

# **The Dowd's Creek Restoration Proposal**

June 1987

## **A Research Proposal to the Sea Grant Program**

### **Response of Macro Organisms to Restoration of Degraded Tidal Marsh Habitats**

#### **Oyster Shell Habitat Associations**

**Submitted May 18, 1987**

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**Rekeyed by the Sound School Adult Education Program**

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**The Sound School, New Haven, CT**

#### **Summary/Abstract:**

In 1986, a site in Hammonasset State Park was selected for an experimental attempt to establish certain habitat indexes for coastal restoration. Important to the effort was habitat associations, preferences regarding estuarine shellfish populations. Included in the proposal was an example project design, site of study, fisheries history project organization, literature search, pre and post restoration plans, examples of support letters, equipment lists and volunteer monitoring outlines. Although this proposal was written more than 2 decades ago, and not funded, shellfish environmental services has recently emerged as a critical environmental area in many coastal estuaries. This study is made available to groups wishing to learn more about project/proposal organization and development regarding coastal resource restoration.

#### **Key Words:**

Shellfish Environmental Services, Specific Habitat Associations with soft shell, hardshell clam and oysters, coastal resource restoration, habitat diversity indexes including shell/sand mud/shell, pebbles, rocks and aquatic vegetation.

# **Environmental Fisheries/ Habitat History For Dowd's Creek June 1987**

**Re-keyed for the LISS – BI State Habitat Restoration Initiative  
Work Group March 25, 2009**

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March 25, 2009

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Restoration of Degraded Salt Marsh Habitats

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**Environmental Fisheries/Habitat History  
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**Environmental Fisheries/Habitat History  
For Dowd's Creek  
June 1987**

**Re-keyed for the LISS - BI State Habitat Restoration Initiative  
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Hammonasset State Park has a long history of coastal resource loss and alteration. Estuarine habitat loss has continued to occur despite the fact that Hammonasset Beach is clearly recognized as a glacial feature and thus, fits the basic description of a coastal barrier<sup>1</sup> below,

"A depositional geologic feature such as a bay barrier tombolo, barrier spit or barrier island that -

1. Consists of unconsolidated sedimentary materials
2. Is subject to wave, tidal, and wind energies
3. Protects landward aquatic habitats from direct wave attack
4. All associated aquatic habitats including the adjacent wetlands, marshes, estuaries inlets and near shore waters"

It has a history of sustaining development actions that have diminished the ecological and habitat roles of such coastal barriers. The shape of and its axis Hammonasset Beach to curve southwest and southeast blows direct tidal and wave energy to what typically can be considered the weakest sections.<sup>2</sup>

This has been the case for the area of Hammonasset State Park - the central sections west of the new 1964 concrete pavilion. Unfortunately, much of the previous ecology has been lost from dredge and fill operations conducted at the park. One area that has been filled is a classic feature, the so-called Barrier Beach inlet. This is the history that Mr. Emil Miller, a former state park employee, described, a seasonal or storm related event that cut or breached the beach front reopening the inlet to a salt pond/salt marsh system adjacent to a large drainage system he called Dowd's Creek. Mr. Stephen Leatherman of the National Park Service - Cooperative Research Unit - UMASS Amherst in a 1980 Barrier Island forum and workshop described this process at a May 1980 meeting in Provincetown, Massachusetts.

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<sup>1</sup> 97<sup>th</sup> Congress 2<sup>nd</sup> Session - House of Representative Report 97-928 Coastal Barrier Resources Act October 1, 1982 - pg 2.

<sup>2</sup> Mr. Emil Miller, whose family owned part of the State Park prior to 1918, described much of the ecology and habitat history for the Dowd's Creek area.

"Inlets are usually formed during a storm, primarily hurricanes because the storm surge is much higher on the average than during winter northeast storms. It is clear that as sea level rises, islands must move; landward littoral drift basically creates the barrier feature in the Northeast with the aid of activity and over wash processes. Over wash in the last ten years has really captured our imagination; it is a phenomenon that we can go out and study since it is common occurrence on some barriers. By comparison inlets have a frequency of occurring only one in fifty to seventy five years along some shorelines, whereas over wash is much more prevalent, happening during most major storms."<sup>3</sup>

What Mr. Miller described, as some of the early State Park history, was two "weak" or thin sections of beach, with adjacent marshes, one at the site of Dowd's Creek/Salt Pond and a second area just west of the 1964, so-called "New Pavilion." In 1971-73, a series of storms over washed these areas, and a new creek threatened to become tidal until bulldozers operated by the State Park quickly closed it. Remnants of this barrier cut can still be observed today southwest of the traffic rotary circle. The over wash at Dowd's Creek wasn't as severe but it did destroy what remained of the 1945-49 elevated fixed board work in front of the famous food concession pavilion. A second section, an elevated boardwalk from the pavilion to the Dowd's Campground beach, 60 feet landward was not impacted by these storms.

The entire 3/8-mile section has been subjected to similar erosion type episodes. According to Mr. Miller, the salt pond and creek was filled as trolley tracks/roadway were constructed and tides redirected to Tom's Creek through an unnatural man-made ditch 1,400 feet west to the most easterly branch of Tom's Creek. As late as the 1970's, old trolley rail lines were seen to the side of and onto a ramp in back of the "Clam Shed" pavilion. The erosion events, according to Mr. Miller, were constant and becoming more severe.

- 1920's - Boardwalk was fronted by some 100 to 150 feet of beach - but by 1938 only enough beach remained to support the 30 foot graduated ramps from the boardwalk. At high tide, the ramps were often near the water. The 1983 Hurricane destroyed much of the first boardwalk and tides/waves were underneath both the beach pavilion and food pavilions but because they were elevated, most of the damage escaped them.
- The post World War II boardwalk was moved back about 50 feet closer the beach pavilion and clam shed that was so popular

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<sup>3</sup> Page 142 Barrier Island forum and workshop May 1980, Published by the National Park Service, North Atlantic Region, Barbara S. Mayo and Lester B. Smith J. editors.

during the war years. He mentioned that on weekends a line would form sometimes in the hundreds to wait for a plate of raw cherrystones clams (late 1940's).

- By the 1960's, the water had come so close that those boardwalk entrance ramps were now near water, so it was decided to replace the boardwalk again, moving it closer to the clam shed (the original pavilion had already come down some years earlier) so that ramps entered directly upon the boardwalk.
- By the 1970's, both the first boardwalk and second removed piling stumps could be seen below the high tide line - some 150 feet of beach had been lost as the beach front retreated towards what had been Dowd's Creek/salt pond.
- The Clam Shed was torn down during Ella Grasso's administration. It was controversial, and many newspaper accounts had people detailing stories and experiences at the clam shed - emotions of the 1940's, the shore and seafood eating experiences. What people didn't realize was during storms, the clam shed (it was a food concession building) and inside covered 30-foot long wood bench type picnic tables had regular storm surges pass underneath its support pilings. It was only a matter of time before the sea claimed it. So to try to rebuild it was foolhardy, but people did not realize the past, just snap shots of past experiences.
- In 1985, Hurricane Gloria destroyed much of platform type boardwalk that was set over the foundation pilings of the clam shed and lifeguard station park office - which had also been torn down by this time. Some 250 feet of landward of the first boardwalk. This storm had over wash even spread into the new paved parking lot - once site of a salt pond and possible Native American fishing camp. Some 350 feet from the regular high tide line.

Maps from the 1860's seem to support some of the oral history from Mr. Miller. It appears that Dowd's Creek and what is today called Tom's Creek, were once two separate creeks, each with its own salt marsh and drainage areas. By the 1890's, only one creek remains shown, Tom's, but a substantial salt marsh system to the east apparently without tidal access is still shown on geodesic maps (a series of 1934 aerial photographs provided by Dan Civco of the

University of Connecticut details the 1934, 1951 and 1985 changes at the park).

Tim Visel Account -

The 1970's saw several park improvements and disappointments. When construction started on a modern parking lot capable of holding several hundred cars, it was first thought to be a project for restoring Dowd's Creek and salt pond! A dredging operation dug out thousands of yards of marsh mud, shells and wood debris. It was immediately east of the Dowd's Creek drainage ditch, and you could clearly see mollusk shells, scallop, clam and oyster shells, and at times, beach sand (T. Visel personal observation). Mr. Emil Miller had mentioned the possibility of an old bridge as poles, wood of all types, and hundreds of old pilings were uncovered about 4 to 5 inches in diameter, but they were trucked off-site. Remnants of parking lot construction material were used to fill more salt marsh west of the lot, which prompted a letter to the Army Corps of Engineers in August of 1979. (Response obtained August 14, 1979).

#### Increased Tidal Flow - Improved Salt Water Habitats

According to recent studies done at Connecticut College, any increase of tidal action could be deemed positive in terms of the Park's original ecology. So much of the Dowd's creek drainage, the salt pond and creek had been lost due to extensive channelization and causeway construction.<sup>4</sup> A large salt marsh/freshwater system had been filled behind and to the west of the Meigs Point double road - now replaced by a higher single lane road. I watched the dredge operations myself, filing in the salt marsh, watching as sea gulls would swoop down and pick up live surf clams *spisula* appearing at the discharge. Today if you walk this filled section, you can find old *spisula* (species) surf clam shells, quahogs and conch. The fill is fine grained gray and filled with shell hatch not typical to the coarser grain "yellow sand" found on the beachfront. On winter days, these fine grain dredge sediments are easily blown across the park road.

Although coastal barriers beaches, inlets and spits have been well recognized in the scientific literature, a connection to fisheries and fisheries habitat loss has been poorly understood by the public. Norbert Psuty, President of the Coastal Society, in a public forum, wrapped up to the 1980 Barrier Island forum and workshop with a

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<sup>4</sup> Source-Tidal Wetlands of Connecticut by William A. Niering, R. Scott Warren, forward by E. Zell Steever. Connecticut Arboretum Bulletin #19, Connecticut College, New London, CT, 1974.

challenged the scientific community to help bridge this gap of understanding to fisheries and fish habitats and barrier ecology.

"I can look to the literature that I deal with and I can see that quite a while ago, in fact around the turn of the century, there is in the literature, a lot of information from observations by scientists at the time that recognize the concept of Barrier Island recognizing the fact that they migrate, that they are dynamic. So we have on the order of eighty or ninety years worth of information of scientists pointing out some of the potential for change along the Shoreline. The scientists on the other hand, were apparently interested in talking to themselves, the "ivory tower" type of scientists, so this information didn't really get into the hands of management. The scientists weren't interested in making management decisions and developing management plans."

One of the organizations trying to breach this "ivory tower" concept here in Connecticut is the Connecticut Arboretum. Dr. William Niering, one of its founders feels it is important that the public learn more about the marine environments and strongly supports the concept of demonstration projects that citizens can observe "off the shelf and into the field." As such, the Connecticut Arboretum at Connecticut College "spearheaded the movement to highlight the roles of tidal marshes in marine productivity through a series of bulletins originating as early as 1961."<sup>5</sup> Dr. Niering acknowledged that the productivity of renewable shellfish and finfish resources was not well understood as most efforts were directed toward protection and conservation and not the fisheries aspect. Dr. Galtsoff, a noted shellfish biologist, in his meeting with state officials on May 14, 1958, urged members of the State Board of Fisheries and Game, who were interested in the fisheries aspect, to conduct such studies focusing upon the value of marshes as nursery grounds for fish populations that sustain public fisheries. During the conference, he urged state officials to conduct a study for winter flounder. Dr. Galtsoff stated with the "data obtained by this study, you probably can make a very good estimate of how much fish is dependent on marsh and determine the value of marsh area with reference to one particular species."

At that time, Mr. Lyle M. Thorpe, then Director of the Connecticut State Board of Fisheries and Game, found himself having to document the importance of salt marsh habitats to fisheries and is quoted at the May 14, 1958 conference as stating: We have been plagued with the destruction of shore marshes, and we have made every effort to try to save the remnants of them by purchase and by moral persuasion of other State and Federal agencies whose case for saving a marsh, as

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<sup>5</sup> Forward William A Niering, Director, Page 2. Tidal Marsh Invertebrates of Connecticut.

such, as compared to turning it into dry land, the usual balancing of value seems to be the creation of some valuable piece of property as compared to a couple of ducks.<sup>6</sup>

During this period, the burden of proof, the value of the habitat seemed to rest squarely with the State in this case, the State Board of Fisheries and Game. Some two decades later in a major policy shift for the state, the Coastal Area Management Act defined habitat values by regulation and state statute. The value of the habitat is now defined by the state and federal agencies and any disturbance/alteration is the responsibility of the applicant to conduct now regulated activities.

### Shellfish/Finfish Habitat Associations

Such a habitat preference study would research an area of concern raised by the shellfish industry and John Baker of the State Department of Agriculture - Aquaculture Division (personal communications 1979). Division Chief Baker felt that shellfish populations and habitats were important to other estuarine organisms as well particularly fish species such as back black flounder, soft shell clams, eels and blue crabs. To him, these habitat associations needed to be researched and documented. He urged state officials to conduct such shellfish and finfish habitat studies between 1978 and 1979.

### Recreational Shellfishing Opportunities

After all of Madison's creeks and rivers were closed to direct shellfish harvesting (due to bacterial contamination of the water), much of Madison's recreational shellfishing areas were lost. In an effort to restore commercial fishing and to increase production from local shellfish beds, the Madison Shellfish Commission approved relaying in 1978. A comprehensive program (shellfish management plan) was adopted and relay sites designated. The recreational relay sites were West Wharf, Middle Beach and East Wharf. It became immediately evident, that Middle Beach was subject to storm movement of sand and could bury large amounts of relayed oysters and was finally abandoned as a relay area (deuration site).

However, continued losses of shellfish at East and West Wharfs due to burial, storms and winter freezes initiated an effort to locate a

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<sup>6</sup> Ibid.

safer more accessible relay site. This site would only have to be a conditional one requiring water quality levels permissible for harvesting in the winter. The idea of restoring Dowd's Creek was suggested by the Intern Director as a possibility. Dowd's Creek is in a relatively undeveloped section of Hammonasset State Park, contains no home or sewer outfall contaminant potential, and has good public access and plenty of parking. In addition to eliminating to above problems associated with present relay operations at East and West Wharfs, a creek environment would provide an opportunity for shellfish growth, spawning, recruitment, and protection from salt-water predators. At the end of Dowd's Creek, a small salt pond would be created, removing fill dumped along its edge.

Before conducting exhaustive water quality tests of the area, it was determined that restoration work was necessary to again sustain shellfish populations. In fact, much of the original portion of Dowd's Creek has been filled and only two original bends remained. The other sections were partially and in one case, totally filled with debris, glass bottles and trash, and in two places, broken bridge abutments blocked tidal flow. Dowd's Creek historically was an important shellfish producing area (E. Miller personal communication). Meetings with Dick Clifford, Director of Connecticut Parks and Recreation Department and Paul Capotosto, Division Chief of the Mosquito and Vector Section Connecticut Department of Health Services endorsed the project both as a habitat restoration/enhancement and elimination of mosquito breeding areas. A letter of support for this project was obtained from Chairman Wiesbrock soon after those meetings. A meeting was held at the Office of Hammonasset Park Manager (Gary Thomas) for the Madison Shellfish Commission (represented by Richard Stoecher), the Department of Health Services (Malcolm Shute), and the Madison Land Conservation Trust (represented by Fred Korsmeyer) as well as other interested public officials in order to explain the goals of the project before work commenced.

#### Water Quality Studies

Most conditional areas are dependant upon water quality tests after rainfalls. A report must be completed and submitted to the Connecticut Department of Health Services (and one that will be forwarded to the F.D.A.) detailing bacterial levels during different seasons, dry and wet periods (especially after 1 inch of rain).

Since a winter or late fall opening would be ideal for the Madison Shellfish Commission, I suggested that sampling be concentrated during those periods. Dowd's Creek in is an isolated area of Hammonasset State Park and is subject to few point source discharges of bacteria (such as poorly designated or inadequate septic systems for example); water quality should be good and better during cold

months with potentially less wildlife in the area. In addition, new criteria for water testing may differentiate human pollution from livestock or poultry. The hundreds of wooden outhouses that once dominated the landscape had been replaced by modern shower/toilet facilities.

In any case, the designation of Dowd's Creek also would require a close working relationship with the Town Sanitation officer (John Bowers) and the Madison Director of Health. The Madison Shellfish Commission could fund the water tests through John Bowers' department; if necessary, and have samples delivered to Hartford for evaluations. (I understand that John Bowers already sends samples to Hartford on a weekly basis, and it may be possible to "double up on these trips to Hartford.") The Madison Shellfish Commission should identify someone (or a laboratory) to collect the samples on a regular basis and have them delivered to John Bowers or to Hartford. A phone call to the State Health Department (Malcolm Shute's office) at 566-1258 should provide information on who can collect the samples, under what supervision and what laboratories are state licensed to do the work if the Commission cannot arrange for transportation to Hartford. Unfortunately, Malcolm Shute's office cannot conduct the necessary studies such as this one regarding a conditional area because of a critical shortage of staff.

#### Equipment Required

It is hoped that the project will stimulate interest in the community and surrounding towns as a component of the study after year two. In order to accomplish the long-term study, volunteers would need to be utilized in periodic sampling. This is a very small project but could provide some interesting results. To ease monitoring studies, equipment should be easily set/hailed by hand and require little maintenance.

Aquatic Plants: establish a 40 long X 20 wide patch - Spartina Alterniflora (species) from the bank edge. Some sections have natural dense strands of Alterniflora; they would be used for the habitat association/matrix.

Small Pebbles/Sand: establish a 40 long x 20 foot wide patch of small aggregate - pebbles sand/ the state park staff has some gravel mix; we need to remove some of the 1979 fill and replace it with this sandy gravel matrix re-deposition to the depth of 4 inches. Rake smooth as possible.

Firm Mud/Shell: A section of creek bottom 40 X 20 will be selected that is firm enough to support a thin covering of oyster shell; oyster shell will be moved from Tom's Creek or a pile of oyster shell at Lang's Dock in Clinton.

Rocks/Small Cobbles: The park staff identified small cobblestones at Meigs Point they would be placed in a 40 X 20 patch. Much evidence exists that structure creates a habitat for many organisms deemed or termed the "riffle effect" according to Dr. John Barclay.

This is the habitat mix that should show to a small extent what type of organisms inhabit which and could shed some light on habitat associations and larger scale restoration projects in the future.

## **Section I**

### **Description Overview and History of Project –Purpose /Location**

- **Need of a Habitat Baseline for the Marine Environment  
December 2005**

– Tim Visel

## The Dowd's Creek Proposal

### "The Need of a Habitat Baseline for the Marine Environment"

S. G. M. A. P. Abbreviated Case History 1983-1989

Timothy C. Visel

Re-keyed for the EPA LISS Habitat Restoration Committee - December 2005

In 1985, I planned a Connecticut citizen monitoring effort similar to the "Pond Watchers" that Dr. Virginia Lee started with Rhode Island Sea Grant. When I was employed at URI at the time (1978-81), I was amazed at how controversial something as simple as citizen monitoring could be. In 1986, I participated in a two-day water quality workshop for the Pond Watchers at the University of Rhode Island. At UCONN Sea Grant, I started to organize a similar group, which were called the "Cove Watchers" and would soon learn how sensitive this issue was first-hand. Most of the "Cove Watchers" program dealt with classifying winter flounder population assemblages to a "habitat index." The index is the measure of how "healthy" the habitat is. It is the "yardstick upon which to measure," according to Dr. Art Gaines at Woods Hole, who I worked with in the early 1980's as a UMASS Marine Extension Agent. In Connecticut, we also needed the critical habitat yardstick - without it, observations were just that, a presence/absence study, but no measure. Observations did have value, but to draw conclusions about reference habitat relationships could not be validated. Without the habitat index, it was a point in time with no historical reference or notation of a norm or expectation. Massachusetts had selected a salt pond on Martha's Vineyard to be the "control" habitat baseline, and Dr. Virginia Lee had done the same in Southern Rhode Island with two relatively undisturbed salt ponds.<sup>1</sup>

Connecticut had no pristine "control" or baseline coastal pond for determining heritage species as with Massachusetts or Rhode Island. Holly Pond, for example, was so degraded, it barely supported vegetation.<sup>2</sup> The coves in our area

<sup>1</sup> University of Rhode Island Marine Technical Report #73 (1980). An Elusive Compromise and the rest is all cut off on the bottom of the page.

<sup>2</sup> Environmental Review Team Report - Holly Pond, Stamford and Darien, Ct. King's Mark Resource Conservation and development Area, May, 1985.

were also in advanced atrophic decline by the 1980's, thus, early attempts to build or "create" a new salt pond (1979 US Army Corps) at Hammonasset State Park with a purpose of trying to restore some flounder and shellfish habitat. After exposure to Dr. Gaines biodiversity habitat index of 25% shell/sand, 25% mud, 25% pebbles/rocks and 25% vegetation, on the Cape I proposed building a small salt pond at the end of Dowd's Creek at Hammonasset State Beach in 1985. We would replace the habitats with the same index mixture from Massachusetts, 25% of each habitat type, and UCONN graduate students would assess the populations. We thought that Madison's waters were relatively "clean," and road runoff could be corrected/mitigated. Everyone thought that it was a great effort, and National Sea Grant Office lined up \$1.5 million for additional test sites in New York, Massachusetts, New Hampshire, Maine and New Jersey. If ours were successful, we would be the beginning of a possible "Fisheries Restoration Service." Similar projects were planned on Long Island and New Jersey (shellfish restoration/habitat enhancement) and New York State had proposed a shell/cultivation program with its hard shell fishermen (Kassner). The project had two phases - clean a partially filled section of creek, and restore a tidal function/pond at the extreme east end. A small section would be shelled with oyster cultch and seeded with both hard clams and soft shell clams. The Madison Shellfish Commission had offered to provide any seed shellfish to support the initiative. Both the Madison Land Trust and Shellfish Commission had pledged membership or volunteer support with long-term monitoring.

Hammonasset State Park has a long history of filling in tidal areas with fill and dredged material. In 1965 an offshore hydraulic dredge filled in much of the salt pond complex between the "water tower" (now absent) and the beach east of it. In December of 1978 a proposal was made to recover a more recently filled salt pond labeled A-L at West Beach. A response from the Army Corps in early 1979 stated that it is not the agency that organized salt-water habitat reclamation.

According to Mr. Emil Miller, a former park resident off Dudley Lane in Madison, the salt pond marsh and tidal creek now known as Dowd's Creek, originally was not the easterly branch of Tom's Creek also named from the Dowd Family that lived at the entrance of Webster Point in Madison. Mr.

Miller stated that when the trolley track line was established to the grand beach pavilion, a pre-existing salt pond marsh and creek inlet was filled. In the process, early 1930's (this pavilion was taken down early 1970's) Dowd's Creek was substantially filled and straightened and connected to Tom's Creek. By 1986, the creek was

little more than a lateral drainage ditch, but still had the opportunity of tidal flow with a direct connection to Tom's Creek to the west at the edge of Hammonasset State Park.

### Habitat Questions

What is the normal or heritage species diversity/assembly was the primary goal. Secondary was restoration of sub tidal shellfish habitats in the Town of Madison. If some stream morphology could be restored and the failing bridges fixed, is it possible to restore some of this habitat that had long ceased to function as its previous ecology? According to Mr. Emil Miller, Hammonasset Beach was once a barrier beach system - a small tidal creek occasionally communicated or breached during storms. Thus, the beach was originally two beaches - with a small marsh salt pond complex separating the two larger sections. What was proposed was very limited removal of fill that had washed/eroded into the creek - several hundred yards - the project proposed to utilize periodic cleaning by the State of CT Health Dept - Mosquito and Vector Section. "The Mosquito and Vector section supports your efforts to obtain Sea Grant funds to study the changes of finfish, shellfish and other wildlife in this restored area." Paul Capotosto, then Chief of Dept. of Health Services Mosquito and Vector Section wrote in May 13th 1987. Information from Daniel Civio at the University of Connecticut, who provided copies of 1934 over-flight of Hammonasset Beach which indicated the presence of two district watershed areas.

When the Dowd's Creek project was halted over permit questions on August 7th 1987 by the DEP Office of Long Island Sound Programs an effort to partially establish habitat indexes again was attempted by way of environmental history fisheries reviews. Similar to what Dr. Virginia Lee had done in parts of Rhode Island - attempt as best as possible to create a fisheries history coast wide on each cove, river, creek, etc.<sup>1</sup>. The overall goal was to try compiling an estuarine habitat index by using historical information. The Coastal Cove and Embayment Board, which was created by the Coastal Area Management Act, which in 1982 had asked DEP to consider and support this statewide historical fisheries review. For some time, especially for finfish and shellfish restoration this discussion was caught in habitat value discussions. The Sound's Conservancy - a non-profit organization then out of Essex, CT continued these habitat quality discussions into formal proposals. A January 19, a 1988 Coastal Embayment Advisory Board member asked these questions squarely - the significance of any parameter depends upon how much that "value departs from the normal or expected value for a particular type of embayment" during the same board meeting

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<sup>1</sup> "A Comprehensive Survey and Action program for Connecticut's Coastal Embayments and Rivers - August 5, 1987 The Sound's Conservancy.

"several board members noted the importance of documenting current shellfish information for historical reference" and asked "how the relative importance of species should be determined in evaluating habitat quality."<sup>2</sup> Cove and Embayment Board members were to vote on this key habitat indexing issue, which many of the Board members were convinced was critical to future finfish and shellfish restoration efforts.

In the 1980's, several organizations in the state had expressed interest in enhancing coastal resources. Memories of the Niantic Bay Scallop Fishery or local flounder fishing, for example, shared large "user group" participation. To address these groups an effort to provide guidance in this area led to a collaborative effort between regulatory agencies, researchers, scientists and municipal leaders. In 1987, A Guide To Restoring Coastal Resources was printed by University of Connecticut Sea Grant Program in 1972. The foreword of this publication was written by William Niering and in it, he states, "Within the Long Island Sound estuary, restoration of finfish and shellfish populations must be another one of our top priorities." However, specific technical guidelines of recommendations for restoring finfish and shellfish resources have been slow to materialize. Although prominently mentioned as part of the new Coastal Area Management goals of restoring coastal resources in 1978 included: <sup>3</sup> (pg 20) Planning Report #24

1. Restoration and enhancement of Connecticut's shellfish industry
2. Restoration, preservation and enhancement of the states recreational and commercial fisheries had raised again by the Coastal Cove and Embayment Board in 1988 they remain unfinished. Although shellfish and finfish restoration opportunities then generated the bulk of the public questions, specific restoration guidelines and recommendations are yet to be developed (some two decades later). That is why we still need the HRI habitat chapters (guidelines) completed.

Today, The Sound School is now working with the environmental organizations and cooperating researchers to establish protocols and standard operations for several marine environmental monitoring efforts. It's quite an undertaking!

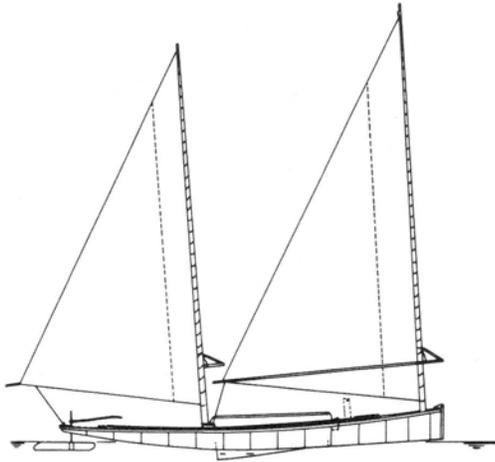
However, we still seek to have the critical baseline habitat index, a look at the "original forest" so to speak and not the stumps of one as one retired Guilford CT shell fisherman mentioned. Comparing "stumps to stumps" without the index is disappointing. If we cannot build or reconstruct the original "forest," or heritage species index, then the effort to establish the historical one, as proposed

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<sup>2</sup> Distribution of Minutes, Arthur J. Rocque Jr. February 22, 1988.

<sup>3</sup> Report to the legislature's committee on coastal management. The Connecticut Coastal Area Management Program, Planning Report, No 27, September 1, 1978.

by the disbanded Coastal Embayment Board, should be renewed. The entire concept of the Citizen's Embayment Board of resource use/management needs to be brought back. Many people were very concerned with its sudden dismissal over policy issue differences. I thought at the time it played a critical role of citizen input from resource user groups in our State. I still do.



# The Sound School

60 South Water Street, New Haven, CT 06519

December 7, 2005

Harry Yamalis  
Environmental Analyst  
Connecticut Department of Environmental Protection  
79 Elm Street  
Hartford, CT 06106-5127

Dear Harry:

It was nice talking to you about habitat restoration. I have noticed several excellent projects at Hammonasset State Park over the few years. Steve Nikituk wanted me to contact you with information about "Dowds Creek" (I believe he sent you the Sea Grant Proposal of May 18, 1987). Just a quick recap - I was fortunate to grow up next to the State park and from 1963 on spent a great deal of time on Hammonasset. One of the State park employees Mr. Emil Miller provided me a great deal of historical information about the area and some of the less than great environmental projects as the park developed in the 1930's and 1940's.

According to Mr. Miller much of the Wetlands and tidal ecology of the Western Park was changed with the bringing of the trolley line into the center of what is called East Beach. Two extensions of land, one for the beach access of Dowds Camp ground and the trolley line itself crossed some salt ponds and creeks. According to Mr. Miller what was left of these tidal areas was straightened and filled leaving a long lateral tidal canal. The "Dowds Creek Proposal" was an attempt to restore tidal movement and create at least one modest tidal salt pond. It was to become Sea Grant effort for a pilot study in support of a national "Fisheries Restoration Service." That effort was described under "Importance to the Marine Community" on page 6 of the Sea Grant Research Proposal titled "Response of Macro- Organisms to Restoration of Degraded Tidal Salt Marsh Habitats." We were also seeking 1.5 million in funding to support demonstration projects in New Jersey, Massachusetts, New Hampshire and Maine. Much of that effort was in conjunction with the Amtrak corridor improvement project. The Dowds Creek project was to be the first with Sea Grant research support.

The Dowds Creek proposal sought also to reverse the trend of filling and channelization of tidal areas in that region of the park. Although at the start of the project shellfish restoration was the prime activity, it was broadened to include macro - fauna and flora. The proposal was submitted by Dr. John Barclay, College of Agriculture University of Connecticut in the spring of 1987.

It's almost two decades since the proposal and Steve's interest represents the shellfishing potential in Madison. I'm happy to provide this background material. Please contact me if I can be of further assistance. In addition, I have enclosed some brochures about our school here in New Haven. It would be great to give you a tour of our program. My phone number here at The Sound School is 203-946-7106. Please give me a call so I could arrange for a convenient time.

I look forward to hearing from you.

Sincerely,

Timothy C. Visel, Coordinator  
The Sound School Regional  
Vocational Aquaculture Center

TCV/ad

Attachment (1)      Restoring Salt Marsh The Saybrook Pictorial July 11, 1987  
Nancy Hall The Saybrook Pictorial

## **Section 2**

### **Initial letter of Concern /Project History**

**Department of the Army,**

**• New England Division, Corps of Engineers  
424 Trapelo Road, 14<sup>th</sup> August 1974 Habitat Reclamation**

**• Macchi Engineers April 26, 1979  
Compensating Measures**

**• Tom's Creek OWMM – Restoration/ Comments  
Restored Ditch No 5 N/F Millicent Brown**



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02154

REPLY TO  
ATTENTION OF

NEDOD-R-13

14 August 1979

Mr. Timothy Visel  
38 Pent Road  
Madison, CT 06443

Dear Mr. Visel:

Thank you for your letter, dated 3 August 1979, concerning our permit, No. CT-CLIN-79-266, issued to the Connecticut Department of Administrative Services to perform work at Hammonasset State Park.

In response to your question on the reclamation of salt water habitats, the Corps of Engineers has no direct plans at this time to perform such reclamation projects; however, we do encourage applicants for Federal permits to consider additional work to mitigate the loss of significant wetland resources. This was the case in the agreement reached on Chases' Pond.

As you know the Corps of Engineers is neither a proponent or an opponent in these matters. Our regulatory responsibility is to weigh, and balance the benefits and detriments of individual projects as they impact wetland and other aquatic resources. Whenever, an application involves fill in wetlands, we require the applicant to investigate alternatives that would eliminate or reduce the need for fill. In this case, as in others, alternatives were not feasible and the loss of wetland was not significant to override the overall public interest to be served by the project.

If you have any questions, please contact me at 617-894-2400, extension 372. You may call collect.

Sincerely yours,

A handwritten signature in cursive script that reads "Kenneth M. Jackson".

KENNETH M. JACKSON  
Chief, Processing Section  
Regulatory Branch  
Operations Division

# MACCHI ENGINEERS

44 GILLET STREET

HARTFORD, CONNECTICUT 06105

PHONE (203) 549-6190

A. J. MACCHI, P.E.

April 26, 1979

Mr. Timothy Charles Visel  
38 Pent Road  
Madison, Conn. 06443

Re: Roadway Improvements in  
Hammonasset Beach State Park  
Dept. of the Army Permit Applic. NEDOD-R-11

Dear Mr. Visel:

Your letter of March 27, 1979 to the Dept of the Army has been forwarded to us for review and consideration. Macchi Engineers has been retained by the Conn. Dept. of Administrative Services as authorized agent for the above-referenced permit application.

We appreciate your candid expressions and concern for the conservation of trees and wetlands in Hammonasset Beach State Park.

Please be advised that a budget of over \$100,000 has been set aside to transplant existing trees and to install new plantings along the proposed roadway improvements.

The proposed roadway layout was arrived at with great concern for the impact on wetlands, and also with due consideration for other environmental factors such as decrease in air pollution, existing camp grounds, raising of roadways above flood level during flash storms, and to decentralize future parking within the park to better serve the public.

On August 18, 1978 we applied for a tidal wetlands permit to the Conn. Dept. of Environmental protection. After an extensive permit process, which included 2 public notices and a public hearing with a subsequent field inspection by all concerned, the Commissioner of the Dept. of Environmental Protection granted the application on April 6, 1979 with limitations.

These limitations include the requirements that proposed culverts be lowered to provide tidal flushing into the park area, and that at least 1/2 acre of upland adjacent to Chases

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- 2 -

Mr. Timothy Charles Visel  
Madison, Conn.

April 26, 1979

Pond be excavated as a compensatory measure for encroaching on the southerly limits of Chases Pond.

We thank you for your letter and trust that this will share with you the concern of public agencies for conservation and responsible planning.

Very truly yours,

MACCHI ENGINEERS

  
JOSEF WOMELSDORF, P.E.

cc. K. M. Jackson, Dept. of the Army  
Commissioner C. Thomas Foley, DAS-Public Works  
Wm. Miller, Parks & Recreation  
D. Cunningham, DEP-Water Resources

N/F STATE OF CONNECTICUT

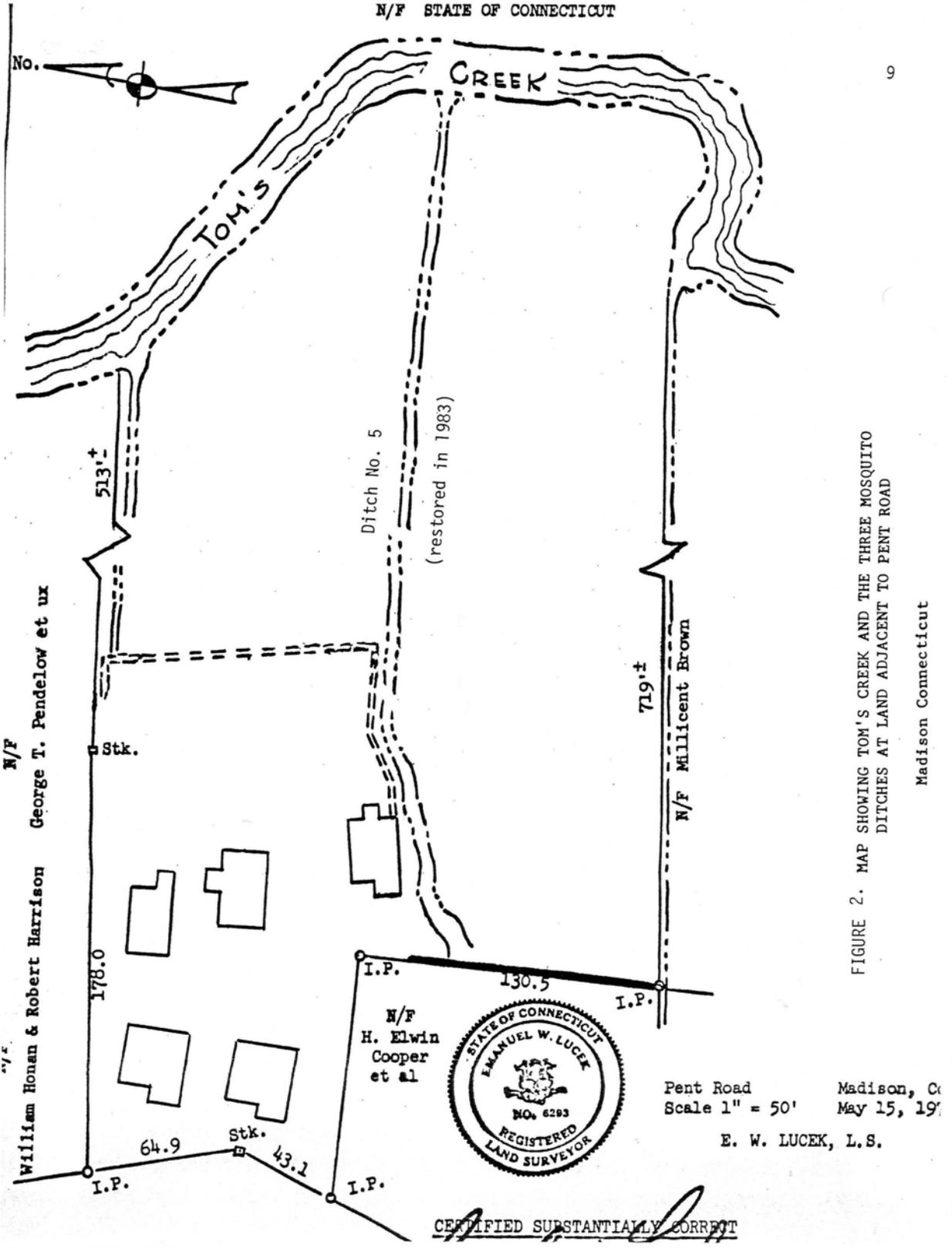


FIGURE 2. MAP SHOWING TOM'S CREEK AND THE THREE MOSQUITO DITCHES AT LAND ADJACENT TO PENT ROAD

Madison Connecticut

Pent Road Madison, Ct  
Scale 1" = 50' May 15, 1971  
E. W. LUCEK, L.S.

## **Section 3**

# **Sea Grant Proposal to the National Sea Grant Office Abstract**

- Dr. Robert Whitlach**
- Dr. John S. Barclay**
- Mr Timothy C Visel**

**Research Proposal**

**To Connecticut Sea Grant Program**

**Edward C. Monahan, Director**

Response of Macro Organisms to Restoration of Degraded Tidal Salt Marsh Habitats

**Submitted May 18, 1987**

**By**

**John S. Barclay, Principal Investigator  
Department of Renewable Natural Resources \***

**Robert B. Whitlatch, Associate Investigator  
Department of Marine Sciences \***

**Timothy C. Visel, Associate Investigator  
Sea Grant Marine Advisory Program \***

**Amount Requested (2 years): \$96,000**

**Funding Interval: July 1, 1988 to June 30, 1990**

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# Response of Macro Organisms to Restoration of Degraded Tidal Salt Marsh Habitats

John S. Barclay, Principal Investigator  
Robert B. Whitlatch, Associate Investigator  
Timothy C. Visel, Associate Investigator

Abstract: Extensive destruction, alteration and pollution of Connecticut's salt marsh estuarine ecosystems and dramatic decline in some coastal fish, shellfish and wildlife populations jeopardize significant commercial, recreational and biological valuable resources. This project is designed to document initial responses of macro-fauna and flora to salt marsh and tidal creek restoration efforts near Madison, CT, with local and state agency assistance. Ecological factors governing biotic responses should be clarified. The results should provide valuable education and demonstration opportunities.

## Introduction

The coastal and estuarine waters represent one of the United States' most valuable renewable natural resources. Two-third of our commercially important fish species on the Atlantic coast are estuarine dependent. (National Marine Fisheries Service, 1984).

For decades, it has been obvious that pollution of rivers and estuaries has profoundly affected the food resources that are dependent on these bodies of water (Ketchum, 1969). It is known that alewives, shad and salmon no longer have spawning runs in many of our New England streams, and that acreage for growing and harvesting shellfish in certified waters continues to be reduced. According to Blake et. al. (1984), Connecticut's tidal marshlands and shellfish beds are the two most ecologically important habitats to suffer from human development and degradation activities. An informational bulletin put out by the Department of Environmental Protection Coastal Area Management Program (C.A.M. Bulletin, 1983) summarizes the effects of development of the Connecticut coastline:

"We are now seeing the effects of development of various trouble spots along the shore. Shellfish beds have been closed, healthy plant and animal life in tidal wetlands are being lost, unpleasant odors at low tide have been reported, and swimming and boating conditions have deteriorated."

Personal observations of Marine Advisory Program shellfish habitat

restoration projects in Madison, Clinton, Old Saybrook and other towns have shown consistent increases in flounder (*Pseudopleuronectes*

americanus), blue crabs (*Callinectes sapidus*), and other wildlife (see appendix). These shellfish enhancement programs

were conducted with municipal shellfish commissions and volunteer shellfishermen.

Of particular interest to Connecticut's shellfisheries is research directed toward revitalizing historically productive setting areas and the "research should be redirected toward improving the knowledge of the ecology of species inhabiting Long Island Sound (Blake et. al., 1984). Unfortunately the ecology of tidal and subtidal habitats has been destroyed or degraded along many western sections of Connecticut's coastline (Schubel, 1987).

The authors are convinced that ample opportunities exist to enhance marine organism and wildlife diversity and productivity in restoration projects given suitable verification. Therefore, we propose to:

- 1) document the effects of physical alteration of tidal circulation and flow patterns of maintained mosquito ditches in a salt marsh on plants and animals;
- 2) document the response of macroorganisms to the restoration of an oyster bed in a degraded tidal channel;
- 3) determine ecological factors influencing responses of the biota to habitat restoration efforts;
- 4) demonstrate the feasibility of restoring degraded tidal salt marsh habitats.

Project Relevance

#### Historical Perspective

Connecticut's creeks, rivers and coastal bays once supported substantial inshore fisheries (Goode, 1887). These unique environments were extremely productive, providing critical habitats for both reproduction and growth of estuarine dependent species. Connecticut's early fisheries were mostly carried on for commerce. The Stonington and New London areas once sustained large fish reduction (menhaden) fisheries (Benoit, 1968). According to Goode (1887), New London was the principal food fish producing port south of Cape Cod. Goode details the

1880 catch of the New London fleet as comprising "1,230,000 pounds of cod, 490,000 pounds of halibut, 467,500 pounds of bluefish, 73,500 pounds of swordfish, 159,800 pounds of striped

bass, 4,223 barrels of mackerel and 170,000 pounds of lobsters. The shore fisheries yielded about 150,000 pounds of flounders, eels, tautog (blackfish), smelts and other species and 30,000 pounds of lobsters."

Connecticut's fisheries have suffered major declines. For instance, landings of blackback flounders declined from a 1930 high of 11 million pounds to as little as 0.5 million pounds annually in recent years. Landings of other estuarine species such as the softshell clam, (*Mya arenaria*) have also shown sharp declines. Commercial landings of softshell clams ceased in 1950 (Blake, et. al. 1984) in contrast to a previous estimated 300,000 bushels annually (Goode, 1887). These landings statistics can be used only as a rough indication of variations in abundance (Blake, et. al., 1984) but serve to illustrate the situation.

Connecticut's early shell fishing history is also rich one. The state's rivers, creeks and bays provided ideal habitats and low salinities that shellfish species such as the oyster (*Ostrea* sp.) prefer. Native Americans and later European settlers availed themselves of the vast populations of clams, oysters, mussels (*Mytilus* sp.) and scallops (*Pecten opercula* is) during winter times when terrestrial food supplies were scarce. Shellfish were gathered with rakes, tongs and hand dredges from shellfish beds along most of Connecticut's 200 miles of coastline (Kochiss, 1974).

The commercial oyster industry peaked in Connecticut at 2 million bushels in 1910 but fell to only 40,000 bushels in 1967 (Matthiessen, 1974). Improvement in water quality in some areas has helped the industry recently (from about 1970) and many beds again produce oysters. Today, oyster culture has become the largest private aquacultural effort in the state (Volk, 1986).

#### Restoration of Marine fisheries

In many coastal towns, shoreline development has damaged or eliminated marine resources in salt ponds, bays and salt marshes. By 1964, shoreline alterations had destroyed or damaged more than 50% of the tidal marsh that existed in 1914 (Niering and Bowers, 1966). For example, in the town of Fairfield one salt marsh acreage has been reduced from over 600 acres in 1914 to about 17 acres in 1979 (Steinke, 1987). Embayment tidal flushing have been restricted by causeways and insufficient culverts. However two state programs currently underway have the potential for restoring the productivity of Connecticut's near shore environments for fisheries.

In 1983, special act # 83-13 was passed by the Connecticut General Assembly authorizing a study of approximately 135 coves and embayments along the state's 280 mile coastline. Under the auspices of the department of Environmental Protection Coastal Area Management Program, a Coastal Coves and embayment Advisory Board has been created to study coastal water bodies and make recommendations for possible restoration efforts.

In 1986, the Connecticut Department of Health Services - Vector Section implemented open Marsh Water Management techniques in coastal salt marshes. This approach replaces an earlier program initiated in 1900 which was established to control mosquito populations after an outbreak of malaria hit coastal regions of the state. Open Marsh Water Management (OMWM) reduces mosquito populations while creating ponds for fish and wildlife, rejuvenating coastal salt marshes to be a productive part of the marine food chain again (Capotosto, 1985).

#### Restoration of Shellfish Resources

In 1979, efforts were made by the Sea Grant Marine Advisory Program to initiate the development of management plans in coastal town which were addressing shellfish restoration (Visel, 1985). Nearly all of these programs were in areas closed by the State Department of Health Services to direct shellfish harvesting because of pollution. Careful cleaning and shelling of formerly productive seed oysters has resulted in dramatic increases of spatfalls (Visel, 1986). To date, over \$1,000,000 worth of seed oysters has been produced from these restoration efforts and the value is increasing rapidly (Sea Grant Informational Bulletin, 1987).

Town shellfish beds still produce significant quantities of mussels, soft shell clams, hard shell clams (Crassostrea virginica), oysters and scallops although production today is just a fraction of past harvests. Many thousands of acres within municipal jurisdiction remain closed to recreational harvests due to sewage outfalls or bacterial contaminations (Shute, 1982). Renewed interest in improving water quality and reducing pollution hopefully may lead to reopening these closed areas. Several town shellfish commissions have taken an active role in rebuilding formerly productive shellfish beds in closed areas with Marine Advisory Program recultivation or habitat enhancement programs. On the state natural beds, the Connecticut Department of Agriculture, Aquaculture Division, has commenced a seed oyster restoration program for historical productive offshore areas.

#### Restoration of Wildlife Resources

"Restoration" implies that the resources to be restored area at a suboptimal level due to conditions adverse to their presence.

Ecologists (MacNamara, 1952; Gossellink, 1980; Teal, 1986) agree that many forms of "wildlife", i.e., free-ranging warm-blooded vertebrates (birds and mammals) benefit from or depend upon the productivity of tidal marshes and estuaries. However, quantification of these roles, particularly in marshes damaged by ditching and pollution, does not appear to have been as well documented. Many of the earlier efforts emphasized waterfowl and other game or furbearing species (MacNamara, 1962; Shaw and Fredine, 1956) and confirmed coastal salt marsh values to waterfowl, rails, mink (Mustela Vison), muskrat (Ondatra zibethicus) and raccoon (Procyon lotor). An exception is the detailed report by Bourn and Cottam (1950) on the biological effects of ditching tidewater marshes.

Given the substantial loss and alteration of coastal wetland habitats in Connecticut and elsewhere (Gosselink, 1980; Frayer et.al., 1983), one can assume that the associated losses to indigenous, migratory and wintering wildlife have at least been equal or greater. Lowered water tables, reduced salinities and changes in flora and fauna are cited by Bourn and Cottam (1950:12) as major factors contributing to the destruction of vital coastal wildlife habitat.

Recent observations by Visel (pers. comm.) of enhanced wildlife use of restored tidal creeks and mosquito drainage ditches appears to be related to the effects of renewed tidal ebb and flow, removal of organic deposits, and establishment of a firm calcareous (oyster shell) substrate in creeks and ditches. Unlike the 1950 study by Bourn and Cottam, which monitored extensive areas of marsh surface, this project will include analyses of ditch and channel characteristics as well. We expect to gain important documentation as to the stability, ecological processes and consequence of substrate restoration for the overall marsh/estuary complex. These results are essential and needed soon if enlightened management decisions are to be made in response to public pressure (see Reed, 1975, and others) for fish, shellfish and wildlife production in the remaining altered tidal marsh habitats.

#### Review of Literature

The areas of study we propose have been researched by others in response to a special problem (mitigation for example) or were mainly concerned with a single species (Bousfield, 1969). Studies have been conducted on the oyster community by Korringa (1951) and also Hedgpeth (1953) both of whom give a comprehensive description of oyster associations. In a 1957 paper Hedgpeth asserts that oyster reefs (beds) are the most

significant aggregations in estuaries since they are a major factor governing patterns of sedimentation and, at the same time, provide habitats for a variety of smaller organisms.

In a study of the oyster community in Delaware Maurer et. al. (1973) provided strong evidence to support the premise that any increase in abundance is associated with a gradual increase in clean, hard shell substrate. Mackenzie (1983) reported that seed oyster beds occupy from 1 to 10 percent of the bottom area of estuaries and that these beds harbor much more algae and many more invertebrates and fish than the remaining bottom. Thus MacKenzie concludes "rehabilitation of seed oyster beds produces an increase in the abundance of oysters and associated species."

In the late 1790's malaria was common during warm weather in Southern New England (Simpson, 1983). Mosquito control in Connecticut salt marshes was started in 1900 when an outbreak of malaria hit the coastal sections of the State (Capotosto, 1986). During the depression a W.P.A. program "grid ditched" nearly all of Connecticut's salt marshes in an attempt to control *Aedes sollicitans*, a salt marsh mosquito, along the coastal regions of the State. Since payment was based "by the foot," marshes were ditched at close regular intervals. In many cases marshes were over ditched, lowering the marsh water table and disrupting normal marsh ecology. Dr. Paul Galtsoff, at a 1958 meeting at the Connecticut Board of Fisheries & Game Office in Hartford (now within the Department of Environmental Protection) is quoted in response to the following:

"Questions: Do you think that tidal marsh that has been ditched for mosquito control is badly damaged or does it provide a good deal of nutrients?"

Dr. Galtsoff: We saw many places where the marsh was very badly damaged because the level of ground water was so lowered that it affected farm land nearby. In other places, where it was more carefully ditched, there was no such lowering of the water level... It will be very desirable to organize a study of the swamp (marsh) nursing grounds for winter flounders."

Techniques for open marsh water management (OMWM) procedures developed by Ferrigno (1968 at the New Jersey Agriculture Experiment Station are now being applied on New England salt marshes (Hruby, 1985). The major objective of open OMWM is to eliminate mosquito breeding while improving salt marshes for fish and wildlife (Ferrigno and Jobbins, 1975). OMWM utilizes pond creation, pond radials and radial ditches instead of the previous grid pools and to increase marine diversity (Meredith et. al., 1985), OMWM procedures were accepted and instituted in Connecticut's Department of Health Services Mosquito and Vector Division in 1986.

Unfortunately, large sections of salt marsh habitats have been filled for development purposes. Connecticut's coastal ponds and coves have been altered, diked or so seriously degraded that marine diversity

and abundance of organisms have suffered. Therefore the grid ditches have in effect supplemented this lost intertidal habitat and may provide considerable opportunities for maintaining marine and coastal wildlife diversity.

#### Importance to the Marine Community

Previous Marine Advisory program shellfish restoration in five coastal towns has produced thousands of bushels of seed oysters (Fish & Wildlife Transactions, 1986) for relay programs (Visel, 1986). All restoration projects have also been associated with dramatic increases of marine life such as flounder and blue crabs. The authors believe that shellfish (oysters) restoration projects will not only increase recreational and commercial shellfisheries but also enhance other fisheries and wildlife as well. By restoration oyster habitat and monitoring species changes or trends, documentation of habitat restoration efforts can be accomplished.

Ultimately, where feasible, appropriate and not in conflict with legitimate uses of linear ditching, restoration of the original meandering marsh creeks may prove most productive and ecologically appropriate. This study constitutes a necessary first step in documenting the factors involved in marsh estuary restoration, the potential results, and optimum ecological conditions.

This study has the potential to improve recreational and commercial marine fisheries by documenting the successful reintroduction of them to restored habitats. Publications and fact sheets obtained from research findings can be used by marine resource and wildlife managers to illustrate the benefits of such projects. Field tours and slide lecture presentations will provide public officials the opportunity to learn about the effectiveness of marine habitat restoration of degraded tidal areas and salt marsh, and confirm the consequences of neglect and abuse.

In a 1979 report to the Legislature's Committee on Coastal Management, a general fisheries policy was delineated as a coastal management goal and policy. Section L (Fisheries) is quoted below.

General Policy: To manage the State's fisheries in order to promote the long term benefits of commercial and recreational fishing.

Specific Policy: To manage the State's fisheries in order to promote the economic benefits of commercial and recreational fishing, enhance recreational fishing opportunities, optimize

the yield of all species, prevent the depletion of indigenous species, maintain and enhance the productivity of natural estuarine resources and preserve healthy fisheries resources for future generations.

Implementation of habitat restoration program and documenting positive responses to living marine resources could have a profound impact upon marine fisheries management. Distribution of published journal articles, abstracts and M.A.P. educational fact sheets would educate public officials and recreational and commercial fishing groups to potential opportunities to rebuild Connecticut's once prosperous inshore fisheries. The economic significance and importance of these inshore fisheries to Connecticut is documented in many of the references cited in this proposal.



College of Agriculture and Natural Resources  
Department of Renewable Natural Resources  
U-87  
1376 Storrs Road  
Storrs, Connecticut 06268

May 15, 1987

Edward C. Monahan, Director  
Connecticut Sea Grant  
University of Connecticut  
Avery Point  
Groton, CT 06340

Dear Director Monahan:

Please find attached a sea grant proposal entitled "Response of Macro-Organisms to Restoration of A Degraded Salt Marsh And Adjacent Tidal Habitat" to be considered for the period July 1, 1988 to June 30, 1990. I look forward to any suggestions or changes that you may provide. If you have any questions please feel free to call me here at the Department of Renewable Resources: 486-2840.

Thank you.

Sincerely,

John S. Barclay  
Associate Professor and  
Wildlife Specialist

JSB:bg

Attachment

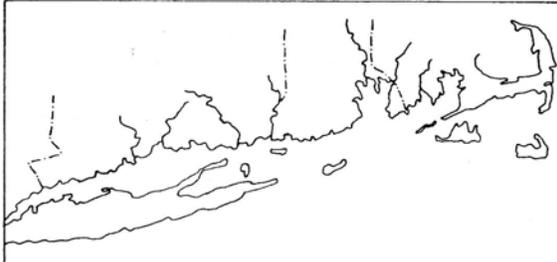
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## **Section 4**

### **Letters of Support from State and Municipal Agencies /Partners**

- **The Sounds Conservancy Inc.**  
May 18, 1987, Christopher Percy President
- **The Town of Madison Connecticut Shellfish Commission,**  
April 28, 1987, Jack Wiesbrook Chairman
- **State of Connecticut, Department of Health Services**  
Malcolm Shute, Principal Environmental Sanitarian
- **State of Connecticut, Department of Agriculture,**  
John H. Volk
- **State of Connecticut, Department of Environmental  
Protection, Bureau of Fisheries**  
Eric M. Smith



The Sounds Conservancy, Inc.

*Gateways to Southern New England Rivers*

Marine Sciences Institute — UCONN Groton, CT 06340  
Tel. (203) 445-1868

May 15, 1987

Mr. Timothy Visel  
Marine Resource Specialist  
Sea Grant Marine Advisory Service  
Avery Point, Groton, CT 06340

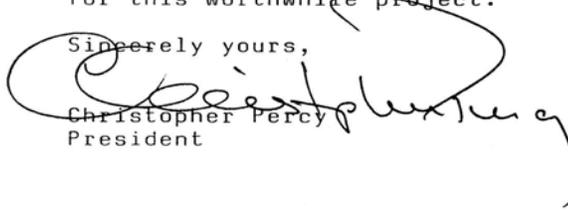
Dear Mr. Visel:

The Sounds Conservancy has learned about the proposal to restore **Dowd's** Creek at Hommonasset State Park to help bring back shell and fin fisheries.

We support this project and offer our help in any way suitable. A principle purpose of The Sounds Conservancy is to restore our tidal embayments and rivers, protection and enhancement of shell and fin fish habitats, and to encourage new enterprises in the mariculture and aquaculture fields.

Please keep us informed of the plans and activities for this worthwhile project.

Sincerely yours,

  
Christopher Percy  
President



TOWN OF MADISON  
CONNECTICUT

3 Maple Avenue  
Madison, CT 06443  
April 28, 1987

Mr. Timothy C. Visel  
Sea Grant Marine Advisory Program  
Avery Point Campus; Groton, CT 06340

Dear Tim,

Thank you for the walking tour, yesterday, of Dowd's Creek in Hammonasset State Park and the explanation of work that the State plans to do to restore the creek's water channel. The Madison Shellfish Commission is anxious for this work to begin. This summer we plan to start laying shell and seed to begin the process of restoring the creek as a viable oyster ground which, as you know, it has historically been.

Sincerely,

A handwritten signature in cursive script that reads "Jack Wiesbrock".

Jack Wiesbrock  
Chairman  
Madison Shellfish Commission



STATE OF CONNECTICUT  
DEPARTMENT OF HEALTH SERVICES  
PREVENTABLE DISEASES DIVISION

May 13, 1987

Mr. Timothy C. Visel  
Regional Marine Extension Specialist  
The University of Connecticut  
Sea Grant Marine Advisory Program  
Avery Point Campus  
Groton, CT 06430

Dear Mr. Visel:

I understand you are attempting to obtain Sea Grant funds to study habitat restoration project effectiveness. Connecticut has many areas that might benefit from restoring habitat and using open water management practices. Documentation of restoration project effectiveness may provide the stimulus for other projects and increase Connecticut's natural resources.

I support this effort to examine the effectiveness of restoration, improvement in estuary flushing, and increase in marine life including shellfish. This study could be a precursor to other studies for the more effective use of shellfish resources and documentation of areas that could be conditionally opened for direct shellfish consumption or relaying inaccord with the U.S. Food and Drug Administration, National Shellfish Sanitation Program Revised Operating Manual.

If you need any assistance or have any questions, please contact me at the number listed herein.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Malcolm Shute".

Malcolm Shute, Principal Env. Sanitarian  
Shellfish Unit  
Preventable Diseases Division

MS/slm 2779C

Telephone .. 566-1258  
150 Washington Street, Hartford, Ct. 06106  
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STATE OF CONNECTICUT

DEPARTMENT OF AGRICULTURE

AQUACULTURE DIVISION



May 7, 1987

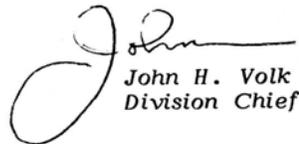
Mr. Timothy C. Visel  
Regional Marine Extension Specialist  
The University of Connecticut  
Sea Grant Marine Advisory Program  
Avery Point Campus  
Groton, Connecticut 06340

Dear Tim:

I have learned of your effort to obtain Sea Grant funds to document the effectiveness of marine habitat restoration projects. Though there is an abundance of information available regarding the success of oyster bed enhancement, there remains a real need to document the positive impacts to other shellfish species, finfish, crustacean and plant life as well.

Our division supports your efforts in response to this need. Please let me know if we can be of assistance.

Best regards,

  
John H. Volk  
Division Chief

JHV:p

Phone

P.O. Box 97 • MILFORD, CONNECTICUT 06460

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STATE OF CONNECTICUT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF FISHERIES  
MARINE FISHERIES OFFICE  
P.O. BOX 248  
WATERFORD, CT 06385



May 12, 1987

Mr. Timothy C. Visel  
The University of Connecticut  
Sea Grant Cooperative Extension Service  
Avery Point Campus  
Groton, CT 06340

Dear Tim:

I've recently been made aware of your intent to propose a study for Sea Grant funding to quantify the biotic recovery process resulting from tidal marsh restoration.

I know you are well aware of my feelings on the subject. While qualitative estimates of resource enhancement through habitat improvement are helpful, confirmation of the benefits gained by these efforts must come from the quantification of results.

Your proposal is long overdue and extremely pertinent. Presently degraded habitat does not necessarily constitute an irrevocable loss. If you can show a quantifiable improvement in biota -- either in abundance or diversity of endemic species -- those of us in resource management will have an extremely useful tool to justify demands for restoration of previously degraded habitat.

I support your efforts to secure funding and will be happy to recommend your study to the National Office if recommendations are solicited. Please keep me informed of your progress and feel free to ask for assistance if you need it.

Sincerely,

Eric M. Smith  
Assistant Director

Phone: (203) 443-0166  
165 Capitol Avenue • Hartford, Connecticut 06106

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## **Section 5**

### **Press Articles**

#### **Tour of Site**

#### **Background Details**

**- June 17, 1987**

**Walking Tour and Presentation to the Madison Shellfish Commission and Madison Land Conservation Trust**

**- July 11, 1987**

**“Restoring Salt Marsh” The Saybrook Pictorial**

**- July 10, 1987**

**“Clean-up of creek aimed at restoring ‘Madisonian’ oysters – the Hartford Courant**

**- Site map, Hammonasset Beach State Park**



THE UNIVERSITY OF CONNECTICUT  
**COOPERATIVE EXTENSION SERVICE**  
SEA GRANT MARINE ADVISORY PROGRAM 

Avery Point Campus, Groton, CT 06340 Telephone: (203) 445-8664 or 446-1020 Ext. 234

June 17, 1987

TO: Interested Parties, Agencies and Participants  
FROM: Timothy C. Visel, Regional Marine Extension Specialist  
Fisheries/Aquaculture  
SUBJECT: Dowd's Channel Habitat Restoration Project

*Tim*

The walking tour and introduction to the Dowd Channel Restoration Project has been scheduled for Tuesday, June 23rd. We will meet at the Hammonasset State Park Central Office to the left of the main park entrance at 10:30 A.M.

Park Manager Mr. Gary Thomas, and Mr. Paul Capotosto, Chief of the Vector Section, will discuss background information and review a series of slides before our tour of the area.

We will be walking adjacent and between marsh areas, so old shoes or knee-high boots might be a good idea. Rain date will be the following day.

I look forward to seeing you on the 23rd.

TCV:ejm

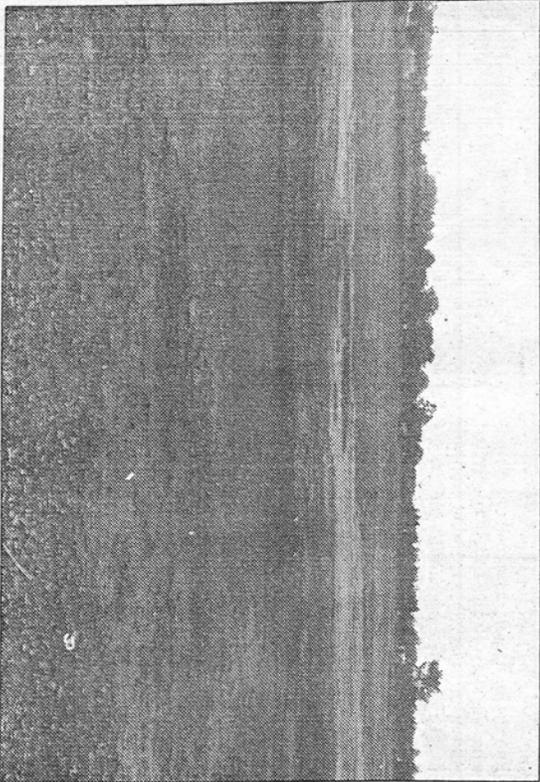
# The Saybrook

# Pictorial

Saturday

Vol. 7, Issue No. 16

July 11, 1987



*CONTRASTS. Above, a destroyed marsh at Hammonasset State Park. At right, an ideal present marsh.*

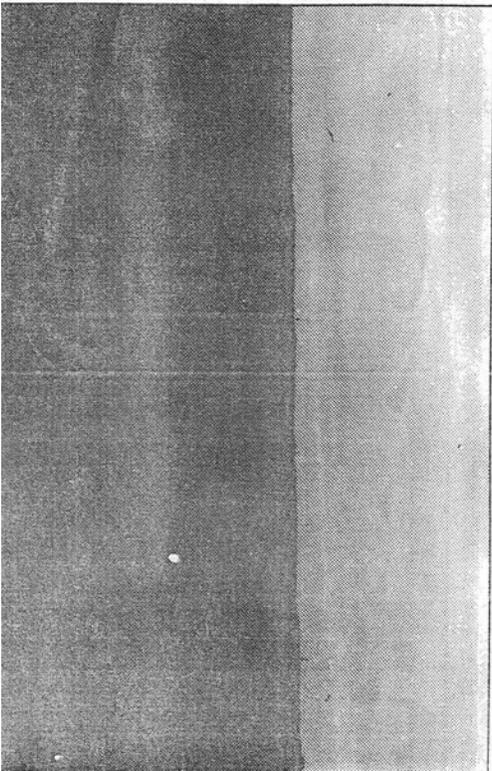
Photos by Nancy Hall

By **NANCY HALL**  
*Special to Saturday*

A marsh restoration planned for eight years got has finally gotten underway.

Portions of Dowd's Creek, which until 1950 drained salt marsh at the Hammonasset State Park in Madison, will be cleared as part of a major coastline program. The project aims to restore restoring mar-

## Restoring salt marsh



cooperative one between the state Department of Health, the Madison Shellfish Commission and the federal government, which will fund the improvements through a \$1.5 million National Sea Grant.

**TIMOTHY C. VISEL**, a marine biologist with the Sea Grant Marine Advisory program, hosted a walking tour of the area recently, pointing out deteriorated areas. Dr. John Barclay and a team of graduate students from the Department of Renewable Resources at the University of Connecticut had earlier marked 50 monitoring points with blue stakes to encourage before and after comparisons. One salt pond lies under a parking lot in the Hammonasset camping area, while a second has dried and cracked.

"This tour gives a good perspective of a lost marsh," Barclay said. "This was once all healthy marsh," he said, sweeping his arm around to include the parking lot, picnic area and unused roads whose bridges have caved in on the creek. "Now it's kind of a biological desert."

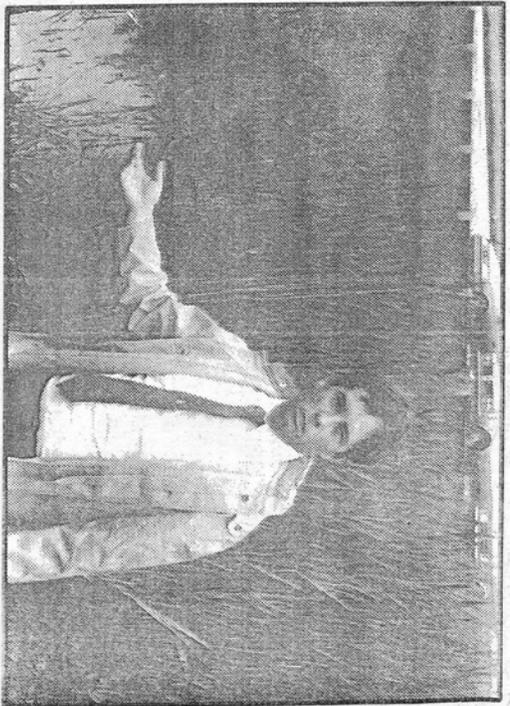
Members of the local shellfish commission joined marine scientists from the University of Connecticut and representatives of the state's health and agriculture agencies to get the "before" picture.

"The theory in the 50's was that all marsh land was in desperate need of fill," Visel quipped, displaying aerial photos in which the path of the former waterway is still apparent. "But public opinion has changed. I think there's general agreement on the need to restore blue crab and flounder habitat, as well as shellfish grounds."

That increased awareness is reflected in recent Environmental Protection Agency funding for a clean-up of Long Island Sound and the state's commitment of \$250,000 to re-establish a system of trenches all along the coast, Visel noted.

(Continued on Page 16)

"The theory in the 50's was that all marsh land was in desperate need of fill. But public opinion has changed. I think there's general agreement on the need to restore blue crab and flounder habitat, as well as shellfish grounds."



*POINTING OUT marsh degradation is Timothy C. Visel, Madison resident and a marine biologist with the Sea Grant Marine Advisory program.*



*HEALTHY marsh soil is buried under nearly a foot of sandy fill.*

## Salt marsh

(Continued from Page 1)

The effort began in Stonington in March and has come as far as Madison. Restoration of 15 coastal areas is planned, according to Paul Capotosto, chief of the Vector Section of the department of health, headquartered here at 51 Mill Rd. Capotosto and a four man team began work Wednesday at Hammonasset. Opening marsh waterways will simultaneously remove mosquito breeding grounds and restore a healthy balance to the marsh, he said.

"What we're seeing is marshes, tidal wetlands, supposedly, with no tidal exchange, no salinity," Capotosto said. "When the tide comes in, it only wets the top layer; nothing soaks down. And when it gets hot they smell."

**AS THE WALKERS** stopped to ponder stagnant sections of Dowd's creek filled with rusted shopping carts, cans and bottles, their expressions reflected the seriousness of the situation.

"Connecticut once had a tremendous inshore estuarine fishing industry," Visel reminded them. "In 1900 they harvested 15 million bushels of softshell clams — the country's biggest producers. That dropped to 6 million by 1910 and less than 40,000 by 1970."

Industrial and residential growth begun in the 1960's called for filling marshes, building roads, and draining marshes. High bacterial counts killed off fish in large numbers and lack of oxygen in choked-

off estuaries nearly finished the job, he said.

"This is a totally degraded area," Visel told the assembled experts. "It's just a mess. We've got to re-establish the marine food chain."

Capotosto and his crew will finish their work of opening the channel in four or five days, weather permitting. Visel will work with local volunteers and shellfish commissioners over the next year or so to complete the job.

**WHAT BEGAN WITH** a letter from him to the Army Corps of engineers in the summer of 1979 may be completed by the end of this summer. He is anticipating receipt of the \$1.5 million Sea Grant next July. Madison shellfish commissioner Richard Stoecker is proud that Madison was at the forefront of Visel's successful oyster restoration program along the Connecticut shore. Commission chairman Jack Weisbrock has assured Visel of that agency's support.

"This summer, we plan to start laying shell and seed to begin restoring the creek as a viable oyster ground," he said in an April letter to Visel.

As his oyster program progressed, Visel noted the reappearance of blue crabs and flounder in the same areas. He is optimistic about the future of the state park's marshes.

"Hopefully, when you come back, you'll see people blue-crabbing," he said.

# INSIDE CONNECTICUT

South Central/Shore Edition

PAGE  
**D3**  
FRIDAY  
JULY 10, 1987

## Cleanup of creek aimed at restoring 'Madisonian' oysters

By CARLA VAN KAMPEN  
Courant Correspondent

MADISON — Efforts to clear debris from Dowl's Creek, at the western section of Hammonasset Beach State Park, will help bring a variety of marine life back to the salt marsh, the chairman of the shellfish commission said Thursday.

Clearing the creek of material that has accumulated over the past 20 years began Wednesday and is expected to take at least two more

weeks, said John Wiesbrock chairman of the commission.

Wiesbrock said that over the years, the creek has been littered with road rubble resulting from parking of nearby parking lots, boulders from bridges over the channel that have begun to crumble and "weeds, bottles and tennis shoes."

When the creek is cleared, Wiesbrock said, summer marine-biology interns from Connecticut College will plant seed oysters and shells at the bottom of the creek, in hopes of

bringing back a delicacy item that thrived 100 years ago in the tidal waters of Madison.

The Dowl Channel Restoration Project is being handled by the Department of Environmental Protection's Office of State Parks and Recreation, the Department of Health Services' Mosquito and Vector Section and by the town's shellfish commission.

According to Timothy C. Visel, an extension marine agent with the University of Connecticut's Sea

Grant Marine Advisory Program, the clearing of the creek has been sought as an attempt to restore the town's oyster resources.

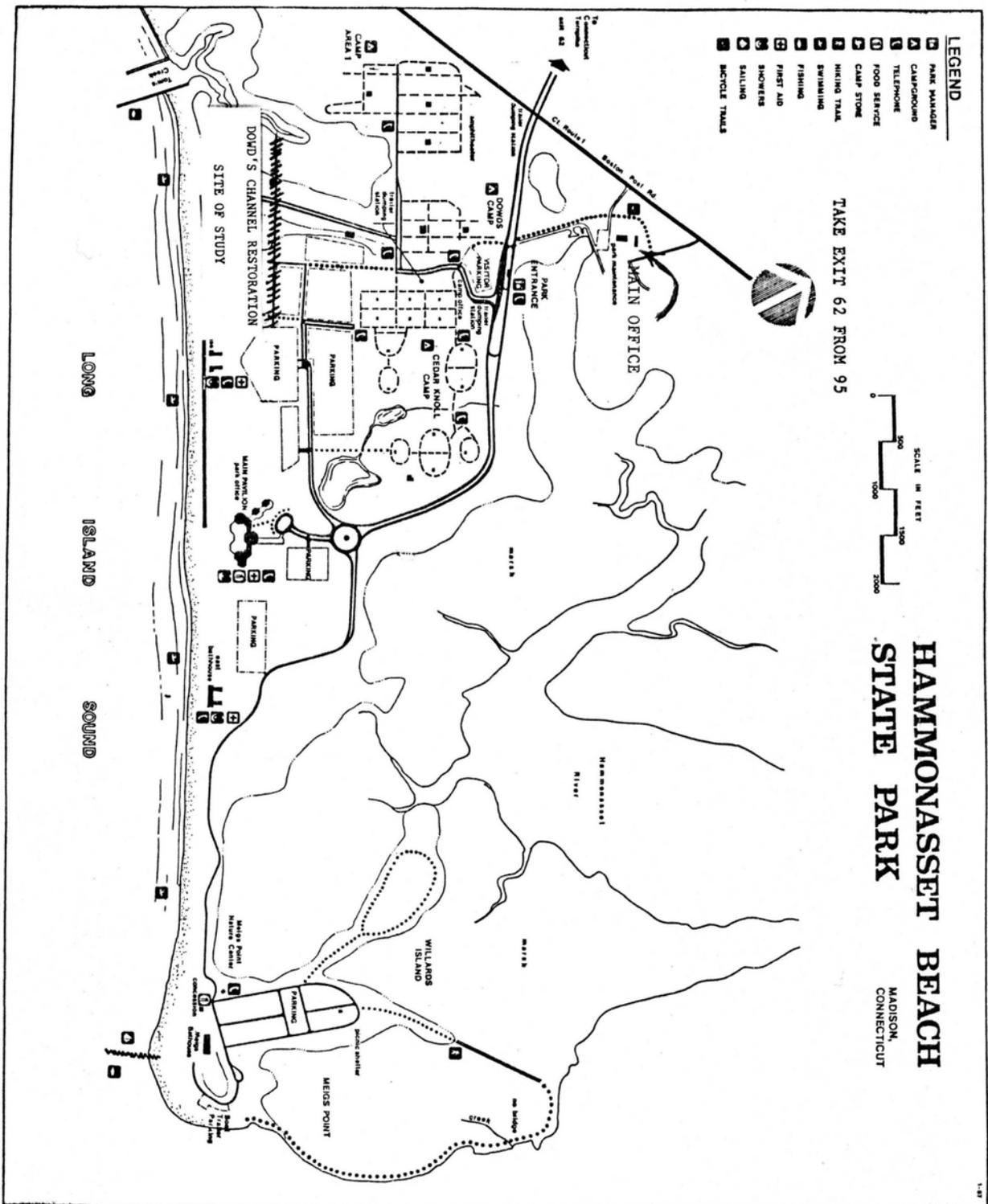
"They were supposed to be re-normed for their oyster," Visel said of the "Madisonians," a type of oyster that proliferated in the channel at the turn of the century.

Wiesbrock said the bridges that have collapsed over the channel have blocked salt water from passing freely and that fresh rain water has filled the creek, which Wies-

brock described as "just a vile-smelling ditch."

Because oysters are a saltwater or reproducing because the channel has been polluted, Wiesbrock said.

"We expect to see blue crabs, fiddler crabs, fish, flounder, to come in very quickly as soon as we see a high tide," Wiesbrock said. "Once we get this restored, we'll be able to fish in it and actually recover a creek that's been lost to shellfish," he said.





THE UNIVERSITY OF CONNECTICUT  
**COOPERATIVE EXTENSION SERVICE**  
SEA GRANT MARINE ADVISORY PROGRAM 

Avery Point Campus, Groton, CT 06340 Telephone: (203) 445-8664 or 446-1020 Ext. 234

Dear Tour Participant:

Thank you for attending the introductory slide presentation and walking tour of the Dowd Channel Restoration Project. This Project is a cooperative effort between the Department of Environmental Protection, Office of State Parks and Recreation, The Connecticut Department of Health Services, Vector Section, and the Town of Madison Shellfish Commission. The University of Connecticut Department of Renewable Natural Resources has applied for National Sea Grant funds to document habitat restoration efforts. The Sea Grant Marine Advisory Program is coordinating and organizing educational services and informational workshops and plans to work closely with Madison Community Television.

Background

Prior to 1950, a small tidal creek formerly known as Dowd's Creek (E. Miller, personal communication, 1972) drained an area of salt marsh in the west section of Dowd's Hollow. A 1934 photograph (courtesy of Daniel Civco, Laboratory of Remote Sensing, University of Connecticut, Storrs) shows Dowd's Creek draining a large salt pond and adjacent salt marshes. After 1950, Dowd's Creek, with the salt pond and marsh, were filled for parking facilities. A tidal mosquito ditch north of the original creek was widened and six bridges allowed access across the new channel. Only two sections of the original Dowd's Creek exist today.

History of Project

In 1979, in a letter to the Army Corps of Engineers, the restoration of Dowd's Channel and creation of a salt pond as flounder habitat was suggested. At that time habitat considerations dealt mostly with mitigation reacting only to development initiatives and, therefore, weren't favorably received. In October of 1986, a letter to Mr. Paul Capotosto, Chief of the State of Connecticut Department of Health Services, Vector Section, outlined this 1979 proposal. On May 13, 1987, Chief Capotosto agreed to clean the marine habitat tidal ditch in 1987. On April 28, 1987, Jack Wiesbrock, Chairman of the Madison Shellfish Commission, requested that this work be done in order to restore the oyster resources there which were historically productive. On May 23, 1987, Richard K. Clifford, Director of Department of Environmental Protection Office of State Parks and Recreation, expressed his support of a Sea Grant study to be done in regards to this habitat restoration project. On May 18, 1987, a proposal titled "Response of Macro-Organisms to Restoration of Degraded Tidal Salt Marsh Habitats" was submitted to the University of Connecticut Sea Grant Office by Dr. John Barclay of the University of Connecticut Department of Renewable Natural Resources.

Present Conditions

Today, the Dowd's Creek tidal channel is filled with road debris, gravel and organic matter. Several of the bridges across the tidal channel

have fallen into the water course blocking tidal exchange. This restricted tidal switch lowers dissolved oxygen levels in sea water and degrades the habitat required by estuarine-dependent species of fish and shellfish.

Connecticut's commercial landings of blackback flounders, oysters and soft-shell clams have declined 92, 96 and 100 percent respectively. Along New England's coastlines, hundreds of coves, salt marshes, salt ponds and tidal creeks have been environmentally degraded. Dowd's Creek channel is one of those degraded marine habitats.

#### Sea Grant Study

The Sea Grant study proposes that two graduate students document the effects of this maintenance (cleaning) project. The goal of this restoration effort with the Town of Madison is to enhance habitat to sustain an oyster population while increasing marine diversity for other species. It is hoped that coastal wild life, especially shore birds, blue crabs and flounders will survive in this restored tidal habitat. It is also anticipated that recreational shellfishing, finfishing and blue crabbing will increase and that Connecticut residents and out of state visitors to the park will be able to take advantage of these new opportunities.

To date, letters of support for this project have been received from: John H. Volk, Division Chief, Department of Agriculture, Aquaculture Division; Malcolm Shute, Principal Environmental Sanitarian, Shellfish Unit Preventable Diseases Division, Department of Health Services; Paul M. Capotosto, Chief, Connecticut Department of Health Services, Vector Section; Eric M. Smith, Assistant Director, Department of Environmental Protection, Bureau of Fisheries; Richard K. Clifford, Director, Department of Environmental Protection; Office of State Parks & Recreation, Christopher Percy, President, The Sounds Conservancy, Inc.; and Jack Wiesbrock, Chairman, Madison Shellfish Commission.

## **Section 6**

### **Dowd's Creek Study Plots**

#### **Hammonasset Beach State Park, Madison, CT**

**June 1987- Dr John Barclay**

**Associate Professor and Wildlife Specialist**

**University of Connecticut**

#### **Results of Analysis of Substrate Soil at the Station # 1,**

**Dowd's Creek, Madison, CT**

**July 9, 1987**

#### **Dowd's Creek Data Falling Tide July 08, 1987**

**Dr John Barclay**

**Associate Professor and Wildlife Specialist**

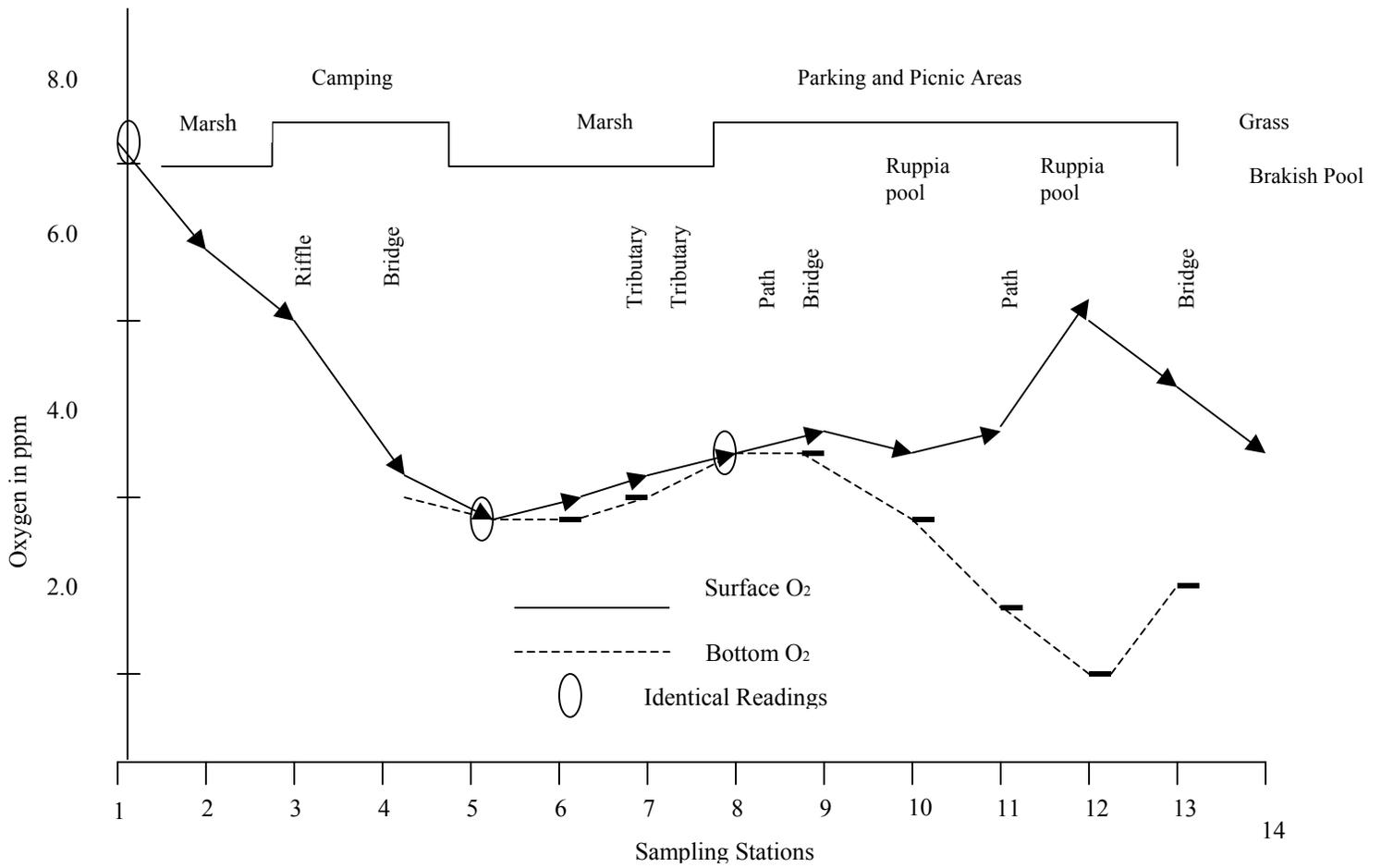
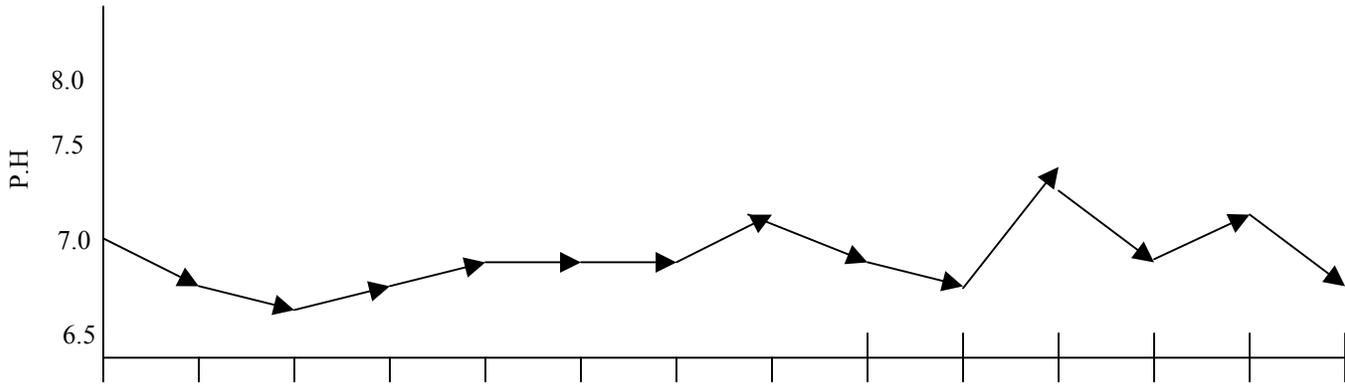
**University of Connecticut**

**July 10, 1987**

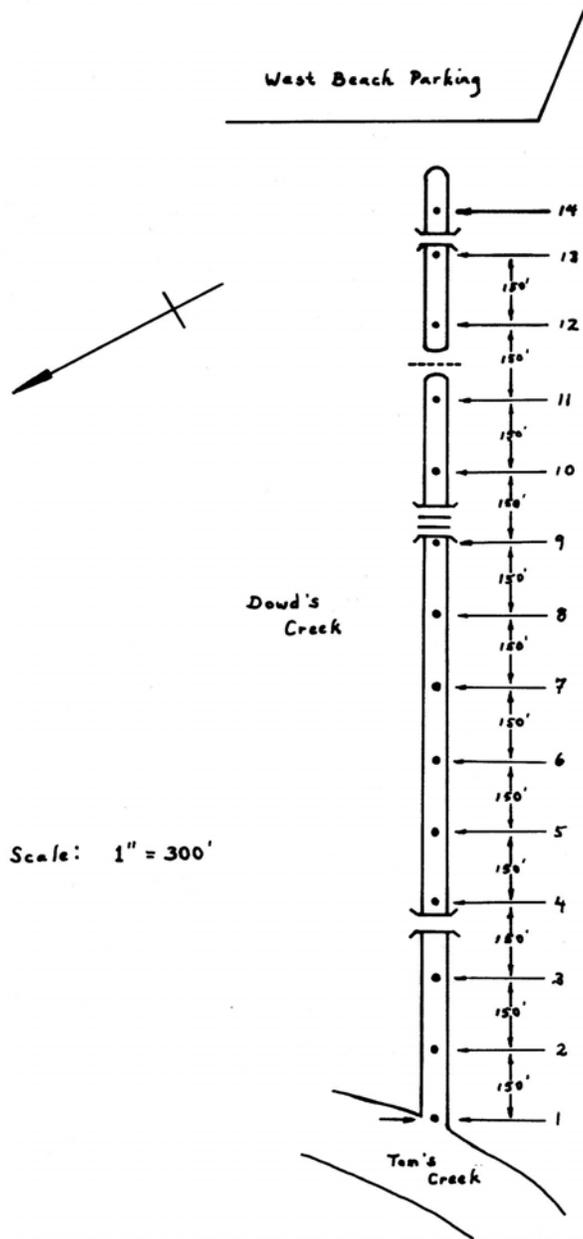
# Dowd's Creek Falling Tide, July 08, 1987 (Raw Data)

John Barclay - 10 July 1987  
Uconn Dept of Renewable Natural

TIME 1:50 1:25 1:15 12:40 11:55 11:40 11:30 10:55 10:45 10:30 10:15 10:00 9:45 9:30



Dowd's Creek Study Plots  
Hammonasset Beach State Park, Madison, CT  
June 1987



## Results of Analysis of Substitute Soil

“Black Mayonnaise”

Station No 11, Dowd’s Creek, Madison, CT

J.S. Barclay

Collection Date:

Report Date: 9 July 1987

Textured Class:

Silt Loan (“Close to Loan”)

2 stones & 1 Tablespoon other material > 2mm

Percent Composition:  
(% dry wt, < 2mm)

Sand	32.6 %
Silt	51.0
Clay	16.4
Organic	8.1

P.H.

Wet  
7.24

Dry  
6.6

Conductivity

900  
(9 millimeters/centimeters  
.01 normal solution kcb = 140)

> 1000 (off the scale)

Calcium  
Potassium  
Magnesium  
Phosphorus

> 4000  
> 600  
> 500  
42

Iron  
Copper  
Zinc  
Mang.

>40.0 p.p.m.  
11.4  
>10.0  
1.6

Soil Test Laboratory, Plant Science Department, University of Connecticut, Storrs. X 4274

## **Section 7**

### **Listing of Mammals and Shore and Inland Birds Prior to Re-channeling**

**Dowd's Creek Study June 18, 1987**

**Dr John Barclay**

**Associate Professor and Wildlife Specialist**

**University of Connecticut**

- **June 23, 1987**
- **July 08, 1987**

LISTING OF MAMMALS AND SHORE AND INLAND BIRDS

PRIOR TO RE-CHANNELIZATION

Dowd's Creek Study

Hammonasset Beach State Park, Madison, CT

18 June 1987

Within Dowd's Creek Channel:

Red-winged blackbird (Agelaius phoeniceus)  
Song sparrow (Melospiza melodia)  
Green heron (Butorides striatus)

Periphery (Dowd's Creek and West Beach salt marsh):

Snowy egret (Egretta thula)  
Green herons  
Herring gulls (Larus argentatus)  
Mallards (Anas platyrhynchos)  
American crows (Corvus brachyrhynchos)  
Northern mockingbirds (Mimus polyglottos)  
House finches (Carpodacus mexicanus)  
Song sparrows  
Sharp-tailed sparrows ? (Ammodramus caudacuta)  
Tree swallows (Iridoprocne bicolor)  
Barn swallows (Hirundo rustica)  
Common yellowthroat (Geothlypis trichas)  
Red-winged blackbirds  
Common grackles (Quiscalus quiscula)  
Rock doves (Columba livia)

Flying Overhead (not landing within Dowd's Creek periphery):

Little blue herons (Florida caerules) - 2 adults  
Double-crested cormorants (Phalacrocorax auritus)

23 June 1987

Within Dowd's Creek Channel:

Song sparrows  
Red-winged blackbirds

Woodchuck (Marmota monax) - burrows, probably one year old  
Meadow vole (Microtus pennsylvanicus) - runs  
unidentified scat - Raccoon (Procyon lotor) or River otter  
(Lutra canadensis)

Periphery (Dowd's Creek and West Beach salt marsh):

Snowy egret  
Herring gulls  
Ring-billed gulls (Larus delawarensis)  
Greater black-backed gulls (Larus marinus)  
Mallards  
American crows  
Northern mockingbirds  
Brown thrasher (Toxostoma rufum) - Meigs Point  
Yellow-shafted flickers (Colaptes auratus) - on e. red cedar  
House finches  
Song sparrows  
Tree swallows  
Barn swallows  
Yellow warbler (Dendroica petechia) - Meigs Point  
Red-winged blackbirds  
Common grackles  
European starlings (Sturnus vulgaris)

Flying Overhead (not landing within Dowd's Creek periphery):

Common tern (Sterna hirundo)  
Greater yellowlegs (Tringa melanoleuca)  
Willet (Catoptrophorus semipalmatus)  
Double-crested cormorants  
Black duck (Anas rubripes)

8 July 1987

Within Dowd's Creek Channel:

Red-winged blackbird  
Song sparrow  
Sharp-tailed sparrow ?  
Green heron

Woodchuck - burrows, probably one year old  
Muskrat (Ondatra zibethica) - runs, cuttings, dens  
slide and crab remains of unidentified mammal - Mink  
(Mustela vison) or River otter  
Meadow vole - runs, cuttings, winter "nest"  
unidentified mammal swimming across control channel -  
Meadow vole or Southern bog lemming (Synaptomys cooperi)

Periphery (Dowd's Creek and West Beach salt marsh)

Green herons  
Herring gulls  
Ring-billed gulls - most numerous gull present  
Greater black-backed gulls  
Common terns  
Little (Least) tern (Sterna albifrons)  
Mallards  
Purple sandpiper ? (Calidris maritima) - on rock approx.  
300 feet offshore from Tom's Creek mouth  
American crow  
Northern mockingbirds  
Eastern kingbird (Tyrannus tyrannus)  
Song sparrows  
Tree swallows  
Barn swallows  
Chimney swifts (Chaetura pelagica)  
Common yellowthroat  
Red-winged blackbirds  
Common grackles  
European starlings  
Rock doves  
Mourning doves (Zenaida macroura)

Flying Overhead (not landing within Dowd's Creek periphery)

Greater Yellowlegs  
Red Knots ? (Calidris canutus) - three  
Glossy ibises (Plegadis falcinellus) - eight in vee formation  
Double-crested cormorants

## **Section 8**

### **Madison Land Trust/ Madison Shellfish Commission Study**

#### **Establishing a Habitat Index for Shellfish and Finfish Species**

**Work Plan and Monitoring Outline  
Tim Visel**

## **Dowd's Creek Restoration Work Plan for Determining Bio Diversity for Four Habitat Associations**

It is recognized that such research should have a multi-season/yearly duration, perhaps 5 years. This would require volunteers from the Madison Land Trust and the Madison Shellfish Commission.

A small salt pond, more resembling a bulb at the end of a long thermometer would be created at Station #1. This activity would consist of removing fill from the 1930's that reduced the area of tidal salt/brackish environments. Earlier studies have indicated and conversations with Dr. Bill Niering of Connecticut College suggested a "plug" or sill to keep the salt "pond" from drying out. Not that would be a diminished habitat, but for the species we were hoping to study, some water was required and sufficient oxygen was needed to support estuarine fishes. Some pre-channelization studies conducted by Dr. John Barclay have indicated this possibility – See Appendix – Site studies, July, 1987. Retaining water was selected to help control mosquito populations.

### **Select and Describe Micro Habitat Types:**

For Fish - A hand-hauled beach or common minnow seine, a circular – minnow steel trap, various size dip nets, a metal eel trap and lines to set traps, etc.

For Shellfish/worms – A clam hoe, a tree shovel (narrow blade) a clam rake – basket type.

For Crabs – A standard style green crab trap, a star style blue crab trap – both require bait and lines for setting.

For collection purposes Sea Grant Marine Advisory Program can loan out a fyke net – small mesh to sample pelagic species. It is set against the current ebb with a collection end bag; captured organisms will remain alive – but the net should not be allowed to "dry out." It is best to sample after 60 minutes. Again, the fyke net should be listed on a DEP research collectors permit.

All of the above equipment can be purchased from George W. Wilcox, Marine Supply Inc, Stonington, CT.

## **Section 9**

### **Questions/Responses for the Micro Habitat types – Walking Tour and Meeting June 17, 1987**

**Hammonasset State Park Office.**

## **Questions/Responses for the Micro Habitat types – Walking Tour and Meeting June 17, 1987**

### **Hammonasset State Park Office.**

Q: Will tidal action influence habitat associations?

R: Survey high tide/low tide so that a comparison can be made.

R: A 1974 Yale study of Tom's Creek showed that bottom dwellers at low tide go into a 2 to 4 hour semi-hibernative state. At tide change, O<sub>2</sub> levels improved and activity increase. It is quite noticeable.

R: Organisms can move with the tides – observations will include tidal (action) levels flow.

Q: Will created habitat types be sufficient as natural ones?

R: No, but the process has the opportunity to begin to define or index habitats and organism preferences – What type of habitats they prefer; color, for example, may influence predation, or predator/prey relationships. Vegetation can trap sediments (silt) and increase water temperatures. Shells may influence pH and provide a buffer for some organisms. Studies such as this can start to define habitat association parameters.

Q: Manmade habitats only draw organisms away from nearby natural habitats.

R: This is true, but for grown mobile organisms; larval forms and benthic organisms colonize the bottom starting one if not multiple food pathways - barnacles on rock surfaces, oyster set on shells, etc.

R: Such would include benthic organisms, such as soft shell clams (*Mya*) and marine worms.

R: All four habitats will be created or mapped in the creek; will migration occur from one habitat type to another.

R: This is expected and a buffer zone of 100 feet (approx.) will be established between each habitat type, but migration is certain to happen.

R: Tidal creeks have a large number of organisms that feed upon small crabs and shellfish, for example, small striped bass, 6 to 8 inches have been caught in Tom's Creek eating sand shrimp and silversides, but enter at high tide and leave by low tide. Eels also enter the creek to feed (eel traps would be used to measure/capture them).

R: Back Black flounder have been found among oyster shells in Tom's Creek, so researchers might find a habitat association or preference.

Q: After the fill has been removed from Dowd's Creek, how quickly will the habitats be utilized?

R: Almost immediately; a small experiment in a tidal mosquito ditch showed rapid re-colonization by a great number of species (Tom's Creek east).

R: Benthic organisms will hopefully begin as soon as the bottom is stabilized; barnacles, mussels may set during spawning season, etc. Oysters may set on shells if clean and below tide line.

Q: What is the role of volunteers?

R: Part of the study/proposal will be to produce an outline of activities that volunteers can use.

R: Some will be invited to observe during the first two years. After the Sea Grant research is finalized, then we would look to organic long-term volunteer monitoring efforts.

Q: Will volunteers obtain funding or be paid?

R: No, it is expected that volunteers would obtain training, but not be paid. Groups are interested in volunteering to do restoration improvement projects like Trout Unlimited, who have decades of

experience. The Fish & Wildlife Duck Stamp program is very similar, working with hunters to improve/concerns duck breeding habitats.

Q: What will be the results?

R: Well, we're not certain, that will depend upon the data, but results from similar studies indicate that shellfish populations form an important part of the ecosystem. We may see important habitat assemblages or associations between structure oyster shells or cobblestones for example, that would be an important result or finding.

R: Certain species may associate with vegetation or cover (shade). What we are trying to do is to create, if possible, charts that show tendencies or statistical information on habitat preference, for example, information indications that juvenile flounder have a habitat affinity for shells, clam shells or oyster shells. If we find that 95% of the flounder surveyed were in or near shells, that could provide information early life cycle habitat preferences.

Q: Distribution of findings/results?

R: We plan to write up the results of the study, positive or negative, for use in Sea Grant and extension programs. One of the goals is to detail the project and make the information available to the public in a useable format.

R: Graduate students have provisions in the grant; the research grant support will cover the cost of publications, etc.

Q: Who is providing the grant cost?

R: A proposal has been submitted to the Connecticut Sea Grant for possible funding. The title of the grant request is: **Response of Macro Organisms to Restoration of Degraded Tidal Salt Marsh Habitats.**

## **Section 10**

### **Permits and Regulatory Procedures**

**Paul M. Capotosto**

- **May 13, 1987 – Correspondence Paul M. Capotosto Chief State of CT, Dept of Health Services**
- **Hammonasset Park – Madison Site # 1**
- **May 13, 1987 – Correspondence Richard K. Clifford Director Office of State Parks and Recreation**
- **Written Submissions for DEP Water Quality Certificate – Work Site Descriptions #228**



STATE OF CONNECTICUT  
DEPARTMENT OF HEALTH SERVICES

May 13, 1987

Mr. Tim Visel  
Marine Advisory Service  
Univ. of Conn./Bldg. 24  
Avery Point  
Groton, Ct. 06340

Dear Tim:

After reviewing Dowd's Creek I am pleased to say that the work we discussed will be accomplished with the cooperation of the DEP crew from Hammonasset Park. The Mosquito and Vector Section will be cleaning the marine habitat-tidal ditch, formally Dowd's Creek, this month.

The Mosquito and Vector Section supports your efforts to obtain Sea Grant funds to study the changes of fin-fish, shellfish and other wildlife in this restored area.

I look forward to working with you in the future and if you have any questions, please call me at 245-2198.

Sincerely,

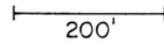
*Paul M. Capotosto*  
Paul M. Capotosto, Chief  
State of Connecticut  
Dept. of Health Services  
Mosquito and Vector Section  
P.O. Box 708  
Madison, Ct. 06443

PMC:fg

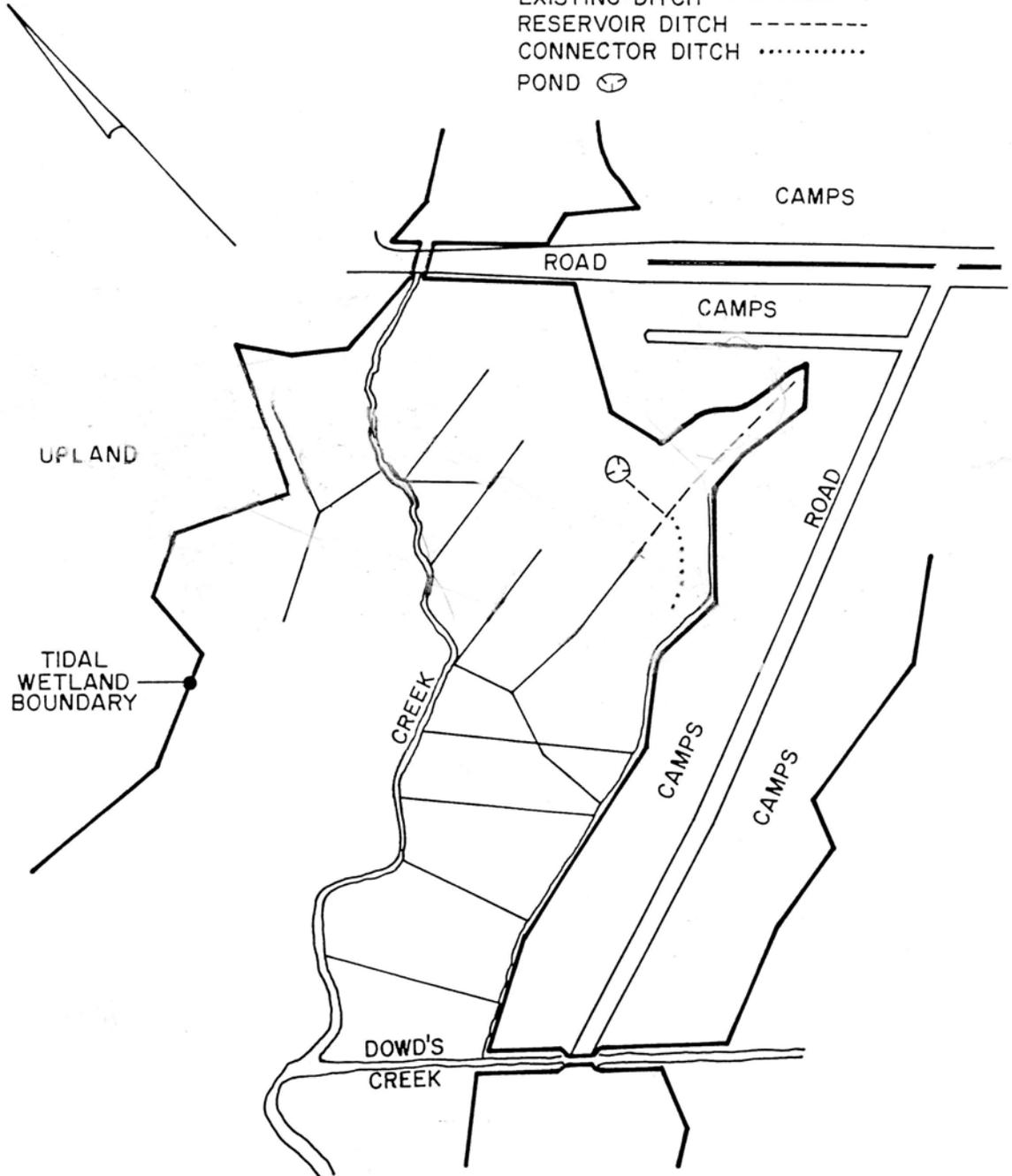
Phone:  
150 Washington Street — Hartford, Connecticut 06106  
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HAMMONASSET PARK, MADISON (SITE #1)

TWM 40-1-1



- EXISTING DITCH —————
- RESERVOIR DITCH - - - - -
- CONNECTOR DITCH ······
- POND (P)





STATE OF CONNECTICUT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



May 13, 1987

RE: FUNDING - EVALUATION OF MARINE HABITAT RESTORATION PROJECTS -

Mr. Timothy C. Visel  
Regional Marine Extension Specialist  
The University of Connecticut  
Sea Grant Marine Advisory Program  
Avery Point Campus  
Groton, Connecticut 06340

Dear Mr. Visel:

I understand that you are currently in the process of applying for Sea Grant funding for the evaluation of marine habitat restoration projects. We are keenly interested in the viability of the marine habitat in all of our coastal state park sites and are receptive to having the Cooperative Extension Service conduct studies at Hammonasset Beach State Park in Madison.

You have our support in your effort. If you are successful in this endeavor, please contact this office for future arrangements.

Sincerely yours,

Richard K. Clifford,  
Director  
Office of State Parks & Recreation

/rcf  
cc: File

Phone: 566-2304  
165 Capitol Avenue • Hartford, Connecticut 06106  
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## CHAPTER 7

### HAMMONASSETT PARK MARSHES, MADISON FY 87-88

**WORK SITE:** Two sites are located in the Park: 1. The marsh is located in the Dowd's Creek system near Beach Road in the campgrounds. 2. The marsh is located on the second dirt road on the left heading out to Meig's Point. Both of these areas are not in the State Natural Area Preserve. The marsh is about 500 acres and have over 200,000 feet of ditches.

**FRESHWATER INTO THE SITE:** The only freshwater into the site would be from road drainage.

**TIDE RANGE:** Tide range is about 4 to 5 ft.

**TYPE OF WORK:** In Dowd's Creek site 1, A pond was constructed with a reservoir system and one connector ditch near the upland edge near Beach Road and the campground. In site 2, a pond with a reservoir ditch was put into a small .75 acre marsh surrounded by a 4 foot berm.

**DITCHING PHASE:** In site 1, the pond was dug by the Clamshell tractor and all spoils from this area was put on the adjacent upland. The Rotary ditcher was then used to complete the reservoir and connector system. In site 2, the Clamshell was used to dig the pond and the reservoir ditch because of the lack of space to move the Rotary ditcher around. All spoils in this area were placed on the 4 foot high berm.

**DISTINCT INFORMATION:** Site 1 area was the back end of old ditches that have filled in. The new reservoir and connector system was put into the old ditch network. The spoil was all peat material. Site 2 used to be a dumping area for the Park's sewerage. The peat of the salt marsh was only 6 to 8 inches, under this layer was sand and gravel.

#### OMWM SITE SURVEY SUMMARY:

**Ownership:**

Public, unspecified use. code 20.

**Land-use (major land-use along upland edge):**

Conservation. code 6.

**Marsh Type:**

Ditched but poorly drained. code 2.

Site 2. Restricted by dirt road.\* code R.

WRITTEN SUBMISSIONS FOR DEP WATER QUALITY  
CERTIFICATE

Hammonasset Park, Madison  
FY 1987-88

- B1. The location of the proposed work site. See attached map.
- B2. The parcel and ecological unit numbers:  
Tidal Wetlands Map #40-1-1  
Parcel #101  
Tidal Wetlands Map #40-1-3  
Parcel #301C
- B3. Sedimentation and erosion control plans:  
a. Most marshes are being ditched with the rotary ditcher and spoils will be thwon out as far as 30' and will be leveled as much as possible on the marsh surface. The leveled depth will be no higher than 3".  
b. Clamshell tractor spoils will be placed into ditches or depressions on breeding area or removed from site to disposal area.
- B4. Work Schedule:  
a. Site 1 three days 11/4-11/9  
Site 2 one day 5/6
- B5. Location of rare or endangered species:  
State Natural Area #356, Hammonasset salt marshes, is part of the Hammonasset Natural Area Preserve and the proposed management recommendations for this preserve should be observed. In addition, this marsh is an important breeding area for shorebirds which should not be disturbed from April to September.
- B6. Location of disposal sites for excavated material:  
All excavated material will be used on the marsh surface or in ditches. Any material to be hauled off the site will be placed in approved DEP areas.
- B7. Equipment to be used:  
1. Quality rotary ditcher with 26" bit.  
2. Oliver clamshell tractor.  
3. Hand equipment.

OMWM SITE SURVEY SUMMARY:

Vegetation Type (species that are most aommon):  
Sp. patens, Sp. alterniflora - short and long  
form. code 7.

Ground Conditions:  
Site 1. Soft. code 2.  
Site 2. Firm. code 1.

Habitat:  
Semi-permanent ponds. code 2.  
Cover up to 30% of the site. code C.

Freshwater Marshes:  
No freshwater marshes along the edge. code 0.

Upland Type:  
Coastal valley. code 3.  
Man-made causeways. code 4.

Appendix A is an index of codes for OMWM Site Survey  
Summary.

VEGETATION SURVEY: A map of the dominant plants on the  
marsh is provided in this chapter. Appendix B contains the  
mapping codes. Most of the spoils were completely removed from  
both sites. The only changes seen this year is that the short  
form of Sp. alterniflora increase in height. No invasive  
terrestrial or freshwater marsh species have taken hold.

## **Section 11**

### **Overflight Photos Dowd's Creek**

Daniel Civco  
University of Connecticut Lab  
For Remote Sensing

1934 – Saltmarsh Watershed  
Dawd's Creek

1951 - Filled Creek  
Channel to Tom's Creek

1985 - New Parking Lot  
Filled Creek + Salt Marsh

**DANIEL L. CIVCO**

LABORATORY FOR REMOTE SENSING  
U-87, RENEWABLE NATURAL RESOURCES  
UNIVERSITY OF CONNECTICUT  
STORRS, CT 06268

OFFICER, AMERICAN SOCIETY OF PHOTOGRAMMETRY

Hammonasset State Park - West 1934



CNG-2H



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OFFICER, AMERICAN SOCIETY OF PHOTOGRAMMETRY

Hammonasset State Park - West 1951

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Hammonasset State Park - West 1985



