



WELLS HARBOR PLAN

Prepared by the Wells Harbor Plan Committee
— Adopted September 17, 1991 —

TC
225
.W45
W45
1991

TC225.W45W45 1991

TABLE OF CONTENTS

<u>Chapter</u>	<u>Page #</u>
Introduction	i
I History of Wells Harbor	1
II Goals	5
III Goals and Working Plan	6
IV Harbor Facilities	10
V Commercial Fishing	15
VI Recreational Boating	19
VII Economy	23
VIII Land Use Surrounding the Harbor	25
IX Natural Areas	28
X Shellfish	31
XI Beach Erosion	36
XII Dredging	38
<u>Appendix.</u>	43
A Lower Wells Division of the Rachel Carson Wildlife Refuge	
B Wells National Estuarine Research Reserve	
C Fish of the Wells Reserve	
D Birds of the Rachel Carson Refuge and the Wells Reserve	
E State Threatened and Endangered Plant List for the Wells Reserve	
F Report of the Wells Harbor Plan Committee Facilitation Meetings	
G Town of Wells Harbor Ordinance	
<u>References</u>	

TABLE OF MAPS

<u>Chapter/ Figure</u>	<u>Page #</u>
3.1 Schematic Plan for the Harbor Park.	11
3.2 Wells Harbor Facilities.	13
3.3 Wells Harbor Natural Features/ Original Army Corps Dredge.	14
6.1 Wells Harbor Existing Mooring Conditions, 1990.	21
6.2a Wells Harbor Mooring Plan/ Original Army Corps Dredge.	22
6.2b Wells Harbor Mooring Plan/ Fore-and-Aft Layout.	22
6.2c Wells Harbor Mooring Plan/ Single Point Layout.	22
8.1 Wells Harbor Area Parcel Map with Proposed Land Use Plan.	26
8.2 Wells Harbor Area Structural Density.	27
12.1 Major Components of Original Army Corps Activity.	40

INTRODUCTION

The Town of Wells meets the Atlantic Ocean in a beautiful and complex system of barrier beaches and estuaries. The Wells and Drakes Island Beaches, the Webhannet River estuary, and Wells Harbor itself constitute a unique body of coastal resources. Every summer, tens of thousands of visitors flock to Wells to enjoy and explore these natural areas. However, this seasonal influx, in conjunction with a growing year-round population, also puts pressure on the natural resources that have drawn visitors to Wells in the first place. Natural forces also contribute to stress on the Wells coast, as harbor in-fill and beach erosion have degraded the quality of these resources. In the face of the manifest need for a comprehensive management plan for the Wells Harbor area, the Wells Harbor Plan Committee has produced the Wells Harbor Management Plan that follows. This document represents the efforts of citizens, town officials, and representatives of federal, state and private organizations to preserve and enhance the natural coastal areas of Wells for the benefit of all.

The management focus of the plan is the harbor proper -- the area roughly defined by the seaward tip of the jetties, Drakes Island, Lower Landing, and the Mile Road. However, given the interconnected relationship of the harbor proper and the estuary, this area must be considered within the context of the larger system of which it is a part, which includes all tidal waters associated with the Webhannet River. The town recognized the importance of this systemic approach to resource management when it defined the area of Wells Harbor in the Town of Wells Code, Chapter 86, § 86-1 as "The Webhannet River and all of its tributaries both now and hereafter appearing where the tide ebbs and flows." Accordingly, this plan includes an inventory and analysis of the natural system that encompasses the geographic area affected by tidal water, and seeks to place policies designed to manage the harbor proper within that larger context.

Of specific concern is the issue of dredging, which is the focus of ongoing efforts to responsibly manage both the harbor proper and the entire estuarine system. As a statement by the Harbor Management Committee reads in part, "[the committee is] of the opinion that the existence of the Wells National Estuarine Research Reserve, including the Rachel Carson National Wildlife Refuge, and a navigable Wells Harbor are compatible under the conditions set forth in this plan." Countervailing sentiments have been expressed by some state regulatory agencies and private environmental organizations, who feel that the ecological value of the estuarine system as defined by state and federal law outweighs the town's legitimate interest in providing a safe and navigable harbor for its recreational and commercial fleet.

At the onset of the planning process the Harbor Management Committee developed a series of goals which outline the town's coastal priorities and provide the baseline for the Goals and Working Plan implementation section of the plan. These goals have been designed to accommodate the broadest possible participation in the management of Wells Harbor. The implementation policies, building on that wide input, support maintenance work on the harbor proper to facilitate public access and water-dependent uses, encourage the protection of the environment and wildlife of the harbor area, and promote continued and integrated research and planning for the coastal area. The cornerstone of these policies is the creation of a Harbor Advisory Committee, to be composed of all members of the Harbor Management Committee, with the charter to "discuss, recommend, coordinate and plan actions necessary to enhance and protect the material resources of the harbor's geographical area." This committee will continue the work begun by this plan, and will be responsible for implementing and monitoring the policies developed herein.

The members of the Harbor Plan Committee would like to express their appreciation for the time and expertise of the several federal, state and private agencies and organizations who have participated in or commented on the creation of this document. While much work remains to be done, it is the committee's hope that the considerable effort that has gone into this plan will form the groundwork for future policies which provide for a safe and navigable harbor, for the protection of the harbor's unique natural resources, and for the enhancement of Wells Harbor as a community asset of ecological, cultural and economic significance.

I HISTORY OF WELLS HARBOR

Cultural History

When coastal Maine was settled by the English in the 1630s, new communities up and down the seaboard were established on navigable waterways which provided routes for commerce, communication and travel. Wells was founded around its harbor and salt marsh and rivers in 1641, and they have been an important resource for the community since that time.

By the mid-1600s, shortly after the township's official incorporation, the area was bustling with activity. The salt marsh was harvested for its hay, the streams for fish and eels, and the flats on the Webhannet river and its branches for "the very best of Clams more than sufficient for the Inhabitants and the several adjoining towns who take as many as they wish for gratis."* The harbor and rivers were being used by coastal traders loading and unloading supplies. Materials for export in 1679 included boards, shingles and hoops. The shipbuilding industry began in earnest during the late 1600s and in 1728 the Littlefield shipyard was established at Six Acres. According to a brief history of Wells by E.E. Bourne,

before the Revolutionary War, a few of the people engaged in navigation. Several small vessels were built; some of these were engaged in the West India trade; others in coasting only. After the great conflict was closed, the enterprise in this direction was more general; larger vessels were built and more of the people embarked in it.

The lumber mills on the banks of the several streams and rivers in Wells turned out oak for shipbuilding and pine for export. In 1790 a vessel of 800 tons was built on the banks of the Webhannet which was probably employed to haul several cargoes of white pine and pitch pine to the West Indies each year. That the town depended significantly on its maritime industry is evident from Bourne's observation that "few or none" of the townspeople of Wells enlisted to serve their new country in the War of 1812, a war in which American mercantile and political interests were at odds over the continued American dependence on British trade.

In the summer of 1825 a pier "120 rods in length" -- 1,980 feet, or just over a third of a mile -- was constructed in order to reach the larger vessels that could not enter the harbor because of the "very bad sand bar which hath occasioned much expense to the ship owners." Then as now, the bar obstructed the harbor mouth and must have caused considerable disruption to the town's commerce, for Congress appropriated \$5,000 for the purpose of building the pier. The old pilings that supported the pier can still be seen along the shore behind the north jetty.

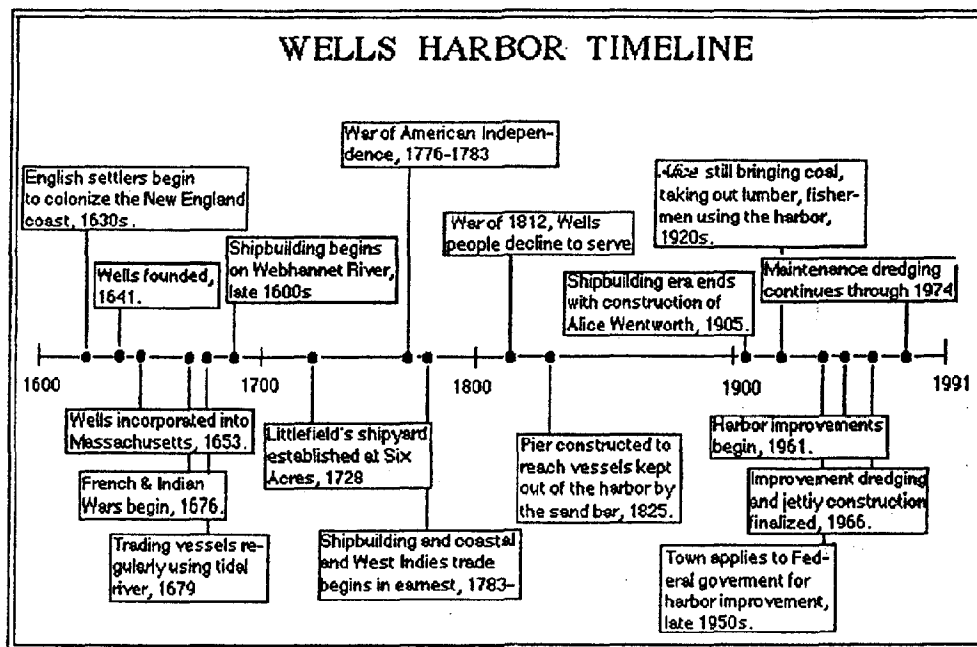
Shipbuilding continued through the 1800s with boatyards located at both the Upper and Lower Landings turning out vessels for local and West Indies trade. The construction of the coasting schooner *Alice S. Wentworth* along the Mile Road in 1905 represented the end of the shipbuilding era in Wells.

The fishing fleet has maintained a presence in the harbor through the present, and although the fleet and the catch have diminished from their historical highs, they have in recent years been

*The sources quoted in this section include a letter written by Jeremiah Hubbard in late 1824 or early 1825, and a brief history of Wells written by E.E. Bourne, c. 1870. These and other histories of Wells can be found in the Maine Historical Society archives.

on the increase. From the early to mid 1900s an average of six to eight small craft, geared primarily for lobstering, made the harbor their home port. Shellfish have also been a natural resource of historic importance to Wells, but following the trend of the entire south-coastal region, the clam beds were severely depleted in the years immediately following the second world war, as men returning home went to work on the flats. While the numbers began to rise again in the 1950s and early 1960s, this rebound was obviated by increased pollution levels which have kept almost all of the beds closed since 1969.

Following the second world war, as income and leisure time both increased, cars got cheaper, and the middle-class tradition of the family vacation began to make its presence felt in places like Wells, the harbor assumed the predominantly recreational character that now defines it. Since the 1970s that attraction of Maine life has led to more permanent residents. The population of Wells has grown from 4,448 in 1970 to 7,778 in 1990, an increase of 75%. The population is projected by the Regional Planning Commission to increase to 9,000 by the year 2000, meaning that in the last thirty years of the century the population of Wells will have more than doubled. These increased numbers of residents have in turn put increased pressure on the facilities that drew them to Wells in the first place. Competition for the finite space within the harbor plus the deteriorating state of the facility itself has forced many commercial fishermen to find other ports or other occupations.



Physical History

As the construction of the pier in 1825 attests, Wells has been tied to maritime commerce throughout its history, and that history has been intertwined with a resourceful approach to a problematic natural facility. By the mid-nineteen hundreds, the shoaling in the harbor from sand in-fill

- was becoming increasingly dangerous, and the harbor was (and is) periodically inaccessible. Accordingly, in the late 1950s the town applied to the federal government for harbor improvements. The plan had four components: the construction of two jetties with a 400 foot opening to seaward, one 940 feet long extending east from Wells Beach, the other 640 feet long extending south from Drake's Island; the dredging out of a 100 foot wide, 10 foot deep entrance channel from the ocean to the first bend in the harbor; the dredging out of a 100 foot wide, 6 foot deep inner channel behind the north end of Wells Beach; and the dredging out of a 7.4 acre, 6 foot deep anchorage. The anchorage was designed to accommodate roughly 200 vessels with fore and aft moorings.

The jetties were the centerpiece of the plan, and they were designed to reduce shoaling by intercepting littoral drift north from Wells Beach and South from Drake's Island, to fix the position and maintain the depth of the channel by controlling the inlet currents, and to shelter vessels in transit and at anchor from ocean waves and swells. These performance criteria were based on assumptions that littoral drift was small, what drift there was was predominantly northward, and that the 400 foot wide artificial aperture would approximate the self-scouring natural harbor mouth. In 1961 and 1962 the jetties were constructed, the channels and anchorage were dredged, and the spoils were used behind the jetties for fill.

The impact of the jetties on the area was immediate and deleterious. By the end of the summer of 1962, the northern tip of Wells Beach was rapidly eroding and the sand was moving into the inner harbor and causing shoaling conditions similar to the current harbor situation. In 1964 the anchorage was dredged and 1965 the anchorage and the channels were redredged. By 1965 it was clear that the original design of the jetties was flawed because the harbor and entrance channel were filling with sand immediately following each successive dredge. Maintenance dredging continued until 1966, when the jetties were extended with a dogleg to the north to their present configuration. The anchorage was last dredged in 1974; the mouth has been dredged once since 1974 -- in July of 1990.

In 1977 the *Coastal Engineering Study, Wells Harbor, Maine* was published, and came to the following conclusions. First, the inlet and entrance channel do not maintain a self-scouring depth because the channel is too wide for the tidal currents generated between the estuarine system and the ocean. Second, because the anchorage lies in the path of the tidal currents, it is a natural deposition area for suspended particles (sand). Third, counter to the assumptions of the initial design, the prevailing direction of onshore seas is within ten degrees of the direction of the length of the channel; therefore, seas run the length of the channel virtually unimpeded. Finally, the study found that the gross movement of sand along the beaches was much more significant than predicted.

Two of the study's primary recommendations were to reduce the width of the mouth of the entrance channel by constructing stone spurs, and by installing a permanent eductor pump in the anchorage to pump sand that would otherwise accumulate in the anchorage onto Drakes Island Beach. Wells harbor residents were cautious about the untested idea of pumping sand up on the beach, so the plan was reworked to propose dumping the sand at the historical disposal site near the Town Landing. This met with the objection of state and federal agencies and in 1980 the plan was dropped.

During the 1980s, the beach erosion along Drakes Island and Wells Beaches, which had been occurring for years, became more severe. The residents along these beaches subsequently united in support for harbor dredging and the placement of dredged sand on the eroding beaches. The navigability of the harbor continued to worsen during the 1980s, due to shoaling, but intense pressure for boat moorings throughout southern Maine resulted in larger numbers of boats using

the harbor. In 1990, the Army Corps applied to the Maine DEP for a permit to dredge 200,000 cubic yards (which would largely recreate the original federal project) and to place the spoils on Drakes Island and Wells Beaches. The U.S. Fish and Wildlife Service, the Maine Geological Survey, and environmental groups opposed the application on the grounds that the dredge would adversely impact the adjacent marsh and sand bar and the habitats these land forms support. The BEP denied the Corps' application in October, 1990.

Since then the town has pursued numerous solutions to the continuing and worsening condition of the harbor. Current efforts include discussions aimed at developing a compromise policy between the interests of the recreational and commercial boating community, the residents of the Wells and Drakes Island Beach communities, the environmental community and state and federal regulatory agencies.

II GOALS

The Harbor Plan Committee developed the following goals for the harbor area at the onset of the planning process. The Committee agreed that the plan and the Town of Wells should seek to:

- * Maintain and restore as safe a harbor as possible for commercial and recreational boating use;
- * Protect and enhance the harbor's valuable natural resources (such as plant and animal species, wildlife habitat, and water resources) while also benefiting, or at least not harming, the long-term economic interests of the town, and the enjoyment of residents and visitors;
- * Encourage consistency among the projects, policies and programs of state, federal and other organizations involved in activities in the harbor area;
- * Support economic interests (such as tourism, fishing and auxiliary services) in part by encouraging business opportunities which protect or at least do not reduce the environmental value of the town or region;
- * Eliminate, or minimize, threats to both environmental and economic interests of the harbor and town, including pollution, over-use and inappropriate uses of valuable and fragile resources;
- * Encourage and support research and monitoring by local, state and federal organizations, promote information sharing and collaboration, and eliminate current barriers among scientists and between them and other professionals;
- * Restore and maintain beaches, park areas, and other recreational amenities in the harbor area.
- * Maintain Wells as a tourist attraction, and take steps to maintain recreational boating, commercial fishing and other economic opportunities in the area;
- * Protect the environment and the wildlife of the harbor area, as these are enjoyed by Wells residents and visitors;
- * Protect the wildlife refuge and seek to mitigate impacts on the refuge caused by future development and activities;
- * Protect the many diverse interests represented in the town;
- * Treat harbor planning as a continuous process -- the town should monitor the plan and implementation process each year to determine their effectiveness and continued appropriateness.

III GOALS AND WORKING PLAN

This section includes the goals listed above and recommended actions the Town of Wells will pursue to attain each goal.

- I *Maintain and restore as safe a harbor as possible for commercial and recreational boating use.*
 - A. Monitor and survey quarterly condition of federal navigation channel for depth and for operational navigation safety issues.
 - 1. Urge the U.S. Army Corps of Engineers to maintenance dredge mouth of jetties annually to eliminate shoaling problem.
 - 2. Continue to work towards a full or modified maintenance dredge of the inner harbor and anchorage basin to:
 - a. properly moor vessels;
 - b. effectively utilize the marine facilities; and
 - c. maintain a functioning harbor for use by marine vessels.
 - B. Review annually existing marine facilities for:
 - 1. Maintenance and repair;
 - 2. New equipment acquisition;
 - 3. Security to facilities and boaters
 - 4. Facility adequacy to serve recreational and commercial boating needs;
 - a. review fees charged for facilities and services
 - b. design additional boat ramp for future use
 - c. evaluate marina operator for service effectiveness to boaters
 - d. install or make arrangements for pump-out facilities for boat septage
 - C. Review annually mooring placement based on water availability and safety to vessels. Determine mooring availabilities prior to accepting yearly mooring applications.
- II. *Protect and enhance the harbor's valuable natural resources (such as plant and animal species, wildlife habitat, and water resources) while also benefiting, or at least not harming, the long-term economic interests of the town, and the enjoyment of residents and visitors.*
 - A. Establish in 1992 a Harbor Monitoring Committee with membership open to each agency participating in the harbor management plan to meet quarterly or when necessary to discuss, recommend, coordinate and plan actions necessary to enhance and protect the material resources of the harbor's geographic area. Prepare an annual report detailing the workplan for the next year and work accomplished will be sent to each participating agency.

- III. *Encourage consistency among the projects, policies and programs of state, federal and other organizations involved in activities in the harbor area.*
 - A. The town and Harbor Monitoring Committee will implement this goal as described in II. A, above.
- IV. *Support economic interests (such as tourism, fishing and auxiliary services) in part by encouraging business opportunities which protect or at least do not reduce the environmental value of the town or region.*
 - A. On-going -- The Town's Economic Development Committee, Board of Selectmen, Chamber of Commerce and Harbor Advisory Committee will encourage the economic viability of the harbor area including beaches, recreational boating and commercial fishing. An environmental park promotional tourist park theme will be discussed and planned between the environmental groups and Town officials in 1991 and 1992 which may involve the harbor and its facilities.
- V. *Eliminate or minimize threats to both environmental and economic interests of the harbor and Town, including pollution, over-use and inappropriate uses of valuable fragile resources.*
 - A. The Town and the Harbor Monitoring Committee will, on an on-going basis, review threats to both environmental and economic interests in the harbor area and make recommendations to resolve the problem.
 - B. The Town and the Harbor Monitoring Committee will coordinate the installation of a marine septage pump-out station to be located at the Lower Landing Town docks and will amend the Harbor Ordinance to prohibit the overboard discharge of wastewater into Wells Harbor.
- VI. *Encourage and support coordinated research and monitoring by local, state and federal organizations, promote information sharing and collaboration, and work to eliminate current barriers among scientists and between them and other professionals;*
 - A. The Town and the Harbor Monitoring Committee will inventory and keep the public appraised of all local, state and federal research projects and work in the harbor area. The final results of each research project will be made available by the committee to the general public at the Wells Public Library.
- VII. *Restore and maintain beaches, park areas, and other recreational amenities in the harbor area.*
 - A. Beach restoration and maintenance
 - 1. The U.S. Army Corps of Engineers will undertake a study of the beaches that surround the harbor in the fall of 1991. The beaches of Wells Beach and Drakes Island will be examined to determine reasons for the erosion and possible solutions.
 - 2. Annually the Town maintains the beaches through a seasonal program

providing restrooms, trash removal and raking services. The Wells Reserve Authority and the Town participate in the annual fall coastal clean-up program sponsored by the federal and state governments.

3. Further examination and construction of temporary boardwalk systems will continue, to increase public access to the beach over the cobble at the Town's rights-of-way. Particular attention will be given to providing greater handicap accessibility to the beach.
4. The Town will continue to limit fires on the beach and examine best management techniques for dog control on the beach.
5. The Town will annually survey the beach for wildlife nesting areas to properly protect and/or relocate to lower traffic areas.
6. The Town will work with beach owners to involve them with beach problems and programs and with state and federal agencies to ensure compliance of laws.

B. Park Areas

1. By 1992, the Town will construct a passive Harbor Park on the filled land off Lower Landing Road. The park will include playground equipment, trails to the harbor beach, a gazebo, 200-car parking facility and picnic facilities.
2. The Town will discuss with the Wells Reserve Authority and the Rachel Carson Refuge the possibility of tying trail systems together to provide a coastal walking network.
3. The Town and the Harbor Monitoring Committee will discuss and examine standardized management and maintenance techniques for coastal parks.
4. The Town and the Harbor Monitoring Committee will discuss and examine options that may present themselves pursuant to the Army Corps' Environmental Restoration Branch program.

C. Recreational Amenities

1. The Town will explore with the Harbor Monitoring Committee areas non-motorized vessels may use and the possibility of constructing facilities to encourage further water exploration of the harbor area.
2. The Town will explore other recreational uses of the harbor area with the Harbor Monitoring Committee.

VIII. *Maintain Wells Harbor as a tourist attraction and take steps to maintain and upgrade the harbor for recreational boating and commercial fishing.*

- A. The Town, the Reserve Authority and the Rachel Carson Refuge will work together to implement a coastal environmental park theme to increase tourism in the spring

and fall seasons as well as the traditional summer tourist season.

- B. The Town and Harbor Monitoring Committee will work on techniques and methods to assist commercial fishermen to remain in Wells and jointly study ways to restore shellfishing in the harbor area.
 - C. The Town and Harbor Monitoring Committee will continue to encourage recreational boating by maintaining and upgrading existing facilities, and will continue to pursue funding for an addition to the public boat launching ramp.
- IX. *Protect the environment and the wildlife of the harbor area, as these are enjoyed by Wells residents and visitors.*
- A. The Harbor Monitoring Committee and the Town will work together to provide a mechanism to meet this goal.
- X. *Protect the wildlife refuge and seek to mitigate impacts on the refuge caused by future development and activities.*
- A. The Town and the Harbor Monitoring Committee will work together to provide a mechanism to meet this goal.
- XI. *Treat harbor planning as a continuous process -- the Town should monitor the plan and implementation process each year to determine their effectiveness and continued appropriateness.*
- A. The Harbor Monitoring Committee and the Town will work together to provide a mechanism to meet this goal.
 - B. Amendments to the harbor plan will be authored by the Harbor Monitoring Committee and approved by the Wells Selectmen.
 - C. The Harbor Monitoring Committee and Town will periodically review the Harbor Ordinance and recommend revision as necessary.

IV HARBOR FACILITIES

Wells harbor offers a number of public and private facilities to the tourists and commercial and recreational boats that use and enjoy the harbor. Most of these facilities are situated on land reclaimed from the water with spoils from the dredging project that reshaped the harbor in 1961. Wells harbor offers a public boat ramp, gas, diesel, ice, water, food, and dumpsters. Some engine repairs and maintenance are available. There are no transient moorings, but short-term dockage at the town floats is available. The location of these facilities is shown in Figure 3.2.

Public Facilities

The town has a total of 5,000 square feet of permanent piers and floating dockage, the sites for which were created by the dredging project in 1961. These facilities are located at the end of Lower Landing Road and across the harbor off Atlantic Avenue. Facilities are shared by commercial and recreational users. Fuel is available at the Lower Landing pier, the larger of the two dock areas, as is dockage for dinghies. Several floating docks off the pier are accessed by a ramped walkway, and there is a slip equipped with a mechanical hoist for offloading. The pier is also set up with scales and tote boards as Wells hosts sportfishing tournaments during the summer. Across the harbor, the Atlantic Avenue pier is also connected to floating docks, but there are no marine services available.

The harbormaster manages the 144 mooring spaces currently in the harbor, of which 107 are allocated to recreational boats and 37 to commercial boats. The waiting list for moorings stands at 290. Because the sandbar in the harbor has greatly reduced the available mooring space, new spaces can be created only by placing them farther up the Webhannet River. The harbormaster gives commercial boats precedence in filling mooring vacancies.

The town of Wells maintains a public boat launching ramp, which is located beside the Lower Landing wharf. The ramp can accommodate one launch at a time, and the town has expressed interest in widening it to accommodate at least two launches at a time. The State Bureau of Parks and Recreation has funding available for such expansions, and the town has been told this project would likely qualify for state funding if the harbor were to be dredged. Fees for the ramp are \$5.00 per launch for boats up to eighteen feet long, plus \$.50 per foot over eighteen feet for larger boats.

The Wells harbormaster's office is a 600 square foot structure located on the pier at Lower Landing which commands an ideal view of the entire harbor. The harbormaster's boat, the *Pride of Wells*, is a radio-equipped 31 foot modified Navy sub tender with a 185 horsepower Perkins turbo diesel engine.

Public parking spaces were constructed around the jetties in 1961, bringing the total to three parking lots in the vicinity of the harbor with a total of 625 spaces. These lots facilitate access to both the harbor and to the Wells and Drake's Island beaches. Total parking on the landing side of the harbor is 205 spaces. This includes 25 spaces for boat trailers just up the road from the boat launching ramp.

There are three public restrooms located at the parking lots around the harbor, and the harbor area is served by public water and sewer.

The harbor is surrounded by the Rachel Carson Wildlife Refuge, an extensive area of salt

marsh habitat owned by the Federal Government. The Wells National Estuarine Research Reserve Visitors Center, an ecological research and information center, is located about a mile north of the harbor, and provides visitors with guided walking tours and information about the history and ecology of the salt marshes.

Passive Park

A three acre passive public harbor park is presently under construction, located on Lower Landing Road behind the marina. The Wells Harbor Park Committee has been planning this park for several years, and the current plans for its completion are pursuant to the 1989 Town Meeting vote to create the park. The park presently consists primarily of a large oval stone dust track surrounding a grassy area. When completed the park will include picnic tables, park benches, nature trails, a playground on the west side, walkways, a gazebo in the center, a handicap accessible wooden walkway to the beach with harbor overlook, lighting, and an assortment of trees and shrubs. The original (currently existing) grass will be preserved as this appears to be the species most suited for the area's soils.

When completed, visitors will be able to use the park to picnic, walk, or relax in an open, scenic environment by the water. The town may also use the park for public gatherings. The park, as presently envisioned, will constitute the best park facilities at any York County harbor, and will probably be equally attractive to visitors by boat and by land. The estimated \$30,000 needed to complete the park is being raised through local individual and business contributions: No municipal dollars are expected to be needed for this project. The Harbor Park Committee anticipates the park will be completed within two to three years.

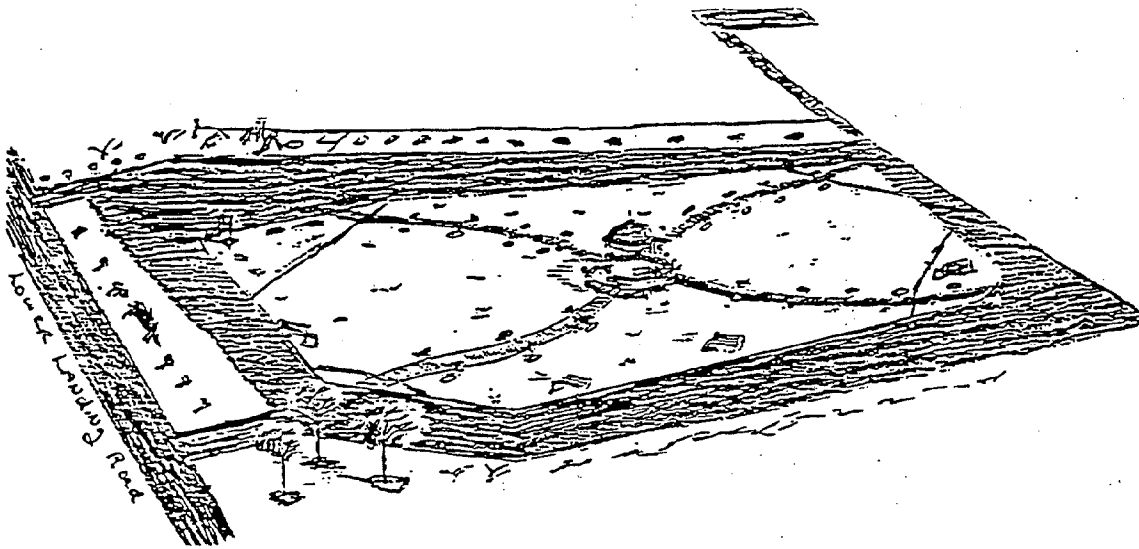


FIGURE 3.1. Schematic Plan for the Harbor Park Prepared by the Harbor Park Committee, 6/91.

Private Facilities

The town leases property on dredge filled property to Lord's Harborside Restaurant and the Wells Marina and Marine Services. Wells Marina is located immediately adjacent to the Lower Landing pier parking area. The marina provides supplies, repairs, fuel and a marine rail to facilitate haulout for repair and seasonal storage.

In contrast to the harbor itself, Wells harbor facilities are generally in very good condition, and they are used by a great number of people, tourists and residents alike. The addition of the harbor park will ensure that the harbor will continue to be a flourishing community resource.

Related Issues

The Harbor Plan Committee discussed several ideas for enhancing public enjoyment and appreciation of the harbor area. One of the things discussed was the concept of constructing a catwalk bridge across the harbor from the landing area to the Wells Beach parking lot. Among the attractive features of this idea: it would provide ready access to the harbor facilities from the Wells Beach parking lot and vice versa, and it would be an interesting tourist attraction. Among its less attractive features: it would be very costly to construct, funding sources are unknown, and it could interfere with navigation.

Another idea that was discussed was the creation of an island in the middle of the harbor (southern portion) to provide high quality bird habitat (birds are particularly fond of islands) This was discussed within the context of dredging -- the island could be constructed of dredged material. The island, it was suggested, would enhance wildlife viewing opportunities and tie in well with the passive harbor park discussed above.

The Harbor

The dredging in 1961 created both new opportunities and future problems for the harbor. As noted above, dredging spoils were used to create significant new facilities around the natural harbor basin, and the "new" harbor was able to accommodate a greater number of moorings for commercial and recreational vessels. The harbor was used effectively for a number of years, but by the mid 1970s, sand in-fill began to cause areas within the channel and the inner harbor to shoal significantly. The failure of the Army Corps to maintenance dredge every seven years, as originally planned, has meant that many sections of the harbor have been virtually unusable in recent years. Shoaling has seriously impacted the entrance to the jetties to the point where swells are reported to break in even moderate seas, making passage in and out of the harbor dangerous. Within the harbor itself, shoaling has decreased the area available for moorings, and is making maneuverability increasingly difficult.

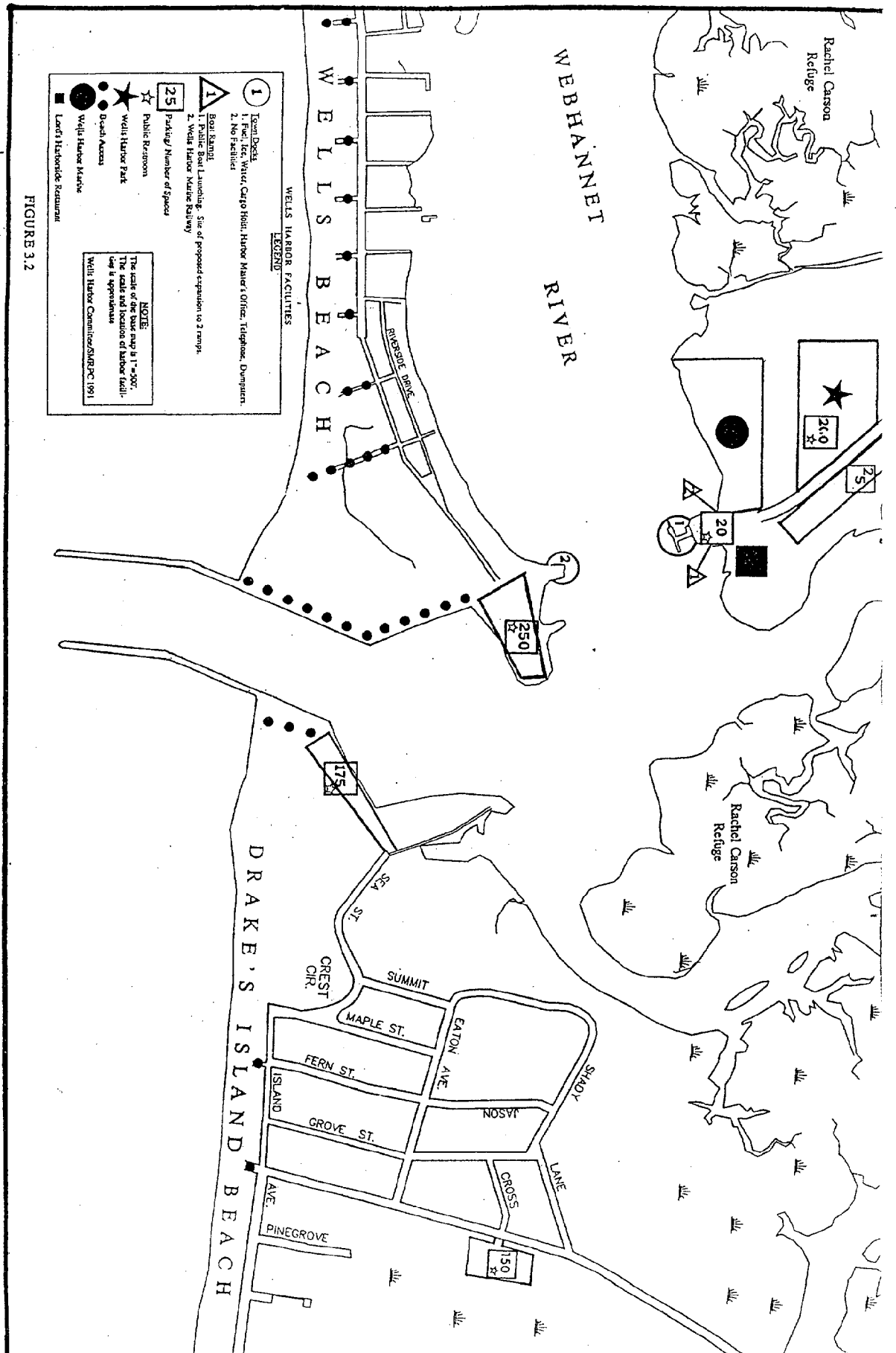


FIGURE 3.2

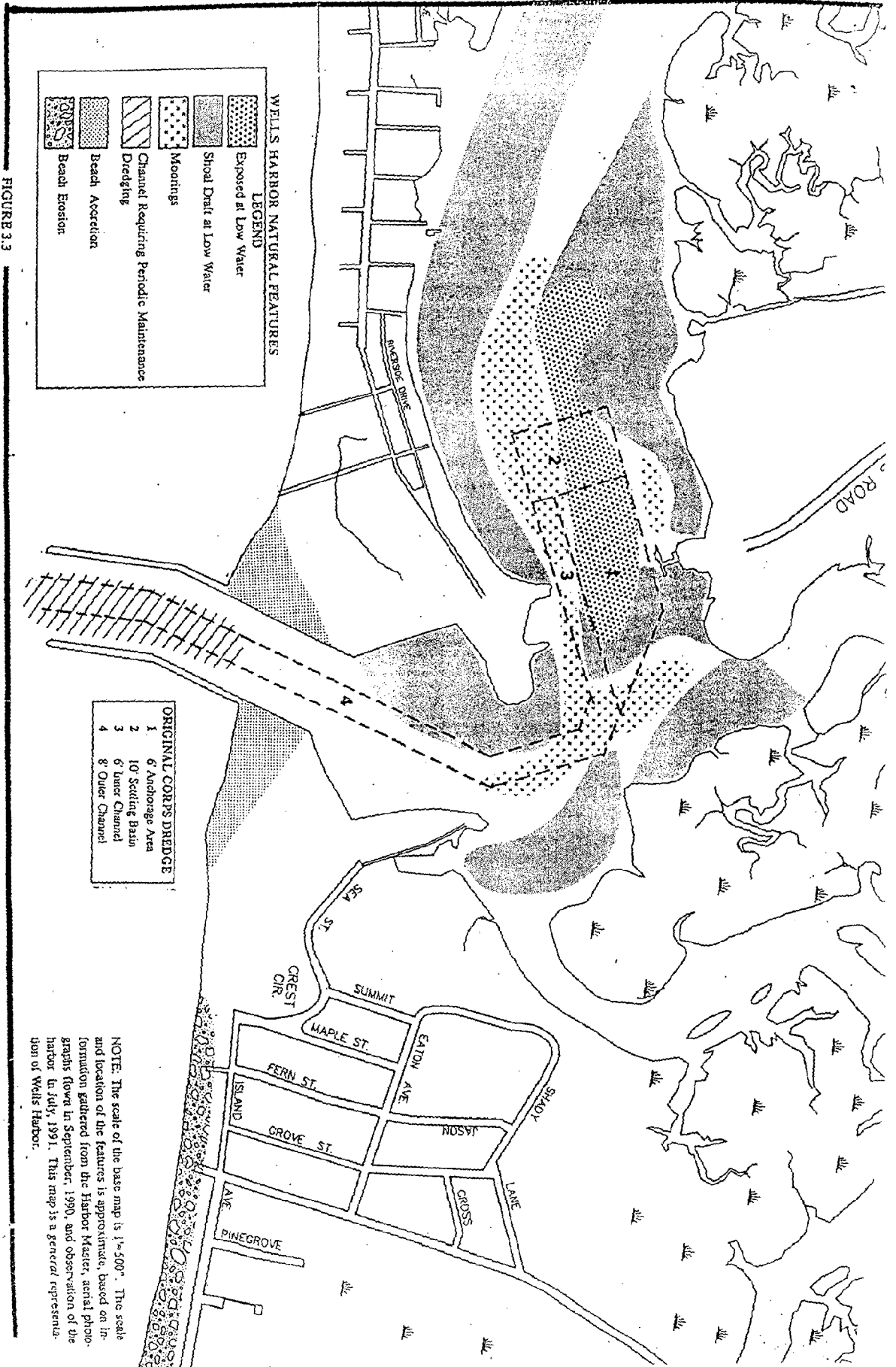


FIGURE 3.3

V COMMERCIAL FISHING

Local historians indicate that commercial fishing vessels have operated out of Wells Harbor since the 1800s, though the present support facilities at the harbor have only been in place since the 1960s. Lobstering is the major commercial fishing endeavor; while some of the lobster boats bring in a substantial tuna catch during certain times of the year (and scallops and other species on occasion), these boats are used primarily as lobster boats. This section will therefore focus on the lobster industry and provide background information on and a discussion of the importance of the Wells lobster fleet to the local economy. Shellfish have also been important historically as a commercial resource; this topic is discussed separately in chapter VIII.

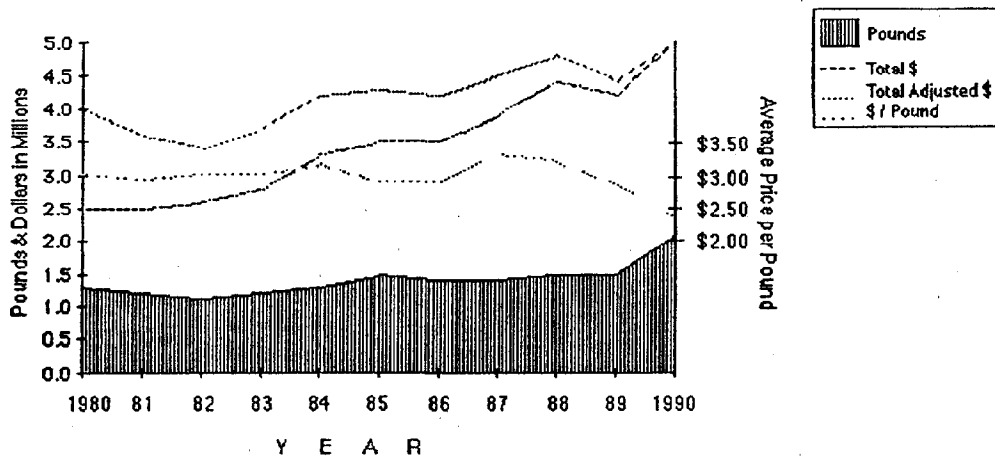
Overview

Lobstering is one of Maine's oldest and most consistently productive industries. In 1889 the total catch was 24.5 million pounds; in 1989 the catch was 23.4 million pounds. But while the catch has remained stable, keeping pace has required a far greater expense of time and money. There are now twenty times as many traps and four times as many lobstermen fishing today as in 1889. With this amount of pressure being exerted on the resource, fears of overfishing in the late 1960s seemed to be justified as more boats and traps were yielding fewer lobsters each year. This trend continued until 1978, when the catch, for reasons still unknown, began to increase. Several theories have been advanced to explain the stabilization of the lobster stocks, from a slight warming of the ocean water that scientists believe may contribute to the survival of a greater number of young post-larval lobsters, to a decrease in the numbers of groundfish that prey on juvenile lobsters.

York County Lobster Landings: 1980 - 1990

<u>Year</u>	<u>Catch (Lbs.)</u>	<u>Value (\$)</u>
1980	1,313,455	2,482,535
1981	1,240,756	2,516,977
1982	1,143,648	2,549,391
1983	1,216,018	2,805,224
1984	1,329,029	3,337,772
1985	1,472,407	3,490,348
1986	1,429,033	3,483,518
1987	1,354,139	3,898,762
1988	1,516,083	4,349,321
1989	1,543,912	4,227,060
1990	2,098,391	4,992,680

For whatever reason, figures compiled by the National Marine Fisheries Service for York County illustrate that while there were periodic downturns, the trend for 1980-1990 is a 60% increase in the catch. This translates to a doubling of the 1980 dockside value of \$2,482,535, to \$4,992,680 in 1990. However, the average price paid per pound to York County lobstermen *declined* by almost 25% over the same period, from \$2.94 to \$2.37. Similarly, the record statewide landing for 1990 of 28.1 million pounds did not translate into a bumper year for lobstermen as prices in all markets were severely depressed.



In order to avoid another bleak season, the Maine lobster industry has begun to substantially expand its marketing efforts. If the trend of the past decade is an indicator of a sustainable increase in the lobster harvest, lobstermen need to develop new markets to maintain enough demand to keep prices up.

Wells Harbor Fleet and Facilities

Wells harbor has supported a small but viable lobster fleet since the [early 1900s]. In the 1950s the fleet was a stable six to eight boats. Although no precise data is available, it may be assumed that the size of the fleet increased in 1961, when harbor dredging and accompanying construction dramatically upgraded the facilities available to commercial fishermen. In 1973, the earliest year for which hard data is available, there were 24 commercial boats in Wells harbor, most of which were presumably geared for lobstering. The following table illustrates the fluctuations in the commercial fleet.

Commercial Lobster Boats Berthed in Wells Harbor

<u>Year</u>	<u>Number of Vessels</u>
1950s	6-8
1965	24
1973	24
1978	11
1985	28
1990	22

The drop from 24 commercial boats in 1973 to 11 in 1978 was caused primarily by the shoaling in the harbor during that period. In the 1970s it was not as difficult to obtain a mooring in other area harbors as it is today, and the worsening accessibility of Wells Harbor prompted some fishermen to relocate to nearby harbors such as Perkins Cove in Ogunquit. As mooring space became much more restricted in the 1980s, additional lobstermen began to locate in Wells Harbor as local mooring policy gave first priority to commercial boaters, moorings were inexpensive for commercial boaters, and the high quality of the docking facilities made the harbor an attractive location despite the navigational difficulties caused by continued shoaling.

The harbor facilities are excellent. The town has a total of 5,000 square feet of permanent piers and floating dockage, the sites for which were created by the dredging project in 1961. These facilities are located at the end of Lower Landing Road and across the harbor off Atlantic Avenue. Facilities are shared by commercial and recreational users. Fuel is available at the Lower Landing pier, the larger of the two dock areas, as is dockage for dinghies. Several floating docks off the pier are accessed by a ramped walkway, and there is a slip equipped with a mechanical hoist for offloading. Across the harbor, the Atlantic Avenue pier is also connected to floating docks, but there are no marine support services available beyond parking.

Wells Harbor Landings and Economic Impact

According to the Wells Harbor Master, full-time lobsterboats fish a rough average of 600 traps, and part-time boats a rough average of 150 traps. Of the 22 boats currently lobstering out of Wells, 8 are full-time and 14 are part-time, which works to a total of approximately 6,900 traps being fished out of Wells harbor. Based on that information, we have provided two estimates of the Wells lobster fleets' landings in pounds and dollars for 1990. The information from local fishermen is the most reliable data, but it is helpful to provide an alternative estimate for purposes of comparison.

In 1990 the Wells Harbor Advisory Committee compiled an estimate for lobster landings through a survey of all the lobstermen in the harbor. The committee calculated the total landings at Wells Harbor to be approximately 100,000 pounds in 1989.

Wells Lobster Landings (1): 1990

Total	Wholesale	Dockside Total	Economic	
<u>Pounds</u>	<u>\$/Lb.</u>	<u>Value</u>	<u>Multiplier</u>	<u>Value</u>
100,000	2.38	\$238,000	2	\$476,000

Source: Wells Town Manager

As part of an ongoing research and tracking program, the Department of Marine Resources analyzes data collected from a rotating random sampling of seafood wholesalers around the state. From this data it is possible to extrapolate an approximate statewide 'catch per trap' figure, which provides, in conjunction with number of traps fished out of Wells, a rough estimate of the landings for the Wells lobster fleet. An examination of wholesale prices then establishes the value of the catch. The following table calculates the catch and value for the Wells lobster fleet based on statewide catch figures.

Wells Lobster Landings (2): 1990*

# of Lobster Boats	# of Traps	Lbs./Trap/ Year**	Total Pounds	Wholesale \$/Lb.	Dockside Value	Economic Multiplier	Total Value
22	6,900	10.0	69,000	2.38	\$164,220	2	\$328,442

**Source: Department of Marine Resources

* These figures are based on several assumptions. The ratio of full-time to part-time boats is estimated by the Wells harbormaster to be 30/70, with a concomitant traps-fished ratio of 600/150.

** Pounds per trap per year is figured on a statewide basis by dividing the total statewide catch by the number of traps fished statewide. The total statewide number of traps is itself an estimate prepared by DMR. It should be noted that the Lbs./Trap/Year figure which is the cornerstone of the second estimate is a *statewide average* and thus subject to many variables, and is presented only as a gross approximation for the purpose of comparison. The wholesale price per pound is based on the York County average for 1990. The economic multiplier is an attempt to quantify the community-wide effect of the income spent by lobstermen and wholesalers on goods and services related to their livelihoods. Because the multiplier can not calculate the *retail* income derived from lobster sales (specific data is unavailable), the actual overall impact on the local economy is much greater than \$476,000, given the numerous restaurants and seafood outlets in the Wells area. See Chapter VI, ECONOMY, for a discussion of the impact of retail lobster sales.

The 1990 Wells landing of 100,000 pounds represented roughly 5% of the York County total catch of 2,098,391 pounds. However, in 1990 Wells was home to 8% of the county's 288 lobsterboats. This discrepancy may be explained by the conditions of Wells harbor, which prevent lobstermen from tending their traps as frequently as their colleagues up and down the coast.

VI RECREATIONAL BOATING

Because of its location in the seasonally popular coastal area of southern Maine, its proximity to recreational beach areas and to sportfishing grounds, Wells harbor is, geographically, ideally suited for the recreational boater. This is reflected in the increasing numbers of recreational boaters in the harbor: in 1979 there were 76 recreational boats on moorings and another 60 or so on the town waiting list; by 1990 there were 107 recreational boats in the harbor and another 290 on the waiting list. This 219% increase in recreational boating traffic has been a boon for local support services and the downtown economy.

In 1979 there were 76 recreational boats on moorings in Wells harbor, and another 60 on the waiting list. When we take two-thirds of 60 (to account for applicants who are on multiple waiting lists at other harbors) and add the sum to 76, we see that total demand for recreational boats in 1979 was 116 boats. To determine current demand, the 107 recreational boats on moorings is added to two-thirds of the 290 boat-long waiting list for a total demand of 298 boats. Therefore, the total Wells harbor recreational demand increased from 116 boats in 1979 to 298 in 1990, a 14% annual increase.

Recreational Demand, 1979 - 1990

Year	Moorings for Recreational Boats	Waiting List	Adjusted W.L.*	Total Demand	Annual Percent Increase
1979	76	60	40	116	--
1990	107	290	191	298	14%

Source: Wells Harbor Committee

* Waiting list is adjusted by 2/3 to account for owners listing their vessels for a mooring in more than one harbor.

Local and Regional Studies

The Southern Maine Regional Planning Commission recently completed the Southern Maine Regional Berthing Study (1991). This study projects supply and demand for boating facilities through the year 2000 for the entire York County coast. The study concludes that, county-wide, demand for boating facilities is likely to increase by about 7% annually over the next decade.

The only local projections developed recently in York County were for the Saco River. The Saco River Public Access Study (1988) projected annual increases in boating demand ranging from 2.3% to 14%. The mid-range estimate was 8%.

A study done for the Portland region (Childs Engineering Corporation, 1989) projects boating demand to increase in that region by 5% annually.

Taken together, existing local and regional studies suggest that the annual increase in demand in southern Maine will be about 7%. This translates into a 70% increase by the year 2000 for a total demand of 507 boats.

Mooring Plans

The existing (1990) mooring layout in Wells Harbor is illustrated in Figure 7.1. Because

of the constraints imposed by harbor in-fill, the Harbor Master cannot work off a mooring plan, but must rather site moorings according to available water. This results in something of a catch-22: In order to safely accommodate a reasonable number of vessels in the harbor (relative to recreational and commercial demand), he needs to use as much available deep water as possible -- but because deep water is at a premium, this requires him to moor vessels in the inner channel and in the approach to the town dock. This compounds the safety hazards of navigating through shoal water.

The following mooring supply projections are presented in reference to scenarios discussed in Chapter XII (see also Figures 7.1 & 7.2).

Wells Harbor Mooring Supply

<u>Layout</u>	<u>Number of Vessels</u>
<u>Current:</u>	
Single Point in Available Deep Water (1990)	98
<u>Projected:</u>	
Fore-and Aft/ Original Corps Dredge	123
Fore-and-Aft/ Including Other Deep Water	172
Single Point/ Original Corps Dredge	68
Single Point/ Including Other Deep Water	82

A complete discussion of official town mooring policy is located in Appendix G, Town of Wells Harbor Ordinance.

Water Sports

Wells Harbor has a beach area well suited for launching windsurfers, canoes, and small sail boats, and these craft use the area regularly. It also has a boat ramp that is used for launching jet skis as well as boats. The harbor and estuary provide excellent opportunities for the passive recreational sports such as windsurfing, sailing and canoeing. Jet skis and water skiers also frequent the harbor during the warm summer months.

To protect the integrity of the harbor as a recreational and commercial resource, some compromises will need to be made. Not *all* water-based sports are appropriate in the harbor. Water skiing and jet skiing, for example, require speed and space in amounts disproportionate to other harbor uses. Additionally, the water is so shallow in so many places that these high speed uses pose a serious safety risk. With an ocean full of open water just outside the mouth of the harbor, it is more appropriate to reserve the calmer harbor waters for canoe, day sailer, dingy traffic, and windsurfing. Windsurfing is a relatively low intensity use that can nevertheless cause problems in the mooring area -- the Harbor Plan Committee has suggested that windsurfing be limited to the area south of the mooring area.

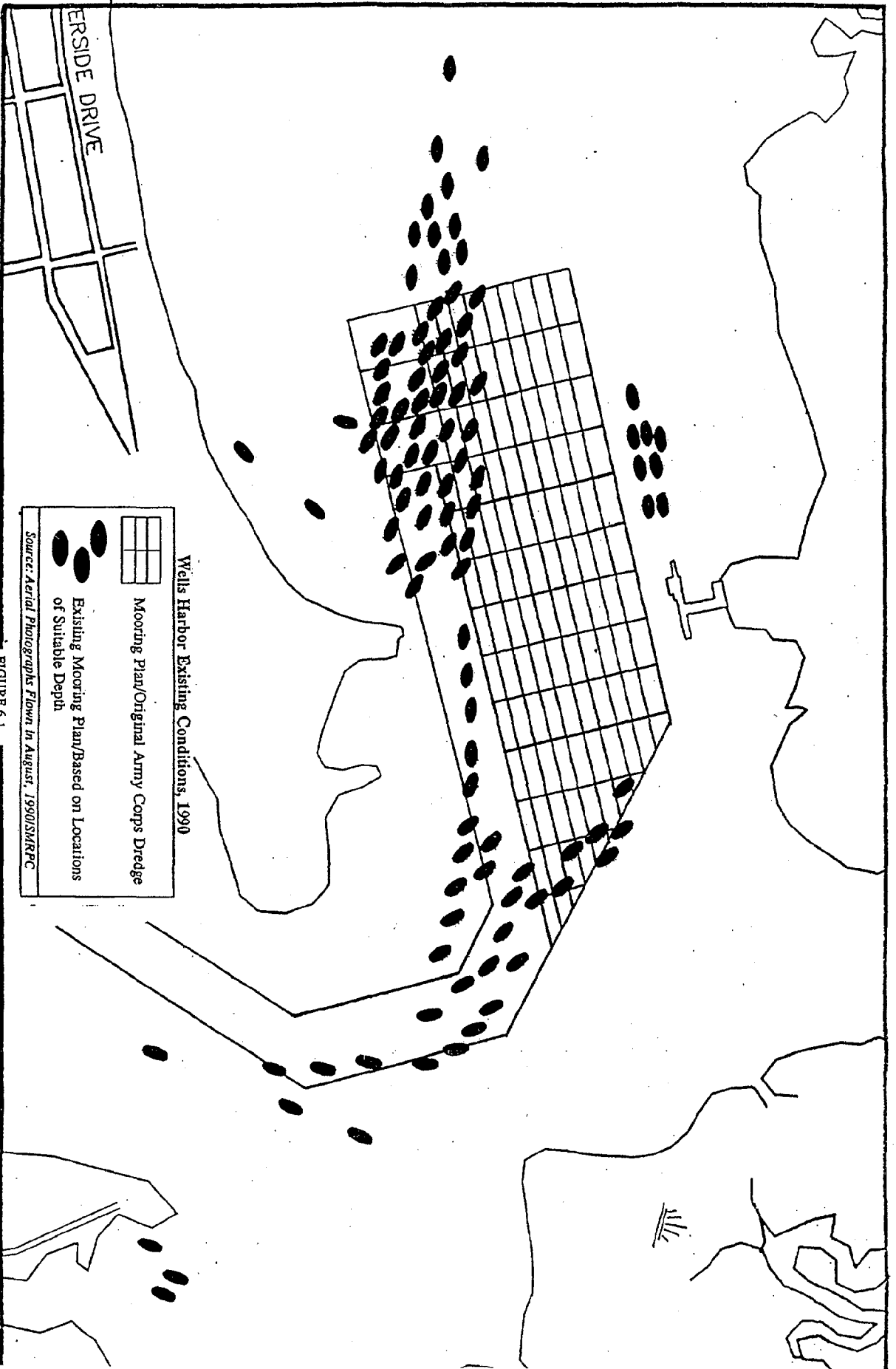
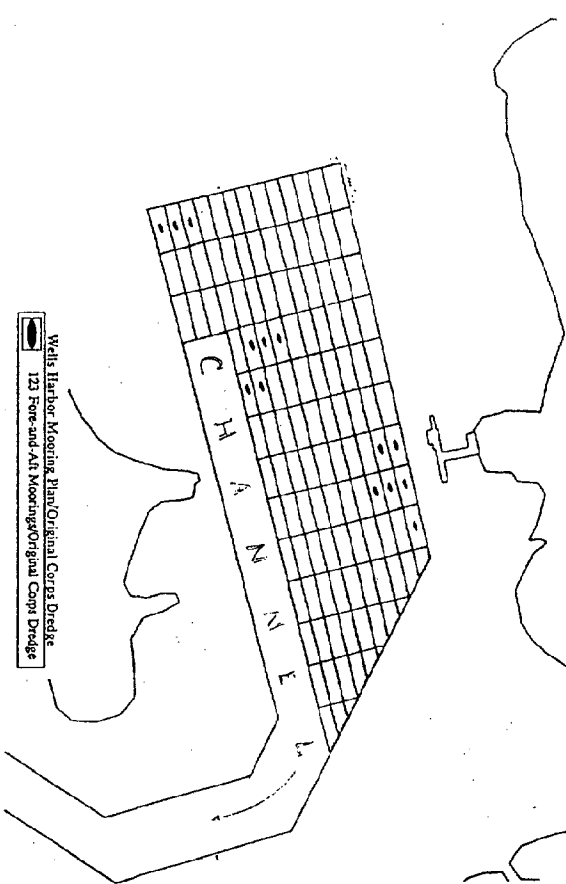


FIGURE 6.1

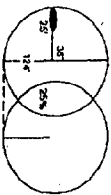
Source: Aerial Photographs Flown in August, 1990/SR/RPC

FIGURE 6.2a

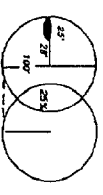


SINGLE-POINT MOORING SPECIFICATIONS

Scalling Basin
 10 MLW + 8 Avg. Tide x 2 (2:1 Slope) = 36' of 3/4 Nylon Line + 25' (Avg. Length of Boat in Wells Harbor) = 62 Mooring Radius. Acceptable Overlap 25% = Mooring Grid of 93'. Individual Mooring Diameter of 124'.



Anchorages
 8 MLW + 8 Avg. Tide x 2 (2:1 Slope) = 28' of 3/4 Nylon Line + 25' (Avg. Length of Boat in Wells Harbor) = 50 Mooring Radius. Acceptable Overlap 25% = Mooring Grid of 75'. Individual Mooring Diameter of 100'.



FORE-AND-AFT MOORING SPECIFICATIONS

Scalling Basin
 10 MLW + 8 Avg. Tide x 2 (2:1 Slope) = 36' of 3/4 Nylon Line Fore and Aft = 72' + 25' (Avg. Length of Boat in Wells Harbor) = Approx. 100' Long "Slips" (Distance Between Bottom Chains) = Width of "Slip" is 50'. Based on Experience of Perkins Cove Harbor Master.



Anchorages
 6 MLW + 8 Avg. Tide x 2 (2:1 Slope) = 28' of 3/4 Nylon Line Fore and Aft = 56' + 25' (Avg. Length of Boat in Wells Harbor) = Approx. 80' Long "Slips" (Distance Between Bottom Chains) = Width of "Slip" is 30'. Based on Experience of Perkins Cove Harbor Master.



General Features
 Heavy Chain is laid perpendicular to the axis of the fore-and-aft mooring scheme at intervals based on depth desired scope, and length of vessel. Chain is anchored at each end by a heavy weight. Heavy nylon mooring lines are made off to the ends of lines as based on the same factors, and are then run up to mooring flasks and pennants.

FIGURE 6.2b

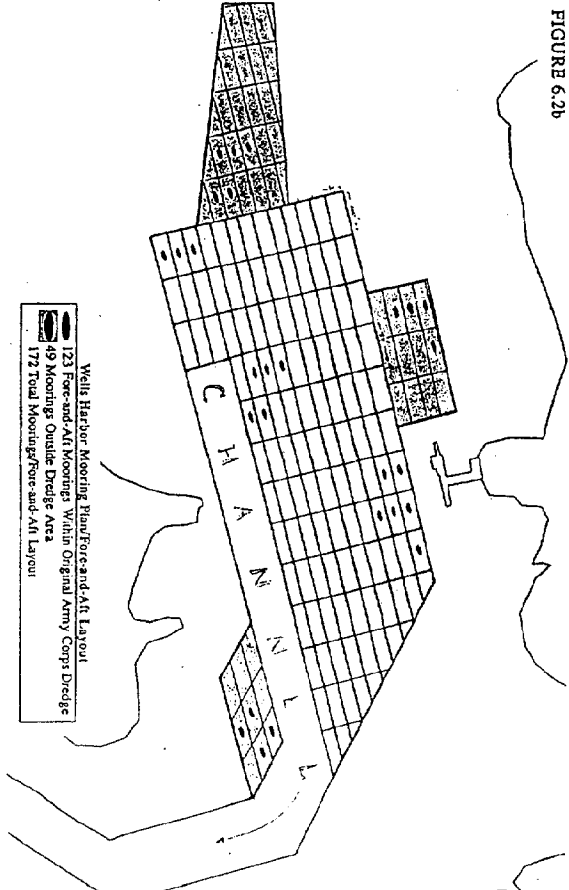
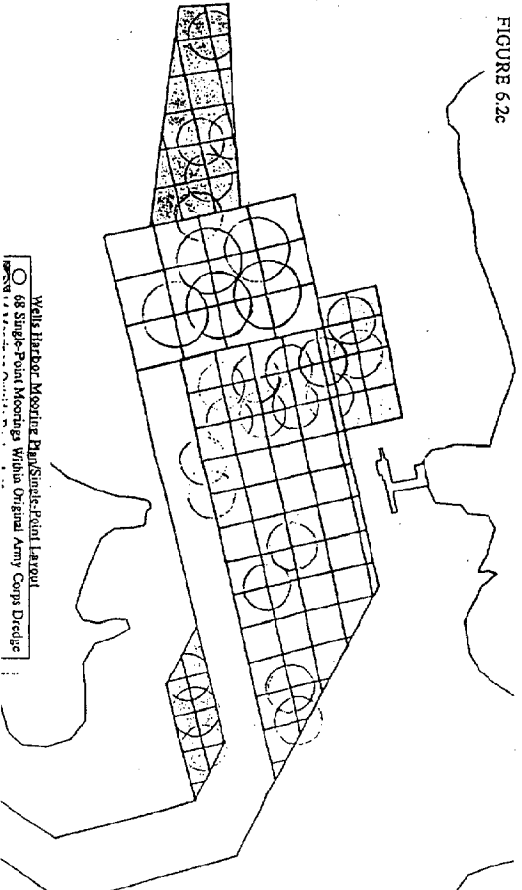


FIGURE 6.2c



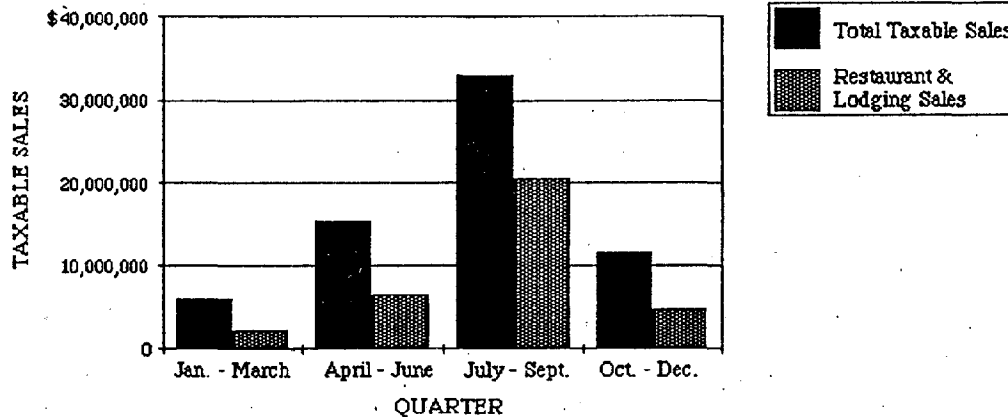
VII ECONOMY

Overview

The economy of the town of Wells is fundamentally based on the value of seasonal visitors. The population increases three-fold during the summer months and that season, defined as the months of July, August and September, accounts for 50% of the town's total taxable sales. A more specific indicator of the town's dependence on tourism is the value of restaurants and hotels, motels and campgrounds. Restaurant and lodging sales constitute no less than 36% of any quarter's total taxable sales; for the third quarter alone they constitute 62% of the total.

Total Taxable Sales & Restaurant/Lodging Sales, Wells: 1990

<u>Quarter</u>	<u>Total Taxable Sales</u>	<u>Restaurant & Lodging Sales</u>	<u>Rest. & Lodging as % of Total</u>
January-March	\$ 6,171,500	\$ 2,201,800	36%
April-June	15,318,400	6,643,600	43
July-September	33,022,300	20,459,000	62
<u>October-December</u>	<u>11,682,100</u>	<u>4,737,900</u>	<u>41</u>
TOTAL	\$66,194,300	\$34,042,300	51%



The 1991 guide to Wells published by the Wells Chamber of Commerce lists 70 businesses that provide accommodations for visitors; of these, 34 are listed as being open only for the summer season. In addition, there are 15 campgrounds/RV parks listed in the guide. According to estimates by the Regional Planning Commission in 1989, Wells has approximately 555 year-round rooms, 1,157 seasonal rooms, and 1,977 campground spaces.

The people who generate this business are drawn to Wells for a variety of reasons. Many come specifically for the beaches. The Town Manager has used parking lot revenues to estimate seasonal foot-traffic to the beaches from the parking lots to be 27,600, based on a conservative estimate of two occupants per vehicle. As this works out to only 460 people per day (assuming a 60 day peak season) this obviously does not account for foot-traffic from other parking areas and seasonal residences.

The harbor area around the terminus of Lower Landing Road is also a popular destination. The harborside restaurant, harbor pier, boat launching ramp, sailboard launch area and the soon-to-be completed passive harbor park are all harbor attractions. Wells hosts two summer festivals, the Wells Harbor Park Day, and the Annual Sand Sculpture Contest.

Wells Harbor Economics

The Wells harbor area contributes directly and indirectly to the town's finances. The economic benefits of the harbor can be looked at in terms of a) the marine and tourist-oriented facilities created from filled areas; b) the increased numbers of recreational and commercial vessels in the harbor; and c) the increased value of the commercial fishing fleet. The following revenues are derived directly from harbor facilities.

Marine & Tourist Facility Revenues: 1990

Restrooms	\$	319
Boat launch		2,250
Restaurant rent		7,348
<u>Parking lots</u>		<u>148,045</u>
TOTAL		157,962

Commercial & Recreational Boating Revenues: 1990

Boat excise tax	\$	9,556
Boat registration fees		1,368
(includes R.V.s)		
<u>Moorings</u>		<u>22,918</u>
TOTAL		33,842

Commercial Fish Revenues: 1989

22 Lobster boats	\$	199,307
15 Tuna Boats		46,620
<u>3 Charter boats</u>		<u>3,333</u>
TOTAL		249,260
TOTAL DIRECT VALUE		\$ 441,064

In addition, the town receives the following indirect revenue from the local lobster industry by the economic multiplier effect. The Wells guide lists 15 restaurants that advertise lobster sales specifically, and of the remaining 21, lobster is no doubt available at most of them. Because [95%] of the Wells catch is sold *and consumed* in Wells, the multiplier can at least attempt to represent the effect on the local economy of both wholesale and retail lobster sales. The total multiplier, including the restaurant economy, is estimated to be 4. Therefore, $4(\$199,307) - 199,307$ [dockside value] = \$597,921.

Secondary Sales Revenue, Lobster: 1989

Secondary Multiplier (4) \$ 597,921

**TOTAL HARBOR
REVENUE*** **\$1,038,985**

*Data for each category is last year available. Total figure is therefore an approximation representing a combination of data-years.

VIII LAND USE SURROUNDING THE HARBOR

The vast majority of the land immediately surrounding the harbor is marshland (see Figure 8.1). Most of this marshland is in the Rachel Carson National Wildlife Refuge and is owned and managed by the U.S. Fish and Wildlife Service. There are pockets of marshland here and there that remain in private ownership. The marshland owned by the U.S. Fish and Wildlife Service is zoned by the town as 'resource protection' and development is not allowed. Those portions of the marsh that are in private ownership are in the same zone as the adjacent upland (see below).

The upland adjacent to the inland side of the marsh is fairly heavily developed with residential structures and an occasional commercial establishment. This land is zoned either "residential A" or "business B" with 20,000 sq. ft. minimum lot sizes and no minimum shore coverage restrictions. The pattern of development along this western side of the marsh is sporadic: there are several subdivisions with housing densities greater than current zoning allows, there are a number of shoreland segments developed at about the 20,000 square foot minimum lot size, and there are a few sections presently undeveloped.

The barrier islands to the east of the harbor are some of the most densely developed land segments in Maine. The minimum lot size for the Wells Beach barrier is 5000 square feet; the entire barrier is developed at this density or greater with average lot coverage (including driveways, etc.) amounting to approximately 80%. The development is almost all residential; a small portion near Mile Road is dominated by commercial establishments. The Drakes Island barrier is exclusively residential with average lot sizes slightly larger, reflecting the current minimum lot size of 7,500 square feet.

The upland north of the harbor area, most of which is encompassed by the Wells Reserve, is zoned "rural" and the minimum lot size is 100,000 square feet. This land is largely undeveloped and contains high numbers of deer and other wildlife.

The shoreland immediately adjacent to the normal high water line or the upland edge of the marsh is addressed by the towns Shoreland Zoning.

The upland in the immediate vicinity of the town landing is in the Harbor Village District. Uses currently permitted or conditionally permitted in this district include Bed and Breakfasts, hotels/motels, passive recreation, retail business, restaurants, and accessory uses including piers and docks. The existing uses in the district include a restaurant, a marina, the town dock & facilities, parking lots, and a passive park.

The Harbor Plan Committee supports the proposed Comprehensive Plan's recommendation to keep the level of use roughly as it is now in this district.

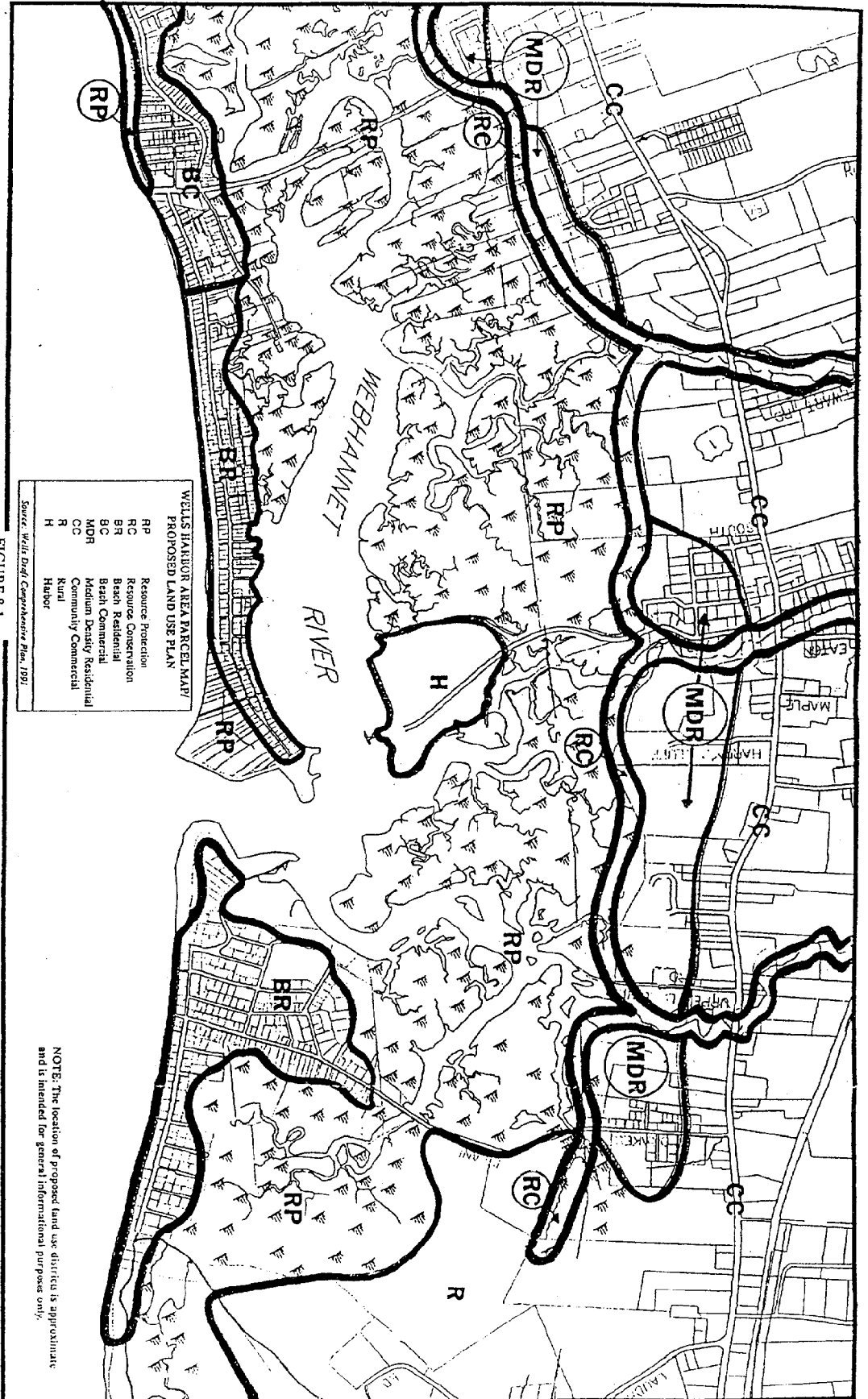


FIGURE 8.1

Source: Wells Draft Comprehensive Plan, 1991

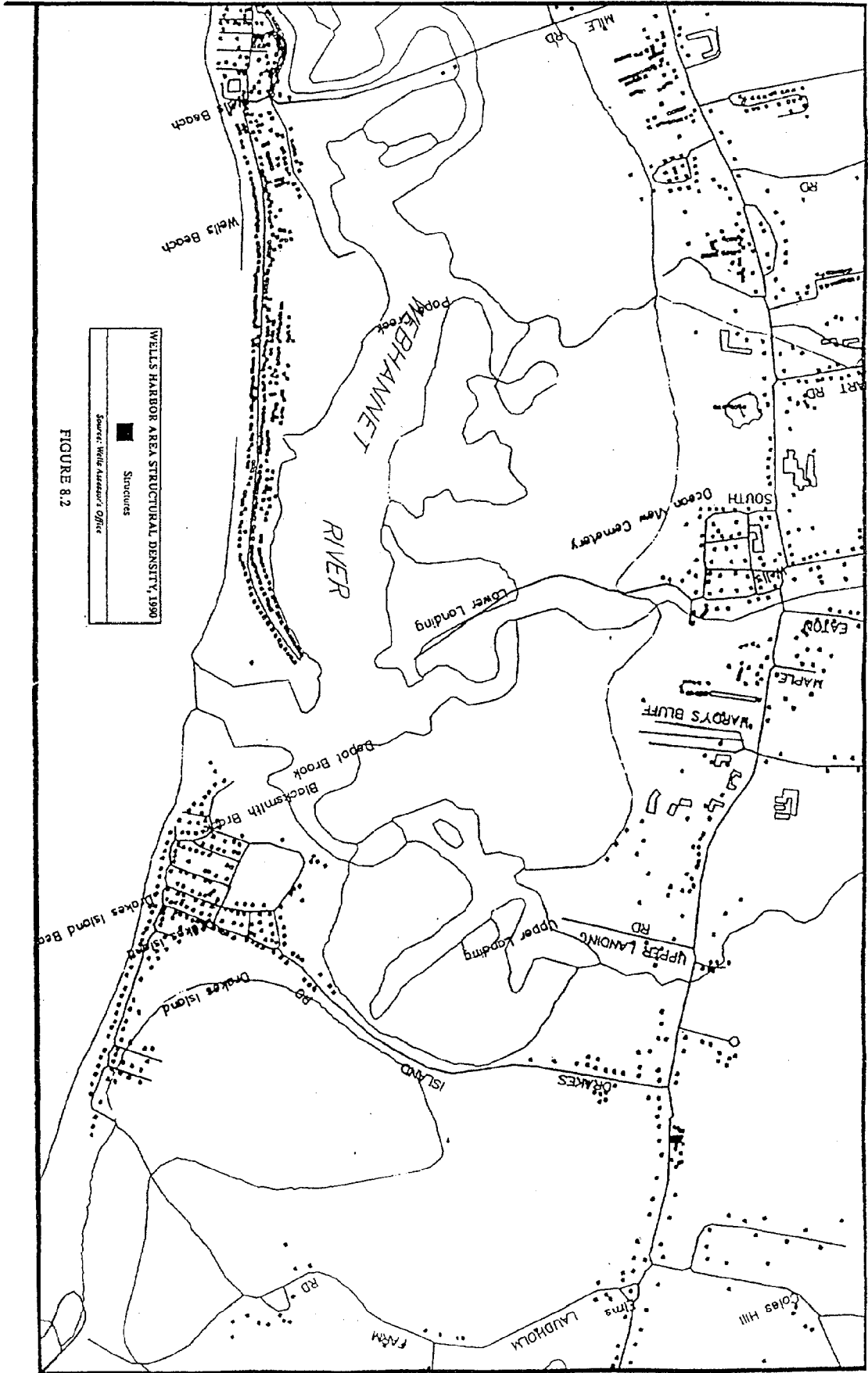


FIGURE 8.2

IX NATURAL AREAS

Wells Harbor is surrounded on several sides by large expanses of salt marsh that serves as habitat for an abundance of wildlife. Most of this marshland is now part of the Rachel Carson National Wildlife Refuge, one of 450 wildlife refuges nation-wide owned by the federal government and administered by the U.S. Fish and Wildlife Service. The Rachel Carson Refuge was established in 1966 and now includes 10 divisions along the southern Maine coast stretching from Kittery to Cape Elizabeth. The division that includes the Wells Harbor area is referred to as the Lower Wells Division (see figure 10.1).

This marshland and adjacent upland is considered an important environmental resource by residents of Wells and government agencies alike. In the early 1980s, the Town of Wells, the State of Maine, Laudholm Trust, and the Federal Government (represented by the National Oceanic and Atmospheric Administration or NOAA) together established the Wells National Estuarine Research Reserve, an educational and research organization dedicated to studying the area's natural resources and enhancing public awareness and understanding of the estuarine environment. The Wells Reserve is one of only 19 such reserves in the country, a fact that reflects the national significance NOAA attributes to this area. The Wells Reserve is now governed by the Reserve Management Authority, a board established by the Maine Legislature and Governor McKernan and comprised of representatives from the Town of Wells, the Maine Bureau of Parks and Recreation, the U.S. Fish and Wildlife Service, the University of Maine, and the Laudholm Trust, a private, non-profit organization responsible for much of the fund raising that continues to support reserve operations. The Reserve Management Authority owns or leases only a small amount of land in the Reserve; the Reserve boundaries encompass land owned by the Town of Wells, and the state and federal governments. Around Wells Harbor, the Wells Reserve overlaps with the Rachel Carson Refuge. Both agencies, therefore, are involved in managing these marshlands, although a Memorandum of Understanding between the two entities gives the U.S. Fish and Wildlife Service primary responsibility for the marsh areas.

A draft brochure about the Rachel Carson Refuge (U.S. F&WS, 1991) notes that the refuge habitats such as those surrounding the harbor "... attract wildlife throughout the year. Spring and Fall migrations draw flocks of waterfowl, particularly black ducks. Songbirds and raptors use the refuges marshes, woodlands and fields to rest and search for prey on their migrations north and south. Many different species of birds, such as the Black-bellied Plover, make brief but important stops along the Eastern chain of coastal salt marshes. Rachel Carson Refuge represents the northern-most end of these sand dune marsh systems. Thousands of shorebirds feast on the rich invertebrate life of the estuaries, gaining fat to carry them as far north as the Arctic Circle and again to their wintering grounds primarily in South America."

The Rachel Carson Refuge has recorded over 250 species of birds in the refuge system, and most of them frequent the Lower Wells Division. Table 10.2 contains the complete list of birds seen in the Rachel Carson Refuge with notes indicating which birds have been seen in the Wells Reserve. The Wells Reserve includes primarily the marsh in the Lower Wells Division of the Refuge, though it includes some upland as well. The Wells Harbor area is also home to a variety of mammals and includes one of the few significantly used seal haul out areas along the southern Maine coast.

The Lower Wells Division and adjacent beaches also includes four state registered critical areas and one nominated (but not yet registered) critical area. A critical area is any site supporting

state listed rare, threatened, or endangered species. The designation of critical area does not result in any regulation of these areas, but it provides recognition and encourages cooperation from land owners. The registered critical areas include a small patch of slender blue flag iris located on the western side of the Webhannet River north of the Town Landing (CA No 48), an historically used Wells Beach Piping Plover nesting area (CA No. 45), a Drakes Island Piping Plover nesting area (CA No. 46), Laudholm Beach (CA No. 160). The nominated critical area is a Sassafras Stand in the Rachel Carson (CA No. 185N). The approximate locations of these areas are shown in figure _ . Wells Beach was last used by nesting piping plovers in 1981. Laudholm Beach (the northern section of Drakes Island), somewhat surprisingly, served as a nesting site for a pair of Piping Plovers and three chicks in 1991.

The Webhannet supports a variety of species of fish and serves as spawning grounds for others. Table 10.1 contains a list of these species. Lists of the vegetation types found in the harbor region of the Wells Reserve are included in the Appendix.

The marshland surrounding the harbor is a valuable asset to the town of Wells: It filters pollutants out of upland runoff and thus works to improve or maintain water quality; it attracts visitors and bird watchers to the area, thus enhancing tourism; and it provides residents and visitors alike with areas for fishing, hunting and hiking.

Access to the marshland within the Rachel Carson Refuge is open to the public. While the area is posted with signs indicating that "unauthorized entry is prohibited", these signs tend to be misleading as most common uses of the marshland are, in fact, "authorized". The Refuge's Draft 1991 brochure states that the following activities are permitted in the refuge: Wildlife observation, nature study and photography, hiking, canoeing, cross country skiing, hunting of permitted species in designated areas, and fishing. The only activities that are prohibited are: Off road vehicles, camping, fires, pets off leash, and the taking of plants. The Webhannet River marshland, incidentally, is one of the sections of the refuge where hunting is permitted.

Issues & Concerns

Some sections of the marshland surrounding the harbor and Webhannet River are eroding. This is a concern because a loss of marshland constitutes a loss of important wildlife habitat and a corresponding reduction of the benefits to the town described above. Some of the factors that cause marshland erosion are winter storms, ice chunks, and boat wake. There is little that the town can do about winter storms and ice chunks. However, the town can address the issue of boat wake by controlling boat speed. While there is currently a five mile per hour no wake zone for the entrance channel and the mooring area, other parts of the river are unregulated. This issue is also discussed in the chapter on recreation boating and water sports.

It is difficult to accurately assess past erosion rates as no one monitored the contribution of sediment from the upper estuary that in-filled the harbor following the 1960s dredging. However, through a process of elimination, one can get an idea of how important the upper estuary source might be following a new dredge: By determining how much sand will likely come from other sources outside the estuary, a reasonable estimate could be obtained as to how much fill would have to come from within the estuary. Timson (1989b), Byrne and Zeigler (1977) and Mariano and FitzGerald (1989) have all speculated that, in addition to Drakes Island and Wells Beaches, a significant source of sand for the beach and estuary sources is off-shore sediment (i.e. sand deposits in shallow or deep waters some distance from shore). The presence of this off-shore source of sand would mean that the amount of sand "sucked" from the upper estuary would be less significant than if there were no off-shore sources. This is one area where additional study may be needed: In the only study conducted to date that attempted to actually locate these off-shore sources,

MGS (1987) was unable to find any. MGS has indicated in verbal communication, however, that the 1987 study was not exhaustive, and a more in-depth study was necessary to fully understand the area's sediment budget and presence or absence of off-shore sediment sources.

The Army Corps has recently established a new "environmental restoration" program (Section 103) ostensibly designed to allow the Corps to correct past mistakes the agency has made, and to fund actions that will improve the environment. At the suggestion of the US F&WS and one or two state agencies, the Army Corps has begun studying the possibility of removing some of the dredged material deposited on Town owned land in the vicinity of the Town Landing/Passive Park, and recreating marsh there. While this idea is inappropriate for those areas where the Town has already made separate plans (i.e. the passive park), the idea may have some merit elsewhere. The Army Corps has also discussed the possibility of using this program to install culverts at various locations in the Refuge to improve water circulation beneath roadways etc. This idea has been seen as generally favorable by the harbor plan committee. The Army Corps will not push any project under this program that is not supported by the Town and relevant government agencies.

X SHELLFISH

Shellfish have been an important part of Wells' history. The extensive estuarine system and mud flats comprise an ideal shellfish habitat. The most important commercial species is the soft-shell clam, *Mya arenaria*, that inhabits the mud flats of the Webhannet river tidal waters. The softshell clam is a filter feeder which entraps planktonic plants and animals from the sea water. Softshells attain their largest size in the lower tidal zone, where they may also achieve a maximum density of 300 clams per square meter (Maine State Planning Office, 1985). Natural predators include flounder, ducks, Moon Snails and most importantly, Green Crabs. Softshells are particularly vulnerable to changes in their stable, low-energy environment: because they circulate water directly through their system, they consume and accumulate biological contaminants in their tissue. And because they depend on water currents to deliver a steady flow of nutrients, any activities that affect the flow of water over the clam flats -- like the Wells Harbor jetties -- will also necessarily affect the condition of the clams. Additionally, both temporary and long-term changes in the sediment structure of the mud flat can harm both mature and juvenile stocks, and prevent or disrupt the reestablishment of clambeds.

Recent History

Through the 1960s, Wells was one of the state's most productive shellfish areas -- the Wells Marsh was rated as one of the two most valuable coastal marshes in the state by marine biologists -- and the town took progressive measures to protect the resource. For example, in the early 1960s the town invested \$2,000 to successfully control green crab predation. The health of the industry reflected this proactive management as the annual shellfish landings through the mid 1960s ranged from 1,500 to 2,700 bushels, with a value in 1991 dollars of \$75,000 to \$135,000. According to a recent University of Maine study, the projected total local economic impact of those shellfish landings can be estimated by factoring in an economic multiplier of 2.85, for a cumulative economic impact of \$213,750 to \$384,750 (Governmental Services, Inc., 1987).

In early 1965, however, the town was being warned by marine biologists about the increasing levels of pollution in the Webhannet River. By 1969 pollution in the river had risen to dangerous levels and in March of that year the State Commissioner of Sea and Shore Fisheries closed the Webhannet estuary to all harvesting of shellfish. The pollution that closed the clamflats was caused by two sources. Most important were "the large number of cesspools, septic tanks, and drainage fields in marshland areas which are washed by high tides," circumstances aggravated by additions made to the jetties at the mouth of the harbor which apparently reduced the exchange of seawater in the estuary. Secondly, town sewer consultants identified extensive development along Route One as a secondary source of estuarine pollution. This development sits atop a "perched" water table -- a water table typically no more than a few feet below the soil surface and held there by an underlying layer of impermeable soil -- which is inhospitable to subsurface waste disposal systems. Poorly constructed septic systems were leaking waste into this confined layer of water, which was then migrating during ebb tides into the several streams and rivers which flow through the area and drain into the estuary (Town of Wells, 1980).

To reverse the pollution of the estuary, the town in the late 1970s built an extensive sewerage system. The system became operational in 1979, at which time fecal coliform counts were very high. All thirteen sampling stations reported unacceptable levels of bacteria -- levels exceeding 70 coliform bacteria per 100 milliliters of water -- and eight of them reported scores of 1,100 or more. The new sewer was expected to take care of the problem, for as the 1980 comprehensive

plan reads, "the Department of Marine Resources... is continuing its regular monthly monitoring...so that the flats may be re-opened to digging as soon as the present pollution is abated to acceptable levels....". However, the authors of the plan were prudent enough to caution against the expectation that the sewer system just going on line would solve the pollution problem absolutely. The plan noted that:

... there is a possibility that significant pollution will continue to exist even after all properties within the sewer area are connected. This possibility exists because of a number of houses built on marginally acceptable soils in several large subdivisions located within the Webhannet catchment area...and also because leachate from the town dump can enter the river....(Town of Wells, 1980).

This caution was justified. The clamflats have remained closed to all but the most restricted harvests because of pollution attributed to non-point human waste sources in the vicinity of the estuarine system. For the last years for which Wells data is available, 1977 through 1980, only six licensed commercial clamdiggers worked in Wells, landing a high of 534 bushels in 1978 (since when landings have been off by two thirds) and a low of 47 bushels in 1980 (Maine Dept. of Marine Resources, 1979). All of the catch was polluted to some extent and subject to depuration.

Webhannet River Shellfish Habitat

The state has classified the tidal portions of the Webhannet River and its tributaries as SB. This is the middle classification for tidal waters, lower than SA but higher than SC. If the SB classification is attained the waters will be suitable for recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation, and as a habitat for fish and other estuarine and marine life. Attainment of a classification is determined by whether or not the water exceeds standards for dissolved oxygen, bacteria, and temperature. The state DEP has published no recent data indicating the Webhannet's attainment status. However, the Department of Marine Resources has closed the area to shellfish harvesting (along with virtually all other York County shellfish areas) due to high bacteria levels.

Little historic data on water quality is available for the Webhannet, but recently several monitoring efforts have focused on the estuary.

In 1989, the Town of Wells commissioned a study of bacterial contamination in the estuary. This study, conducted by two microbiologists at the University of New England (Vaughn and Novotny, 1991) includes analyses of water samples taken from five sites (see figure 9.1) from October, 1989 to September, 1990. This study revealed that all five sites exceeded the bacteria level set by the state for legal shellfish harvesting. The study showed considerable variation in bacteria levels by season and by site. The two upper sites yielded the lowest contamination levels; the three lower sites yielded very high levels of contamination, particularly during the summer. This would suggest that much of the bacteria is probably coming from surface water runoff originating in the more developed portions of the watershed. Further testing in the small streams that feed into the estuary revealed that significant bacteria loading seemed to be coming from areas relatively close to the estuary. The study speculates that a probable source for much of the bacteria is septic systems serving homes that never connected to the public sewer. Other possible sources of bacteria include animal feces, both wild and domestic, that is picked up in the runoff farther up in

the watershed, and leaks in the public sewer pipes that often run adjacent to the tributary streams. The Wells Sewer District, however, doubts that the sewer system, which is almost all quite new, could be leaking.

In addition to affecting shellfish harvestability, bacterial contamination, in high enough concentrations, can cause areas to be closed to swimming and other water contact activities. The U.N.E. study did not find bacterial levels consistently high enough to exceed state standards for water contact recreation, but readings were high enough to suggest that this could be a problem in the future.

The Wells Reserve also began a water quality monitoring program in Wells Harbor recently. The Reserve collected samples at the town dock from May 18 to August 20, 1990. Samples were collected every half hour, 24 hours a day. The parameters tested included temperature, PH, conductivity, salinity, dissolved oxygen, and oxygen reduction potential. The samples have recently been analyzed at UNH's Jackson Laboratory, and a report is forthcoming. The report will include recommendations regarding the type of on-going monitoring program that will be most appropriate for the Reserve to pursue in the harbor. One thing that is clear from the testing results is that the site contained relatively low levels of dissolved oxygen (DO). This is a concern as many marine organisms, including fish, require an abundant supply of dissolved oxygen. Low DO levels suggest, among other things, that the water is relatively nutrient rich (high nutrient levels typically trigger DO consuming algae growth). While the final report is not yet available, the raw data are currently available from the Wells Reserve or the Wells Town Office.

The Wells Reserve is planning to develop a program for on-going monitoring in the Webhannet based on the results of this effort. As both the Reserve and the Town are interested in on-going monitoring, it would seem logical for the two entities to consider coordinating research needs and perhaps designing a monitoring program that would serve both interests.

Threats to Shellfish Habitat

There are three main categories of contaminants that typically cause problems in coastal estuaries: 1) bacteria, 2) nutrients, and 3) heavy metals and other chemical contaminants. Bacterial contamination affects the harvestability of shellfish and ultimately human contact with the water. Pathogens associated with bacteria are harmful to humans if consumed either through shellfish or directly from the water. Common sources of bacterial contamination include septic systems, animal feces, and malfunctioning sewer systems.

Nutrients, such as nitrogen and phosphorous, act as fertilizers in the water and often trigger algae blooms. Nitrogen causes the most concern as it is usually the limiting nutrient in marine waters. The growth of algae and other marine plants is typically a problem both for aesthetic and biological reasons. Algae blooms usually result in a depletion of dissolved oxygen (especially when the algae die) and many marine organisms need plentiful amounts of dissolved oxygen to survive. Thus nutrient loading can adversely affect the quantity and quality of marine organisms, including fish. Common sources of nutrients include stormwater runoff from agricultural land, lawns, exposed soil, and developed areas, as well as sewage treatment plants and poorly functioning septic systems.

Heavy metals such as zinc, iron and lead typically sink to the bottom of the water body and settle in the bottom sediment. They are mainly a problem when the sediment is disturbed. Some chemicals such as chlorine, however, remain suspended in the water and can cause avoidance reactions in marine organisms. These contaminants are toxic to most marine organisms and to humans that eat affected organisms. Common sources include industrial and municipal discharges, over-

board discharges (chlorine), stormwater runoff, chemically treated wooden structures in the water, and antifouling paints used on boats.

Possible Sources of Pollution

The watershed that drains into the Webhannet contains the most developed areas in Wells. The 1990 Wells Comprehensive Plan identifies several confirmed and potential pollution sources within the Webhannet watershed. The plan identifies leachate from the old landfill as a confirmed source, and the old Town dump on Route 9B and the Town public works garage on Route 9 as potential sources. The old oil recovery pit on Burnt Mills Rd is also a likely source of oil contamination. Runoff from the industrial park and the heavily developed areas along Route 1 is probably a major source of nutrients (phosphorous, nitrogen etc.) as well as a source of some bacteria and various toxic pollutants such as petroleum hydrocarbons.

As noted above, a likely source for the bacterial contamination is septic systems in the vicinity of the estuary. The Vaughn and Novotny study singles out several trailer parks and a number of individual residences near the harbor as possible sources.

Part of the reason for the Webhannet's poor water quality is the proximity of development to the marsh in many areas. When development extends directly to the marsh's edge, the vegetative buffer around the marsh is lost. This buffer filters out some of the nutrients and other contaminants before they enter the water. Without the buffer, runoff enters the marsh directly and is only filtered by the marsh itself.

Recent Efforts to Re-open the Flats

In the late 1980s, the town became increasingly interested in re-opening the flats. The Vaughn and Novotny study revealed that all five sites within the estuary contained bacteria levels above the state limit for legal shellfish harvesting. Additionally the study concluded that: 1) the highest readings occurred during early Summer to mid-Fall, when human activity in the watershed was greatest, 2) freshwater, including surface runoff, streams, sewer, and groundwater accounted for the main sources -- oceanic sources were not significant, 3) rainfall greatly enhanced the rate of contamination, 4) the highest concentrations were recorded at the three lower monitoring sites (those near the most developed portions of the watershed) and the lowest concentrations were found at the two upper, less developed, sites, and 5) overall, water quality in the estuary has gone down since 1980, although the Lower Landing site improved somewhat; the overall degradation is probably related to the increased development in the watershed.

The study also identified a number of very specific potential sources of bacterial contamination through the "sanitary survey" part of the study. Most of these potential sources were residential septic systems associated with either single family residences or condominiums. While most residences east of Route 1 are connected to the public sewer, there are still a number with private systems including some trailer parks. Animal sources were cited as possible contributors in several instances, but human sources were found to be far more probable in almost all cases.

The Next Step

At a Selectmen's workshop meeting in June, 1991, it was recommended that the town attempt to verify septic system sources by placing dyes into individual systems and checking for the presence of the dye in the estuary. Once a source was verified the town could request the owner to connect up with the public sewer. This issue has yet to be acted on by the full body of Selectmen. One concern that has been raised regarding the dye testing technique is that contamination can be

very slow in some cases, and the dye may take a long time to reach the estuary. Some people who have tried this technique in the past have cautioned that they sometimes got no results from the dye even when they knew there could be no other source. Should the town embark on this testing route, it would be advisable to contact the individual at DEP's licensing and enforcement division who has been using this technique fairly successfully. Participants at the June workshop determined that the dye testing should begin on a trial basis at the northern end of the estuary, near Drakes Island, as this is the area that is least polluted and could be brought up to legal harvesting levels most quickly.

Other Issues

Another problem affecting the Wells shellfish resource is productivity. Even if the clams were legally harvestable, there are not nearly as many of them as there used to be. This is not just a problem in Wells: shellfish populations are down all along the southern Maine coast. The reasons for this are not fully understood, but predation by green crabs, birds and seals is considered a significant factor.

The town and the Wells Reserve have discussed the possibility of constructing a clam rearing laboratory at the Town Dock to improve productivity and serve as an educational facility for use by local school groups and tourists alike. Preliminary plans for a \$60,000 structure were drawn up several years ago. The project has stalled due to lack of funding sources.

There has been little agreement as to what effect a (potential) future dredge would have on the shellfish resource. The Wells shellfish warden feels that a dredge would greatly improve shellfish productivity as the dredge would increase the flushing activity in the estuary and would clear out some of the sand that is presently suffocating the flats. Others suggest that dredging would likely destabilize sections of the flats and might therefore harm portions of the resource. At least one marine biologist has indicated that dredging would probably have mixed effects; some areas would be improved, other areas might be harmed.

XI BEACH EROSION

The beaches along the eastern side of Drakes Island and Wells Beach make up two of the town's three major sandy beach segments. Wells Beach is a municipally owned and managed public beach and Drakes Island Beach is privately owned but open to the public. Historically, these beaches have been well supplied with sand and have always been considered to be among the finest beaches in southern Maine. Both beaches are used heavily during the summer months by Wells residents and visitors alike. Many residents who own property along these beaches derive a significant percentage of their income from renting their cottages to summer visitors who come to use the beaches.

Why are we discussing beach erosion in the Harbor Management Plan? Because the beaches are an integral part of the local sand transport system that includes the harbor. Actions taken related to beach erosion will affect sand movement in the harbor and movement of sand in the harbor will affect the beaches. Clearly, decisions regarding the management of either area should not be made in isolation of the other.

Since the construction of the Jetties at the harbor entrance in the early 1960s, the sections of these beaches farthest from the jetties have been slowly eroding and sand has been accumulating on both sides of the jetties. A number of geological studies have looked at the sand transport patterns in this area. These studies have indicated that littoral drift (sand transported by longshore currents) occurs in both a northerly and southerly direction but net transport appears to be towards the north (Byrne and Zeigler, 1977; Mariano and FitzGerald, 1989). While the sand trapped along the jetties has produced some excellent beaches in the immediate vicinity of the jetties, large sections of both Drakes Island and Wells Beach are now badly eroded and cobble now dominates the beach surface in several areas. A comparison of air photos from 1953 to 1990 reveals that most sections of the beaches are now more than 30 meters narrower than they were prior to construction of the jetties.

However, it is important to recognize that the jetties are not the only, nor necessarily the most significant, factor affecting the erosion of these beaches. For one thing, the sand trapped in the jetties on the Drakes Island side has been in a roughly "equilibrium" state for the last 10 to 15 years. Hence the sand that has been eroding in recent years from farther down on Drakes Island Beach has not been caught in the jetties -- it appears that the jetties are no longer obstructing the flow of sand the way they initially did. The sand currently being eroded from the beaches is therefore probably either going around (and over) the ends of the jetties and into the harbor, or it is being transported out of the system out to sea. The most important factor in the present erosion appears to be the presence of sea walls. Seawalls reflect wave energy back onto the beach and thus enhance the scouring effect on the sand. As a beach becomes narrower and the beach profile becomes steeper, the erosion will tend to increase as larger waves (no longer impeded by shallow lower beach conditions) are able to reach the shore. Larger waves can move larger sediment, and this is why cobble has replaced the sand in many parts of the beaches: these rocks are very common in high energy wave environments. The seawalls that line these beaches are responsible for initiating this process, and the beaches were most likely eroding slowly even before the jetties were constructed in 1962. While the jetties clearly enhanced the erosion problem, the seawalls and residential development along the frontal dunes of a naturally mobile barrier system are probably the most important factors affecting beach erosion.

Regardless of the causes, the erosion has created some major problems for the town. Now that Moody Beach is largely closed to the public, Wells and Drakes Island beaches are the major beaches open to tourists and residents alike. Since the condition of the beaches has deteriorated,

fewer tourists and summer renters are being drawn to the town. As noted in chapter VI, tourism represents the life blood of the local economy in Wells; anything that impacts tourism impacts the local economy. In addition to adversely affecting tourism, the eroding beaches are a serious concern to local residents (both those who live on the barrier islands and those who live elsewhere in town) who have witnessed a steady decline in the quality of one of the town's most important natural resources. Evidence of this concern includes a November 1990 petition to Governor McKernan signed by 95% of the residents of Drakes Island requesting state assistance with the erosion.

The Army Corps is undertaking a sand-transport analysis of the Wells and Drakes Island Beaches beginning this fall (1991) which will attempt to definitively establish the dynamics of local erosion and accretion.

XII DREDGING

While neither the Town of Wells nor the Harbor Plan Committee is in a position to make a final decision on dredging the harbor -- which decision lies with state and federal agencies -- the town and its citizens are certainly a part of the decision-making process or at least are in a position to influence the process. In the interest of promoting informed decision-making, the major arguments voiced to date for and against dredging are briefly summarized below.

Dredging Supporters' Concerns

Among other things, supporters of harbor dredging cite the following arguments: 1) The present "undredged" conditions in the harbor constitute a serious safety risk, 2) the present conditions pose severe hardship on the commercial fishing fleet that is based in the harbor, 3) the dredged sand is the only feasible source of sand for beach nourishment at Drakes Island and Wells Beaches, 4) mooring space in York County is now "maxed out" and Wells Harbor is an important mooring area, 5) Wells has invested in some of the best public harbor facilities in York County -- dredging is essential for the community and the region to realize full benefit from these facilities, 6) there will be major adverse impacts on tourism and the local economy if dredging is abandoned, and 7) there may be some environmental benefits to dredging.

The safety issue pertains both to entry and exit through the channel between the jetties and to navigation within the harbor. As noted above, the shoaling in the entrance channel has become so bad that even moderate seas make navigation dangerous. The Harbormaster himself ran aground here on a rescue mission in 1990. The shoaling in the mooring area has also proved hazardous on numerous occasions as even the most experienced boaters have "touched" in their attempts to access the town dock. Perhaps the greatest safety risk is associated with visiting recreational boaters unfamiliar with the harbor who access the water from the boat ramp. Posted hazard warnings might reduce but would certainly not eliminate this problem.

The hardship to the commercial fishing fleet is discussed somewhat in chapter V. As dock access as well as entry and exit from the harbor can only occur at higher tides, fishermen must operate under a severely restricted and constantly changing schedule. As conditions continue to worsen, it will only be a matter of time before this situation begins to force fishermen out of the harbor or out of business.

The need for sand on the Drakes and Wells Beaches has been discussed in detail in chapter XI. Many advocates for beach nourishment point to Wells Harbor sand as the only logical and feasible source for the needed sand.

Mooring space is at a premium in York County and the demand for moorings is projected to be more than double the supply in York County by the year 2000, according to a 1991 regional berthing study by the Southern Maine Regional Planning Commission. The study indicates that all the region's harbors are essentially at capacity and demand currently exceeds supply by some 1,600 boats. As the continued lack of dredging will gradually reduce the amount of usable mooring space in the harbor, dredging is essential to retain the current quantity of moorings. The recreational boating chapter of this plan indicates that the local demand for moorings is projected to increase to 507 boats (mid-range estimate) by the year 2000. This is clearly both a local and a regional issue.

The impacts on tourism and the local economy of not dredging the harbor would be significant. These impacts would include the eventual loss of the many "day trippers" who currently use the public boat ramp; the many non-resident recreational boaters who currently spend money in town because they moor their boats here; and the loss of tourist attracting activities such as the fishing derbies and the Arundel School of Boat Building and Design's annual launching festivals.

Supporters of dredging have also pointed to several potentially beneficial effects that dredging would likely have on the harbor environment. Dredging would improve the flushing process in the harbor which would tend to improve water quality and benefit marine organisms, including fish, in the estuary. Additionally the dredged material, if placed appropriately, could improve the attractiveness of area beaches to nesting piping plovers. Lastly, it has been suggested that by removing the sand that is currently smothering shellfish beds in the vicinity of the harbor, dredging may improve the productivity of the harbor's soft shell clams. These arguments do not pretend that all the environmental effects will be positive; they merely point out that there are likely to be some environmental benefits, and these benefits should be considered along with the detriments.

Dredging Opponents' Concerns

Opponents to dredging have identified three major environmental impacts that they suggest will result from dredging: 1) enhanced erosion of the Webhannet River marsh, 2) Habitat loss associated with the destruction of the harbor's intertidal sandbar, and 3) migration of sand northward along Drakes Island if dredged sand is placed on Drakes Island Beach.

The issue of marsh erosion is discussed in more detail in Chapter X. The basic concern is that if the harbor is dredged, the new harbor basin will act as a sink and suck sediment from the surrounding area. Some of this sediment will come from creeks that dissect the marsh. As sand is removed from these creeks, the marsh along the edges of the creeks will gradually be undermined and the marsh area will decrease. Loss of marshland is primarily a concern because of its high wildlife habitat value. This concern exists regardless of the magnitude of proposed dredging, although clearly the impact would be less if the dredged basin was very small. The loss of habitat is important to legal arguments against dredging: State and federal environmental laws, (the federal Clean Water Act and state laws adopted pursuant to it), contain "antidegradation" provisions that protect existing uses -- including wetlands supporting wildlife or estuarine life -- present in water bodies.

The concern regarding destruction of the sandbar is quite simple. The intertidal sandbar now lining much of Wells Harbor and extending up the Webhannet River some distance is used by a number of species of birds and other invertebrates. Removing a portion of sandbar in the dredging process would reduce the amount of this type of intertidal habitat in the area and would again, it is suggested, violate the Clean Water Act as discussed above.

The placing of dredged material on Drakes Island Beach, which has been part of the more recent dredge proposals, is also discussed in Chapter XI, Beach Erosion. As noted in that chapter, geologic studies completed to date for this coastal area have indicated that there is a net northerly flow of long shore drift at Drakes Island. This means that if a large quantity of sand were added to Drakes Island Beach (which is now, according to recent studies, approaching "dynamic equilibrium") this new sand would quickly be dispersed up and down the beach and to the lower beach profile, such that some sand would travel north and clog the Little River inlet. The Little River inlet serves as an important source of salt water to the Little River estuary system. While sand has not blocked the Little River inlet in the recent past (even when large amounts of sand were in

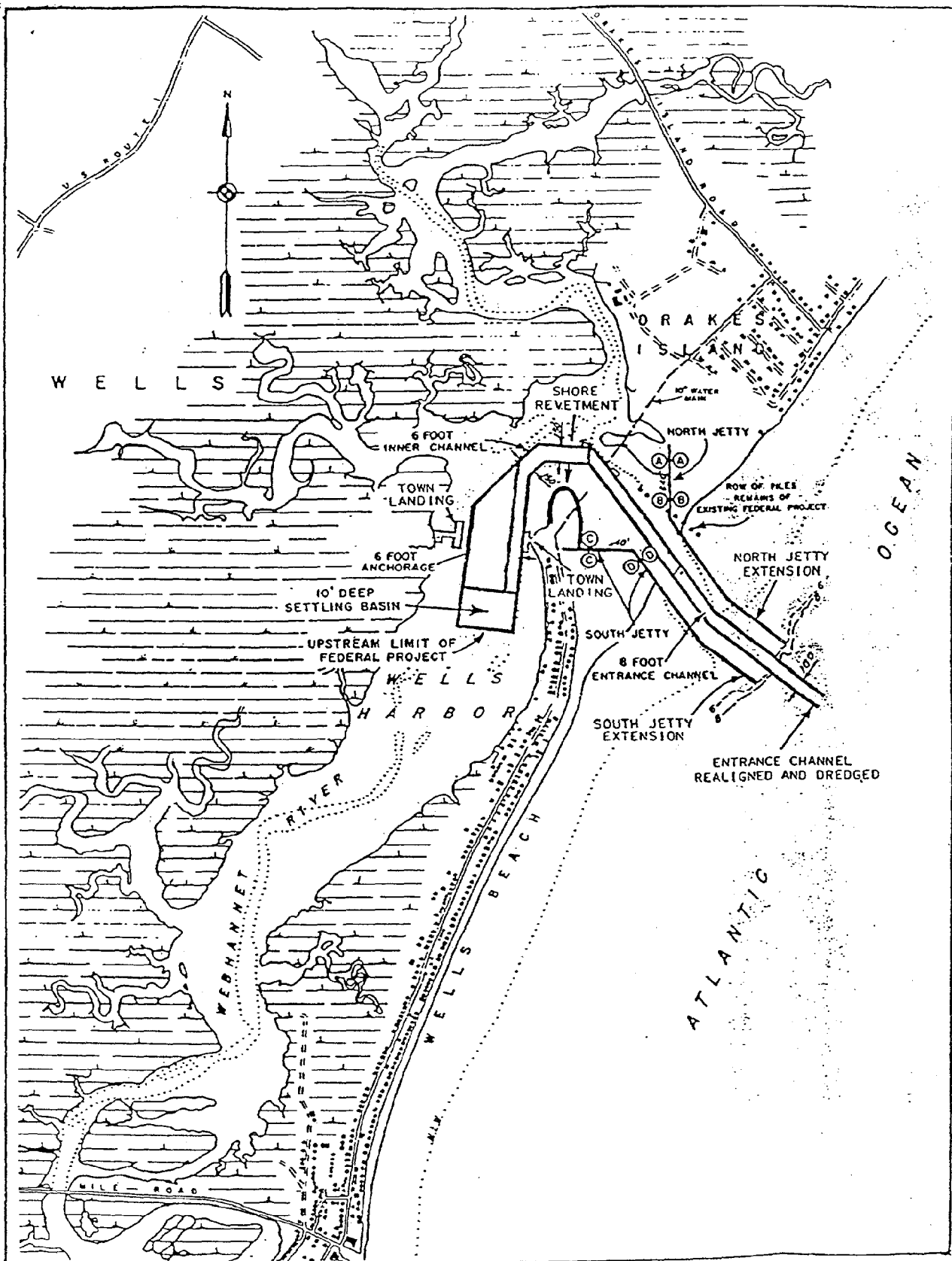


FIGURE 12.1 The Major Components of the Army Corps' 1960s Jetty Construction and Dredging Activities.

Source: The U.S. Army Corps of Engineers, 1977.

beach system) sand transport following beach nourishment tends to be very different from transport under more natural conditions where beaches have adjusted gradually to changes in wave energy. Inlet blockages following nourishment projects are not uncommon and have been observed elsewhere in Maine in recent years. Some geologists have suggested that there is a "nodal point" mid-way along Drakes Island Beach such that south of this point most deposited sand would travel south. Despite the numerous studies relating to this area that have been completed to date, the movement of sand along Drakes Island is not yet fully understood. If the concept of this nodal point is sound, it may well be that sand could be placed on the southern portion of the beach and pose little threat to the Little River inlet.

Alternatives to Dredging

Any discussion of dredging would be incomplete without some consideration of possible alternatives to continued dredging of the harbor. The Harbor Plan Committee discussed several such alternatives, but was hampered by the lack of currently available information on the feasibility of some of these alternatives. Five of the alternatives considered at least in a cursory manner by the committee were: 1) a modified maintenance dredge for navigation and safety; 2) creation of a new mooring area off of Wells Beach at Fishermen's Cove; 3) relocating the docking and mooring facilities to the east side of the Wells Beach parking lot, inside the jetties; 4) relocating moored boats to other harbors; and 5) no action.

The modified maintenance dredge for navigation and safety would be the most desirable alternative, from the committee's point of view. The benefits of this plan are many. First, this plan would address the serious hazards posed by the current condition of the harbor to *all vessels* that use the facility -- commercial and recreational, deep and shallow draft vessels alike. Second, moorings could be allocated on the basis of a formal mooring plan. This would alleviate the current situation which jeopardizes the vessels both from damage by collision and damage from grounding, is a hazard to navigation, and which makes the mooring allocation process unfair to resident and non-resident owners alike -- five moorings, say, may go in one season and have to come out the next. Third, this plan would allow vessels to take full advantage of the excellent harbor support infrastructure. As discussed in Chapter IV, these facilities were constructed on fill from the original dredge, and were envisioned to be the foundation for a perpetually vital recreational and commercial harbor. Given the chronic shortage of both recreational and commercial berthing in southern Maine, the lack of appropriate shoreside facilities for commercial fishermen, and the expense and difficulty of creating new facilities, it would seem to be a waste of resources to allow a location with established access, shoreside facilities and berthing to slip away. Fourth, a modified dredge would allow the town to continue to realize significant economic benefits from commercial and recreational boating (see Chapters V, VI & VII). Finally, this plan would create the framework for an environmentally responsible relationship with the Rachel Carson Refuge and the Wells Reserve and provide the basis for compliance with applicable state and federal laws governing resource protection.

The Fishermen's Cove alternative would involve the construction of a jetty along the existing rocky outcropping at the cove and making this area into a mooring area. The advantages of this idea are that this is a naturally hard bottomed cove, there appears to be little sand movement in the area that would be intercepted, and there would be plenty of mooring space accessible at all tides. Additionally, the potential environmental problems associated with dredging the existing harbor would be avoided. The disadvantages include the lack of parking facilities, and, of course the cost of constructing the jetty. The feasibility of establishing a public dock at the cove is uncertain. Committee members suggested that this alternative might include improvements to the existing jetties; possibly these jetties could be shortened somewhat and the excess rock could be used in the

construction of the new jetty. The Army Corps admits that there are some problems with the existing jetties but cautions that any tampering with them will require careful study. Clearly, the specifics of this alternative, including the geologic feasibility, the economic feasibility and the logistical feasibility, would have to be looked at much more thoroughly before any real assessment of the viability of this alternative could be made.

The idea of moving the town dock across the harbor to the enclave inside the jetties on the east side of the Wells Beach parking lot was discussed only briefly by members of the committee. The advantages of this alternative are that the dock would be closer to the ocean and would necessitate much less dredging to remain accessible. Likewise, moorings would be much closer to the sea and ample parking is available. As with the above alternative, the potential environmental impacts would be less than those associated with dredging the existing federal project area. The disadvantages are that the area is not large enough to accommodate all of the boats currently moored in the harbor and that frequent dredging would still be required. The Army Corps has indicated informally that it would not support this alternative as the frequency of needed dredges would be even greater than that of the present harbor area. This alternative would also need further study to fully assess its feasibility.

The concept of moving boats to other regional harbors is dubious at best. To begin with, all the other harbors in York County are currently at or above capacity (and have long waiting lists) according to SMRPC's 1991 Regional Berthing Study. Additionally, the commercial fishing vessels need to be near their fishing grounds; they can not simply move to a harbor in Kittery or Saco, for instance, and continue business as usual. The Wells lobster fleet fishes within a few miles of Wells Harbor, and winter conditions as well as transportation costs make long distance travel to fishing grounds unrealistic. There's also the issue of land transportation; 20 out of the 22 lobster boats are operated by fishermen who live in Wells. Finally, commercial fishing at Wells Harbor represents an important part of the community's tradition and lifestyle. One can not simply uproot an industry woven this deeply into the community fabric, and reestablish it elsewhere.

The 'no action' alternative has been touched on elsewhere in this chapter. The main advantage is that the potential environmental impacts discussed above would be avoided. The disadvantages are that all of the problems described above in the "dredging supporters concerns" section would not be addressed. This alternative was not recommended by the Harbor Plan Committee.

Agreements/Recommendations: Report of the Barry Lawson Report

The observation of the Harbor Plan Committee is that dredging, even if limited in extent, could have some important benefits not only to boating interests of the community but also, potentially, to the health of the marshland, the restoration of clamming, and the return of piping plovers. At the same time, it is recognized that dredging could also have negative impacts on marshland stability, encourage more and larger vessels, and disturb the ecosystem of the refuge.

The recommendation is to continue the research on the dynamics of the harbor; to obtain a better understanding of the potential effects, both positive and negative, of dredging and at various levels; to explore other options in lieu of dredging; and on the basis of evolving knowledge, determine cooperatively with state and federal agencies, appropriate plan implementation actions to take to accomplish harbor management goals.

While dredging with the current level of understanding may not be favored, the door should not be closed to its consideration if trends in siltation, beach sand migration, and reduced channel flow and intra-harbor flushing continue to have increasingly negative impacts on important environmental resources as well as on boating interests.

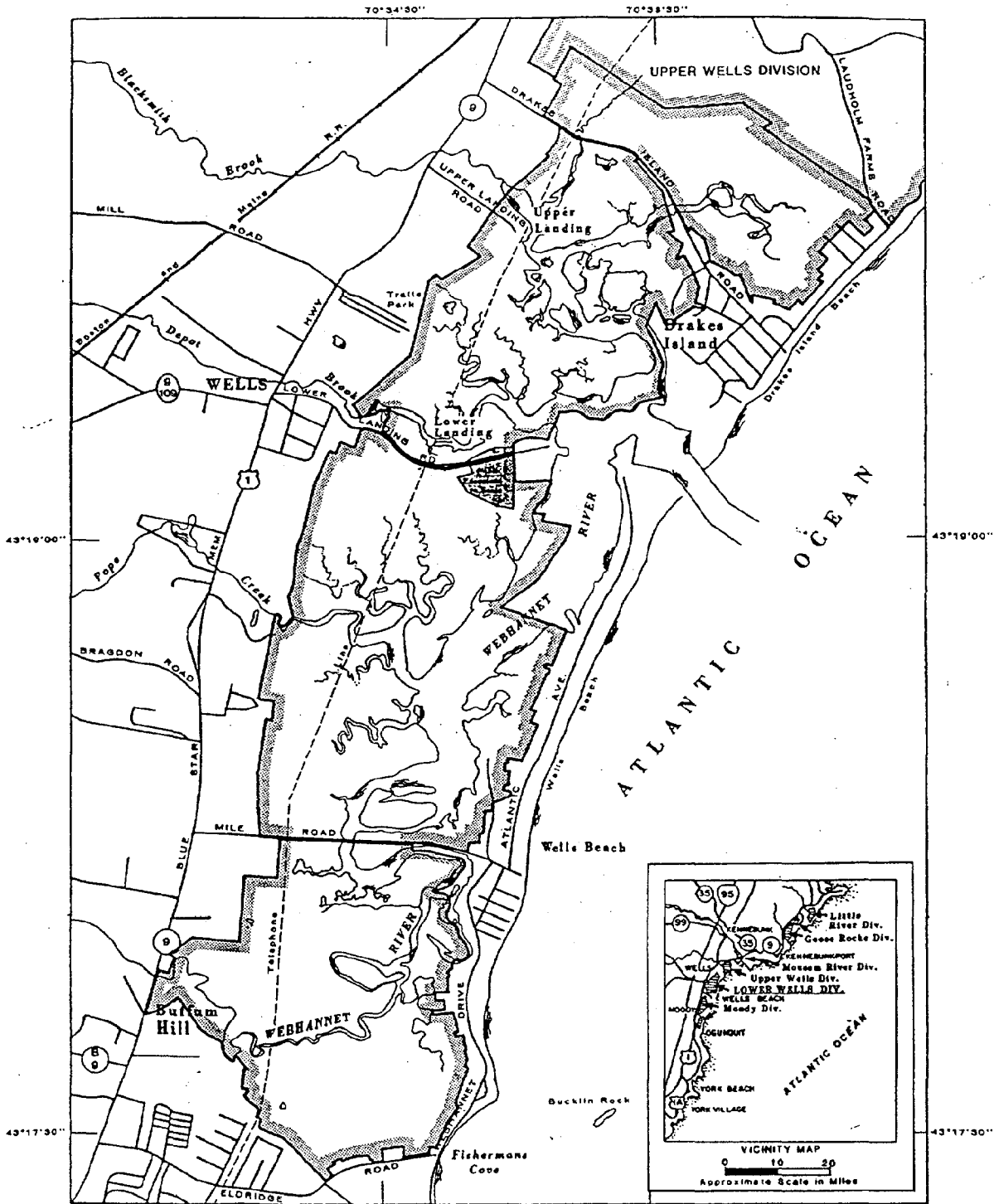
RACHEL CARSON NATIONAL WILDLIFE REFUGE

LOWER WELLS DIVISION

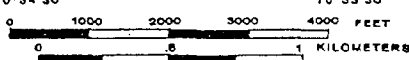
UNITED STATES DEPARTMENT OF THE INTERIOR

YORK COUNTY, MAINE

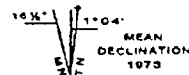
UNITED STATES FISH AND WILDLIFE SERVICE



COMPILED IN THE DIVISION OF REALTY FROM SURVEYS BY U.S.G.S. AND U.S.F.W.S.



NEWTON CORNER, MASSACHUSETTS JUNE, 1966
REVISED: MARCH 1969

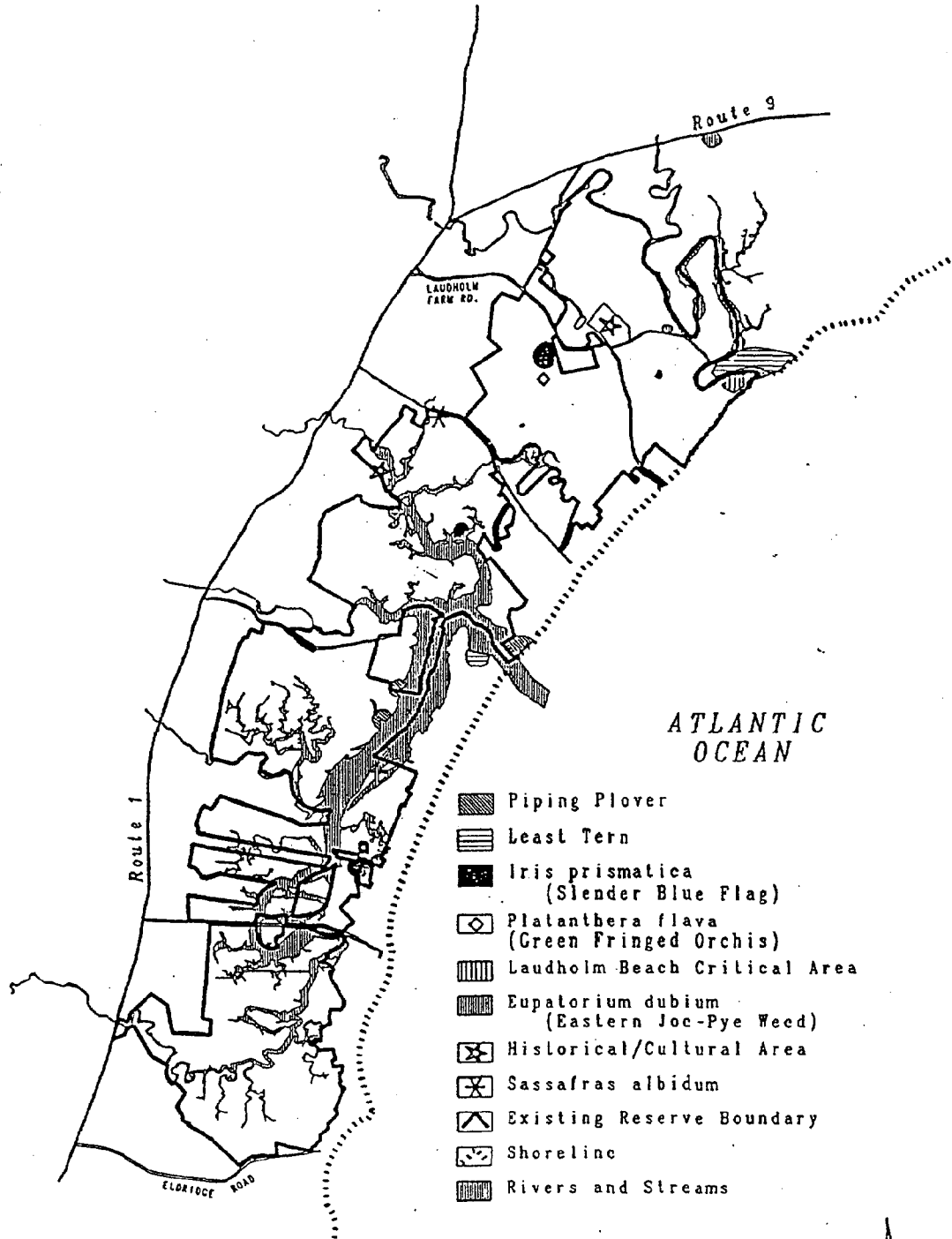


5R ME 770

APPENDIX A Lower Wells Division of the Rachel Carson Wildlife Refuge.

Map prepared by the U.S. Fish and Wildlife Service.

Wells National Estuarine Research Reserve
WELLS, MAINE



SOURCE: Widoff, L., 1985, The Vegetation of the Wells National Estuarine Sanctuary. Maine State Planning Office, Nomination for the Official List of Maine Heritage Coastal Areas, Region 1, 1987.

APPENDIX B Current or Recent Locations of Sensitive and Endangered Species.

This map is from the Wells National Estuarine Research Reserve Management Plan, 1991, and is included courtesy of the Wells Reserve.

APPENDIX C Fish of the Wells Reserve¹

<u>Species Name</u>	<u>Common Name</u>
<u>Ammodvdes hexapterus</u>	Sandlaunce
<u>Anquilla rostrata</u>	American Eel
<u>Apeltes quadracus</u>	Fourspine Stickleback
<u>Clupea harengus</u>	Atlantic Herring
<u>Fundulus heteroclitus</u>	Mummichog
<u>Gasterosteus aculeatus</u>	Threespine Stickleback
<u>Gasterosteus wheatlandi</u>	Blackspotted Stickleback
<u>Liopsetta putnami</u>	Smooth Flounder
<u>Menidia menidia</u>	Atlantic Silverside
<u>Merluccius bilinearis</u>	Silver Hake
<u>Microgadus tomcod</u>	Tomcod
<u>Mugil cephalus</u>	Common Mullet
<u>Mvoxcephalus aeneus</u>	Grubby
<u>Pollachius virens</u>	Pollock
<u>Pseudopleuronectes americanus</u>	White Flounder
<u>Pungitius pungitius</u>	Ninespine Stickleback
<u>Salvelinus fontinalis</u>	Sea-run Brook Trout
<u>Scomber scombrus</u>	Atlantic Mackerel
<u>Syngnathus fuscus</u>	Northern Pipefish
<u>Tautoglabrus adspersus</u>	Cunner

¹ Includes primarily the Webhannet River and the Little River. This table is from the Wells National Estuarine Research Reserve Management Plan, 1991 and is included courtesy of the Wells Reserve. The list was compiled by Mr. Sean Murphy, University of Massachusetts, 1988.

APPENDIX D Birds of the Rachel Carson Refuge and the Wells Reserve

This list of birds was prepared by the U.S. Fish and Wildlife Service. Those birds listed with an "X" have been seen in the Rachel Carson Refuge lands in the Wells Reserve.

The following coding scheme applies to the list of birds:

Season

s - Spring	March 21 - June 20
S - Summer	June 21 - September 20
F - Fall	September 21 - December 20
W - Winter	December 21 - March 21

- + - Nesting has occurred on the refuge, within the past 5 years.
- * - A species which occurs and/or nests in only one or two locations in the refuge.

Relative Abundance

a - abundant	a species which is very numerous
c - common	certain to be seen or heard in suitable habitat
u - uncommon	present, but not certain to be seen
o - occasional	seen only a few times during the season
r - rare	seen at intervals of 2 to 5 years

Note: This information on birds, including the lists on the following pages, is included courtesy of the U.S. Fish and Wildlife Service and the Wells Reserve. Most of the birds seen in the Wells Reserve frequent the marshes and waters of the Webhannet River.

a S F W

LOONS - GREBES

<u>X</u>	Red-throated Loon	o	o	u
<u>X</u>	Common Loon	c	o	c c
<u>X</u>	Pied-billed Grebe	o	o	o
<u>X</u>	Horned Grebe	u	o	u
<u>X</u>	Red-necked Grebe	o	u	u

GANNET - PETRELS - CORMORANTS

—	Wilson's Storm-Petrel	r	r	
—	Northern Gannet	o	u	o
—	Great Cormorant	u	u	c
<u>X</u>	Double-crested Cormorant	c	c	c o

BITTERNS - HERONS - IBISES

<u>X</u>	American Bittern	u	u	u
<u>X</u>	Great Blue Heron	c	c	c o
<u>X</u>	Great Egret	o	o	o
<u>X</u>	Snowy Egret	c	c	c
<u>X</u>	Little Blue Heron	o	u	u
—	Incolored Heron	o	o	o
<u>X</u>	Cattle Egret	r		
<u>X</u>	Green-backed Heron †	u	c	u
<u>X</u>	Black-crowned Night-Heron †	u	c	c
—	Yellow-crowned Night-Heron	r	r	r
<u>X</u>	Glossy Ibis	u	u	r

SWANS - GEESE - DUCKS

<u>X</u>	Snow Goose	o		r
<u>X</u>	Brant	o		o
<u>X</u>	Canada Goose	c	o	c u
<u>X</u>	Wood Duck	o	o	u
<u>X</u>	Green-winged Teal †	u	o	c o
<u>X</u>	American Black Duck †	c	c	c c
<u>X</u>	Mallard †	c	c	c c
<u>X</u>	Northern Pintail	u	u	o
<u>X</u>	Blue-winged Teal †	u	o	u
<u>X</u>	Northern Shoveler	o		
<u>X</u>	Gadwall	r	r	r
<u>X</u>	American Wigeon	o	o	
—	Ring-necked Duck	o	o	
<u>X</u>	Greater Scaup	o	o	o
<u>X</u>	Common Eider	u	u	c
—	King Eider			r
<u>X</u>	Oldsquaw	u	o	u
—	Black Scoter	u	u	u
<u>X</u>	Surf Scoter	u	u	u
<u>X</u>	White-winged Scoter	u	u	u
<u>X</u>	Common Goldeneye	c	u	c

* S F W

—	Barrow's Goldeneye	r	r	
<u>X</u>	Bufflehead	c	c	c
<u>X</u>	Hooded Merganser	o	o	o
<u>X</u>	Common Merganser	o	o	o
<u>X</u>	Red-breasted Merganser	c	c	c

VULTURES - HAWKS - FALCONS

<u>X</u>	Turkey Vulture	o	o	
<u>X</u>	Osprey	u	o	u
<u>X</u>	Bald Eagle			o
<u>X</u>	Northern Harrier	u	o	u u
<u>X</u>	Sharp-shinned Hawk †	u	o	c o
<u>X</u>	Cooper's Hawk †*	o	o	
<u>X</u>	Northern Goshawk	o	o	o o
—	Red-shouldered Hawk	o	o	o
<u>X</u>	Broad-winged Hawk	u	u	c
<u>X</u>	Red-tailed Hawk	u	o	u o
<u>X</u>	Rough-legged Hawk	o		c
<u>X</u>	American Kestrel	u	u	u o
<u>X</u>	Merlin	o	o	
<u>X</u>	Peregrine Falcon			u

GROUSE - PHEASANT

<u>X</u>	Ring-necked Pheasant †	u	u	u u
<u>X</u>	Ruffed Grouse †	u	u	u u

RAILS

<u>X</u>	Virginia Rail	o	o	
<u>X</u>	Sora	o	o	
—	Common Moorhen	r	r	
—	American Coot	r	r	

PLOVERS - SANDPIPERS

<u>X</u>	Black-bellied Plover	c	u	c
<u>X</u>	Lesser Golden-Plover	o	o	
<u>X</u>	Semipalmated Plover	c	u	c
<u>X</u>	Piping Plover †*	o	u	o
<u>X</u>	Killdeer †	u	c	u o
<u>X</u>	American Avocet	r		
<u>X</u>	Greater Yellowlegs	c	c	c
<u>X</u>	Lesser Yellowlegs	u	u	c
<u>X</u>	Solitary Sandpiper	o	u	u
<u>X</u>	Willet †	u	c	o
<u>X</u>	Spotted Sandpiper †	u	c	u
—	Upland Sandpiper	r	r	
<u>X</u>	Whimbrel	u	o	u
<u>X</u>	Hudsonian Godwit	o	o	
<u>X</u>	Marbled Godwit	r	r	
<u>X</u>	Ruddy Turnstone	o	o	o r

<u>X</u>	Eastern Bluebird †	o	o	o
<u>X</u>	Veery †	c	c	o
<u>X</u>	Gray-cheeked Thrush	o	o	
—	Swainson's Thrush	u	o	
<u>X</u>	Hermit Thrush	c	u	u
<u>X</u>	Wood Thrush †	c	c	o
<u>X</u>	American Robin †	c	c	u
<u>X</u>	Gray Catbird †	c	c	c
<u>X</u>	Northern Mockingbird †	u	u	u
<u>X</u>	Brown Thrasher	c	c	c
WAXWINGS - SHRIKES - STARLING				
<u>X</u>	Water Pipit	u	u	
<u>X</u>	Cedar Waxwing †	u	c	c
<u>X</u>	Northern Shrike	o	o	o
<u>X</u>	European Starling †	a	a	a
VIREOS - WOOD WARBLERS				
<u>X</u>	Solitary Vireo †	u	u	u
<u>X</u>	Warbling Vireo	o	o	r
—	Philadelphia Vireo	o	o	r
<u>X</u>	Red-eyed Vireo †	u	c	u
—	Tennessee Warbler	u	u	u
<u>X</u>	Nashville Warbler †	u	u	u
<u>X</u>	Northern Parula	u	u	u
<u>X</u>	Yellow Warbler †	c	c	o
<u>X</u>	Chestnut-sided Warbler †	u	o	u
<u>X</u>	Magnolia Warbler †	u	u	u
—	Cape May Warbler	u	o	u
<u>X</u>	Black-throated Blue Warbler	u	o	u
<u>X</u>	Yellow-rumped Warbler †	c	u	a
<u>X</u>	Black-throated Green Warbler †	c	c	u
—	Blackburnian Warbler	u	u	u
<u>X</u>	Pine Warbler †	u	u	u
—	Prairie Warbler	o	o	o
<u>X</u>	Palm Warbler	u	u	u
—	Bay-breasted Warbler	u	u	u
<u>X</u>	Blackpoll Warbler	u	u	
—	Black-and-white Warbler †	c	c	c
<u>X</u>	American Redstart †	c	c	c
<u>X</u>	Ovenbird †	u	u	u
—	Northern Waterthrush	u	u	
—	Louisiana Waterthrush	r		
—	Mourning Warbler	o	o	o
<u>X</u>	Common Yellowthroat †	c	c	c
<u>X</u>	Wilson's Warbler	u	u	u
<u>X</u>	Canada Warbler †	c	u	u

—	Yellow-breasted Chat	o	o	
TANAGERS - SPARROWS				
<u>X</u>	Scarlet Tanager †	u	u	u
<u>X</u>	Northern Cardinal †	u	u	u
<u>X</u>	Rose-breasted Grosbeak †	u	u	o
<u>X</u>	Indigo Bunting †	u	u	u
<u>X</u>	Rufous-sided Towhee †	c	c	c
<u>X</u>	American Tree Sparrow	c	c	c
—	Chipping Sparrow †	c	c	c
<u>X</u>	Field Sparrow †	u	u	u
—	Vesper Sparrow	o	u	
<u>X</u>	Savannah Sparrow †	c	c	c
<u>X</u>	Sharp-tailed Sparrow †	c	c	c
—	Fox Sparrow	u	u	
—	Song Sparrow †	c	c	u
—	Lincoln's Sparrow	o	o	
—	Swamp Sparrow †	u	u	u
—	White-throated Sparrow †	c	u	c
—	White-crowned Sparrow	u	u	
—	Dark-eyed Junco	c	c	c
—	Lapland Longspur	o	o	c
—	Snow Bunting	u	u	
BLACKBIRDS - FINCHES				
<u>X</u>	Bobolink	c	u	
<u>X</u>	Red-winged Blackbird †	a	a	c
<u>X</u>	Eastern Meadowlark †	u	u	u
<u>X</u>	Rusty Blackbird	o	u	
<u>X</u>	Common Grackle †	a	c	c
<u>X</u>	Brown-headed Cowbird †	a	c	c
<u>X</u>	Northern Oriole †	u	u	u
—	Pine Grosbeak	o		
<u>X</u>	Purple Finch †	u	u	c
<u>X</u>	House Finch †	c	c	c
—	Red Crossbill			
—	White-winged Crossbill			
—	Common Redpoll	o	o	
<u>X</u>	Pine Siskin	o	o	
<u>X</u>	American Goldfinch †	c	c	c
<u>X</u>	Evening Grosbeak	c	u	
<u>X</u>	House Sparrow †	u	c	c

S F W

X	Red Knot	o	o	o
X	Sanderling	u	o	u
X	Semipalmated Sandpiper	a	c	a
X	Western Sandpiper	u	u	
X	Least Sandpiper	u	u	c
X	White-rumped Sandpiper	u	o	u
X	Baird's Sandpiper	r	r	
X	Pectoral Sandpiper	u	u	u
X	Purple Sandpiper	o	o	u
X	Dunlin	u	o	c
X	Curlew Sandpiper	r	r	
X	Silt Sandpiper	o	o	
X	Ruff	r	r	
X	Short-billed Dowitcher	r	c	c
	Long-billed Dowitcher	r	r	
X	Common Snipe	u	o	u
X	American Woodcock †	u	u	u
X	Wilson's Phalarope	o	o	o
	Red-necked Phalarope	r	r	r
GULLS - TERNS - MURRES				
	Laughing Gull	o	o	o
X	Bonaparte's Gull	u	u	u
X	Ring-billed Gull	c	c	c
X	Herring Gull	a	a	a
X	Iceland Gull	o	r	o
X	Glaucous Gull	o	r	o
X	Great Black-backed Gull	c	c	c
	Roseate Tern	r	r	
X	Common Tern †	c	c	u
X	Arctic Tern	o	o	o
X	Least Tern †	u	u	u
	Black Tern	r		
	Dovekie	r		r
	Common Murre	r		
X	Thick-billed Murre	r		
	Razorbill	r		
X	Black Guillemot	r		r
DOVES - CUCKOOS - OWLS - SWIFTS				
X	Rock Dove	c	c	c
X	Mourning Dove †	c	c	c
X	Black-billed Cuckoo	u	u	o
X	Yellow-billed Cuckoo	o	o	o
X	Great Horned Owl †	u	u	u
X	Snowy Owl	r		r
X	Barred Owl	u	u	u

S F W

X	Short-eared Owl	r	r	r	o
X	Northern Saw-whet Owl	o	o	o	o
X	Common Nighthawk			u	
X	Whip-poor-will †	u	u	u	
X	Chimney Swift	u	u		
X	Ruby-throated Hummingbird	u	o	u	
X	Belted Kingfisher †		c	c	c
WOODPECKERS - FLYCATCHERS					
X	Yellow-bellied Sapsucker		u	u	
X	Downy Woodpecker †		c	c	c
X	Hairy Woodpecker †		u	u	u
X	Northern Flicker †		c	c	c
X	Pileated Woodpecker		o	o	o
	Olive-sided Flycatcher		o	o	
X	Eastern Wood-Pewee †		u	u	u
	Yellow-bellied Flycatcher		o	u	
	Alder Flycatcher		u	u	
	Willow Flycatcher †		o	u	o
	Least Flycatcher		u	u	u
X	Eastern Phoebe †		u	u	u
X	Great Crested Flycatcher †		c	c	c
X	Western Kingbird		r		
X	Eastern Kingbird †		c	c	c
LARKS - SWALLOWS - JAYS - CROWS					
X	Horned Lark †		u	u	u
X	Purple Martin †		c	c	
X	Tree Swallow †		c	c	o
X	Northern Rough-winged Swallow †		o	o	
X	Bank Swallow		u	u	u
X	Cliff Swallow †		u	u	o
X	Barn Swallow †		c	c	o
X	Blue Jay †		c	c	c
X	American Crow †		c	c	c
CHICKADEES - NUTHATCHES - WRENS					
X	Black-capped Chickadee †		c	c	c
	Boreal Chickadee				r
X	Tufted Titmouse †		o	o	o
X	Red-breasted Nuthatch †		c	c	c
X	White-breasted Nuthatch †		c	c	c
X	Brown Creeper †		c	c	c
X	House Wren †		o	u	o
	Marsh Wren		o	o	
KINGLETS - THRUSHES - THRASHERS					
X	Golden-crowned Kinglet		c	u	
X	Ruby-crowned Kinglet		c	c	

APPENDIX E State Threatened and Endangered Plant List for the Wells Reserve

<u>Agalinis maritima (Raf.)</u>	Seaside gerardia	WL, Salt Marsh
<u>Arethusa bulbosa L.</u>	Arethusa	WL, Wet Meadow
<u>Aster divaricatus L.</u>	White wood aster	T, Woodlands
<u>Aster dumosus L.</u>	Bushy aster	E, Field
<u>Calamagrostis cinnoides (Muh)</u>	Reed grass	SC-PE, Salt Marsh
<u>Cardamine sp. (possibly C. bellidifolia L. or C. longii Fern.)</u>	Bittercress	E;T (E) T(b)
<u>Chenopodium rubrum L.</u>	Coast blite	T, Salt Marsh
<u>Clethra alnifolia L.</u>	Sweet pepperbush	T(c), Salt Marsh
<u>Eupatorium dubium Willd.</u>	Eastern joe pye	E, Salt Marsh
<u>Ilex laevigata (Pursh) Gray</u>	Smooth winterbrier	SC, Back Dune
<u>Iris prismatica Pursh</u>	Slender blue flag	T, Fresh Wetland
<u>Rhynchospora sp. (possibly R. capillacea Torr.)</u>	Beak rush	E, Meadow
<u>Verbena urticifolia L.</u> Swamp	White vervain	SC-PE, Shrub

This table is from the Wells National Estuarine Research Reserve Management Plan, 1991, and is included courtesy of the Wells Reserve.

APPENDIX F

Report

Agreements Regarding Objectives, Issues and Policies to be Included in a Harbor Plan for Wells, Maine

by the
Wells Harbor Plan Committee



submitted by

Barry R. Lawson, Committee Facilitator
Barry Lawson Associates, Inc.
Concord, MA

May 1991

NOTE: This report was a precursor study to the Wells Harbor Plan. The purpose of the report was to establish frank and open dialogue between the parties with a vested interest in the future of the Wells Harbor area. This report is an open discussion and is presented here as background information. This report should therefore not be read as a statement of fact.



Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

May 20, 1991

Mr. Jonathan Carter
Town Manager
Town of Wells
Wells, Maine 04090


Dear Jon:

Attached please find a "List of Agreements" which encompasses the agreements reached by the Wells Committee during the facilitated discussions of the past two months. These are the principal statements of policy from the committee to the town from which Eric Perkins will subsequently develop implementation proposals.

I appreciate the cooperation I have received from each of the committee members, from you and Jack Lyons, and all others involved in this project. I believe that some significant steps have been taken, but realize there are challenges ahead. It is critical that steps toward involving state and federal agencies in positive dialogues be taken with a "firm but flexible" attitude. It is often not *what* is done but *how* it is done which can spell the difference in forging these types of cooperative efforts.

Please feel free to give me a call to talk over how you want to proceed, or if you have questions you would like to discuss. In the meantime, the best of luck to you all, and I would be pleased to receive a copy of Eric's report and other "evidence" of your progress toward a proactive harbor plan for Wells.

Sincerely,


Barry R. Lawson
President

Attachment

List of Agreements

Goals for the Harbor Plan

- The committee wishes to develop a harbor plan and ongoing planning process to guide the protection and development of the harbor and to establish steps to be taken, or avoided, to achieve the objectives the town sets for the harbor. Objectives of a harbor plan would include:
 - emphasize consistency among the projects, policies and programs of state, federal and other organizations with the goals and elements of the harbor plan
 - provide an historical perspective of the harbor
 - protect the many interests represented in the town
 - be a "proactive" plan which will identify the issues that will develop over time and prepare the town to anticipate and respond to trends and activities of the future
 - recognize and encourage tourism as a major and continuing factor in the economic growth of the town
 - protect and enhance the water quality of the harbor, emphasizing the identification and elimination of contaminants from vessels and bordering residences and lands
 - acknowledge the comprehensive plan which currently exists for the town and to which the harbor plan will be an addendum
 - ensure that the plan development/refinement process will continue with a committee oversight
 - monitor the plan and process every year to determine the progress made in its implementation and to identify impacts that result from the plan and harbor development
 - promulgate new rules and strong regulations to implement the plan with incentives for compliance and penalties for non-compliance
 - produce a set of specific recommendations to the town from this plan

- Seek solutions which achieve a balance among diverse interests, taking actions which, although they may require some 'give-and-take' on issues where interests conflict, are in general mutually satisfactory. Such actions, for example, include:
 - * protect and enhance the harbor's valuable natural resources (e.g., species, habitats, the refuge and water resources), while also benefitting, or at least not harming, the long-term economic interests of the town and the enjoyment of residents and visitors

- * support economic interests (e.g., tourism, fishing and auxiliary services) in part by encouraging business opportunities which protect, or at least do not reduce, the environmental value of the town and region
 - * eliminate, or minimize, threats to both the environmental and economic interests of the harbor and town, including pollution, over-use, and inappropriate uses of valuable and fragile resources
- Maintain and restore a 'safe harbor' (using Coast Guard standards) for commercial and recreational boats
 - Encourage and support research and monitoring by local, state and federal organizations, promote information sharing and collaboration, and eliminate current barriers among scientists and between scientists and other professionals
 - Restore and maintain beaches, park areas and other recreational amenities

Presentation of Specific Issues with Points of Agreement

Planning Process: Seeking A Balance Among Diverse Values

The harbor plan should stress the economic value of the harbor for the Town of Wells and its region. Wells should continue to be a tourist attraction, and steps should be taken to maintain commercial fishing and other economic opportunities in the area. Simultaneously there is a need to protect the environment and the wildlife of the harbor area, recognizing their enjoyment by Wells residents and visitors. The town wishes to protect the wildlife refuge and to ensure no negative impacts on the refuge or other natural resources from future development and activities.

To accomplish these dual objectives, the plan must define the 'fine line' where environmental interests are protected but economic interests are not hurt, and vice versa, i.e., to seek a balance between the refuge and harbor interests by finding and utilizing the common ground between conservation and harbor use.

The harbor planning process includes the following phases:

- committee deliberation and issues resolution, emphasizing establishing and maintaining a positive dialogue between the town and state and federal agencies, encouraging these parties to work cooperatively, continually seeking consistency on problem solving. This will be accomplished through a committee comprised of members of the harbor plan committee supplemented by members of other agencies and organizations who have contributed to the deliberations on the plan (e.g., Corps of Engineers, DEP, SMRPC, BPL, Maine CZM, DMR, Maine Audubon and others).
- preparation of a proactive plan, with boundaries of the geographic area sufficiently flexible to encompass all direct and indirect impacts on the harbor and within a ten-year timeframe, utilizing the Southern Maine Regional Planning Commission's staff to develop inventory information and plan implementation strategies, with review and refinements by the harbor committee and then with town boards and citizens
- plan review, modification and approval by town citizens and officials
- plan implementation, including the development of rules and regulations to achieve the goals where appropriate and assuring consistency with the plan using a system in which project, policy and program advocates have the burden of proof of demonstrating, in a written statement, their consistency with the harbor plan
- plan monitoring over time to measure the impacts of plan and harbor development, and suggesting revisions to the plan as necessary

Restoring and Maintaining a Safe Harbor

Restoring and maintaining a 'Safe Harbor' includes:

- as safe an entry and exit as possible, i.e., protection from 'death and destruction'
- accommodation for various types of vessels - commercial, recreational, different sizes
- provision of 300 mooring spaces, as designated in the original federal project (there were 142 in 1990)
- accessible boat ramps
- adequate dock services, a pumping station for boats, emergency response capability, mechanics, boat services
- depth of 8-foot draft for outer channel; 10-foot draft settling basin

- sufficient channel to mooring basin
- more efficient spacing plan for moored boats
- capacity to meet demand from many types of boats; there is, however, a preference order on waiting list for assigning mooring space
- adequate navigational aids (see Coast Guard guidelines), including a bell buoy to assist on the foggiest days
- cautionary signs posted for the public at the boat ramp concerning the special conditions regarding obstacles to safe passage in and out of the harbor

While vestiges of a harbor would remain even without dredging, the definition of the harbor would change dramatically in terms of how many vessels of what types could be accommodated and how well. A harbor would remain without dredging, but would basically become accessible only at high tide, and for relatively fewer and smaller boats. Even in this scenario, appropriate facilities should be provided to maintain the harbor.

- Plan should provide for retaining the harbor as a safe port, where boats could come and go, both of a recreational and commercial nature. To ensure that there will be important harbor resources to manage at the end of 1990s, it is important that economic interests be considered with other interests. Plan should leave the door open to consider solutions appropriate for solving specific problems, including dredging if it is consistent with achieving all harbor plan goals.

Furthermore, to contribute to the maintenance and enhancement of a safe harbor with appropriate facilities and services, the town should:

- set specific zoning limits for commercialization of the harbor area;
- maintain the facilities that currently exist;
- ensure adequate docking and mooring facilities;
- contact the Coast Guard concerning the installation of a bell buoy outside the harbor area, jetty lighting, and the provision of rescue services;
- provide an educational and information program regarding safe passage in and out of the harbor;
- if there were to be dredging, consider an additional boat ramp or double the width of the existing ramp;
- consider a floating dock and other marina services off Atlantic Avenue on the harbor side; and
- consider research regarding a catwalk bridge, or boat services, to connect the marina area with Wells Beach.

Research and Monitoring

It is desirable to include within the planning process a significant role for research, e.g., providing for information-sharing on clamming research, harbor water dynamics, beach and marshland erosion and the effects of various levels of dredging, to mention only examples. Current barriers between scientists and other professionals must be overcome and there is a need to underscore the educational and scientific value of the harbor area.

Among these research and monitoring concerns are:

- obtaining an improved understanding of harbor water dynamics;
- identifying sources of problems of, and alternative solutions for: habitat loss, beach loss, human effects such as boats, pollution, flood plain and other uses;
- involving participants from federal, state, local, non-profit, and private organizations in collaborative efforts, appropriately communicated to all interests;
- monitoring 'before' and 'after' actions included as part of the plan and restoration programs - perhaps seeking grants for this monitoring from the state coastal zone management office.

Loss of Marshland

There is little solid evidence of the cause of observed erosion of the harbor's marshlands in the past. Dredging is not the present culprit as there has been none in recent years. Although critics of new dredging have pointed to the potential problem of erosion of the marshland and subsequent destruction of a part of the food chain in this ecosystem, few sources of the current erosion problems have been explicitly identified (e.g., winter ice chunks, boat wakes and storms have all contributed). There is little scientific consensus on the likelihood that dredging causes erosion. Therefore, the town welcomes information to help identify the steps that should be taken to reduce marshland erosion.

To underscore its proactive approach, the town will work closely with federal agencies (e.g., Corps of Engineers, US Fish & Wildlife Service, and NOAA) to identify the cause of, and possible solutions to, the problem of marshland erosion. The Corps' habitat restoration program could be a partial solution as could both reducing the area for water skiing and the speed limits of boats within the harbor.

The problem of long-term sea level rise is not likely to be a factor during the next ten years. But harbor planners should identify the longer-term steps that could be taken to replace marshland (lost in the future due to sea-level rise) with new upland areas which could be converted to marshland. Identifying such areas is in the town's long-term interest.

The jetties and their orientation may affect the marshlands, and dredging probably would cause two effects: (1) increased wave action on the area adjacent to the dredging and (2) sucking action on the marshland area back from the dredging area. The larger the amount of dredge, the larger could be the effect on the marshland. Therefore, more information is needed on the effects of different levels of dredging; some of that information may be forthcoming in research work currently underway.

The dynamics of the harbor are not sufficiently well understood to be able to attribute effects to different causes at this point. Continuing cooperative research and monitoring of ongoing research by harbor planners are appropriate. Again, the need for positive dialogue between the town and the agencies and organizations with knowledge and expertise is underscored.

Flood plain zoning under the state's shoreline protection program addresses the appropriate uses adjacent to the harbor. Coordination between that effort and the town's harbor planning effort is essential.

Beach Loss

Major problems are the gradual shifting of large amounts of sand from both Wells Beach and Drake's Island toward the harbor's jetty, an accumulation of sand at these two points, and subsequent migration of sand around or through the jetties and into the harbor. This observed seasonal pattern reduces the amount of sand for beach use, and may increase silting of the harbor.

When the jetties were built, it was assumed that maintenance dredging and the replacement of the dredged material on the beaches every seven years would abate, to some degree, this problem. Because there has been no dredging, the problem has been exacerbated. There may be possibilities of beach nourishment from offshore areas (if there is sand there to use for the beaches). Because it has regulations which constrain the options open to the town, Maine's DEP should provide advice to the town on how to replenish the sand appropriately. Other suggestions including underwater breakwaters

and structural modification of the jetties are expensive and probably economically unjustifiable.

The USF&WS may be interested in having dredged material (if there were to be dredging) used in conjunction as habitat for threatened terns and plovers. Nourishment from this or other sources on Drake's Island must consider the 'nodal point' on the beach so that material placed on the beach would be less likely to drift north toward the Little River. A hydrological study is appropriate to determine what, if any, potential problems to Little River are posed by beach nourishment programs at Drake's Island. A current study of the barrier beach may provide keys to the solution of the beach erosion problem.

As a long-term issue (beyond the ten-year perspective of this plan), two or three houses on Drake's Island are under a threat due to constant beach erosion. Suggestions for moving these houses before the threat becomes imminent should be considered, although current National Flood Insurance Program law requires "imminence" before funds can be used to move structures.

Clamming

Although clamming has been diminishing south of Casco Bay in general in recent years, there are two problems regarding clamming in Wells Harbor:

- (1) the public health issues related to bacterial pollution, and
- (2) reductions in the numbers of clams (noted elsewhere along the coast south of Casco Bay) in recent years.

On the first problem, research is currently underway at UNE to define the areas of high pollution and to conduct testing for pollution sources, particularly from fresh water, e.g., septic problems, sewer leaks and waste from birds which use the area for breeding and nesting. Low salinity of the water in clam seeding areas is a probable problem resulting from a restricted channel which interrupts the flow of saline water throughout the harbor.

Predation is considered a significant problem, particularly from birds, seals and green crabs. Matted netting should be used as protection as it has been in the past, but clams must be so protected until they reach at least 1 1/4 in. There must also be stable clam breeding areas because too much disturbance, including that which could be induced by dredging (if it were near breeding areas), could adversely affect breeding attempts. Good circulation and

flushing of water are also essential in the breeding area. A cooperative habitat restoration program could have a positive effect in promoting better circulation and in contributing to the restoration of clamming in the harbor.

The Jetty Issue

As mentioned earlier, the current jetty (and its alignment) is suspected of causing problems with respect to the dynamics of the water in the harbor and the accumulation of sand from the beaches. It is unclear, however, that any cost-effective structural solution can be undertaken because the Corps of Engineers may not include recreational benefits in its estimation of costs and benefits on this type of project.

The jetty is porous and it is likely that sand is getting through the jetty and making its way into the harbor, exacerbating the channel depth problems. The town will have to "make do" with the jetty problem unless limited dredging is conducted between the jetties and in the settling basin within the harbor in maintaining the federal channel.

Habitat Restoration

Efforts toward habitat restoration should be initiated within the harbor. Current indicators of this need include: eroding marshland; poor clam breeding; the decrease in dissolved oxygen in the water, perhaps caused by the increase in water temperature; perceived diminished levels of fish in the harbor, caused in part by a drop in the salinity of the water; increases in fecal coliform; increased intrusion of phragmites, also influenced by the decreased salinity of the water; and diminished numbers of piping plovers.

Several federal programs should be implemented to help reverse these trends. The Corps of Engineers has a three-year program to begin later in 1991. One of the actions already identified as having some potential for helping is the installation of culverts in selected areas to increase the flushing action throughout the harbor. NOAA also has a program run in conjunction with the Corps; and the Fish & Wildlife Service similarly has a program, with Corps review, which stresses the benefits to fish and wildlife values. The

town should work closely with all these agencies and encourage them to initiate these programs on a cooperative basis with the town.

Three steps are also recommended for local action in relation to these federal programs:

- there should be direct communication and collaboration between federal and local interests concerning the steps proposed and taken with regard to habitat restoration;
- the existing Wells Harbor Committee should become the focal point for this dialogue; and
- the eventual plans for restoration should become an integrated part of the town's harbor plan.

Impacts and Opportunities of the Refuge

The USF&WS may have plans for a visitor contact station which could positively affect tourism in the town by attracting thousands of people to the area. The town should be receptive to discussing the Refuge's plan and working cooperatively with the Service in its planning. Moreover, the town should be directly involved in the development of all the Refuge's plans, particularly those activities which coincide with, or affect the achievement of, the town's harbor objectives.

All planned federal projects and programs should be congruent with local plans. One suggestion to accomplish this consistency and coordination is to require, as part of the regular permitting, licensing or plan review functions of town government, that each agency planning some action in Wells first demonstrate, in a written statement, how its proposed action is consistent - or inconsistent - with the town's harbor plan.

Consideration should be given to having the town's harbor plan become part of the state's coastal zone management plan, which requires federal consistency.

Water-based Sports

Several steps should be taken in formulating guidelines for water-based recreation in the harbor. Among them are:

- ensure safety for participants of, and others affected by, the water-based sports activities;
- maintain public access to the boat ramp;
- permit windsurfing in the harbor, but only south of the mooring area;
- establish a septage pumping station for boats in the marina;
- limit the speed of boats south of the mooring area to no more than 5 miles an hour, that is, slow enough to ensure that there is no wake;
- ban water skiing and jet skiing in the harbor because there is not enough room to do them safely, there are conflicts with sailboats and canoes, and they have potential negative effect on marshland.

Enforcement of these steps should be through the Wells Harbor Master, the Wells Reserve Authority, the State's Department of Marine Resources, and the U.S. Fish & Wildlife Service.

Passive Recreation Activities

Steps to promote passive recreation should include:

- continue current efforts to develop the town's passive park;
- encourage the Landing School to do its boat building near the park;
- provide easy access between the school and the harbor, for field trips;
- recognize and protect Lower Landing Road as a good birding area;
- develop an island of dredged material, if and when dredging occurs, in coordination with the habitat restoration program, to encourage birds who particularly like to feed on this type of habitat;
- encourage the development, and perhaps privatization, of canoe trails;
- promote an annual "regatta" and/or other events to focus activities centered on the harbor.

Note on Dredging as an Element of the Harbor Plan

There was considerable discussion concerning the value, viability, and feasibility of dredging, at one level or another, the harbor channel and settling basin. The observation of the group is that dredging, even if limited in extent, could have some important benefits not only to the boating interests of the community, but also potentially to the health of the marshland, the restoration of clamming, and return of piping plovers. At the same time, it is recognized that dredging could also have negative impacts on marshland stability, encourage more and larger vessels, and disturb the ecosystem of the refuge.

The recommendation is to continue the research on the dynamics of the harbor; to obtain a better understanding of the potential effects, both positive and negative, of dredging at various levels; to explore other options in lieu of dredging; and on the basis of evolving knowledge, determine cooperatively with state and federal agencies appropriate plan implementation actions to take to accomplish harbor management goals.

While dredging with the current level of understanding may not be favored, the door should not be closed to its consideration if trends in silting, beach sand migration, and reduced channel flow and intraharbor flushing continue to have increasingly negative impacts on important environmental resources as well as on boating interests.

Background to Wells Harbor Committee Facilitation Project

This project was initiated to provide assistance and guidance to a harbor plan committee - a group of local people representing a number of interests in Wells. A number of representatives from state, federal and non-profit organizations were also invited to participate in these committee meetings. Several observers did attend many of the sessions and made considerable contributions, adding depth and breadth to the committee's issue analyses.

Through a state grant, a professional facilitator, Barry R. Lawson of Barry Lawson Associates, Inc. was hired to organize and run a series of five meetings of the committee. His tasks were to help the committee establish a workable agenda for its deliberations, both for the entire project as well as each individual meeting, to ensure that all interests had an opportunity to contribute to the discussions, and to prepare 'minutes' or summaries of each session's discussions. The committee determined that, to the degree possible, agreements would be reached by the members, and that the facilitator was to assist the group in reaching consensus where possible. A final report was also requested to include a list of the agreements that the committee reached during the sessions. The list is included as part of this report.

The committee proved to be successful in meeting its objectives. This success is attributable to several reasons:

- It had been previously determined that the committee was not the appropriate forum to try to determine if there would be dredging of the harbor. That decision involves state and federal as well as local interests; and while the committee freely discussed the pros and cons of dredging, and generally favored finding a compromise solution with other agencies, the extent, timing and conditions of such dredging, or even if it would be undertaken ultimately, was beyond the scope of the group;
- Good attendance by the members of the committee. The chart on the following page presents the names of the meeting attendees, by session. Attendance at each meeting was excellent, and only occasionally could it be said that discussion suffered from lack of attendance of one or more interests;
- An organized agenda for each session, with the facilitator's and Town Manager's staffs helping to organize background, supplementary and summary information material for the committee;
- A willingness of all the members to develop the basis for a proactive plan for the harbor, recognizing that in such a plan lay the foundations for a future for the town which protects and enhances the local natural

environment and provides the basis for ongoing economic opportunity and growth for the townspeople;

- Assistance from a number of agencies who aided immensely the level and relevance of the discussion. The participation of the Corps of Engineers, the U.S. Fish & Wildlife Service, and (for the last meeting) of Maine Audubon Society were most noteworthy. The participation of the personnel of the Department of Environmental Protection would have been most welcomed. Budget constraints were cited as being an obstacle to that participation; and
- Holding the meetings on a weekly basis for the first four meetings helped to maintain interest and momentum toward a common goal.

Members in Attendance	4/1	4/8	4/16	4/22	5/13
Bob Bemis	X				
Matt Bley (observer)			X		
Jon Carter	X	X	X	X	X
Ron Collins	X	X	X		X
Ken Creed	X	X	X	X	X
Chick Falconer	X	X	X	X	X
Vander Forbes		X	X		X
Terry Fleming (observer)		X			
Russ Grethe		X	X	X	X
Dave Houghton	X	X	X		
Bill Hubbard (observer)		X	X	X	
John Hudson	X				
Dave Kershaw	X	X	X	X	
Norm Lessard	X	X	X		
Jim List	X	X	X	X	X
Jack Lyons	X	X	X	X	X
Ed Mackel		X	X	X	
Marcel Moreau (observer)					X
Eric Perkins	X	X	X	X	X
Robert Pirozok					X
Tammy Risser (observer)		X	X	X	X
Brad Sterl (observer)			X		X
George Tousey	X		X	X	X

APPENDICES

Summaries of Committee Meetings

April 1, 1991

April 8, 1991

April 16, 1991

April 22, 1991

May 13, 1991

Initial List of Committee Members

Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-4200



Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

March 14, 1991

Mr. Jonathan Carter
Town Manager
Municipal Office Building
Wells, ME

Dear Jon:

Under separate cover I am sending the revised letter of agreement between the Town of Wells and Barry Lawson Associates, Inc. for facilitation services to be provided to the town in conjunction with the development of a harbor plan for the town. Please sign one copy and return to me at your earliest convenience.

With regard to materials to be sent out to advisory committee members, I see nothing in the package that you sent me which I think needs to be sent. I should think a short letter from you thanking them for agreeing to participate and saying in your own words what you hope to gain from this project should be sufficient. I may want to send something out to them after I have had a chance to speak to some of them personally, or perhaps just bring some material with me for the first meeting.

As for the agenda for that first meeting, I would keep that simple, too. Let me know if you want to modify this suggested list of items.

- 3:00 p.m. Coffee or refreshments and informal get together
- 3:30 Welcome and Purpose by Jon Carter
- 3:40 **Introductory comments by Barry Lawson on process, possible schedule, and introductions of committee members - a few words (less than a minute) from each on particular concerns, interests, or biases he/she is willing to share with the group**
- 4:00 Group brainstorming of the issues the group members wish to offer for consideration by the committee during this process. Facilitator will assist group in categorizing these issues, setting priorities, and determining which issues should be logically addressed first, second, etc.

- 5:00 Establish an initial set of group goals, procedures to be followed during the facilitation process (facilitator will suggest some options), and a schedule for proceeding.
- 5:30 Final comments regarding number and range of participants, other factors to be considered, information required by committee, and other special concerns.
- 5:45 Adjourn

Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609



Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

April 3, 1991

From: Barry R. Lawson
To: Harbor Plan Committee
Re: Notes and Conclusions from the April 1 Session

First, I want to thank you all for a productive beginning. We have challenges ahead, but I feel we are off to a good start. I hope that most of you will be able to participate in all the sessions; continuity will be valuable both for the town and for you.

In this memo I will only provide the outline from the flip charts. In the ensuing days I will attempt to rearrange the information and to organize it in a fashion which suggests a productive way to proceed. I'll bring that along with me to our meeting next Monday.

Our agenda for the April 1 meeting, which we followed fairly closely was:

Introduction	Jon Carter, members of committee, and Barry Lawson (10 minutes)
Facilitator's Role	Barry Lawson (10 minutes)
Expectation of the Group	Group discussion (25 minutes)
Harbor Plan Issues	Group discussion (70 minutes)
Schedule for Group Deliberations	Group discussion (10 minutes)
Geographic Scope	(5 minutes)
Other Participants	(5 minutes)

With respect to a schedule for future deliberations, we decided that we would meet once a week in April on the following tentative dates: April 8, April 16, April 22, and (only if necessary) April 29. All meetings would start at 3:00 p.m. sharp and run until 5:00 pm.

With respect to geographic scope, it was tentatively agreed that we would include an area one property shoreward from the harbor and also any area in which there is activity which could affect the harbor or harbor plan.

Several suggestions were made concerning possible other participants in the group. The committee expressed a strong desire to leave the door open for Maine Audubon Society participation. In addition, it was suggested that personnel from the Maine Geological Survey and from a state

harbor/dredging agency be invited to participate. It was noted that several people who were unable to make the first meeting are expected to attend the second and subsequent meetings. It was agreed that all such people would receive the notes from Meeting One.

Expectations of the Group

Members of the group expressed individually what they felt were the results they hoped would come from the committee deliberations. Responses included:

- The preparation of a finished plan, which did what it could to protect the self-interests of many in the group
- Plans for retaining the harbor as a safe port, where boats could come and go, both of a recreational and commercial nature
- The need to protect the environment and the wildlife of the harbor area, recognizing their enjoyment by Wells residents and visitors
- The desire to protect the wildlife refuge and to ensure no negative impacts on the refuge from future development and activities
- To define the "fine line" where environmental interests are protected but economic interests are not hurt
- To seek a balance between the refuge and harbor interests
- To include a role for research, e.g., providing for information sharing on clamming problems
- To find the common ground between conservation and using the water for the harbor - setting important priorities and engaging in a process of giving-and-taking
- Address the issue of beach use, recognizing the unfortunate disappearance of some of Drake's Island beach
- To find a way to satisfy all interests
- To develop a "proactive" plan which will identify ahead of time the issues that will develop over time; not to have the town placed on the defensive but to be prepared for trends and activities of the future
- To find a way to promote commercial fishing
- To ensure that there will be important harbor resources to manage at the end of 1990s - and tell the state that economic interests have to be considered - plan should not indicate that the town intends to concede plans for dredging
- To draw in DEP and the Corps of Engineers to help work on the town's behalf - there is a need for a positive dialogue
- A comprehensive plan currently exists for the town and should be acknowledged - the harbor plan would be an addendum to this plan
- This harbor plan should be monitored over time; planning as an ongoing process, and that it is important to check every year to see the progress that is made in its implementation and the impacts that result from the plan and harbor development - a system of checks and balances should be in place

- The plan should lead to some new rules and regulations which have teeth in them, with fines for non-compliance
- There should be a set of specific recommendations made to the town from this plan
- Must break down the barriers between scientists and other professionals, e.g., on the clamming issue
- Plan development process would continue, with this group's participation, after the facilitation process is completed

Harbor Issues/Plan Elements

- Habitat restoration
 - The Corps of Engineers and NOAA have new habitat restoration programs; the town should be aware of the implications should these new programs be implemented
 - The Corps might take action to mitigate past errors; town should be aware of the implications
- Impacts of harbor plan on the Refuge as a landowner, also other residents (e.g. on Drake's), and vice-versa
- Future of fishing and "safe" access to ocean
 - Safe harbor for fishermen and other boaters
 - Maintain viability as a harbor
- Marshland loss (erosion); important to understand cause and effect and the dynamics. Dynamics of beach erosion need also to be understood. Plan should include material to describe how to manage causes of erosion or changes in land and other resources.
- Clamming - seek restoration of industry by cleaning up pollution and determining impact of industry on the harbor and refuge. The research aspect should be acknowledged. Seek agreement among scientists and professionals on why there is not reproduction.
- Potential for aquaculture in Wells (i.e., mussels) and the possible impacts
- "Passive park" like Plum Island, for instance, perhaps access for birding
- Water sports and beach use should be addressed. A lot of information exists, but priorities must be determined - how to accommodate sports?
- Expansion of interpretive trails and canoe trails to increase access
- Mooring plan - availability of water is a problem
- Jetties problem - seek possible engineering solutions to help solve flushing problem in the harbor. Does the Corps have alternatives?
- Protect existing residences and parking areas
- Boundary identification: (a) one property in from the marsh (these properties potentially have the most impact (b) location of impacting activities might not be easily definable in terms of distance; boundary should include all activities which impact the harbor
- Plan should address where this plan stops and others start, to avoid duplication

- Harbor infrastructure (mechanical, fueling services, for instance) should be sufficient to support the plan
- Dredging - without dredging, it is almost not a harbor
- Relocation of the harbor as a possibility
 - to Fisherman's Cove
 - to Little River
- Define areas for certain boating activities



Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

April 10, 1991

From: Barry R. Lawson
To: Harbor Plan Committee
Re: Notes and Conclusions from the April 8 Session

Attached please find notes from last Monday's session. It was good to see some new people who were unable to participate in the first session. I hope that we are able to maintain active involvement by the whole group from here on out, as we're really starting "to get down to brass tacks." And please do what you can to be there sharply at three o'clock.

Members in Attendance	4/1	4/8	4/16	4/22	4/29
Bob Bemis	X				
Jon Carter	X	X			
Ron Collins	X	X			
Ken Creed	X	X			
Chick Falconer	X	X			
Vander Forbes		X			
Terry Fleming (observer)		X			
Russ Grethe		X			
Dave Houghton	X	X			
Bill Hubbard (observer)		X			
John Hudson	X				
Dave Kershaw	X	X			
Norm Lessard	X	X			
Jim List	X	X			
Jack Lyons	X	X			
Ed Mackel		X			
Eric Perkins	X	X			
Tammy Risser (observer)		X			
George Tousey	X				

I am providing the notes a little differently this week. I have transferred, word for word, the flip chart sheets that I prepared for the meeting; but will save you the problem of trying to decipher the notes from the meeting. I have reorganized that information to make it more legible. Look at it carefully, so that I don't lose something important in my translation.

4/10/91

1

The Agenda for 4/8/91:

Introductions 3:20 p.m. (10 minutes)

Opening Comments, Barry Lawson (5 minutes)

Preview and Approve Agenda (5 minutes)

Conclusions of First Session on April 1 (20 minutes)

- plan and plan process
- goals or expectations of group
- issues to be addressed by committee

Assumptions, parameters of Option A, i.e., "no dredging" (50 minutes)

Issues To Be Resolved (50 minutes)

Pursue Agreements of Issues

Critique and Plan for Next Meeting, April 16 (5 minutes)

Actually, the path we took once we got into defining issues was a bit different than had been planned at the beginning of the meeting. Essentially, on the basis of group discussion and some good suggestions, we decided to determine, on an issue-by-issue basis, the degree to which dredging might make a difference. We stopped short of reaching solid agreements on any of the issues, but we did discuss the issues to the point that the next step after this process can be to forge specific agreements. We may get to this stage by the end of meeting 3; if not it will occupy most of meeting #4, I would guess.

Conclusions from Meeting #1

Planning Process

- committee deliberation and issues resolution, emphasizing "positive dialogue between state and federal agencies," and getting these parties together to work toward problem solving
- plan preparation, with key words being "proactive," "developing a set of recommendations", that the harbor plan will be an "addendum to the comprehensive plan," ensure that plan is integrated with others' plans, and that the boundaries of the geographic area would be flexible enough to consider all impacts on harbor, as appropriate; 10-yr. timeframe
- plan review and approval
- plan implementation, including rules and regulations with "teeth"
- plan monitoring over time - registering impacts of plan and harbor development

Goals, Expectations

- Maintain and restore a safe harbor for commercial, recreational boats [see Coast Guard for meaning of 'safe harbor']
- Seek a balance between environmental and economic interests ("give-and-take," "satisfy all interests")

- * protect environment and wildlife for enjoyment of Wells residents, others (no negative impacts of refuge)
- * protect economic interests (minimize adverse impacts, seek new opportunities)
- Encourage research (clamming protection, information sharing, eliminate barriers between scientists and other professionals)
- Restore and maintain beaches
- Address problems regarding commercial fishing

Issues To Be Addressed [to a large degree in order of importance as reflected by discussion of April 1]

- Maintain and restore safe harbor and ocean access [includes mooring plan, infrastructure for harbor facilities, and possible relocation of harbor]
- Reducing, eliminating loss of marshland
- Reducing, eliminating loss of beaches
- Restoring, protecting clamming [research and exploring aquaculture potential]
- Understanding, monitoring, regulating impact of plan on refuge, economic interests, and other environmental values
- Addressing the jetty issue [problem and possible solutions]
- Restoring habitats, possible with help of Corps of Engineers, NOAA, and USF&WS
- Developing guidelines for water-based sports [what, when, where, and how]
- Exploring opportunities for more passive recreational activities [e.g., birding]
- Expanding opportunities for interpretive trails and canoe trails
- Providing adequate, appropriate facilities, services for parking, traffic, harbor infrastructure

Questions to Address - These were thoughts by Barry Lawson generated by a review of the first week's comments and the directions we were likely to follow in meeting #2:

- Are the goals we have established so far applicable whichever dredging/without dredging option is selected?
- Do we have agreement on the critical issues, their definition?
- Can we agree on a plan process?
- Do/will we need more research or resources before some issues can be successfully resolved?
- Are there new economic opportunities that should be explored, others regulated?
- Are there new environmental opportunities including those which can benefit the economy?
- Must environmental and economic interests be opposing?

Dredging Variations

Some time was spent by the group defining various levels of dredging, in terms of cubic yardage of dredged material removed (or water area affected) and the effect on the various issues of assuming dredging(at various levels)/no dredging

- Maintenance dredging of original channel, basin and anchorage - 200,000 cubic yards (5 acs)
- Partial maintenance dredging of authorized federal channel- 100,000 cubic yards (3 acs)
- Minor corrective angling (modification of 100,000 option) - 85,000 cubic yards
- Open closed-in mouth of channel only (this is the option reserved by USF&WS;- in effect abandoning federal channels) - 15,000 cubic yards
- No dredging, whatsoever

Issues Addressed As Part of Evolving Plan

The first issue discussed was that of "Safe Harbor" and early discussion focused on the attributes that a safe harbor would have, in committee members' minds. These attributes included:

- safe entry and exit, i.e., protection from 'death and destruction'
- various types of vessels - commercial, recreational, different sizes
- number of boats accommodated, i.e., moored - 142 in 1990, 300 a goal
- boat ramps
- adequate dock services, pumping station for boats, emergency response capability, mechanics, boat services
- depth of 8 foot draft for outer channel; 10 foot draft settling basin
- channel to mooring basin
- adequate spacing for moored boats (current lack of space = damages)
- capacity to meet demand from whatever type of boat; there is, however, a preference order on waiting list for assigning mooring space
- adequate navigational aids (see coast Guard); need for a bell buoy to assist on the foggiest days

Effect of Various Levels of Dredging
(in thousands of cubic yards)

Safe Harbor Characteristics	200 (5 acres)	85-100 (3 acres)	15	W/o Dredge
Type of Vessels	Full range	More limiting, restricted depth, area or both	Some commercial boats; many would go elsewhere or out-of-business	Serious threat to commercial and deep draft boats
Number of Vessels	300	225	150, but limitations on commercial	150, but limitations on commercial
Safe Entry/Exit (depth)	Very Safe	Safe	Unsafe at low tide; delays	Unsafe at low tide; delays
Safe Mooring (space)	Very satisfactory	Satisfactory	Limited, move upriver	Limited, move all boats upriver
Dock Services	Full range	Full range, but some limited capacities, e.g. ramps, fuel	Same services as now but limited capacities; no marina	Very few services would be provided; no marina
Navigational Aids	No effect	No effect	May need enhancement	Safety aids will need to be enhanced

The net effect of the group's analysis of this issue is that while vestiges of a harbor would remain even without dredging, the definition of the harbor would change dramatically in terms of how many vessels of what types could be accommodated and how well. A harbor would remain without dredging, but would basically become accessible only at high tide, and for relatively fewer and smaller boats.

Loss of Marshland

This issue seemed to be one whose resolution was somewhat independent of dredging. That is, there is little solid evidence of what has caused the observed erosion of the marshland over the past few years. Certainly dredging cannot be the culprit as there has been no dredging in recent years. Although critics of new dredging have pointed to the potential problem of erosion of this marshland and therefore destruction of a part of the food

chain in this ecosystem, none has been forthcoming as far as the group knows, in determining the sources of the current erosion problems. The town is looking for information which can help identify what steps should be taken by anybody to reduce the problem of marshland erosion.

It was also pointed out that recent seeding of clams has been largely unsuccessful, again reasons unknown; there is some speculation that predation by green crabs and increased sand levels may be a problem. On the other hand, clamming has been going down along the coast south of Portland, so the phenomenon is not unique to Wells Harbor.

To follow its proactive approach, the town would probably work closely with agencies to identify the cause of, and possible solutions to, the problem of marshland erosion. It is possible that Corps habitat restoration program could help in these regard; it is possible that both reducing the area for water skiing and the speed limits of boats within the harbor would be beneficial.

The problem of long-term sea level rise was addressed and it was determined that its influence is not likely to be a factor during the next ten years. But then, the plan might well keep an eye on longer term steps that could be taken to replace lost marshland with new upland areas which could be transferred to marshland with a sea level rise. Identifying these areas may be in the town's long term interest.



Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

April 18, 1991

From: Barry R. Lawson *BRL*
To: Harbor Plan Committee
Re: Notes and Conclusions from the April 16 Session

Attached please find notes from last Tuesday's session.

Members in Attendance	4/1	4/8	4/16	4/22	4/29
Bob Bemis	X				
Jon Carter	X	X	X		
Ron Collins	X	X	X		
Ken Creed	X	X	X		
Chick Falconer	X	X	X		
Vander Forbes		X	X		
Terry Fleming (observer)		X			
Russ Grethe		X	X		
Dave Houghton	X	X	X		
Bill Hubbard (observer)		X	X		
John Hudson	X				
Dave Kershaw	X	X	X		
Norm Lessard	X	X	X		
Jim List	X	X	X		
Jack Lyons	X	X	X		
Ed Mackel		X	X		
Eric Perkins	X	X	X		
Tammy Risser (observer)		X	X		
George Tousey	X		X		
Matt Bley (observer)			X		
Brad Sterl (observer)			X		

The notes this week are a bit shorter, not because we didn't accomplish much. I thought our discussions were productive, but we now have to get on with the other issues facing us beside dredging. If you can all preview these issues as I suggested at the end of the meeting on Tuesday, we can have a good chance of getting through them all at our Monday meeting. that would save an April 29 meeting to review and approve the range of agreements and priorities.

Our agenda on Tuesday consisted of:

Introductions of new people (5 minutes)

Summary of Accomplishments to date (5 minutes)

Looking at Issues and Possible Solutions (2 hours, 20 minutes)

Marshland Loss

At Dave Houghton's request, we reviewed the discussions on marshland from the previous meeting, looking more closely at the effects that dredging could have on the goal of eliminating the loss of marshland. Our discussions basically pointed out that more information is necessary and that some of it may be forthcoming in some of the work that is currently underway by researchers.

On one hand, it was pointed out that the jetties and their orientation may effect marshlands, and that dredging probably causes two effects: (1) increased pressure on the area adjacent to the dredging and (2) sucking action on the marshland area back from the dredging area. These effects are largely a function of the volume and depth of the dredge. Therefore, it is likely that the larger the amount of dredge, the larger could be the effect on the marshland.

On the other hand, erosion of marshland has been occurring despite the fact there has been no dredging in recent years, so there is obviously some other, perhaps natural, causes. The dynamics of the harbor are not sufficiently well known to be able to attribute effects to different causes at this point. In addition to the suggestions made the previous week concerning federal restoration programs and boat speeds, continuing cooperative research and monitoring of that research by town planners are appropriate. Again, the need for positive dialogue between the town and the agencies and organizations with knowledge and expertise was underscored.

The enormous relative effect of large storms was also noted.

It was also pointed out the flood plain zoning under the shoreline protection program is addressing the appropriate uses adjacent to the harbor. Certainly coordination between that effort and the town's harbor planning effort is essential.

Beach Loss

The problem of beach loss was discussed in detail. The major problem appears to be the gradual shifting of sand from both Wells Beach and Drake's Island toward their respective jetties, and an accumulation of land at these two points. It was conjectured that some of the sand has gone over or around

Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-6609

the jetties and may be also getting into the harbor. This observed drift causes seasonal problems in the distribution of sand for beach use.

There are evidently problems in moving sand around and in dealing with the cobble which gets exposed in areas from which sand migrates. It was noted that even if dredged material were to be placed in areas of sand loss, that it would provide only cosmetic improvements, demonstrating the large amounts of sand that are lost over time.

The possibilities of nourishment from offshore (if there is sand there to use for the beaches) was mentioned. Evidently DEP has regulations which constrain the options open to the town. It was suggested that DEP provide some advice to the town on how to replenish the sand appropriately. Some other suggestions were posited including underwater breakwaters and modification of the jetties. These are expensive and probably judged uneconomical. It was pointed out that when the jetties were built it was assumed that maintenance dredging every 7 years would occur to abate, to some degree this problem. Since there has been no dredging, this problem has been exacerbated.

Dave Houghton mentioned the interest USF&WS could have in seeing dredged material (if there were to be some) used in conjunction with promoting the threatened terns and plovers.

Any nourishment of Drake's Island, it was noted, would have to take into consideration the "nodal point" on the beach so that material placed on the beach would not drift north toward the Little River. It was also noted that a current study of the barrier beach is being conducted and its results may provide some key to the solution of the beach erosion problem. Perhaps one result could be the development of a comprehensive budget of the sand and its dynamics.

Finally, it was noted that two or three houses on Drake's Island are under a long-term threat due to constant erosion. Suggestions were offered about moving these houses before the threat became imminent (current Maine law requires imminence before funds can be used to move structures). This was considered a long-term issue, extending beyond the 10 years supposed for the current planning effort.

Clamming

Two problems were noted here: (1) the public health issues related to bacterial pollution, and (2) reductions in the numbers of clams (noted elsewhere along the coast south of Casco Bay) in recent years. On the first problem, research is currently underway at UNE to define the areas of high pollution and to conduct testing for pollution sources, particularly from fresh water, e.g., septic

Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

problems, sewer leaks and waste from birds which use the area for breeding and nesting. Low salinity of the clam seeding areas was also pointed out as a potential problem; the possible effect of a closed channel interrupting the flow of saline water into the harbor was mentioned.

For the second problem, predation was considered a big problem, particularly from birds, seals and green crabs. Matted netting has been used in the past, but it was emphasized that clams need to be protected until they reach at least 1 1/4 in. Moreover, the need to have a stable breeding area was pointed out. Obviously if there is too much disturbance, including that which could be induced from dredging (if it were near breeding areas), such stability would be lost. Finally, good circulation and flushing of water is essential for good breeding. Perhaps, the restoration program mentioned in conjunction with the marshland could have a positive effect in promoting better circulation.

Next Week

We have several issues to go over for the meeting on April 22. Two of these issues have been addressed pretty directly already - the jetty issue and restoring habitats. I will summarize at the beginning of the meeting what we have said about them already so that we need not reinvent the wheel. We have also underscored the relationship between the refuge and harbor and the impacts of each on the other. Some of this has already been addressed. Perhaps I can summarize what has been said about this relationship so that we can cover only new ground on Monday.

Please take a little time before the meeting to jot down a few notes on new facts, problems, possible solutions to the other problems which were outlined in the notes from meeting #2 held on the 8th but have not yet been addressed in our meetings. This could be a big help. Thanks!!

Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8009



Barry Lawson Associates, Inc.

9 Main Street P.O. Box 648 (508) 369-4213
Concord, MA 01742 FAX (508) 369-8609

April 29, 1991

From: Barry R. Lawson 
To: Harbor Plan Committee
Re: Notes and Conclusions from the April 22 Session

Attached please find notes from last Tuesday's session. These include a summary of the points made. A follow-up document will provide a draft of the proposed areas for group agreement to be addressed as part of next week's meeting.

Members in Attendance	4/1	4/8	4/16	4/22	5/6
Bob Bemis	X				
Jon Carter	X	X	X	X	
Ron Collins	X	X	X		
Ken Creed	X	X	X	X	
Chick Falconer	X	X	X	X	
Vander Forbes		X	X		
Terry Fleming (observer)		X			
Russ Grethe		X	X	X	
Dave Houghton	X	X	X		
Bill Hubbard (observer)		X	X	X	
John Hudson	X				
Dave Kershaw	X	X	X	X	
Norm Lessard	X	X	X		
Jim List	X	X	X	X	
Jack Lyons	X	X	X	X	
Ed Mackel		X	X	X	
Eric Perkins	X	X	X	X	
Tammy Risser (observer)		X	X	X	
George Tousey	X		X	X	
Matt Bley (observer)			X		
Brad Sterl (observer)			X		

The agenda for the session consisted of:
Introduction (5 minutes)
Summary of Progress (5 minutes)
Complete Issue Discussion (2 hours, 10 minutes)

4/29/91

1

Agreements - plans for next session (10 minutes)

After accepting a recommendation that tourism development be added as another issue for the group to deliberate, the group decided to take the remaining issues in the following order:

- the jetty(ies)
- habitat restoration
- mutual impacts of refuge and other landowners on harbor
- water-based sports
- more passive recreational activities
- provision of adequate harbor facilities and services
- tourism development

All of the above were addressed except tourism, which will be the lead-off item at the last session.

The Jetty Issue

Although the current jetty, and particularly its alignment, is suspected of causing problems with respect to the dynamics of the water in the harbor and the accumulation of sand from the beaches, it is unclear that there is any cost-effective solution that can be undertaken. Any federal structural change is difficult, because the Corps of Engineers may not include recreational benefits in its estimation of costs and benefits to the project.

It was also pointed out that the jetty is porous and there is a suspicion that sand is getting through the jetty and making its way into the harbor, exacerbating the channel depth problems. The general feeling is that the town may have to "make do", although a more justifiable option for resolving the jetty problem would be to conduct limited dredging between the jetties and the settling basin within the harbor in order to maintain the federal channel.

Habitat Restoration

There are several indicators that efforts should be made toward habitat restoration within the harbor. Eroding marshland and poor clam breeding are two. Others include: the decrease in dissolved oxygen over time, perhaps caused by the increase in water temperature; perceived diminished levels of fish in the harbor, caused in part by a drop in the salinity of the water; increases in fecal coliform; increased intrusion of fragmites, also influenced by the decreased salinity of the water; and diminished numbers of piping plovers.

There are several federal programs which can be tapped to help reverse these trends. The Corps of Engineers has a three-year program which could begin later this year. One of the actions already identified as having some potential for helping is the installation of culverts in selected areas to increase the flushing actions throughout the harbor area. NOAA also has a program run in conjunction with the Corps; and the Fish & Wildlife Service similarly has a program, with Corps review, which stresses the benefits to fish and wildlife values.

Three steps were identified for local action in relation to these programs. One is to assure that there is direct communication and collaboration between federal and local interests concerning the steps proposed and taken with regard to habitat restoration. Two, the Wells Harbor Monitoring Committee should be the focal point for this dialogue. Three, whatever plans for restoration are undertaken should become an integrated part of the town's harbor plan.

Impacts on the Refuge

The USF&WS may have plans, it was noted, which could positively impact tourism in the town. A visitor contact station is being considered which could attract thousands of people to the area. The group's opinion was that the town should be receptive to the Refuge's plan but not that the entire town be turned into a refuge - stressing an "appropriate or proper balance." It was emphasized that the town should be directly involved in the development of the Refuge's plans particularly with respect to those activities which coincide with the town's objectives.

Some discussion focused on the ways in which all federal activities could be made congruent with local plans. One suggestion was to require, as part of the regular permitting or licensing functions of local government, that each agency proposing some action in Wells demonstrate, by written statement, how its proposed plan is consistent with - or inconsistent with - the town's harbor plan. Other thoughts included the consideration of the town's plan as part of the state's coastal zone management plan, which does require federal consistency. Just how this latter suggestion might work and whether it was a good idea were not determined.

Water-based Sports

Several specific steps were suggested as part of a set of guidelines for water-based recreation in the harbor. Among them were the following:

- take appropriate steps to ensure safety in the sports activities;
- maintain public access to the boat ramp;
- permit windsurfing in the harbor, but only south of the mooring area;

- establish a septage pumping station for boats in the marina;
- limit the speed of boats south of the mooring area to no more than 5 miles an hour, that is, slow enough to ensure that there is no wake;
- ban water skiing and jet skiing in the harbor because there is not enough room to do them safely, there are conflicts with sailboats and canoes, and they have potential negative effect on marshland.

Enforcement of these steps was suggested through the Wells Reserve Authority, the State's Department of Marine ??, and the Fish & Wildlife Service.

Passive Recreation Activities

Among the steps identified to promote passive recreation were:

- continuing current efforts in developing the Passive Park;
- possibility of encouraging the Landing School to do its boat building near the park;
- providing easy access between the school and the harbor, for field trips;
- recognizing and protecting Lower Landing Road as a good birding area;
- possibly developing an island of dredged material, were dredging to occur, in coordination with the restoration program, to encourage birds who particularly like to feed on this type of habitat; and
- encouraging the development, perhaps privatization, of canoe trails;
- promoting an annual "regatta" which could focus activities centered on the harbor.

Adequate Harbor Services/Facilities

A number of specific steps were mentioned as contributing to the harbor facilities. These included:

- set specific zoning limits for commercialization of the harbor area;
- maintain the facilities that currently exist;
- ensure adequate docking and mooring facilities;
- contact the Coast Guard concerning the installation of a bell buoy outside the harbor area, jetty lighting, and the provision of rescue services;
- if there were to be dredging, consider an additional boat ramp or double the width of the existing ramp;
- consider a floating dock and other marina services off Atlantic Avenue on the harbor side; and
- consider research regarding a catwalk bridge, or boat services, to connect the marina area with Wells Beach.

It was pointed out that some other minor facilities (e.g., picnic tables and cookers) will be part of the passive park now being developed

Other Points Made

It was suggested that the harbor plan should provide a history of the harbor, identify and underscore the educational and scientific value of the harbor area, and stress the economic value of the harbor for the Town of Wells and its region. With regard to this lattermost point, it was agreed that Wells should continue to be a tourist attraction.

In addition, a number of points were mentioned regarding research and monitoring in the context with the plan and its orderly implementation. Among these research concerns were:

- understanding harbor water dynamics;
- identifying sources of problems of, and alternative solutions for: habitat loss, beach loss, human effects such as boats, pollution, flood plain and other uses;
- involving participants from federal, state, local, non-profit, and private organizations in collaborative efforts, appropriately communicated;
- monitoring "before" and "after" actions included as part of the restoration program - perhaps seeking grants for this monitoring from the state coastal zone management office.

APPENDIX G

Chapter 86

HARBOR

- § 86-1. Definitions.
- § 86-2. Applicable area.
- § 86-3. Effect of other regulations.
- § 86-4. Appointment of Harbor Master.
- § 86-5. Responsibilities of Harbor Master.
- § 86-6. Obedience to Harbor Master; Appeals Board.
- § 86-7. Selectmen to make rules and regulations.
- § 86-8. Designation of mooring areas.
- § 86-9. Mooring standards.
- § 86-10. Moorings for smaller boats and flotations.
- § 86-11. Mooring blocks.
- § 86-12. Inspection of moorings.
- § 86-13. Repair by Harbor Master; recovery of costs.
- § 86-14. Denial of mooring placement.
- § 86-15. Tying up to moorings required.
- § 86-16. Permit for construction required.
- § 86-17. Abandoning of vessels and flotations; notice to remove.
- § 86-18. Sunken vessels or flotations.
- § 86-19. Laying out and marking of channel.
- § 86-20. Speed limit.
- § 86-21. Marking of shoals.
- § 86-22. Aircraft and airboats prohibited.
- § 86-23. Rules and regulations; fees.
- § 86-24. Authorization to promulgate fishing rules and regulations.
- § 86-25. (Reserved)
- § 86-26. Enforcement; appointment of Deputy Harbor Master.
- § 86-27. Violations and penalties.
- § 86-28. Mooring fee schedule.
- § 86-29. Moorings not transferable.
- § 86-30. Leaving boats unattended restricted.
- § 86-31. Damages to moorings, floats or docks; liability.
- § 86-32. Unapproved moorings restricted.
- § 86-33. Scuba divers to display flag.
- § 86-34. Diving and swimming.
- § 86-35. Lengths of tenders.
- § 86-36. Maintenance of tenders.
- § 86-37. Placement of moorings.
- § 86-38. Fishing gear restricted.
- § 86-39. Children to be accompanied by adults.
- § 87-40. Throwing of rocks prohibited.

[HISTORY: Adopted 3-11-67 ATM, Art. 40. Amendments noted where applicable.]

§ 86-1. Definitions.

As used in this chapter, the following terms shall have the meanings indicated:

WELLS HARBOR - The Webhannet River and all of its tributaries both now and hereafter appearing where the tide ebbs and flows.

§ 86-2. Applicable area.

A. This chapter shall apply to all shores of the Wells Harbor as described in the definition of "Wells Harbor" in § 86-1, with the addition of the channel to the outer end of the north and south jetties, all of its access roads and lands adjacent thereto, both now and hereafter created by natural or mechanical erosion, including acreage on all public properties.

B. This chapter and all other rules and regulations shall apply to the jetties, access roads and all other public properties adjacent thereto.

§ 86-3. Effect of other regulations.

This chapter shall include all state and federal statutes and rules and regulations in effect and hereafter enacted.

§ 86-4. Appointment of Harbor Master.

The Board of Selectmen shall be authorized to appoint a suitably qualified Harbor Master and fix a reasonable compensation for such service.

§ 86-5. Responsibilities of the Harbor Master.

The Harbor Master shall enforce all ordinances, rules and regulations and state and federal statutes applicable to the Wells Harbor and other public properties as herein described in this chapter.

other part of the river as set forth in the definition of "Wells Harbor" in § 86-1 for the purpose of mooring which would not be safe to others and would not be in the best interest of the harbor facilities. This section shall not apply in the event of emergency or by written permit of the Harbor Master approved by the Town Manager and the Board of Selectmen as required by law.

§ 86-16. Permit for construction required.

No dock, floats or any other type of structure shall be erected in an area as described in the definition of "Wells Harbor" in § 86-1 without first obtaining a permit from the Board of Selectmen and the Army Engineers whenever required.

§ 86-17. Abandoning of vessels and flotations; notice to remove.

A. No boat, vessel or any type of flotation shall be abandoned or left to disintegrate in any area as set forth in the definition of "Wells Harbor" in § 86-1.

B. The Harbor Master, by direction of the Town Manager and the Board of Selectmen, shall notify its owner, owners or agents for its removal within a reasonable length of time, after which it shall be removed by others, the cost of which shall be levied upon its owner, owners or agents.

§ 86-18. Sunken vessels or flotations.

Any boat, vessel or any type of flotation which sinks at a mooring, dock or float in any area as set forth in the definition of "Wells Harbor" in § 86-1 shall be subject to § 86-17B.

§ 86-19. Laying out and marking of channel.

The Town Manager, Board of Selectmen and the Harbor Master shall lay out channel of not less than forty (40) feet in width through the anchorage and place markers determining such channel.

§ 86-20. Speed limit.

A. No boat, vessel or any type of flotation shall travel more than five (5) miles per hour when approaching the anchorage, through the anchorage or near its docks or floats.

B. The speed of any boat, vessel or flotation from the anchorage to the outer end of the jetties shall be reasonable so as not to endanger others.

§ 86-21. Marking of shoals.

The Harbor Master shall mark for public safety any shoal or other submerged object when not marked by others.

§ 86-22. Aircraft and airboats prohibited.

No aircraft or airboat or any other type of air-driven craft shall be operated in the area as set forth in the definition of "Wells Harbor" in § 86-1.

§ 86-23. Rules and regulations; fees.

The Board of Selectmen, the Town Manager and the Harbor Master shall be authorized to make reasonable rules and regulations and set reasonable fees for the use of all harbor facilities on an equal basis as to the requirements of each.

§ 86-24. Authorization to promulgate fishing rules and regulations.

The Board of Selectmen, the Town Manager and the Harbor Master shall be authorized to make reasonable rules and regulations as to the storage of bait, bait barrels and all types of fishing gear, including skiffs, punts and tenders, applicable to all for the purpose of safety, cleanliness and facility deterioration except by natural wear and tear.

§ 86-25. (Reserved)

(Former § 86-25, Liability for damages, repealed 11/4/86)

§ 86-26. Enforcement; appointment of Deputy Harbor Master.

The enforcement of this chapter shall be the duty of the Harbor Master whenever not otherwise provided, and in the absence of the Harbor Master, he may appoint a Deputy Harbor Master after approval of the Board of Selectmen and the Town Manager and fix a reasonable compensation for such service.

§ 86-27. Violations and penalties.

(11/4/86)

It shall be unlawful to throw rocks or any hard objects at boats or in the water of Wells Harbor.

REFERENCES

- Byrne, R.J., and Zeigler, J.M., 1977. Coastal Engineering Study, Wells Harbor, Maine. U.S. Army Corps of Engineers: Waltham, MA.
- Childs Engineering Corporation, 1989. Harbor Berthing Management Plan for the City of Portland & City of South Portland. City of Portland, Portland ME.
- Doggett, L., 1990. "Preserving and Protecting Marine Water Quality through Comprehensive Planning." Maine Department of Environmental Protection, Augusta, ME.
- Governmental Services Inc., 1988. Saco River Public Access Study. The City of Saco, Saco, ME.
- _____, 1987. Comprehensive Harbor Plan for the Town of Scarborough. The Town of Scarborough, Scarborough, ME.
- Humm, W.R., 1985. "Wells Harbor: Beach Erosion, Sedimentation, and Mediation." in Gambling with the Shore: Proceedings of the Ninth Annual Conference of the Coastal Society. The Coastal Society, Atlantic City, N.J., p. 55-60.
- Lawson, B.R., 1991. "Agreements Regarding Objectives, Issues, and Policies to be Included in a Harbor Plan for Wells, Maine." Barry Lawson Associates, Inc., Concord, MA.
- Maine Department of Marine Resources, 1979. Shellfish Management in Maine Towns. MDMR, Augusta, ME.
- Maine State Planning Office, 1985. Maine Intertidal Habitats. MSPO, Augusta, ME.
- Mariano, C.G., and FitzGerald, D.M., 1989. Sediment Transport Patterns and Hydraulics at Wells Inlet, Maine. CERG Tech. Rept. No. 12, Boston University, Boston, MA.
- Milliken A.S., and Lee, V., 1990. "Pollution Impacts from Recreational Boating: A Bibliography and Summary Review." Rhode Island Sea Grant Publications, University of Rhode Island Bay Campus, Narragansett, RI.
- Southern Maine Regional Planning Commission, 1991. Southern Maine Regional Berthing Study. SMRPC, Sanford, ME.
- Timson, B.S., Pickart, D., and Pickart, G., 1989. Sand Transport Budget: Wells Harbor & Adjacent Beaches. Timson, Schepps & Peters, Inc., Hallowell, ME, for the Town of Wells.
- Timson, Schepps & Peters, Inc., 1989. Analysis of Salt Marsh Shoreline Changes, Webhannet River Estuary, Wells, ME. Timson, Schepps & Peters, Inc., Hallowell, ME, for the Town of Wells.
- U.S. Army Corps of Engineers, 1980. "Wells Harbor, Maine: Operation and Maintenance Reconnaissance Report." U.S. A.C.E., Waltham, MA.
- _____, 1978. Design for Harbor Entrance Improvements, Wells Harbor, Maine. U.S. A.C.E., Waltham, MA.

U.S. Fish and Wildlife Service, 1991. "Rachel Carson Wildlife Refuge, Draft Brochure." U.S. F&WS, Wells, ME.

_____, 1990. Station Management Plan, Rachel Carson National Wildlife Refuge. U.S. F&WS Region 5, Wells, ME.

Vaughn, J.M., and Novotny, J.F., 1991. Microbial Contamination in the Webhannet River Estuary. Dept. of Microbiology, University of New England, Biddeford, ME.

Wells National Estuarine Research Reserve, 1991. Wells National Estuarine Research Reserve Management Plan. The Wells Reserve: Wells, ME.

Wells, Town of, 1980. Town of Wells Comprehensive Plan, 1980 Update. Town of Wells, Wells, ME.

_____, 1991. The 1990 Update of the Town of Wells Comprehensive Plan. Town of Wells, Wells, ME.

COMPREHENSIVE HARBOR PLAN

List of Members:

Richard Moody
HARBOR MARINA PARTNERS
P. O. Box 366
Moody, Maine 04054

Vander Forbes, Jr.
P. O. Box 99
Wells, Maine 04090

Jim List
WELLS RESERVE AUTHORITY
RR#2, Box 806
Wells, Maine 04090

Dick Steinbeck
RACHEL CARSON WILDLIFE RESERVE
RR#2, Box 751
Wells, Maine 04090

Robert Foley
DRAKES ISLAND ASSOCIATION
RR#2, Box 373
Wells, Maine 04090

Russ Grethe
WELLS PLANNING BOARD
P. O. Box 512
Wells, Maine 04090

Debra Richard
DEPT. OF ENVIRONMENTAL PROTECTION
State House Station #17
Augusta, Maine 04333

Donald "Chick" Falconer
WELLS HARBOR MASTER
P. O. Box 398
Wells, Maine 04090

Norman Lessard
WELLS HARBOR ASSOCIATION
2 Rosewood Circle
Springvale, Maine 04083

Martin Smith, Chairman
COMPREHENSIVE PLAN COMMITTEE
RFD#1, Box 518A
So. Berwick, Maine 03908

BOARD OF SELECTMEN

V. Owen Grumbling, Chair
WELLS CONSERVATION COMMISSION
RFD#1, Box 213A
Sanford, Maine 04073

Robert Pirozok
P. O. Box 274
Wells, Maine 04090

Joseph Ignazio
DEPARTMENT OF THE ARMY
424 Trapelo Road
Waltham, MA 01890

David Kershaw
P. O. Box 100
Wells, Maine 04090

Robert Bemis
Commercial Fisherman
RFD#1, Box 250
No. Berwick, Maine 03906

Mr. Kenneth Creed
WELLS CHAMBER OF COMMERCE
P. O. Box 356
Wells, Maine 04090

18

NOAA COASTAL SERVICES CENTER LIBRARY

3 6668 14102 6981