tier 2 – alteration of 15,000 - 43,560 sq. ft. of a P-WL2 or P-WL3 wetland, not containing a critically imperiled or imperiled natural community.**
   - _____ Tier 3 – any size alteration of a P-WL1 wetland, alteration of an acre or more of a P-WL2 or P-WL3 wetland, or alteration of 15,000 sq. ft. or more of a P-WL2 or P-WL3 wetland containing a critically imperiled or imperiled natural community.**
   - _____ None – alteration of less than 4,300 sq. ft. of a P-WL2 or P-WL3 wetland – no wetland review is required. You may stop here and return this supplement with your application.

   **Information on these communities is available through the LURC office.

MAINE LAND USE REGULATION COMMISSION
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CERTIFICATION AND SIGNATURE – All applicants please read and sign the following:

General requirements for wetland alterations:

The proposed alteration:

- must be avoided if feasible after considering natural features of the site, cost, existing technology, logistics and the overall purpose of the project;
- if unavoidable, must be limited to the minimum amount necessary to complete the project; and
- must not violate any state water quality law, including those governing the classification of the State's waters.

✓ I have read the general requirements above and affirm that my project meets all the requirements regarding avoidance, minimization, and water quality and classification standards.

✓ I authorize the staff of State and Federal agencies, having jurisdiction over this activity, to access the project site for the purpose of determining compliance with the rules.

✓ Tiers 2 and 3 only: I have attached 2 copies of the required submissions checked in Part II.

✓ I hereby declare that I have examined this wetland supplement, including the accompanying attachments, and, to the best of my knowledge and belief, it is true, accurate and complete.. I certify that the proposed wetland alteration(s) will be completed in accordance with permit requirements and applicable standards of the Commission.

Signature:_____ Date:_____

Location of property: Township/Plantation:_____ County:_____

NOTE: Both the Maine Department of Environmental Protection and the U.S. Army Corps of Engineers also regulate alterations of wetlands in the unorganized areas of Maine, including wetlands that may not be regulated by LURC. Either of these agencies, or their review agents, may contact you for further information regarding your project.

PLEASE MAKE SURE THAT THIS SUPPLEMENT IS COMPLETE. APPLICATIONS WITH INCOMPLETE WETLAND SUPPLEMENTS MAY BE RETURNED. IN CERTAIN INSTANCES, THE MAINE LAND USE REGULATION COMMISSION MAY REQUIRE ADDITIONAL INFORMATION NOT ASKED FOR IN THIS SUPPLEMENT IN ORDER TO PROCESS YOUR APPLICATION.

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MAINE LAND USE REGULATION COMMISSION

WETLAND COMPENSATION GUIDELINES

Adopted February 26, 1998

I. COMPENSATION

"Compensation is the off-setting of a lost wetland function with a function of equal or greater value. The goal of compensation is to achieve no net loss of wetland functions and values." [Section 10.17, B, 7, b. (5)]

Every case where compensation may be applied is unique due to differences in wetland type and geographic location. For this reason, the method, location and amount of compensation work necessary is variable.

In some instances, a specific impact may require compensation on-site or within very close proximity to the affected wetland. For example, altering a wetland that is providing stormwater retention which reduces the risk of flooding downstream will likely require compensation work to ensure no net increase in flooding potential. In other cases, it may not be necessary to compensate on-site in order to off-set project impacts. Where wetland priorities have been established at a local, regional or state level, these priorities should be considered in devising a compensation plan in the area to allow the applicant to look beyond on-site and in-kind compensation possibilities.

A. When required

Compensation may be required when the Commission *"determines that a wetland alteration will cause a wetland function or functions to be lost or degraded as identified by an assessment of wetland functions and values in accordance with application requirements or by the Commission's evaluation of the project."* [10.17, B, 7, b. (5)]

If a functional assessment is not required under LURC's wetland rules and these compensation guidelines, no compensation will be required unless the Commission identifies wetland functions that will be lost or degraded.

3. Great Ponds

A great pond alteration that does not place any fill below the normal high water mark, except as necessary for shoreline stabilization projects, and has no adverse effect on aquatic habitat as determined by the Department of Inland Fisheries and Wildlife or the Department of Environmental Protection.

4. Walkways/Access Structures

A wetland alteration consisting of a walkway or access structure for public educational purposes or to comply with the Americans with Disabilities Act.

D. Location of compensation projects

The compensation must take place in a location:

1. On or close to a project site as necessary to off-set direct impacts to an aquatic ecosystem;

2. Otherwise, compensation may occur in an off-site location where it will satisfy wetland priority needs as established at the local, regional or state level to achieve an equal or higher net benefit for wetland systems, if approved by the Commission.

E. Types of compensation

Compensation may occur in the form of:

1. Restoration of previously degraded wetlands;

2. Enhancement of existing wetlands;

3. Preservation of existing wetlands or adjacent uplands where the site to be preserved provides significant wetland functions and might otherwise be degraded by unregulated activity; or

4. Creation of wetland from upland.

More than one method of compensation may be allowed on a single project. Preference is generally given to restoration projects that will off-set lost functions within, or in close proximity to, the affected wetland. However, other types of compensation may be allowed by the Commission if the result is an equal or higher overall net benefit for wetland systems.

B. Financial Resources

The applicant shall demonstrate sufficient financial resources to complete the proposed compensation work, including subsequent monitoring and corrective actions.

C. Persistence

For restoration, enhancement and creation projects, on the basis of an updated functional assessment, a minimum of 85% of the compensation area must successfully replace the altered wetland's functions after a period of three years unless otherwise approved by the Commission. If this level is not achieved, or if evidence exists that the compensation site is becoming less effective, the Commission may require additional monitoring and corrective action, or additional wetland restoration, enhancement or creation in order to achieve the compensation ratio as originally approved.

D. Monitoring

The applicant shall set forth a plan for interim reporting and remediation measures during monitoring of the restored or created wetland over a minimum of five years, which shall include contingency plans for replanting, contouring or other corrections if the project fails to meet project goals during that time.

E. Maintenance

A compensation project that will naturally maintain itself without active intervention is preferred. However, the permittee may be required to conduct activities to assure continuation of the wetland, or the accomplishment of compensation goals, after a compensation project has been technically completed. Such activities may include, but are not limited to, water level manipulations and control of non-native plant species.

F. Protection

1. A compensation project involving restoration, enhancement or creation must provide for deed covenant and restriction or a conservation easement conveyed to a qualified holder that requires maintenance of the area as a coastal wetland, freshwater wetland or great pond in perpetuity. The conservation easement must list the Department of Conservation as an enforcing agent. Regardless of the size of the compensation area, any future alterations in, on or over it must be approved by the Commission.

2. A compensation project involving preservation must provide for a conservation easement conveyed to a qualified holder or deed covenant and restriction so that the parcel will remain undeveloped in perpetuity. The easement must list the Department of Conservation as an enforcing agent. Compensation areas may be deeded to local or state conservation groups or agencies, but any land management practices must be approved by the Commission.

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V. SUBMISSION REQUIREMENTS

A. Alternatives Analysis

If required, an alternatives analysis must be conducted, that analyzes whether a less environmentally damaging practicable alternative to the proposed alteration, which meets the project purpose, exists. Determining whether a practicable alternative exists includes:

1. Utilizing, managing or expanding one or more other sites that would avoid the wetland impact;

2. Reducing the size, scope, configuration or density of the project as proposed, thereby avoiding or reducing the wetland impact;

3. Developing alternative project designs, such as cluster development, that avoid or lessen the wetland impact; and

4. Demonstrating the need, whether public or private, for the proposed alteration.

B. Functional Assessments

If required, a functional assessment must be conducted of the wetland to be altered, that analyzes the wetland's value based on the functions it serves and how the wetland will be affected by the proposed alteration. The functional assessment must be conducted by a qualified professional(s) using an acceptable methodology approved by the Commission. If other than an established methodology is proposed, the applicant must submit documentation describing how the methodology was developed, how the wetland functions and values are determined using the methodology, and how much field testing the technique has undergone.

In cases where the size of the wetland alteration or other factors make the use of an established assessment methodology impracticable or inappropriate, the Commission may instead accept the best professional judgment of a qualified professional. The applicant must notify the Commission if he or she intends to use best professional judgment.

MAINE LAND USE REGULATION COMMISSION

ILLUSTRATION OF LEVELS OF REVIEW IN RELATION TO WETLAND PROTECTION SUBDISTRICTS

JUNE 9, 1997

	No Review Required[1]	Tier 1	Tier 2	Tier 3
P-WL1: Wetlands of special significance	*Not applicable*	*Not applicable*	*Not applicable*	Any size alteration
P-WL2: Scrub shrub and other non-forested freshwater wetlands	If the alteration is less than 4,300 sq. ft.	If the alteration is 4,300 up to 15,000 sq. ft.	If the alteration is 15,000 up to 43,560 sq. ft.[2]	If the alteration is 43,560 sq. ft. or more
P-WL3:[3] Forested freshwater wetlands	If the alteration is less than 4,300 sq. ft.	If the alteration is 4,300 up to 15,000 sq. ft.	If the alteration is 15,000 up to 43,560 sq. ft.[2]	If the alteration is 43,560 sq. ft. or more

Note: This summary of the levels of review is provided only as a guide. See the text of the draft rule, 10.16 K, 10.17 A and B, and 10.02, for complete requirements.

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[1]Forest management activities and most agricultural activities are allowed in all Wetland Protection Subdistricts without a permit.

[2]If the wetland alteration is 15,000 sq. ft. or more and involves a wetland containing a critically imperiled or imperiled natural community as defined by the Maine Natural Areas Program, then a Tier 3 review will be required.

[3]Land management roads, as defined, are allowed in P-WL3 Subdistricts without a permit.

APPENDIX 7:
FEDERAL REGULATIONS IMPACTING WATER USE IN AGRICULTURE

Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (q)(1)–(6) of this section.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Act (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

[53 FR 20773, June 6, 1988, as amended at 58 FR 8182, Feb. 11, 1993]

§ 232.3 Activities not requiring permits.

Except as specified in paragraphs (a) and (b) of this section, any discharge of dredged or fill material that may result from any of the activities described in paragraph (c) of this section is not prohibited by or otherwise subject to regulation under this part.

(a) If any discharge of dredged or fill material resulting from the activities listed in paragraph (c) of this section contains any toxic pollutant listed under section 307 of the Act, such discharge shall be subject to any applicable toxic effluent standard or prohibition, and shall require a section 404 permit.

(b) Any discharge of dredged or fill material into waters of the United States incidental to any of the activities identified in paragraph (c) of this section must have a permit if it is part of an activity whose purpose is to convert an area of the waters of the United States into a use to which it was not previously subject, where the flow or circulation of waters of the United States may be impaired or the reach of such waters reduced. Where the proposed discharge will result in significant discernable alterations to flow or circulation, the presumption is that flow or circulation may be impaired by such alteration.

NOTE: For example, a permit will be required for the conversion of a cypress swamp to some other use or the conversion of a wetland from silvicultural to agricultural use when there is a discharge of dredged or fill material into waters of the United States in conjunction with construction of dikes, drainage ditches or other works or structures used to effect such conversion. A conversion of section 404 wetland to a non-wetland is a change in use of an area of waters of the U.S. A discharge which elevates the bottom of waters of the United States without converting it to dry land does not thereby reduce the reach of, but may alter the flow or circulation of, waters of the United States.

(c) The following activities are exempt from section 404 permit requirements, except as specified in paragraphs (a) and (b) of this section:

(1)(i) Normal farming, silviculture and ranching activities such as plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices, as defined in paragraph (d) of this section.

(ii)(A) To fall under this exemption, the activities specified in paragraph (c)(1) of this section must be part of an established (i.e., ongong) farming, silviculture, or ranching operation, and must be in accordance with definitions in paragraph (d) of this section. Activities on areas lying fallow as part of a conventional rotational cycle are part of an established operation.

(B) Activities which bring an area into farming, silviculture or ranching use are not part of an established operation. An operation ceases to be established when the area in which it was conducted has been converted to another use or has lain idle so long that modifications to the hydrological regime are necessary to resume operation. If an activity takes place outside the waters of the United States, or if it does not involve a discharge, it does not need a section 404 permit whether or not it was part of an established farming, silviculture or ranching operation.

(2) Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Mainte-

EXEMPTION

failed does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs in order to qualify for this exemption.

(3) Construction or maintenance of farm or stock ponds or irrigation ditches or the maintenance (but not construction) of drainage ditches. Discharge associated with siphons, pumps, headgates, wingwalls, wiers, diversion structures, and such other facilities as are appurtenant and functionally related to irrigation ditches are included in this exemption.

(4) Construction of temporary sedimentation basins on a construction site which does not include placement of fill material into waters of the United States. The term "construction site" refers to any site involving the erection of buildings, roads, and other discrete structures and the installation of support facilities necessary for construction and utilization of such structures. The term also includes any other land areas which involve land-disturbing excavation activities, including quarrying or other mining activities, where an increase in the runoff of sediment is controlled through the use of temporary sedimentation basins.

(5) Any activity with respect to which a State has an approved program under section 208(b)(4) of the Act which meets the requirements of section 208(b)(4)(B) and (C).

(6) Construction or maintenance of farm roads, forest roads, or temporary roads for moving mining equipment, where such roads are constructed and maintained in accordance with best management practices (BMPs) to assure that flow and circulation patterns and chemical and biological characteristics of waters of the United States are not impaired, that the reach of the waters of the United States is not reduced, and that any adverse effect on the aquatic environment will be otherwise minimized. The BMPs which must be applied to satisfy this provision include the following baseline provisions:

(i) Permanent roads (for farming or forestry activities), temporary access roads (for mining, forestry, or farm purposes) and skid trails (for logging) in waters of the United States shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific farming, silvicultural or mining operations, and local topographic and climatic conditions;

(ii) All roads, temporary or permanent, shall be located sufficiently far from streams or other water bodies (except for portions of such roads which must cross water bodies) to minimize discharges of dredged or fill material into waters of the United States;

(iii) The road fill shall be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows;

(iv) The fill shall be properly stabilized and maintained to prevent erosion during and following construction;

(v) Discharges of dredged or fill material into waters of the United States to construct a road fill shall be made in a manner that minimizes the encroachment of trucks, tractors, bulldozers, or other heavy equipment within the waters of the United States (including adjacent wetlands) that lie outside the lateral boundaries of the fill itself;

(vi) In designing, constructing, and maintaining roads, vegetative disturbance in the waters of the United States shall be kept to a minimum;

(vii) The design, construction and maintenance of the road crossing shall not disrupt the migration or other movement of those species of aquatic life inhabiting the water body;

(viii) Borrow material shall be taken from upland sources whenever feasible;

(ix) The discharge shall not take, or jeopardize the continued existence of, a threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species;

(x) Discharges into breeding and nesting areas for migratory waterfowl, spawning areas, and wetlands shall be avoided if practical alternatives exist;

(xi) The discharge shall not be located in the proximity of a public water supply intake;

(xii) The discharge shall not occur in areas of concentrated shellfish production;

(xiii) The discharge shall not occur in a component of the National Wild and Scenic River System;

(xiv) The discharge of material shall consist of suitable material free from toxic pollutants in toxic amounts; and

(xv) All temporary fills shall be removed in their entirety and the area restored to its original elevation.

(d) For purpose of paragraph (c)(1) of this section, cultivating, harvesting, minor drainage, plowing, and seeding are defined as follows:

(1) Cultivating means physical methods of soil treatment employed within established farming, ranching and silviculture lands on farm, ranch, or forest crops to aid and improve their growth, quality, or yield.

(2) Harvesting means physical measures employed directly upon farm, forest, or ranch crops within established agricultural and silvicultural lands to bring about their removal from farm, forest, or ranch land, but does not include the construction of farm, forest, or ranch roads.

(3)(i) Minor drainage means:

(A) The discharge of dredged or fill material incidental to connecting upland drainage facilities to waters of the United States, adequate to effect the removal of excess soil moisture from upland croplands. Construction and maintenance of upland (dryland) facilities, such as ditching and tiling, incidental to the planting, cultivating, protecting, or harvesting of crops, involve no discharge of dredged or fill material into waters of the United States, and as such never require a section 404 permit;

(B) The discharge of dredged or fill material for the purpose of installing ditching or other water control facilities incidental to planting, cultivating, protecting, or harvesting of rice, cranberries or other wetland crop species, where these activities and the discharge occur in waters of the United States which are in established use for such agricultural and silvicultural wetland crop production;

(C) The discharge of dredged or fill material for the purpose of manipulating the water levels of, or regulating the flow or distribution of water within, existing impoundments which have been constructed in accordance with applicable requirements of the Act, and which are in established use for the production or rice, cranberries, or other wetland crop species.

NOTE: The provisions of paragraphs (d)(3)(i)(B) and (C) of this section apply to areas that are in established use exclusively for wetland crop production as well as areas in established use for conventional wetland/non-wetland crop rotation (e.g., the rotations of rice and soybeans) where such rotation results in the cyclical or intermittent temporary dewatering of such areas.

(D) The discharge of dredged or fill material incidental to the emergency removal of sandbars, gravel bars, or other similar blockages which are formed during flood flows or other events, where such blockages close or constrict previously existing drainageways and, if not promptly removed, would result in damage to or loss of existing crops or would impair or prevent the plowing, seeding, harvesting or cultivating of crops on land in established use for crop production. Such removal does not include enlarging or extending the dimensions of, or changing the bottom elevations of, the affected drainageway as it existed prior to the formation of the blockage. Removal must be accomplished within one year after such blockages are discovered in order to be eligible for exemption.

(ii) Minor drainage in waters of the United States is limited to drainage within areas that are part of an established farming or silviculture operation. It does not include drainage associated with the immediate or gradual conversion of a wetland to a non-wetland (e.g., wetland species to upland species not typically adequate to life in saturated soil conditions), or conversion from one wetland use to another (for example, silviculture to farming). In addition, minor drainage does not include the construction of any canal, ditch, dike or other waterway or structure which drains or otherwise significantly modifies a stream, lake, swamp, bog or any other wetland or aquatic area constituting waters of the United States. Any discharge of dredged or fill material into the waters of the United States incidental to the construction of any such structure or waterway requires a permit.

(4) Plowing means all forms of primary tillage, including moldboard, chisel, or wide-blade plowing, discing, harrowing, and similar physical means used on farm, forest or ranch land for the breaking up, cutting, turning over, or stirring of soil to prepare it for the planting of crops. Plowing does not include the redistribution of soil, rock, sand, or other surficial materials in a manner which changes any area of the waters of the United States to dryland. For example, the redistribution of surface materials by blading, grading, or other means to fill in wetland areas is not plowing. Rock crushing activities which result in the loss of natural drainage characteristics, the reduction of water storage and recharge capabilities, or the overburden of natural water filtration capacities do not constitute plowing. Plowing, as described above, will never involve a discharge of dredged or fill material.

(5) Seeding means the sowing of seed and placement of seedlings to produce farm, ranch, or forest crops and includes the placement of soil beds for seeds or seedlings on established farm and forest lands.

(e) Federal projects which qualify under the criteria contained in section 404(r) of the Act are exempt from section 404 permit requirements, but may be subject to other State or Federal requirements.

PART 233–404 STATE PROGRAM REGULATIONS

Subpart A—General

Subpart B—Program Approval

Subpart C—Permit Requirements

Subpart D—Program Operation

Subpart E—Compliance Evaluation and Enforcement

Subpart F—Federal Oversight

Subpart G—Treatment of Indian Tribes as States

Subpart H—Approved State Programs

AUTHORITY: Clean Water Act, 33 U.S.C. 1251 *et seq.*

SOURCE: 53 FR 20776, June 1, 1988, unless otherwise noted.

Subpart A—General

§ 233.1 Purpose and scope.

(a) This part specifies the procedures EPA will follow, and the criteria EPA will apply, in approving, reviewing, and

USDA United States Department of Agriculture
Natural Resources Conservation Service
967 Illinois Ave., Suite 3
Bangor, ME 04401-2700
(207) 990-9100

June 5, 2000

Robert W. Spear, Commissioner
Maine Dept. of Agriculture, Food and Rural Resources
28 State House Station
Augusta, ME 04333-0028

Dear Commissioner Spear,

I am submitting for your consideration some comments on the Draft Blueprint for Agricultural Water Resources Management. My staff and I have had a chance to read the plan and offer the following comments:

Issue 1, Recommendation 1.1: Item 4 (pg. 10) does not specify from what source the technical and financial assistance would come from. We would support this being from both the state and federal levels.

Issue 2, Recommendation 2.1: We would hope that the Department would indicate specific financial support to the Districts for this task.

Issue 3, Recommendation 2.2: It may be unrealistic to entirely eliminate the need for alternatives analysis, mitigation and/or compensation requirements in the permitting process where wetland impacts are involved. We have begun work (with your Department's participation) with State and Federal partners to address some of the uncertainty regarding the permitting process. This Irrigation Pond Permitting Task Force is preparing to make recommendations on ways to streamline and clarify the permit process for producers. We suggest that this item in your plan read something to the effect that your Department would continue to work with the Irrigation Pond Permitting Task Force in order to streamline the process and assist producers through the process.

Issue 4: In the last paragraph on page 14 the plan describes a prohibition on the use of funds for wetland alterations and the mitigation requirements that accompany any financial or technical assistance from federal sources. I would like to see that statement modified to read that the use of federal funds for projects (such as irrigation ponds) that impact wetlands is **not** prohibited but is conditional on the wetland impacts being mitigated. (Note: Technical and financial assistance through the Environmental Quality Incentives Program (EQIP) may be used for irrigation pond development; however, the program is woefully under funded at this time in Maine.)

I would also like to add that our agency is now working at the national level to amend our Farm Bill policy to include a U.S. Army Corps of Engineers (USACE) Permit Exemption for mitigation requirements where a USACE permit is required. In cases where USDA might be providing technical and/or financial assistance to a producer on a project that requires a USACE permit, the only mitigation requirements that the producer would have to meet would be the ones that were a condition of the permit from USACE.

Issue 4, Recommendation 4.1: We suggest that the first sentence of this section read "The USDA Farm Services Agency and Natural Resources Conservation Service have various loan, **cost share** and technical assistance programs. The Committee suggests.....federal programs that support USDA-NRCS technical **and financial** assistance and USDA-FSA loan and grant funds....."

Thanks you for allowing us to comment on the Department's Blueprint for Agricultural Water Resources Management. We applaud your efforts in this area and look forward to working together to assist the producers of Maine develop irrigation water sources in a way that meets their business demands while protecting and enhancing the resource base.

Sincerely,

Russell A. Collett
State Conservationist

cc: Norm Kalloch, Assistant State Conservationist, NRCS, Bangor, ME
Chris Jones, Assistant State Conservationist, NRCS, Bangor, ME

USDA POLICY ON WETLAND CONSERVATION

On May 24, 1977, Executive Order 11990, Protection of Wetlands, was issued by President Jimmy Carter. It ordered all federal agencies to provide leadership and to take action to minimize the destruction, loss or degradation of wetlands.

The Food Security Act of 1985 (FSA), as amended by the Food, Agriculture, Conservation Trade Act of 1990 (FACTA) established wetland conservation provisions frequently referred to as Swampbuster. The Federal Agriculture Improvement and Reform Act of 1996 (FAIRA) continues Swampbuster provisions but presents additional opportunities for landowners to stay in compliance with Swampbuster provisions.

Wetland converted prior to 1985 and used for commodity production was permitted as long as the land was not abandoned. Wetland converted between December 23, 1985 and November 28, 1990 cannot be used for commodity crop production unless an exception applies to the situation. After November 28, 1990, converting wetlands so as to make production of an agricultural commodity possible is not allowed unless an exception applies to the situation.

USDA POLICY ON LOANS AND WETLAND CONSERVATION

Section 363 of the Consolidated Farm and Rural Development Act became effective on November 28, 1990, upon its enactment of Section 1824 of the Food, Agriculture, Conservation and Trade Act of 1990 (FACTA). This section says that the Secretary shall not approve any loan under this title to drain, dredge, fill, level, or otherwise manipulate a wetland, or to engage in any activity that results in impairing or reducing the flow, circulation, or reach of water, except in the case of activity related to the maintenance of previously converted wetlands, or in the case of such activity that is already commenced before November 28, 1990.

SUBJECT: Making Loans to Applicants Whose Operation May or May Not Affect a Wetland

TO: David B. Marshall
Farmer Programs Chief
Bangor, Maine

This memorandum is in response to your questions concerning making loans to applicants whose upland cranberry operations may or may not affect a wetland.

We received an Office of General Counsel opinion that cited Section 363 of the Consolidated Farm and Rural Development Act that became effective on November 28, 1990, upon its enactment as Section 1824 of the Food, Agriculture, Conservation, and Trade Act of 1990. It provides as follows:

> The Secretary shall not approve any loan under this title to drain, dredge, fill, level, or otherwise manipulate a wetland (as defined in Section 1201(a)(16) of the Food Security Act of 1985 (16 U.S.C. 3801(a)(16), or to engage in any activity that results in impairing or reducing the flow, circulation, or reach of water, except in the case of activity related to the maintenance of previously converted wetlands, or in the case of such activity that is already commenced before November 28, 1990.

In subsequent discussions with the Soil Conservation Service (SCS) on wetland manipulation, we noted that certain activities such as running a pipe through the wetland may be permissible. SCS, in addition to making wetland determinations, will serve as technical experts in advising FmHA on what constitutes wetland manipulation.

If you have any questions or we can be of further assistance, please contact Kathleen Miller, Farmer Programs Loan Making Division, at (202) 720-1643.

LOU ANNE KLING
Assistant Administrator
Farmer Programs

101ST CONGRESS
2d Session

HOUSE OF REPRESENTATIVES

REPORT
101-916

FOOD, AGRICULTURE, CONSERVATION, AND TRADE ACT OF 1990

CONFERENCE REPORT

TO ACCOMPANY

S. 2830

OCTOBER 22, 1990.—Ordered to be printed

duction is not intended to circumvent the conservation requirements otherwise applicable to lands under this subtitle.".

Subtitle B—Wetland Conservation

SEC. 1421. WETLAND PROGRAM IMPROVEMENTS.

(a) DEFINITION.—Section 1201(a)(16) of the Food Security Act of 1985 (16 U.S.C. 3801(a)(16)) is amended by amending the first sentence to read as follows:

"(16) The term 'wetland', except when such term is part of the term 'converted wetland', means land that—

"(A) has a predominance of hydric soils;

"(B) is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and

"(C) under normal circumstances does support a prevalence of such vegetation.".

(b) WETLAND.—Section 1221 of the Food Security Act of 1985 (16 U.S.C. 3821) is amended—

(1) by striking "Except as provided" and inserting "(a) Except as provided";

(2) in paragraph (1)(D), by inserting before the semicolon ", under section 132 of the Disaster Assistance Act of 1989 (16 U.S.C. 1421 note), or under any similar provision enacted subsequent to August 14, 1989";

(3) in paragraph (1)(E), by striking the final "or";

(4) in paragraph (2), by striking the period at the end and inserting a "; or";

(5) by adding at the end the following:

"(3) during such crop year—

"(A) a payment made under section 8, section 12, or section 16(b) of the Soil Conservation and Domestic Allotment Act (16 U.S.C. 590h, 590l or 590p(b));

"(B) a payment made under section 401 or section 402 of the Agricultural Credit Act of 1978 (16 U.S.C. 2201 or 2202);

"(C) a payment under any contract entered into pursuant to section 1231;

"(D) a payment under chapter 2;

"(E) a payment under chapter 3; or

"(F) a payment, loan or other assistance under section 3 or section 8 of the Watershed Protection and Flood Prevention Act (16 U.S.C. 1003 or 1006a).''; and

(6) by adding after subsection (a) (as designated by paragraph (1)), a new subsection (b) as follows:

"(b) Except as provided in section 1222 and notwithstanding any other provision of law, any person who in any crop year subsequent to the date of enactment of the Food, Agriculture, Conservation, and Trade Act of 1990 converts a wetland by draining, dredging, filling, leveling, or any other means for the purpose, or to have the effect, of making the production of an agricultural commodity possible on such converted wetland shall be ineligible for those payments, loans,

or programs specified in subsections (a) (1) through (3) for that crop year and all subsequent crop years.".

SEC. 1422. DELINEATION OF WETLAND; EXEMPTIONS.

Section 1222 of the Food Security Act of 1985 (16 U.S.C. 3822) is amended to read as follows:

"SEC. 1222. DELINEATION OF WETLANDS; EXEMPTIONS.

"(a) DELINEATION OF WETLANDS.—

"(1) WETLAND DELINEATION MAPS.—The Secretary shall delineate wetlands on wetland delineation maps. The Secretary shall make a reasonable effort to make an on-site wetland determination whenever requested by an owner or operator, prior to such delineation.

"(2) CERTIFICATION.—Upon providing notice to affected owners or operators, the Secretary shall certify each such map as sufficient for the purpose of making determinations of ineligibility for program benefits under section 1221 and shall, in accordance with section 1243, provide an opportunity to appeal such delineations to the Secretary prior to making such certification final. In the case of an appeal, the Secretary shall review and certify the accuracy of the mapping of all lands subject to the appeal mapped prior to the date of enactment of the Food, Agriculture, Conservation, and Trade Act of 1990 for the purpose of wetland delineations to ensure that wetland on such lands has been accurately delineated. Prior to rendering a decision on any such appeal, the Secretary shall conduct an on-site inspection of the subject land. The Secretary shall not be required to provide an opportunity for an appeal of delineations completed prior to the enactment of this subsection that are not changed, and for which an appeal had already occurred and, in connection with such previous appeal, an on-site determination had been conducted.

"(3) PUBLIC LIST.—The Secretary shall maintain a public listing of all such certifications that have been completed.

"(4) PERIODIC REVIEW AND UPDATE.—The Secretary shall provide by regulation a process for the periodic review and update of such wetland delineations as the Secretary deems appropriate. No person shall be adversely affected because of having taken an action based on a previous determination by the Secretary.

"(b) EXEMPTIONS.—No person shall become ineligible under section 1221 for program loans, payments, and benefits—

"(1) as the result of the production of an agricultural commodity on—

"(A) converted wetland if the conversion of such wetland was commenced before December 23, 1985;

"(B) an artificial lake, pond, or wetland created by excavating or diking nonwetland to collect and retain water for purposes such as water for livestock, fish production, irrigation (including subsurface irrigation), a settling basin, cooling, rice production, or flood control;

"(C) a wet area created by a water delivery system, irrigation, irrigation system, or application of water for irrigation; or

"(D) wetland on which the owner or operator of a farm or ranch uses normal cropping or ranching practices to produce an agricultural commodity in a manner that is consistent for the area where such production is possible as a result of a natural condition, such as drought, and is without action by the producer that destroys a natural wetland characteristic; or

"(2) for the conversion of—

"(A) an artificial lake, pond, or wetland created by excavating or diking nonwetland to collect and retain water for purposes such as water for livestock, fish production, irrigation (including subsurface irrigation), a settling basin, cooling, rice production, or flood control; or

"(B) a wet area created by a water delivery system, irrigation, irrigation system, or the application of water for irrigation.

"(c) ON-SITE INSPECTION REQUIREMENT.—No program loans, payments, or benefits shall be withheld from a person under this subtitle unless the Secretary has conducted an on-site visit of the subject land.

"(d) PRIOR LOANS.—Section 1221 shall not apply to a loan described in section 1221 made before December 23, 1985.

"(e) NONWETLANDS.—The Secretary shall exempt from the ineligibility provisions of section 1221 any action by a person upon lands in any case in which the Secretary determines that any one of the following does not apply with respect to such lands:

"(1) Such lands have a predominance of hydric soils.

"(2) Such lands are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

"(3) Such lands, under normal circumstances, support a prevalence of such vegetation.

"(f) MINIMAL EFFECT; MITIGATION.—The Secretary shall exempt a person from the ineligibility provisions of section 1221 for any action associated with the production of an agricultural commodity on a converted wetland, or the conversion of a wetland, if, as determined by the Secretary—

"(1) such action, individually and in connection with all other similar actions authorized by the Secretary in the area, will have a minimal effect on the functional hydrological and biological value of the wetland, including the value to waterfowl and wildlife;

"(2) such wetland has been frequently cropped prior to the date of such action and the wetland values, acreage, and functions are mitigated by the producer through the restoration of a converted wetland, the conversion of which occurred or was commenced prior to December 23, 1985, where such restoration is—

"(A) in accordance with a restoration plan;

"(B) in advance of, or concurrent with, such action;

"(C) not at the expense of the Federal Government;

"(D) on not greater than a one-for-one acreage basis unless more acreage is needed to provide equivalent functions and values that will be lost as a result of such wetland conversion to be mitigated;

"(E) on lands in the same general area of the local watershed as the converted wetland; and

"(F) with respect to such restored wetland, made subject to an easement to be recorded on public land records, and which shall remain in force for as long as the converted wetland for which the restoration is to mitigate remains in agricultural use or is not returned to its original wetland classification with equivalent functions and values, and which easement prohibits making alterations to such restored wetland that lower the restored wetland's functions and values; or

"(3) such wetland was converted subsequent to December 23, 1985, but prior to the date of enactment of this section, and the wetland values, acreage, and functions are mitigated by the producer through the restoration of a converted wetland, the conversion of which occurred or was commenced prior to December 23, 1985, if such restoration meets the requirements of subparagraphs (A), (B), (C), (D), (E), and (F) of paragraph (2).

"(g) MITIGATION APPEALS.—A producer shall be afforded the right to appeal, under section 1243, the imposition of a mitigation agreement requiring greater than one-to-one acreage mitigation to which the producer is subject.

"(h) GOOD FAITH EXEMPTION; GRADUATED SANCTIONS.—

"(1) GOOD FAITH EXEMPTION.—A person's ineligibility under section 1221 for program loans, payments, and benefits as the result of the conversion of a wetland subsequent to the date of enactment of this subsection, or the production of an agricultural commodity on a converted wetland subsequent to December 23, 1985, may be reduced under paragraph (2) if—

"(A) such person is actively restoring the wetland under an agreement entered into with the Secretary to fully restore the characteristics of the converted wetland to its prior wetland state, or such person has previously restored the characteristics of the converted wetland to its prior wetland state as determined by the Secretary; and

"(B) the Secretary determines that—

"(i) the person has not otherwise violated the provisions of section 1221 in the previous 10-year period on a farm; and

"(ii) such person converted a wetland, or produced an agricultural commodity on a converted wetland, in good faith and without the intent to violate the provisions of section 1221.

"(2) GRADUATED SANCTIONS.—If the Secretary determines that a person who has violated the provisions of section 1221 meets the requirements of paragraph (1), the Secretary shall, in lieu of applying the ineligibility provisions in section 1221, reduce by not less than $750 nor more than $10,000, depending on the seriousness of the violation, program benefits described in section 1221 that such person would otherwise be eligible to receive in a crop year.

"(3) RELIEF.—The relief allowed by this subsection shall include the restoration of benefits withheld for violations that occurred prior to the date of enactment of this section.

"(i) RESTORATION.—Any person who is determined to be ineligible for program benefits under section 1221 for any crop year shall not be ineligible for such program benefits under such section for any subsequent crop year if, prior to the beginning of such subsequent crop year, the person has fully restored the characteristics of the converted wetland to its prior wetland state.

"(j) DETERMINATIONS; RESTORATION AND MITIGATION PLANS; REPORTING; MONITORING ACTIVITIES.—

"(1) DETERMINATIONS; PLANS.—Technical determinations and the development of restoration and mitigation plans under this section shall be made through the agreement of the local representative of the Soil Conservation Service and a representative of the Fish and Wildlife Service. If agreement cannot be reached at the local level under the preceding sentence, such determinations shall be referred to the State Conservationist, who in making a determination under this paragraph, shall consult with the Fish and Wildlife Service.

"(2) REPORT OF DETERMINATIONS.—The State Conservationist and a representative of the Fish and Wildlife Service shall report to their respective national offices concerning all determinations made under paragraph (1) at the State level as a result of an agreement not being reached at the local level.

"(3) MONITORING ACTIVITIES.—The Secretary shall conduct such monitoring activities as are necessary to ensure the success and effectiveness of the wetland restorations undertaken pursuant to this section.".

SEC. 1423. CONSULTATION.

Section 1223 of the Food Security Act of 1985 (16 U.S.C. 3823) is amended—

(1) in paragraph (2), by striking "and";

(2) in paragraph (3), by striking the period and inserting "; and"; and

(3) by adding at the end the following:

"(4) mitigation; and

"(5) the restoration of wetland values and functions on converted wetland as required under this subtitle.".

SEC. 1424. FAIRNESS OF COMPLIANCE.

Subtitle C of title XII of the Food Security Act of 1985 (16 U.S.C. 3821 et seq.) is amended by adding at the end the following new section:

"SEC. 1224. FAIRNESS OF COMPLIANCE.

"If the actions of an unrelated person or public entity, outside the control of, and without the prior approval of, the landowner or tenant result in a change in the characteristics of cropland that would cause the land to be determined to be a wetland, the affected land shall not be considered to be wetland for purposes of this subtitle.".

Subtitle C—Agricultural Resources Conservation Program

SEC. 1431. AGRICULTURAL RESOURCES CONSERVATION PROGRAM.

Subtitle D of title XII of the Food Security Act of 1985 (16 U.S.C. 1231 et seq.) is amended—

(1) in the subtitle heading, by striking "Conservation Reserve" and inserting "Agricultural Resources Conservation Program"; and

(2) by inserting before section 1231 the following:

"CHAPTER 1—ENVIRONMENTAL CONSERVATION ACREAGE RESERVE PROGRAM

"Subchapter A—General Provisions

"SEC. 1230. ENVIRONMENTAL CONSERVATION ACREAGE RESERVE PROGRAM.

"(a) ESTABLISHMENT.—During the 1991 through 1995 calendar years, the Secretary shall, in accordance with this chapter, establish an Environmental Conservation Acreage Reserve Program and implement such program through contracts and the acquisition of easements to assist owners and operators of highly erodible lands, other fragile lands (including land with associated ground or surface water that may be vulnerable to contamination), and wetlands in conserving and improving the soil and water resources of the farms or ranches of such owners and operators.

"(b) NUMBER OF ACRES.—In carrying out the Environmental Conservation Acreage Reserve Program, the Secretary shall enter into contracts with owners and operators and acquire interests in lands through easements from owners as provided for in subchapters B and C to place in the Environmental Conservation Acreage Reserve Program during the 1986 through 1995 calendar years a total of not less than 40,000,000 nor more than 45,000,000 acres.

"(c) IMPLEMENTATION.—The Secretary shall carry out the Environmental Conservation Acreage Reserve Program established under subsection (a) through the conservation reserve program and the wetland reserve program established in subchapters B and C, respectively. Acreage enrolled into the conservation reserve under subchapter B prior to the date of enactment of this chapter shall be considered to be land placed in the Environmental Conservation Acreage Reserve Program for the purposes of this chapter.".

SEC. 1432. CONSERVATION RESERVE PROGRAM.

Title XII of the Food Security Act of 1985 is amended—

(1) by inserting after section 1230 (as added by section 1431 of this Act) the following:

"Subchapter B—Conservation Reserve"; and

(2) by amending section 1231 (16 U.S.C. 3831) to read as follows:

SEC. 1822. SENSE OF CONGRESS REGARDING ASSISTANCE FOR QUALIFIED BEGINNING FARMERS OR RANCHERS.

It is the sense of Congress that, in carrying out the Consolidated Farm and Rural Development Act (7 U.S.C. 1921 et seq.), the Secretary of Agriculture should—

(1) establish innovative programs of finance and assistance for land transfer between generations and for establishment of new farm and ranch units;

(2) expand the use of the credit sale and land contract method for the sale of suitable property acquired under such Act; and

(3) maintain statistics on the number of loans made, insured, or guaranteed, and inventory farmland sold or leased, to qualified beginning farmers or ranchers under such Act.

SEC. 1823. SENSE OF CONGRESS REGARDING FmHA LOAN APPLICATION REVIEW AND LOAN SERVICING.

(a) FINDINGS.—Congress finds that reports issued by the Inspector General of the Department of Agriculture and the Comptroller General of the United States found problems with the system of loan application review, and monitoring of loan servicing of guaranteed loans, used under the Consolidated Farm and Rural Development Act (7 U.S.C. 1921 et seq.).

(b) SENSE OF CONGRESS.—It is the sense of Congress that the Secretary of Agriculture should quickly take all actions necessary to correct the problems identified by the reports and report to Congress on the actions taken.

SEC. 1824. PROHIBITION ON USE OF LOANS FOR CERTAIN PURPOSES.

Subtitle D of the Consolidated Farm and Rural Development Act is amended by adding after the sections added by sections 1818(a), 1819, 1820, and 1821 of this Act the following new section:

"SEC. 363. PROHIBITION ON USE OF LOANS FOR CERTAIN PURPOSES.

"The Secretary shall not approve any loan under this title to drain, dredge, fill, level, or otherwise manipulate a wetland (as defined in section 1201(a)(16) of the Food Security Act of 1985 (16 U.S.C. 3801(a)(16)), or to engage in any activity that results in impairing or reducing the flow, circulation, or reach of water, except in the case of activity related to the maintenance of previously converted wetlands, or in the case of such activity that is already commenced prior to the date of enactment of this section.".

Subtitle B—Farm Credit System

SEC. 1831. REFERENCES TO THE FARM CREDIT ACT OF 1971.

Wherever in this subtitle an amendment or repeal is expressed in terms of an amendment to, or repeal of, a section or other provision, the reference shall be considered to be made to a section or other provision of the Farm Credit Act of 1971 (12 U.S.C. 2001 et seq.), except to the extent otherwise specifically provided.

SEC. 1832. FINANCING FOR BASIC PROCESSING AND MARKETING OPERATIONS OWNED BY BONA FIDE PRODUCERS.

(a) FARM CREDIT BANKS.—Section 1.11(a) (12 U.S.C. 2019(a)) is amended—

(1) by striking "(a) Agricultural or Aquatic Purposes.—Loans made by a Farm Credit Bank" and inserting the following:
"(a) Agricultural or Aquatic Purposes.—
"(1) In general.—Loans made by a Farm Credit Bank";

(2) by striking "at least 20 percent," and all that follows through "Farm Credit Administration," and inserting "some portion"; and

(3) by adding after and below the end the following new paragraph:

"(2) Limitation on loans for basic processing and marketing operations.—The aggregate of the financing provided by any Farm Credit Bank for basic processing and marketing directly related to the operations of farmers, ranchers, and producers or harvesters of aquatic products, if the operations of the applicant supply less than 20 percent of the total processing or marketing for which financing is extended, shall not exceed 15 percent of the total of all outstanding loans of such bank.".

(b) PRODUCTION CREDIT ASSOCIATIONS.—Section 2.4(a)(1) (12 U.S.C. 2075(a)(1)) is amended by striking "at least 20 percent," and all that follows through the end of the paragraph and inserting "some portion of the total processing or marketing for which financing is extended, except that the aggregate of the financing provided by any association for basic processing and marketing directly related to the operations of farmers, ranchers, and producers or harvesters of aquatic products, if the operations of the applicant supply less than 20 percent of the total processing or marketing for which financing is extended, shall not exceed 15 percent of the total of all outstanding loans of all associations in the district at the end of its preceding fiscal year;".

SEC. 1833. RESTORATION OF FIRST LIEN ON STOCK.

Subtitle A of title II is amended—

(1) by redesignating section 2.6 (12 U.S.C. 2077) as section 2.7; and

(2) by inserting after section 2.5 (12 U.S.C. 2076) the following new section:

"SEC. 2.6. LIENS ON STOCK.

"Except with regard to stock or participation certificates held by other Farm Credit System institutions, each production credit association shall have a first lien on stock and participation certificates the association issues, on allocated surplus, and on investments in equity reserve, for any indebtedness of the holder of the capital investments and, in the case of equity reserves, for charges for association losses in excess of reserves and surpluses.".

SEC. 1834. INSURANCE SERVICES.

Section 4.29 (12 U.S.C. 2218) is amended—

(1) in subsection (a)(2)—

(A) in the first sentence, by inserting before the period at the end the following: ", if more than two insurers for each type of insurance have proposed programs to a bank that will, in all likelihood, have long-term viability and meet the requirements of subsection (b)(2)(D)"; and

THIS IS NOT "FARMBILL" OR SWAMPBUSTER!

650.26 Conservation of Wetlands

(a) Purpose.

This rule prescribes procedures by which NRCS will provide technical assistance relative to wetlands.

(b) Applicability.

This policy applies to all NRCS activities and programs involving planning and implementation that may have positive or negative impacts on wetlands, including:

1) Technical and financial assistance that will result in construction (which includes draining, dredging, channelizing, filling, diking, impounding and related activities, and any structures or facilities) in wetlands, as defined in Section 1221, Title XII of the Food Security Act of 1985, 16 U.S.C. 3801 et seq.

2) The wetland conservation provisions of Food Security Act of 1985, 16 U.S.C. 3801 et seq.

3) Financial and technical programs as administered by NRCS such as, Watershed Programs, River Basin Programs, RC&D Programs, and Great Plains Conservation Programs.

This policy is effective concurrent with the issuance of the rule.

(c) General Policy.

NRCS advocates coordinated conservation assistance as an integral part of NRCS policy and program objectives. The principles of coordinated conservation assistance apply to the technical and financial assistance provided by NRCS to clients, particularly when that assistance will affect wetlands. It is the policy of NRCS to protect and promote wetland communities in all NRCS planning and application assistance. NRCS recognizes the beneficial and varied functional attributes of the different wetland types, and as such, strives to reconcile the need for wetland protection with that of promoting viable agricultural enterprises. NRCS supports that the restoration, enhancement, creation

and preservation of wetlands are important and realistic components of comprehensive conservation plans, not only on a farm-by-farm basis, but also on a watershed or landscape basis.

As a means of determining the appropriate balance between the varied resource uses, NRCS uses an environmental evaluation process. This evaluation, and a functional assessment as needed, is initiated in the early stages of planning and is based upon achieving an interim goal of no net loss of wetlands and moves towards a net gain in wetland functions and values.

Among the other related factors considered in the environmental evaluation are:

(1) Public health, safety, and welfare, including water supply, quality, recharge, and discharge; pollution; flood and storm hazards; and sedimentation and erosion;

(2) Maintenance of natural systems, including conservation and long-term productivity of native flora and fauna; species and habitat diversity and stability; hydrological utility and fish, wildlife, timber, food and fiber resources; and

(3) Other uses in the public interest, including recreation, scientific and cultural uses.

(d) Specific Policy

As part of a coordinated conservation assistance, NRCS will aid in the development of a wetland stewardship component, of the plan which will ensure that the technical and financial assistance provided conserves the functions and values of wetlands. This wetland stewardship component may include options for clients to modify agricultural wetlands (wetlands intensively used and managed) and natural wetland inclusions less than one acre in size without rigorous sequencing, provided that the functions and values are fully mitigated. For natural wetlands greater than one acre in size, NRCS will provide assistance only if one of the preferred alternatives identified by the environmental

evaluation is selected for installation, project impacts have been avoided, unavoidable impacts have been minimized, and the adequate compensatory mitigation is conducted.

Additional applicable provisions of this policy are,

(1) The client must make provisions, agreed to by NRCS, for managing and protecting the mitigation site(s) to ensure that wetland functions obtained through mitigation remain equal or greater to the original wetland functions that were lost.

(2) The client, or designee, must obtain all necessary local, state, and federal permits. In all cases NRCS may consult, in the preparation of the environmental evaluation and subsequent mitigation plan, as applicable, with the appropriate agencies involved in the wetland regulatory activities, including the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the state regulatory agency. Such consultation will be conducted early in the planning process in order to gain consensus and avoid duplication

(3) The environmental evaluation shall include a discussion of appropriate environmental factors such as topography, soils, and climate, evaluated in light of the proposed action, in order to demonstrate the need to install a conservation system that will minimize future adverse effects on natural resources of the watershed.

(4) NRCS will encourage clients and projects sponsors to consider and use programs of other federal, state and local agencies, and private organizations that may help to preserve, restore, enhance and create wetlands.

(5) In addition to compliance to the Wetland Mitigation Policy and Executive Order 11990, NRCS will follow the provisions of Section 16A of the Soil Conservation and Domestic Allotment Act, Public Law 87-732, 16 U.S.C. 590-p-1, in the states of Minnesota, North Dakota, and South Dakota.

(6) Wetlands on private lands that are restored or created under agreements with the Fish and Wildlife Service or NRCS (e.g. Partners for Wildlife or Conservation Reserve Program) may be modified back to pre-restoration or creation conditions without violation of Swampbuster. However, the extent of the modification may not alter the hydrologic conditions beyond those present prior to restoration.

(7) The NRCS will document and determine whether the proposed action, including operation and maintenance activities, may constitute a conversion of wetlands as defined under the wetland conservation provisions of the Food Security Act of 1985 and the implementing regulations in Part 12 of this title.

NRCS will inform the clients of findings, and provide information regarding the requirements for compliance. NRCS may provide technical or financial assistance for modifications to wetlands only if the wetland conservation goals are achieved.

This policy applies to both USDA and non-USDA program participants.

(e) Exceptions

The NRCS State Conservationist may grant written exception to this rule, taking into account program requirements, economic, environmental, and other pertinent factors.

NATURAL RESOURCES CONSERVATION SERVICE
WETLAND MITIGATION POLICY

(a) General Policy

Conservation coordinated assistance is an integral part of NRCS policy and program objectives, which provides a sound, ecologically based planning framework to address soil and water conservation issues. In addition, conservation coordinated assistance provides clients with comprehensive natural resource management information with which land use decisions may be made that minimize conflict with environmental regulations while maximizing land productivity.

As a part of the NRCS policy on wetland protection, the concept of wetland mitigation is pivotal. To ensure that the appropriate principles and practices of mitigation are incorporated into all NRCS activities, the following specific policy on wetland mitigation is prescribed.

This policy applies to all NRCS activities and programs including:

1) Technical and financial assistance that will result in construction (which includes draining, dredging, channelization, filling, diking, impoundment, and related activities and any associated structures or facilities) in wetlands, as defined in Section 1221, Title XII of the Food Security Act of 1985, 16 U.S.C. 3801 et seq.

2) The wetland conservation provisions of the Food Security Act of 1985, 16 U.S.C. 3801 et seq.

3) Financial and technical programs as administered NRCS, such as, Watershed Programs, River Basin Programs, RC&D Programs, and Great Plains Conservation Programs.

This policy is effective concurrent to the issuance of the rule.

(b) Specific Policy

(1) Mitigation
The definition of mitigation consistent with the Council on Environmental Quality (CEQ) regulations 40 CFR 1508.20 includes the avoidance of impacts,; the minimization of impacts; and the compensation for unavoidable impacts, considered in that order of preference. Mitigation for a single project may incorporate one or more of these aspects of mitigation. The terms avoidance, minimization and compensatory mitigation are described below.

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(i) Avoidance - A comprehensive evaluation of practicable alternatives to the proposed modification must be conducted. Included in this evaluation are alternatives that would avoid wetland impacts entirely. This evaluation must demonstrate that the least environmentally damaging practicable alternative that satisfies the project purpose has been selected.

A practicable alternative is one that is available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes. The alternatives analysis includes consideration of the following factors:

(a) Environmental - Fish and wetland wildlife habitat, threatened and endangered species, soil erosion, water quality, flooding, groundwater, recharge/discharge, and recreation;

(b) Economics - Cost effectiveness, including changes in farm operation costs attributed to labor, equipment, timeliness, and convenience of farm operation;

(c) Resource suitability - Ability of soil, water, and related resources to support the intended use;

(d) Technology - Availability of technology to reasonably accomplish the objectives; and

(e) Other pertinent factors.

(ii) Minimization - Wetland impacts may be at least partially mitigated through minimization efforts, such as modification of the activity to limit the wetland acreage affected by the proposed activity. As with avoidance, all steps to minimize the wetland impacts must be fully considered, and those taken determined to be appropriate and practicable.

(iii) Compensatory mitigation - Compensatory mitigation is a physical measure taken to offset unavoidable wetland impacts and includes: restoration, creation and enhancement. Compensatory mitigation is required for those unavoidable impacts which result from the proposed activity after avoidance and minimization steps have been fully applied.

(a) Restoration - Wetland restoration is the rehabilitation or re-establishment of a former wetland area (i.e., a severely impacted wetland area characterized by relic hydric soils and presence of few or no hydrological, biological or chemical functions) to its original natural wetland condition.

(b) Enhancement/Management - Wetland enhancement or management is the manipulation, maintenance or management for a particular wetland function, which would improve that function in an existing wetland.

(c) Creation - Wetland creation is the conversion of a non-wetland area into a wetland, typically through the modification and manipulation of hydrology and vegetative characteristics.

(d) Preservation - Wetland preservation is the protection of ecologically important wetlands through implementation of appropriate legal and physical mechanisms.

Once it is determined that compensatory mitigation is required, the appropriate type of compensation (i.e., restoration, creation, enhancement and/or preservation) must be determined. This selection process, as well as the acreage ratio at which compensation is performed, is dependent upon the site specific characteristics of the impacted wetland and the need and ability to replace the wetland functions resulting from the impacts.

Of the four types of compensatory mitigation, restoration is usually the preferable option from an ecological as well as economical standpoint. Restoration reestablishes the natural order and ratio of community composition in a watershed or ecosystem. In addition, it is typically much easier to reintroduce the requisite water sources and vegetation to former wetland areas since site morphology, seed bank and soil organic parameters may already be present. Creation and enhancement require much greater physical manipulation, and may inadvertently damage important terrestrial environmental resources. Preservation of existing wetlands will be an option only under exceptional circumstances (wetlands must perform physical and biological functions which are important to preserve in the region and must be under demonstrable threat of loss or degradation by human activities that may not otherwise be restricted) and will generally require a greater number of acres of compensation than would restoration, creation or enhancement.

As part of the mitigation process, the functional attributes of the wetland to be impacted, and the significance of the loss of those wetland functions to the aquatic and terrestrial ecosystem, must be determined. The hydrogeomorphic approach to wetland functional

assessment, or other approved procedures for wetland functio 1 assessment, will be used to evaluate wetland functions.

(2) Applicability of Mitigation Sequencing Requirements

The purpose of the sequencing process of mitigation is to provide the maximum consideration and protection of significant wetland functions in the implementation of planning and program activities. However, it is recognized that certain types of activities that are typically conducted in or near wetlands generally have minimal adverse environmental impacts, individually or cumulatively. Similarly, there are certain types of wetlands, because of their state of degradation, landscape position, or hydrologic source, that may be impacted by a variety of activities, with a few adverse environmental effects occurring.

Therefore, application of the mitigation requirements, i.e., avoidance, minimization and compensation, will vary to reflect the degree of potential for adverse impacts on wetlands posed by specific activities.

(Note: For the purpose of this section, agricultural wetlands are defined as those wetlands that have been intensively used or managed for food, fiber or forage at least once in the last five years.

(a) Activities Impacting Natural Wetlands

The sequencing requirements of mitigation must be thoroughly applied as three independent steps for activities (including irrigation water management, water conservation/quality and erosion control systems) impacting natural wetlands.

The application of avoidance and minimization steps of mitigation, in which practicable alternatives are evaluated, is particularly important when planning projects in natural

wetland systems. This is due primarily to the environmental costs of wetland losses and the difficulties associated with physical compensation from complex wetland systems. Thus, it is technically and economically preferable to avoid impacts to natural wetlands rather than compensate for losses.

(b) Activities Impacting Agricultural Wetlands, Including Natural Wetland Inclusions Less Than One Acre in Size in Agricultural Lands

For activities impacting agricultural wetlands, the mitigation requirements are considered satisfied when appropriate compensatory mitigation, restoration, enhancement, creation or preservation is provided.

(3) On-Site vs. Off-Site Mitigation

When compensatory mitigation cannot be achieved at the site of impact or it is less environmentally beneficial to mitigate at the impact site or in the immediate vicinity, mitigation banking may be an option. Mitigation banks are usually constructed in the watershed and are functioning in advance of adverse wetland impacts, in order to insure limited loss of wetland functions and values. Refer to the Draft Federal Guidance for the Establishment, Use and Operation of Mitigation Banks for additional clarification on mitigation banking.

(4) Mitigation Planning, Implementation, Monitoring and Evaluation

The success or failure of the mitigation rests upon the appropriate biological, physical and chemical decisions being made at all steps of the mitigation process, including the mitigation plan, the site evaluation procedures, and the physical mitigative measures employed. Thus, the technical validity of the mitigation plan, which drives the mitigation process from conceptual to on-the-ground, is essential to the

process. Technical procedures by which mitigation planning, implementation, monitoring and evaluation must be conducted in order to increase the potential of mitigation success are found in Part 527.2 of the March 1994 National Food Security Act Manual, Third Edition.

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