

William Floyd Estate Tidal Wetland Restoration Project

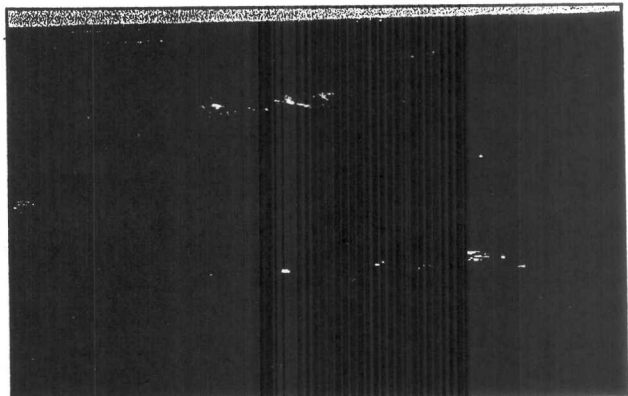
PROJECT GOAL: To restore the quality of tidal wetland habitat at the William Floyd Estate, located in the town of Brookhaven, for waterfowl, wading birds, shorebirds and other wildlife, along with naturally controlling mosquito populations.

PROJECT OBJECTIVE: As a result of the negative impacts from past grid-ditching in tidal wetlands, the objective is to enhance the habitat quality of 150+ acres of saltmarsh by restoring the natural hydrology of the wetland.

LANDOWNER: National Park Service.

PARTNERS: Ducks Unlimited, Inc., U.S. Fish & Wildlife Service (Long Island National Wildlife Refuge Complex), New York State - Department of Environmental Conservation, Suffolk County Vector Control and the National Park Service.

BACKGROUND: This project entails restoring the natural drainage to tidal wetlands. The majority of Long Island's tidal marshes were grid-ditched in the 1930's to control mosquitoes. The purpose of the ditching was to drain tidal wetlands and prevent water from accumulating on the marsh surface which could act as mosquito breeding habitat. The drainage ditches are only partially successful in reducing mosquito numbers, and in fact, many negative impacts have resulted, including lowering the marsh's water table, eliminating panne habitats and creating conditions suitable for the spread of invasive plant species like Phragmites. The elimination of panne habitats and spread of Phragmites in the saltmarsh reduces the habitat suitability of the marsh for use by waterfowl, wading birds and shorebirds. Pilot wetland restoration projects on Long Island have demonstrated that restored marshes receive greater use by waterfowl, wading birds, and shorebirds than ditched marshes and naturally control mosquito populations through fish predation. The tidal wetlands of Long Island provide critical habitat for black ducks and many other waterfowl species. Long Island is strategically located in the center of the black duck's main wintering range. Long Island's coastal location also makes its wetlands a key migration corridor for shorebirds. This project will restore the habitat quality of these tidal wetlands for waterfowl, wading birds and shorebirds, while helping to naturally control mosquito populations.

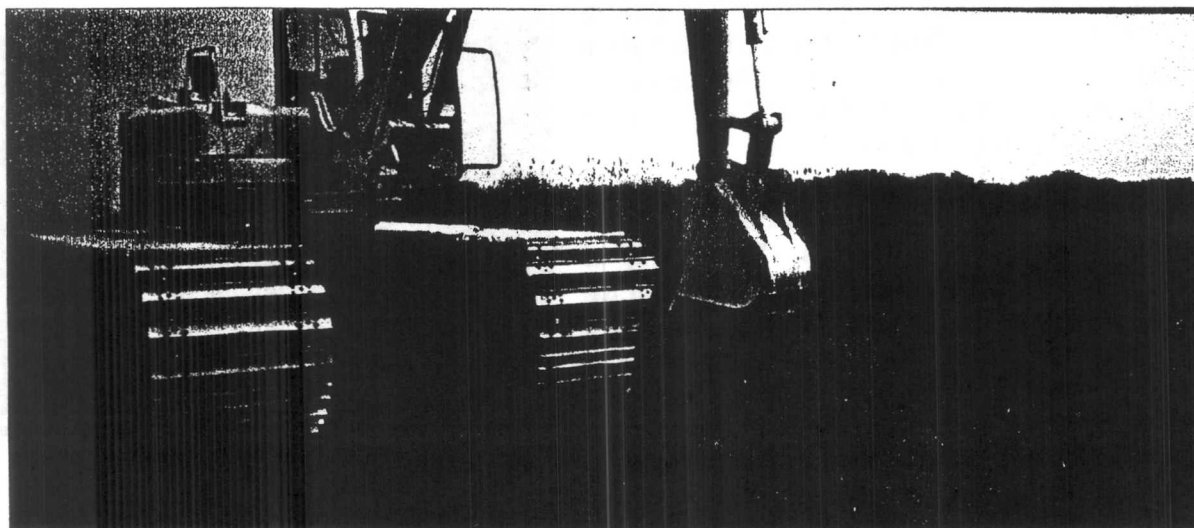


Man made drainage ditches are evident in most of Long Island's tidal wetlands thus reducing the habitat quality of the marsh to wildlife.

ACTION: This project involves working within the existing ditch system. Major activities include cleaning out the main existing ditches that provide tidal flow, plugging drainage ditches, creating fish reservoirs or sump areas and creating small spur ditches from plugged ditches to pannes to provide passageways for the saltmarsh fish community.

Cleaning Main Ditches: The existing main ditches of the wetland will be cleared of debris and silt to allow tidal inundation and fish passage onto the saltmarsh. Any natural saltmarsh creeks on the site will not be cleaned, plugged or disturbed. A low ground pressure rotary ditcher will be used to clean these existing ditches. Ditches will be cleaned to no more than their original depth. The purpose of cleaning and maintaining a subset of the existing ditch system is to ensure proper tidal inundation, and in some instances, allow fresh water input from upland areas to drain off the marsh surface.

Plugging Ditches: All drainage ditches, except those providing main tidal flow, will be plugged. Ditches drain marshes and lower their water table. The purpose of plugging these ditches is to negate the impacts of drainage. Ditch plugs consist of sections of 3/4" marine-grade plywood that are pressed vertically into the ditch. Spoil from the ditch bottom is then used to back-fill behind the plywood for stability. Plugs are built slightly above the marsh surface elevation and extend onto the edges of the marsh surface to account for settling and erosion. The size of the plug will vary depending on site specific variables including length and width of the ditch, tidal amplitude, water volume and erosion factors; a more extreme hydrologic regime will require a larger plug. Also, cordgrass or salt hay will be planted on top of ditch plugs to improve plug stability within the first growing season. Redundant or baffle plugs will also be used on longer ditches to avoid failures associated with a single plug. Ditch plugs will be installed by low ground pressure excavators and hand crews. Special low ground pressure equipment ensures minimal impact to marsh vegetation. Saltmarsh grasses recover quickly within the next growing season.



Installation of ditch plugs is accomplished with the use of the Initiative's low ground pressure, amphibious excavator.

Creating Fish Reservoirs: Portions of plugged ditches, between 50 to 200 feet, will also be cleaned. These cleaned segments of blocked ditches will serve as deep water habitats or "sumps" for fish survival during dry periods. The purpose of these fish reservoirs is to assist in controlling mosquito larvae.

Spur Ditches: Frequently, after plugging drainage ditches, shallow pannes will reform on the saltmarsh surface. To ensure that these pannes do not function as prominent breeding areas for mosquitoes, spur ditches (shallow, short ditches) will be used to connect the shallow pannes with the deeper fish reservoirs (plugged existing ditches) where appropriate.

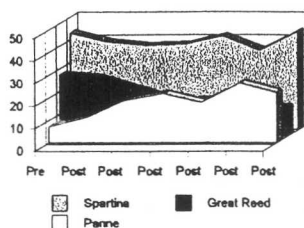


Restored saltmarsh with plugged drainage ditches. Note the panne habitats that have formed on the marsh surface allowing greater use by waterfowl, shorebirds and wading birds.

Natural Resource Responses to Open Marsh Water Management

Open Marsh Water Management or OMWM is a term which refers to the management technique of restoring the hydrology of grid-ditched saltmarshes. The ditching was originally established to help control the breeding activities of the saltmarsh mosquito - the technique was partially successful for controlling mosquitoes. Grid-ditching, however, did impact other functions of the saltmarsh particularly in regards to habitats and wildlife use. OMWM is a technique which has evolved to restore the habitat value of grid-ditched saltmarshes while still providing mosquito control through natural means. OMWM was conducted at the saltmarsh on the Seatuck National Wildlife Refuge, here on Long Island, several years ago. The site has been monitored annually to gauge the impacts of OMWM on the natural resources. The following figures provide some general trends on the impacts of OMWM management on a saltmarsh.

COVER TYPES

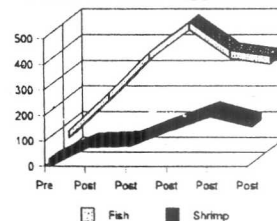


* **HABITAT.** OMWM resulted in little change in the occurrence of the saltmarsh *Spartina* grasses but did restore panne (or open water) habitats on the marsh and decreased the amount of great reed (*Phragmites communis*) habitats (a nuisance wetland species).

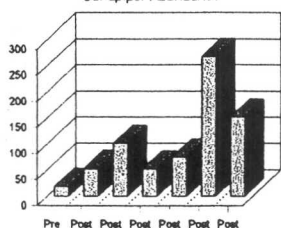
sheepshead minnow and banded killifish - species which consume mosquito larvae. Grass shrimp use of the marsh also increased after OMWM was conducted.

* **FISH COMMUNITY.** The saltmarsh fish community increased significantly in the years after OMWM was conducted. Species which exhibited the largest increases were

FISH & SHRIMP RESPONSE



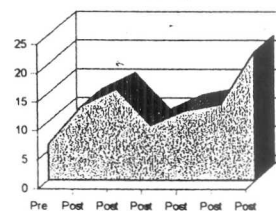
Sandpiper Abundance



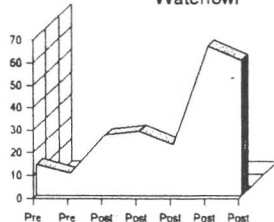
* **SHOREBIRD ABUNDANCE.** Shorebirds are conspicuous species of the saltmarshes of Long Island. Shorebird numbers increased in the marsh after OMWM was completed by a factor of 4 to 5. The restoration of panne habitats was responsible for the greater use by shorebirds.

* **WADING BIRDS.** Herons and egrets are common components of the saltmarsh bird community. After OMWM was completed wading bird use of the marsh doubled.

Wading Birds



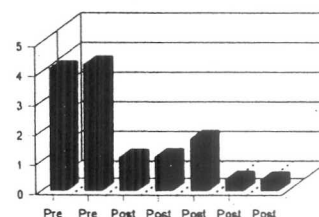
Waterfowl



* **WATERFOWL.** Waterfowl in particular black ducks increased on the marsh by a factor of 2 to 3 after the OMWM project was completed.

* **MOSQUITOES.** Mosquito larvae numbers declined after OMWM was conducted on the saltmarsh although larvae were still present they were less common. Complaints from the local community regarding mosquitoes dropped significantly after the project was completed.

Mosquito Larvae



COMMON QUESTIONS CONCERNING THIS PROJECT AND SIMILAR PROJECTS

What is the purpose of the project? *The purpose of the project is to restore the hydrology of a 100 acre marsh and restore the habitat value of the wetland to wildlife. It will also enhance wildlife observation opportunities for the public. This tidal wetland, like many others on Long Island, was grid-ditched in the past which resulted in a lowered marsh water table which lowered the salinity of the wetland, decreased the amount of panne (open water areas) habitats, and increased the amount of great reed habitats (*Phragmites communis*). Wetlands lacking panne habitats and/or with a large great reed component receive less wildlife use than other wetlands.*

What does the project entail? *The project entails plugging the majority of the man-made ditches in the tidal wetland. Plugging consists of using a piece of marine plywood (approximately 4' by 4') pushed into the ditch to start the plug and then backfilling behind the plywood with debris from the existing ditch to form the plug. An excavator will be used to plug the ditches. The project also entails cleaning out organic debris in the existing ditches so they can function as fish reservoirs. A rotary ditcher will be used to clean the ditches.*

When will this project occur and how long will it take? *The project, once all the necessary permits and approvals are received, will occur in the winter (October through March). Work is done in the winter after nesting birds are off the marsh. The project will take approximately one month to complete.*

What and when will the results of the project occur? *The project will result in increased wildlife use of the marsh particularly by waterfowl (puddle ducks), wading birds and shorebirds because of the increase in panne habitats and decrease in reed habitats. Changes in the tidal wetland due to the project will occur gradually (over years).*

Will the use of equipment damage the marsh? *Heavy equipment will be used on the marsh to clean ditches and to plug ditches. Equipment is used in the marsh only during the dormant season not during the growing season to minimize impacts. Both low ground pressure and amphibious equipment will be used on the project. All equipment used will meet New York State ground pressure requirements which causes minimal damage to the marsh. In some cases, shoots from wetland plants are toppled but the rhizomes remain intact for next year's shoot growth. Evidence that heavy equipment was in the wetland is not evident after the first growing season.*

What about mosquito problems, will this increase their numbers? *Suffolk County Vector Control (SCVC), the local agency tasked with managing local mosquito problems, is a partner on this project. SCVC is involved with this project to ensure that it does not exacerbate local mosquito problems and to ensure that the project design will naturally minimize mosquito concerns. This type of project, open marsh water management, is typically used in other Middle Atlantic States to control mosquito numbers in tidal wetlands. Similar projects in tidal wetlands at both the Seatuck NWR and Wertheim NWR resulted in lower mosquito numbers as well as neighbor complaints regarding mosquitos. However, this project may result in the reduction of mosquito activities but it will not eliminate them.*

Will this project increase flooding? *This project will result in increasing the water table in the tidal wetland but adjacent uplands will not be impacted. Wetlands actually assist in the reduction of flooding, erosion, and pollution for nearby communities.*

Will the equipment used on the project impact neighbors and park users? *Both the excavator and ditcher have diesel engines and depending on the proximity engine noises will be heard however the level will be similar to noises heard from the local highway. The project will also be accomplished during winter, when most individuals are indoors and any noise will have less impact to the public. The equipment for the project will only be used on the project site.*

Why is the U.S. Fish and Wildlife Service involved in this project? *The Service is the Federal agency assigned with the legal responsibility for the management of the nation's wildlife particularly migratory birds. This project and similar ones benefit migratory waterbirds in addition to increasing wildlife observation opportunities for the public. The Service looks to support such projects on its own lands and other lands as well.*

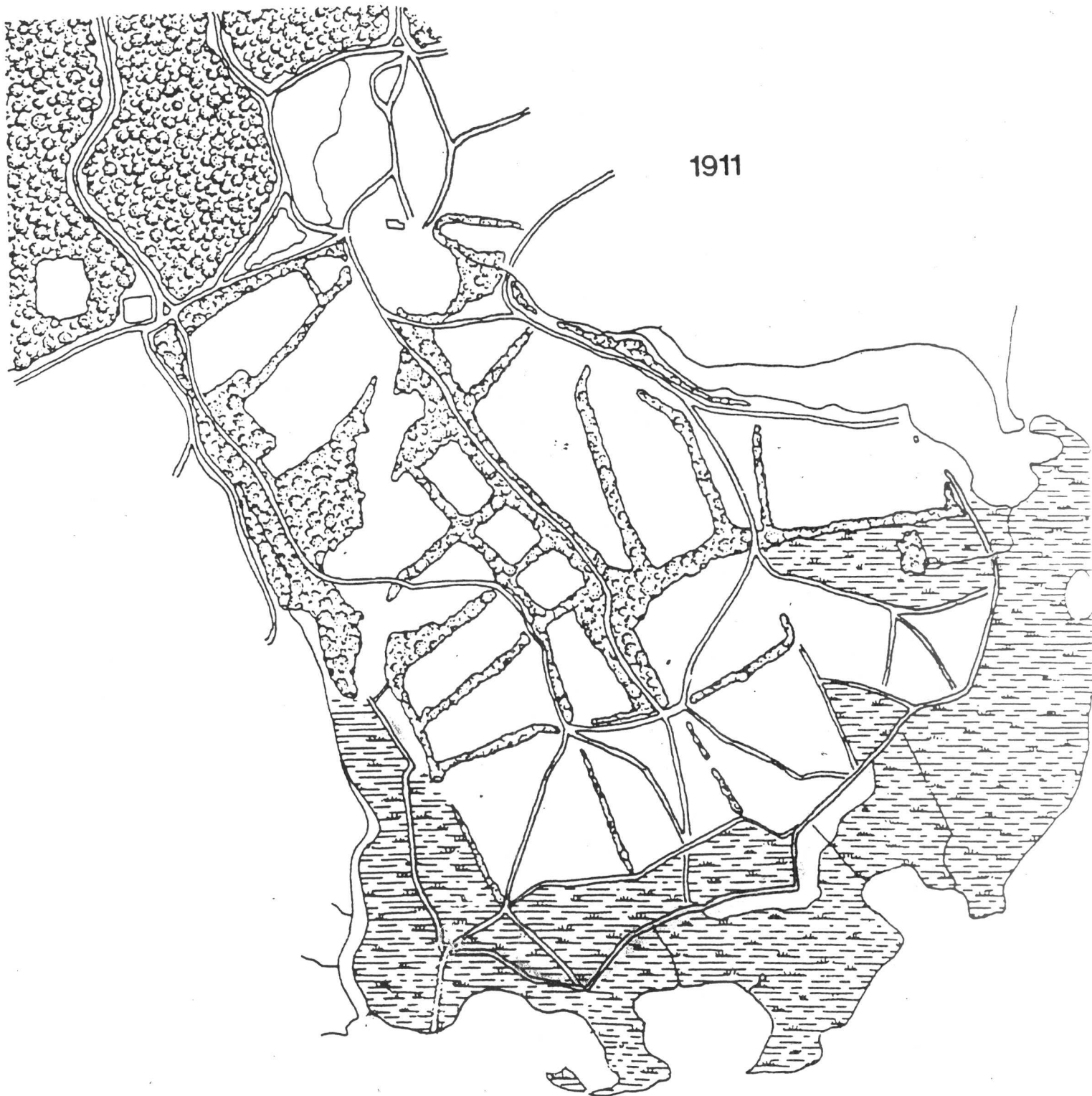
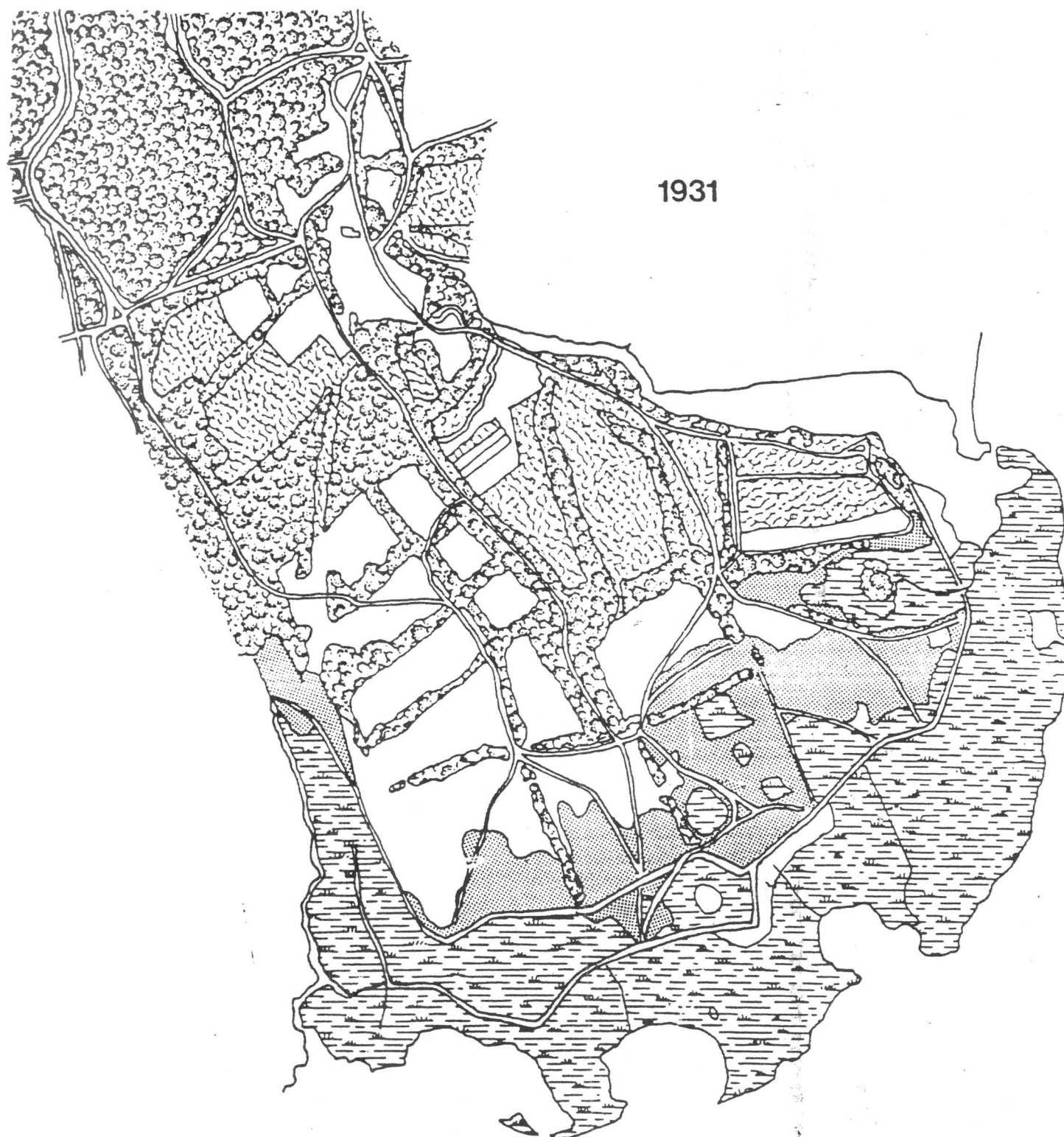


Figure 8. The 1911 survey redrafted



1931

Meadow path - green
no grid ditching

Figure 9. Interpretation of the 1931 photo

4-30-77

FIVE 3-2



1977 aerial - note extensive grid ditching

KEY TO SITE PLAN

Sections (identified in green) – for planning purposes the restoration project has 5 components identified as sections. This design is for identifying progress of project.

Plug locations (orange marks) – locations where plywood/sediment plugs will be installed. * Note how historic ditches (large blue waterways) will be left intact. Only grid ditches will be plugged. Drains that service ponds will not be plugged.

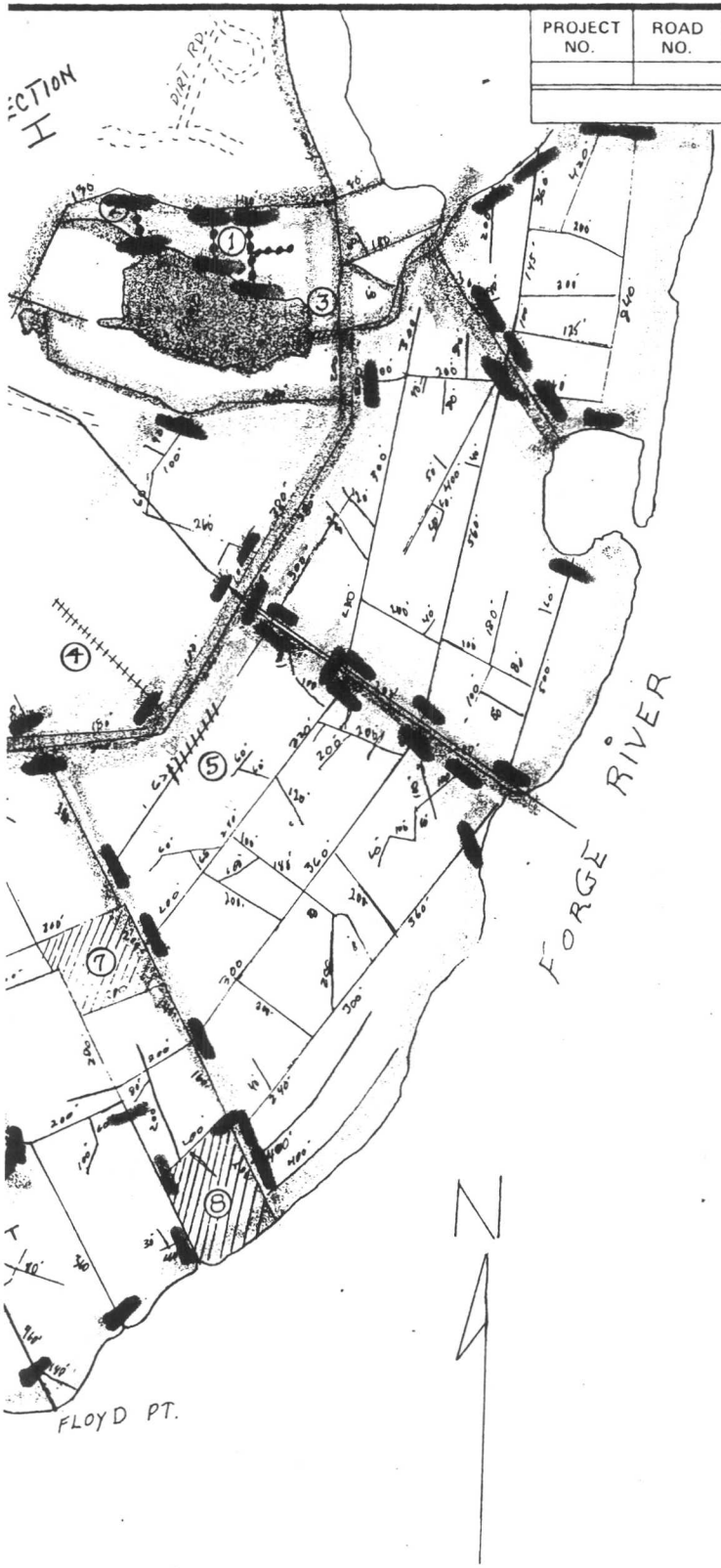
Proposed ditches (black line with circles) – these spur ditches are shallow and provide lateral transport for predatory fish to areas that are expected to flood eventually creating salt pannes (small pond like features).

KNOW CULTURAL RESOURCES

The long blue (east to west) feature identified as “double hog back” is the meadow path. No new breaches of meadow path are identified in project. Existing breaches will be restored to original depth so tidal effect will reach upper salt marsh.

Corduroy Road (pink) – this feature does not appear on the project plan. I have marked the known location in pink.

PROJECT NO.	ROAD NO.	SHEET NO.



===== DIAT RD.	
===== BLACK TOP	
===== DITCHES	
APPROX 1" TO 200'	
GREEN	OMWM SECTION
+++++	PROPOSED DITCHES
BLUE	OPEN DITCH / WATERWAY

COUNTY OF SUFFOLK

VECTOR CONTROL
YAPHANK, N.Y.



MODEL FORM FOR ASSESSMENT OF ACTIONS HAVING AN EFFECT ON CULTURAL RESOURCES

A. DESCRIPTION OF UNDERTAKING

1. Park: **Fire Island National Seashore** Park district (optional) **Wm. Floyd Estate**

2. Work/Project Description:

a. Project name - **Salt Marsh Restoration** date **7/25/99** park project #(s)

b. Describe project and area of potential effects (as defined in 36 CFR Part 800.2(c)); explain why work/project is needed.
The William Floyd Estate is managed by the National Park Service. The 613 acre tract of land derives its eminent association from Gen. Wm. Floyd, a Long Island Signer of the Declaration of Independence.

The Estate was accepted for inclusion to the National Register of Historic Places on 11/16/79. The property contains 11 LCS buildings, 2 LCS paths/roads, 3 LCS landscape features, 6 LCS structures and 4 LCS monuments/markers. Of the 22 LCS listings, 2 landscape features (The Great Ditch LCS#40914), 3 ponds (LCS #40936) are within the immediate project area. Dirt roads leading to the salt marsh will provide access for materials and machinery and listed as (LCS 40911)

The proposed salt marsh restoration is designed to restore ecological processes compromised by grid ditching. Grid ditching was initiated by local government agencies (circa 1930-1975) as a form of mosquito control. Salt marshes along the entire NE United States coastline were ditched in this manner in the belief mosquito populations could be controlled by manipulating water levels after high tides. It is now recognized that by depriving salt marshes of flooding has profound negative effects on saltmarsh flora and fauna. The project planned envisions the practice of open water marsh management which will facilitate natural flooding cycles by plugging grid ditches and restoring existing grid ditches to original depths for fish habitat. Fish, wildlife, and plant communities will accordingly respond to a more natural system.

SEE ATTACHED FOR PLANNED SCOPE OF WORK AND ASSOCIATED DOCUMENTATION.

3. Has the area of potential effects been surveyed to identify cultural resources?

☐ No

☒ Yes Source or Reference **Pedestrian Survey – McCormack + Associates 1975**
Contract 2000-4-0010

☐ Check here if no known cultural resources will be affected. (If this is because area has been disturbed, please explain or attach additional information to show the disturbance was so extensive as to preclude intact cultural deposits.)

4. Potentially Affected Resource(s):

Name and number(s): **LCS 40911 – Dirt access trails** location: **Floyd Estate**

LCS 40936 – WFE ponds

Name and number(s): **LCS 40914 – The Great Ditch** location: **Floyd Estate Salt Marsh**

NR status: **Poor – ponds and great ditch, Fair – dirt roads**

(REPEAT FOR EACH AFFECTED RESOURCE)

5. **The proposed action will:** (Check as many as apply.)
- ____ Destroy, remove, or alter features/elements from a historic structure
- ____ Replace historic features/elements in kind
- ____ Add nonhistoric features/elements to a historic structure
- x Alter or remove features/elements of a historic setting or environment (inc. terrain)
- x Add nonhistoric features/elements (inc. visual, audible, or atmospheric) to a historic setting or cultural landscape
- ____ Disturb, destroy, or make archeological resources inaccessible,
- ____ Disturb, destroy, or make ethnographic resources inaccessible
- x Potentially affect presently unidentified cultural resources
- x Begin or contribute to deterioration of historic features, terrain, setting, landscape elements, or archeological or ethnographic resources
- ____ Involve a real property transaction (exchange, sale, or lease of land or structures)
- ____ Other (please specify) _____
6. Measures to prevent or minimize loss or impairment of historic/prehistoric properties (Remember that setting, location, and use may be relevant): **Activities relating to the salt marsh restoration will be confined to existing ditches that were maintained by both manual and mechanical methods pre circa 1970. Ditch plugs will utilize sediment accumulated within ditch; no ditches will be excavated below depths as historically designed. Plugs will be to grade and will not present visual intrusion to the average pedestrian. Only existing breaches of the meadow path (circa 1890) will be utilized to promote tidal exchange to the upper salt marsh complex. No culverts will be installed – rather existing breaches will be brought back to original depth and width.**
7. **Historic drainage channels (pre 1930) will not be managed. Documented corduroy road system will not be manipulated. Any unexpected discoveries will be left "in situ" until a professional determination/documentation can be completed. Heavy equipment will access site from south western boundary of salt marsh via public roads to reduce "traffic" on dirt road system.**
7. **Supporting Study Data:** (attach if feasible; if action is in a plan, EA or EIS, give name and project or page number):
8. **Attachments:** [**X**] Maps [**X**] Archeological survey, if applicable [**X**] Drawings [**X**] Specifications [] Photographs
- [**X**] Scope of Work [] Site plan [] List of Materials [] Samples
- [] Other _____

Prepared by Richard P. Stavdal Date 7/25/99

Title Acting Unit Manager – Wm. Floyd Estate

Telephone _____

B. REVIEWS BY CULTURAL RESOURCE SPECIALISTS

The park 106 coordinator requested review by the park's cultural resource specialist/advisers as indicated by check-off boxes or described below:

SPECIALISTS: Your comments here (or attached) show that you have reviewed this proposal for conformity with requirements of Section 106, with the 1995 Servicewide PA (if applicable), and applicable parts of the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, NPS Management Policies, and NPS-28, and have given your best professional advice about this project and the issues relevant to the Section 106 process, including identification and evaluation of historic properties and further consultation needs.

☐ ARCHEOLOGIST

Name:

Date:

Comments:

Check if project does not involve ground disturbance ☐

Assessment of Effect: ☐ No Effect ☐ No Adverse Effect ☐ - Adverse Effect ☐ Programmatic Exclusion

Recommendations for conditions or stipulations:

☐ CURATOR

Name:

Date:

Comments

Assessment of Effect: ☐ No Effect ☐ No Adverse Effect ☐ Adverse Effect ☐ Programmatic Exclusion

Recommendations for conditions or stipulations:

☐ ETHNOGRAPHER

Name:

Date:

Comments:

Assessment of Effect: ☐ No Effect ☐ No Adverse Effect ☐ Adverse Effect ☐ Programmatic Exclusion

Recommendations for conditions or stipulations:

[] HISTORIAN

Name:

Date:

Comments:

Assessment of Effect: ___ No Effect ___ No Adverse Effect ___ Adverse Effect ___ Programmatic Exclusion

Recommendations for conditions or stipulations:

[] HISTORICAL ARCHITECT:

Name:

Date:

Comments:

Assessment of Effect: ___ No Effect ___ No Adverse Effect ___ Adverse Effect ___ Programmatic Exclusion

Check if project meets Secretary's Standards []

Recommendations for conditions or stipulations:

[] HISTORICAL LANDSCAPE ARCHITECT

Name:

Date:

Comments:

Assessment of Effect: ___ No Effect ___ No Adverse Effect ___ Adverse Effect ___ Programmatic Exclusion

Check if project meets Secretary's Standards []

Recommendations for conditions or stipulations:

[] OTHER ADVISERS

Name:

Title or area of specialty:

Date:

Comments:

Assessment of Effect: ___ No Effect ___ No Adverse Effect ___ Adverse Effect ___ Programmatic Exclusion

Recommendations for conditions or stipulations:

C. **PARK 106 COORDINATOR REVIEW AND RECOMMENDATIONS** (completed by the park Section 106 coordinator)

1. **Assessment of Effect :**

_____ No Effect XXX _____ No Adverse Effect _____ Adverse Effect

2. **Compliance requirements:** (The following is the park's assessment of Section 106 process needs and requirements for this undertaking.):

[X] A. **STANDARD 36 CFR PART 800 CONSULTATION**

Further consultation under 36 CFR Part 800 is needed.

[] B. **PROGRAMMATIC EXCLUSION UNDER THE 1995 SERVICEWIDE PROGRAMMATIC AGREEMENT (PA)**

The above action meets all conditions for a programmatic exclusion under Stipulation IV of the 1995 Servicewide PA for Section 106 compliance.

APPLICABLE EXCLUSION: Exclusion IV.B _____ [Specify 1-13 or IV.C addition to the list of exclusions.]

[] C. **PLAN-RELATED UNDERTAKING**

Consultation and review of the proposed undertaking were completed in the context of a plan review process, in accordance with the 1995 Servicewide PA and 36 CFR Part 800. Specify plan/EA/EIS: _____

[] D. **UNDERTAKING RELATED TO ANOTHER AGREEMENT**

The proposed undertaking is covered for Section 106 purposes under another document such as a statewide agreement established in accord with 36 CFR Part 800.7 or counterpart regulations. Specify: _____

[] E. **STIPULATIONS/CONDITIONS**

Following are listed any stipulations or conditions necessary to ensure that the assessment of effect above is consistent with 36 CFR Part 800 criteria of effect or to avoid or reduce potential adverse effects.

Recommended by Park Section 106 coordinator:

Name _____

Title _____

Date _____

D. **SUPERINTENDENT'S APPROVAL**

The proposed work conforms to NPS Management Policies and NPS-28 and I have reviewed and approve the recommendations, stipulations or conditions noted in Section C of this form.

Name/Signature of Superintendent _____

Date _____