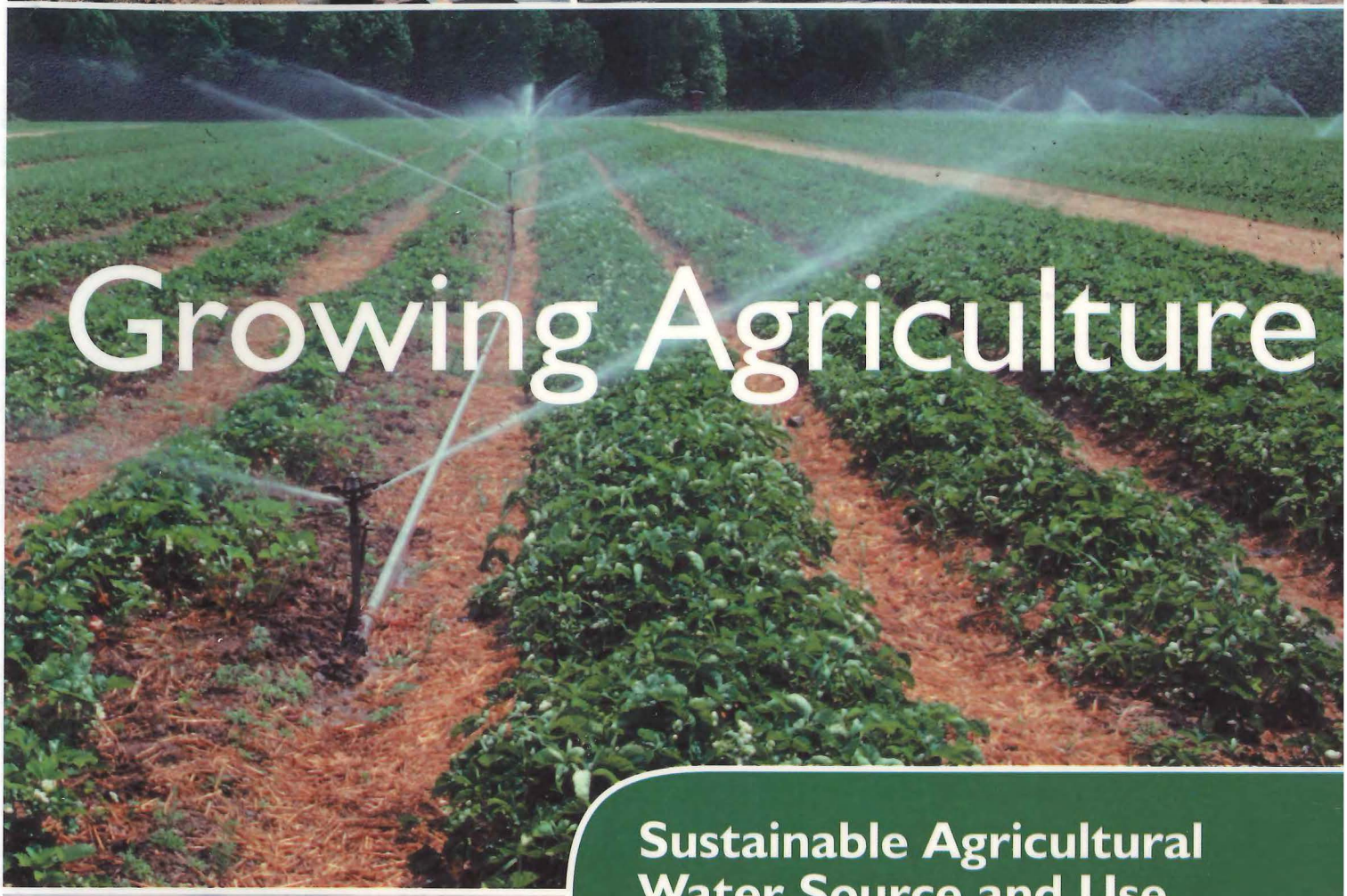


# Growing Agriculture

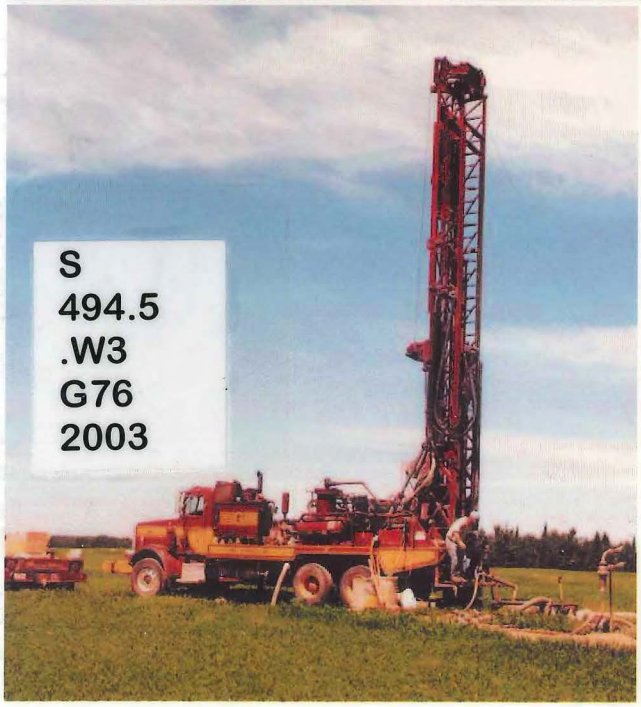
## Sustainable Agricultural Water Source and Use Policy and Action Plan

Prepared for

Robert W. Spear, Commissioner
Maine Department of Agriculture,
Food and Rural Resources

by the Maine Agricultural
Water Management
Advisory Committee

**March 2003**



April 1, 2003

TO: Robert W. Spear
Commissioner, Maine Department of Agriculture
28 State House Station
Augusta, Maine 04333

FROM: Lauchlin Titus, Chairman
Maine Agricultural Water Use Advisory Committee

RE: Updated Policy for Agricultural Water Resource Use and Management

Dear Commissioner Spear,

We are pleased to present you with this comprehensive policy document on agricultural water source and agricultural water use needs on behalf of the State of Maine's farmers. The policy recommendations included are the result of a year's worth of discussion and deliberation of the Agricultural Water Management Advisory Committee which is compromised of agricultural leaders from all over the state and representing all of the commodity groups impacted by the severe drought years of the past decade.

The Committee was challenged to review the impact that the recent drought years have had on our farming economy and to find ways to prevent the severe economic losses we have experienced. We reviewed the programs and regulations that either support or hinder our farmer's ability to access water. We also listened to presentations from members of the various regulatory agencies involved in water and irrigation issues around the State. We assessed the current use patterns and needs of our farmers through a comprehensive survey.

The recommendations presented in this document for state development and regulatory program changes will assure that our farmers have access to the water resources they need to consistently produce and maintain the highest quality and quantity of farm products for the competitive marketplace.

We strongly support the recommendations that we have provided. We trust that they will be aggressively pursued by this administration so that farmers can be assured that they will have the water they need in order to keep Maine agriculture profitable and sustainable. We know that a healthy Maine environment and a viable Maine economy have been, and will continue to be, built around a strong and diverse Maine agriculture.

Sincerely,

Lauchlin Titus, Chairman

# *Acknowledgements*

The Committee would like to thank the following people for their assistance in revising the 2000 Blueprint and production of this document: Bill Bell of the Maine Association of Conservation Districts and the individual County Soil and Water Conservation Districts for their work in helping to gather the important survey data that supports the recommendations in this action plan; to the 1640 farmers who took the time to fill out the survey and provide the data that helped to develop the needs assessment for the action plan; to the work of Jodie Caldwell and Jace Harker for data input; Linda and Lauchlin Titus for summarizing the survey data and revising and rewriting the appendix on current use of water in agriculture; Dan Baumert of USDA-NRCS, Gordon Starr and Wayne Honeycutt of USDA-ARS for insight into federal programs to support irrigation; Mark Margerum, Nick Archer, and Stacie Beyer of DEP, Sara Bruscila of LURC, and Shawn Mahany of Army Corps of Engineers for providing information about their various regulatory programs that may impact water use; Carol Jones of the Department of Agriculture for the graphic arts and cover; and Dave Brooks and Dave Yarborough for the photo credits.

# *List of Committee Members*

**Maine Agricultural Water Management Advisory Committee**

| | |
|---|---|
| David Bell | Wild Blueberry Commission |
| Bill Bell | Maine Association of Conservation Districts |
| Julie-Marie Bickford | Maine Dairy Industry Association |
| Dean Bradshaw | Maine Cranberry Growers Association |
| Mike Bragdon | Maine Potato Growers, Inc |
| David Brooks | Sevee and Maher Engineers, Inc. |
| Brad Caswell | Cherryfield Foods |
| Doug Chipman | Maine Vegetable and Small Fruit Growers Association |
| Neil Crane | Crane Brothers, Inc |
| Timothy Dalton | University of Maine - Resource Economics |
| Don Fitzpatrick | Fitzpatrick Farms |
| Jack Flaherty | Flaherty's Family Farm Inc. |
| Tom Gyger | Five Fields Farm |
| Tim Hobbs | Maine Potato Board |
| Mark Hutton | University of Maine Cooperative Extension |
| Daniel LaBrie | Labrie Farms |
| Tahd McGinnis | Central Aroostook Soil and Water Conservation District |
| Leigh Morrow | McCain Foods |
| Jesse O'Brien | Down East Turf Farms, Inc. |
| Jeff O'Donal | O'Donal's Nurseries, Inc. |
| Fred Olday | Jasper Wyman & Son |
| Jon Olson | Maine Farm Bureau |
| Sid Reynolds | Cherryfield Foods |
| Harry Ricker | Ricker Hill Orchards |
| Eric Sideman | Maine Organic Farmers and Gardeners Association |
| Ford Stevenson | Stevenson's Strawberry Farm |
| Lauchlin Titus | CPA Ag/CCA Ag Matters |
| Bussy York | York Farms |

Staff to the Committee:

Ann Gibbs, State Horticulturist, Maine Department of Agriculture, Food and Rural Resources
John Harker, Irrigation Program Manager, Maine Department of Agriculture, Food and Rural Resources

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# *Executive Summary*

***The goal of Maine's Sustainable Agricultural Water Source and Use Policy is to ensure that Maine crop and livestock farmers have adequate water*** for their operations to keep the public food supply protected and to make agriculture economically and environmentally sustainable in Maine.

***Accessing water and building sustainable water sources for agriculture is the way to reduce drought impacts on Maine farmers,*** the number one weather risk that has caused over 32 million dollars in loss of crops in the past two years. The Maine Department of Agriculture and the State Soil and Water Conservation Districts just completed an extensive survey of farmers which provides a clear picture of the extensive drought impact and the increasing number of livestock and crop farmers who need to access new sources of water to attempt to manage drought risk.

***Maine needs farmers to maintain a local, fresh food production capability and help the rural Maine economy while maintaining a balance with environmental protection of wildlife habitat.*** Maine citizens depend on an abundant supply of clean air, clean water, and adequate food supplies to keep them healthy and maintain quality of life. Support for farmers to find adequate, sustainable sources of water and assure adequate water supplies will help maintain a healthy agricultural sector in Maine's economy. In turn, profitable farms will maintain fresh food supplies wanted by Maine citizens, and keep open space in Maine's communities. The more agriculture is put at risk of not being profitable, the more likely farmers will go out of farming and significantly impact Maine citizen's health and welfare.

***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 recognize that some varieties will respond well to irrigation, while in Downeast Maine wild blueberry farmers recognize the need for consistent yields in order to maintain markets from year to year. Wild blueberry growers have experienced crop losses of 80-100% in recent dry years. Potatoes will risk major losses in 3 out of 10 years. Other crops, such as strawberries and nursery crops, would be uneconomical to grow at all without a source of adequate water.

***State policy on agricultural water use has evolved since the 1970's, with farmers providing much of the support and direction in research on crop needs, environmental impact, low flow studies, and policy development.***

***Maine potato and wild blueberry farmers have spent over 2 million dollars in studies defining the need for supplemental irrigation.*** With support from the state, Army Corps of Engineers, and USGS, farmers are determining what low flow limits can be maintained in rivers and streams in Aroostook and Washington counties to maintain aquatic habitat and still provide irrigation water supplies. Wild blueberry companies are providing

hundreds of thousands of dollars for studies that have shown that seasonal use of high yield wells do not negatively impact surface water or wetlands.

## State sustainable agricultural water source policy issues include:

- The need of farmers for more access to sources of water. Farmers need acceptance by the environmental community and regulators for building sustainable water sources and storage as the way to eliminate the need for costly regulation of water access during drought periods. Water sources include impoundments in upper reaches of watersheds, dug ponds, and wells. The key drought risk reduction strategy is to capture the excess water when available in the spring and during rain events. Building sources meets the water needs of agriculture and protects critical aquatic habitat during low flow periods.

- Reducing financial and regulatory impediments to building new sustainable water sources and storage. This is of utmost importance to fast remediation of drought risk, animal watering needs, reducing economic losses in farming operations and reducing conflicts in use during low flow periods.

## Sustainable agricultural water source recommendations include:

- Continued funding of the successful State cost share program for sustainable water source development including engineering design and offset of permitting costs.

- Changing LURC regulations for water source development to mirror DEP regulations regarding well and pond development.

- Studying ways to reduce or eliminate the requirement for federal and state (LURC) mitigation of wetland impacts for agricultural pond development.

## Sustainable agricultural water use policy issues include:

- Obtaining public recognition that preservation of farming operations, including water use, is a high public benefit and homeland security goal.

- Making sure that no environmental regulation limits the ability of farmers to use the water necessary to maintain crop and livestock operations without first assuring economically viable alternative sources exist.

- Providing adequate technical assistance so that farmers have all the tools necessary to utilize water in an effective manner, with a high priority put on whole farm water management plans, conservation and efficient use of water.

## Sustainable agricultural water use recommendations include:

- Adding seasonal water use for agriculture as a high priority use in Maine law.

- Eliminate LURC permitting regulations on seasonal agricultural water use, similar to DEP regulation.

- Supporting non-regulatory solutions to water withdrawal complaints during low flow periods while maintaining traditional, longstanding riparian rights of users. Utilize the successful Aroostook Water and Soil Management Board low flow policy as a model.

- Funding more research studies on economics of supplemental irrigation and alternative methods to increase soil water holding capacity and create water use conservation and efficiency.

- Funding low flow studies to establish realistic limits on withdrawal to water bodies in regions where irrigation is likely to continue with direct withdrawals.

- Funding increased technical assistance from the Department, Cooperative Extension, Soil and Water Conservation Districts, and USDA-Natural Resources Conservation Service for developing farm water management plans; selecting, siting and development of sustainable water sources; and educational programs to better understand the permitting process and understanding and accessing the latest irrigation technology.

# *The Goals of the Policy*

## *Provide Adequate Water Supplies for All Farmers*

The Goal of Maine's Sustainable Agricultural Water Source and Use Policy is to ensure that Maine crop and livestock farmers have adequate water for their operations to keep the public food supply protected and to make agriculture economically and environmentally sustainable in Maine.

## *Protect Agriculture as an asset to Maine's economy and local communities*

Maine citizens depend on an abundant supply of clean air, clean water, and adequate food supplies to keep them healthy and maintain our quality of life. Maine citizens depend on farms and open farmland as having other social and psychological benefits as well. Support for farmers finding adequate sources of water will help maintain a healthy agricultural sector in Maine's economy and in Maine's communities.

Maine agriculture is the basis of over 1.2 billion dollars of food and fiber products annually, employs 22,000 workers statewide, preserves a lifestyle for over 5,500 Maine families, and provides stewardship of over 1.5 million acres of land and wildlife habitat.

Farms are important to Maine communities. Maine farms provide open space and fresh food for Maine citizens and tourists. Keeping working farms profitable helps prevent sprawl. Of primary importance to the community is the preservation of local food supplies as a homeland security issue. Farms also provide open space and the buffering of property 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.

## *Provide Agriculture with water in drought times in order to reduce risks and remain profitable*

Drought episodes in Maine the last three years have had devastating effects on Maine farmers. A recent study completed by the Department and the Soil and Water Conservation Districts, summarized later in this report, shows that Maine farmers lost over 32 million dollars due to drought. That has underscored the need for new policies to protect public water supplies and agriculture.

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 and drought is the number one risk faced by farmers. Frost has also taken a toll on many crops during

springtime. Many farmers interviewed believe irrigation capacity is necessary for economic survival so that crop failure is avoided and markets are supplied with the quantity and quality demanded by the consuming public. Livestock, poultry and dairy operations find it a must to have water supplies, similar to the human need for water. In addition, farmers who do not have access to water need other methods to reduce the risk of drought in order to stay in business.

In Department surveys, some farmers stated they might go out of business in the next 5 years if they cannot access water because using water increases the profitability of the farm operation. 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). Supplemental Irrigation has become a critical factor for keeping Maine farms viable.

## *History of Public Policy Development for Agricultural Water Sources and Use*

Farms in Maine have benefited by public support for water source development since the late 1960's when the United States experienced it's worst drought period and irrigation technology development started becoming economically viable. During that time the USDA provided technical and financial assistance to many farmers to develop farm ponds for livestock and crops. Hundreds of acres of ponds were developed at a time when ponds were felt to be a benefit to the environment and public welfare. Maine was blessed with abundant rainfall most of the year so that storage ponds were considered the perfect hedge against dry spells and supplemental irrigation became an accepted. However, Maine farmers never got the large federal subsidies for water source development like in the west.

In the late 1970's the Army Corps of Engineers (ACE) recognized that Aroostook County potato farmers were at risk because of lack of adequate pond development and a major study provided justification for development of multiple ponds and dam projects to help keep potato farms economically viable. The study accurately forecast the more rapid decline of the industry if water source safeguards were not put in place. In the late 1980's the Maine legislature, Maine Potato Board, and Department of Agriculture successfully lobbied Congress to appropriate 3 million dollars to study the needs of the potato industry and come up with a strategy to increase irrigated acreage. The Aroostook Water and Soil Management Board (AWSMB), a regional advisory group, was formed to oversee irrigation development for the county. In the 1990's the ASWMB and the Maine Potato Board successfully funded studies to prove the need for supplemental irrigation and has been funding low flow studies on streams to ascertain what water sources would be best to use to meet crop water needs.

In the early 1990's continued droughts and the cranberry development effort led to state environmental law change to allow use of wetlands for pond development without the need for mitigation. The Maine Department of Environmental Protection (MDEP) worked with the Agricultural Council of Maine to show that pond development in wetlands changed functions and values of wetlands, but did not destroy wetlands. In fact, ponds were found to have additional environmental benefits beyond their use for irrigation water sources. The Army Corps of Engineers also allowed for cranberry pond development without mitigation for small wetland impacts because ponds are absolutely necessary for crop survival. General Permits not requiring mitigation were developed for 5 years to help the industry get established.

In the late 1990's two major droughts caused millions of dollars of crop losses to Maine farms, and a number of farmers went out of business, in part due to inability to manage that risk. Wild blueberry, potato and vegetable farmers were hardest hit. At the same time

the federal services were moving to list the Atlantic Salmon as an endangered species. This move led to additional pressure to prevent farmers from accessing rivers downeast for critically needed water for crops. In one year alone, the wild blueberry industry suffered devastating losses to drought due to lack of clear public policy supporting new source development, especially federal approval for use of wetlands without mitigation. At this time additional issues included the lack of consistency between LURC and DEP regulations, where DEP had determined that water use and new source development was exempt from NRPA regulation, LURC was requiring permits for any water use or wetland impacts.

Most recently, in 1999 Governor King, after seeing the devastation of the wild blueberry crop to drought, directed the Maine Department of Agriculture to produce an action plan to provide the water needed for Maine farmers. The Blueprint was developed and called for more water sources and ability to withdraw from streams without the need for permits. However, at this time, environmental groups were concerned that increased use of water during low flows would damage the environment. A compromise was reached on the water source issue and the King administration did two things; 1) developed two bond issues in 2001 and 2002 to invest in new sustainable water source developments for agriculture and 2) supported a legislative initiative to develop low flow standards that would protect wildlife habitat during low flows after study on what low flows are supportive of habitat.

# *Issues and Recommendations*

## *Issue 1: State financial assistance for environmentally sound and sustainable water source development and irrigation technology to improve water use efficiency.*

The Advisory Committee lists financial assistance as the number one priority to meet the goal of providing sustainable water sources for all farmers.

### *Drought Risk Management Needed*

Drought risk management requires the development of sustainable water sources. Farmers who have access to ponds, lakes and streams can adopt irrigation readily by making large capital investments in equipment that is only used a few days to a few weeks per year. Those who cannot access natural water sources must also make large capital investments in water sources. Maine's farmers are being told by Federal policy they must assume more risk management responsibility while at the same time they must compete with farmers in other parts of the county that have cheap sources of water supplied by Federally funded projects.

The Maine Department of Agriculture conducted surveys in 1999 to ascertain the amount of ponds and wells required to fully mitigate water need. The total capital investment needed was over 50 million dollars. In a more recent Department survey, with 28% of farmers responding, farmer's stated that they expect to need about 15 million dollars worth of new sources in the next 2 to 5 years.

### *Innovative Cost Share Program for New Sources*

This need has led to a successful publicly financed cost share investment program for new source development. Currently the legislature and Maine citizens have bonded $1.2 million dollars for cost share. 26 projects are currently underway. Both small and large farmers are developing sustainable water sources. 13 wells, 12 ponds, and one impoundment are in the works and additional proposals are being accepted for review in this, the first year of the program.

Maine's program to date has protected 946 acres of farmland and will prevent over 9 million dollars of crop loss due to drought over the life of these projects. Projects are helping reduce dependence of surface water bodies, a win-win for farmers and Maine's wildlife habitat.

Roughly 40 more projects are possible under the current funding of $750,000. Based on the limited projects to date, the average cost per acre served for a well is approximately $1,900, for a pond is $2,500, and for an impoundment is $20,000. Costs will vary depending on many site specific variables.

### *Agricultural Marketing Loan Fund for Irrigation*

The State Agriculture Department operates a low interest loan program that can be used to make capital purchases as well. The high capital cost associated with sustainable water source development puts farms at a greater economic risk if capitalized with loans, but lower interest rates would help farmers. Typically farmers do not have the necessary equity in the business to collateralize the loans. In addition, the State program requires up to 45% participation by another lending institution and commercial banks typically do not like to have a second position or do the additional paperwork for the applicant to participate in the state program. Ways need to be found to make the state program better adapted to meet the needs of farmers who want to irrigate.

### *USDA-NRCS Cost Share Program*

In addition to new source development, farmers are interested in adopting new irrigation practices and technology to improve the efficient use of water. The USDA-NRCS cost share programs have received additional funds through the recent Farm Bill passage in 2002. USDA may have more funds from the Environmental Quality Incentive Program (EQIP) and AMA programs to fund irrigation equipment that improves water efficiency.

The Maine agricultural community and Maine's congressional delegation strongly supported using NRCS-EQIP conservation funding to cost share sustainable water sources for farmers. At the current time it appears USDA draft rules will preclude its use for new or previously non-irrigated land in Maine.

For those farmers who do not have access to water, the risk of crop damage from drought still remains an unresolved risk. Those farms have commented that soil building practices, mulching and other conservation practices need to be provided to maximize water holding capacity of soils. Managing soil microorganisms can be as critical as supplemental irrigation for mitigating mild droughts.

***Recommendations:***

1.1 Fund an additional 15-20 million dollars of bonding over the next 10 years to meet the needs of farmers for infrastructure investment for new environmentally sound and sustainable sources of water.

1.2 Investigate funding to include technical assistance for pre-new water source management planning.

1.3 Continue to support efforts to get additional federal funds through the USDA-NRCS cost share programs to help supplement state funds for environmentally sound and sustainable water source development and the adoption of new technology and other practices to improve irrigation water use efficiency.

1.4 Change AMLF loan program to allow for 75% loans for irrigation improvements, increasing it from the current 45% state share of the project costs.

1.5 Determine the need for additional state funding for offsetting mitigation requirements for federal permits.

## *Issue 2: Agricultural water use research*

The University of Maine conducted research on the need for supplemental water for potato and wild blueberry production. This research has shown on what varieties and at what periods of time supplemental irrigation is critical. In addition, economic research is determining at what levels of production irrigation is profitable. However, this work largely does not account for the large cost associated with sustainable water source development. Due to the wide range of costs of site-specific solutions, sustainable source development costs are hard to predict.

In addition, research on the economics of supplemental irrigation 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.

Research on soil water conservation practices could also aid in reducing the need for irrigation in periods of mild droughts, reducing the need to expend capital for ponds, wells or impoundments.

***Recommendations:***

2.1 Fund Research at the University of Maine and with the USDA Agricultural Research Service Soil and Water Plant lab for:

- Economic studies of supplemental irrigation for selected crops for better decision-making;
- Determine and fine tune crop water needs in Maine including plant water demands and water scheduling;
- Assist farmers in identifying ways to minimize the need for irrigation through building the organic matter content of the soil by mulching and other soil management techniques.

## *Issue 3: Federal requirement for mitigation*

Mitigating wetland impacts is an uncertainty in developing new sources in wetlands. Mitigation costs are a major impediment to developing sustainable alternative water sources. 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.

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 process for altering wetlands also requires mitigation of wetland impacts in some cases. The federal Clean Water Act requires Army Corps of Engineers to require mitigation in any cases of wetland impacts greater than a minimum threshold. For farmers who have received USDA program benefits, they also have to comply with USDA mitigation requirements if a wetland is altered on the farm.

However, even with minimization, some projects have still been required to mitigate. Mitigation requires creating new wetlands to serve the same functions and values lost during pond construction, or enhancing functions and values of other wetlands, or preservation. Each of these requirements can, and do, cost thousands of dollars and time to develop and get approval for the project.

Farmers have been concerned about consistency and why LURC and Federal regulatory agencies, when determining the function of a wetland for a pond, do not use the current intent and rationale of DEP Law that does not require mitigation. The basis of the DEP law that exempts farm ponds from wetland regulation is that it is believed that changing the function and values of some wetlands to open water habitat is actually not a loss of wetlands, but just a change in wetland functions and values.

Sometimes there is also 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 in the same local area. All this then causes confusion for the farmers.

In addition, Federal authorities rely on the applicant to provide a mitigation plan but typically do not give clear guidance on what mitigation is required. The 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 often do not feel the necessity to assist.

Since alternative water source development is a very costly undertaking, 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.

***Recommendations:***

3.1 The Committee proposes the agencies continue the Federal/State Site Assessment 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.

3.2 Encourage any mitigation teams that are established to use the Irrigation Pond Permit Application Process that was developed by the Irrigation Pond Permitting Task Force. Any changes or additions to improve the process will be encouraged.

3.3 Explore and assess whether to obtain a federal general permit or mitigation banks for pond development in order to eliminate the requirement for mitigation of wetland impacts for irrigation pond development.

## *Issue 4: State environmental policy*

Farmers believe that state environmental law is moving towards limiting the use of waters by farmers and others who need that water during critical drought periods. Growers are very concerned that proposed DEP water quality law changes will end up with regulations that will unnecessarily limit agriculture's use of water, compared to other water users. They have also been confused by why different state environmental agencies have differing regulations concerning water use and new source development.

### *Water Withdrawal Reporting Program*

In the last session of the legislature, P.L. 2002, Chapter 619 created a water reporting law that would require farmers to report water use. While farmers are willing to comply with reporting, they are very concerned that the information will be used out of context, and with out justification, to further limit their ability to access ground and surface water during droughts. Farmers would like to see precious state dollars channeled to the development of sustainable water sources rather than costly regulatory systems.

### *Water Low Flow Studies*

The Legislature had also previously funded the Aroostook Water and Soil Management Board to conduct studies, with the United States Geologic Service (USGS), to determine what are the low flows of various potential water sources. This will help better determine the amount of water that could be used while protecting habitat or minimizing impacts. These studies are ongoing and are providing much helpful data. Farmers in other parts of the state see the need to expand these low flow studies to other watersheds.

### *LURC Water Source and Use Regulation Inconsistency with DEP Regulation*

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. Farmers in the Downeast area have commended the Director and staff for evolving toward reasonable requirements, but the farmers still have concerns about the process itself.

Unlike the organized territories that rely on DEP regulations and common law practice of reasonable use of State waters, LURC only recently increased regulating agricultural 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 that encourage environmentally sound solutions, reasonable exemptions, and clearer processes for permitting.

Another issue facing LURC is that the permitting process for water withdrawals and wetland alteration. The process 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 from the Land and Water Resources Council for permitting water withdrawal because of the Federal listing of the Atlantic salmon as endangered. This has created further scrutiny, data requirements, and extended the time and cost of permitting.

***Water Classification Law and Designated Water Uses***

The DEP has a responsibility to assure that all state waters remain as clean as possible. A water classification program has been ongoing for many years to determine the cleanliness of the waters to protect designated uses and identify potential threats. The Federal Government, through the EPA, establishes designated uses of those waters in order to assure that certain users, agriculture included, have access to the waters. During a recent reclassification rulemaking, it came to light that DEP law did not have agriculture as a designated use like EPA. Because of this, when DEP upgrades the water quality classification of streams this could potentially eliminate new agricultural irrigation development which would include pumping of water for new acreage, development of new dams and impoundments on those streams.

On December 6th, 2002, the Maine Association of Conservation Districts unanimously passed an emergency resolution requesting that the Maine Department of Environmental Protection utilize Conservation Districts as an "information dissemination contact point when issues arise which may impact landowners."[1] This resolution was the direct result of the recent *Proposal for Reclassification of Maine Waters*, which was drafted by the DEP. The resolution asserts that the State has a responsibility to involve citizens in decision-making processes, and that Districts are able to fulfill a vital role in that mission. Districts also recognize the importance of building support for water rights beyond the traditional agricultural community. For example, restrictions on agricultural water use may affect processors and other agriculture related industry, but also municipal economies, rural development, environmental stewardship and tourism. Alliances with organizations representing these and other interests can only strengthen the position of all who seek to safeguard the future of agricultural water use in the State.

***Recommendations***

4.1 Support non-regulatory solutions for protection of aquatic systems for specific, problematic water withdrawal situations that draw water directly from natural surface sources during low flow periods.

4.2 Work with the legislature and governor to reassess LURC regulation development process, especially as it relates to requiring permits for water withdrawal, wetland development and mitigation requirements. Require LURC and DEP to base all regulation on scientific basis for habitat impact and be consistent with DEP law and rule.

4.3 Change LURC regulations to current DEP regulatory language regarding well and pond development.

4.4 Fund low flow studies of streams in critical watersheds and conduct environmental assessments of the low flows on aquatic ecosystems;

4.5 Fund gauging stations in order to get a better handle on flows in rivers.

4.6 Add agriculture as a designated use in water quality law and place agriculture as a high priority for first access to water during drought periods as a high public health, welfare and homeland security issue.

## *Issue 5: Technical assistance*

Farmers have expressed concern that technical capacity is now lacking in the agencies that traditionally help farmers with new technology development, primarily some of the local USDA-NRCS, Soil and Water conservation Districts and Cooperative Extension offices. Due to the small nature of our irrigation needs relative to other states, the number of private irrigation consultants and supply companies are few. Private consultants have also noted that they 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.

Maine's sixteen Soil and Water Conservation Districts are ideally situated to assume a strategically significant role in the ongoing discussion of agricultural water use in the State of Maine. With offices and staff throughout the State, Districts are on the frontlines of conservation issues and enjoy excellent relationships and frequent communication with their local constituency. To date, District involvement in agricultural water use has varied from region to region, based in part on the relative local significance of agriculture, capacity of technical staff, and on the priorities set by District strategic plans and Local Work Group resource assessments.

### *Recommendations*

5.1 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 sustainable water sources on their farms.

5.2 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.

5.3 Encourage USDA program funding for the development and implementation of irrigation water management plans.

## *Issue 6: Need for regional agricultural water advisory councils*

The committee reviewed the work of the current regional board established for Aroostook County farmers (See Appendix 3) which has served the County very well over the past few years. The Aroostook Water and Soil Management Board has successfully funded research on crop response to supplemental irrigation, low flow studies, and has helped resolve disputes regarding noise complaints and low flow withdrawals.

A set of regional guidelines is critical to clarify roles and responsibilities, and establish procedures and guidelines on agricultural water use matters. Farmers in northern Maine have different needs than those in southern Maine. The guidelines, established through consensus building with all state and local agencies, have worked well in Aroostook County. The regional policy provides a successful model that could be used in other regions of the state.

Regional agricultural water use advisory groups, at a minimum, would also address:

1. State and Federal regulatory and technical assistance process to evaluate and address agricultural water complaints, extreme drought situations and sustainable 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. Identification and implementation of sustainable water source solutions applicable to the region;
4. Other issues raised concerning procedures, permitting and technical assistance as needed.

A policy developed for a region would also address how long any guidelines developed need to be in place. This non-regulatory, voluntary system is critical to success in developing a sustainable water use management program for Maine farmers.

***Recommendations***

6.1 Continue to use as a model, and to fund the voluntary solutions-oriented activities of the Aroostook Water and Soil Management Board in Aroostook County.

6.2 Establish regional processes similar to the Aroostook County model for non-regulatory complaint response to low flow issues and to foster regionally relevant sustainable water source solutions.

# *Appendix 1:*
# *Agricultural Water Source and Use Policy Plan of Action Outline*

| Issue/Recommendation | Actions To Be Taken | Desired Outcome | Timeline |
|---|---|---|---|
| **1. State/Federal Financial Assistance** | | | |
| **1.1 Funding New Sustainable Sources** | Continue to support State bond funding for development of a cost share program for sustainable water source development including engineering design. Could amount to 15 -20 million dollars for cost share | Obtain the necessary bond funds for full resolution of water needs by farmers. | **Bond Voted on November, 2004 and On-going** |
| **1.2 Technical Assistance** | Obtain funds for technical assistance for water management planning for new sustainable water sources. | All farmers who need assistance for development of new sources will be provided assistance. | **By March, 2005** |
| **1.3 Federal Funding** | Continue to support Federal Dollars for conservation/efficiency cost share programs through USDA-NRCS Equip and AMA funds and maintenance of 75% cost share for those funds. | All farmers have assistance they need for cost share of efficient irrigation systems and other practices to improve irrigation efficiency and water conservation, as well as to augment new water source development. | ***Ongoing*** |
| **1.4 AMLF Loan Program** | Review the Agricultural Marketing Loan Fund to allow for additional non-capital costs for water resource development. | AMLF changed to allow for 5% low interest loans at 75% state involvement in total project costs for equipment and source development for irrigation | ***June, 2003*** |
| **1.5 Offset Mitigation Costs** | Explore the need for additional state funding to offset mitigation requirements for federal permits | All farmers who have mitigation requirements for new source development have ability to meet those requirements quickly. | ***January, 2005*** |

| Issue/Recommendation | Actions To Be Taken | Desired Outcome | Timeline |
|---|---|---|---|
| **2 Agricultural Water Management Research and Education** | | | |
| **2.1 Research Funding** | Economic studies of supplemental irrigation for selected crops for better decisionmaking | Economic thresholds established for profitable adoption of irrigation for all major crops grown in Maine | ***ongoing*** |
| | Fine tune water needs of crops in Maine including water demand and water scheduling. | All Maine farmers know how much water various crops need, and when they need it. | ***ongoing*** |
| | Research and Extension activities increased to assist farmers in identifying ways to minimize the need for irrigation, improve irrigation efficiency and adopt soil building and mulching technology. | All farmers have adopted water conservation practices. | ***ongoing*** |
| **3 Federal Mitigation Requirements** | | | ***December, 2004*** |
| **3.1 Site Assessment Teams** | Continue on site Federal/State Site Assessment Teams to assist farmers with proper site selection for pond or impoundment development. | All farmers who put in ponds have minimized wetland or waterway impacts to the maximum extent practicable. | ***Ongoing*** |
| **3.2 Irrigation Pond Permit Application process** | Encourage the use of Irrigation Pond Permit Application Process and review process periodically for changes. | All farmers knowledgable and follow proper permitting application processes. | ***Ongoing*** |
| **3.3 Federal General Permit or Mitigation Banks** | Explore and assess whether to obtain a federal general permit or create a state mitigation bank for pond development. | Federal mitigation is reduced or eliminated for any farm ponds developed. | ***March, 2004*** |

| Issue/Recommendation | Actions To Be Taken | Desired Outcome | Timeline |
|---|---|---|---|
| **4. State Environmental Policy** | | | |
| **4.1 Support for Non-regulatory solutions to water withdrawals** | Support non-regulatory solutions to water withdrawals during low flow periods for protection of aquatic systems as a state policy statement. | State policy adopted in law or rule for methods to resolve water rights and access to water during low flow periods. | ***December, 2004*** |
| **4.2 LURC regulations development process.** | Reassess LURC regulation development process, especially as it relates to requiring permits for water withdrawal, wetland development and mitigation requirements. Base regulations on scientific basis. Build consistency with DEP law and rules. | All irrigating farmers treated the same in LURC and DEP permitting processes, and LURC law and regulation based on science. | ***December, 2004*** |
| **4.3 LURC well and pond development** | Change LURC regulations to current DEP regulatory language regarding well and pond development | All farmers developing wells and ponds treated the same in LURC and DEP law | ***December, 2004*** |
| **4.4 Low Flow Studies** | Fund Low flow studies of streams in critical watersheds and conduct environmental assessments of the low flows on aquatic ecosystems. | All streams used for irrigation have established low flow standards based on true impact and not politically established limits. | ***January, 2005 through January, 2010*** |
| **4.5 Gauging Stations** | Fund gauging stations to help in administering low flow limits on rivers and streams | All streams and rivers have benchmark gauges for determining low flow limits | ***January, 2005*** |
| **4.6 Water Quality Law changed to adopt Agriculture as a dedicated use.** | Add agriculture as a water use to be protected in DEP water quality law. | Policy statement developed supporting agriculture as a natural resource to be protected . | ***March, 2003*** |

| Issue/Recommendation | Actions To Be Taken | Desired Outcome | Timeline |
|---|---|---|---|
| **5. Technical Assistance** | | | |
| **5.1 Establish technical assistance and educational programs for whole farm water management plans** | Develop a technical assistance/education program for farmers to help develop whole farm water management plans to minimize water use, adopt appropriate irrigation technology, and develop sustainable water sources. | All Maine irrigating farmers will have whole farm water management plans . | ***350 Farmers by December, 2004, 350 Farmers by December 2005.*** |
| **5.2 Funding for technical assistance programs** | Funding for increased technical assistance for developing water management plans, understanding permitting processes, and accessing irrigation technology. | Programs and staff in place with Cooperative Extension and Soil and Water Conservation Districts to help farmers. | ***March, 2004*** |
| **5.3 USDA funding** | Encourage and lobby for increased USDA funding for development and implementation of water management plans. | All Maine irrigating farmers will be able to cost share development of whole farm water management plans. | ***November 2003*** |
| **6. Regional Agricultural Water Advisory Councils** | | | |
| 6.1Aroostook Water and Soil Management Board | Continue to fund and model the AWSMB activities in Aroostook County. | AWSMB fully funded to assist in implementing state policy on agricultural water management. | ***March, 2004*** |
| 6.2 Regional advisory groups | Develop regional advisory groups South, Central, West, North and East. Use Aroostook Model for development of plan of work and regional policy. | Regional Advisory Committees Set up, with policies written and accepted by all agencies involved | ***By 6/04, 6/05 depending on need, and results of water reporting law.*** |
| | | | |

# *APPENDIX 2:*
# *CURRENT AND FUTURE IRRIGATION PRACTICES IN MAINE*

## *Background*

The information that follows has been compiled from the 1997 Census of Agriculture and the 2002 Maine Department of Agriculture (MDAFRR) Water Use Survey. The MDAFRR survey was distributed to each of the sixteen Soil and Water Conservation Districts in Maine in November 2002. Farmers were asked to respond to a number of questions regarding current and future water use. The information was summarized and is presented in the tables that follow.

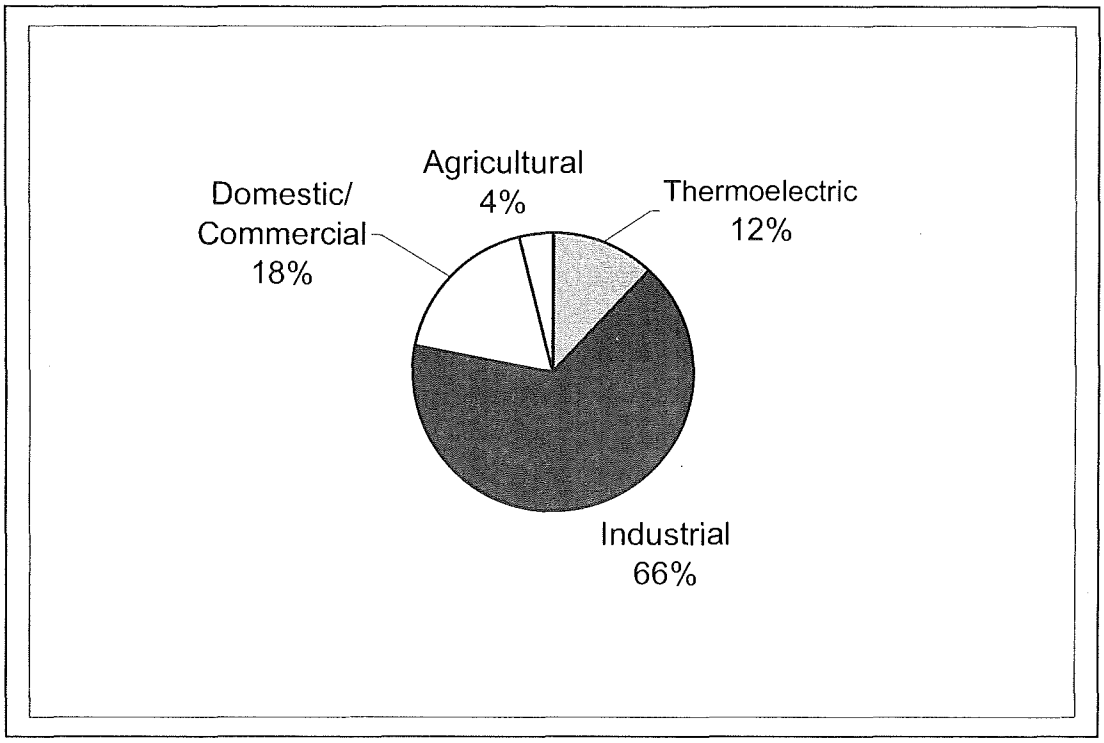
### *A small number of farms actually irrigate*

According to the 1997 United States Census of Agriculture data, Maine had 5810 farms of which 671 irrigated. This represents only 12% of all farmers. The overall 2002 MDAFRR survey response overall was 1638 (28% of Census totals). The number of farmers who reported using water was 1092, with 549 stating that they are animal farms and 572 reporting as irrigating crop farmers. Compared to the 1997 Census, the MDAFRR survey resulted in an 84% return from irrigators (see Table 1).

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

The use of water by agriculture in the state of Maine is relatively small. Maine farmers use 4% of the total water available as compared with its use by industrial, commercial and residential consumers (See Graph 1). The need for high quality, clean water in agriculture is often critical for crop propagation and survival, especially in times of drought and frost. The economic risks associated with a potential lack of water are significant. One Maine farmer aptly remarked that, "Irrigation is as important to maintaining farms as snowmaking is to maintaining the ski industry."

**Graph 1**




(*Source – 1987 National Water Summary, USGS)

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

In Idaho, there are 3.3 million acres of harvested cropland. 98% (3 million acres) are irrigated using government built reservoirs and canals for water sources. Maine farmers harvested 403,000 acres of cropland in 1997. 21,791 acres, 5% of the harvested acreage, were irrigated. (See Table 1) The major reason is that the amount of Federal dollars subsidizing water source development and use in the West has far outweighed funding support for Northeastern farmers.

## *All Maine counties have farms that 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 1). Counties with relatively low numbers of irrigated acres reported might at the same time have crops planted to small acreages with significant monetary value per acre, i.e. strawberries vs. hay.

Table 1 shows us that of the 403,014 acres harvested in 1997, only 21,791 acres (5.4%) were actually irrigated. In the most recent Maine Department of Agriculture Survey, the irrigated acreage was reported as 28,928 acres (See Table 8). The discrepancy can be attributed to the fact that additional farmers have adopted irrigation in the past two years subsequent to the 1997 census.

Table 3 indicates that the majority of farms (80%) (442/572) of the 28% of Maine Farms surveyed in 2002 were farms that irrigated ten acres or less land. Farms with smaller acreages will generally be irrigating high value crops with relatively simple, yet efficient, irrigation systems that utilize garden hoses or drip irrigation. This is supported by facts about individual commodity systems used in Table 4.

Virtually all crops grown in Maine benefit from supplemental irrigation to improve the quality and quantity of food, sod, fiber, and hay produced. In addition, Maine is so diverse geologically that different areas in the state have different types of water supplies and ways in which drought impacts the region's crops and livestock.

**Table 1: 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 | 17842 | 36 | 784 | 13% | 4% |
| Aroostook | 889 | 143507 | 76 | 11058 | 9% | 8% |
| Cumberland | 455 | 18484 | 107 | 906 | 24% | 5% |
| Franklin | 223 | 10604 | 6 | 20 | 3% | 0% |
| Hancock | 310 | 6459 | 40 | 195 | 13% | 3% |
| Kennebec | 455 | 34425 | 42 | 365 | 9% | 1% |
| Knox | 194 | 7173 | 24 | 102 | 12% | 1% |
| Lincoln | 210 | 7541 | 26 | 92 | 12% | 1% |
| Oxford | 358 | 15794 | 43 | 1086 | 12% | 7% |
| Penobscot | 525 | 40029 | 65 | 1592 | 12% | 4% |
| Piscataquis | 141 | 8179 | 11 | 166 | 8% | 2% |
| Sagadahoc | 118 | 5530 | 13 | 66 | 11% | 1% |
| Somerset | 431 | 27191 | 22 | 73 | 5% | 0% |
| Waldo | 315 | 21460 | 26 | 60 | 8% | 0% |
| Washington | 399 | 20235 | 39 | 3771 | 10% | 19% |
| York | 499 | 18561 | 95 | 1455 | 19% | 8% |
| | | | | | | |
| Total Maine | 5810 | 403014 | 671 | 21791 | 12% | 5% |

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

Table 4 shows the extent of use, and the wide array of technology used to irrigate crops in Maine. Many Maine farmers realize the positive impact of soil quality improvement and have found that coupling this with supplemental irrigation can be beneficial to both the crop and the environment. The type of irrigation system used can be very crop specific in both design and application. Different crops may require water in different seasons, such as cranberries in the fall, potatoes in midsummer, and strawberries in the spring. Table 4 helps to demonstrate that irrigation needs and technologies are both site and crop specific.

## *Supplemental irrigation critical to meet consumer demand*

Supplemental irrigation has become a necessity for meeting public demand for consistent, 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 wild blueberry production, customers depend on a consistent supply of fruit products each year. A year of low crop yields and lack of product results in loss of long-term contracts with major customers. Large swings in crop size leads to unstable, low prices to growers, as markets are difficult to develop and maintain. 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. Most new crops will require supplemental irrigation to meet consumer demand and expectations.

**Table 2: Number of Farms in Survey, Irrigation and Animal Use, % Response, by County**

| County | Total Number of Farms Census | Irrigating Farms Census | Number of Respondents To 2002 Survey | Overall Response Rate compared to the Census Data | Farms not using water | Farms using water | Animal Farms | Irrigating Crops Farms Based on survey data | % Of Irrigators Responding to Survey compared to Census data |
|---|---|---|---|---|---|---|---|---|---|
| Kennebec | 455 | 42 | 124 | 27% | 4 | 90 | 47 | 39 | 93% |
| Southern Aroostook | 297 | 25 | 57 | 19% | 10 | 47 | 35 | 12 | 48% |
| Central Aroostook | 296 | 25 | 42 | 14% | 15 | 21 | 0 | 10 | 40% |
| Northern Aroostook | 296 | 26 | 64 | 22% | 12 | 51 | 22 | 19 | 73% |
| Franklin | 223 | 6 | 80 | 36% | 8 | 53 | 46 | 13 | 217% |
| Piscataquis | 141 | 11 | 54 | 38% | 1 | 44 | 27 | 12 | 109% |
| Oxford | 358 | 43 | 87 | 24% | 4 | 51 | 34 | 17 | 40% |
| Cumberland | 455 | 107 | 83 | 18% | 9 | 73 | 31 | 48 | 45% |
| York | 499 | 95 | 131 | 26% | 5 | 103 | 47 | 68 | 72% |
| Penobscot | 525 | 65 | 133 | 25% | 9 | 86 | 40 | 47 | 72% |
| Androscoggin/ Sagadahoc | 406 | 49 | 219 | 54% | 13 | 104 | 56 | 53 | 108% |
| Hancock | 310 | 40 | 185 | 60% | 36 | 80 | 35 | 50 | 125% |
| Knox-Lincoln | 404 | 50 | 101 | 25% | 8 | 71 | 36 | 41 | 82% |
| Waldo | 315 | 26 | 70 | 22% | 11 | 58 | 36 | 25 | 96% |
| Somerset | 431 | 22 | 69 | 16% | 9 | 47 | 32 | 18 | 82% |
| Washington | 399 | 39 | 139 | 35% | 23 | 113 | 25 | 100 | 256% |
| | | | | | | | | | |
| Total all State | 5810 based on Census Data | 67 1 based on Census Data | 1638 | 28% | 177 | 1092 | 549 | 572 | 85% as compared to Census Data |

(*Source – 1997 Census of Agriculture & 2002 Maine Department of Agriculture Water Use Survey)

(Note: percentages over 100% means that either more farmers are irrigating or that more farmers responded to the MDAFRR survey than the census survey)

## *Status of supplemental irrigation on various cropping and livestock systems*

The following is a snapshot of where various commodities stand in regard to the use of supplemental irrigation.

### *Potatoes*

Maine's **potato** industry has completed an intensive 10-year research effort on supplemental 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.

Table 5 points out that Aroostook County, the largest user of irrigation in Maine, has shown a significant increase in irrigation use in the past 10 years. Aroostook County's water needs increased 417.94% between the years 1982 and 1997. Table 11 shows clearly that the water needs of Aroostook County are far from being fulfilled.

### *Wild 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. Maine wild blueberry producers are increasingly relying on supplemental water to irrigate their crop. Producers reported irrigating 3874 acres in 1997 as compared to 1177 acres 15 years earlier, in 1982. Current irrigated acreage of blueberries is much higher, potentially greater than 6,000 acres.

**Table 3: Number of Farms Currently Irrigating by Amount of Acreage Irrigated**

| Acres Irrigated | Number of Farms |
|---|---|
| 1 or less | 230 |
| 1.1 to 10 | 212 |
| 11 to 25 | 42 |
| 26 to 50 | 30 |
| 51 to 100 | 20 |
| 101 to 200 | 16 |
| 201 to 300 | 8 |
| 301 to 400 | 4 |
| 401 to 500 | 3 |
| 501 to 1000 | 2 |
| 1000 to 2500 | 1 |
| 2501 to 4000 | 4 |
| **Total** | **572** |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

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 supporting a long-term, university and USDA-ARS directed, research project to understand plant water requirements and the effects and timing of irrigation on yield and quality so that irrigation water management can be fine-tuned.

The development of sustainable water sources for the wild blueberry crop includes the need for ponds, impoundments and wells. Development of these sources and storage 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.

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 protect habitat. This effort has impacted wild blueberry growers who utilize those water sources for irrigation. The original State of Maine Salmon Conservation Plan, which gained consensus of agricultural interests and State and Federal Environmental Agencies, encouraged a solutions-based approach to the issue. 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 rivers and 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. Wild blueberry growers are willing participants in the need to seek alternative water sources, but they have felt the State and Federal government has not adequately supported a solutions-based approach as originally intended in the plan. However, full implementation of the Downeast Rivers Water use management Plan could result in significant progress.

**Table 4: 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 |
| Wild 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 build and maintain 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 effects on dwarf trees, 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 building; Overhead sprinkler, drip and black plastic |
| Hay land | 958 | Used to maintain or 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 |

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

## *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 that 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 and coastal 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 Department of Agriculture forums stated irrigation was needed to maintain profitability in this market, and he 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.

## Table 5: Amount of Irrigation in Aroostook County, by Year

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Aroostook County | | | | | | | |
| Year | Total Number of Farms | Number of Irrigating Farms | Percent of Total Farms Irrigating | Total Farmland in County | Total Cropland in County | Total Farmland on Irrigated Farms | |
| 1982 | 1253 | 14 | 1% | 385828 | 203750 | 11642 | |
| 1987 | 1012 | 36 | 4% | 329971 | 187566 | 22518 | |
| 1992 | 884 | 47 | 5% | 334040 | 189850 | 43768 | |
| 1997 | 889 | 76 | 9% | 324887 | 187599 | 72045 | |
| | | | | | | | |
| | | | | | | | |
| Year | Irrigated Acreage | Percent of Cropland Irrigated | Increase in Acreage Irrigated | Overall Increase Since 1982 | Estimated Amount of Water Used acre-feet | | |
| 1982 | 1066 | 1% | | | 530 | | |
| 1987 | 2135 | 1% | 100% | | 1061 | | |
| 1992 | 4948 | 3% | 132% | 364% | 2460 | | |
| 1997 | 11058 | 6% | 123% | 418% | 5498 | | |
| | | | | | | | |

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

## *Livestock, Poultry and Dairy*

Maine's livestock and poultry industry must have water in order to function (See Table 7). Most dairy milkers require up to 30 gallons per day, and beef, horse, deer, sheep, pig and exotic animal farms require at least 5 gallons per day per animal. Dairy farms require additional amounts for washing and cleaning equipment, and for managing disposal of manure. Many livestock farmers depend on open access to ponds or streams during the summer period when livestock graze in pastures. Most of Maine's grain and hay acreage for animal feed is not irrigated, and drought risk is high. Livestock farmers manage that risk by having to purchase feed from out of state, costing millions of extra dollars in increased feed costs during periods of drought. Maine's poultry farms, which represent 20% of Maine total contribution to the farm economy, depend on wells for high quality water to feed caged poultry. Without a constant supply, millions of dollars of losses could occur overnight. As with livestock, Maine poultry grain crops, if impacted by drought, result in increased feed costs.

Table 6 demonstrates that the need for development of future water sources is not limited to crop production. Livestock operations in every county in Maine project acquisition of additional animal units and will need to develop water sources as herd sizes increase, new manure management systems are implemented, and new milk room and barn wash water techniques are used. In every County in Maine there are livestock farms that need water for animal drinking, cleaning and manure management and that need continues to increase.

**Table 6: Current and Projected Animal Units Watered by County**

| | Current Dairy | Projected Additional Dairy | Large Animal | Projected Additional Large Animal | Poultry | Projected Additional Poultry | Other | Projected Additional Other |
|---|---|---|---|---|---|---|---|---|
| Kennebec | 5760 | 1852 | 770 | 590 | 2568 | 1600 | 258 | 100 |
| Southern Aroostook | 764 | 75 | 1321 | 911 | 1337 | 1885 | 63 | 35 |
| Central Aroostook | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Northern Aroostook | 0 | 4 | 4191 | 1646 | 243 | 630 | 4 | 0 |
| Franklin | 2039 | 125 | 541 | 104 | 559 | 0 | 58 | 0 |
| Piscataquis | 919 | 75 | 231 | 160 | 778 | 1274 | 125 | 189 |
| Oxford | 490 | 0 | 535 | 106 | 810 | 215 | 0 | 0 |
| Cumberland | 922 | 10 | 1858 | 220 | 1141 | 270 | 120343 | 50 |
| York | 1218 | 0 | 788 | 227 | 583 | 179 | 800 | 6 |
| Penobscot | 4528 | 1452 | 782 | 353 | 1837 | 1262 | 287 | 33 |
| Androscoggin/ Sagadahoc | 5220 | 2268 | 950 | 101 | 418 | 325 | 277 | 19 |
| Hancock | 27 | 7 | 348 | 67 | 2528 | 1009 | 595 | 170 |
| Knox-Lincoln | 695 | 101 | 326 | 98 | 23857 | 32235 | 410 | 115 |
| Waldo | 4086 | 1150 | 255 | 55 | 385 | 310 | 221 | 156 |
| Somerset | 4182 | 410 | 141 | 335 | 217 | 71 | 371 | 280 |
| Washington | 100 | 15 | 334 | 337 | 1400 | 783 | 195 | 243 |
| | | | | | | | | |
| **TOTAL ALL STATE** | **30950** | **7544** | **13371** | **5310** | **38661** | **42048** | **124007** | **1396** |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

# *The Future Need for Agricultural Water Sources in Maine*

Tables 8 & 9 indicate that Maine farmers recognize the need for alternative water sources. There is no doubt that farmers need more water sources, both based on market forces described above, and losses due to drought documented in Table 10. They also indicate a need for new or supplemental sources to meet crop demand. This need seems to be consistent across all counties of the state. Washington County however, has significantly large number of farmers with water source concerns.

## *Significant economic loss of crops due to drought*

Table 10 shows the significant economic loss of crops to Maine farmers (and the Maine economy in general) due to the drought years of 2001 and 2002. **The 28% of Maine farmers who responded to the survey report losses in excess of $32,000,000 dollars over the two-year drought period.**

## *How many new acres and quantities of water needed?*

The number of farm acres irrigated in Maine has 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 provided anecdotal estimates that in the next five years irrigation may increase an additional 20,000 acres.

The most recent 2002 Department of Agriculture survey provides more accurate information and shows that the respondents indicated 28,928 acres irrigated in 2002, compared to 1997 Census data of 22,000 acres irrigated. Table 11 from the survey indicates that **the responding survey farms currently estimate a need for an additional 21,730 acres to be irrigated.** This reaffirms the estimates projected previously.

## *Current and future capital investment in irrigation systems*

Of the Maine farmers who were surveyed, they have reported capital investments in excess of $15 million dollars in irrigation equipment for systems like those described in Table 4. From Table 13, we see that an additional $13,806,500 is estimated to be necessary to set up new irrigation systems as described in Table 12. These figures do not include source development. This information was calculated by the number of systems in use multiplied by an assumed cost/system. This figure is a conservative estimate in that we only surveyed 28% of the farmers in Maine.

## Table 7: What Livestock Farms Use Water For

| Counties | Animal Drinking | Cleaning Equipment | Manure Management | Have a Manure Pit |
|---|---|---|---|---|
| | (Farms) | (Farms) | (Farms) | (Farms) |
| Kennebec | 47 | 36 | 10 | 13 |
| Southern Aroostook | 35 | 11 | 5 | 4 |
| Central Aroostook | 0 | 0 | 0 | 0 |
| Northern Aroostook | 22 | 10 | 1 | 2 |
| Franklin | 46 | 26 | 5 | 8 |
| Piscataquis | 27 | 14 | 2 | 1 |
| Oxford | 34 | 13 | 0 | 0 |
| Cumberland | 31 | 15 | 0 | 5 |
| York | 47 | 26 | 1 | 3 |
| Penobscot | 40 | 26 | 7 | 14 |
| Androscoggin/ Sagadahoc | 56 | 37 | 6 | 16 |
| Hancock | 35 | 14 | 1 | 1 |
| Knox-Lincoln | 36 | 19 | 1 | 4 |
| Waldo | 36 | 27 | 7 | 13 |
| Somerset | 32 | 23 | 3 | 9 |
| Washington | 25 | 8 | 1 | 0 |
| | | | | |
| **TOTAL ALL STATE** | 549 | 305 | 50 | 93 |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

## *Capital investment for new water sources*

When asked if they are planning for new water sources in the next 2 to 5 years, 54 % of the survey respondents said they are making plans. 59%, five percent more, said they would proceed if government cost share money is available (Table 14) With the help of reservoirs and ponds, farmers can capture and conserve the water they need. Farmers irrigating from all classes of rivers, streams and lakes need clean water. Farmers need to know that they can draw from streams and rivers during high flows and peak flow periods to fill storages. 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 waterfowl, creation of peripheral wetland wildlife habitat, and reduction of flood potential in areas where ponds and impoundments are developed. In addition, new storage development will protect in-stream habitat during low flow periods due to the reduced use of streams and rivers during those low flows.

It is clear from Table 15 that a majority of the new water sources to be developed will be ponds and wells. These alternative sources may have lower environmental impacts than natural sources, but they require a major capital investment to develop and establish. **Although costs will vary widely from site to site, the estimated averages presented in the table provide a good estimate that $15,800,000 is needed for new and sustainable water sources for Maine Farmers.** It would seem that most farmers planning for new water sources perceive a strong need and urgency for this at this time, as indicated and supported by the economic loss estimates in Table 10.

When the amount of $13,800,000 needed for future capital investment in irrigation equipment is combined with the $15,800,000 needed for new and alternative water sources, we arrive at a total of $29,604,000 necessary to meet the water use needs of the respondents to the 2002 Maine Department of Agriculture Water Use Survey. These results are conservative, since we only heard from about 1/3 of the non-irrigating farmers in the State.

**Table 8: Extent of Need For New Water Sources Based on Current and Future Potential Use**

| | | | Drawing From Stream or Pond |
|---|---|---|---|
| County | Current Needs Not Met in a drought year | Future Needs are not met with the current water supply | If drawdown limit is imposed, will not have adequate water for future needs |
| Kennebec | 21 | 10 | 20 |
| Southern Aroostook | 16 | 10 | 20 |
| Central Aroostook | 7 | 7 | 11 |
| Northern Aroostook | 28 | 19 | 34 |
| Franklin | 13 | 11 | 18 |
| Piscataquis | 15 | 16 | 10 |
| Oxford | 10 | 11 | 12 |
| Cumberland | 15 | 10 | 19 |
| York | 27 | 20 | 34 |
| Penobscot | 29 | 19 | 27 |
| Androscoggin Sagadahoc | 25 | 24 | 31 |
| Hancock | 29 | 18 | 28 |
| Knox-Lincoln | 23 | 10 | 10 |
| Waldo | 17 | 14 | 10 |
| Somerset | 16 | 11 | 10 |
| Washington | 69 | 75 | 93 |
| **TOTAL ALL STATE** | 360 | 285 | 387 |
| | | | |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

**Table 9: Non-irrigators, by county, who plan to start irrigating in the next 2-5 years**

| County | Number of farmers interested in starting to irrigate |
|---|---|
| Kennebec | 5 |
| Southern Aroostook | 12 |
| Central Aroostook | 6 |
| Northern Aroostook | 2 |
| Franklin | 1 |
| Piscataquis | 2 |
| Oxford | 2 |
| Cumberland | 2 |
| York | 2 |
| Penobscot | 2 |
| Androscoggin/ Sagadahoc | 4 |
| Hancock | 11 |
| Knox-Lincoln | 4 |
| Waldo | 5 |
| Somerset | 5 |
| Washington | 20 |
| **TOTAL** | **95** |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

**Table 10: Economic Loss of Crops due to Drought, 2001 and 2002 with 28% of Maine Farmers responding to Survey**

| Farmers Self- reporting | | | | | | |
|---|---|---|---|---|---|---|
| County | 2001 Loss | Number of Farms Reporting | Average Loss Per Farm | 2002 Loss | Number of Farms Reporting | Average Loss Per Farm |
| Kennebec | $ 249,275 | 43 | $ 5,797 | $ 327,810 | 38 | $ 8,627 |
| Southern Aroostook | $ 643,250 | 29 | $ 22,181 | $ 575,900 | 21 | $ 27,424 |
| Central Aroostook | $2,897,260 | 29 | $ 99,906 | $ 3,300,701 | 27 | $ 122,248 |
| Northern Aroostook | $1,764,600 | 34 | $ 51,900 | $ 1,718,300 | 33 | $ 52,070 |
| Franklin | $ 122,150 | 26 | $ 4,698 | $ 193,350 | 30 | $ 6,445 |
| Piscataquis | $ 226,450 | 25 | $ 9,058 | $ 164,950 | 24 | $ 6,873 |
| Oxford | $ 102,067 | 22 | $ 4,639 | $ 421,370 | 26 | $ 16,207 |
| Cumberland | $ 409,950 | 30 | $ 13,665 | $ 398,600 | 27 | $ 14,763 |
| York | $ 335,210 | 50 | $ 6,704 | $ 486,291 | 52 | $ 9,352 |
| Penobscot | $1,747,400 | 61 | $ 28,646 | $ 2,151,950 | 61 | $ 35,278 |
| Androscoggin/ Sagadahoc | $ 769,400 | 55 | $ 13,989 | $ 960,650 | 56 | $ 17,154 |
| Hancock | $2,385,460 | 46 | $ 51,858 | $ 1,586,280 | 43 | $ 36,890 |
| Knox-Lincoln | $ 197,770 | 36 | $ 5,492 | $ 212,025 | 36 | $ 5,890 |
| Waldo | $ 410,625 | 33 | $ 12,443 | $ 343,425 | 30 | $ 11,447 |
| Somerset | $ 88,250 | 19 | $ 4,645 | $ 145,300 | 25 | $ 5,812 |
| Washington | $3,154,126 | 93 | $ 33,915 | $ 4,343,393 | 83 | $ 52,330 |
| **TOTAL ALL STATE** | **$15,503,243** | 631 | $ 24,569 | **$17,330,295** | 612 | **$ 28,317** |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

## Table 11: Current and Future Acreage Irrigated In Maine by County

| County | Current acreage | Additional future acreage |
|---|---|---|
| Kennebec | 165 | 195 |
| Southern Aroostook | 3762 | 1133 |
| Central Aroostook | 6045 | 4615 |
| Northern Aroostook | 849 | 2968 |
| Franklin | 46 | 138 |
| Piscataquis | 126 | 309 |
| Oxford | 1211 | 65 |
| Cumberland | 450 | 220 |
| York | 792 | 398 |
| Penobscot | 3924 | 2278 |
| Androscoggin/ Sagadahoc | 1124 | 1289 |
| Hancock | 3971 | 2069 |
| Knox/Lincoln | 175 | 304 |
| Waldo | 199 | 227 |
| Somerset | 77 | 95 |
| Washington | 6011 | 5430 |
| | | |
| **Total All State** | **28928** | **21730** |

(Source-Maine Department of Agriculture Water Use 2002 Survey)

**Table 12: Type and Number of Potential New Systems Contemplated by Farmers**

| System | Number of Systems contemplated |
|---|---|
| Drip or Trickle Irrigation | 173 |
| Center Pivot | 65 |
| Linear Move | 11 |
| Traveler | 103 |
| Solid Set | 110 |
| Garden Hose | 140 |

(*Source – 2002 Maine Department of Agriculture Water Use Survey -These figures may be overstated as some farmers may use existing systems to expand their operations.)

**Table 13: Current and Future Capital Investment in Irrigation Equipment**

| | |
|---|---|
| **Current Total Reported Capital Investment** | $15,030,900 |
| **Future Potential Added Capital Investment** | $13,806,500 |
| | |

(*Source – 2002 Maine Department of Agriculture Water Use Survey)

**Table 14: Of the 28% survey responders, those planning a new water source in next 2-5 years**

| County | # who plan a new water source | # who would put in a new water source if cost sharing became available: |
|---|---|---|
| Kennebec | 32 | 31 |
| Southern Aroostook | 29 | 27 |
| Central Aroostook | 26 | 25 |
| Northern Aroostook | 41 | 45 |
| Franklin | 23 | 27 |
| Piscataquis | 22 | 23 |
| Oxford | 18 | 16 |
| Cumberland | 32 | 30 |
| York | 53 | 50 |
| Penobscot | 47 | 51 |
| Androscoggin/ Sagadahoc | 46 | 53 |
| Hancock | 50 | 58 |
| Knox-Lincoln | 34 | 32 |
| Waldo | 30 | 37 |
| Somerset | 22 | 26 |
| Washington | 85 | 111 |
| | | |
| Total Farmers | 590 | 642 |
| % Reporting Farmers | 54% | 59% |

(Source – 2002 Maine Department of Agriculture Water Use Survey)

**Table 15: Where the water will come from: Future sources of water to be developed by farmers**

| | | | Natural | Sources | Of Water | | |
|---|---|---|---|---|---|---|---|
| County | Own Well | Municipal Water | Impoundment | Free Flowing River | Natural Lake or Pond | Farm Pond, No Outlet | Farm Pond With Outlet |
| | | | | | | | |
| Kennebec | 22 | | | 4 | 2 | 7 | 10 |
| Southern Aroostook | 13 | | | 3 | 2 | 10 | 9 |
| Central Aroostook | 2 | | 2 | 12 | 5 | 12 | 9 |
| Northern Aroostook | 8 | | | 9 | 2 | 11 | 13 |
| Franklin | 9 | 2 | | 6 | | 4 | 1 |
| Piscataquis | 8 | | | 4 | | 6 | 8 |
| Oxford | 6 | | | 2 | 1 | 3 | 5 |
| Cumberland | 20 | 1 | | 5 | 2 | 7 | 10 |
| York | 16 | | 1 | 8 | 4 | 10 | 22 |
| Penobscot | 20 | 1 | 2 | 7 | 2 | 26 | 16 |
| Androscoggin/ Sagadahoc | 24 | 2 | 2 | 9 | 2 | 10 | 15 |
| Hancock | 24 | | | 4 | 5 | 13 | 11 |
| Knox-Lincoln | 17 | 2 | 1 | 5 | | 17 | 10 |
| Waldo | 16 | | | 3 | 1 | 9 | 6 |
| Somerset | 11 | 3 | 1 | 5 | 1 | 2 | 6 |
| Washington | 43 | | 2 | 19 | 7 | 54 | 70 |
| **TOTAL ALL STATE** | 259 | 11 | 11 | 105 | 36 | 201 | 221 |
| Est. avg. cost of est. new source | $7500 | | $200,000 | | | $25,000 | $30,000 |
| Est. total capital investment for farmers responding | **$1,942,500** | | **$2.200,000** | | | **$5,025,000** | **$6.630,000** |

(Source: Maine Department of Agriculture 2002 Water Use Survey)

# *APPENDIX 3:*

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.

## Maine Agricultural Water Management Advisory Committee

| | |
|---|---|
| **David Bell** | Wild Blueberry Commission |
| **Bill Bell** | Maine Association of Conservation Districts |
| **Julie-Marie Bickford** | Maine Dairy Industry Association |
| **Dean Bradshaw** | Maine Cranberry Growers Association |
| **Mike Bragdon** | Maine Potato Growers, Inc |
| **David Brooks** | Sevee and Maher Engineers, Inc. |
| **Brad Caswell** | Cherryfield Foods |
| **Doug Chipman** | Maine Vegetable and Small Fruit Growers Association |
| **Neil Crane** | Crane Brothers, Inc |
| **Timothy Dalton** | University of Maine–Resource Economics |
| **Don Fitzpatrick** | Fitzpatrick Farms |
| **Jack Flaherty** | Flaherty's Family Farm Inc. |
| **Tom Gyger** | Five Fields Farm |
| **Tim Hobbs** | Maine Potato Board |
| **Mark Hutton** | University of Maine Cooperative Extension |
| **Daniel LaBrie** | Labrie Farms |
| **Tahd McInnis** | Central Aroostook Soil and Water Conservation District |
| **Leigh Morrow** | McCain Foods |
| **Jesse O'Brien** | Down East Turf Farms, Inc. |
| **Jeff O'Donal** | O'Donal's Nurseries, Inc. |
| **Fred Olday** | Jasper Wyman & Son |
| **Jon Olson** | Maine Farm Bureau |
| **Sid Reynolds** | Cherryfield Foods |
| **Harry Ricker** | Ricker Hill Orchards |
| **Eric Sideman** | Maine Organic Farmers and Gardeners Association |
| **Ford Stevenson** | Stevenson's Strawberry Farm |
| **Lauchlin Titus** | CPA Ag/CCA Ag Matters |
| **Bussy York** | York Farms |

### Maine Department of Agriculture Staff to the Committee

| | |
|---|---|
| **Ann Gibbs** | State Horticulturist |
| **John Harker** | Agricultural Water Management Program Manager |