STATUS AND TRENDS OF FRESHWATER WETLAND PROTECTION AND MANAGEMENT IN RHODE ISLAND

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TABLE OF CONTENTS

Introduction……...1

Wetland Systems …….…….1

Extent of Freshwater Wetland…….…..1

Freshwater Wetland Legislation ……..…….…..….2

Freshwater Wetland Regulation…….…...3

.

Wetland Delineation…….…5

Wetland Data and Data Management……...6

Wetland Permits……7

Wetland Compliance and Inspection…… ……..…….8

Wetland Losses and Gains……... 8

Other Wetland Program Initiatives……..11

More Information…….11

References……....12

Introduction

There are approximately 112,000 acres of freshwater wetlands in Rhode Island comprising 16.2% of the State's area. Under Title 2, Chapter 1 of the Rhode Island General Laws, the Department of Environmental Management (DEM) must approve alteration of the majority of the State's freshwater wetlands. DEM is obligated to report to the Environmental Protection Agency (EPA) on the State's wetlands permitting and enforcement programs as well as other wetland protection and management initiatives. This Status and Trends report summarizes 1) data on the extent of Rhode Island's freshwater wetlands, 2) wetland regulatory reforms of the 1990's, 3) freshwater wetland permit and enforcement actions for the years 1996 through 1998, and 4) the extent of wetland losses and gains during the same period.

Wetland Systems

The United States Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979) groups wetlands into five major systems, three of which are freshwater systems: the palustrine, lacustrine, and riverine systems. Most of Rhode Island's freshwater wetlands are **palustrine** wetlands including palustrine forested, scrub-shrub, emergent, and open water wetlands. Rhode Island's palustrine wetlands include swamps, marshes, bogs, and ponds. The **lacustrine** system includes wetlands with nonpersistent emergents, submergents, and floating plants as well as deepwater habitats, such as Rhode Island's lakes, reservoirs, and ponds that are larger than 20 acres in size and/or greater than 2 meters in depth. The **riverine** system includes both wetlands and deepwater habitats that occur within a channel. The riverine system includes Rhode Island's rivers, perennial streams, and intermittent streams.

Extent of Freshwater Wetland

According to the Rhode Island Geographic Information System dataset (1988) there are 92,536 acres of palustrine wetland, 17,518 acres of lacustrine wetland and deepwater habitat, and 1,839 acres classified as riverine within Rhode Island. Palustrine wetlands represent 13.4% of the State's surface area; lacustrine areas represent 2.5%; and riverine areas represent 0.3% of Rhode Island's area. In total, freshwater wetlands and deepwater habitats comprise approximately 16.2% of Rhode Island's surface area.

The most abundant wetland type in Rhode Island is palustrine forested wetland, commonly known as wooded swamps. There are approximately 72,000 acres of swamp dominated by either red maple (*Acer rubrum*) or Atlantic white cedar (*Chamaecyparis thyoides*) trees. Red maple swamps are more common; they occur on poorly and very poorly drained soils throughout the State. Other classes of Rhode Island wetlands and their approximate acreage are listed in Table 1.

Freshwater Wetland Legislation

Rhode Island's freshwater wetlands are under the jurisdiction of both the federal and state governments through the authority of several statutes. The major federal laws that effect freshwater wetlands are the National Environmental Policy Act (NEPA) of 1969, and the Federal Water Pollution Control Act of 1972 (Clean Water Act, 33 U.S.C. 1251 et seq). NEPA requires all federal agencies that propose alteration of wetlands to complete alternative analyses and environmental reports that assess the impacts to wetlands and other resources. The Clean Water Act Section 404 gives authority for the regulation of wetlands to the USACE and the EPA. Permits are required from the USACE for discharges of dredged or fill material into wetlands. Through Section 401 of the Clean Water Act DEM can ensure compliance with the State's water quality standards thereby protecting wetlands.

Rhode Island was among the first states in the nation to pass its own legislation to protect freshwater wetlands. According to the Freshwater Wetlands Act (1971) (R. I. Gen. Laws §2-1-18 et seq.) it is the public policy of the State of Rhode Island and Providence Plantations to preserve the purity and integrity of the State's freshwater wetlands in order to protect the health, welfare, and general well-being of the public. Section 2-1-18 of the Act describes the wetland functions and values that are regulated and preserved: floodwater storage, groundwater recharge, water quality improvement, wildlife habitat and recreation.

In 1995, Governor Almond issued Executive Order 95-12, which established the Governor's Advisory Committee on Wetlands and Septic Systems. The Governor directed this Committee to review DEM's freshwater wetlands and septic systems programs and to recommend ways to

Table 1. Freshwater wetland and deepwater habitats of Rhode Island (RIGIS 1988)

Type	Area (acres)
Palustrine system	
Forested wetland	
deciduous wooded swamp	60,694
coniferous wooded swamp	10,900
dead wooded swamp	225
Scrub-shrub wetland	
shrub swamp	9,606
shrub fen or bog	2,060
Emergent wetland	
marsh or wet meadow	4,341
emergent fen or bog	229
Open water wetland	
ponds	4, 481
Lacustrine system	
Lacustrine open water	17,518
Riverine system	
Riverine nontidal open water	1,832
Riverine tidal open water	7
Total area	111,893

improve the regulations, the overall operation of the programs, and the protection of wetlands. The Committee's Final Report (1995) included 60 recommendations for operational and legislative changes within these two programs. The Committee then drafted revised wetlands legislation, and the Governor's Office introduced the legislation to the General Assembly in March 1996. The bill failed to pass in 1996, and was reintroduced, in slightly modified forms, in 1997, 1998, and again in 1999, without success.

Freshwater Wetland Regulation

DEM is the State agency charged with protection and regulation of the majority of the State's freshwater wetlands. The Office of Water Resources (OWR) and the Office of Compliance and Inspection (OCI) currently administer and enforce the Wetlands Act and the *Rules and*

Regulations Governing the Administration and Enforcement of the Act (April 1998). In general, approval is required for any activity that may alter the character of any freshwater wetland. Applicants are required to avoid and minimize all impacts to wetlands, and no random, unnecessary, or undesirable alteration to wetlands is permitted. Exempt activities, as specified by law or by the Rules, which are carried out in a manner which is protective of wetland functions and values, do not need a specific written approval from DEM. Certain projects including new farm roads, new farm ponds, and drainage structures for agricultural purposes are regulated by DEM's Office of Agriculture and Resource Marketing. The Office of Agriculture coordinates the review and evaluation of such projects with the OWR to ensure that such projects represent insignificant alterations to freshwater wetlands.

If a freshwater wetlands permit is required from DEM the application usually takes either one of two forms, depending on the extent of the proposed wetland alteration. Both application types are reviewed in the order in which they are received, except that any application that is submitted with a *Certificate of Critical Economic Concern* is given priority review.

The applicant may submit a *Request for a Preliminary Determination* application to determine if the Wetlands Act applies, if the proposed project represents an insignificant alteration of wetland, or if the proposed project represents a significant alteration of wetland. There are no public notice requirements for this application type. The Act requires that DEM make a determination within 30 days of the receipt of a complete application, however, the average decision time for this type of application is approximately 45 to 60 days. The DEM has committed in its workplan to reducing the decision times.

If the proposed project represents a significant alteration of wetlands, then an *Application to Alter* would be filed. An *Application to Alter* includes a 45-day public notice period. If a substantive objection is received during the public notice period, then a public hearing is scheduled. A city or town may vote to disapprove an application during the public notice period and DEM is then obligated to deny the application. The average decision time for an *Application to Alter* is approximately 1 year from the receipt of a complete application. If the application is submitted with a *Certificate of Critical Economic Concern*, the decision time is approximately 4

to 6 months. Processing times may vary depending upon the completeness of the application submitted.

Within the last five years, DEM has implemented several regulatory changes aimed at clarifying and streamlining the Wetland Program. In 1994, DEM completed a comprehensive revision of the wetland Rules in order to codify practices, results of case law, and policies which had developed since the Rules were last revised in 1981. In 1997, the OWR finalized a coordinated review process with the USACE, New England District, for wetland alteration under the authority of the Clean Water Act, Section 404. DEM implements the Programmatic General Permit (PGP) authorized by the USACE for freshwater wetland alterations that are below specified thresholds. In April 1998, as part of a continuing streamlining initiative, DEM promulgated additional revisions to the wetland Rules to expand the list of activities exempt from permit requirements, provided that certain standard conditions are met (Rule 6.00).

In 1996, the State legislature passed a revision to R.I. Gen. Law §46-23-6 which gave the Coastal Resources Management Council (CRMC) exclusive jurisdiction over freshwater wetlands in the vicinity of the coast. It was the legislators' objective to eliminate duplicative permitting requirements for freshwater wetlands in the coastal zone. DEM and the CRMC have delineated a jurisdictional boundary which is depicted on maps that are available at the agencies and the municipalities. CRMC has promulgated *Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast* (August 1999) to implement the legislative change. Henceforth, freshwater wetlands on the shoreward side of the jurisdictional boundary will be regulated by the CRMC, while wetlands on the landward side of the boundary will be regulated by DEM. The CRMC will adhere to the same baseline standards of freshwater wetland protection as those upheld by DEM under the Wetlands Act.

Wetland Delineation

One of the more substantive changes made to the Rules in 1994 was related to the definition and delineation of freshwater wetlands. The Wetlands Act defines freshwater wetlands as:

> "marshes, swamps, bogs, ponds, rivers, river and stream floodplains and banks, areas subject to storm flooding and flowage; emergent and submergent plant communities in any body of fresh water including rivers and streams and that area of land within 50 feet of the edge of any bog, marsh, swamp, or pond."

Wetland types are further defined based on indicator plants or hydrology. Some of these definitions are not in step with current science, particularly the hydrological criteria. As a result delineation in Rhode Island had been based almost exclusively on vegetation dominance. This has been problematic in certain circumstances because many of the indicator plants listed in the Act grow in both wetlands and uplands.

Through the 1994 revisions to the Rules, DEM presented criteria for wetland delineation that are more consistent with current science; these criteria referenced hydrological indicators and soils to a greater degree than the prior Rules (Appendix 4). The Rules advised that, if an edge cannot be determined based on vegetation alone, then "other hydrological indicators must be considered." These indicators are physical features that can be observed and used as evidence of the presence of surface water or shallow groundwater at some time during the year. The Rules included "morphological features or properties associated with hydric soils as one of the hydrologic indicators." Although the Rules recognize two official parameters (vegetation and hydrology), soils can be used to document the hydrology. The Rules also stated that the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), which requires the presence and documentation of hydrophytic vegetation, hydrologic indicators, and hydric soils, would be acceptable for delineation of wetlands in Rhode Island.

Wetland Data and Data Management

The OWR and OCI use the windows-based *Visual Foxpro* data management system to manage and track the flow of paper associated with all wetlands applications and enforcement complaints. The system, which has been in place since 1985, was upgraded to the visual system in 1999 (version 2.5), and at the same time it was made Y2K compliant. *Foxpro* is used heavily and effectively for tracking all events, retrieving information, generating reports, and to some extent for workload management. A geographic information component may be incorporated into the data system and ultimately a spot location reference may be in place for all applications and enforcement actions. A separate DEM-wide permit streamlining effort is underway, and it is estimated that by September 2000 an ORACLE data management system may be developed which would link wetlands data with other programs.

Almost ten years ago, Rhode Island's freshwater wetlands were delineated and classified using 1988 panchromatic aerial photographs (scale 1:24,000; minimum map unit ¼ acre). They were then digitized for incorporation into the RIGIS database. The RIGIS wetlands maps and dataset are seldom used by the permitting or compliance staffs because they do not provide the parcel-level detail necessary to make site specific determinations. However, the RIGIS-based wetlands dataset is used by others within DEM and by municipalities, consultants, and scientists for project planning, research, management and assessment. There is some interest in updating the statewide wetland mapping due to the age and the limitations of the original delineations and classifications.

DEM's aerial photograph collection is used frequently by OWR and OCI biologists to identify and classify wetlands, to determine wetland size, to assess wetland function, to identify unauthorized alterations, etc. The collection includes panchromatic stereoscopic contact prints for the years 1970, 1985, 1992, 1995, and 1999 at scales of 1: 9600 or 1:12,000. In addition DEM has monoscopic photographs for 1972 and 1981. This photograph collection enables staff biologists to visually observe and monitor wetland change at any location in the State at various time intervals since the Act was enacted in 1971. These photographs are available for public inspection on an appointment basis.

Wetland Permits

In the calendar years 1996, 1997, and 1998 the OWR Wetlands Program issued 416, 362, and 328 new permits respectively. In each of these three years, over 90% of the new permits were for projects involving insignificant alterations to wetlands. A total of 69 significant alteration permits and 8 emergency permits were granted during this time period. Eleven applications were denied in 1996 through 1998.

The greatest number of new permits were issued for residential development, including new residential lots, modifications to already developed lots, and residential subdivisions. Permits for residential development represented 58% of the permits issued in 1996, 52% of the permits issued in 1997, and 57% of the permits issued in 1998. Permits issued for apartments and condominiums are not included in these figures.

More specifically, the greatest number of permits granted in each of the years 1996, 1997, and 1998 was for the development of new residential lots: 127, 107, and 161, respectively. This represents 31%, 30%, and 49% of the total permits granted in each of those years. During that 3-year period, 44 of the permits for residential development were significant alteration permits, 29 of which were significant alteration permits for new residential lots. The numbers of insignificant alteration and significant alteration permits granted for other project types are given in Table 2.

Wetland Compliance and Inspection

During calendar year 1998, the OCI received 593 wetland-related complaints. The OCI issued 68 enforcement actions, including, warning letters, Notices of Intent to Enforce, and Notices of Violation. The OCI also determined that 110 complaints were unfounded and that 62 additional complaints needed no further action. A total of 639 inspections were completed in 1998. A majority of enforcement actions are resolved without the need for adjudication or court action. The OCI seeks informal resolution of enforcement actions whenever possible. When necessary, cases are referred to the State's Attorneys General Office for prosecution; however no cases were referred in 1998. It is a goal of DEM's workplan to eliminate the backlog of enforcement cases.

Wetland Losses and Gains

Based on a review of *Application to Alter* files, the OWR has determined that 4.1 acres of wetland loss were authorized in 1993 through 1995 through 18 permit decisions (Table 3). During the same period, there were 2.1 acres of wetland gain authorized through one permit.

Table 3. Wetland loss and gain (acres) authorized by *Application to Alter* permits granted during 1993 through 1995.

	1993	1994	1995	Total
Wetland loss	2.9 ac.	0.6	0.6	4.1
Wetland gain	0	2.1	0	2.1

Table 2. Wetland permits granted 1996 through 1998 (Foxpro 1999)

	Number of permits			
	1996	**1997**	**1998**	**Totals**
Permit type /project type				
Insignificant alterations				
Apartments/condos	8	10	6	24
Residential lots	182	127	145	454
Residential subdivisions	49	42	30	121
Office/commercial	36	46	48	130
School/church	10	7	2	19
Industrial subdivision	2	3	0	5
Parks/recreation	4	5	3	12
Golf course	1	2	2	5
Road and bridge recon.	17	11	10	38
Driveway/access road	2	5	5	12
Trails,paths,footbridges, sidewalks	6	4	4	14
Drainage and subdrains	11	11	12	34
Utilities and wells	25	26	13	64
Dam repair	0	0	3	3
Fish ladder	0	0	3	3
New pond/pond excavation	5	0	3	8
Shoreline stabilization	1	0	3	4
River relocation	1	1	0	2
Demolition	0	1	1	2
Dry hydrant	0	1	1	2
Docks and floats	3	2	2	7
Land clearing	3	1	1	5
Irrigation	2	1	0	3
Boat launch	1	2	0	3
Remediation	0	1	0	1
Unclassified	21	21	8	50
Subtotal	391	332	306	1029
Significant alterations				
Residential lots	10	16	9	35
Residential subdivisions	2	3	4	9
Office/commercial	1	2	1	4
Road and bridge	2	3	1	6
Drainage	0	0	1	1
Utilities	0	0	1	1
Pond excavate	1	0	0	1
River relocate	0	1	0	1
Unclassified	5	2	4	11
Subtotal	21	27	21	69
Emergency Permits	4	3	1	8
Total permits	416	362	328	1106

In 1997, with the support of a 104(b)3 wetlands grant, OWR completed improvements to the data system to initiate computer tracking of wetland gains and losses in the permitting and compliance programs. Computerized tracking of losses and gains went on-line in January 1998. Data for calendar year 1998 indicate that 3.3 acres of wetland loss were permitted across 17 sites. All of these loss figures refer to vegetated wetlands and standing and flowing water wetlands only and do not include permitted alterations of the perimeter wetland, riverbank wetland, or floodplain. At this time, we are not able to relate the 1998 losses and gains to the actual project type.

It should also be noted that the results of a recent project to evaluate whether permit conditions are followed during site construction indicated that permit compliance is a concern and that additional losses are occurring in the field (Faneuf 1998). Therefore, total wetland loss may be somewhat higher due to unauthorized construction-related activities.

It is not possible to quantify what the statewide wetland loss would be without the Wetlands Permit Program or if all applications were approved as proposed. Rule 10.01 specifically requires applicants to avoid and minimize impacts to wetlands. This is an ongoing process that begins with the consultant and the applicant well before an application is submitted to the Program. Further avoidance and minimization happens as a result of preapplication meetings and finally avoidance and minimization occurs during the Program's review of an application.

Based upon enforcement activities, the OCI determined that in 1998, there were 8.7 acres of unauthorized wetland alteration, 1.9 acres of unauthorized alteration of rivers and streams, and 14.1 acres of unauthorized alteration of the 50-foot perimeter wetland, riverbank wetland or floodplain. A total of 5.4 acres of wetlands, 0.3 acres of rivers and streams, and 11.1 acres of perimeter wetland, riverbank wetland, and floodplain were reported restored during this period. Note that these figures reflect restorations completed in 1998 and may relate to violations initially reported in prior years. A total of 70 restoration actions were taken during 1998.

There is no data on the extent of overall wetland loss in Rhode Island. Dahl (1990) reported that Rhode Island lost 37% of its wetlands from the 1780's to the 1980's. However, the methodology

used to generate this figure was seriously flawed (F. Golet, University of Rhode Island Department of Natural Resource Science; pers. comm., 1999). In the Providence metropolitan area, major wetland losses can be attributed to urbanization. In the more rural parts of the State, transportation projects and residential development have been the primary causes of wetland loss both historically and in more recent times. Parkhurst (1977) found that highway construction and residential development caused the greatest amount of wetland loss in South Kingstown between the years 1939 and 1972. Wetland loss due to agriculture in Rhode Island has been relatively minor compared to other parts of the country.

In addition to direct wetland loss there has historically been conversion of wetlands from one class to another, with the construction of dams being the primary mechanism. The construction of dams has resulted in the conversion of palustrine vegetated wetlands and riverine wetlands to open water and deepwater habitats. Over time, areas of palustrine vegetated wetland have developed at the edges of the impoundments.

Other Wetland Program Initiatives

In 1999, DEM hired a wetland policy specialist who is dedicated to wetland program development and rulemaking. The wetland policy specialist works closely with the EPA Regional Wetland Program Coordinator, the University of Rhode Island, and other wetland professionals. The DEM is presently participating in Phase I of a study with the Environmental Protection Agency, Region 1, and the University of Rhode Island Department of Natural Resources Science looking at freshwater wetland restoration opportunities and developing criteria for identification and prioritization of restoration sites. DEM is also committed to working with the EPA and other New England states on the development and implementation of a regional bioassessment study in forested wetlands in the northeast. The Watershed Approach will be the key strategy for integrating more proactive wetland protection and restoration initiatives.

DEM is working on Rule changes to facilitate wetland restoration projects and water quality improvement projects in Rhode Island, as well as changes to the application fee schedule. Finally, DEM is carefully assessing the Rules and Regulations and associated management

procedures used in the Wetlands Program with a view toward identifying and implementing measures to improve the efficiency of the permitting process. This effort is being undertaken in conjunction with the Department-wide permit streamlining project and as an alternative to statutory reform.

More Information

For more information about wetland protection and management in Rhode Island contact:

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More about the DEM can found at the Department's website at www.state.ri.us/dem.

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