UPPER PASSAIC RIVER FLOOD CONTROL
LONG HILL TOWNSHIP, NEW JERSEY
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS

DETAILED PROJECT REPORT
APPENDIX E – ENVIRONMENTAL COMPLIANCE & COORDINATION

October 2004

EPA REVIEW

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

APR 0 2 2004

Paul A. Tumminello, P.E.
U.S. Army Corps of Engineers, New York District
26 Federal Plaza
Programs and Project Management Division, Room 2127
New York, New York 10278

Dear Mr. Tumminello:

The Environmental Protection Agency (EPA) has reviewed the Draft Detailed Project Report and Environmental Assessment (DPR/EA) for the Upper Passaic River and Tributaries at Long Hill Township, New Jersey. This is a flood damage reduction project and is located in Morris County, New Jersey within the Passaic River Basin.

The project purpose is to address the periodic flooding from storms along the Passaic River, particularly at Long Hill Township. The DPR/EA investigates the feasibility of Federal action to address flooding problems and ecosystem restoration opportunities in the area. The EA discusses several alternatives including a "No Action Alternative" and identifies Alternative 4 as the preferred alternative. The plan consists of one levee/floodwall system with two sluice gate closure structures on the western side of the township and a sluice gate closure structure on the eastern side of the township. The proposed action includes the construction of 3,996 linear feet of floodwall and 61 feet of earthen levee south of residences and businesses located along the south side of Valley Road.

Plan formulation for ecosystem restoration along the Passaic River at Long Hill Township was conducted simultaneously with flood damage reduction plan formulation. Seven potential sites were identified during the reconnaissance phase of this study, and these sites were carried forward into the feasibility study. The results of the feasibility study indicated that none of the seven sites examined provided viable opportunities for restoration. A lack of local support for restoration action (by landowners, stakeholders, or potential partners) and the limited scale of the potential sites led to elimination of these sites. Therefore, a greater emphasis was placed on locating compensatory mitigation within or nearby the project corridor.

Impacts to Wetlands

The proposal is for the construction of a flood control structure in Long Hill Township, Morris County, New Jersey. Specifically, the proposal entails the construction of 3,996 linear feet of flood wall and 61 linear feet of levee between flood prone areas of the Township and the Passaic River. The flood wall and levee would range from 2.2 and 5.4 feet above grade and incorporate three tributary closure structures within the flood wall/levee and a portion of Valley Road, which will also be raised to act as a levee. The project is designed to provide flood damage reduction up to the 100 year storm event. The proposed activities would impact 1.10 acres of waters of the U.S. To compensate for these impacts, 0.53 acres of mitigation have been proposed through wetlands creation and enhancement. In addition, the document identified a state mitigation area

of 12.61 acres, to compensate for the project, which is not to be included in the federal mitigation proposal. The document also described an "Ecosystem Restoration" component of the project. However, as previously mentioned, none of the seven potential ecosystem restoration sites identified proceeded beyond the initial screening process. Consequently, there is currently no plan to pursue the ecosystem restoration component at this time.

While it appears that the proposed wetland impacts for the flood control project have been minimized to the greatest extent practicable, we believe that additional mitigation would be appropriate to compensate for the proposed impacts. EPA normally requires a minimum wetlands enhancement ratio of 3:1 and a minimum wetlands creation ratio of 2:1. In addition, we would be interested in seeing further detail on how the proposed mitigation would be carried out. Without a detailed proposal, it is difficult for us to conclude whether the mitigation effort would be successful in compensating for the proposed impacts.

Based on our review, we are pleased to note that wetland impacts appear to have been minimized to the greatest extent practicable. For clarification and assessment purposes, the document should describe in greater detail the mitigation plan to be carried out. All other resource issues have been adequately addressed.

Thank you for the opportunity to comment. Should you have any questions regarding these comments, please call Rajini Ramakrishnan, of my staff, at (212) 637-3731.

Sincerely yours,

Grace Musumeci

Grace Musumeci, Chief
Environmental Review Section
Strategic Planning and Multi-Media Programs Branch

UPPER PASSAIC RIVER FLOOD CONTROL
LONG HILL TOWNSHIP, NEW JERSEY
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS

DETAILED PROJECT REPORT

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL LETTER OF INTERPRETATION FOR THE BOUNDARY OF FRESH WATER WETLANDS AND STATE OPEN WATERS

James E. McGreevey
Governor

State of New Jersey
Department of Environmental Protection
Natural and Historic Resources
Division of Engineering & Construction

Bradley M. Campbell
Commissioner

NJDEP DAM SAFETY SECTION
FACSIMILE TRANSMITTAL SHEET

TO: Paul T	FROM: CE DePendonk
COMPANY: Cof R	DATE:
FAX NUMBER: 212-264-5779	TOTAL NO. OF PAGES INCLUDING COVER: 4
PHONE NUMBER:	SENDER'S PHONE NUMBER: (609) 984-0859
RE:	SENDER'S FAX NUMBER: (609) 984-1908

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS: LOI

Long Hill

E-Mail Address: DamSafety@dep.state.nj.us
Internet Address: www.state.nj.us/dep/nhr/engineering/damsafety
Mailing Address: 501 East State Street, P.O. Box 419, Trenton, NJ 08625
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State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection
Land Use Regulation Program
P.O. Box 439, Trenton, NJ 08625-0439
Fax # (609) 777-3656
www.state.nj.us/dep/landuse

Bradley M. Campbell
Commissioner

NOV 17 2003

Brett Berkley
MATRIX Environmental & Geotechnical Services, Inc.
215 Ridgedale Avenue
Florham Park, NJ 07932

Re: Letter of Interpretation-Line Verification
Applicant: Charles Defendorf, NJDEP, Division of Engineering & Construction
Program Interest No.: 1430-03-0001.1 FWW 030001
Portions of: Block 1, Lots 16.04, 17, 18, 18.01, 19, 24, 25 & 26;
Block 2, Lots 1, 4 & 6;
Block 3, Lot 10;
Block 12, Lots 1 & 3;
Block 13, Lot 1;
Block 70, Lots 11, 26, 29;
Block 30, Lot 10
Project: Upper Passaic Flood Control Project
Long Hill Township, Morris County

Dear Mr. Berkley:

This letter is in response to your request for a Letter of Interpretation to establish the boundary of the freshwater wetlands and State open waters on portions of the referenced properties.

In accordance with agreements between the State of New Jersey Department of Environmental Protection, the U.S. Army Corps of Engineers Philadelphia and New York Districts, and the U.S. Environmental Protection Agency, the NJDEP, Land Use Regulation Program is the lead agency for establishing the extent of State and Federally regulated wetlands and waters. The USEPA and/or USACOE retain the right to reevaluate and modify the jurisdictional determination at any time should the information prove to be incomplete or inaccurate.

Based upon the information submitted, and upon site inspections conducted on December 2, 2002, July 29, 2003 and August 6, 2003, the Land Use Regulation Program has determined that freshwater wetlands and State open waters are present on the

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referenced property. The extent of the wetlands and State open waters is shown on the attached plans, entitled "UPPER PASSAIC FLOOD CONTROL STUDY LONG HILL TOWNSHIP, MORRIS COUNTY, NEW JERSEY, WETLANDS DELINEATION PLAN" consisting of 5 sheets, dated April 1, 2003, last revised August 28, 2003 and prepared by Matrix Environmental and Geotechnical Services, Inc. Sheet 5D shows the wetlands and waters for portions of Block 30, Lot 10 and Block 70, Lots 11, 26 and 29.

Any activities regulated under the Freshwater Wetlands Protection Act proposed within the wetlands, open water or transition areas, will require a permit from this office unless exempted under the wetlands rules, N.J.A.C. 7:7A.

Pursuant to the Freshwater Wetlands Protection Act Rules, N.J.A.C. 7:7A, you may rely upon this boundary determination for a period of five years from the date of this letter.

The freshwater wetlands and waters boundary lines, as determined in this letter, must be shown on any future site development plans. The line should be labeled with the above LURP file number and with the following note:

> "Freshwater Wetlands/Waters Boundary Line as verified by the NJDEP, File # 1430-03-0001.1, FWW030001"

The Department has determined that wetlands identified on the subject properties by wetland flags A1 to A14; E76 to E69; E59 to E35; E 29 to E8; E6 to E1; D50 to D1; C1 to C18; and C27 to C51 are of Exceptional Resource Value due to documented suitable habitat for Endangered and Threatened species. The standard transition area or buffer required adjacent to these wetlands is 150 feet. The remaining wetlands are of Intermediate resource value and the standard transition area or buffer required adjacent to these wetlands is 50 feet. State open waters are indicated on the approved plans by flags E59 to E 69, B1 to B4 and C18 to C27. Please note that a buffer is not required adjacent to State open waters under the Freshwater Wetlands Protection Act, but a 25-foot buffer is required under the Flood Hazard Area Control Act.

These classifications affect the requirements for an Individual Wetlands Permit (see N.J.A.C. 7:7A-7), the types of Statewide General Permits available for the wetlands portion of this property (see N.J.A.C. 7:7A-4 and -5) and the modification available through a transition area waiver (see N.J.A.C. 7:7A-6). Please refer to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) and implementing rules for additional information.

It should be noted that this determination of wetlands classification is based on the best information presently available to the Department. The classification is subject to change if this information is no longer accurate, or as additional information is made available to the Department, including, but not limited to, information supplied by the applicant.

The wetlands and waters have also been identified as being priority wetlands by the U.S. Environmental Protection Agency. This classification may affect the types of permits or transition area waivers available for the above referenced property.

This determination does not affect your responsibility to obtain any local, State, or Federal permits that may be required for activities on the referenced property. This letter in no way legalizes any fill that may have been placed, or other regulated activities that may have been conducted on this site.

In accordance with N.J.A.C. 7:7A-1.7, any person who is aggrieved by this decision may request a hearing within 30 days of the decision date by writing to: New Jersey Department of Environmental Protection, Office of Legal Affairs, Attention: Adjudicatory Hearing Requests, PO Box 402, Trenton, NJ 08625. This request must include a completed copy of the Administrative Hearing Request Checklist.

Please contact Janice Arnett of our staff at (609) 633-9277 should you have any questions regarding this letter. Be sure to indicate the Program's file number in all communication.

Sincerely,

Mark A. Godfrey, Supervisor
Morris and Bergen Counties Region
Bureau of Inland Regulation

/jla

c: Long Hill Township Clerk
Long Hill Construction Official
Charles Defendorf, Applicant

UPPER PASSAIC RIVER FLOOD CONTROL
LONG HILL TOWNSHIP, NEW JERSEY
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS

DETAILED PROJECT REPORT

DRAFT RECORD OF NON-APPLICABILITY (RONA)

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

DRAFT RECORD OF NON-APPLICABILITY (RONA)

Project/Action Name: Upper Passaic Flood Control and Environmental Restoration Project

Project/Action Identification Number: XXXXXX

Project/Action Point of Contact: *Paul Tumminello, XXXXXX, (212)-264- 0437*

Begin Date: XXXX

End Date: XXXX

1. General Conformity under the Clean Air Act, Section 176 has been evaluated for the project at the most current development level described above according to the requirements of 40 CFR 93, Subpart B.

2. The requirements of this rule do not apply to this project/action because the total direct and indirect NOx emissions from this project have been estimated at 19.4 tons, and are therefore below the conformity threshold value established at 40 CFR 93.153(b) of 25 tons per year.

3. The project/action is not considered regionally significant under 40 CFR 93.153(i).

Supporting documentation and emissions estimates are as follows:

Equipment Type	Make/Model	Engine HP Rating	No.	Percent Utilization During 26 Week Period	Operating Hours*	Nox Emissions (tons)
Back Hoe	CAT 225LC	135	1	100	1040	1.7
Dump Truck	CAT 769C	450	2	50	1040	5.7
Dozer	CAT D7G	200	2	60	1248	3.0
Loader	CAT 966D	200	2	60	1248	3.0
Compactor	CAT 825C	310	1	20	208	.8
Pile Driver Crane	Lorain MCH200E	250	1	100	1040	3.2
Hydraulic Crane	Terex HC110	230	1	50	520	1.5
Grader	CAT 12G	135	1	30	312	.5

*Assumptions: 26 week construction schedule of 40 hours/week, for a total of 1040 construction hours. Engine HP ratings estimated, and an average NOx emission factor of 11g/hp-hr used. Licensed/regulated on-road vehicles not included in estimate.

UPPER PASSAIC RIVER FLOOD CONTROL
LONG HILL TOWNSHIP, NEW JERSEY
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS

DETAILED PROJECT REPORT

BOG TURLTE EVALUATION

FINAL BOG TURTLE SURVEY

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

In Reply Refer to:

FP-04/20

APR 12 2004

Leonard Houston, Chief
Environmental Analysis Branch, CENAN-PL-E
New York District, Army Corps of Engineers
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York 10278-0090

Dear Mr. Houston:

This is in regard to the U.S. Army Corps of Engineers, New York District (Corps) Upper Passaic River Tributaries flood control project. The project is located in Long Hill Township, Morris County, New Jersey, and consists of an approximately 0.7-mile proposed floodwall that would separate developed lots along the south side of Valley Road from floodplain wetlands along the Passaic River's northern floodplain. The project also includes a flood gate on an unnamed Passaic River tributary, east of Morristown Road. The U.S. Fish and Wildlife Service (Service) has reviewed the February 2004 draft Environmental Assessment (DEA) for the project, as well as an October 2003 survey report for the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*).

AUTHORITY

This response is provided pursuant the National Environmental Policy Act of 1969 (83 Stat. 852; 42 U.S.C. 4321 *et seq.*) (NEPA), and Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. This correspondence also constitutes an amendment to the Service's August 2003 report in behalf of the Secretary of the Interior pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) (FWCA), based on new information regarding wildlife resources.

FEDERALLY LISTED SPECIES

The Service previously requested that a recognized, qualified herpetologist conduct a bog turtle habitat survey in all areas of scrub/shrub and emergent wetlands within the project area for the presence or absence of suitable bog turtle habitat and, if appropriate, bog turtles. The Service has

reviewed an October 10, 2003 bog turtle habitat evaluation and Phase II presence or absence survey report prepared by Herpetological Associates (HA), that was submitted to this office by Matrix Environmental and Geotechnical Services on February 5, 2004 in behalf of the Corps. According to the report, a survey team conducted a habitat evaluation on April 28, 2003 and Phase II presence or absence surveys on May 14, May 19, June 3, and June 10. Based on vegetative characteristics and a mucky substrate observed during the habitat evaluation, HA concluded an area of emergent wetlands along a utility right-of-way within the project area was potentially suitable, but marginal, bog turtle habitat.

No turtles were found during the subsequent Phase II presence or absence surveys. Additional site characteristics were observed during Phase II surveys inconsistent with bog turtle habitat; specifically deeper standing water (12 to 20 inches) from Passaic River flooding, lack of spring-fed seeps, and shallower muck overlaying a clay layer. Based on these observations, HA concluded that bog turtles are not present in the emergent wetlands along the right-of-way, or in the surrounding hardwood floodplain forest.

The survey was generally conducted in accordance with the Service's "Guidelines for Bog Turtle Surveys" by a team that included recognized, qualified bog turtle surveyors. Based on site characteristics described in the survey report, and the absence of turtles, the Service concurs that the project area does not support bog turtles. In particular, the floodplain hydrology of the project area is inconsistent with typical bog turtle habitat.

The Service concurs that the proposed project is not likely to adversely affect the bog turtle based on: (1) the absence of bog turtles documented during surveys; and (2) the Corps' conservation measure to fence and inspect the construction corridor (in accordance with recommendations #4 and 5 in the FWCA Report) to avoid harming any transient turtles.

Except for the above-mentioned species and an occasional transient bald eagle (*Haliaeetus leucocephalus*), no other federally listed or proposed endangered or threatened flora or fauna under Service jurisdiction are known to occur within the vicinity of the proposed project site. If additional information on federally listed species becomes available, or if project plans change, this determination may be reconsidered.

STATE-LISTED SPECIES

In the bog turtle survey report, HA notes that a pair of barred owls (*Strix varia*) was observed defending nesting territory in the project area on May 19 and June 10, 2003. Barred owls are State-listed as a threatened species in New Jersey. This species was not previously known from the project area, and was therefore not addressed in the Service's FWCA Report.

In the DEA, the Corps states that impacts to barred owl habitat are not anticipated and temporary construction impacts to individuals are expected to be minimal due to the species high tolerance of human presence and the presence of large areas of suitable habitat located adjacent to the

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project corridor. Pursuant to the FWCA, however, the Service recommends that the Corps coordinate with the New Jersey Endangered and Nongame Species Program (ENSP) at the following address, and adopt any recommendations of the ENSP to protect barred owls during construction.

Michael Valent, Senior Zoologist
Endangered and Nongame Species Program
Division of Fish and Wildlife
26 Route 173 West
Hampton, New Jersey 08827
(908) 735-8975

COMPENSATORY MITIGATION FOR WETLAND IMPACTS

According to the DEA, wetland impacts have been reduced from the 1.17 acres reported in the FWCA Report to 1.10 acres. The reduction was caused by removal of all but the western 61 linear feet of levee and replacement with floodwall. Although this change served to reduce aesthetic impacts to two residential lots and overall project cost, it also reduced the total wetland impacts by .07 acre. The Service supports the Corps ongoing efforts to reduce wetland impacts through refinement of the selected plan.

The Service has concerns regarding proposed compensatory mitigation, and the presentation of mitigation information related to mitigation in the DEA. Based on information provided by the Corps, the FWCA Report indicates the following proposed on-site compensatory mitigation (for 1.17 acres of impacts): 1.10 acres of enhancement, 0.14 acre of creation from upland lawns, and 11.0 acres of floodplain forest preservation. In the FWCA Report, the Service recommended:

- Provide the following information in final project documents: (a) total acres of temporary and permanent wetland impacts; (b) acres of wetland impacts classified by forested wetlands, disturbed wetlands, and mowed ("lawn") wetlands; and (c) extent of proposed wetland and upland tree removal.

- Adopt the following planning goals for the proposed compensatory mitigation. Forested wetlands: no net in-kind loss. Disturbed wetland areas: no net loss of wetland acreage, while minimizing net loss of emergent and scrub-shrub wetland types.

- Adopt a high compensatory mitigation ratio for any unavoidable impacts to forested wetlands to account for the low success rate of creating and restoring these systems as documented by Balzano *et al.* (2002). (The Service deferred recommending a specific ratio until project review under the State wetland permitting process.)

- Indicate in final project documents the specific preservation mechanism (*i.e.*, deed restriction, public ownership), and who will own and manage the property for the acreage

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to be preserved as part of compensatory mitigation.

None of the above recommendations are reflected in the DEA. Instead, the DEA provides a discussion of the discrepancy between federal and State compensatory mitigation requirements. To determine federal requirements, the Corps performed an Evaluation of Planned Wetlands (EPW) within the project corridor and on a reference wetland site. Using EPW, the Corps determined that 0.53 acre of mitigation (enhancement or creation) is required to replace the wetland functions and values of the 1.10 acres to be impacted, for a compensation ratio of 0.48:1. The DEA gives costs of the proposed 0.53 acre, but not the proposed mitigation type (enhancement or creation) or the type (forested, scrub/shrub, emergent) or location of the proposed replacement wetland.

The Service has not been provided the EPW report for review. In the DEA, one set of EPW Functional Capacity Index (FCI) values is given for the entire 1.10-acre impact area, even though different types of wetlands will be impacted (forested, disturbed, lawn). Each of these types of wetlands provides different habitat values to wildlife. The Corps does not explain how different FCI values for each wetland type were combined to produce one set of values for the entire impact area. In addition, the Service is concerned with any compensatory mitigation proposal with a replacement ratio of less than 1:1 on an acreage basis. The Service understands that Corps regulations and policies specify compensatory mitigation equivalent to the project impact based on habitat value, not acreage. The Service notes that our compensatory mitigation recommendations in the FWCA Report are based upon habitat value, consistent with the Service's Mitigation Policy.

State compensatory mitigation requirements are determined by regulations pursuant to the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B *et seq.*) (FWPA). State requirements dictate greater mitigation than the 0.53 acre proposed by the Corps. Therefore, we understand that the local project sponsor, the New Jersey Department of Environmental Protection (NJDEP), would provide the additional mitigation required by the FWPA without federal cost sharing (in addition to the regular non-federal 35 percent share of the federally required 0.53-acre mitigation). According to the DEA, the NJDEP will provide 100 percent of the cost for an additional 12.61 acres of mitigation.

A comparison of federal (EPW-based) and State requirements is presented in Table 6-3 of the DEA. The terms "Raw State Mitigation Area" and "State Mitigation Area with Ratio Applied," used in Table 6-3, should be explained. With no explanation of these terms, the total compensatory mitigation proposed is unclear. In addition, the DEA does not indicate the composition of the 12.61 acres by mitigation (enhancement, creation, preservation) or wetland (forested, scrub/shrub, emergent) type, or provide the location of the proposed replacement wetlands.

The Service continues to recommend that the total (federal plus State) compensatory mitigation plan strive to achieve the planning goals contained in the FWCA Report for each wetland type.

Jun 09 04 09:55a Alvarez 201 848 8998 p.5

The Service recommends that the Corps revise the discussion of compensatory mitigation in the final Environmental Assessment to clarify the acreage of each wetland type to be impacted and each type to be replaced. Lacking this information, the Service objects to the proposed mitigation plan, since we cannot ascertain if habitats for wetland-dependant species will be replaced in the same proportions they will be impacted.

The Service appreciates the Corps' ongoing cooperation to mitigate adverse impacts to wildlife resources from the Upper Passaic Tributaries at and Long Hill Township flood control project. Please contact Wendy Walsh of my staff at (609) 646-9310, extension 48 if you have any questions about the above comments.

Sincerely,

Clifford G. Day

Clifford G. Day
Supervisor

LITERATURE CITED

Balzano, S., A. Ertman, L. Brancheau, and W. Smejkal. 2002. Creating indicators of wetland status (quantity and quality) of freshwater wetland mitigation in New Jersey. New Jersey Department of Environmental Protection, Division of Science, Research and Technology. Trenton, New Jersey.

Jun 09 04 09:55a Rivarez 201 848 8998 p.6

Herpetological Associates, Inc. - Environmental Consultants
- Plant and Wildlife Specialists -

Phone: 732-833-8600, Fax: 732-928-9257, E-mail: RZappalort@aol.com
575 Toms River Road, Jackson, New Jersey 08527

April 25, 2003

RECEIVED
APR 28 2003

Brett Berkley, PWS
Senior Wetland Scientist
Matrix Environmental & Geotechnical Services
215 Ridgedale Avenue
Florham Park, NJ 07932

Re: Bog Turtle (*Glyptemys muhlenbergii*) Phase I habitat evaluation on a 10 acre portion of the U.S. Army Corps of Engineers Upper Passaic Flood Control Project in Long Hill Township, Morris County, New Jersey - HA File Number NJ03.18dws.

Dear Mr Berkley:

On April 23, 2003, Herpetological Associates, Inc. (HA) staff conducted a one day habitat evaluation at the abovementioned property in Morris County, New Jersey. The 10 acre site was evaluated to assess its potential as bog turtle habitat. The survey was conducted in accordance with U.S. Fish and Wildlife guidelines for Phase I bog turtle surveys.

HA staff observed potential habitat for bog turtles, particularly the area east of Main Avenue along the powerline right-of-way. Indicator plant species such as broad-leaved cattail (*Typha latifolia*), sensitive fern (*Onoclea sensibilis*), soft rush (*Juncus effusus*), red maple (*Acer rubrum*), multiflora rose (*Rosa multiflora*) and various sedges (*Carex sp.*) were observed, along with areas of suitable soil (mucky) and hydrology. Because of these findings and the sites' close proximity to confirmed bog turtle habitat, Phase II presence or absence surveys are warranted.

If you have any questions or need additional information, please do not hesitate to contact us.

Sincerely,

HERPETOLOGICAL ASSOCIATES, INC.

Robert T. Zappalorti

Robert T. Zappalorti
Executive Director/President

Bog Turtle (*Glyptemys muhlenbergii*)

Herpetological Associates, Inc. - Environmental Consultants - Plant and Wildlife Specialists -

Phone: 732-833-8600, Fax: 732-928-9257, E-mail: RZappalort@aol.com
575 Toms River Road (Route 571), Jackson, New Jersey 08527

April 24,2003

Brett Berkley, PWS
Senior Wetland Scientist
Matrix Environmental & Geotechnical Services
215 Ridgedale Avenue
Florham Park, NJ 07932

Re: Cost for a Phase II Bog Turtle (*Glyptemys muhlenbergii*) Survey for the Upper Passaic Flood Control Project Long Hill Township, Morris County, New Jersey - HA File Number NJ03.18dws.

Dear Mr. Berkley:

In response to your request for a proposal, Herpetological Associates Inc. (HA) has put together this project outline and cost estimate for your review and consideration. This proposal is for a Phase II bog turtle survey at the U.S. Army Corps of Engineers Upper Passaic Flood Control and Environmental Restoration Project site in Long Hill Township, Morris County, New Jersey. HA is available to conduct all field work on this project, within the guidelines specified by the U.S. Fish and Wildlife Service ("Guidelines for Bog Turtle Surveys," revised May 2001).

HA'S BOG TURTLE EXPERIENCE

Herpetological Associates, Inc. has been conducting bog turtle surveys and research since in 1977. The following HA staff members have vast experience working with bog turtles and have taken part in various research and field work in the states of Pennsylvania, New Jersey, Maryland, New York, and North Carolina: Michael Torocco, Pennsylvania Regional Manager and Staff Herpetologist; Tessa Bickhart, Staff Herpetologist; Ray Farrell, New York Regional Manager and Staff Turtle Biologist; Dave Schneider, Staff Herpetologist; Matt McCort, Staff Herpetologist; William Callaghan, Field Biologist, and Robert Zappalorti, Executive Director and Principal Herpetologist. All HA staff are well qualified and experienced turtle biologists in general, and specialists in bog turtles. Robert Zappalorti, Ray Farrell, Michael Torocco, Matt McCort and David Schneider have all been certified by the U.S. Fish and Wildlife Service as bog turtle experts in New Jersey.

A brief description of HA Staff bog turtle experience is as follows: Ray Farrell, and Bob Zappalorti conducted the 1988-1989 bog turtle survey for the New Jersey Department of Environmental Protection, Division of Fish, Game & Wildlife, Endangered & Nongame Species Program. Bob also worked in Pennsylvania over the last several years conducting bog turtle surveys and nesting behavior/predator studies for the Pennsylvania Chapter of The Nature Conservancy. HA's Pennsylvania Regional Manager, Michael Torocco, has been on staff since 1994 and has assisted with numerous bog turtle surveys in New Jersey and Pennsylvania, as well as assisting with research on the bog turtle for the Pennsylvania Chapter of The Nature Conservancy. Matt and Dave have been on staff since 1999 and have assisted in numerous habitat evaluations and bog turtle surveys in the

Herpetological Associates, Inc. - Environmental Consultants
- Plant and Wildlife Specialists -
Phone: 732-833-8600, Fax: 732-928-9257, E-mail: RZappalort@aol.com
575 Toms River Road (Route 571), Jackson, New Jersey 08527

states of Pennsylvania, New Jersey, and Maryland. Bill Callaghan has been conducting bog turtle surveys for over 20 years and is an expert at identifying suitable bog turtle habitat and locating bog turtles. HA's experience with bog turtle ecology and behavior, as well as on-going radiotelemetry mark-and-recapture studies for TNC between 1992 and 2003 has given us the knowledge to make quick and accurate judgements on the presence or absence of bog turtles. HA's research on bog turtles has been held in high regard by the New Jersey Department of Environmental Protection (NJDEP),Pennsylvania Fish and Boat Commission (PFBC), the U.S. Fish and Wildlife Service (USFWS), and The Nature Conservancy.

METHODS

HA uses the conditions set forth in the Guidelines for Bog Turtle Surveys (revised May 2001) issued by USFWS as follows:

Conditions:

1. Phase II surveys will be performed during the period from April 15 to June15. This coincides with the period of greatest annual turtle activity (spring emergence and breeding), and is before the period when vegetation gets too dense to accurately survey. While turtles may be found outside of these dates, a result of no turtles would be considered inconclusive. Surveys beyond June also have a higher likelihood of disruption/destruction of nests or newly hatched young.

2. Air and water temperatures will be a minimum of 55° F.

3. Surveys will be done during the day, at least one hour after sunrise and no later than one hour before sunset.

4. Cloud cover will be <50%, and surveys will not be performed during or immediately following rain events.

5. One to three people will survey each wetland. Robert Zappalorti, Ray Farrell, Michael Torocco, Matt McCort and David Schneider of HA staff are USFWS recognized qualified bog turtle surveyors. One of these certified individuals will be present during all surveys. All HA staff members have been instructed on proper survey techniques. To maintain survey effort consistency and increase the probability of encountering turtles, the same survey team will be used at all wetlands. HA has a valid scientific collector's permit from the NJDEP.

6. A *minimum* of four (4) surveys per wetland site will be performed to adequately assess the site for presence of bog turtles. At least two of these surveys will be performed in May. From mid-April to mid-May, surveys will be separated by six or more days. From mid-May to mid-June, surveys will be separated by three or more days. The shorter period between surveys during late May and June ensures that surveys are carried out during the optimum window of time (i.e.,

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before wetland vegetation becomes too thick and while temperatures are optimal). It should be noted that bog turtles are more likely to be encountered by spreading the surveys out over a longer period. For example, erroneous survey results could be obtained if surveys were conducted on three successive days in late April due to possible late spring emergence, or during periods of extreme weather because turtles may be buried in mud and difficult to find. If turtles are found on the first or second visit, the site does not need to be revisited.

7. Survey time will be a minimum of two hours (6 person-hours) per acre of wetland per site visit unless a bog turtle is found before this time has elapsed. Both random opportunistic searching and transect surveys will be used at each wetland.

8. The client will be sent copies of survey results for distribution to the NJDEP and the U.S. Fish and Wildlife Service, including the following: a site map; a description of the wetlands within the project area; an explanation of which wetlands were or were not surveyed, and why; and survey methodology.

For each site visit, the report will include: date, time spent surveying, surveyors' names, weather (air and water temperatures, percent cloud cover, wind, precipitation), presence or absence of bog turtles, number of bog turtles found, age/sex of turtles found, and other reptile, amphibian, and mammal species found. HA will use random opportunistic sampling and time-constrained searching (transect searching) to locate bog turtles. A description of these methods is presented below. Both of these methods are recommended by the USFWS, and are standard methods used by HA.

Sampling Methods

Bog turtles inhabit unpolluted, open, *Sphagnum* bogs and wet meadows with a soft, deep muddy bottom. Their habitat is usually vegetated with various sedge grass tussocks, cattail, jewel-weed, skunk cabbage, and alder (Kiviat, 1978; Zappalorti et al, 1978,1979 Herman, 1994). Most searching for this species will consist of walking through a wetland and carefully looking for basking turtles in shallow, muddy water, atop or amid tussock grasses, and in or on dead/decaying plant debris. A rake or wooden pole will also be used to search and probe matted vegetation and the soft, mushy bottom of waterways for hidden turtles. An attempt to find eggs, egg shells, turtle shells, or bones of this species will be made in all suitable areas within the study sites. In keeping with the conditions of HA's scientific collecting permit, we must report all sightings of state or federal endangered species to the NJDEP and USFWS.

Random Opportunistic Sampling. ROS can be employed while other sampling techniques are being performed on the study site. It involves searching various habitats of the site that show potential habitat for a species of interest, as well as examining areas between potential habitats. This ensures that all areas of the site are given a cursory examination, so that no potential habitat is overlooked. This method is effective if there are no time constraints on the survey and the survey area is visited often. Qualitative impressions can be developed as to the relative abundance and habitat use of

Alvarez, Melissa D NAN02

From: Wendy_Walsh@fws.gov
Sent: Monday, September 08, 2003 2:27 PM
To: Alvarez, Melissa D NAN02
Cc: Lisa_Arroyo@fws.gov; John_Staples@fws.gov
Subject: RE: Bog Turtle Draft Report Upper Passaic

Hi Melissa:

Sorry I could not get to this sooner. Lisa Arroyo and I looked over the draft bog turtle survey report and feel it looks good. My only suggestion would be to clarify the areas searched and assessed as potential habitat. Brett Berkeley originally indicated several sites could offer potential habitat - a small scrub/shrub wetland on the corner of Valley Rd., the utility ROW, and emergent wetlands on both sides of Main St. Based on the report, it seems only one area (east of Valley Rd.) was deemed suitable and surveyed in the Phase II. I suggest that the report include a map showing all areas identified in previous correspondence and project documents as potentially suitable habitat, and a suitability determination from HA for each of these areas based on the Phase I survey.

Thanks for the opportunity to provide input. When you submit the final survey report, we'll return a response letter. These usually take 30 days but I can try to expedite it since we've already reviewed the draft report (I know your schedule is tight).

By the way, I noticed that the surveyors documented barred owl in the area. This species was not previously known to occur in the project area, and was not addressed in the 2(b) report. In my response letter on the consultation, I plan include a "2(b) addendum statement" to address this new info. I'll get in touch with ENSP to see what they recommend; if they have any conservation recommendations for the owl, I'll suggest the District coordinate directly with ENSP during plans and specs.

Thanks again.
Wendy

Wendy Walsh
Fish and Wildlife Biologist

U.S. Fish and Wildlife Service
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"Alvarez, Melissa D NAN02" <Melissa.D.Alvarez@nan02.usace.army.mil> 08/22/03 12:02 PM

To: "'Wendy_Walsh@fws.gov'" <Wendy_Walsh@fws.gov>
cc:
Subject: RE: Bog Turtle Draft Report Upper Passaic

HA File Number NJ2003.18dws

Bog Turtle Habitat Evaluation and Phase II Presence or Absence Surveys for the Proposed Upper Passaic Flood Control Project in Long Hill Township, Morris County, New Jersey

Submitted October 10, 2003

to

Brett Berkley, PWS
Senior Wetland Scientist
Matrix Environmental & Geotechnical Services
215 Ridgedale Avenue
Florham Park, NJ 07932

by

Matthew P. McCort, David W. Schneider, and Robert T. Zappalorti

Herpetological Associates, Inc.
Plant and Wildlife Consultants
575 Toms River Road (Route 571)
Jackson, New Jersey 08527

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INTRODUCTION

Herpetological Associates (HA) was retained by Matrix Environmental and Geotechnical Services (contracted by the U.S. Army Corps of Enginners) to conduct Phase I and Phase II bog turtle (*Clemmys muhlenbergii*) surveys for the Upper Passaic Flood Control Project site located in Long Hill township, Morris County, New Jersey. The purpose of this study was to determine presence or absence of bog turtles on the property.

LOCATION OF STUDY SITE

The study property is located on Main street off of Valley road in Long Hill Township (Figure 1). The site is bordered to the east by Warren street and ends north of the Passaic River which lies to the south (Figure 2).

BACKGROUND

On April 28, 2003, HA staff conducted a one day bog turtle habitat evaluation (Phase I) on the aforementioned site. HA staff observed potential habitat for bog turtles, particularly the area east of Main Avenue along the powerline right-of-way. Indicator vegetative species such as cattail (*Typha latifolia*) and (*Typha augustifolia*), jewel weed (*Impatiens capensis*), tussock sedge (*Carex stricta*), sensitive fern (*Onoclea sensibilis*), fox-tail sedge (*Carex vulpinoidea*), soft rush (*Juncus effusus*), common reed (*Phragmites australis*), and red maple (*Acer rubrum*) were observed on site, along with areas of "mucky" soil and potentially suitable hydrology. Because of these findings and the sites' close proximity to confirmed bog turtle habitat (The Great Swamp National Wildlife Refuge), HA recommended a Phase II bog turtle presence or absence survey.

MATERIALS AND METHODS

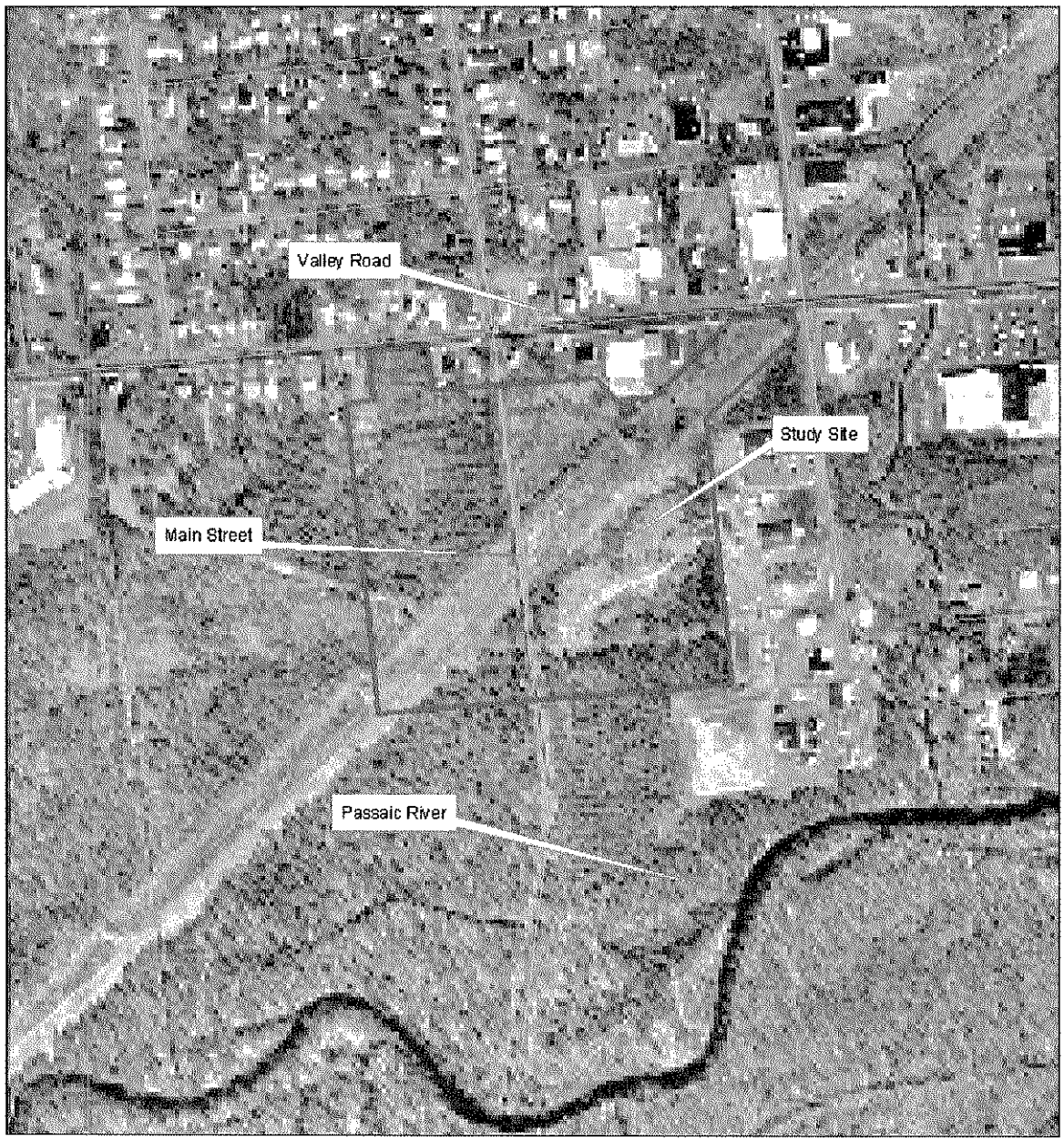
SURVEYORS

The following HA staff were present during the habitat evaluation: Robert T. Zappalorti, Matthew P. McCort and David W. Schneider. Brett Berkley of Matrix Environmental and Geotechnical Services and Melissa Alvarez of the U.S. Army Corps of Engineers met HA on site.

HABITAT EVALUATION METHODS

The suitability of the wetland as bog turtle habitat was determined by evaluating existing habitat components at the survey sites. Both the biotic and abiotic components were considered in our evaluation. Hydrology, substrate, and indicator plant species were used to judge the habitat for bog turtle presence (Zappalorti, 1976; Chase et al,1989).

Figure 1. Location of the Upper Passaic Flood Control Project Study Area, Long Hill Township, Morris County, New Jersey



On a broad scale, HA has three criteria for judging the value of the existing conditions and habitat available for bog turtles. These are:

1. Structure of Available Habitat: Both the biotic and abiotic components are considered. These are good indicators for the possible occurrence of bog turtles within a particular study area or ecosystem (Zappalorti, 1976; Ernst, Lovich, and Barbour, 1994). This category is described in greater detail below.

2. Historic Evidence: The overall range of the bog turtle and historic records on or near a study site are examined. Historic records are important to the overall evaluation of a site.

3. Indicator Species: The presence of plant and animal species that are often found in association with bog turtles is highly informative when evaluating a site. Such species may include food/prey organisms, or species that typically occur in similar or identical habitats as the target species. The presence of indicator species will often increase the ranking of a study site.

These criteria are valuable for identifying habitats that could support bog turtles. Once potential habitats are found, it becomes necessary to rank the habitats as to their overall value for bog turtles. At this stage in the evaluation, specific aspects of the habitat structure are examined. Important characteristics of bog turtle habitat are derived from HA's research and published data on bog turtles. The incorporation of this information into HA's ranking system is described below.

Bog turtles inhabit unpolluted, open bogs, marshes, and wet meadows with shallow water and a soft, deep muddy substrate. Their habitat is usually vegetated with various sedges, cattail, jewelweed, skunk cabbage, red maple, and alder (Kiviat, 1978; Zappalorti and Zanelli, 1978; Zappalorti et al., 1979; Herman 1994). These features are typically found in distinct combinations, forming a characteristic ecological community. These characteristics can be grouped into three main features: hydrology, substrate, and vegetation. These are considered significant components of bog turtle habitat (Zappalorti, 1976; Chase et al.,1989). The wetland sites were then compared with confirmed bog turtle habitat located elsewhere in New Jersey and eastern Pennsylvania (Zappalorti et al., 1998a; Zappalorti et al., 1998b). In order to standardize the results of bog turtle habitat evaluations, each wetland was given a numerical score or rank using HA's revised wetland habitat ranking system for bog turtles (Table 1).

Table 1. HA's Standardized Bog Turtle Habitat Ranking System (Revised January 2002).

	RANK	Description
Phase II Not Required	1	**Not suitable**: Site lacks all of the three main features of bog turtle habitat: hydrology, soil, and vegetation.
	2	**Atypical**: Site contains two of the three habitat features, one of which must be vegetation.
Phase II Required	3	**Marginal**: Site contains hydrology and soils, but does not contain the ideal vegetation.
	4	**Typical**: Site contains all three features of bog turtle habitat.
	5	**Ideal**: Site has all three features of bog turtle habitat, and has numerous rivulets, seeps, and/or springs; area of perceived bog turtle habitat is large with multiple interconnected cores; area may be hydrologically connected with confirmed bog turtle populations.

In reality, some sites may not fall perfectly into one of the five categories. However, for simplicity, each wetland was ranked to best represent the existing conditions of the area as bog turtle habitat. Of the three main features of bog turtle habitat (i.e., hydrology, soil, and vegetation), hydrology and soils are considered the most important by HA. Without the combination of these two features, it is highly unlikely that bog turtles can persist at a site. Vegetation, while an important feature of bog turtle habitat, is the most variable and therefore the least important. Situations where natural succession have turned a typical bog habitat into a shrub or hardwood dominated swamp are often encountered, but bog turtles may still persist. With management, these types of sites may become productive bog turtle habitats. Therefore, wetlands that lack vegetation but have suitable soils and hydrology are ranked higher than sites that have indicator plants but lack either soils or hydrology.

This revised ranking system, based on HA's original Z-Scale ranking system, is provided for the convenience of NJDEP's Endangered and Nongame Species Program (ENSP), U.S. Fish and Wildlife Service (USFWS), and HA's clients. This system provides a standardized method for ranking bog turtle habitat based on HA's 30 years of bog turtle experience. These rankings closely follow the recommendations of the USFWS's "Guidelines for Bog Turtle Surveys"(revised May 2001).

HERPETOLOGICAL METHODS

Bog Turtle Search Methods

The protocol for conducting the bog turtle presence or absence surveys consists of walking through the wetland site while carefully looking for basking turtles in shallow, muddy water, atop or amid tussock grasses, and in or on dead/decaying plant debris. Meter-long wooden sticks were used to move sedge grass and other vegetation aside and to probe into soft mud in search of hidden turtles. Additionally, shallow water and the muddy substrate was searched by muddling (*i.e.,* feeling around in the mud by hand) (Ernst and Bury 1977). HA also searched for turtle footprints or tracks in soft mud and searched for eggs, egg shells, turtle shells or bones of the species in all suitable areas within the wetland under scrutiny (Ernst, Lovich, and Barbour 1994; Herman 1994).

HA employed two standard sampling methods for reptiles and amphibians to survey the sites in this study; random opportunistic sampling (ROS), which examines an entire site, including both high and low potential areas; and time-constrained searching (TCS), which focuses on areas within a site with high habitat potential. HA used the ROS method primarily during its initial surveys of the sites. This enabled HA to first observe all habitats on the site and to then determine specific locations of highly potential bog turtle habitat. TCS was used in later surveys, after potential bog turtle areas were delineated within a site. Details of these two methods follow.

ROS *(Random Opportunistic Sampling)*

ROS involves searching all areas of a site, regardless of the potential for bog turtle habitat. This allows for the identification of areas of potentially suitable habitat within a site. All reptiles, amphibians, birds, and mammals encountered are recorded to supplement the species list generated by other field methods. Through the employment of this method, qualitative impressions can be developed as to the relative abundance and habitat use of certain species (Campbell and Christman 1982; Karns 1986).

TCS *(Time-constrained Searching)*

The TCS method is most effective when searching for very secretive forms of wildlife (e.g. bog turtles). A specific habitat, such as a cattail swamp, open *Carex* marsh, or spring-fed meadow is selected and an experienced team of 2-5 persons conducts an intensive, timed search within the area. Depending on the number of times an area is to be searched, all individual reptiles and amphibians encountered can be uniquely marked to avoid counting animals twice or to obtain a population estimate. Spatial boundaries for each search are limited to the selected habitat. During times of the year when target species are known to congregate in particular habitats (e.g. nesting, stream, and spring areas) for some aspect of their life history (e.g. egg laying, mating, and hibernation), TCS is highly productive and superior to other types of surveys. Time limits ensure that each habitat is adequately, but not excessively examined. This method allows a quantitative comparison of species richness, relative abundance, and movement between habitats (Campbell and Christman 1982; Karns 1986).

Botanical Identification

HA staff observed and recorded the various plant communities present at each wetland survey site. Plant species were grouped into community types (*e.g.* bog, swamp, hardwood forest, oak upland forest, and wet meadow). Various field guides and manuals, dichotomous technical keys, guides to synonymy, and local plant lists on floras were used by HA staff in order to prepare for and perform fieldwork. Unfamiliar plants were identified using the technical keys from Fernald (1950), Gleason and Cronquist (1991), and Snyder and Vivian. (1981).

RESULTS

SITE DESCRIPTION AND WETLAND INFORMATION

During the April 28, 2003 habitat evaluation (Phase I), HA observed wetland characteristics that were consistent with potential bog turtle habitat (Figure 2). Many areas, all of which are along the powerline right-of-way, were wet with 2 to 6 inches of surface water. In addition, there were several channelized drainage ditches at various locations on the right-of-way (Figure 3). The surface substrate was mucky with an underlying clayey base. These observations led HA to rank the site as **3 Marginal** and recommend a Phase II presence or absence survey (Table 1).

Wetlands were identified and delineated by Brett Berkley, Senior Wetland Scientist, of Matrix Environmental and Geotechnical Services in November 2002.

Table 2. Wetland Information

Wetland Number	**Size** (Acres)	**Type** (e.g., PEM, PSS, PFO)	**Extent of "Mucky" Soils** (≥3" deep)	**Lat/Long**	**Potential Bog Turtle Habitat?** (yes/no)	**Bog Turtles Found?** (yes/no)
1	4.5	PEM–50% PSS–50%	PEM–80% PSS–60%	---	yes	no

The site falls within the floodplain of the Passaic river which lies approximately 1200 feet from the southern border of the site. The entire site, except the powerline right-of-way, is hardwood

southern border of the site. The entire site, except the powerline right-of-way, is hardwood floodplain forest dominated by pin oak (*Quercus palustris*) and red maple. This forest shows evidence of hydrological influence from the Passaic River. The right-of-way bisects the site from the southwest to the northeast and at one time, before clearing, was probably consistent in structure to the surrounding hardwood floodplain forest. There is a channelized drainage ditch that crosses the right-of-way in the southwestern portion of the site.

Figure 2. This photo, taken during HA's Phase I evaluation on April 28, illustrates an area of potential bog turtle habitat. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

PHASE II

Phase II surveys were conducted on May 14, and 19, and June 3, and 10 2003 (Table 2). HA observed several changes over the study period that have influenced our opinion of the habitat as it pertains to bog turtles. Periodic fluctuation of the water level and flooding of the site, which is within the floodplain of the Passaic River, was observed over the study period (Figures 4-7). These conditions, although natural, can preclude bog turtles from persisting. It would be almost impossible for bog turtles to nest anywhere along the right-of-way or in the surrounding hardwood floodplain forest due to the influence the Passaic River has on the wetland habitat on site. No bog turtles or their signs were observed on site.

Table 3. Phase II Bog Turtle Survey Results for the Upper Passaic Flood Control Project Site, which is 4.5 acres in size.

Date	**Time**	**Surveyors**	**Search Effort** (hours, by surveyor)	**Total Hours of Search Effort**	**Weather** (Start and Stop) (Temp in °C)	**No. of Bog Turtles Found** (by surveyor)	**Time when Bog Turtle Found**
5/14/03	1000-1700hrs	R. Zappalorti M.P. .McCort D. Schneider B. Berkley	6 6 6 1	19	In: 23.9, 75-80% cloudy Out: 19.8, 75-80% cloudy	0 0 0 0	--- --- --- ---
5/19/03	0915-1645hrs	M.P. .McCort D. Schneider D. Kissling Teresa Crane	6.5 6.5 6.5 6.5	26	In : 19.1, sunny Out: 26.1, sunny	0 0 0 0	--- --- --- ---
6/3/03	0900-1630hrs	M.P. .McCort D. Schneider D. Kissling Teresa Crane Matrix Biologist	6.5 6.5 6.5 4.5 4.5	28.5	In: 21.2, sunny Out: 17.9, 75% cloudy	0 0 0 0 0	--- --- --- --- ---
6/10/03	0900-1700hrs	M.P. .McCort D. Schneider D. Kissling	7 7 7	21	In: 22.0, sunny Out: 29.2, sunny	0 0 0	--- --- ---

Figure 3. Photo showing habitat. This feature is a channelized swale that funnels water off of the right-of-way. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

Figure 5. Photo, facing southeast, showing the channelized drainage ditch that crosses the right-of-way in the southwestern portion of the site. This feature became inundated with water after the Passaic River flooded in June. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

Figure 7. Photo showing broom handle (turtle stick) buried in 12 inches of water. Although there are indicator vegetative species present the overall conditions are not suitable for bog turtles. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

Figure 4. Photo showing the high water level from the flooding of the Passaic River. The feature shown is a gravel access road that runs under the powerline right-of-way along its length. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003

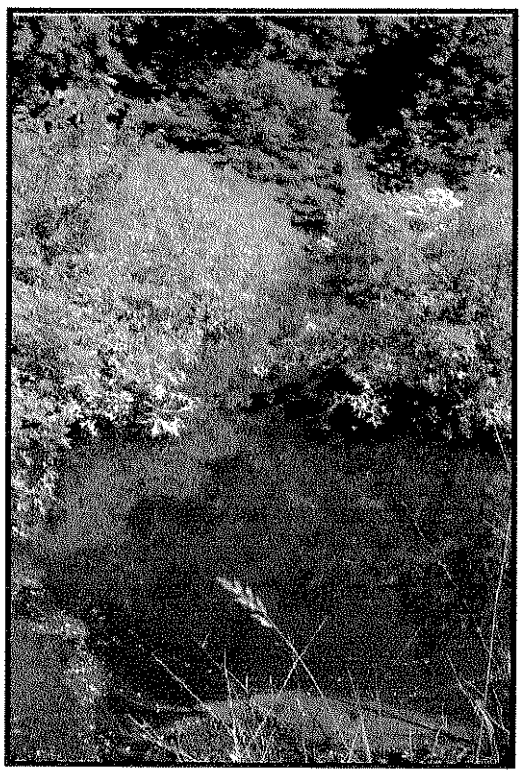


Figure 6. Photo, facing northwest, showing the channelized drainage ditch that crosses the right-of-way in the southwestern portion of the site. This feature became inundated with water after the Passaic River flooded in June. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

Wildlife Observed

Although no bog turtles were found, the Phase II surveys produced a number of common species throughout the site (Figures 8-10).

Table 4. Scientific and Common Names of Wildlife Species Observed During Phase I and Phase II Bog Turtle Surveys.

Common Names	**Scientific Names**
Birds	
barred owl (pair defending nesting territory on 5/19 and 6/10)	***Strix varia***
red-tailed hawk	*Buteo jamaicensis*
american kestrel	*Falco spaverius*
great blue herron	*Ardea herodias*
gray catbird	*Dumetella carolinensis*
american robin	*Turdus migratorius*
northern mockingbird	*Mimus polyglottus*
northern cardinal	*Cardinalis cardinalis*
tufted titmouse	*Parus bicolor*
wild turkey	*Meleagris gallopavo*
blue-gray gnatcatcher	*Polioptila caerulea*
rose-breasted grossbeak	*Pheucticus ludovicianus*
american goldfinch	*Carduelis tristis*
ovenbird	*Seiurus aurocapilllus*
northern flicker	*Colaptes auratus*
common yellowthroat	*Geothlypis trichas*
redwing blackbird	*Agelaius phoeniceus*
Amphibians	
green frog	*Rana clamitans melanota*
northern leopard frog	*Rana pipiens*
bullfrog	*Rana catesbiana*
wood frog	*Rana sylvatica*
pickerel frog	*Rana palustris*
redback salamander	*Plethodon cinereus*
Reptiles	
eastern milk snake	*Lampropeltis t. triangulum*

eastern garter snake	*Thamnophis s. sirtalis*
common snapping turtle	*Chelydra serpentina*
Mammals	
whitetail deer	*Odocoileus virginianus*
raccoon	*Procyon lotor*
eastern cottontail	*Sylvilagus floridanus*

***Source: Herpetological Associates, Inc.* 2003.**

Figure 8. Eastern milk snake found during Phase II bog turtle surveys. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

Figure 9. Northern leopard frog found along the right-of-way on the subject property. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

Figure 10. Common snapping turtle found while probing the substrate for bog turtles. Photo: Matthew P. McCort, Herpetological Associates, Inc. 2003.

DISCUSSION

The clayey substrate present on site is less permeable than the typical organic muck/mud that is found in habitat that supports bog turtles. The clay serves as a barrier to the absorption of surface water from the flooding of the river during heavy precipitation events. The extent of seasonal surface water depth at this site may be exaggerated due to the impermeability of the clay substrate. Surface water from rain events seems to remain present for extended periods of time on this site.

The overall characteristics of the wetland habitat present on this site are, after further investigation, not consistent with typical bog turtle habitat. Although there are some minimal hydrological and soil characteristics that are suggestive of bog turtle habitat, the lack of spring fed seeps and deep, mucky soils, along with the sites' tendency to flood with 12 to 20 inches of water, makes it poor bog turtle habitat. The overall rank assigned to the wetlands is a **3 (Marginal)** due to the lack of suitable existing hydrological and soil conditions. It is HA's professional opinion that bog turtles do not exist on this site or in the surrounding hardwood floodplain forest.

EXECUTIVE SUMMARY

HA performed a Phase I bog turtle habitat evaluation on April 28, 2003 at the Upper Passaic Flood Control Project Site. It was determined that the site had potential habitat for bog turtles and a Phase II survey was necessary. In May and June 2003 HA conducted Phase II presence or absence surveys to determine if bog turtles occurred on the property. All wetland habitat on the site was surveyed four times, for the appropriate number of hours per acre, for bog turtles. None of the areas surveyed contain all three of the main wetland characteristics associated with bog turtle habitat. While indicator vegetative species were found throughout the site, the hydrology and substrate were ultimately found to be inconsistent with that of known bog turtle habitat. It is HA's professional opinion that there are no bog turtles present on the Upper Passaic Flood Control Project Site.

Respectfully Submitted,

Herpetological Associates, Inc.

LITERATURE CITED AND OTHER REFERENCES

In addition to the literature cited, this list includes other publications concerned specifically with the bog turtle (Clemmys muhlenbergii) or with amphibians and reptiles in general. Those who wish to learn more about bog turtles in Pennsylvania, New Jersey, or throughout the eastern United States may find these publications or papers of interest.

Anderson, J.D. 1976. The status of the tiger salamander, *Ambystoma tigrinum*, blue-spotted salamander, *Ambystoma laterale*, Tremblay's salamander, *Ambystoma tremblayi*, gray treefrog, *Hyla versicolor* and *Hyla chrysoscelis*, Pine Barrens treefrog, *Hyla andersonii*, and bog turtle, *Clemmys muhlenbergii*, in New Jersey. Special report to the Nongame and Endangered Species Project, mimeographed, pp. 1-7.

Arndt, R.G. 1977. Notes on the natural history of the bog turtle, *Clemmys muhlenbergii,* in Delaware. Chesapeake Science, 18(1), pp. 67-76.

Arndt, R.G. 1986. Notes on the Bog Turtle, *Clemmys muhlenbergii*, in Warren County, New Jersey. Bulletin Maryland Herpetological Society, Vol. 22, No. 2, p. 56.

Barton, A.J. 1957. Our knowledge of the bog turtle, *Clemmys muhlenbergii*, further augmented. M.S. thesis, University of Pittsburgh, PA, p. 75.

Barton, A.J. and J.W. Price, Sr. 1955. Our knowledge of the bog turtle, *Clemmys muhlenbergii*, surveyed and augmented. Copeia(3), pp. 159-165.

Bloomer, T.J. and D. Bloomer. 1973. New Jersey Bog Turtle...Destined to Extinction? Bulletin New York Herpetological. Society, 9(3-4) p. 8-12.

Bury, R.B. 1979. Review of the ecology and conservation of the bog turtle, *Clemmys muhlenbergii*. U.S. Department of Interior, Fish and Wildlife Service, Special Scientific Report No. 219, p. 1-9.

Bury, R.B. and C.H. Ernst. 1977. *Clemmys muhlenbergii*. Cat. Am. Amphibians and Reptiles, p. 203, 1-203.2, p. 204, 1-204-2.

Campbell, H.W. and S.P. Christman. 1982. Field techniques for herpetofaunal community analysis in herpetological communities. Ed. by Norman J. Scott, Jr., U.S. Dept. of the Interior, Fish and Wildlife Service. Wildlife Research Report No. 13, pp. 193-200.

Chase, J.D., K.R. Dixon, J.E. Gates, D. Jacobs and G.J. Taylor. 1989. Habitat characteristics, population size, and home range of the bog turtle, *Clemmys muhlenbergii*, in Maryland. Journal of Herpetology, 23(4):356-362.

Congdon, J.D., A.E. Dunham and R.C. Van Loben Sels. 1993. Delayed sexual maturity and demographics of Blanding's turtles (*Emydoiea blandingii*): Implications for conservation and management of long-lived organisms. Conservation Biology, 7(4):826-833.

Eckler, J.T., A.R. Breisch and J.L. Behler. 1990. Radio telemetry techniques applied to the bog turtle (*Clemmys muhlenbergii* Schoepff 1801). *In* Mitchell, R.S., C.J. Sheviak, and D.J. Leopold, Eds. Ecosystem management: Rare species and significant habitats, 69-70. Bulletin No. 471, New York State Museum, Proc. 15th Annual Natural Areas Conference.

Ernst, C.H. 1992. Personal communication. George Mason University, Fairfax, Virginia 22030

Ernst, C.H. and R.W. Barbour. 1989. Turtles of the World. Smithsonian Institution Press, Washington, D.C. 313 pp.

Ernst, C.H., R.W. Barbour and M.F. Hershey. 1974. A new coding system for hard shelled turtles. Trans. Kentucky Acad. Sci. 35:27-28.

Ernst, C.H. and R.B. Bury. 1977. *Clemmys muhlenbergii.* Catalog of American Amphibians and Reptiles. SSAR, 204:1-2.

Ernst, C.H., J.E. Lovich and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington and London. 578 pp.

Ernst, C.H., J.E. Lovich, R.T. Zappalorti, and Herman, D.W. 1996. Geographic Variation in Growth and Sexual Size Dimorphism of Bog Turtles (*Clemmys muhlenbergii*). In Press - American Midland Naturalist.

Ernst, C.H., R.T. Zappalorti, and J.E. Lovich. 1989. Overwintering sites and thermal relations of hibernating bog turtles, *Clemmys muhlenbergii. Copeia* 1989(3), pp. 761-764.

Farrell, R. 1995 - 1999. Herpetological Associates, Inc. staff. Personal communication.

Gibbons, J.W. 1986. Movement patterns among turtle populations: Applicability to management of the desert tortoise. Herpetologica 42:104-113.

Gibbons, J.W. 1990a. Sex ratios and their significance among turtle populations. *In* Life History and Ecology of the Slider Turtles. (*Ed.*) Smithsonian Institution Press, Washington, D.C., London. pp. 171-182.

Gibbons, J.W. 1990b. Life history and ecology of the slider turtle. Smithsonian Institution Press, Washington, D.C., London. 368 pp.

Gist, D.H. and J.M. Jones. 1989. Sperm storage within the oviduct of turtles. J. Morphol. 199:379-384.

Herman, D.W. 1994. The bog turtle, *Clemmys muhlenbergii*, in North Carolina: An action plan for its conservation and management. Zoo Atlanta, Department of Herpetology, Atlanta, Georgia. 144 pp. *Submitted to* The North Carolina Wildlife Resources Commission, Contract No. 93 SG 06.

Holub, R.J. and T.J. Bloomer. 1977. The bog turtle, *Clemmys muhlenbergii* - A natural history. Herp. Bull. New York Herpetological. Soc. 13:9-23.

Karns, D.R. 1986. Field herpetology methods for the study of amphibians and reptiles in Minnesota. Published in cooperation with the Nongame Wildlife Program of the Minnesota Dept. of Natural Resources. James Ford Bell Museum of Natural History, Univ. of Minnesota, Occasional Paper No. 18.

Kiviat, E. 1978. Bog turtle habitat ecology. Bull. Chicago Herpetological. Society 13:29-42.

Krebs, C.J. 1989. Ecological Methodology. University of British Columbia. Harper Collins Publishers, Chapter 2.

Lovich, J.E., D.W. Herman and K.M. Fahey. 1992. Seasonal activity and movements of bog turtles (*Clemmys muhlenbergii*) in North Carolina. Copeia 1992:1107-1111.

Morreale, S.J., J.W. Gibbons and J.D. Congdon. 1984. Significance of activity and movements in the yellow-bellied slider turtle (*Pseudemys scripta*). Canadian J. Zool. 62:1038-1042.

Nemuras, K.T. 1967. Notes on the natural history of *Clemmys muhlenbergii*. Bulletin of the Maryland Herpetological Society 3:80-96.

Paukstis, G.L. and F.J. Janzen, 1990. Sex determination in reptiles: Summary of effects of constant temperatures of incubation on sex ratios of offspring. Smithsonian Herpetological Information Service, No. 83.

Ryan, J.J. 1981. A record size female and egg clutch for the bog turtle, *Clemmys muhlenbergii*. Bull. Maryland Herpetological Society, pp. 102-106.

Tuberville, T.D. and V.J. Burke. 1994. Do flag markers attract turtle nest predators? Journal of Herpetology 28(4):514-516.

Vogt, R.C. 1994. Temperature controlled sex determination as a tool for turtle conservation. Chelonian Conservation and Biology. 1(2):159-162.

Zappalorti, R.T. 1976. The Amateur Zoologist's Guide to Turtles and Crocodilians. Harrisburg, Pa., Stackpole Books. pp. 122-139.

Zappalorti, R.T. 1978-79. An updated progress report on the distribution and locality records of New Jersey's Endangered and Threatened reptiles and amphibians. For NJDEP, E&NSP, Vol. 10, Herpetological Associates, Inc., Parts 1-4. pp. 198.

Zappalorti, R.T. 1975 -1999. Personal field and laboratory observations. Herpetological Associates, Inc. N.J.

Zappalorti, R.T. and R.F. Farrell. 1980. An ecological study of the bog turtle, *Clemmys muhlenbergii* (Schoepff, Reptilia, Testudines, Emydidae), in New Jersey, Part III. Unpublished progress report submitted to NJDEP. HA File No. 81.12, pp. 1-36.

Zappalorti, R.T. and R. Farrell. 1989. A habitat evaluation and updated bog turtle survey of known colonies and locations throughout New Jersey. Report to NJDEP, E&NSP. Herpetological Associates, Inc. pp. 1-100.

Zappalorti, R.T., R.F. Farrell and P.A. Reap. 1985. Progress report on an experimental bog turtle management program in Monmouth County, New Jersey, Part II. Unpublished Report submitted to Endangered and Nongame Species Program, Division of Fish, Game and Wildlife, NJDEP. HA File No. 84.02.

Zappalorti, R.T. and E.W. Johnson. 1980. Additional updated locality and distribution records of endangered and threatened herptiles in New Jersey, Third Supplement. Unpublished report submitted to the NJDEP, HA File No. 81.15, pp. 55-68.

Zappalorti R.T. and E.W. Johnson. 1981. Proposed management plans for endangered and threatened amphibians and reptiles in New Jersey. Unpublished report submitted to the NJDEP, HA File No. 81.12, pp. 12-15.

Zappalorti, R.T. and G. Rocco. 1992. An intensive collection program and habitat evaluation to determine the population status of the bog turtle (*Clemmys muhlenbergii*) at the Nature Conservancy's Preserve in Lancaster, Pennsylvania, HA File No. 91.01, pp. 1-41.

Zappalorti, R.T. and G. Rocco. 1993. Surveys, habitat evaluations and ecological studies of the bog turtle (*Clemmys muhlenbergii*) in Chester and Lancaster Counties, Pennsylvania with recommendations on its conservation and management, HA File No. 93.08, pp. 1-71.

Zappalorti, R.T., G. Rocco, and P. J. Drake. 1995. Results of a two phase bog turtle (*Clemmys muhlenbergii*) study within the Cocalico Creek Drainage Basin in Lancaster County, Pennsylvania, with special notes on nesting. Unpublished report submitted to The Nature Conservancy. HA File No. 94.18 & 94.19, pp. 1-84.

Zappalorti, R.T., M.E. Torocco, and P.J. Drake. 1995. Results of bog turtle (*Clemmys muhlenbergii*) surveys and habitat evaluations conducted in eastern Pennsylvania during May and June, 1995. Unpublished report submitted to The Nature Conservancy. HA File No. 95.05, pp. 1-40.

Zappalorti, R.T. and E. Zanelli. 1978. The status and distribution of the bog turtle, *Clemmys muhlenbergii,* in New Jersey, Part I. Unpublished progress report submitted to NJDEP, pp. 1-58.

Zappalorti, R.T., E. Zanelli, and R.J. Farrell. 1979. The ecology and distribution of the bog turtle, *Clemmys muhlenbergii* (Schoepff), in New Jersey, Part II. Unpublished progress report submitted to NJDEP. HA File No. 79.02, pp. 1-38.

**********INSERT**********

Letter expected to be received
Late February from USFWS
Concurring with Conclusions
Of the Final Bog Turtle Phase II
Report

UPPER PASSAIC RIVER FLOOD CONTROL
LONG HILL TOWNSHIP, NEW JERSEY
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS

DETAILED PROJECT REPORT

CULTURAL RESOURCES

ATTN: LYNN RAKOS

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

January 31, 2003

RECEIVED
FEB 7 2003
HISTORIC PRESERVATION OFFICE

HPO-B2003-236
03-1024-1 DF

REPLY TO
ATTENTION OF
Environmental Assessment Section
Environmental Analysis Branch

Ms. Dorothy P. Guzzo
Deputy Chief Historic Preservation Officer
Historic Preservation Office
New Jersey Department of Environmental Protection
CN 404
Trenton, New Jersey 08625

Dear Ms. Guzzo:

The U.S. Army Corps of Engineers, New York District (Corps), is currently conducting a feasibility study along the Upper Passaic River in Long Hill Township, Morris County, NJ. A cultural resources survey was conducted by the Corps for one of the proposed alternatives. The resulting draft report entitled, "A Cultural Resources Survey in Connection with the Upper Passaic Flood Control Study, Long Hill Township, Morris County, New Jersey", by Lynn Rakos and Carsissa DeRooy is enclosed for your review.

Background research was conducted which was followed by fieldwork. A total of 21 tests were excavated along a proposed 3,650-foot alignment on the flood plain of the Passaic River. No significant cultural materials were recovered.

It is the Corps' opinion that there are no resources eligible for the National Register of Historic Places within the area of proposed construction. No further cultural resources work will be undertaken if project plans remain as proposed. Please review the enclosed document and provide Section 106 comments, pursuant to 36 CFR 800.5. Original photographs will be submitted with the final report. If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (212) 264-0229.

CONCUR

FEB 28 2003

DEPUTY STATE HISTORIC
PRESERVATION OFFICER

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

Enclosure

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

December 5, 2002

Environmental Assessment Section
Environmental Analysis Branch

Mr. Larry Fast
Chairman,
Long Hill Township Historical
Preservation Advisory Committee
498 Long Hill Road
Gillette, NJ 07933

Dear Mr. Fast:

The Army Corps of Engineers, New York District (Corps) is undertaking the Upper Passaic River and Tributaries Feasibility Study in Long Hill Township, Morris County, New Jersey. Several alternatives are being considered, one of which includes the construction of a levee and floodwall south of Valley Road from a tributary west of South Main Street, running east to Poplar Drive. Enclosed is a map on which the proposed levee/floodwall is indicated (Enclosure 1). The enclosed fact sheet contains further information about the overall study (Enclosure 2).

In addition to researching the history of the area, including an examination of historic maps, the Corps recently conducted a subsurface archaeological survey in the location of proposed construction. A total of 21 shovel tests were excavated. No cultural materials were recovered. A report will be prepared which will be coordinated with the New Jersey Historic Preservation Office. We will be happy to provide you with a copy of the draft document.

Should the Preservation Advisory Committee have any questions or comments about the cultural resources work conducted to date or have any information about the project area that you would like to provide to us please contact the Corps. Ms. Lynn Rakos, Project Archaeologist, can be reached at (212) 264-0229 and Ms. Carissa DeRooy, Archeological Intern, can be reached at (212) 264-0248. Thank you for your interest in this project.

Sincerely,

L. Houston

Leonard Houston
Chief, Environmental Analysis Branch

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278–0090

REPLY TO
ATTENTION OF

December 5, 2002

Environmental Assessment Section
Environmental Analysis Branch

Peg Schultz
Morris County Heritage Commission
PO Box 900
Morristown, NJ 07963-0900

Dear Ms. Schultz:

The Army Corps of Engineers, New York District (Corps) is undertaking the Upper Passaic River and Tributaries Feasibility Study in Long Hill Township, Morris County, New Jersey. Several alternatives are being considered, one of which includes the construction of a levee and floodwall south of Valley Road from a tributary west of South Main Street, running east to Poplar Drive. Enclosed is a map on which the proposed levee/floodwall is indicated (Enclosure 1). The enclosed fact sheet contains further information about the overall study (Enclosure 2).

In addition to researching the history of the area, including an examination of historic maps, the Corps recently conducted a subsurface archaeological survey in the location of proposed construction. A total of 21 shovel tests were excavated. No cultural materials were recovered. A report will be prepared which will be coordinated with the New Jersey Historic Preservation Office. We will be happy to provide you with a copy of the draft document.

Should the Morris County Heritage Committee have any questions or comments about the cultural resources work conducted to date or have any information about the project area that you would like to provide to us please contact the Corps. Ms. Lynn Rakos, Project Archaeologist, can be reached at (212) 264-0229 and Ms. Carissa DeRooy, Archeological Intern, can be reached at (212) 264-0248. Thank you for your time.

Sincerely,

L. Houston

Leonard Houston
Chief, Environmental Analysis Branch

UPPER PASSAIC RIVER FLOOD CONTROL
LONG HILL TOWNSHIP, NEW JERSEY
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS

DETAILED PROJECT REPORT

US FISH AND WILDLIFE COORDINATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

FP-02/066

MAR 20 2003

Leonard Houston, Chief
Environmental Analysis Branch, CENAN-PL-E
New York District, Army Corps of Engineers
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York 10278-0090

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶ 3

To	From
Melissa Alverez	Wendy Walsh
Dept./Agency	Phone #
NY Corps	609-383-3938 x48
Fax #	Fax #
212-264-0961	

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Dear Mr. Houston:

This is in regard to ongoing informal consultation between the U.S. Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers, New York District (Corps) pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) regarding potential effects of the Corps Upper Passaic River Tributaries flood control project on the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*). The project is located in Long Hill Township, Morris County, New Jersey, and consists of an approximately 0.7-mile proposed floodwall that would separate developed lots along the south side of Valley Road from forested wetlands along the Passaic River's northern floodplain. The project also includes a flood gate on an unnamed Passaic River tributary, east of Morristown Road. The project originally included seven areas under consideration for an ecosystem restoration component of the project. In our December 2, 2002 letter (ES-02/727), the Service requested that a recognized, qualified herpetologist conduct a bog turtle habitat survey in all areas of scrub/shrub and emergent wetlands potentially affected by flood control and/or restoration activities.

AUTHORITY

This response is provided pursuant to the ESA to ensure the protection of federally listed endangered and threatened species. This does not constitute the report of the Secretary of the Interior pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*) (FWCA). These comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comments by the Service pursuant to the December 22, 1993 Memorandum of Agreement among the U.S. Environmental Protection Agency, New Jersey Department of Environmental Protection (NJDEP), and the Service, if project implementation requires a permit from the NJDEP pursuant to the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B *et seq.*); nor do they preclude comments on

any forthcoming environmental documents pursuant to the National Environmental Policy Act of 1969 as amended (83 Stat. 852; 42 U.S.C. 4321 *et seq.*).

SURVEY RECOMMENDATIONS

Based upon a review of the Service's National Wetlands Inventory maps and aerial photographs, five of the seven restoration sites appear to offer the most suitable bog turtle habitat in the project vicinity. A February 26, 2003 electronic mail from Corps staff indicates that none of these seven areas are currently being considered for an ecosystem restoration project, or as mitigation sites for wetland impacts from the proposed flood control structures. Therefore, habitat surveys of these areas are not necessary.

On March 6, 2003, Service staff conducted a site visit with the Corps contractor, Matrix Environmental & Geotechnical Services, Inc. Based on the site visit and the Corps Natural Resource Inventory Report, the Service concurs that the floodgate area does not provide any potential bog turtle habitat. The Service also concurs that most of the wetlands potentially affected by the proposed floodwall do not provide suitable habitat for bog turtles. Most of the wetlands along the flood wall route are forested and may be occupied by transient turtles, but do not constitute core habitat for this species. The Service will provide recommendations in our forthcoming Planning Aid Letter to avoid impacts to any transient bog turtles during floodwall construction.

Although most wetlands potentially affected by the floodwall are forested, a few are not forested. The utility right-of-way that crosses the project route includes mowed areas and a *Phragmites*-dominated emergent wetland. Areas dominated by cattail (*Typha* spp.) are also present in this vicinity. Wetlands in the right-of-way will be directly and indirectly affected by the floodwall. In addition, emergent wetlands located on both sides of Main Avenue may be indirectly affected by the floodwall, due to hydrologic alterations. Neither of these areas appears to provide optimal bog turtle habitat. However, habitat suitability of these wetlands could not be determined definitively during the March 6 site visit, in part due to weather conditions (*i.e.*, heavy snow). Furthermore, bog turtles have been found in habitats considered sub-optimal.

To ensure compliance with the ESA and to avoid any potential effects to bog turtles, the Service recommends that a recognized, qualified bog turtle surveyor survey the above-specified emergent wetland areas in the vicinity of the proposed floodwall for the presence or absence of suitable bog turtle habitat. Survey guidance and a list of recognized surveyors were provided with our December 2, 2002 correspondence. Habitat surveys can be conducted at any time of year. However, if suitable habitat is documented in the project area, the Service will recommend proceeding with visual surveys, which must be conducted between April 15 and June 15. The results of any surveys, whether showing presence or absence, must be forwarded to this office for review. Please include the survey methods used and the qualifications of the surveyors.

Please contact Wendy Walsh of my staff at (609) 646-9310, extension 48 if you have any questions about Service's survey request, or consultation pursuant to Section 7 of the ESA.

Sincerely,

John C. Staples
Assistant Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

ES-02/727

DEC 2 2002

RECEIVED
DEC - 3 2002

Christopher Lanna, Project Manager
Matrix
215 Ridgedale Avenue
Florham Park, New Jersey 07932

Dear Mr. Lanna:

This responds to your October 10, 2002 request to the U.S. Fish and Wildlife Service (Service) for information on the presence of federally listed endangered and threatened species within the vicinity of the proposed U.S. Army Corps of Engineers (Corps) Upper Passaic Flood Control and environmental restoration project to be located in Long Hill Township, Morris and Somerset Counties, New Jersey. The Corps proposes to construct two flood control structures, a floodwall or levee and a floodgate, on unnamed tributaries of the Passaic River. We understand that the Corps is also investigating seven potential wetland restoration sites, which are: South of Rolling Hill Road; Warren Township Former Golf Course; Popular Drive, Laurel and Cedar Avenues; Morristown Road; Passaic River Reach; Valley Road, Warren Road Utility Corridor; and New Longhill Township Townhall. At this time, it is unclear whether the wetland restoration projects will be considered as compensatory mitigation for the flood control project or will be considered as separate ecosystem restoration projects.

AUTHORITY

This response is provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. These comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comments by the Service pursuant to the December 22, 1993 Memorandum of Agreement among the U.S. Environmental Protection Agency, New Jersey Department of Environmental Protection (NJDEP), and the Service, if project implementation requires a permit from the NJDEP pursuant to the New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B *et seq.*); nor do they preclude comments on any forthcoming environmental documents pursuant to the National Environmental Policy Act (83 Stat. 852; 42 U.S.C. 4321 *et seq.*), or comments and recommendations pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*).

FEDERALLY LISTED SPECIES

There are known occurrences of the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*) within approximately 1.0 mile of the project site. Bog turtles inhabit open, wet meadows and bogs with standing or slow-moving shallow water over a mucky substrate. Bog turtles also occur in emergent and scrub/shrub wetlands and spring-fed fens, and have been found within forested wetlands that contain areas of emergent or scrub/shrub wetland habitat. Bog turtles prefer areas with good sunlight, high evaporation rates, high humidity in the near-ground microclimate, and perennial saturation of portions of the ground. Threats to bog turtles include habitat loss from wetland alteration, development, natural vegetation succession, and illegal collection for the commercial pet trade (Bourg, 1992).

The Service's National Wetlands Inventory maps (Bernardsville and Chatham, New Jersey quadrangle) show emergent and scrub/shrub wetlands on the project site. Many areas of New Jersey have not been thoroughly surveyed for endangered and threatened plant and animal species. Therefore, bog turtles could be located within emergent or scrub/shrub wetlands on or adjacent to the project sites.

The Service recommends that the Corps conduct a bog turtle habitat screening of all scrub/shrub and emergent wetlands on and adjacent to any areas that may be affected by any of the project alternatives. The screening should be conducted by a qualified wetland scientist, and include a cursory assessment of hydrology, vegetation, and soils. The screening should be based upon maps and imagery, as well as site inspections. The results of the screening, including maps, photographs, site descriptions, and qualifications of the surveyor should be submitted to this office for review. Based on these results, the Service will work cooperatively with the Corps to identify any areas that warrant bog turtle habitat and/or visual surveys by a recognized, qualified bog turtle surveyor (see enclosed guidance and surveyor list).

A scope of work (SOW) between the Corps and the Service for the Fish and Wildlife Coordination Act assistance for the subject project is currently being developed. Ongoing consultation under Section 7 of the ESA regarding the bog turtle may be combined with other project coordination via the SOW. Threatened and endangered species and their habitats are afforded protection under Section 7(a)(2) of the ESA, which requires every federal agency, in consultation with the Service, to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. An assessment of potential direct, indirect, and cumulative impacts is required for all federal actions that may affect listed species. Further consultation between the Corps and the Service will be necessary pursuant to Section 7 of the ESA if bog turtles are found to occur on or adjacent to the project sites.

Except for the above-mentioned species and an occasional transient bald eagle (*Haliaeetus*

leucocephalus), no other federally listed or proposed endangered or threatened flora or fauna under Service jurisdiction are known to occur within the vicinity of the proposed project site. If additional information on federally listed species becomes available, or if project plans change, this determination may be reconsidered.

Current information regarding federally listed and candidate species occurring in New Jersey is enclosed, as well as addresses of State agencies that may be contacted for current site-specific information regarding federal candidate and State-listed species. The Service encourages federal agencies and other planners to consider federal candidate species in project planning. Information is also enclosed regarding permit requirements for activities in wetlands.

Please contact Lisa Solberg of my staff at (609) 646-9310, extension 47 if you have any questions about the enclosed material or require further assistance regarding federally listed endangered or threatened species.

Sincerely,

John C. Staples
Assistant Supervisor

Enclosures

REFERENCE

Bourg, N.A. 1992. Status of the bog turtle (*Clemmys muhlenbergii*) in North America. Eastern Heritage Task Force of the Nature Conservancy, Middletown, Pennsylvania. Report to the U.S. Fish and Wildlife Service. 33 pp.

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY

An **ENDANGERED** species is any species that is in danger of extinction throughout all or a significant portion of its range.

A **THREATENED** species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	Shortnose sturgeon*	*Acipenser brevirostrum*	E
REPTILES	Bog turtle*	*Clemmys muhlenbergii*	T
	Atlantic Ridley turtle*	*Lepidochelys kempii*	E
	Green turtle*	*Chelonia mydas*	T
	Hawksbill turtle*	*Eretmochelys imbricata*	E
	Leatherback turtle*	*Dermochelys coriacea*	E
	Loggerhead turtle*	*Caretta caretta*	T
BIRDS	Bald eagle	*Haliaeetus leucocephalus*	T
	Piping plover	*Charadrius melodus*	T
	Roseate tern	*Sterna dougallii dougallii*	E
MAMMALS	Eastern cougar	*Felis concolor couguar*	E+
	Indiana bat	*Myotis sodalis*	E
	Gray wolf	*Canis lupus*	E+
	Delmarva fox squirrel	*Sciurus niger cinereus*	E+
	Blue whale*	*Balaenoptera musculus*	E
	Finback whale*	*Balaenoptera physalus*	E
	Humpback whale*	*Megaptera novaeangliae*	E
	Right whale*	*Balaena glacialis*	E
	Sei whale*	*Balaenoptera borealis*	E
	Sperm whale*	*Physeter macrocephalus*	E

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY

An ENDANGERED species is any species that is in danger of extinction throughout all or a significant portion of its range.

A THREATENED species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	Shortnose sturgeon*	*Acipenser brevirostrum*	E
REPTILES	Bog turtle	*Clemmys muhlenbergii*	T
	Atlantic Ridley turtle*	*Lepidochelys kempii*	E
	Green turtle*	*Chelonia mydas*	T
	Hawksbill turtle*	*Eretmochelys imbricata*	E
	Leatherback turtle*	*Dermochelys coriacea*	E
	Loggerhead turtle*	*Caretta caretta*	T
BIRDS	Bald eagle	*Haliaeetus leucocephalus*	T
	Piping plover	*Charadrius melodus*	T
	Roseate tern	*Sterna dougallii dougallii*	E
MAMMALS	Eastern cougar	*Felis concolor couguar*	E+
	Indiana bat	*Myotis sodalis*	E
	Gray wolf	*Canis lupus*	E+
	Delmarva fox squirrel	*Sciurus niger cinereus*	E+
	Blue whale*	*Balaenoptera musculus*	E
	Finback whale*	*Balaenoptera physalus*	E
	Humpback whale*	*Megaptera novaeangliae*	E
	Right whale*	*Balaena glacialis*	E
	Sei whale*	*Balaenoptera borealis*	E
	Sperm whale*	*Physeter macrocephalus*	E

FEDERAL CANDIDATE SPECIES IN NEW JERSEY

CANDIDATE SPECIES are species that appear to warrant consideration for addition to the federal List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the U.S. Fish and Wildlife Service encourages federal agencies and other planners to give consideration to these species in the environmental planning process.

SPECIES	SCIENTIFIC NAME
Bog asphodel	*Narthecium americanum*
Hirst's panic grass	*Panicum hirstii*

Note: For complete listings of taxa under review as candidate species, refer to Federal Register Vol. 64, No. 205, October 25, 1999 (Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species).

Revised 11/99

FEDERAL CANDIDATE AND STATE-LISTED SPECIES

Candidate species are species under consideration by the U.S. Fish and Wildlife Service (Service) for possible inclusion on the List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the Service encourages federal agencies and other planners to consider federal candidate species in project planning.

The New Jersey Natural Heritage Program maintains the most up-to-date information on federal candidate species and State-listed species in New Jersey and may be contacted at the following address:

Mr. Thomas Breden
Natural Heritage Program
Division of Parks and Forestry
P.O. Box 404
Trenton, New Jersey 08625
(609) 984-0097

Additionally, information on New Jersey's State-listed wildlife species may be obtained from the following office:

Dr. Larry Niles
Endangered and Nongame Species Program
Division of Fish and Wildlife
P.O. Box 400
Trenton, New Jersey 08625
(609) 292-9400

If information from either of the aforementioned sources reveals the presence of any federal candidate species within a project area, the Service should be contacted to ensure that these species are not adversely affected by project activities.

Revised 08/00

PERMIT REQUIREMENTS FOR ACTIVITIES IN WETLANDS

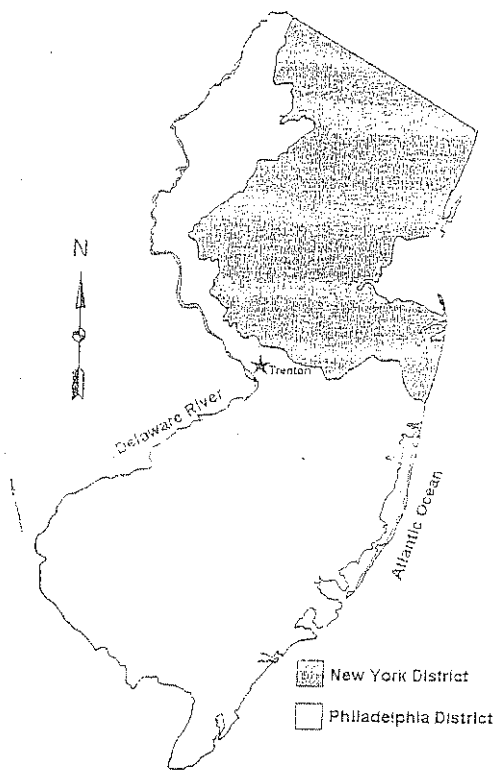
A review of the Service's National Wetland Inventory maps indicates that wetlands occur within the project area. Wetlands provide habitats for a variety of migratory and resident species of fish and wildlife. Thus, the Service discourages activities in and affecting the Nation's wetlands that would unnecessarily damage, degrade, or destroy the values associated with them. Project activities in wetlands may require federal and State permits from the U.S. Army Corps of Engineers pursuant to the Clean Water Act of 1977 (33 U.S.C. 1344 *et seq.*), and the New Jersey Department of Environmental Protection and Energy pursuant to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 *et seq.*). Thus, if work is proposed in wetlands, the following offices must be contacted to determine federal and State permit requirements, respectively:

Federal Permitting Authority:

Regulatory Branch
U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278-0090
(212) 264-3996
Fax #: (212) 264-4260

or

Regulatory Branch
U.S. Army Corps of Engineers
Philadelphia District
100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
(215) 656-6725
Fax #: (215) 656-6724



State Permitting Authority:

Land Use Regulation Program
Department of Environmental Protection and Energy
CN 401
Trenton, New Jersey 08625-0401
(609) 292-1235
Fax #: Northern Counties (609-292-1231); Southern Counties (609-292-8115)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Field Office
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

In Reply Refer to:

FP-03/08

APR 8 2003

Leonard Houston, Chief
Environmental Analysis Branch, CENAN-PL-E
New York District, Army Corps of Engineers
26 Federal Plaza
New York, New York 10278-0090
(ATTN: Melissa Alverez)

Dear Mr. Houston:

The U.S. Fish and Wildlife Service (Service) has reviewed preliminary project information for the U.S. Army Corps of Engineers, New York District's (Corps) Upper Passaic River Tributaries flood control project located in Long Hill Township (formerly Passaic Township), Morris County, New Jersey. The Service provides this Planning Aid Letter (PAL) pursuant to a Scope of Work dated December 27, 2002. The Service conducted a site visit with the Corps contractor Matrix Environmental & Geotechnical Services, Inc. (Matrix) on March 6, 2003. The Service has also reviewed the following project materials:

- Reconnaissance Study, July 1998 (U.S. Army Corps of Engineers, 1998);
- P-7 Milestone Report, November 2002 (U.S. Army Corps of Engineers, 2002a);
- Natural Resource Inventory Report, December 2002 (U.S. Army Corps of Engineers, 2002b); and
- Vegetation Survey Report, February 2003 (U.S. Army Corps of Engineers, 2003).

As described in various project materials and communications from Matrix staff, the preferred flood control alternative consists of: (1) a 3,200-foot-long floodwall to be constructed at the interface between Passaic River floodplain wetlands and developed lands along the south side of Valley Road between Poplar Drive and Passaic Avenue; and (2) a floodgate on an unnamed Passaic River tributary where the stream crosses Valley Road west of Western Boulevard. All environmental restoration alternatives were eliminated from further Corps consideration due to lack of local support.

AUTHORITY

The following comments are provided as planning aid and do not constitute the report of the Secretary of the Interior pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*) (FWCA). Comments are also provided under the authority of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) and the Migratory Bird Treaty Act (MBTA) (40 Stat. 755;16 U.S.C. 703-712), and are consistent with the intent of the Service's Mitigation Policy (Federal Register, Vol. 46, No. 15, Jan. 23, 1981).

ENDANGERED SPECIES CONSULTATION

In addition to our activities pursuant to the Scope of Work, the Service is conducting informal consultation with the Corps regarding potential effects of the proposed flood control project on the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*), pursuant to Section 7(a)(2) of the ESA. Based on our March 6, 2003 site visit, the Service recommended limited bog turtle habitat surveys in our March 20, 2003 letter (FP-02/066). Through the informal consultation process, the Service will make recommendations to avoid adverse effects to bog turtles. Consultation must be completed before finalization of documents prepared pursuant to the National Environmental Policy Act (83 Stat. 852; 42 U.S.C. 4321 *et seq.*) (NEPA), and before the Corps makes any irreversible or irretrievable commitment of resources (50 CFR Part 402.14).

WILDLIFE RESOURCES

The Service has reviewed the Corps Natural Resources Inventory Report (Inventory) and Vegetation Survey Report, including separate vegetation community maps of the proposed floodwall and floodgate areas. Together, these documents present an adequate overview of wildlife resources in the project areas. The Service offers the following information and comments to enhance the characterization of wildlife resources in future project documents.

Wildlife

On page 28 of the Inventory, the Corps indicates that field research in the project area was conducted during September and October 2002. The field research methodology, areas searched, and level of effort should be described. The results of the field research and a literature review are reported in the Inventory. The results consist of brief descriptions and species lists of various faunal groups. For reptiles, amphibians, and fish, the species given are potentially present in the project area, based on documents produced by the nearby Great Swamp National Wildlife Refuge. In the Inventory, the Corps states that no reptiles or amphibians were observed during field research, but does not indicate if any fish were observed; this should be clarified. For mammals and birds, the Inventory does not distinguish species that were actually observed in the project area from those likely or potentially present based on published reports. This distinction should be made in future project documents. In addition, species observed in the flood control project areas should be distinguished from those observed in the environmental restoration project areas, which are no longer under consideration for inclusion in the project.

Enclosed is a list of 84 bird species known to breed in the Breeding Bird Atlas block that

contains the forested wetlands immediately south of the proposed floodwall and floodgate. The list includes 15 species of management concern to the Service at the State, Bird Conservation Region, Northeast Region, or National level (U.S. Fish and Wildlife Service, 2002). Based on the size and connectivity of the forested wetlands south of the project areas, many breeding birds recorded in this Atlas block likely use this floodplain habitat. In addition, the central Passaic wetlands, including the project site, are a key pathway for migratory birds in New Jersey (Dunne, 1989).

The Service would support any Corps efforts to collect detailed, site-specific information regarding wildlife usage of the Passaic River floodplain habitats south of the flood control project areas. However, the Service does not find that such documentation is essential, given the size and nature of the proposed flood control structures. The Service's central concern in protecting wildlife resources is ensuring that the proposed floodwall and floodgate will not adversely affect the hydrology of the wetland system along the Passaic River, as discussed further below. A thorough assessment of effects to the hydrology of the floodplain is more important to protecting wildlife than a detailed faunal inventory.

Rare, Threatened, and Endangered Species

In Section 3.3.2 of the Inventory, the Corps presents the results of Service and New Jersey Department of Environmental Protection's (NJDEP) Natural Heritage Program (Heritage Program) endangered species reviews. Based on the Service's review, the Corps and the Service are conducting informal consultation to determine the presence or absence of bog turtle habitat in the floodwall project area, as noted above.

On pages 33-39 of the Inventory, the Corps presents results of the Heritage Program database search. This information should be clarified in future project documents. Correspondence from the Heritage Program in Appendix I of the Inventory indicates that the Heritage database has no records of rare species or natural communities on the project sites in Passaic (Long Hill) and Warren Townships. The Corps should clarify if this search included both the flood control and environmental restoration project sites. On page 33 of the Inventory, the Corps presents a list from the Natural Heritage database of rare species and natural communities "occurring in the project area." This wording is misleading, as the list is actually for all of Morris and Somerset Counties; as stated in its letter, the Heritage Program has no species records on the actual project sites.

Additionally on page 33 of the Inventory, the Corps mistakenly states that the Heritage Program database identified blue-spotted salamander (*Ambystoma laterale*), great blue heron (*Ardea herodias*), red-shouldered hawk (*Buteo lineatus*), and wood turtle (*Clemmys insculpta*) in habitat patches located on some of the project sites. Although reported in the Heritage Program's letter, these records are not from the Heritage Program database, but rather from the NJDEP's Landscape Project mapping (New Jersey Department of Environmental Protection, undated). The Service reviewed the Landscape Project and found that habitat for blue-spotted salamander, great blue heron, and wood turtle is depicted only on certain environmental restoration project sites, which are no longer under consideration. These three species are not considered present in

the flood control project areas. However, the flood control project areas do provide habitat for red-shouldered hawk, according to the Landscape Project. Red-shouldered hawk should be considered present in the flood control project areas. Breeding populations of red-shouldered hawks are State-listed as endangered. The Service will coordinate with the NJDEP to determine if any mitigative measures are appropriate for this species.

The Service has reviewed the Heritage Program Rare Plant Grid and found that no State-listed or rare plants are recorded in the grid containing the flood control project sites. This is consistent with the Heritage Program's letter stating that no rare species are recorded from the project sites. Likewise, the Corps did not find any State-listed or rare plants during the vegetation survey and mapping effort. However, the Corps indicates in the Vegetation Survey Report that some species that were outside of their normal flowering or fruiting season or that exhibit non-persistent vegetation may not have been identified during the survey, which was conducted in late fall. The Service recommends conducting a rare plant survey along the floodwall right-of-way during appropriate seasons. Surveys should include those species on the Heritage Program's Morris and Somerset County list that may be present in the floodwall corridor, based on habitat suitability.

Vegetation Survey Report

The most serious limitation of the Corps effort to characterize vegetation in the project area is that nearly all the sample stations were located at the edges of cover types. This is likely the result of focusing vegetation survey efforts in the immediate vicinity of the floodwall and floodgate construction areas. The Vegetation Survey Report adequately characterizes the vegetation in the construction zones, and the Service concurs that documentation of the vegetative communities in the construction zones is a priority, as these areas will be directly impacted by clearing and other activities. However, due to the lack of survey stations in interior forest locations, information in the Vegetation Survey Report is insufficient to characterize the larger floodplain wetland complex south of the proposed floodwall and floodgate. If additional vegetation surveys are possible, the Service recommends locating sample stations in interior areas of forested wetland blocks, particularly those blocks that are contiguous with the construction zones such as tax Blocks 1 (Wetland Area E), 3 (Wetland Area D), and 39 (Wetland Area A).

Discrepancies exist between the Vegetation Survey Report and the accompanying maps. On page 7 of the report, Wetland Area A is described as containing floodplain forest and scrub/shrub cover types; however, no scrub/shrub areas are shown on the map. There are also discrepancies between the maps and the report regarding cover types at three sample stations. Station 7 is mapped at the edge of floodplain forest, but is described on page 7 of the report as developed land consisting of landscaped lawn. The report continues to describe an understory at station 7, and indicates that size of the sample plot was 30 meters, the size used in floodplain forest. The report should clarify the extent of floodplain forest at station 7. Likewise, station 11 is described as containing scrub/shrub and floodplain forest cover types (page 8 of the report), but is mapped only in a scrub/shrub area. Station 17 is described on page 9 as a floodplain forest cover type, but is mapped in a narrow area classified as disturbed floodplain forest at the edge of an area classified as developed land. These discrepancies need to be corrected.

In describing the survey methods, the report would be improved with a citation or justification to support the size of the community-dependant diameters used at the sampling stations. For sample stations 11 and 18, species compositions and percent aerial cover are combined between tree and shrub layers of forested wetlands; vegetation composition of different strata should be distinguished. On page 8 of the report, the Corps should clarify if broad-leaved cattail (*Typha latifolia*) dominates station 12 and common reed (*Phragmites australis*) dominates station 13, or if both species occur at both stations. On page 13, the Corps should clarify in which cover types Virginia wild rye (*Elymus virginicus*) and wood reedgrass (*Cinna arundinacea*) are the dominant herbaceous species. Finally, it would be helpful to add scale bars to the vegetation community maps, and to provide a map of the wetland delineation showing Wetland Areas A through E, which are referenced in the Vegetation Survey Report and in the Inventory.

ALTERNATIVES ANALYSIS

The P-7 Milestone Report (U.S. Army Corps of Engineers, 2002a) presents the results of preliminary project alternative formulation and screening. All environmental restoration alternatives have been eliminated from further consideration, primarily due to lack of local interest and support, and lack of a local sponsor to cost-share in funding.

The P-7 Milestone Report presents clear planning objectives and constraints, including minimizing adverse impacts on fish and wildlife resources. The Service appreciates the Corps' early and explicit identification of the need to protect wildlife. The report presents descriptions and screening results for nine flood control alternatives. Based on substantial environmental impacts, the Service concurs with the Corps decision to reject Alternative 1 (dredging, channelization and streambank clearing), Alternative 2 (upstream detention structures), and Alternative 3 (levee along the Passaic River).

To minimize adverse impacts to wildlife, Alternative 8 (non-structural measures) or Alternative 9 (automated flood warning system) are the most preferable. The Service recognizes that a flood warning system alone was deemed insufficient to address flooding problems, but recommends that the Corps provide economic data in future project documents to support elimination of non-structural measures. In the screening rationale for Alternative 8 (page 23 of the P-7 report), the Corps states that neither widespread floodproofing of residences, businesses, and public facilities, nor acquisition and relocation of structures from the floodplain, is economically feasible as a primary alternative. These statements should be supported with a summary of economic findings.

Based on minimal environmental impacts, the Service would find Alternatives 4 (closure structures on tributaries at road crossings), 5 (closure structures on tributaries plus road raising), or 6 (closure structures plus I-wall along flood prone roads) the most preferable alternatives after Alternatives 8 and 9. However, the Service recognizes that Alternative 4 was deemed insufficient to address flooding problems, and that Alternatives 5 and 6 were rejected by the local sponsor due to traffic disruptions during construction.

Alternative 7 (setback floodwall levee off Valley Road with gates on tributaries) was retained for further study in the P-7 Milestone Report. With some modifications, this is currently the Corps

preferred alternative. Impacts to wildlife resources from the flood control project, as currently proposed, are addressed below.

PROPOSED PROJECT

Project Description

According to the Vegetation Survey Report, the proposed floodwall would be approximately 3,200 feet long, beginning about 85 feet west of Poplar Drive at the southern edge of developed land along Valley Road, and ending approximately 200 feet west of Passaic Avenue. According to the P-7 Milestone Report, the wall would be tied into higher ground on either end, and constructed to an elevation of 216 feet above the North American Vertical Datum. The P-7 report gives an expected wall height of 3 to 4 feet above the existing terrain, but more recent correspondence from Matrix indicates the height would be 4 to 5 feet, with an additional 15 feet of wall extending below ground. As originally conceived in the P-7 report, the structure would be a combination levee and floodwall. However, more recently Matrix staff described the structure as a vinyl sheet pile wall, about 6 inches thick, along the entire alignment. Construction of the wall would require a 20-foot-wide corridor for vehicle and equipment access. A somewhat narrower right-of-way would be maintained after construction for maintenance of the floodwall. Ramps would be constructed on Warren Avenue and Main Avenue to allow traffic on these side streets to move over the wall.

In the P-7 Milestone Report, the Corps indicates that two closure structures would be required to restrict Passaic River backwater flow through two unnamed Passaic River tributaries that would be crossed by the floodwall. Alterations of the stream channels would be required to construct vertically hinged gates in these locations. A section of stream channel upstream and downstream of the floodwall crossing would require concrete lining with vertical sides at the gate location, and trapezoidal sides where the stream discharge is diverted from the natural channel towards the gate. Permanent or temporary pump facilities would be required at each stream crossing, and passive drainage, perhaps achieved by gated weep holes, would be needed along the length of the floodwall.

According to Matrix staff, the map labeled *Mitigation Analysis Floodwall Only - Modified Alignment "Chosen Alternative"* depicts the floodwall alignment currently under active consideration by the Corps. In the P-7 Milestone Report, the Corps states that wherever possible, the alignment has been adjusted to allow inundation of wetlands along the Passaic River. Based on the Service's site visit, most of the proposed alignment is located at the interface of floodplain wetlands and developed retail and residential properties that lie on the south side of Valley Road. In addition to the floodwall, one of four closure structures considered under Alternative 4 is included as part of the proposed flood control project. A manually-operated floodgate would be installed on a third unnamed Passaic River tributary located east of the floodwall. The gate would be installed where this tributary crosses Valley Road just west of Western Boulevard. The gate would normally remain open, but would be closed by emergency management personnel when triggered by a flood warning system.

Project Impacts

At this time, the Service does not have sufficient information to evaluate direct project impacts from in-stream work, such as installation of closure structures, or to make specific recommendations for avoiding construction-related impacts (*e.g.*, fencing, equipment access, best management practices). The Service requests that the Corps provide project plans for both the proposed floodwall, including draining and closure features, and for the floodgate as they become available. At that time, the Service can more fully evaluate direct project impacts to wildlife, and can make more specific recommendations to mitigate direct effects from construction of the flood control structures. Preliminary comments are provided below regarding expected project impacts to wildlife resources, and initial recommendations to avoid adverse effects.

Based on information available to the Service, it appears that the floodwall alignment has been designed to avoid and minimize wetland impacts. In addition, some wetland areas to be crossed by the wall have been converted to maintained lawns by residents. However, the Service recommends that the Corps investigate additional adjustments to the alignment that would further reduce wetland impacts. Specifically, the Corps should determine if the wall can be relocated closer to Valley Road where it crosses the utility right-of-way, to avoid emergent wetlands in that area. The Corps should also determine if wetland impacts could be reduced by moving the wall closer to the homes on tax Block 1. The Service also recommends that the Corps locate and design the wall to minimize removal of mature trees, as they provide food and cover for migratory birds.

Future project documentation needs to provide acreage of freshwater wetlands and transition areas expected to be impacted by the project, distinguishing wetlands maintained as lawn from other wetlands. The documentation should also differentiate any permanent freshwater wetland fill from other wetland impacts, such as vegetation clearing, and should describe the extent of necessary tree clearing (*i.e.*, numbers and locations of mature trees). In addition, future project documents need to include descriptions of the compensatory freshwater wetland mitigation proposed for compliance with State regulations.

The total area impacted by construction of the floodwall would be approximately 1.5 acres (20 feet wide by 3,200 feet long). Along much of the alignment, the northern half of the 20-foot construction zone would be located on developed lands such as parking lots and maintained lawns. Therefore, the floodplain wetland complex would be reduced in total size by less than 1.5 acres. These direct impacts would be located at the wetland/developed land interface, where habitats are of marginal value to wildlife. Location of the floodwall at the edge of the wetlands would also avoid fragmenting these habitats. Therefore, the Service does not anticipate significant direct effects to wildlife resources from floodwall construction, particularly if the Corps continues to emphasize minimization of both wetland impacts and tree clearing during project planning and design.

Although significant direct impacts are not expected from floodwall construction, indirect effects from changes in wetland hydrology could severely impact wildlife resources. The Service recognizes that the hydrology of the Passaic River floodplain south of the project areas was historically altered, to include construction and/or straightening of the tributaries. However, the largely forested wetland complex along the river is currently part of a functioning and intact floodplain, providing valuable wildlife habitat and flood water storage. The Service's central

concern is that the proposed flood control structures must not alter the hydrology of the floodplain wetland complex in ways that would impair these critical functions.

The Service recommends that future project documents include a thorough and detailed assessment of project effects on wetland hydrology. The assessment should include anticipated changes in sheetflows, streamflows, and groundwater flows into the floodplain wetlands, including a more detailed description of how the proposed pump and passive draining facilities along the floodwall would function. The assessment should also address the effects of backing up flood waters in the wetlands behind the flood control structures during storm events. The Service also recommends that the Corps investigate current water quality of flows into wetlands in order to: (1) ensure that the proposed flood control structures would not worsen water quality; and (2) investigate options to incorporate project features that would improve water quality where appropriate and feasible.

CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

The Service's primary concern to protect wildlife resources from the proposed Upper Passaic flood control project is to ensure that floodwall and floodgate structures would not alter wetland hydrology in ways that may impair the functions of the Passaic River floodplain. Due to ongoing Corps efforts to avoid tree clearing, fragmentation, and wetland impacts, the Service does not anticipate significant direct adverse effects to wildlife from construction of the flood control structures. The Service offers the following summary recommendations for future project documents.

1. Describe the methodology, areas searched, and level of field research effort for the Natural Resources Inventory Report.

2. Distinguish actual wildlife observations from species likely or potentially present in the project area based on published records.

3. In describing natural resources, distinguish flood control project areas from environmental restoration areas, which are no longer under consideration.

4. Clarify the presentation of Heritage Program and Landscape Project information regarding rare and State-listed species.

5. Incorporate appropriate mitigative measures for red-shouldered hawk as may be recommended by the Service and the NJDEP.

6. Conduct a rare plant survey during appropriate seasons along the floodwall construction corridor.

7. Conduct additional vegetation sampling to characterize forested wetland interior cover types.

8. Clarify the presentation of results in the Vegetation Survey Report.

9. Provide economic data to support the finding that non-structural means of alleviating flood damages (*i.e.*, floodproofing, acquisition, or relocation of structures) are not economically feasible.

10. Provide project plans for the proposed floodwall, including draining and closure features, and for the floodgate, as this information becomes available.

11. Investigate additional adjustments to the floodwall alignment that would further reduce wetland impacts and tree clearing.

12. Provide acreage of freshwater wetlands and transition areas expected to be impacted by the project. Distinguish wetlands maintained as lawn from other wetlands, differentiate any permanent freshwater wetland fill from other wetland impacts, such as vegetation clearing, and describe the extent of tree clearing.

13. Provide the compensatory mitigation proposal for unavoidable adverse impacts to freshwater wetlands.

14. Conduct a thorough and detailed assessment of project effects on wetland hydrology, including anticipated changes in sheetflows, streamflows, and groundwater flows into the floodplain wetlands, and the effects of backing up flood waters in the wetlands behind the flood control structures during storm events.

15. Investigate current water quality of flows into wetlands, ensure that the proposed flood control structures would not further degrade water quality, and seek opportunities to improve water quality.

In addition, informal consultation regarding the bog turtle must be completed prior to finalization of any NEPA documents.

The Service appreciates the opportunity to provide input into the Upper Passaic flood control project. Should you have any questions, please contact John Staples or Wendy Walsh of my staff at (609) 646-9310 extensions 18 and 48, respectively.

Sincerely,

Clifford G. Day
Supervisor

Enclosure

REFERENCES

Dunne, P. (ed.). 1989. New Jersey at the crossroads of migration. New Jersey Audubon Society. Bernardsville, New Jersey. 75 pp.

New Jersey Department of Environmental Protection. Undated. New Jersey's Landscape Project, wildlife habitat mapping for community land-use planning and endangered species conservation. http://www.state.nj.us/dep/fgw/ensp/landscape/index.htm. Accessed April 3, 2003.

U.S. Army Corps of Engineers. 1998. Reconnaissance study, Upper Passaic River, New Jersey flood control and environmental restoration study, Section 905(b) (WRDA 86) preliminary analysis. U.S. Army Corps of Engineers, New York District, New York, New York. 20 pp. + Attachments.

_____. 2002a. Upper Passaic River, New Jersey flood control and environmental restoration feasibility study, P-7 milestone report, preliminary formulation of alternatives. U.S. Army Corps of Engineers, New York District, New York, New York. 35 pp.

_____. 2002b. Natural resource inventory report, feasibility study for the Upper Passaic River, New Jersey flood control and environmental restoration project, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 86 pp. + Appendices.

_____. 2003. Vegetation survey report, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 13 pp. + Appendices.

U.S. Fish and Wildlife Service. 2002. Birds of management concern 2002. Department of the Interior, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia 23 pp. + tables.

cc: NJFO (2)
NJDEP, DFW
NJDEP, ENSP
NJDEP, LURP

Brett Berkeley, Senior Wetland Scientist
MATRIX Environmental & Geotechnical Services, Inc.
215 Ridgedale Avenue
Florham Park, New Jersey 07932

ES:NJFO: WWalsh:wlw:4/3/02 j:\wwalsh\fp03008wlw.wpd
Final: jg 4/4/03

Enclosure

BREEDING BIRD ATLAS BLOCK SPECIES LIST

"NJFO" denotes a breeding bird of concern in New Jersey to the Service's New Jersey Field Office.

"Service" denotes a bird of management concern to the Service at the level of one of three Bird Conservation Regions in New Jersey, the Northeast Region, or the Nation (U.S. Fish and Wildlife Service, 2002).

Species Common Name	Species Latin Name	Species of Concern
Acadian Flycatcher	*Empidonax virescens*	
Alder Flycatcher	*Empidonax alnorum*	NJFO, Service
American Crow	*Corvus brachyrhynchos*	
American Goldfinch	*Carduelis tristis*	
American Robin	*Turdus migratorius*	
American Woodcock	*Scolopax minor*	NJFO
Bank Swallow	*Riparia riparia*	
Barn Swallow	*Hirundo rustica*	
Belted Kingfisher	*Ceryle alcyon*	
Black Vulture	*Coragyps atratus*	
Black x Mallard Hybrid	*Anas sp.*	
Black-and-white Warbler	*Mniotilta varia*	
Black-billed Cuckoo	*Coccyzus erythropthalmus*	NJFO, Service
Black-capped Chickadee	*Parus atricapillus*	
Blue Jay	*Cyanocitta cristata*	
Blue-winged Warbler	*Vermivora pinus*	Service
Bobolink	*Dolichonyx oryzivorus*	NJFO
Broad-winged Hawk	*Buteo platypterus*	
Brown Thrasher	*Toxostoma rufum*	
Brown-headed Cowbird	*Molothrus ater*	
Canada Goose	*Branta canadensis*	
Carolina Wren	*Thryothorus ludovicianus*	
Cedar Waxwing	*Bombycilla cedrorum*	
Chimney Swift	*Chaetura pelagica*	
Chipping Sparrow	*Spizella passerina*	
Common Grackle	*Quiscalus quiscula*	
Common Yellowthroat	*Geothlypis trichas*	
Cooper's Hawk	*Accipiter cooperii*	
Downy Woodpecker	*Picoides pubescens*	
Eastern Kingbird	*Tryannus tryannus*	NJFO
Eastern Meadowlark	*Sturnella magna*	NJFO
Eastern Phoebe	*Sayornis phoebe*	
Eastern Wood-Pewee	*Contopus virens*	
European Starling	*Sturnus vulgaris*	
Field Sparrow	*Spizella pusilla*	
Fish Crow	*Corvus ossifragus*	
Gray Catbird	*Dumetella carolinensis*	
Great Crested Flycatcher	*Myiarchus crinitus*	
Green Heron	*Butorides striatus*	
Hairy Woodpecker	*Picoides villosus*	
House Finch	*Carpodacus mexicanus*	
House Sparrow	*Passer domesticus*	

House Wren	*Troglodytes aedon*	
Indigo Bunting	*Passerina cyanea*	
Killdeer	*Charadrius vociferus*	
Louisiana Waterthrush	*Seiurus noveboracensis*	Service
Mallard	*Anas platyrhynchos*	
Mourning Dove	*Zenaida macroura*	
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	
Northern Cardinal	*Cardinalis cardinalis*	
Northern Flicker	*Colaptes auratus*	
Northern Harrier	*Circus cyaneus*	NJFO, Service
Northern Mockingbird	*Mimus polyglottos*	
Northern Oriole	*Icterus galbula*	
Orchard Oriole	*Icterus spurius*	
Ovenbird	*Seiurus aurocapillus*	
Pileated Woodpecker	*Dryocopus pileatus*	
Purple Martin	*Progne subis*	
Red-bellied Woodpecker	*Centurus carolinus),*	
Red-eyed Vireo	*Vireo olivaceus*	
Red-shouldered Hawk	*Buteo lineatus*	NJFO
Red-tailed Hawk	*Buteo jamaicensis*	
Red-winged Blackbird	*Agelaius phoeniceus*	
Rock Dove	*Columba livia*	
Rufous-sided Towhee	*Pipilo erythrophthalmus*	
Scarlet Tanager	*Piranga olivacea*	
Song Sparrow	*Melospiza melodia*	
Spotted Sandpiper	*Actitis macularia*	NJFO
Swamp Sparrow	*Melospiza georgiana*	NJFO
Tree Swallow	*Tachycineta bicolor*	
Tufted Titmouse	*Parus bicolor*	
Turkey Vulture	*Cathartes aura*	
Veery	*Catharus fuscescens*	
Warbling Vireo	*Vireo gilvus*	
White-breasted Nuthatch	*Sitta carolinensis*	
Wild Turkey	*Meleagris gallopavo*	
Willow Flycatcher	*Empidonax traillii*	
Wood Duck	*Aix sponsa*	
Wood Thrush	*Hylocichla mustelina*	Service
Worm-eating Warbler	*Helmitheros vermivorus*	Service
Yellow Warbler	*Dendroica petechia*	
Yellow-billed Cuckoo	*Coccyzus americanus*	NJFO
Yellow-throated Vireo	*Vireo flavifrons*	

LITERATURE CITED

U.S. Fish and Wildlife Service. 2002. Birds of management concern 2002. Department of the Interior, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 23 pp. + tables.

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United States Army Corps of Engineers - New York District

Memo:

To:	Wendy Walsh	**From:**	Melissa D. Alvarez
Re:	Upper Passaic PAL Comments	**CC:**	R. Henn, B. Berkely
Date :	May 12, 2003		

Recommendations:

1. **Describe the methodology, areas searched, and level of field research effort for the Natural Resources Inventory Report.**

   The methodology used to search the project corridor is documented in the Natural Resources Inventory, the Vegetation Sampling Report and the Vegetation Survey Report prepared in support of the Environmental Assessment. Approximately, 120 man hours of field time was invested in the Natural Resources Inventory (NRI). This effort is continuing through the completion of a Phase II bog turtle survey within a portion of the project corridor. We anticipate adding an additional 160 man hours of field research by the end of June. Although this effort will focus primarily on bog turtle any other wildlife observed during the field investigation will be documented by members of the project team. In addition to the man hours spent in the field an additional 120 man hours of research were expended during the production of the NRI.

   Approximately, 140 man hours were spent conducting the vegetation survey in the field. An additional 100 man hours of research and production time were expended during the production of the vegetation survey report.

   Every effort will be made to further clarify this in future project documents.

2. **Distinguish actual wildlife observations from species likely or potentially present in the project area based on public records.**

   The Integrated Feasibility Report & Environmental Assessment has been amended to show which species were actually observed in the field.

3. **In describing natural resources, distinguish flood control project areas from environmental restoration areas, which are no longer under consideration.**

   The Integrated Feasibility Report & Environmental Assessment clearly distinguishes between areas that were evaluated for ecosystem restoration potential from natural resources located within the project corridor.

4. **Clarify the presentation of Heritage Program and Landscape Project information regarding rare and State-listed species?**

   The Integrated Feasibility Report & Environmental Assessment has been amended to clearly indicate the difference between Landscape Project Data and the information contained within the Heritage Program Database.

5. **Incorporate appropriate mitigative measures for red-shouldered hawk as may be recommended by the Service and the NJDEP.**

   Any forwarded recommendations will be evaluated and addressed appropriately.

6. **Conduct a rare plant survey during appropriate seasons along the floodwall construction corridor.**

   Current project schedules and budgets will not permit such a survey. The vegetation survey that has already been completed gives not indication of rare plants.

7. **Conduct additional vegetation sampling to characterize forested wetland interior cover types**

   The Corps recognizes the validity of this comment however, at this time our impact analysis indicates that there will not be an impact to any interior habitats and therefore additional sampling is not warranted at this time.

8. **Clarify the presentation of results in the Vegetation Survey Report.**

   The vegetation survey sent to your office for review was a draft copy. The vegetation survey report is being revised based on ACE and FWS staff comments. A copy of the final report can be forwarded to your office upon request.

9. **Provide economic data to support the finding that non-structural means of alleviating flood damages (i.e. floodproofing, acquisition,or relocation of structures) are not economically feasible.**

   See the formulation section within the Integrated Feasibility Report & Environmental Assessment.

10. **Provide project plans for the proposed flood wall, including drainage and closure features, and for the floodgates, as this information becomes available.**

    As more detailed design information is developed it will be forwarded. However in this phase of the project detailed plans are not available.

11. **Investigate additional adjustments to the floodwall alignment that would further reduce wetland impacts.**

    As detailed design plans are developed in the next phase of the project, any feasible adjustments to the alignment that may further reduce wetland impacts will be investigated. Additionally, a Joint Application for an Individual Freshwater Wetlands and Stream Encroachment will be prepared and submitted to the NJDEP during a later phase of the project. The present alignment and all viable alternatives will be thoroughly investigated again during the regulatory review of this permit application. However, the project is currently in the Feasibility Phase where this level detail is not currently available.

12. **Provide acreage of freshwater wetlands and transition areas expected to be impacted by the project. Distinguish wetlands maintained as lawn from other wetlands, differentiate any permanent freshwater wetland fill from other wetland impacts, such as vegetation clearing, and describe the extent of tree clearing.**

    This comment is addressed to the extent possible within the mitigation section of the Integrated Feasibility Report and Environmental Assessment. These impacts are quantified along with preliminary proposals for mitigation including approaches and acreages in the Feasibility Report. A greater level of detail will be developed during later phases of the project and within the Joint NJ Freshwater Wetlands and Stream Encroachment Application.

13. **Provide the compensatory mitigation proposal for unavoidable adverse impacts to freshwater wetlands.**

    This comment is addressed within the mitigation section of the Integrated Feasibility Report and Environmental Assessment. It is also addressed in greater detail within the separate Environmental Assessment document. A greater level

of detail will be developed during later phases of the project and within the Joint NJ Freshwater Wetlands and Stream Encroachment Application.

14. **Conduct a thorough and detailed assessment of project effects on wetland hydrology, including anticipated changes in sheetflows, streamflows, and groundwater flows into the floodplain wetlands, and the effects of backing up flood waters in the wetlands behind the flood control structures during storm events.**

A. Passaic River floodplain wetlands south of the floodwall.

Sheetflows- The floodwall will be a barrier to sheetflows into the wetlands that flow from areas to the north; however, the size of the drainage areas to the north are not significant. Most of the flow from the north is collected along Valley Road and directed into ditches that take the runoff to the Passaic River. Sheet flows that are intercepted by the floodwall are not the major source of water that supports the wetlands to the south of the floodwall. Direct precipitation and floodwaters that spill out of the banks of the Passaic River are the primary sources of water that supports these wetlands. When the Passaic River spills out of its banks, it will inundate the floodplain to the floodwall (a distance of almost 2000 feet) because the ground elevation at floodwall is not significantly higher than the ground elevation of the bank of the Passaic River (elevation 210).

Stream Flows- The depth and duration of flooding will not be impacted significantly by the floodwall. Removal of natural floodplain storage north of the floodwall will increase the 100-year flood elevation by 0.1 feet due to minor increases in discharge along the Passaic River (hydrologic effect). Confining effective flowing floodwaters south of the floodwall will cause a negligible effect (0.01 feet) to 100-year flood elevation (hydraulic effect). Neither the hydrologic or hydraulic effect is expected to change the duration of flooding.

Groundwater Flows- The soil along the floodwall alignment is comprised mostly of dense clay to a depth of approximately 15 feet. The sheetpile floodwall will be driven into the ground approximately 11 feet. Groundwater was encountered in the borings along the floodwall between 5 and 10 feet; however, it was not clear that this was the groundwater table (possible capillary rise in the water table). Given that the permeability in dense clays is very low and the ground water table is not near the surface, the floodwall is not expected to have a major impact on groundwater levels. In addition, groundwater is not the major source of water to support the wetlands south of the floodwall. The major sources of water to support these wetlands are direct precipitation and water spilling out of the banks of the Passaic River (see "sheetflows" above).

B. Wetlands on the interior side north of the floodwall.

Sheetflows- The floodwall is not expected to change any sheetflow within interior drainage areas because the 3 sluice gates (at Passaic, Warren, and Western Roads)

will be open most of the time allowing interior drainage to flow naturally out towards the Passaic River. All 3 sluice gates are operated in conjunction with each other. That is, the three gates are either all open or all closed.

Stream Flows- Approximately once every 3 years, the gates will be closed to prevent floodwaters from the Passaic River (3-year Passaic River flood elevation of 211.0) from backing up into the interior areas and causing flood damage to homes and other property. Storms on the Passaic River less than the 3-year frequency will be allowed to ebb and flow into these wetlands as is currently occurring. Table 1 shows the frequency of flood stages on the Passaic River. For floods on the Passaic River much greater than the 3-year frequency, the gates will be closed before the Passaic River rises to elevation 211. This is done to reserve flood storage for interior runoff which will pond behind the floodwall. This interior ponding is estimated to rises to elevation 211.9 for the 100-year interior rainfall event and 211.5 for the 50-year interior rainfall event. Consequently, Passaic River floodwaters that are prevented from backflowing into these areas will be compensated for by the ponding of water that occurs from rainfall falling in the interior areas.

TABLE 1 Flood Stages on the Passaic River

2-year	5-year	10-year	25-year	50-year	100-year	250-year	500-year
210.4	212.2	213.4	214.5	215.2	216.2	216.9	217.6

For both minor and significant localized interior rainfall events when the Passaic River stages are low, the gates will remain open and the drainage patterns will essentially be unaltered from existing conditions.

The interior wetlands are located in areas where the ground elevation is between elevations 208 and 211 (primarily located along the high tension electric wire right-of-way). The change in hydrology occurring once every 3 years caused by the closing of the sluice gates to prevent flooding from the Passaic River is not expected to significantly impact the wetlands because water will hydrate these wetlands by interior rainfall events (when the Passaic River stages are low) as well as backflooding from the Passaic River for storms less than the 3-year event on the Passaic River.

Groundwater Flows- No changes are expected to groundwater levels because of the minimal changes to sheet and stream flow.

15. Investigate current water quality of flows into wetlands, ensure that the proposed flood control structures would not further degrade water quality, and seek opportunities to improve water quality.

Every attempt will be made utilizing Best Management Practices to ensure that no adverse impacts to water quality occur during construction. The proposed restoration pursuant to the mitigation proposal will provide additional water quality improvements due to the conversation of a lawn to highly functional wetland. In addition, a 3,200 ± vegetated swale will be constructed to convey storm flows to the nearest tributary. Vegetated swales have been documented by the State of New Jersey and other states to provide up to 85% total suspended solids removal rates. This will be a large improvement over the existing condition, which consists primarily of seldom maintained catch basins. As the project progresses, we will continue to seek opportunities to improve habitat and water quality where possible.

DRAFT
FISH AND WILDLIFE COORDINATION ACT
SECTION 2(b) REPORT

ASSESSMENT OF THE
UPPER PASSAIC RIVER AT LONG HILL TOWNSHIP
FLOOD DAMAGE REDUCTION AND
ECOSYSTEM RESTORATION PROJECT,
MORRIS COUNTY, NEW JERSEY

Prepared by:

U.S. Fish and Wildlife Service
Ecological Services, Region 5
New Jersey Field Office
Pleasantville, New Jersey 08232

June 2003

United States Department of the Interior

FISH AND WILDLIFE SERVICE

FP- 03/23

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JUN - 4 2003

Colonel John B. O'Dowd
District Engineer, New York District
U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278-0090

Dear Colonel O'Dowd:

This is the draft report of the U.S. Fish and Wildlife Service (Service) regarding anticipated impacts on fish and wildlife resources from the U.S. Army Corps of Engineers (Corps) proposed Upper Passaic River at Long Hill Township Flood Damage and Ecosystem Restoration Project, Morris County, New Jersey. This report was prepared pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat 401; 16 U.S.C. 661 *et seq.*). This report is provided in accordance with our Fiscal Year-2002 Scope Of Work and funding transfer agreement dated February 21, 2003, and is based on information provided in various Corps planning documents.

In addition to our activities pursuant to the Scope of Work, the Service is conducting informal consultation with the Corps regarding potential effects of the proposed flood control project on the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*), pursuant to Section 7(a)(2) of the Endangered Species Act (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). Based on our March 6, 2003 site visit, the Service recommended limited bog turtle habitat surveys in our March 20, 2003 letter (FP-02/066). The Corps has completed habitat surveys, and documented some areas of potentially suitable bog turtle habitat. In accordance with Service guidance, the Corps is conducting bog turtle visual surveys as of the date of this draft report. If bog turtles are documented in the vicinity of the flood control project area, further consultation will be required. Through the informal consultation process, the Service will make recommendations to avoid adverse effects to bog turtles. Consultation must be completed before finalization of documents prepared pursuant to the National Environmental Policy Act (83 Stat. 852; 42 U.S.C. 4321 *et seq.*), and before the Corps makes any irreversible or irretrievable commitment of resources (50 CFR Part 402.14). Other than the possible presence of bog turtles and an occasional transient bald eagle (*Haliaeetus leucocephalus*), no other federally listed or proposed endangered or threatened flora or fauna under Service jurisdiction are known to occur within the project area.

The Service appreciates effective Corps efforts to avoid and minimize wildlife impacts through this phase of planning by selecting and refining the recommended plan for flood damage reduction in Long Hill Township. We would appreciate any comments on this draft report within 30 days. If you have any questions regarding this report, please contact Wendy Walsh of my staff at (609) 646-9310, extension 48. We look forward to working with the New York District during the course of this project.

Sincerely,

for Clifford G. Day
Supervisor

DRAFT
FISH AND WILDLIFE COORDINATION ACT
SECTION 2(b) REPORT

ASSESSMENT OF THE
UPPER PASSAIC RIVER AT LONG HILL TOWNSHIP
FLOOD DAMAGE REDUCTION AND
ECOSYSTEM RESTORATION PROJECT,
MORRIS COUNTY, NEW JERSEY

Prepared for:

U.S. Army Corps of Engineers
New York District
New York, New York
10278-0090

Prepared by:

U.S. Fish and Wildlife Service
Ecological Services, Region 5
New Jersey Field Office
Pleasantville, New Jersey 08232

Preparer: Wendy L. Walsh
Assistant Project Leader: John C. Staples
Project Leader: Clifford G. Day

June 2003

EXECUTIVE SUMMARY

A May 7, 1997 U.S. House of Representatives Resolution (Docket 2517) authorized the U.S. Army Corps of Engineers, New York District (Corps) to study flood damage reduction and ecosystem restoration along the Upper Passaic River at Long Hill Township, Morris County, New Jersey. The Corps completed a reconnaissance study in 1998. In the subsequent feasibility study, the Corps developed and screened seven alternatives for ecosystem restoration. The Corps eliminated all restoration options from further consideration due to various constraints, including lack of local support.

The Corps investigated numerous flood control options, both structural and non-structural, and combinations of these. Five alternatives were developed for full consideration, including no action. The action alternatives include various combinations of tributary closure structures, road raising, levee/floodwall structures, structural flood proofing, and a flood warning system. The recommended plan is designed to provide flood protection to developed areas along both sides of Valley Road, as well as an area of Madison Avenue, up to the 100-year flood event. The proposed project includes a manually operated floodgate on each of three Passaic River tributaries, a flood warning system, and a floodwall and levee system approximately 4,000 feet long, set back 1,500 to 2,500 feet from the Passaic River, along approximately 3,200 feet of Valley Road.

An extensive forested wetland lies south of the proposed floodwall alignment. This and other wetlands in the study area provide wildlife habitats of high quality. Due to the quality, size, and connectivity of these wetlands, and proximity to Great Swamp National Wildlife Refuge, the study area provides habitats for a diversity of vertebrate species, including species of concern such as raptors, forest-interior neotropical migratory birds, and transient wood turtles (*Clemmys insculpta*) (State-listed) and bog turtles (*Clemmys muhlenbergii*) (federally and State-listed).

The Corps has avoided and minimized wildlife impacts through this phase of planning by selecting and refining the recommended plan for flood damage reduction in Long Hill Township. Most significantly, the proposed flood control structures are expected to have only minor direct and indirect effects on the substantial wetland resources in the study area. The project will impact 1.17 acres of State-jurisdictional freshwater wetlands and adjacent areas, with a total construction footprint of approximately 1.8 acres (a 20-foot construction corridor along the 4,000-foot floodwall). Much of the impacted area, including some of the jurisdictional wetlands, consist of developed commercial or residential properties. Affected wildlife habitats are mainly within forest edge communities at the interface of development. These areas mostly support abundant and weedy species. By selecting a floodwall/levee set back from the river, the Corps has also minimized hydrologic effects on wetlands.

The U.S. Fish and Wildlife Service provides various recommendations and planning goals to further reduce impacts to wildlife resources. Recommendations include construction zone fencing, limited survey efforts for rare or listed species, protection of mature trees and forested wetlands, inclusion of animal passage features in project design, maintenance of local regulations to protect floodplains, acquisition of flood storage areas, investigation of opportunities to improve water quality, and limited hydrologic monitoring.

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Appendix A	Federally listed endangered and threatened species and candidate species in New Jersey
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I. INTRODUCTION

This constitutes the U.S. Fish and Wildlife Service's (Service) Fish and Wildlife Coordination Act, (48 Stat. 401; 16 U.S.C. 661 *et seq.*) Section 2(b) report describing the fish and wildlife resources and supporting ecosystems in the area of the proposed Upper Passaic River at Long Hill Township flood control project. This report is provided in accordance with a Fiscal Year-2002 Scope of Work and funding transfer agreement dated February 21, 2003, between the New York District, U.S. Army Corps of Engineers (Corps) and the Service's New Jersey Field Office. Information presented in this report documents the fish and wildlife resources in the project area, identifies potential adverse impacts to those resources, and includes the Service's recommendations to minimize adverse impacts. The project area is located along approximately 3,200 feet of Passaic River floodplain in Long Hill Township, Morris County, New Jersey. The local sponsor for the project is the New Jersey Department of Environmental Protection (NJDEP). In addition to our activities pursuant to the Scope of Work, the Service is conducting informal consultation with the Corps regarding potential effects of the proposed flood control project on the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*), pursuant to Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA).

The Service requests that no part of this report be used out of context, and if the report is reproduced, it should appear in its entirety. Furthermore, any data, opinions, figures, recommendations, or conclusions excerpted from this report should be properly cited and include the page number from which the information was taken. This report should be cited as follows:

Walsh, W.L. 2003. Assessment of the Upper Passaic River at Long Hill Township Flood Damage Reduction and Ecosystem Restoration Project, Morris County, New Jersey. Draft Fish and Wildlife Coordination Act Section 2(b) Report, U.S. Department of the Interior, Fish and Wildlife Service, New Jersey Field Office, Pleasantville, New Jersey. 20 pp. + appendices.

Questions or comments regarding this report are welcomed by the Service. Written inquiries should be addressed to:

Supervisor
New Jersey Field Office
Ecological Services
U.S. Fish and Wildlife Service
927 North Main Street, Building D
Pleasantville, New Jersey 08232

II. DESCRIPTION OF THE PROPOSED PROJECT

A May 7, 1997 U.S. House of Representatives Resolution (Docket 2517) authorized the Corps to study flood damage reduction and ecosystem restoration along the Upper Passaic River at Long Hill Township, Morris County, New Jersey (Figure 1). The Corps completed a reconnaissance study in 1998, and has subsequently conducted a feasibility study culminating in the recommended plan described below.

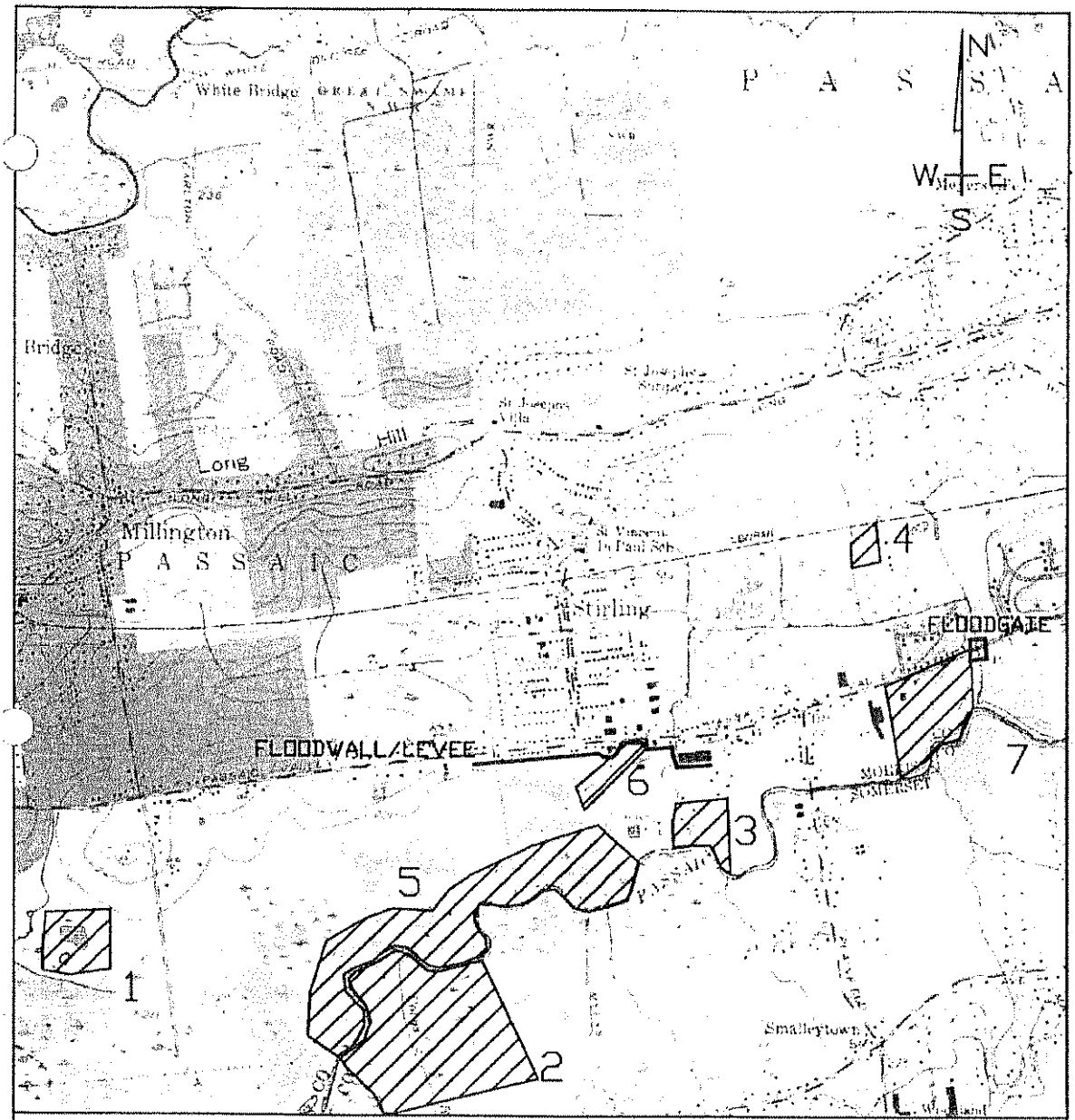
A. ECOSYSTEM RESTORATION

During the feasibility study, the Corps developed and screened seven alternatives for ecosystem restoration. All restoration options were eliminated from further consideration due to various constraints. The Corps considers restoration at most of these sites to be technically and economically feasible, but rejected many of these alternatives based on a lack of local support from landowners, stakeholders, or potential project partners. Although the Corps rejected all seven sites for inclusion in this project, some of the sites may present future restoration opportunities. For example, restoration at some of the seven sites may be re-examined during the Corps recently-initiated Passaic River Basin Restoration Study. The following is a summary of the restoration alternatives considered by the Corps (Figure 1), and reasons why none are being pursued for implementation in Upper Passaic River at Long Hill Township project (U.S. Army Corps of Engineers, 2003a). The Service encourages the Corps to pursue these opportunities in the future.

Site 1. South of Rolling Hill Road. This 10-acre site is a former swim club with a 1-acre artificial lake, and a smaller drainage retention basin located northeast of the lake. The Corps considered wetland enhancement and/or lake shore restoration. This site was rejected because the privately-owned lake is managed as a recreational facility for an adjacent housing development, and because part of the site is included in a stormwater management plan for certain permitted activities regulated by the NJDEP.

Site 2. Warren Township Former Golf Course. The Corps considered a 20-acre restoration on this 60-acre golf course, which has not been used for approximately 25 years. The Corps rejected this site because Warren Township, which owns the property, has no interest in restoration.

Site 3. Poplar Drive, Laurel and Cedar Avenues. The Corps considered removing the three residential dwellings located in this area, and restoring forested wetlands. The Corps rejected this site because local land use was deemed incompatible with ecological enhancement.



TOPOGRAPHIC MAP

BERNARDSVILLE/CHATHAM QUADS

MATRIX		PROJECT: UPPER PASSAIC FLOOD CONTROL LONGHILL TOWNSHIP MORRIS/SOMERSET COUNTY, NEW JERSEY	
SCALE: 1" = 2000'	DATE: OCTOBER 2002	JOB No. 00P133E-B FILENAME: TOPO	FIGURE NO.: 1 – PAGE 6

Figure 1. Project location (U.S. Army Corps of Engineers, 2002b). Sites 1-7 were screened for ecosystem restoration potential.

Site 4. Morristown Road. The Corps considered acquisition of this site, with minor restoration activities, such as removing piles of landscape materials located in the wetlands. The Corps rejected this site because acquisition for preservation was deemed economically infeasible, and local sponsor interest was minimal.

Site 5. Passaic River Reach. Based on discussions with the Passaic River Coalition and other local environmental groups, the Corps determined that the Passaic River and adjacent wetlands in this reach are not in need of restoration and, therefore, eliminated this site from further study.

Site 6. Valley Road/Warren Road Utility Corridor. The Corps considered enhancing the wetlands along the utility corridor, which are currently dominated by common reed (*Phragmites australis*). The Corps rejected this site based on logistical problems with the utility right-of-way, and lack of a local proponent to sponsor the restoration.

Site 7. Long Hill Township Town Hall. The Corps considered establishing a continuation of the adjacent forested wetlands, or creating a transitional habitat, within a disturbed portion of this property. A new town hall is currently under construction on the site. The Corps rejected this site because there was no local proponent to sponsor the restoration.

B. FLOOD CONTROL

The Corps investigated numerous flood control options, both structural and non-structural, and combinations of these. Several structural alternatives were eliminated from further consideration for various reasons, including significant environmental impacts. Rejected options include an upstream detention structure; and dredging, channelization, and streambank clearing. Non-structural alternatives included acquisition of flood-prone properties, floodplain zoning, flood proofing buildings, and a flood warning system. None of the non-structural options were deemed to provide a sufficient level of flood protection as stand-alone alternatives, but several were carried forward to be combined with various structural components. The April 2003 draft Integrated Feasibility Report and Environmental Assessment (U.S. Army Corps of Engineers, 2003a) presents five flood control alternatives:

1. No action.

2. Install closure structures on Passaic River tributaries that convey floodwaters into Long Hill Township, implement limited non-structural armoring and structure raisings, and install a flood warning system.

3. Install closure structures on Passaic River tributaries that convey floodwaters into Long Hill Township, raise Valley Road to act as a barrier to floodwaters from the 1 percent chance exceedence (100-year) event, implement limited non-structural armoring and structure raisings, and install a flood warning system.

4. Construct a levee/floodwall along the Passaic River to the 1 percent chance exceedance (100-year) event with tributary closure gates, and install a tributary closure structure outside of the levee/floodwall line of protection.

5. Construct a setback levee/floodwall close to Valley Road with tributary closure gates along the levee/floodwall, and install a tributary closure structure outside of the levee/floodwall line of protection.

The Corps selected Alternative 5 as the environmentally preferred alternative, and the plan that maximizes net economic benefits. Alternative 5 also includes implementation of a flood warning system, and may include limited non-structural armoring and structure raisings (U.S. Army Corps of Engineers, 2003a). The March 2003 draft Environmental Assessment (U.S. Army Corps of Engineers, 2003b) presents three variations on the setback levee/floodwall plan to determine if modifications of design or alignment could reduce environmental, particularly wetland, impacts. Wetland impacts were subsequently reduced by shifting the alignment of the floodwall closer to Valley Road in several locations. Shifting the floodwall closer to residences along the western part of the alignment would further reduce wetland impacts; however, this option was rejected because it would require condemnation of private property (Tumminello, pers. comm., 2003). Some State-jurisdictional wetlands [N.J.S.A. 13:9B-1 *et seq.*, "Freshwater Wetlands Protection Act" (FWPA)] in these areas are maintained by residents as lawn, and offer negligible wildlife value.

The recommended plan consists of 4,057 feet of linear protection at the rear of developed properties along the south side of Valley Road for approximately 3,200 feet (between the Shop Rite shopping center at the corner of Poplar Drive and the Loudenberry Meadow Senior Condominium Development across from Passaic Avenue). The structure would consist of 3,996 feet of vinyl sheetpile floodwall, plus 61 feet of earthen levee at the western end to tie into high ground. The levee section would have a 12-foot-wide crest with side slopes of 3 feet horizontal to 1 foot vertical, and a maximum height of 4.5 feet. The floodwall reaches would consist of continuous watertight vinyl sheet pile driven approximately 10 feet into the soil. A section of earthen berm is proposed where the line of protection crosses the Transco natural gas pipeline, as sheet pile cannot be driven in this area. Where the floodwall crosses Main Street and Warren Avenue, the roads would be elevated for traffic to pass over the wall. The top of the line of protection is between +216.7 feet and 216.2 feet NGVD, extending 2.2 to 5.4 feet above grade, and tapering to the ground at either end (U.S. Army Corps of Engineers, 2003a). At this elevation, the levee/floodwall would provide flood protection to developments on both sides of Valley Road up to the 100-year event (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003).

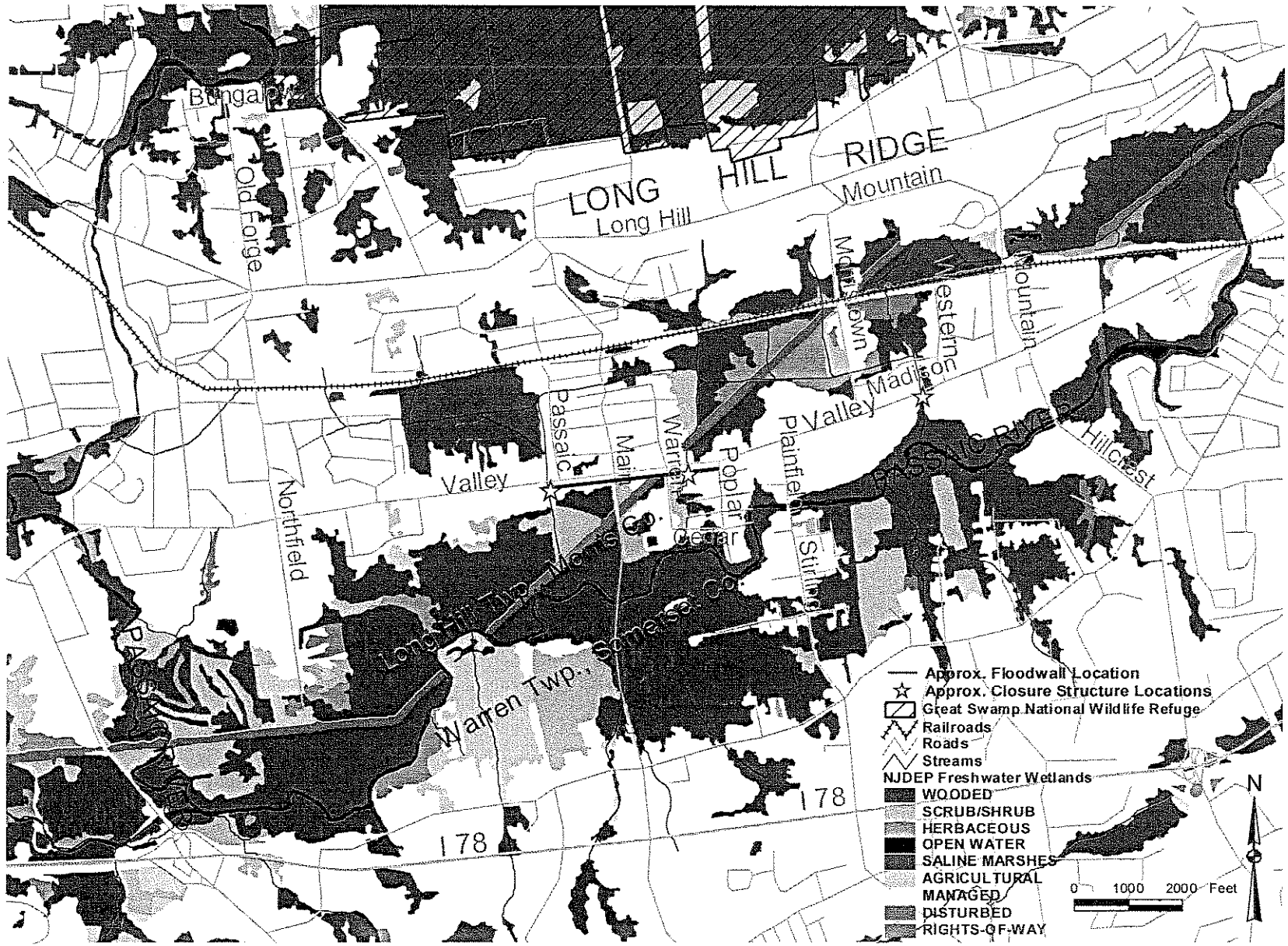


Figure 2. Wetlands

The project includes manually-operated closure structures on two unnamed Passaic River tributaries where the streams cross the floodwall (Figure 2). An additional closure structure is proposed on a third unnamed tributary east of the floodwall, near Western Avenue where the stream crosses Valley Road. The closures would be concrete structures housing sluice gates. One 4-foot by 4-foot gate is proposed on the western tributary; two 5-foot by 7-foot gates are recommended on the middle stream near Warren Avenue; and one gate approximately 6 feet by 6 feet is proposed for the eastern stream near Western Avenue (Tumminello, pers. comm., 2003). The western and central structures would tie into the levee/floodwall. The eastern closure would employ vinyl sheet piling to tie into to Valley Road embankment. In this area, a section of Valley Road would be raised to +216.2 to act as a levee, requiring repaving for about 780 feet. All three gates would normally remain open, to be closed by Long Hill Township emergency management personnel when triggered by a flood warning system that will be implemented as part of the project.

III. METHODS

The Service reviewed the following documents in preparing the subject draft 2(b) report.

- Reconnaissance Study, July 1998 (U.S. Army Corps of Engineers, 1998).
- P-7 Milestone Report, November 2002 (U.S. Army Corps of Engineers, 2002a).
- Natural Resource Inventory Report, December 2002 (U.S. Army Corps of Engineers, 2002b).
- Vegetation Survey Report, February 2003 (U.S. Army Corps of Engineers, 2003c).
- Draft Environmental Assessment, March 2003 (U.S. Army Corps of Engineers, 2003b).
- Draft Integrated Feasibility Report and Environmental Assessment, April 2003 (U.S. Army Corps of Engineers, 2003a).

The Service also conducted a site visit with the Corps contractor, Matrix Environmental & Geotechnical Services, Inc. (Matrix), on March 6, 2003, and has coordinated with Corps personnel and the NJDEP, Division of Fish and Wildlife.

IV. EXISTING CONDITIONS

A. PHYSICAL CHARACTERISTICS

The study area is within an extensive floodplain of the Passaic River. In the vicinity of the central Stirling business district of Long Hill Township, the Passaic River flows from west to east approximately 1,500-2,500 feet south of Valley Road (Figure 2). Surface hydrology in the

area has been modified by development, and by historical alterations of natural stream channels and creation of drainage ditches (Papson, pers. comm., 2003). Three unnamed Passaic River tributaries each drain a small area (1-2 square miles) south of the Long Hill Ridge. These altered or man-made streams are connected by a west-to-east flowing ditch located north of Valley Road. This ditch causes water from different drainage areas to mix during heavy rainfall events (U.S. Army Corps of Engineers, 2003a). Through this ditch, the two western tributaries also drain to the wetland complex located between Warren Avenue and Morristown Road, north of Valley Road and south of the railroad (northeast of the floodwall alignment). This low-lying wetland is also maintained by direct precipitation and sheet flows off the Long Hill ridge. Water retained in this wetland is slowly released to the Passaic River via the eastern tributary near Western Avenue (Preusch, pers. comm., 2003).

South of Valley Road is a vast Passaic River floodplain consisting mainly of forested wetlands. Most of this area is owned by Morris County and maintained as open space (Papson, pers. comm., 2003). Hydrologic conditions in this area are maintained by overtopping of the Passaic River and its tributaries and direct precipitation, combined with low-permeable clay soils. Valley Road acts as a barrier to sheet flows. Sheet flows into this southern wetland come only from the developed strip south of Valley Road, and therefore comprise only a minor component of hydrologic conditions in the floodplain. Runoff north of Valley Road flows to the northeastern wetland complex and into the tributary system both directly and via storm sewers (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003; Berkely, pers. comm., 2003).

Backwater flows during Passaic River flood events are a significant component of hydrologic conditions in the southern floodplain and northeastern wetland complexes. At a flood stage of about +206 feet NGVD, water from the Passaic River begins moving into the tributaries. This corresponds to a 1-year, or possibly even lower magnitude, storm event. Due to flat topography, the direction of flow in the streams and ditches reverses as flood waters move into the tributary system (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003). These frequent backwater flooding events are important in maintaining wetland conditions in the southern floodplain and northeastern wetland complexes.

Backwater flows are also considered the primary cause of flooding in the study area. The Corps determined that the tributary system is sufficient to provide drainage for low-magnitude, high-frequency rainfall events. During high-magnitude, low-frequency rainfall events, high coincident stages on the Passaic River reduce the discharge capacity and effectiveness of the tributary drainage system. As stages on the Passaic River continue to rise, the tributary system becomes the pathway for floodwater from the Passaic River to enter the developed areas. Water surface elevations within the lower portions of the tributaries rise coincident with stages on the Passaic River. In the upper portions of the tributaries, water surface elevations are possibly higher in the tributaries than in the Passaic River, as additional runoff from each tributary watershed adds to backwater flooding from the Passaic River (U.S. Army Corps of Engineers, 2002a).

Bankfull stage on the Passaic River is about +210 feet NGVD, corresponding to about a 2-year storm event. Existing grade along the floodwall route is between 210.8 and 214 feet. Flood damages along Valley Road begin at about 211 feet, corresponding to a 3-year storm event. The forested wetland south of Valley Road receives frequent backwater flows, both through direct overbank sheet flows from the Passaic River and from the tributaries. Lying at about 208-209 feet, the northeastern wetland complex also receives frequent backwater flooding via the tributary system (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003). The forested wetland block west of Passaic Avenue and north of Valley Road lies at a slightly higher elevation (about 215 feet), and is less subject to backwater flooding (Preusch, pers. comm., 2003).

B. VEGETATION

The Corps retained Matrix to conduct a field investigation to characterize the vegetation in the areas to be impacted by the proposed flood control structures. The floodplain south of Valley Road is predominantly a forested wetland. Forest interior areas were not sampled, but close to the floodwall alignment the vegetative community is dominated by red maple (*Acer rubrum*), pin oak (*Quercus palustris*), and American elm (*Ulmus americana*) in the canopy. Where present, the shrub layer is dominated by musclewood (*Carpinus caroliniana*) and highbush blueberry (*Vaccinium corymbossum*), with wood reedgrass (*Cinna arundinacea*) abundant in the herbaceous layer. A utility corridor about 200 feet wide crosses the forested wetland in a southwest-northeast direction. Near the floodwall, emergent wetlands dominated by broad-leaved cattail (*Typha latifolia*) and *Phragmites* are present in the corridor. At the interface between the forested wetlands and developed land along Valley Road, the vegetative community is typical of disturbed habitats including species such as Japanese honeysuckle (*Lonicera japonica*), Japanese berberry (*Berberis thunbergii*), and poison ivy (*Toxicodendron radicans*) (U.S. Army Corps of Engineers, 2003c). The wetland complexes northeast and northwest of the floodwall were not sampled, but likely contain a similar mix of wetland species, with vegetation characteristic of disturbed sites at the edges and along the utility corridor.

No federally listed, State-listed, or plant species of concern were documented along the floodwall alignment during field surveys. However, some species that were outside their flowering or fruiting season, or non-persistent species, may not have been identified during the Corps late fall survey. In our April 8, 2003 Planning Aid Letter, the Service recommended that the Corps conduct a rare plant survey along the floodwall right-of-way during appropriate seasons, to determine presence or absence of those species on the New Jersey Natural Heritage Program's (NJNHP) Morris and Somerset County list that may be present in the floodwall corridor, based on habitat suitability. In the May 12, 2003 response, the Corps indicated that current project schedules and budgets will not permit such a survey. The Service concurs with the Corps that the probability of rare plant occurrences along the floodwall alignment is not great, based on the disturbed character of vegetation in the area and the absence of rare plants found during the vegetation survey. However, the Service recommends that the Corps review

the NJNHP's Morris and Somerset County rare plant lists to determine which species, if any, could potentially inhabit the construction zone (based on habitat), and that may have been missed during the late fall survey. The Service recommends including this information with project documents, and conducting surveys for these species during the appropriate season if schedules and budgets permit.

C. WILDLIFE

The Corps retained Matrix to conduct field and literature investigations of wildlife in the project area. As field surveys were limited to the immediate vicinity of the floodwall alignment (Berkely, pers. comm., 2003), both mammalian and avian field observations consisted mainly of common and abundant species. Matrix observed evidence of the following mammals in the field: gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), opossum (*Didelphis virginiana*), white-footed mouse (*Peromyscus leucopus*), house mouse (*Mus musculus*), racoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*). Birds observed by Matrix during field surveys include: rock dove (*Columba livia*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and mourning dove (*Zenaida macroura*). No reptiles, amphibians, or fish were directly observed during these field investigations (U.S. Army Corps of Engineers, 2002b).

Based on published reports from the nearby Great Swamp National Wildlife Refuge and habitat conditions, the Service concludes that wetlands in the project area are most likely occupied by a greater diversity of wildlife than the common faunal assemblages documented by Matrix. Although not directly observed during limited field searches by Matrix, sensitive species such as raptors and forest-interior neotropical migratory birds are likely present. The Breeding Bird Atlas indicates that 84 species of birds nest along the Passaic River floodplain in this area, including 15 species of management concern to the Service at the State, Bird Conservation Region, Northeast Region, or National level (U.S. Fish and Wildlife Service, 2002). In addition, the central Passaic wetlands, including the project site, are a key pathway for migratory birds in New Jersey (Dunne, 1989). The NJDEP's Landscape Project (March 2002 database) indicates that the project area provides habitat for the State-listed (endangered) red-shouldered hawk (*Buteo lineatus*). In addition, the State-listed (threatened) wood turtle (*Clemmys insculpta*) and the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*) may be transient in the area.[1]

The Service would support any Corps effort to collect detailed, site-specific information regarding wildlife usage of project area wetlands, especially Passaic River floodplain habitats south of Valley Road and the wetland complex northeast of the floodwall route. However,

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[1] At the time of this draft report (June 2003), the Corps and the Service are conducting informal consultation to determine if bog turtles may be resident in the project area, and to assess project impacts to this species.

additional documentation is not essential for this project, given the size and nature of the proposed structural measures included in the Corps recommended flood control plan. The Service's central concern in protecting wildlife resources is ensuring that the proposed floodwall and floodgates will not adversely affect these wetlands. At this stage, careful planning and design to further avoid both direct and indirect wetland impacts is more important to protecting wildlife resources than preparing additional faunal inventories.

V. PROJECT IMPACTS AND RECOMMENDED MITIGATIVE MEASURES

The Service's views and recommendations on this project are guided by its Mitigation Policy (Federal Register, Vol. 46, No. 15, January 23, 1981). This policy reflects the goal that the most important fish and wildlife resources should receive priority in mitigation planning. The term "mitigation" is defined as: (a) avoiding a negative impact altogether by not taking a certain action or parts of an action; (b) minimizing negative impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the negative impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating negative impacts over time; and, (e) compensating for negative impacts by replacing or providing substitute resources or habitats.

The Service's Mitigation Policy provides different wildlife planning goals based upon the value of the habitat to be impacted. The Service views the wildlife value of non-developed lands in the project area as follows:

Habitat Type	**Habitat Value**	**Planning Goal**
forested wetlands	high	no-net-loss of in-kind habitat value
disturbed wetlands (*i.e.*, wetland edges, utility corridors)	medium	no-net-loss of habitat value while minimizing loss of in-kind habitat value
Passaic River tributaries (in-stream habitats)	medium	no-net-loss of habitat value while minimizing loss of in-kind habitat value
State-jurisdictional wetlands maintained as lawn	low	minimize loss of habitat value (may be suitable as compensatory mitigation sites)

A. DIRECT IMPACTS

1. Disturbance and Mortality

Construction of the floodwall and floodgates may temporarily disturb and displace wildlife due to noise, activity, machinery, equipment staging, and earth moving. These effects would occur only during construction, which is expected to last approximately 3-4 months (Fronius, pers. comm., 2003).

Some mortality of less mobile, burrowing, or denning species of wildlife such as small rodents, snakes, turtles, and amphibians may occur during levee and floodwall construction (U.S. Army Corps of Engineers, 2003a). Mortality of slow-moving transient wildlife, such as turtles, may also occur during construction. Any rare plants in the construction corridor may be permanently impacted. To minimize disturbance and mortality of wildlife resources during floodwall construction, the Service recommends the following.

- Minimize temporary wetland impacts by selecting equipment and material staging areas and access routes in uplands whenever possible. Restore temporary wetland impacts to pre-construction conditions in accordance with State regulations.

- Clean and inspect all construction equipment used in areas dominated by *Phragmites* to ensure that rhizomes are not inadvertently spread along the construction corridor or to other work areas.

- Install and maintain fencing along the southern limit of the construction corridor to preclude entrance of transient terrestrial species into the work area. To prevent entry of any protected bog turtles and wood turtles, fencing should consist of a double row of standard silt fencing (*i.e.*, a solid sheet with no holes or projections) at least 1 foot high stretched taught and embedded several inches in the ground. Fencing may be combined with sediment and erosion control plans if a single design can meet both purposes.

- Conduct a pre-construction survey of the fenced construction area and remove any transient or denning wildlife several yards into the adjacent forested wetland. As sheet pile driving proceeds along the alignment, re-survey the immediate area within 1 day of starting work in a new section. If any bog turtles are found in the construction zone: (1) do not move the turtles; (2) document the occurrence; (3) contact the Service immediately; and (4) halt work until consultation pursuant to the ESA is completed.

- Conduct a playback survey, using a qualified biologist, for red-shouldered hawk at two locations along South Main Street equally spaced between the floodwall alignment at the Passaic River between March 1 and May 15, and report the results to the NJDEP and the Service. If nesting hawks are documented, the NJDEP and the Service will recommend a 0.25-mile buffer for construction activities around the nest site between

March 1 and July 15. The known red-shouldered hawk occurrence in the area is greater than 0.25 mile from the floodwall alignment; therefore, no protective measures are necessary for the known site (Valent, pers. comm., 2003).

- Conduct a rare plant survey of the construction zone as schedules and budgets permit. If any occurrences are documented, notify this office and the NJNHP to determine appropriate mitigation.

Disturbance and mortality of freshwater organisms such as benthic invertebrates and fish may occur during installation of the three floodgates. Up to 10,000 square feet of open waters and surrounding wetlands may be temporarily disturbed at each closure site. The Corps proposes to use a temporary flowing stream diversion to bypass each closure location to create a dry work environment without blocking water flows. These systems should allow aquatic wildlife to pass upstream and downstream of the work zone during construction. Each diversion would consist of two sets of wooden, framed, wing-walls connected to a flexible, bag-like PVC tube used to convey flowing water around a work area. The tube would be laid in a channel to be excavated adjacent to the culvert that conveys stream flow beneath Valley Road. The downstream end of the diversion would be installed first, followed by the upstream end, with a set of wing walls tied into the upstream end of the channel. The stream diversion would be installed prior to beginning floodgate construction, and flow would be restored to the work area section of the channel upon completion of work. Proposed mitigation for the three closure structures also includes restoring any stream bed or bank areas disturbed during construction. Restoration may include minor grading, installation of temporary or permanent erosion control measures, and planting or seeding with native riparian vegetation. Any restoration efforts would be monitored in accordance with the appropriate State permit regulatory performance standards and monitoring requirements (U.S. Army Corps of Engineers, 2003a). While some disturbance and mortality of freshwater organisms may still occur during flood gate installation, the Service concurs with the Corps that the proposed mitigative measures would minimize such impacts.

2. Habitat Loss and Fragmentation

The floodwall and levee system would occupy a right-of-way approximately 4,000 feet long by 20 feet wide, for about 1.8 acres of disturbance. A straight line between starting and ending points would be approximately 3,200 feet; however, the wall takes numerous jogs to avoid wetlands and man-made structures. Along most of the alignment, the northern half of the 20-foot construction zone would be located on developed lands such as parking lots and maintained lawns.

Some of the disturbance along the alignment is expected to be temporary. The vinyl floodwall itself is approximately 6 inches thick. A permanent right-of-way will be maintained after construction for maintenance of the floodwall, but is not expected to be as wide as the 10 feet on either side required for construction (Berkely, pers. comm., 2003). The Service recommends minimizing the width of the permanent right-of-way on the south side of the floodwall, and

conducting maintenance of the wall from developed or upland sites along the north side whenever possible.

In total, the Corps anticipates 1.17 acres of permanent impacts to State-jurisdictional freshwater wetlands from the levee and floodwall (U.S. Army Corps of Engineers, 2003a), including areas maintained as lawn. The Service concurs with the Corps that the floodwall design and alignment have been selected to avoid and minimize wetland impacts to the extent possible through this stage of design. The Service recommends that the Corps continue to refine wetland protections through the engineering phase of the project, which will include the State permitting process. Consistent with the Service's habitat value determinations, forested wetlands should receive the highest priority for avoidance, followed by disturbed wetlands. To clarify impacts, the Service recommends that final project documents present the following information: (1) total acres of temporary and permanent wetland impacts; (2) acres of wetland impacts classified by forested wetlands, disturbed wetlands, and mowed turf ("lawn") wetlands; and (3) extent of proposed wetland and upland tree removal.

As compensatory mitigation for wetland impacts, the Corps proposes on-site mitigation that includes enhancement of 1.10 acres of degraded wetlands, creation 0.14 acre of wetlands from upland lawn areas, and preservation of 11.0 acres of floodplain forest. If local land owners are not willing to sell the properties selected for mitigation, the Corps proposes off-site mitigation through the purchase of credits at the C&C Builders Mitigation Bank (U.S. Army Corps of Engineers, 2003a).

The Service recommends that the Corps compensatory mitigation plan seek to achieve the planning goals outlined above. Specifically, the Service recommends that the planning goal for forested wetlands be no net in-kind loss. For disturbed wetland areas, the Service recommends a goal of no net loss of wetland acreage, while minimizing net loss of emergent and scrub-shrub wetland types. Compensatory mitigation of forested wetlands is prone to high failure rates (Balzano *et al.*, 2002). Therefore, maximum avoidance of impacts to forested wetlands is highly recommended. Wherever possible, unavoidable wetland impacts should be shifted to lower value "lawn" wetlands or disturbed wetlands if doing so can protect forested wetlands. If some forested wetland impacts are unavoidable, the Service recommends a high compensatory mitigation ratio that takes into account the low success rate. The Service will recommend a specific ratio during the State wetland permitting process. Although the Service supports preservation of the substantial floodplain acreage proposed by the Corps, preservation does not achieve the Service's planning goal of no let loss of forested wetlands. If the final mitigation plan includes preservation, project documents should indicate the specific preservation mechanism (*i.e.*, deed restriction, public ownership), and who will own and manage the property.

As a linear feature, the levee/floodwall system has the potential to fragment habitats. Fragmentation can impair animal movements and introduce adverse edge effects. Forest fragmentation seriously affects nesting success of obligate forest interior birds (Robbins, 1988),

which are known to occur in the Passaic River floodplain. The Service concurs that the floodwall alignment has been selected to minimize fragmentation. Most of the alignment follows parking lots and lawns, impacting only existing forest edge. An earlier alignment would have fragmented 0.17 acre of intact floodplain forest (U.S. Army Corps of Engineers, 2003b) located on Block 1, Lot 24 (about mid-way between South Main Avenue and the western tributary; see Figure 2). This adverse effect has been avoided by squaring off the floodwall with Valley Road. Some fragmentation of disturbed forested floodplain habitats will occur at the western terminus of the wall between Lots 18 and 23 (the western half of the section between South Main Avenue and the western tributary; see Figure 2). To minimize habitat loss and the effects of fragmentation, the Corps should make every effort to retain mature trees.

Permanent loss of in-stream habitats at the location of the closure structures is expected to be negligible. Preliminary plans for each closure structure show that a rectangular concrete pad spanning the width of the stream will be installed in the stream bed. These structures vary in length from 8 to 15 feet (Tumminello, pers. comm., 2003). Following normal deposition, these pads are expected to become buried at least 1 foot below the stream bed, allowing recolonization by benthic organisms (Fronius, pers. comm., 2003). A gated concrete wall, approximately 1-foot thick, will extend from the foundation pad to a height just above the top of the adjacent floodwall/levee sections. Effects of the wall on stream banks would be negligible. A previous flood gate design involving a vertically-hinged gate, and concrete lining of the stream upstream and downstream of the closure structures, has been rejected (Fronius, pers. comm., 2003).

The three project area streams offer important connections for movement of aquatic and terrestrial animals between wetlands north and south of Valley Road. Because of intervening development, smaller terrestrial mammals, reptiles, and amphibians likely utilize culverts under Valley Road for this purpose. The size and design of the closure structures are expected to allow free movement of fish and other aquatic organisms up and downstream, except during flood events when the flood gates will be closed (Tumminello, pers. comm., 2003). The Service recommends that the Corps incorporate design features into the closure structures to permit passage of terrestrial wildlife when the flood gates are open, such as small, gated holes on land adjacent to each stream channel. We also recommend that the Corps assess the size and design of the three culverts under Valley Road to determine if any modifications to these structures could be implemented during project construction that would improve terrestrial animal passage along the tributary corridors.

The levee/floodwall will present a more impenetrable barrier to north-south animal movements than the existing road and development. With adequate design features to permit movements through the closure structures, this barrier may benefit wildlife by promoting animal movements along the tributaries and through the culverts, and discouraging entrance into developed areas along Valley Road where human and vehicle interactions pose a danger. The floodwall may impair the ability of larger terrestrial wildlife, primarily deer, to move between

northern and southern habitats, with both negative (isolation, confinement into smaller habitats) and positive (reduced risk of vehicle collision) consequences. Some exchange is still likely to occur, as these larger animals will most likely move around the wall.

B. INDIRECT IMPACTS

1. Land Use

The proposed flood control project will reduce potential damage to personal and commercial property resulting from current flooding problems, thus making the area a more appealing place to live and work. Any changes in population density must conform to existing land use and Township regulations (U.S. Army Corps of Engineers, 2003b). However, amelioration of flooding problems will offer an economic incentive to relax rules regarding further development of the Passaic River floodplain in the Stirling section of Long Hill Township. New development in the study area would adversely affect wildlife, and would offset some of the project's benefits of flood damage reduction. Therefore, the Service recommends that the Corps acquire binding agreements from the local sponsor and the Township prior to construction, to ensure that State and local land use regulations to protect wetlands and floodplains, and to manage storm water, will not be relaxed over the life of the project.

Acquisition of flood storage areas offers benefits for both wildlife and flood damage prevention. This alternative was not considered in project documents. Although wetland acquisition would not reduce existing flooding problems in developed areas of Long Hill, acquisition and permanent protection of these natural storage areas would prevent increased flooding in the future. Much of the floodplain wetlands in the study area already owned by Morris County, which manages the areas as open space (Papson, pers. comm., 2003). The Service recommends that the Corps pursue preservation of remaining privately-owned flood storage wetlands in the study area as a component of the project. Wetland acquisition could be undertaken in partnership with the local sponsor and the Township, perhaps as a component of the non-federal cost share of the project. Consistent with this recommendation, the Service supports the preservation component of the Corps compensatory mitigation plan, while recognizing that preservation cannot achieve the recommended planning goal of "no net in-kind loss" if impacts to forested wetlands cannot be avoided.

2. Water Quality

Surface water quality will be temporarily impacted during construction because of increased suspended sediments in the water column. The Corps proposes to implement best management practices for erosion and sediment control during construction to reduce any potential runoff, sedimentation, or turbidity into the tributaries or the Passaic River as a result of the proposed project (U.S. Army Corps of Engineers, 2003a). The New Jersey Soil Erosion and Sediment Control Act (N.J.A.C. 4:24-39 *et seq.*) requires a plan for erosion and sediment control for virtually all activities on non-agricultural land disturbing more than 5,000 square feet of surface

area (New Jersey Department of Agriculture, 2003). The plan must be consistent with the Standards for Soil Erosion and Sediment Control in New Jersey (New Jersey State Soil Conservation Committee, 1987).

In addition to preventing erosion and sedimentation during construction, the Service recommends that the Corps evaluate and document potential for the proposed flood control structures to cause ongoing erosion, sedimentation, or scouring following construction. If engineering and hydraulic assessments indicate that such effects are possible, the Service recommends that the Corps: (1) take all appropriate measures to prevent post-construction erosion, sedimentation, or scouring; (2) monitor appropriate areas for 5 years following project construction to ensure that the preventative measures were effective; and (3) report monitoring results to the Service and NJDEP annually.

The proposed project may provide water quality improvements by retaining runoff in a vegetated swale along the north side of the proposed floodwall before discharging to the tributary system. According to the Corps May 12, 2003 correspondence, vegetated swales have been documented by New Jersey and other States to remove up to 85 percent of total suspended solids. The swale should reduce pollutant loads of storm water running off developments south of Valley Road (Preusch, pers. comm., 2003). The much larger volume of runoff that enters the tributary system north of Valley road would not be affected by the swale under normal flow conditions. During the design phase, the Service recommends that the Corps actively investigate possibilities to incorporate storm water treatment features into the three proposed closure structures to treat runoff coming from the northern developments.

3. Hydrology

The Service's central concern for wildlife resources from the Upper Passaic at Long Hill Township flood control project is that the proposed floodwall and floodgates do not alter the hydrology of wetlands in the study area. In our April 8, 2003 Planning Aid Letter, the Service requested information regarding project effects on sheet flows, stream flows, and ground water flows. The Corps has subsequently provided this information in writing and by personal communication. Two wetland areas are of concern: the forested wetland floodplain south of the floodwall alignment, and the wetland complex northeast of the proposed floodwall between Morristown Road and Warren Avenue (Figure 2). The Corps and the Service have considered potential changes to the volume and type of base flows into these wetlands, as well as the frequency, depth, and duration of flooding.

The project is expected to have only minor effects on hydrologic inputs into wetlands during non-flood conditions, including precipitation up to the 3-year event, or a water elevation of about 211 feet. Although lower magnitude events cause overtopping of Passaic River and tributary banks, flood damages are not incurred. Under these condition, the three flood gates would be left open, and the proposed flood control structures would have no effect on either normal or backwater stream flows into either of the wetland areas of concern. One minor

project effect would be conversion of sheet flows south of Valley Road into stream flows, by retaining this runoff in a swale, which would discharge into the tributary system. Due to the small drainage area in question, this change would not have significant hydrologic effects (Preusch, pers. comm, 2003), and would improve water quality as discussed above.

For 3-year or greater storm events, Township emergency personnel would close the floodgates. Operation of the system as proposed may affect the frequency and depth of flooding in the subject wetlands. Frequency would not be affected for the floodplain wetland south of the wall. The Corps selection of a setback floodwall/levee system, rather than a levee along the Passaic River, ensures that the floodplain will continue to receive overbank flooding from the river and its tributaries at the same frequency as current baseline conditions. Maintaining the normal overbank flooding regime is essential to maintaining the ecologic and hydrologic integrity of this system.

The proposed project will have minor effects on the depth of flooding in this southern wetland. According to the Corps May 19, 2003 correspondence, removal of natural floodplain storage north of the floodwall will increase the 100-year flood elevation by 0.1 foot due to minor increases in discharge along the Passaic River (hydrologic effect). Confining flowing flood waters south of the floodwall will cause an additional, but negligible effect of 0.01 foot for the 100-year flood (hydraulic effect). The elevation of the 100-year flood is 216.2 feet, or about 2-5 feet of standing water in the floodplain south of Valley Road. With the floodwall, this depth would increase by about 1.3 inches, which is not expected to affect flood duration (Preusch, pers. comm., 2003). Based on this information, the Service does not expect adverse hydrologic effects to the wetlands south of the proposed floodwall.

For 3-year and greater events, the proposed project may affect both frequency and depth of flooding in the wetland complex northeast of the floodwall. Currently, Passaic River flood waters are conveyed to this wetland through backwater flows in the tributary/ditch system. With the floodgates closed for 3-year and greater events, these waters will be cut off from the northeastern wetland complex. For this reason, the Service recommends the following measures to protect wildlife habitats and other values of this wetland.

- Assess the hydrology of this wetland, during the design phase, to determine the extent to which backwater flooding during higher-magnitude (≥ 3-year) events contributes to overall hydrologic conditions.

- Provide the results of the assessment to the Service to determine if adverse ecological effects may result from hydrologic changes expected in the northeastern wetland complex from isolating that component of the hydrologic regime.

- Without compromising human safety or flood damage protection, design and operate the flood warning system to minimize the closure time of the floodgates.

- Monitor the northeastern wetland area for hydrologic changes for at least 5 years following project completion to determine if elimination of backwater flooding during higher-magnitude (≥ 3-year) events actually effects overall hydrologic conditions in this area; provide a summary of results to the Service annually.

- Allow for adaptive management of the flood warning system if wetland conditions and/or flood damage conditions warrant a change in the operation of the floodgates.

The project is not expected to affect groundwater flows at either wetland area of concern. Although the Corps encountered some water along the floodwall route in borings between 5 and 10 feet deep, the water table is generally considered to lie at lower depths due to a dense layer of clay approximately 15-feet deep. Lateral groundwater movements within the clay layer are likely negligible. The sheet pile floodwall would be driven approximately 11 feet deep, and would therefore not interfere with water movements below the clay. In addition, groundwater is a minor hydrologic component in the floodplain wetland south of the floodwall (Preusch, pers. comm., 2003). The Service recommends that the Corps conduct additional borings along the floodwall route during the next phase of project design to confirm the absence of a perched water table within the clay layer. If a lens of water is present, the sheet pile could interfere with ground water flows. In addition, if a perched lens of water is present and under pressure, driving the sheet pile may cause safety or flooding problems.

Changing the hydrologic conditions in the study area may also affect the incidence of fish stranding after overbank flood events (Papson, pers. comm., 2003). South of the floodwall, the project may benefit fish by preventing flood waters from entering developed areas where fish could be adversely effected as the waters recede. North of the floodwall, ponding of base flows and storm flows will occur in low spots (*i.e.*, the wetlands northeast of the floodwall, the proposed east-west drainage swale immediately north of the wall) when the floodgates are closed. Compared to current baseline conditions, ponding depths will be shallower as the flood control structures will prevent the addition of backwater flows into these areas. Recedence time (*i.e.*, speed of drainage) of these waters will depend on the difference in water elevations north and south of the floodwall when the gates are re-opened after a flood event. The Service recommends that the Township open the gates as soon as the threat of backwater flood damages has passed to: (1) promptly restore fish passage and (2) permit a gradual recedence of waters ponded north of the wall, allowing time for fish to return to the stream channels. Prior to construction, the Service requests an opportunity to review documentation describing the proposed operation of the flood warning system and the floodgates.

VI. CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

The Service concurs that the Corps has avoided and minimized environmental impacts through this phase of planning by selecting and refining the recommended plan for flood damage reduction in Long Hill Township. The Service recommends the following measures to further reduce and mitigate project effects to wildlife resources.

1. Review the NJNHP's Morris and Somerset County rare plant lists to determine which species, if any, may potentially inhabit the construction zone (based on habitat characteristics), and that may have been undetected during the Corps late fall vegetation survey. Include this information with final project documents. Conduct surveys for these species along the construction zone during the appropriate season if schedules and budgets permit. If any occurrences are documented, notify the Service and the NJNHP to determine appropriate mitigation.

2. Minimize temporary wetland impacts by selecting equipment and material staging areas and access routes in uplands whenever possible. Restore temporary wetland impacts to pre-construction conditions in accordance with State regulations.

3. Clean and inspect all construction equipment used in areas dominated by *Phragmites* to ensure that rhizomes are not inadvertently spread along the construction corridor, or to other work areas.

4. Install and maintain fencing along the southern limit of the construction corridor to preclude entrance of transient terrestrial species into the work area. To prevent entry of any protected bog turtles and wood turtles, fencing should consist of a double row of standard silt fencing (*i.e.*, a solid sheet with no holes or projections) at least 1 foot high stretched taught and embedded several inches in the ground. Fencing may be combined with sediment and erosion control plans if a single design can meet both purposes.

5. Conduct a pre-construction survey of the fenced construction area and remove any transient or denning wildlife into the adjacent forested wetland. As sheet pile driving proceeds along the alignment, re-survey the immediate area within 1 day of starting work in a new section. If any bog turtles are found in the construction zone: (a) do not move the turtles; (b) document the occurrence; (c) contact the Service immediately; and (d) halt work until consultation pursuant to the ESA is completed.

6. Conduct a playback survey, using a qualified biologist, for red-shouldered hawk at two locations along South Main Street equally spaced between the floodwall alignment at the Passaic River between March 1 and May 15, and report the results to the NJDEP and the Service. If nesting hawks are documented, the NJDEP and the Service will recommend a 0.25-mile construction buffer around the nest site between March 1 and July 15.

7. Minimize the width of the permanent right-of-way on the south side of the floodwall, and conduct maintenance of the wall from developed or upland sites along the north side whenever possible.

8. Preferentially avoid impacts to forested wetlands over disturbed wetlands or wetland areas maintained as mowed lawns.

9. Provide the following information in final project documents: (a) total acres of temporary and permanent wetland impacts; (b) acres of wetland impacts classified by forested wetlands, disturbed wetlands, and mowed ("lawn") wetlands; and (c) extent of proposed wetland and upland tree removal.

10. Adopt the following planning goals for the proposed compensatory mitigation. Forested wetlands: no net in-kind loss. Disturbed wetland areas: no net loss of wetland acreage, while minimizing net loss of emergent and scrub-shrub wetland types.

11. Adopt a high compensatory mitigation ratio for any unavoidable impacts to forested wetlands to account for the low success rate of creating and restoring these systems. The Service will recommend a specific ratio during the State wetland permitting process.

12. Make every effort to retain mature trees.

13. Incorporate design features into the tributary closure structures to permit passage of terrestrial wildlife when the floodgates are open, and determine if the culverts under Valley Road can be modified to improve animal passage along the tributary corridors.

14. Acquire binding agreements from the local sponsor and the Township to ensure that State and local land-use regulations to protect wetlands and floodplains, and to manage storm water, will not be relaxed over the life of the project.

15. Pursue preservation of remaining privately-owned flood storage wetlands in the study area as a component of the project, in partnership with the local sponsor and the Township.

16. Evaluate and document potential for the proposed flood control structures to cause ongoing erosion, sedimentation, or scouring following construction. If engineering and hydraulic assessments indicate that such effects are possible: (a) take all appropriate measures to prevent post-construction erosion, sedimentation, or scouring; (b) monitor appropriate areas for 5 years following project construction to ensure that the preventive measures have been effective; and (c) report monitoring results to the Service and NJDEP annually.

17. Actively investigate possibilities to incorporate storm water treatment features into the three proposed closure structures to treat runoff coming from the developments north of Valley Road.

18. Assess the hydrology of the wetland northeast of the floodwall, during the design phase, to determine the extent to which backwater flooding during higher-magnitude (≥ 3-year) events contributes to overall hydrologic conditions. Provide the results of the assessment to the Service and NJDEP to determine if adverse ecological effects may result from expected hydrologic changes.

19. Design and operate the flood warning system to minimize the closure time of the floodgates, without compromising human safety or flood damage protection.

20. Monitor the northeastern wetland area for hydrologic changes for at least 5 years following project completion, and provide a summary of results to the Service annually.

21. Allow for adaptive management of the flood warning system if wetland conditions and/or flood damage conditions warrant a change in the operation of the floodgates.

22. Conduct additional borings along the floodwall route during the next phase of project design to confirm the absence of a perched water table within the clay layer.

23. Open the floodgates as soon as the threat of backwater flood damages has passed to: (a) promptly restore fish passage and (b) permit a gradual recedence of waters ponded north of the wall, allowing time for fish to return to the stream channels.

24. Prior to construction, forward documentation describing the proposed operation of the flood warning system and the floodgates to the Service and NJDEP for review.

VII. REFERENCES

A. LITERATURE CITED

Balzano, S., A. Ertman, L. Brancheau, and W. Smejkal. 2002. Creating indicators of wetland status (quantity and quality) of freshwater wetland mitigation in New Jersey. New Jersey Department of Environmental Protection, Division of Science, Research and Technology. Trenton, New Jersey.

Dunne, P. (ed.). 1989. New Jersey at the crossroads of migration. New Jersey Audubon Society. Bernardsville, New Jersey. 75 pp.

New Jersey Department of Agriculture. 2003. Natural Resource Conservation Web Site. http://www.state.nj.us/agriculture/rural/natrsrc.htm. Accessed May 31, 2003.

New Jersey Department of Environmental Protection. Undated. New Jersey's Landscape Project, wildlife habitat mapping for community land-use planning and endangered species conservation. http://www.state.nj.us/dep/fgw/ensp/landscape/index.htm. Accessed April 3, 2003.

New Jersey State Soil Conservation Committee. 1987. Standards for soil erosion and sediment control in New Jersey. New Jersey Department of Agriculture, Division of Rural Resources, Trenton, New Jersey.

Robbins, C.S. 1988. Forest fragmentation and its effects on birds. In Johnson, J.E. (ed.) 1988. Managing North Central forests for non-timber values. Publication 88-4, Society of American Foresters, Bethesda, Maryland. 156 pp.

U.S. Army Corps of Engineers. 1998. Reconnaissance study, Upper Passaic River, New Jersey flood control and environmental restoration study, Section 905(b) (WRDA 86) preliminary analysis. U.S. Army Corps of Engineers, New York District, New York, New York. 20 pp. + Attachments.

_____. 2002a. Upper Passaic River, New Jersey flood control and environmental restoration feasibility study, P-7 milestone report, preliminary formulation of alternatives. U.S. Army Corps of Engineers, New York District, New York, New York. 35 pp.

_____. 2002b. Natural resource inventory report, feasibility study for the Upper Passaic River, New Jersey flood control and environmental restoration project, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 86 pp. + Appendices.

_____. 2003a. Draft integrated feasibility report and environmental assessment, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 92 pp. + Appendices.

_____. 2003b. Draft environmental assessment, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 121 pp. + Appendices.

_____. 2003c. Vegetation survey report, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S.

Army Corps of Engineers, New York District, New York, New York. 13 pp. + Appendices.

U.S. Fish and Wildlife Service. 2002. Birds of management concern 2002. Department of the Interior, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 23 pp. + tables.

B. PERSONAL COMMUNICATIONS

Berkley, B. 2003. Senior Wetland Scientist. MATRIX Environmental & Geotechnical Services, Inc. Florham Park, New Jersey.

Fronius, M. 2003. Project Manager. Baker Engineering NY, Inc. Elmsford, New York.

Papson, B. 2003. Principal Biologist. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Bureau of Freshwater Fisheries, Lebanon, New Jersey.

Preusch, D. 2003. Project Manager. Michael Baker Junior, Inc. Alexandria, Virginia.

Tumminello, P. 2003. Project Manager. Upper Passaic River, New Jersey Flood Control and Environmental Restoration Study, U.S. Army Corps of Engineers, New York District, New York, New York.

Valent, M. 2003. Principal Zoologist. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program, Clinton, New Jersey.

APPENDIX A

Federally listed endangered and threatened species
and candidate species in New Jersey

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY

An **ENDANGERED** species is any species that is in danger of extinction throughout all or a significant portion of its range.

A **THREATENED** species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	**Shortnose sturgeon***	*Acipenser brevirostrum*	E
REPTILES	**Bog turtle**	*Clemmys muhlenbergii*	T
	Atlantic Ridley turtle*	*Lepidochelys kempii*	E
	Green turtle*	*Chelonia mydas*	T
	Hawksbill turtle*	*Eretmochelys imbricata*	E
	Leatherback turtle*	*Dermochelys coriacea*	E
	Loggerhead turtle*	*Caretta caretta*	T
BIRDS	**Bald eagle**	*Haliaeetus leucocephalus*	T
	Piping plover	*Charadrius melodus*	T
	Roseate tern	*Sterna dougallii dougallii*	E
MAMMALS	**Eastern cougar**	*Felis concolor couguar*	E+
	Indiana bat	*Myotis sodalis*	E
	Gray wolf	*Canis lupus*	E+
	Delmarva fox squirrel	*Sciurus niger cinereus*	E+
	Blue whale*	*Balaenoptera musculus*	E
	Finback whale*	*Balaenoptera physalus*	E
	Humpback whale*	*Megaptera novaeangliae*	E
	Right whale*	*Balaena glacialis*	E
	Sei whale*	*Balaenoptera borealis*	E

	Sperm whale*	*Physeter macrocephalus*	E

	COMMON NAME	SCIENTIFIC NAME	STATUS
INVERTEBRATES	Dwarf wedgemussel	*Alasmidonta heterodon*	E
	Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*	T
	Mitchell saytr butterfly	*Neonympha m. mitchellii*	E+
	American burying beetle	*Nicrophorus americanus*	E+
PLANTS	Small whorled pogonia	*Isotria medeoloides*	T
	Swamp pink	*Helonias bullata*	T
	Knieskern's beaked-rush	*Rhynchospora knieskernii*	T
	American chaffseed	*Schwalbea americana*	E
	Sensitive joint-vetch	*Aeschynomene virginica*	T
	Seabeach amaranth	*Amaranthus pumilus*	T

STATUS:			
E	endangered species	PE	proposed endangered
T	threatened species	PT	proposed threatened
+	presumed extirpated**		

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

** Current records indicate the species does not presently occur in New Jersey, although the species did occur in the State historically.

Note: for a complete listing of Endangered and Threatened Wildlife and Plants, refer to 50 CFR 17.11 and 17.12.

For further information, please contact:

U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232
Phone: (609) 646-9310

FEDERAL CANDIDATE SPECIES IN NEW JERSEY

CANDIDATE SPECIES are species that appear to warrant consideration for addition to the federal List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the U.S. Fish and Wildlife Service encourages federal agencies and other planners to give consideration to these species in the environmental planning process.

SPECIES	SCIENTIFIC NAME
Bog asphodel	*Narthecium americanum*
Hirst's panic grass	*Panicum hirstii*

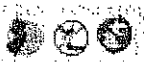
Note: For complete listings of taxa under review as candidate species, refer to Federal Register Vol. 64, No. 205, October 25, 1999 (Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species).

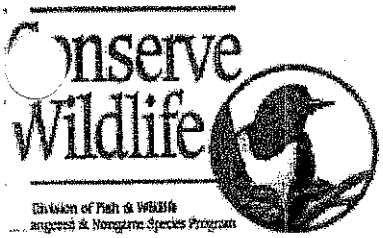
Revised 11/99

APPENDIX B

State-listed endangered and threatened species in New Jersey

New Jersey Division of Fish and Wildlife





Endangered and Threatened Wildlife of New Jersey

Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, ...er-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New ...sey.

Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

L... updated 3/18/02

BIRDS

Endangered		Threatened	
Bittern, American	*Botaurus lentiginosos**	Bobolink	*Dolichonyx oryzivorus*
Eagle, bald	*Haliaeetus leucocephalus* BR **	Eagle, bald	*Haliaeetus leucocephalus* NB **
Falcon, peregrine	*Falco peregrinus*	Hawk, Cooper's	*Accipiter cooperii*
...hawk, northern	*Accipiter gentilis**	Hawk, red-shouldered	*Buteo lineatus* NB
Grebe, pied-billed	*Podilymbus podiceps**	Night-heron, black-crowned	*Nycticorax nycticorax**
Harrier, northern	*Circus cyaneus**	Night-heron, yellow-crowned	*Nyctanassa violaceus*
Hawk, red-shouldered	*Buteo lineatus* BR	Knot, red	*Calidris canutus*
Owl, short-eared	*Asio flammeus**	Osprey	*Pandion haliaetus**
Plover, piping	*Charadrius melodus***	Owl, barred	*Strix varia*
Sandpiper, upland	*Batramia longicauda*	Owl, long-eared	*Asio otus*
Shrike, loggerhead	*Lanius ludovicianus*	Rail, black	*Laterallus jamaicensis*
Skimmer, black	*Rynchops niger* BR	Skimmer, black	*Rynchops niger* NB
Sparrow, Henslow's	*Ammodramus henslowii*	Sparrow, grasshopper	*Ammodramus savannarum**
Sparrow, vesper	*Pooecetes gramineus* BR	Sparrow, Savannah	*Passerculus sandwichensis**
Tern, least	*Sterna antillarum*	Sparrow, vesper	*Pooecetes gramineus* NB
Tern, roseate	*Sterna dougallii***	Woodpecker, red-headed	*Melanerpes erythrocephalus*
Wren, sedge	*Cistothorus platensis*		

*Only breeding population considered endangered or threatened

**Federally endangered or threatened

BR - Breeding population only; NB - non-breeding population only

REPTILES			
Endangered		**Threatened**	
Rattlesnake, timber	*Crotalus h. horridus*	Snake, northern pine	*Pituophis m. melanoleucus*
Snake, corn	*Elaphe g. guttata*	Turtle, Atlantic green	*Chelonia mydas***
Turtle, bog	*Clemmys muhlenbergii*	Turtle, wood	*Clemmys insculpta*
Atlantic Hawksbill	*Eretmochelys imbricata***		
Atlantic Leatherback	*Dermochelys coriacea***		
Atlantic Loggerhead	*Caretta caretta***		
Atlantic Ridley	*Lepidochelys kempi***		
**Federally endangered or threatened			

AMPHIBIANS			
Endangered		**Threatened**	
Salamander, blue-spotted	*Ambystoma laterale*	Salamander, eastern mud	*Pseudotriton montanus*
Salamander, eastern tiger	*Ambystoma tigrinum*	Salamander, long-tailed	*Eurycea longicauda*
Salamander, Tremblay's	*Ambystoma tremblayi*		
Treefrog, pine barrens	*Hyla andersonii*		
Treefrog, southern gray	*Hyla chrysocelis*		

INVERTEBRATES			
Endangered		**Threatened**	
tle, American burying	*Nicrophorus mericanus***	Beetle, northeastern beach tiger	*Cincindela d. dorsalis***
opper, bronze	*Lycaena hyllus*	Floater, triangle (mussel)	*Alasmidonta undulata*
Floater, brook (mussel)	*Alasmidonta varicosa*	Elfin, frosted (butterfly)	*Callophrys irus*
Floater, green (mussel)	*Lasmigona subviridis*	Fritillary, silver-bordered (butterfly)	*Bolaria selene myrina*
Skipper, arogos (butterfly)	*Atrytone arogos arogos*	Lampmussel, eastern (mussel)	*Lampsilis radiata*
Skipper, Appalachian grizzled (butterfly)	*Pyrgus wyandot*	Lampmussel, yellow (mussel)	*Lampsilis cariosa*
		Mucket, tidewater (mussel)	*Leptodea ochracea*
		Mussel, dwarf wedge	*Alasmidonta heterodon***
		Pondmussel, eastern (mussel)	*Ligumia nasuta*
		Satyr, Mitchell's (butterfly)	*Neonympha m. mitchellii***
		White, checkered (butterfly)	*Pontia protodice*
		**Federally endangered or threatened	

MAMMALS	
Endangered	
Bat, Indiana	*Myotis sodalis***
Bobcat	*Lynx rufus*
Whale, black right	*Balaena glacialis***
Whale, blue	*Balaenoptera musculus***
Whale, fin	*Balaenoptera physalus***
Whale, humpback	*Megaptera novaeangliae***
Whale, sei	*Balaenoptera borealis***
Whale, sperm	*Physeter macrocephalus***
Woodrat, eastern	*Neotoma floridana*
**Federally Endangered	

FISH	
Endangered	
Sturgeon, shortnose	*Acipenser brevirostrum***
**Federally Endangered	

The lists of New Jersey's endangered and nongame wildlife species are maintained by the DEP's Division of Fish and Wildlife's Endangered and Nongame Species Program. These lists are used to determine protection and management actions necessary to ensure the survival of the state's endangered and nongame wildlife. This work is made possible through voluntary contributions received through Check-off donations to the Endangered Wildlife Conservation Fund on the New Jersey State Income Tax Form, the sale of Conserve Wildlife License Plates, and donations. For more information about the Endangered and Nongame Species Program or to report a sighting of endangered or threatened wildlife, contact the Endangered and Nongame Species, NJ Division of Fish and Wildlife, P.O. Box 400, Trenton, NJ 08625-0400; or call 609-292-9400.

APPENDIX C

Coordination with the New Jersey Division of Fish and Wildlife

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

FP-03/23

JUN - 4 2003

Martin McHugh, Director
New Jersey Division of Fish and Wildlife
P.O. Box 400
Trenton, New Jersey 08625

Dear Mr. McHugh:

Enclosed is the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act Report entitled, "Assessment of the Upper Passaic River at Long Hill Township Flood Damage Reduction and Ecosystem Restoration Project, Morris County, New Jersey." This constitutes the Service's draft report on fish and wildlife impacts that can be expected to result from the Army Corps of Engineers (Corps) proposed plan. This report has been prepared pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*).

The Service's report contains an assessment of the proposed plan and recommendations for the protection of fish and wildlife resources. Please provide a letter of comment including indication of concurrence, or lack thereof, within 30 days from the date of this letter. If there are any questions concerning this report, please contact John Staples or Wendy Walsh of my staff at (609) 646-9310, extensions 18 and 48, respectively. Thank you for your assistance in this matter.

Sincerely,

Clifford G. Day
Supervisor

Enclosure

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, N.Y. 10278-0090

July 2, 2003

REPLY TO
ATTENTION OF
Planning Division, Rm2136

Mr. Cliff Day
Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
Ecological Services
927 N. Main St., Building D
Pleasantville, NJ 08232

Dear Mr. Day:

This letter is in response to the receipt of the draft report from the Service regarding the anticipated impacts on fish and wildlife resources from the Corps proposed Upper Passaic River at Long Hill Township Flood Damage and Ecosystem Restoration Project, Morris County, New Jersey. This report was prepared pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat 401; 16U.S.C. 661 *et seq.*). This report and the Corps comments are provided in accordance with the Fiscal Year 2003 Scope of Work and funding transfer agreement dated February 21, 2003.

Please review the comments and provide the final report within 30 days. The District will coordinate with your agency as needed, to assist in your preparation of the report. If you have any questions or comments, please contact Ms. Melissa Alvarez, project biologist at (212) 264-2008.

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

Enclosures

OFFICIAL COMMENTS

DRAFT FISH AND WILDLIFE COORDINATION ACT SECTION 2(b) REPORT

ASSESSMENT OF THE UPPER PASSAIC RIVER AT LONG HILL TOWNSHIP FLOOD DAMAGE REDUCTION AND ECOSYSTEM RESTORATION PROJECT, MORRIS COUNTY, NEW JERSEY

Prepared for:

U.S. Fish and Wildlife Service
Ecological Services, Region 5
New Jersey Field Office
Pleasantville, New Jersey 08232

Prepared by:

U. S. Army Corps of Engineers
New York District
Planning Division
Environmental Analysis Branch
New York, New York 10278-0090

Project Biologist: Melissa D. A. Alvarez
Project Team Leader: Roselle Henn
Environmental Analysis Branch Chief: Leonard Houston

June 2003

I. General Comments from Main Report

Page 2, Site 2	" No interest in restoration.." Should read "prefers habitats as they currently function, although degraded"
Page 3	Need to get the new map from USACE which has the USACE Logo not the consultants on it
Page 4, Site 4	Should mention invasive removal as part of the enhancement activities
Page 4, Site 7	Should mention that enhancement is not of a scale that warrants Federal interest
Page 7,	Reference Corps Contractor only, not the Contractor (Matrix) directly through out report.
Page 8, Para 1	Clarify statement that states "Most of this area is owned by Morris County...." There are a series of lots between Valley Rd and the county land that are privately owned and are forested wetlands. These wetlands are currently threatened by sprawl and expanding illegal activities.
Page 9, Part B	Reference "Corps Contractor was retained to conduct..."
Page 10	Reference "Corps Contractor was retained to conduct..." Correction - Matrix was not retained for Field surveys on wildlife, but only literature searches basing assumptions on habitat types and literature. All observations were made while conducting other field activities and were incorporated to enhance the information. Please reflect this information in the report.
Page 11	The Corps does not intend to conduct additional faunal inventories as they are not essential to this project and its compliance to regulations. It is the Corps intention to continue to design and plan in a manner that minimizes and avoids where feasible both direct and indirect impacts to habitat values.
Page 15, Para 3	The Corps concurs with the concern of the Service regarding animal movement within the project area. It will be recommended by the Environmental Analysis Branch that the design incorporate small earthen ramps on either side of the tributaries to promote this essential animal movement. This would minimize maintenance and operational efforts, while allowing for a more natural setting for movement. This recommendation will also be coordinated with NJDEP in order to minimize any additional wetland impacts.

Page 16, Para 2 — "This alternative was not considered in project documents" Acquisition of flood storage areas was considered in the early stages of project development, but were soon dropped out for various reasons. The existing storage areas surrounding Long Hill Township already function to this capacity and many are public held. The option to create a detention/ storage area was evaluated, but no such location was found in a magnitude that would give the Township the proper amount of flood protection.

Page 19 — The Corps conducted borings along the flood wall route every 500 feet. The borings indicated the absence of a perched water table. Given the uniformity of the existing clay layer within the samples, the Corps is confident that a perched water table does not exist within the flood wall route.

II. Specific Service Recommendations

1. The finalized vegetation report will take into account this recommendation. Additional surveys will not be undertaken at this time, however during construction a Biologist will be stationed on site to monitor for all species of concern.
2. All wetland impacts, both permanent and temporary, will be minimized during construction by implementing Best Management Practices and utilizing equipment appropriate for this type of work. All temporary impacts will be restored according to State regulations.
3. During the Design Phase, this specification will be added to project documents in order to minimize any spread of *Phragmites sp.*
4. The Corps concurs with the Service recommendation and it will be addressed within the sediment and erosion control plans. The Corps feels this can be addressed in a single design.
5. The Corps will have a staff biologist onsite to complete these surveys and to monitor the construction activities in order to minimize any impact to the resources within the project boundaries.
6. This recommendation will be taken into consideration as the project approaches construction.
7. Due to the nature of the forested wetlands on the south side of the wall, the majority of the project maintenance will be conducted on the north side. The width will be minimized to the extent possible.
8. The Corps concurs with this statement and where feasible impacts to forested wetlands have been and will continue to be minimized and/or avoided.
9. This information will be updated in the project's supporting environmental documents as feasible and when possible.

10. USACE regulations and policies specify compensatory mitigation of equivalent habitat value to the impact. If the non-Federal sponsor wishes to include additional mitigation that may be developed into a locally preferred alternative.
11. See response to recommendation #10.
12. Every effort will be made to maintain mature trees where feasible.
13. This project does not authorize the Corps to modify the culverts under Valley Road, however as stated in the General Comments the Corps will make efforts to incorporate design features to permit terrestrial wildlife movement.
14. Long term project maintenance is the responsibility of the non-Federal sponsor and will be defined in the Project Construction Agreement.
15. The Corps plans on pursuing preservation of the privately owned flood storage wetlands on the south side of the project site.
16. During the Design Phase, sediment and erosion control plans will be developed for both during and after construction. The effectiveness of the project will be monitored as stated in the general comments.
17. The Corps project authorization does not permit the Corps to incorporate this type of work. However, the Corps will recommend in the Operation and Maintenance Manual other improvements that can be made to enhance the functionality of the project.
18. It is unclear to the Corps what type of assessment the Service is looking for here beyond the modeling already performed. The Corps intends on implementing three years of monitoring on years 1, 3, and 5, at this site and other areas for vegetative changes occurring in the project area. This monitoring will also recommend any project modifications to adjust for unanticipated adverse impacts.
19. The Corps will be working with NJDEP and the Township to develop a flood warning system that minimizes closure time to preserve natural resources, without comprising human safety.
20. The Corps intends on implementing three years of monitoring on years 1, 3, and 5, at this site and other areas for vegetative changes occurring in the project area. This monitoring will also recommend any project modifications to adjust for unanticipated adverse impacts.
21. It will be recommended that a clause be put into the flood warning system agreement to accommodate this type of adaptive management.
22. The Corps conducted borings along the flood wall route every 500 feet. The borings indicated the absence of a perched water table. Given the uniformity of the existing clay layer within the samples, the Corps is confident that a perched water table does not exist within the flood wall route.
23. The Corps is looking to minimize any adverse impacts, which include the duration of the floodgate closure. As this plan develops further, the Corps will solicit input from the Service in order to ensure minimized impact.
24. The Corps looks forward to continue to solicit input from cooperating agencies on the Flood Warning System and other aspects of the project in order minimize all adverse impacts.

FISH AND WILDLIFE COORDINATION ACT
SECTION 2(b) REPORT

ASSESSMENT OF THE
UPPER PASSAIC RIVER AT LONG HILL TOWNSHIP
FLOOD DAMAGE REDUCTION AND
ECOSYSTEM RESTORATION PROJECT,
MORRIS COUNTY, NEW JERSEY

Prepared by:

U.S. Fish and Wildlife Service
Ecological Services, Region 5
New Jersey Field Office
Pleasantville, New Jersey 08232

August 2003

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://njfieldoffice.fws.gov

In Reply Refer to:

FP- 03/37

AUG 13 2003

Colonel John B. O'Dowd
District Engineer, New York District
U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278-0090

Dear Colonel O'Dowd:

This is the final report of the U.S. Fish and Wildlife Service (Service) regarding anticipated impacts on fish and wildlife resources from the U.S. Army Corps of Engineers (Corps) proposed Upper Passaic River at Long Hill Township Flood Damage and Ecosystem Restoration Project, Morris County, New Jersey. This report was prepared pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat 401; 16 U.S.C. 661 *et seq.*) (FWCA). This report is provided in accordance with our Fiscal Year-2002 Scope Of Work and funding transfer agreement dated February 21, 2003, and is based on information provided in various Corps planning documents.

In addition to our activities pursuant to the Scope of Work, the Service is conducting informal consultation with the Corps regarding potential effects of the proposed flood control project on the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*), pursuant to Section 7(a)(2) of the Endangered Species Act (87 Stat. 884; 16 U.S.C. 1531 *et seq.*) (ESA). Based on our March 6, 2003 site visit, the Service recommended limited bog turtle habitat surveys in our March 20, 2003 letter (FP-02/066). The Corps has completed habitat surveys, and documented some areas of potentially suitable bog turtle habitat. In accordance with Service guidance, the Corps is preparing a report on the results of bog turtle visual surveys as of the date of this report. If bog turtles are documented in the vicinity of the flood control project area, further ESA consultation will be required. Through the informal Section 7 consultation process, the Service will make recommendations to avoid adverse effects to bog turtles. Consultation must be completed before finalization of documents prepared pursuant to the National Environmental Policy Act (83 Stat. 852; 42 U.S.C. 4321 *et seq.*), and before the Corps makes any irreversible or irretrievable commitment of resources (50 CFR Part 402.14). Other than the possible presence of bog turtles and an occasional transient bald eagle (*Haliaeetus leucocephalus*), no other federally listed or proposed endangered or threatened flora or fauna under Service jurisdiction are known to occur within the project area.

A draft copy of this report was forwarded to the New Jersey Division of Fish and Wildlife (NJDFW) for review. The Service received a letter from NJDFW dated July 7, 2003 (Appendix C) concurring with the draft report. Additionally, the Service received comments on the draft report from the Corps, dated July 2, 2003. These comments were incorporated into the final report.

The Service appreciates the efforts made by the Corps to avoid and minimize wildlife impacts through this phase of planning by selecting and refining the recommended plan for flood damage reduction in Long Hill Township. If you have any questions regarding this report, please contact Wendy Walsh of my staff at (609) 646-9310, extension 48. We look forward to coordinating with the New York District during implementation of this project.

Sincerely,

Clifford G. Day
Supervisor

FISH AND WILDLIFE COORDINATION ACT
SECTION 2(b) REPORT

ASSESSMENT OF THE
UPPER PASSAIC RIVER AT LONG HILL TOWNSHIP
FLOOD DAMAGE REDUCTION AND
ECOSYSTEM RESTORATION PROJECT,
MORRIS COUNTY, NEW JERSEY

Prepared for:

U.S. Army Corps of Engineers
New York District
New York, New York
10278-0090

Prepared by:

U.S. Fish and Wildlife Service
Ecological Services, Region 5
New Jersey Field Office
Pleasantville, New Jersey 08232

Preparer: Wendy L. Walsh
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Project Leader: Clifford G. Day

August 2003

EXECUTIVE SUMMARY

A May 7, 1997 U.S. House of Representatives Resolution (Docket 2517) authorized the U.S. Army Corps of Engineers, New York District (Corps) to study flood damage reduction and ecosystem restoration along the Upper Passaic River at Long Hill Township, Morris County, New Jersey. The Corps completed a reconnaissance study in 1998. In the subsequent feasibility study, the Corps developed and screened seven alternatives for ecosystem restoration. The Corps eliminated all restoration options from further consideration due to various constraints, including lack of local support.

The Corps investigated numerous flood control options, both structural and non-structural, and combinations of these. Five alternatives were developed for full consideration, including no action. The action alternatives include various combinations of tributary closure structures, road raising, levee/floodwall structures, structural flood proofing, and a flood warning system. The recommended plan is designed to provide flood protection to developed areas along both sides of Valley Road, as well as an area of Madison Avenue, up to the 100-year flood event. The proposed project includes a manually operated floodgate on each of three Passaic River tributaries, a flood warning system, and a floodwall and levee system that when constructed would be approximately 4,000 feet long, set back 1,500 to 2,500 feet from the Passaic River, along approximately 3,200 feet of Valley Road.

An extensive forested wetland lies south of the proposed floodwall alignment. This and other wetlands in the study area provide wildlife habitats of high quality. Due to the quality, size, and connectivity of these wetlands, and proximity to Great Swamp National Wildlife Refuge, the study area provides habitats for a diversity of vertebrate species, including species of concern such as raptors, forest-interior neotropical migratory birds, and transient wood turtles (*Clemmys insculpta*) (State-listed) and bog turtles (*Clemmys muhlenbergii*) (federally and State-listed).

The Corps has avoided and minimized wildlife impacts through this phase of project planning by selecting and refining the recommended plan for flood damage reduction in Long Hill Township. Most significantly, the proposed flood control structures are expected to have only minor direct and indirect effects on the substantial wetland resources in the study area. The project will impact 1.17 acres of State-jurisdictional freshwater wetlands and adjacent areas, with a total construction footprint of approximately 1.8 acres (a 20-foot construction corridor along the 4,000-foot floodwall). Much of the impacted area, including some of the jurisdictional wetlands, consist of developed commercial or residential properties. Affected wildlife habitats are mainly within forest edge communities at the interface of development. These areas mostly support abundant and weedy species. By selecting a floodwall/levee set back from the river, the Corps has also minimized hydrologic effects on wetlands.

The U.S. Fish and Wildlife Service provides various recommendations and planning goals to further reduce potential adverse impacts to wildlife resources. Recommendations include construction zone fencing, limited survey efforts for rare or listed species, protection of mature trees and forested wetlands, inclusion of animal passage features in project design, maintenance of local regulations to protect floodplains, acquisition of flood storage areas, investigation of opportunities to improve water quality, and limited hydrologic monitoring.

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Appendix A	Federally listed endangered and threatened species and candidate species in New Jersey
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I. INTRODUCTION

This constitutes the U.S. Fish and Wildlife Service's (Service) Fish and Wildlife Coordination Act, (48 Stat. 401; 16 U.S.C. 661 *et seq.*) (FWCA) Section 2(b) report describing the fish and wildlife resources and supporting ecosystems in the area of the proposed Upper Passaic River at Long Hill Township flood control project. This report is provided in accordance with a Fiscal Year-2002 Scope of Work and funding transfer agreement dated February 21, 2003, between the New York District, U.S. Army Corps of Engineers (Corps) and the Service's New Jersey Field Office. Information presented in this report documents the fish and wildlife resources in the project area, identifies potential adverse impacts to those resources, and includes the Service's recommendations to minimize adverse impacts. The project area is located along approximately 3,200 feet of Passaic River floodplain in Long Hill Township, Morris County, New Jersey. The local sponsor for the project is the New Jersey Department of Environmental Protection (NJDEP). In addition to our activities pursuant to the Scope of Work, the Service is conducting informal consultation with the Corps regarding potential effects of the proposed flood control project on the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*), pursuant to Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA).

The Service requests that no part of this report be used out of context, and if the report is reproduced, it should appear in its entirety. Furthermore, any data, opinions, figures, recommendations, or conclusions excerpted from this report should be properly cited and include the page number from which the information was taken. This report should be cited as follows:

Walsh, W.L. 2003. Assessment of the Upper Passaic River at Long Hill Township Flood Damage Reduction and Ecosystem Restoration Project, Morris County, New Jersey. Fish and Wildlife Coordination Act Section 2(b) Report, U.S. Department of the Interior, Fish and Wildlife Service, New Jersey Field Office, Pleasantville, New Jersey. 24 pp. + appendices.

Questions or comments regarding this report are welcomed by the Service. Written inquiries should be addressed to:

Supervisor
New Jersey Field Office
Ecological Services
U.S. Fish and Wildlife Service
927 North Main Street, Building D
Pleasantville, New Jersey 08232

II. DESCRIPTION OF THE PROPOSED PROJECT

A May 7, 1997 U.S. House of Representatives Resolution (Docket 2517) authorized the Corps to study flood damage reduction and ecosystem restoration along the Upper Passaic River at Long Hill Township, Morris County, New Jersey (Figure 1). The Corps completed a reconnaissance study in 1998, and has subsequently conducted a feasibility study culminating in the recommended plan described below.

A. ECOSYSTEM RESTORATION

During the feasibility study, the Corps developed and screened seven alternatives for ecosystem restoration. All restoration options were eliminated from further consideration due to various constraints. The Corps considers restoration at most of these sites to be technically and economically feasible, but rejected many of these alternatives based on a lack of local support from landowners, stakeholders, or potential project partners. Although the Corps rejected all seven sites for inclusion in this project, some of the sites may present future restoration opportunities. For example, restoration at some of the seven sites may be re-examined during the Corps recently-initiated Passaic River Basin Restoration Study. The following is a summary of the restoration alternatives considered by the Corps (Figure 1), and reasons why none are being pursued for implementation in the Upper Passaic River at Long Hill Township project (U.S. Army Corps of Engineers, 2003a). The Service encourages the Corps to pursue these opportunities in the future.

Site 1. South of Rolling Hill Road. This 10-acre site is a former swim club with a 1-acre artificial lake, and a smaller drainage retention basin located northeast of the lake. The Corps considered wetland enhancement and/or lake shore restoration. This site was rejected because the privately owned lake is managed as a recreational facility for an adjacent housing development, and because part of the site is included in a stormwater management plan for certain permitted activities regulated by the NJDEP.

Site 2. Warren Township Former Golf Course. The Corps considered a 20-acre restoration on this 60-acre golf course, which has not been used for approximately 25 years. The Corps rejected this site because Warren Township, which owns the property, prefers the area as it is although the wildlife habitats are degraded.

Site 3. Poplar Drive, Laurel and Cedar Avenues. The Corps considered removing the three residential dwellings located in this area, and restoring forested wetlands. The Corps rejected this site because local land use was deemed incompatible with ecological enhancement.

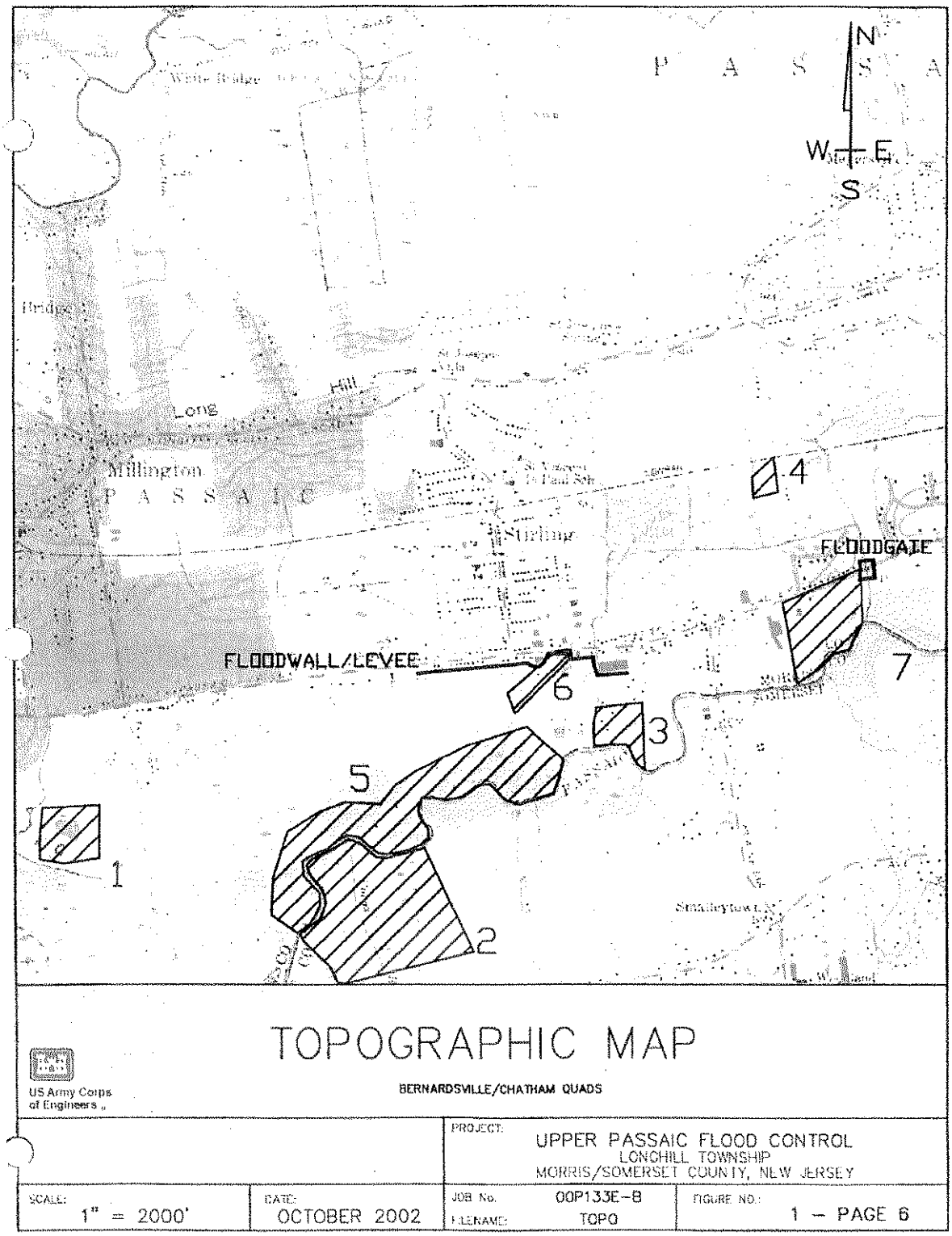

Figure 1. Project location (U.S. Army Corps of Engineers, 2002b). Sites 1-7 were screened for ecosystem restoration potential.

Site 4. Morristown Road. The Corps considered acquisition of this site, with minor restoration activities, such as removing invasive species and piles of landscape materials located in the wetlands. The Corps rejected this site because acquisition for preservation was deemed economically infeasible, and local sponsor interest was minimal.

Site 5. Passaic River Reach. Based on discussions with the Passaic River Coalition and other local environmental groups, the Corps determined that the Passaic River and adjacent wetlands in this reach are not in need of restoration and, therefore, eliminated this site from further study.

Site 6. Valley Road/Warren Road Utility Corridor. The Corps considered enhancing the wetlands along the utility corridor, which are currently dominated by common reed (*Phragmites australis*). The Corps rejected this site based on logistical problems with the utility right-of-way, and lack of a local proponent to sponsor the restoration.

Site 7. Long Hill Township Town Hall. The Corps considered establishing a continuation of the adjacent forested wetlands, or creating a transitional zone, within a disturbed portion of this property. A new town hall is currently under construction on the site. The Corps rejected this site because there was no local proponent to sponsor the restoration, and because enhancement is not of a scale that warrants federal interest.

B. FLOOD CONTROL

The Corps investigated numerous flood control options, both structural and non-structural, and combinations of these. Several structural alternatives were eliminated from further consideration for various reasons, including significant environmental impacts. Rejected options include an upstream detention structure; and dredging, channelization, and streambank clearing. Non-structural alternatives included acquisition of flood-prone properties, floodplain zoning, flood proofing buildings, and a flood warning system. None of the non-structural options were deemed to provide a sufficient level of flood protection as stand-alone alternatives, but several were carried forward to be combined with various structural components. The April 2003 draft Integrated Feasibility Report and Environmental Assessment (U.S. Army Corps of Engineers, 2003a) presents five flood control alternatives:

1. No action.

2. Install closure structures on Passaic River tributaries that convey floodwaters into Long Hill Township, implement limited non-structural armoring and structure raisings, and install a flood warning system.

3. Install closure structures on Passaic River tributaries that convey floodwaters into Long Hill Township, raise Valley Road to act as a barrier to floodwaters from the 1 percent chance exceedence (100-year) event, implement limited non-structural armoring and structure raisings, and install a flood warning system.

4. Construct a levee/floodwall along the Passaic River to the 1 percent chance exceedence (100-year) event with tributary closure gates, and install a tributary closure structure outside of the levee/floodwall line of protection.

5. Construct a setback levee/floodwall close to Valley Road with tributary closure gates along the levee/floodwall, and install a tributary closure structure outside of the levee/floodwall line of protection.

The Corps selected Alternative 5 as the environmentally preferred alternative, and the plan that maximizes net economic benefits. Alternative 5 also includes implementation of a flood warning system, and may include limited non-structural armoring and structure raisings (U.S. Army Corps of Engineers, 2003a). The March 2003 draft Environmental Assessment (U.S. Army Corps of Engineers, 2003b) presents three variations on the setback levee/floodwall plan to determine if modifications of design or alignment could reduce environmental, particularly wetland, impacts. Wetland impacts were subsequently reduced by shifting the alignment of the floodwall closer to Valley Road in several locations. Shifting the floodwall closer to residences along the western part of the alignment would further reduce wetland impacts; however, this option was rejected because it would require condemnation of private property (Tumminello, pers. comm., 2003). Some State-jurisdictional wetlands [N.J.S.A. 13:9B-1 *et seq.*, "Freshwater Wetlands Protection Act" (FWPA)] in these areas are maintained by residents as lawn, and offer negligible wildlife value.

The recommended plan consists of 4,057 feet of linear protection at the rear of developed properties along the south side of Valley Road for approximately 3,200 feet (between the Shop Rite shopping center at the corner of Poplar Drive and the Loudenberry Meadow Senior Condominium Development across from Passaic Avenue). The structure would consist of 3,996 feet of vinyl sheetpile floodwall, plus 61 feet of earthen levee at the western end to tie into high ground. The levee section would have a 12-foot-wide crest with side slopes of 3 feet horizontal to 1 foot vertical, and a maximum height of 4.5 feet. The floodwall reaches would consist of continuous watertight vinyl sheet pile driven approximately 10 feet into the soil. A section of earthen berm is proposed where the line of protection crosses the Transco natural gas pipeline, as sheet pile cannot be driven in this area. Where the floodwall crosses Main Street and Warren Avenue, the roads would be elevated for traffic to pass over the wall. The top of the line of protection is between +216.7 feet and 216.2 feet NGVD, extending 2.2 to 5.4 feet above grade, and tapering to the ground at either end (U.S. Army Corps of Engineers, 2003a). At this elevation, the levee/floodwall would provide flood protection to developments on both sides of Valley Road up to the 100-year event (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003).

The project includes manually-operated closure structures on two unnamed Passaic River tributaries where the streams cross the floodwall (Figure 2). An additional closure structure is proposed on a third unnamed tributary east of the floodwall, near Western Avenue where the stream crosses Valley Road. The closures would be concrete structures housing sluice gates. One 4-foot by 4-foot gate is proposed on the western tributary; two 5-foot by 7-foot gates are recommended on the middle stream near Warren Avenue; and one gate approximately 6 feet by 6 feet is proposed for the eastern stream near Western Avenue (Tumminello, pers. comm., 2003). The western and central structures would tie into the levee/floodwall. The eastern closure would employ vinyl sheet piling to tie into the Valley Road embankment. In this area, a section of Valley Road would be raised to +216.2 to act as a levee, requiring repaving for about 780 feet. All three gates would normally remain open, to be closed by Long Hill Township emergency management personnel when triggered by a flood warning system that will be implemented as part of the project.

III. METHODS

The Service reviewed the following documents in preparing this FWCA report.

- Reconnaissance Study, July 1998 (U.S. Army Corps of Engineers, 1998).
- P-7 Milestone Report, November 2002 (U.S. Army Corps of Engineers, 2002a).
- Natural Resource Inventory Report, December 2002 (U.S. Army Corps of Engineers, 2002b).
- Vegetation Survey Report, February 2003 (U.S. Army Corps of Engineers, 2003c).
- Draft Environmental Assessment, March 2003 (U.S. Army Corps of Engineers, 2003b).
- Draft Integrated Feasibility Report and Environmental Assessment, April 2003 (U.S. Army Corps of Engineers, 2003a).

The Service also conducted a site visit with the Corps contractor on March 6, 2003, and has coordinated with Corps personnel and the NJDEP, Division of Fish and Wildlife.

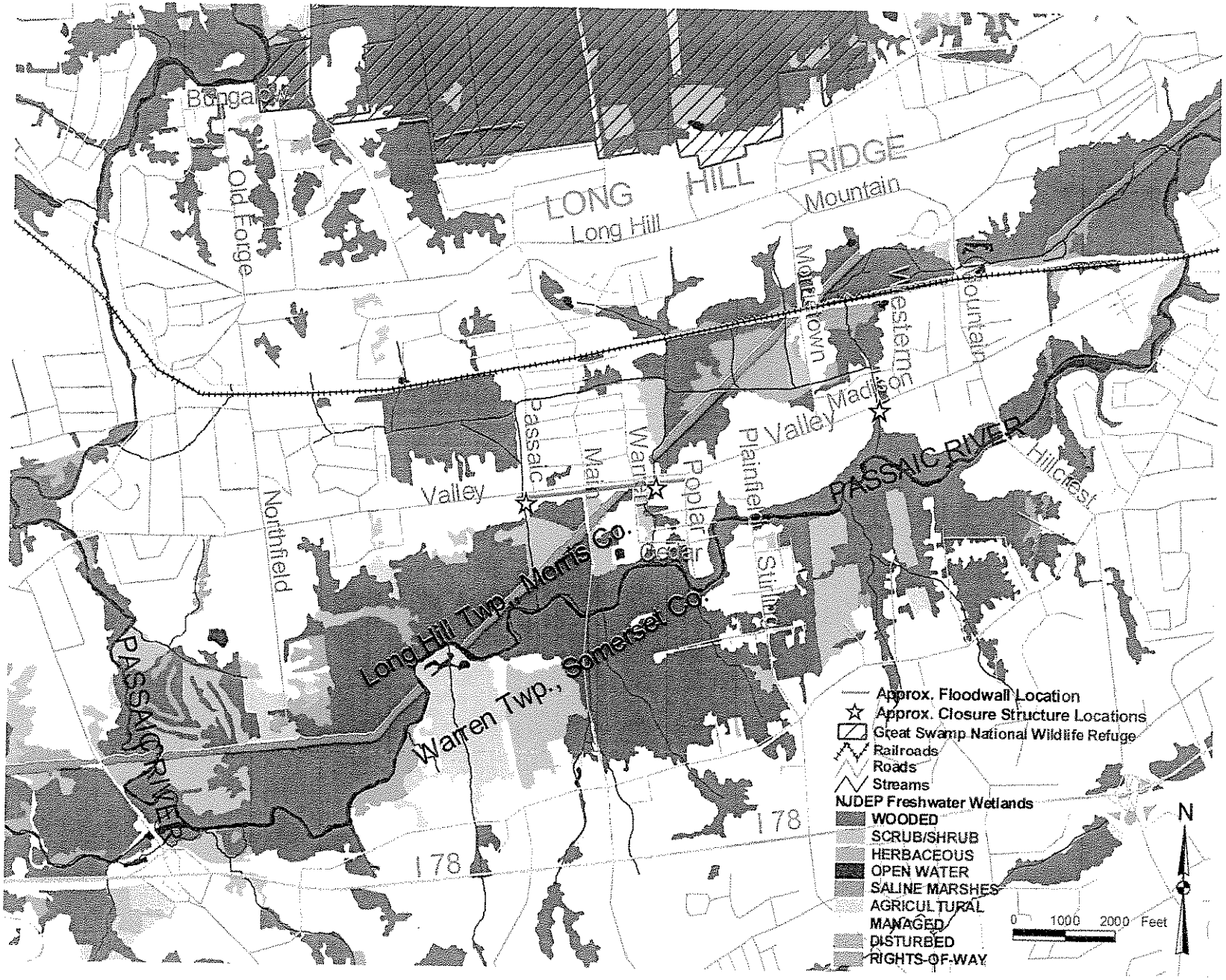

Figure 2. Wetlands

IV. EXISTING CONDITIONS

A. PHYSICAL CHARACTERISTICS

The study area is located within an extensive floodplain of the Passaic River. In the vicinity of the central Stirling business district of Long Hill Township, the Passaic River flows from west to east approximately 1,500-2,500 feet south of Valley Road (Figure 2). Surface hydrology in the area has been modified by development, and by historical alterations of natural stream channels and creation of drainage ditches (Papson, pers. comm., 2003). Three unnamed Passaic River tributaries each drain a small area (1-2 square miles) south of the Long Hill Ridge. These altered or man-made streams are connected by a west-to-east flowing ditch located north of Valley Road. This ditch causes water from different drainage areas to mix during heavy rainfall events (U.S. Army Corps of Engineers, 2003a). Through this ditch, the two western tributaries also drain to the wetland complex located between Warren Avenue and Morristown Road, north of Valley Road and south of the railroad (northeast of the floodwall alignment). This low-lying wetland is also maintained by direct precipitation and sheet flows off the Long Hill ridge. Water retained in this wetland is slowly released to the Passaic River via the eastern tributary near Western Avenue (Preusch, pers. comm., 2003).

South of Valley Road is a vast Passaic River floodplain consisting mainly of forested wetlands. Much of this area is owned by Morris County and maintained as open space (Papson, pers. comm., 2003). However, several lots comprised of forested wetlands are privately owned. These lots may be threatened by future development and encroachment of illegal activities into transition and wetland areas. Hydrologic conditions in this area are maintained by overtopping of the Passaic River and its tributaries and direct precipitation, combined with low-permeable clay soils. Valley Road acts as a barrier to sheet flows. Sheet flows into this southern wetland come only from the developed strip south of Valley Road, and therefore comprise only a minor component of hydrologic conditions in the floodplain. Runoff north of Valley Road flows to the northeastern wetland complex and into the tributary system both directly and via storm sewers (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003; Berkely, pers. comm., 2003).

Backwater flows during Passaic River flood events are a significant component of hydrologic conditions in the southern floodplain and northeastern wetland complexes. At a flood stage of about +206 feet NGVD, water from the Passaic River begins moving into the tributaries. This corresponds to a 1-year, or possibly even lower magnitude, storm event. Due to flat topography, the direction of flow in the streams and ditches reverses as flood waters move into the tributary system (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003). These frequent backwater flooding events are important in maintaining wetland conditions in the southern floodplain and northeastern wetland complexes.

Backwater flows are also considered the primary cause of flooding in the study area. The Corps determined that the tributary system is sufficient to provide drainage for low-magnitude, high-

frequency rainfall events. During high-magnitude, low-frequency rainfall events, high coincident stages on the Passaic River reduce the discharge capacity and effectiveness of the tributary drainage system. As stages on the Passaic River continue to rise, the tributary system becomes the pathway for floodwater from the Passaic River to enter the developed areas. Water surface elevations within the lower portions of the tributaries rise coincident with stages on the Passaic River. In the upper portions of the tributaries, water surface elevations are possibly higher in the tributaries than in the Passaic River, as additional runoff from each tributary watershed adds to backwater flooding from the Passaic River (U.S. Army Corps of Engineers, 2002a).

Bankfull stage on the Passaic River is about +210 feet NGVD, corresponding to about a 2-year storm event. Existing grade along the floodwall route is between 210.8 and 214 feet. Flood damages along Valley Road begin at about 211 feet, corresponding to a 3-year storm event. The forested wetland south of Valley Road receives frequent backwater flows, both through direct overbank sheet flows from the Passaic River and from the tributaries. Lying at about 208-209 feet, the northeastern wetland complex also receives frequent backwater flooding via the tributary system (U.S. Army Corps of Engineers, 2003a; Preusch, pers. comm., 2003). The forested wetland block west of Passaic Avenue and north of Valley Road lies at a slightly higher elevation (about 215 feet), and is less subject to backwater flooding (Preusch, pers. comm., 2003).

B. VEGETATION

The Corps contractor conducted a field investigation to characterize the vegetation in the areas to be impacted by the proposed flood control structures. The floodplain south of Valley Road is predominantly a forested wetland. Forest interior areas were not sampled, but close to the floodwall alignment the vegetative community is dominated by red maple (*Acer rubrum*), pin oak (*Quercus palustris*), and American elm (*Ulmus americana*) in the canopy. Where present, the shrub layer is dominated by musclewood (*Carpinus caroliniana*) and highbush blueberry (*Vaccinium corymbosum*), with wood reedgrass (*Cinna arundinacea*) abundant in the herbaceous layer. A utility corridor about 200 feet wide crosses the forested wetland in a southwest-northeast direction. Near the floodwall, emergent wetlands dominated by broad-leaved cattail (*Typha latifolia*) and *Phragmites* are present in the corridor. At the interface between the forested wetlands and developed land along Valley Road, the vegetative community is typical of disturbed habitats including species such as Japanese honeysuckle (*Lonicera japonica*), Japanese berberry (*Berberis thunbergii*), and poison ivy (*Toxicodendron radicans*) (U.S. Army Corps of Engineers, 2003c). The wetland complexes northeast and northwest of the floodwall were not sampled, but likely contain a similar mix of wetland species, with vegetation characteristic of disturbed sites at the edges and along the utility corridor.

No federally listed, State-listed, or plant species of concern were documented along the floodwall alignment during field surveys. However, some species that were outside their flowering or fruiting season, or non-persistent species, may not have been identified during the Corps late fall survey. In our April 8, 2003 Planning Aid Letter, the Service recommended that the Corps

conduct a rare plant survey along the floodwall right-of-way during appropriate seasons, to determine presence or absence of those species on the New Jersey Natural Heritage Program's (NJNHP) Morris and Somerset County list that may be present in the floodwall corridor, based on habitat suitability. In the May 12, 2003 response, the Corps indicated that current project schedules and budgets will not permit such a survey. The Service concurs with the Corps that the probability of rare plant occurrences along the floodwall alignment is not great, based on the disturbed character of vegetation in the area and the absence of rare plants found during the vegetation survey. However, the Service recommends that the Corps review the NJNHP's Morris and Somerset County rare plant lists to determine which species, if any, could potentially inhabit the construction zone (based on habitat), and that may have been missed during the late fall survey. The Service recommends including this information with project documents, and conducting surveys for these species during the appropriate season if schedules and budgets permit.

C. WILDLIFE

The Corps contractor conducted literature investigations of wildlife in the project area, and recorded incidental wildlife observations during other field activities. As field observations were limited to the immediate vicinity of the floodwall alignment (Berkely, pers. comm., 2003), both mammalian and avian field observations consisted mainly of common and abundant species. The contractor observed evidence of the following mammals in the field: gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), opossum (*Didelphis virginiana*), white-footed mouse (*Peromyscus leucopus*), house mouse (*Mus musculus*), racoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*). Birds observed by the Corps contractor during field surveys include: rock dove (*Columba livia*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and mourning dove (*Zenaida macroura*). No reptiles, amphibians, or fish were directly observed during field investigations (U.S. Army Corps of Engineers, 2002b).

Based on published reports from the nearby Great Swamp National Wildlife Refuge and habitat conditions, the Service concludes that wetlands in the project area are most likely occupied by a greater diversity of wildlife than the common faunal assemblages documented by the Corps contractor. Although not directly observed, sensitive species such as raptors and forest-interior neotropical migratory birds are likely present. The Breeding Bird Atlas indicates that 84 species of birds nest along the Passaic River floodplain in this area, including 15 species of management concern to the Service at the State, Bird Conservation Region, Northeast Region, or National level (U.S. Fish and Wildlife Service, 2002). In addition, the central Passaic wetlands, including the project site, are a key pathway for migratory birds in New Jersey (Dunne, 1989). The NJDEP's Landscape Project (March 2002 database) indicates that the project area provides habitat for the State-listed (endangered) red-shouldered hawk (*Buteo lineatus*). In addition, the

State-listed (threatened) wood turtle (*Clemmys insculpta*) and the federally listed (threatened) bog turtle may be transient in the area.[1]

The Service would support any Corps effort to collect detailed, site-specific information regarding wildlife usage of project area wetlands, especially Passaic River floodplain habitats south of Valley Road and the wetland complex northeast of the floodwall route. However, additional documentation is not essential for this project, given the size and nature of the proposed structural measures included in the Corps recommended flood control plan. The Service's central concern in protecting wildlife resources is ensuring that the proposed floodwall and floodgates will not adversely affect these wetlands. At this stage, careful planning and design to further avoid both direct and indirect wetland impacts is more important to protecting wildlife resources than preparing additional faunal inventories.

V. PROJECT IMPACTS AND RECOMMENDED MITIGATIVE MEASURES

The Service's views and recommendations on this project are guided by its Mitigation Policy (Federal Register, Vol. 46, No. 15, January 23, 1981). This policy reflects the goal that the most important fish and wildlife resources should receive priority in mitigation planning. The term "mitigation" is defined as: (a) avoiding a negative impact altogether by not taking a certain action or parts of an action; (b) minimizing negative impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the negative impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating negative impacts over time; and, (e) compensating for negative impacts by replacing or providing substitute resources or habitats.

The Service's Mitigation Policy provides different wildlife planning goals based upon the value of the habitat to be impacted. The Service views the wildlife value of non-developed lands in the project area as follows:

Habitat Type	**Habitat Value**	**Planning Goal**
forested wetlands	high	no-net-loss of in-kind habitat value
disturbed wetlands (*i.e.*, wetland edges, utility corridors)	medium	no-net-loss of habitat value while minimizing loss of in-kind habitat value
Passaic River tributaries (in-stream habitats)	medium	no-net-loss of habitat value while minimizing loss of in-kind habitat value
State-jurisdictional wetlands maintained as lawn	low	minimize loss of habitat value (may be suitable as compensatory mitigation sites)

[1] At the time of this report (August 2003), the Corps and the Service are conducting informal consultation to determine if bog turtles may be resident in the project area, and to assess project impacts to this species.

A. DIRECT IMPACTS

1. Disturbance and Mortality

Construction of the floodwall and floodgates may temporarily disturb and displace wildlife due to noise, activity, machinery, equipment staging, and earth moving. These disturbance and displacement effects would occur only during construction, which is expected to last approximately 3-4 months (Fronius, pers. comm., 2003).

Some mortality of less mobile, burrowing, or denning species of wildlife such as small rodents, snakes, turtles, and amphibians may occur during levee and floodwall construction (U.S. Army Corps of Engineers, 2003a). Mortality of slow-moving transient wildlife, such as turtles, may also occur during construction. Any rare plants in the construction corridor may be permanently impacted. To minimize disturbance and mortality of wildlife resources during floodwall construction, the Service recommends the following.

- Minimize temporary wetland impacts by selecting equipment and material staging areas and access routes in uplands whenever possible. Restore temporary wetland impacts to pre-construction conditions in accordance with State regulations.

- Clean and inspect all construction equipment used in areas dominated by *Phragmites* to ensure that rhizomes are not inadvertently spread along the construction corridor or to other work areas.

- Install and maintain fencing along the southern limit of the construction corridor to preclude entrance of transient terrestrial species into the work area. To prevent entry of any protected bog turtles and wood turtles, fencing should consist of a double row of standard silt fencing (*i.e.*, a solid sheet with no holes or projections) at least 1 foot high stretched taught and embedded several inches in the ground. Fencing may be combined with sediment and erosion control plans if a single design can meet both purposes.

- Conduct a pre-construction survey of the fenced construction area and remove any transient or denning wildlife several yards into the adjacent forested wetland. As sheet pile driving proceeds along the alignment, re-survey the immediate area within 1 day of starting work in a new section. If any bog turtles are found in the construction zone: (1) do not move the turtles; (2) document the occurrence; (3) contact the Service immediately; and (4) halt work until consultation pursuant to the ESA is completed.

- Conduct a playback survey, using a qualified biologist, for red-shouldered hawk at two locations along South Main Street equally spaced between the floodwall alignment at the Passaic River between March 1 and May 15, and report the results to the NJDEP and the Service. If nesting hawks are documented, the NJDEP and the Service will recommend a 0.25-mile buffer for construction activities around the nest site between March 1 and July 15. The known red-shouldered hawk occurrence in the area is greater than 0.25 mile

from the floodwall alignment; therefore, no protective measures are necessary for the known site (Valent, pers. comm., 2003).

- Conduct a rare plant survey of the construction zone as schedules and budgets permit. If any occurrences are documented, notify this office and the NJNHP to determine appropriate mitigation.

Disturbance and mortality of freshwater organisms such as benthic invertebrates and fish may occur during installation of the three floodgates. Up to 10,000 square feet of open waters and surrounding wetlands may be temporarily disturbed at each closure site. The Corps proposes to use a temporary flowing stream diversion to bypass each closure location to create a dry work environment without blocking water flows. These systems should allow aquatic wildlife to pass upstream and downstream of the work zone during construction. Each diversion would consist of two sets of wooden, framed, wing-walls connected to a flexible, bag-like PVC tube used to convey flowing water around a work area. The tube would be laid in a channel to be excavated adjacent to the culvert that conveys stream flow beneath Valley Road. The downstream end of the diversion would be installed first, followed by the upstream end, with a set of wing walls tied into the upstream end of the channel. The stream diversion would be installed prior to beginning floodgate construction, and flow would be restored to the work area section of the channel upon completion of work. Proposed mitigation for the three closure structures also includes restoring any stream bed or bank areas disturbed during construction. Restoration may include minor grading, installation of temporary or permanent erosion control measures, and planting or seeding with native riparian vegetation. Any restoration efforts would be monitored in accordance with the appropriate State permit regulatory performance standards and monitoring requirements (U.S. Army Corps of Engineers, 2003a). While some disturbance and mortality of freshwater organisms may still occur during flood gate installation, the Service concurs with the Corps that the proposed mitigative measures would minimize such impacts.

2. Habitat Loss and Fragmentation

The floodwall and levee system would occupy a right-of-way approximately 4,000 feet long by 20 feet wide, for about 1.8 acres of disturbance. A straight line between starting and ending points would be approximately 3,200 feet; however, the wall takes numerous jogs to avoid wetlands and man-made structures. Along most of the alignment, the northern half of the 20-foot construction zone would be located on developed lands such as parking lots and maintained lawns.

Some of the disturbance along the alignment is expected to be temporary. The vinyl floodwall itself is approximately 6 inches thick. A permanent right-of-way will be maintained after construction for maintenance of the floodwall, but is not expected to be as wide as the 10 feet on either side required for construction (Berkely, pers. comm., 2003). The Service recommends minimizing the width of the permanent right-of-way on the south side of the floodwall, and conducting maintenance of the wall from developed or upland sites along the north side whenever possible.

In total, the Corps anticipates 1.17 acres of permanent impacts to State-jurisdictional freshwater wetlands from the levee and floodwall (U.S. Army Corps of Engineers, 2003a), including areas maintained as lawn. The Service concurs with the Corps that the floodwall design and alignment have been selected to avoid and minimize wetland impacts to the extent possible through this stage of design. The Service recommends that the Corps continue to refine wetland protections through the engineering phase of the project, which will include the State permitting process. Consistent with the Service's habitat value determinations, forested wetlands should receive the highest priority for avoidance, followed by disturbed wetlands. To clarify impacts, the Service recommends that final project documents present the following information: (1) total acres of temporary and permanent wetland impacts; (2) acres of wetland impacts classified by forested wetlands, disturbed wetlands, and mowed turf ("lawn") wetlands; and (3) extent of proposed wetland and upland tree removal.

As compensatory mitigation for wetland impacts, the Corps proposes on-site mitigation that includes enhancement of 1.10 acres of degraded wetlands, creation 0.14 acre of wetlands from upland lawn areas, and preservation of 11.0 acres of floodplain forest. If local land owners are not willing to sell the properties selected for mitigation, the Corps proposes off-site mitigation through the purchase of credits at the C&C Builders Mitigation Bank (U.S. Army Corps of Engineers, 2003a).

The Service recommends that the Corps, in its compensatory mitigation plan, seek to achieve the planning goals outlined above. Specifically, the Service recommends that the planning goal for forested wetlands be no net in-kind loss. For disturbed wetland areas, the Service recommends a goal of no net loss of wetland acreage, while minimizing net loss of emergent and scrub-shrub wetland types. Compensatory mitigation of forested wetlands is prone to high failure rates (Balzano *et al.*, 2002). Therefore, maximum avoidance of impacts to forested wetlands is highly recommended. Wherever possible, unavoidable wetland impacts should be shifted to lower value "lawn" wetlands or disturbed wetlands if doing so can protect forested wetlands. If any forested wetland impacts are unavoidable, the Service recommends a high compensatory mitigation ratio that takes into account the low success rate. The Service will recommend a specific ratio during the State wetland permitting process. Although the Service supports preservation of the substantial floodplain acreage proposed by the Corps, preservation does not achieve the Service's planning goal of no let loss of forested wetlands. If the final mitigation plan includes preservation, project documents should indicate the specific preservation mechanism (*i.e.*, deed restriction, public ownership), and who will own and manage the property.

As a linear feature, the levee/floodwall system has the potential to fragment habitats. Fragmentation can impair animal movements and introduce adverse edge effects. Forest fragmentation seriously affects nesting success of obligate forest interior birds (Robbins, 1988), which are known to occur in the Passaic River floodplain. The Service concurs that the floodwall alignment has been selected to minimize fragmentation. Most of the alignment follows parking lots and lawns, impacting only existing forest edge. An earlier alternative alignment would have fragmented 0.17 acre of intact floodplain forest (U.S. Army Corps of Engineers,

2003b) located on Block 1, Lot 24 (about mid-way between South Main Avenue and the western tributary; see Figure 2). This adverse effect has been avoided by "squaring off" the floodwall with Valley Road. Some fragmentation of disturbed forested floodplain habitats will occur at the western terminus of the wall between Lots 18 and 23 (the western half of the section between South Main Avenue and the western tributary; see Figure 2). To minimize habitat loss and the effects of fragmentation, the Corps should make every effort to retain mature trees.

Permanent loss of in-stream habitats at the location of the closure structures is expected to be negligible. Preliminary plans for each closure structure show that a rectangular concrete pad spanning the width of the stream will be installed in the stream bed. These structures vary in length from 8 to 15 feet (Tumminello, pers. comm., 2003). Following normal deposition, these pads are expected to become buried at least 1 foot below the stream bed, allowing recolonization by benthic organisms (Fronius, pers. comm., 2003). A gated concrete wall, approximately 1-foot thick, will extend from the foundation pad to a height just above the top of the adjacent floodwall/levee sections. Effects of the wall on stream banks would be negligible. A previous flood gate design involving a vertically hinged gate, and concrete lining of the stream upstream and downstream of the closure structures, has been rejected (Fronius, pers. comm., 2003).

The three project area streams offer important connections for movement of aquatic and terrestrial animals between wetlands north and south of Valley Road. Because of intervening development, smaller terrestrial mammals, reptiles, and amphibians likely utilize culverts under Valley Road for such connections. The size and design of the closure structures are expected to allow free movement of fish and other aquatic organisms up and downstream, except during flood events when the flood gates will be closed (Tumminello, pers. comm., 2003). The Service recommends that the Corps incorporate design features into the closure structures to permit passage of terrestrial wildlife when the flood gates are open, such as small, gated holes on land adjacent to each stream channel. We also recommend that the Corps assess the size and design of the three culverts under Valley Road to determine if any modifications to these structures could be implemented during project construction that would improve terrestrial animal passage along the tributary corridors.

The Corps July 2, 2003 response to the draft FWCA report indicates that the Environmental Analysis Branch will recommend that the project design incorporate small earthen ramps on either side of the tributaries to promote animal movement. The Corps will coordinate with the NJDEP to minimize any resulting additional wetland impacts. The Service supports the aforementioned actions.

The levee/floodwall will present a more impenetrable barrier to north-south animal movements than the existing road and development. With adequate design features to permit movements through the closure structures, this barrier may benefit wildlife by promoting animal movements along the tributaries and through the culverts, and discouraging entrance into developed areas along Valley Road where human and vehicle interactions pose a danger. The floodwall may impair the ability of larger terrestrial wildlife, primarily deer, to move between northern and southern habitats, with both negative (isolation, confinement into smaller habitats) and positive (reduced risk of vehicle collision) consequences. Some exchange is still likely to occur, as these larger animals will most likely move around the wall.

B. INDIRECT IMPACTS

1. Land Use

The proposed flood control project will reduce potential damage to personal and commercial property resulting from current flooding problems, thus making the area a more appealing place to live and work. Any changes in population density must conform to existing land use and Township regulations (U.S. Army Corps of Engineers, 2003b). However, amelioration of flooding problems will offer an economic incentive to relax rules regarding further development of the Passaic River floodplain in the Stirling section of Long Hill Township. New development in the study area would adversely affect wildlife, and would offset some of the project's benefits of flood damage reduction. Therefore, the Service recommends that the Corps acquire binding agreements from the local sponsor and the Township prior to construction, to ensure that State and local land use regulations to protect wetlands and floodplains, and to manage storm water, will not be relaxed over the life of the project.

Acquisition of flood storage areas offers benefits to wildlife as well as flood damage prevention. The Corps considered this alternative during early stages of project planning, but dropped it from further consideration because existing storage areas surrounding Long Hill Township already function in this capacity, and many are publicly held. Although wetland acquisition would not reduce existing flooding problems in developed areas of Long Hill, acquisition and permanent protection of these natural storage areas would prevent increased flooding in the future. Much of the floodplain wetlands in the study area are already owned by Morris County, which manages the areas as open space (Papson, pers. comm., 2003). The Service recommends that the Corps pursue preservation of remaining privately-owned flood storage wetlands in the study area as a component of the project. Wetland acquisition could be undertaken in partnership with the local sponsor and the Township, perhaps as a component of the non-federal cost share of the project. Consistent with this recommendation, the Service supports the preservation component of the Corps compensatory mitigation plan, while recognizing that preservation cannot achieve the recommended planning goal of "no net in-kind loss" if impacts to forested wetlands cannot be avoided.

2. Water Quality

Surface water quality will be temporarily impacted during construction because of increased suspended sediments in the water column. The Corps proposes to implement best management practices for erosion and sediment control during construction to reduce any potential runoff, sedimentation, or turbidity into the tributaries or the Passaic River as a result of the proposed project (U.S. Army Corps of Engineers, 2003a). The New Jersey Soil Erosion and Sediment Control Act (N.J.A.C. 4:24-39 *et seq.*) requires a plan for erosion and sediment control for virtually all activities on non-agricultural land disturbing more than 5,000 square feet of surface area (New Jersey Department of Agriculture, 2003). The plan must be consistent with the Standards for Soil Erosion and Sediment Control in New Jersey (New Jersey State Soil Conservation Committee, 1987).

In addition to preventing erosion and sedimentation during construction, the Service recommends that the Corps evaluate and document potential for the proposed flood control structures to cause ongoing erosion, sedimentation, or scouring following construction. If engineering and hydraulic assessments indicate that such effects are possible, the Service recommends that the Corps: (1) take all appropriate measures to prevent post-construction erosion, sedimentation, or scouring; (2) monitor appropriate areas for 5 years following project construction to ensure that the preventative measures were effective; and (3) report monitoring results to the Service and NJDEP annually.

The proposed project may provide water quality improvements by retaining runoff in a vegetated swale along the north side of the proposed floodwall before discharging to the tributary system. According to the Corps May 12, 2003 correspondence, vegetated swales have been documented by New Jersey and other States to remove up to 85 percent of total suspended solids. The swale should reduce pollutant loads of storm water running off developments south of Valley Road (Preusch, pers. comm., 2003). The much larger volume of runoff that enters the tributary system north of Valley road would not be affected by the swale under normal flow conditions. During the design phase, the Service recommends that the Corps actively investigate possibilities to incorporate storm water treatment features into the three proposed closure structures to treat runoff coming from the northern developments.

3. Hydrology

The Service's primary concern for wildlife resources from the Upper Passaic at Long Hill Township flood control project is that the proposed floodwall and floodgates do not alter the hydrology of wetlands in the study area. In our April 8, 2003 Planning Aid Letter, the Service requested information regarding project effects on sheet flows, stream flows, and ground-water flows. The Corps has subsequently provided this information in writing and by personal communication. Two wetland areas are of concern: the forested wetland floodplain south of the floodwall alignment, and the wetland complex northeast of the proposed floodwall between Morristown Road and Warren Avenue (Figure 2). The Corps and the Service have considered potential changes to the volume and type of base flows into these wetlands, as well as the frequency, depth, and duration of flooding.

The project is expected to have only minor effects on hydrologic inputs into wetlands during non-flood conditions, including precipitation up to the 3-year event, or a water elevation of about 211 feet. Although lower magnitude events cause overtopping of Passaic River and tributary banks, flood damages are not incurred. Under these conditions, the three flood gates would be left open, and the proposed flood control structures would have no effect on either normal or backwater stream flows into either of the wetland areas of concern. One minor project effect would be conversion of sheet flows south of Valley Road into stream flows, by retaining this runoff in a swale, which would discharge into the tributary system. Due to the small drainage

area in question, this change would not have significant hydrologic effects (Preusch, pers. comm, 2003), and would improve water quality as discussed above.

For 3-year or greater storm events, Township emergency personnel would close the floodgates. Operation of the system as proposed may affect the frequency and depth of flooding in the subject wetlands. Frequency would not be affected for the floodplain wetland south of the wall. The Corps selection of a setback floodwall/levee system, rather than a levee along the Passaic River, ensures that the floodplain will continue to receive overbank flooding from the river and its tributaries at the same frequency as current baseline conditions. Maintaining the normal overbank flooding regime is essential to maintaining the ecologic and hydrologic integrity of this system.

The proposed project will have minor effects on the depth of flooding in this southern wetland. According to the Corps May 19, 2003 correspondence, removal of natural floodplain storage north of the floodwall will increase the 100-year flood elevation by 0.1 foot due to minor increases in discharge along the Passaic River (hydrologic effect). Confining flowing flood waters south of the floodwall will cause an additional, but negligible effect of 0.01 foot for the 100-year flood (hydraulic effect). The elevation of the 100-year flood is 216.2 feet, or about 2-5 feet of standing water in the floodplain south of Valley Road. With the floodwall, this depth would increase by about 1.3 inches, which is not expected to affect flood duration (Preusch, pers. comm., 2003). Based on this information, the Service does not expect adverse hydrologic effects to the wetlands south of the proposed floodwall.

For 3-year and greater events, the proposed project may affect both frequency and depth of flooding in the wetland complex northeast of the floodwall. Currently, Passaic River flood waters are conveyed to this wetland through backwater flows in the tributary/ditch system. With the floodgates closed for 3-year and greater events, these waters will be cut off from the northeastern wetland complex. For this reason, the Service recommends the following measures to protect wildlife habitats and other values of this wetland.

- Assess the hydrology of this wetland, during the design phase, to determine the extent to which backwater flooding during higher-magnitude ($\geq$ 3-year) events contributes to overall hydrologic conditions.

- Provide the results of the assessment to the Service to determine if adverse ecological effects may result from hydrologic changes expected in the northeastern wetland complex from isolating that component of the hydrologic regime.

- Without compromising human safety or flood damage protection, design and operate the flood warning system to minimize the closure time of the floodgates.

- Monitor the northeastern wetland area for hydrologic changes for at least 5 years following project completion to determine if elimination of backwater flooding during higher-magnitude ($\geq$ 3-year) events actually effects overall hydrologic conditions in this area; provide a summary of results to the Service annually.

- Allow for adaptive management of the flood warning system if wetland conditions and/or flood damage conditions warrant a change in the operation of the floodgates.

The project is not expected to affect groundwater flows at either wetland area of concern. Although the Corps encountered some water along the floodwall route in borings between 5 and 10 feet deep, the water table is generally considered to lie at lower depths due to a dense layer of clay approximately 15 feet deep. Lateral groundwater movements within the clay layer are likely negligible. The sheet pile floodwall would be driven approximately 11 feet deep, and would therefore not interfere with water movements below the clay. In addition, groundwater is a minor hydrologic component in the floodplain wetland south of the floodwall (Preusch, pers. comm., 2003). The Service recommends that the Corps conduct additional borings along the floodwall route during the next phase of project design to confirm the absence of a perched water table within the clay layer. If a lens of water is present, the sheet pile could interfere with ground water flows. In addition, if a perched lens of water is present and under pressure, driving the sheet pile may cause safety or flooding problems. If adequate data already exist to demonstrate the absence of a perched water table, the Service recommends referencing these data in project documents.

Changing the hydrologic conditions in the study area may also affect the incidence of fish stranding after overbank flood events (Papson, pers. comm., 2003). South of the floodwall, the project may benefit fish by preventing flood waters from entering developed areas where fish could be adversely effected as the waters recede. North of the floodwall, ponding of base flows and storm flows will occur in low spots (*i.e.*, the wetlands northeast of the floodwall, the proposed east-west drainage swale immediately north of the wall) when the floodgates are closed. Compared to current baseline conditions, ponding depths will be shallower as the flood control structures will prevent the addition of backwater flows into these areas. Recedence time (*i.e.*, speed of drainage) of these waters will depend on the difference in water elevations north and south of the floodwall when the gates are re-opened after a flood event. The Service recommends that the Township open the gates as soon as the threat of backwater flood damages has passed to: (1) promptly restore fish passage; and (2) permit a gradual recedence of waters ponded north of the wall, allowing time for fish to return to the stream channels. Prior to construction, the Service requests an opportunity to review documentation describing the proposed operation of the flood warning system and the floodgates.

VI. CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

The Service concurs that the Corps has avoided and minimized environmental impacts through this phase of planning by selecting and refining the recommended plan for flood damage reduction in Long Hill Township. The Service recommends the following measures to further reduce and mitigate project effects to wildlife resources.

1. Review the NJNHP's Morris and Somerset County rare plant lists to determine which species, if any, may potentially inhabit the construction zone (based on habitat characteristics), and that may have been undetected during the Corps late fall vegetation survey. Include this information with final project documents. Conduct surveys for these species along the construction zone during the appropriate season if schedules and budgets permit. If any occurrences are documented, notify the Service and the NJNHP to determine appropriate mitigation.

2. Minimize temporary wetland impacts by selecting equipment and material staging areas and access routes in uplands whenever possible. Restore temporary wetland impacts to pre-construction conditions in accordance with State regulations.

3. Clean and inspect all construction equipment used in areas dominated by *Phragmites* to ensure that rhizomes are not inadvertently spread along the construction corridor, or to other work areas.

4. Install and maintain fencing along the southern limit of the construction corridor to preclude entrance of transient terrestrial species into the work area. To prevent entry of any protected bog turtles and wood turtles, fencing should consist of a double row of standard silt fencing (*i.e.*, a solid sheet with no holes or projections) at least 1 foot high stretched taught and embedded several inches in the ground. Fencing may be combined with sediment and erosion control plans if a single design can meet both purposes.

5. Conduct a pre-construction survey of the fenced construction area and remove any transient or denning wildlife into the adjacent forested wetland. As sheet pile driving proceeds along the alignment, re-survey the immediate area within 1 day of starting work in a new section. If any bog turtles are found in the construction zone: (a) do not move the turtles; (b) document the occurrence; (c) contact the Service immediately; and (d) halt work until consultation pursuant to the ESA is completed.

6. Conduct a playback survey, using a qualified biologist, for red-shouldered hawk at two locations along South Main Street equally spaced between the floodwall alignment at the Passaic River between March 1 and May 15, and report the results to the NJDEP and the Service. If nesting hawks are documented, the NJDEP and the Service will recommend a 0.25-mile construction buffer around the nest site between March 1 and July 15.

7. Minimize the width of the permanent right-of-way on the south side of the floodwall, and conduct maintenance of the wall from developed or upland sites along the north side whenever possible.

8. Preferentially avoid impacts to forested wetlands over disturbed wetlands or wetland areas maintained as mowed lawns.

9. Provide the following information in final project documents: (a) total acres of temporary and permanent wetland impacts; (b) acres of wetland impacts classified by forested wetlands, disturbed wetlands, and mowed ("lawn") wetlands; and (c) extent of proposed wetland and upland tree removal.

10. Adopt the following planning goals for the proposed compensatory mitigation. Forested wetlands: no net in-kind loss. Disturbed wetland areas: no net loss of wetland acreage, while minimizing net loss of emergent and scrub-shrub wetland types.

11. Adopt a high compensatory mitigation ratio for any unavoidable impacts to forested wetlands to account for the low success rate of creating and restoring these systems. The Service will recommend a specific ratio during the State wetland permitting process.

12. Make every effort to retain mature trees.

13. Incorporate design features into the tributary closure structures to permit passage of terrestrial wildlife when the floodgates are open, and determine if the culverts under Valley Road can be modified to improve animal passage along the tributary corridors.

14. Acquire binding agreements from the local sponsor and the Township to ensure that State and local land-use regulations to protect wetlands and floodplains, and to manage storm water, will not be relaxed over the life of the project.

15. Pursue preservation of remaining privately-owned flood storage wetlands in the study area as a component of the project, in partnership with the local sponsor and the Township.

16. Evaluate and document potential for the proposed flood control structures to cause ongoing erosion, sedimentation, or scouring following construction. If engineering and hydraulic assessments indicate that such effects are possible: (a) take all appropriate measures to prevent post-construction erosion, sedimentation, or scouring; (b) monitor appropriate areas for 5 years following project construction to ensure that the preventive measures have been effective; and (c) report monitoring results to the Service and NJDEP annually.

17. Actively investigate possibilities to incorporate storm water treatment features into the three proposed closure structures to treat runoff coming from the developments north of Valley Road.

18. Assess the hydrology of the wetland northeast of the floodwall, during the design phase, to determine the extent to which backwater flooding during higher-magnitude (≥ 3-year) events contributes to overall hydrologic conditions. Provide the results of the assessment to the Service and NJDEP to determine if adverse ecological effects may result from expected hydrologic changes.

19. Design and operate the flood warning system to minimize the closure time of the floodgates, without compromising human safety or flood damage protection.

20. Monitor the northeastern wetland area for hydrologic changes for at least 5 years following project completion, and provide a summary of results to the Service annually.

21. Allow for adaptive management of the flood warning system if wetland conditions and/or flood damage conditions warrant a change in the operation of the floodgates.

22. Conduct additional borings along the floodwall route during the next phase of project design to confirm the absence of a perched water table within the clay layer. If adequate data already exist to demonstrate the absence of a perched water table, the Service recommends referencing these data in project documents.

23. Open the floodgates as soon as the threat of backwater flood damages has passed to: (a) promptly restore fish passage and (b) permit a gradual recedence of waters ponded north of the wall, allowing time for fish to return to the stream channels.

24. Prior to construction, forward documentation describing the proposed operation of the flood warning system and the floodgates to the Service and NJDEP for review.

The Corps July 2, 2003 response to the draft FWCA report indicates that all but four of the above Service recommendations will be partially or fully implemented; these four are recommendations 6, 10, 11, and 22. The Corps will consider implementation of recommendation 6. In response to the Corps comments, the Service has modified recommendation 22 as presented above.

In response to recommendations 10 and 11, the Corps stated that its regulations and policies specify compensatory mitigation of habitat value equivalent to the project impact. The Service notes that our compensatory mitigation recommendations (#10 and 11) are based upon habitat value, consistent with the Service's Mitigation Policy. Due to the small size and nature of the project, a formal habitat assessment such as Habitat Evaluation Procedures (HEP) was not warranted. However, available information is sufficient to support an informal determination of habitat values in the project area (see page 11). The Service's recommendations for compensatory mitigation are based on this determination and intended to avoid habitat loss, particularly of forested wetlands, which are difficult if not impossible to replace adequately.

VII. REFERENCES

A. LITERATURE CITED

Balzano, S., A. Ertman, L. Brancheau, and W. Smejkal. 2002. Creating indicators of wetland status (quantity and quality) of freshwater wetland mitigation in New Jersey. New Jersey Department of Environmental Protection, Division of Science, Research and Technology. Trenton, New Jersey.

Dunne, P. (ed.). 1989. New Jersey at the crossroads of migration. New Jersey Audubon Society. Bernardsville, New Jersey. 75 pp.

New Jersey Department of Agriculture. 2003. Natural Resource Conservation Web Site. http://www.state.nj.us/agriculture/rural/natrsrc.htm. Accessed May 31, 2003.

New Jersey Department of Environmental Protection. Undated. New Jersey's Landscape Project, wildlife habitat mapping for community land-use planning and endangered species conservation. http://www.state.nj.us/dep/fgw/ensp/landscape/index.htm. Accessed April 3, 2003.

New Jersey State Soil Conservation Committee. 1987. Standards for soil erosion and sediment control in New Jersey. New Jersey Department of Agriculture, Division of Rural Resources, Trenton, New Jersey.

Robbins, C.S. 1988. Forest fragmentation and its effects on birds. In Johnson, J.E. (ed.) 1988. Managing North Central forests for non-timber values. Publication 88-4, Society of American Foresters, Bethesda, Maryland. 156 pp.

U.S. Army Corps of Engineers. 1998. Reconnaissance study, Upper Passaic River, New Jersey flood control and environmental restoration study, Section 905(b) (WRDA 86) preliminary analysis. U.S. Army Corps of Engineers, New York District, New York, New York. 20 pp. + Attachments.

_____. 2002a. Upper Passaic River, New Jersey flood control and environmental restoration feasibility study, P-7 milestone report, preliminary formulation of alternatives. U.S. Army Corps of Engineers, New York District, New York, New York. 35 pp.

_____. 2002b. Natural resource inventory report, feasibility study for the Upper Passaic River, New Jersey flood control and environmental restoration project, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 86 pp. + Appendices.

_____. 2003a. Draft integrated feasibility report and environmental assessment, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 92 pp. + Appendices.

_____. 2003b. Draft environmental assessment, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 121 pp. + Appendices.

_____. 2003c. Vegetation survey report, Upper Passaic River, New Jersey flood control and environmental restoration study, Long Hill Township, Morris County, New Jersey. U.S. Army Corps of Engineers, New York District, New York, New York. 13 pp. + Appendices.

U.S. Fish and Wildlife Service. 2002. Birds of management concern 2002. Department of the Interior, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 23 pp. + tables.

B. PERSONAL COMMUNICATIONS

Berkley, B. 2003. Senior Wetland Scientist. MATRIX Environmental & Geotechnical Services, Inc. Florham Park, New Jersey.

Fronius, M. 2003. Project Manager. Baker Engineering New York, Inc. Elmsford, New York.

Papson, B. 2003. Principal Biologist. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Bureau of Freshwater Fisheries, Lebanon, New Jersey.

Preusch, D. 2003. Project Manager. Michael Baker Junior, Inc. Alexandria, Virginia.

Tumminello, P. 2003. Project Manager. Upper Passaic River, New Jersey Flood Control and Environmental Restoration Study, U.S. Army Corps of Engineers, New York District, New York, New York.

Valent, M. 2003. Principal Zoologist. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program, Clinton, New Jersey.

APPENDIX A

Federally listed endangered and threatened species
and candidate species in New Jersey

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY

An **ENDANGERED** species is any species that is in danger of extinction throughout all or a significant portion of its range.

A **THREATENED** species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	Shortnose sturgeon*	*Acipenser brevirostrum*	E
REPTILES	Bog turtle	*Clemmys muhlenbergii*	T
	Atlantic Ridley turtle*	*Lepidochelys kempii*	E
	Green turtle*	*Chelonia mydas*	T
	Hawksbill turtle*	*Eretmochelys imbricata*	E
	Leatherback turtle*	*Dermochelys coriacea*	E
	Loggerhead turtle*	*Caretta caretta*	T
BIRDS	Bald eagle	*Haliaeetus leucocephalus*	T
	Piping plover	*Charadrius melodus*	T
	Roseate tern	*Sterna dougallii dougallii*	E
MAMMALS	Eastern cougar	*Felis concolor couguar*	E+
	Indiana bat	*Myotis sodalis*	E
	Gray wolf	*Canis lupus*	E+
	Delmarva fox squirrel	*Sciurus niger cinereus*	E+
	Blue whale*	*Balaenoptera musculus*	E
	Finback whale*	*Balaenoptera physalus*	E
	Humpback whale*	*Megaptera novaeangliae*	E
	Right whale*	*Balaena glacialis*	E
	Sei whale*	*Balaenoptera borealis*	E

	Sperm whale*	*Physeter macrocephalus*	E

	COMMON NAME	SCIENTIFIC NAME	STATUS
INVERTEBRATES	**Dwarf wedgemussel**	*Alasmidonta heterodon*	E
	Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*	T
	Mitchell satyr butterfly	*Neonympha m. mitchellii*	E+
	American burying beetle	*Nicrophorus americanus*	E+
PLANTS	**Small whorled pogonia**	*Isotria medeoloides*	T
	Swamp pink	*Helonias bullata*	T
	Knieskern's beaked-rush	*Rhynchospora knieskernii*	T
	American chaffseed	*Schwalbea americana*	E
	Sensitive joint-vetch	*Aeschynomene virginica*	T
	Seabeach amaranth	*Amaranthus pumilus*	T

STATUS:			
E	endangered species	PE	proposed endangered
T	threatened species	PT	proposed threatened
+	presumed extirpated**		

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

** Current records indicate the species does not presently occur in New Jersey, although the species did occur in the State historically.

Note: for a complete listing of Endangered and Threatened Wildlife and Plants, refer to 50 CFR 17.11 and 17.12.

For further information, please contact:

U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232
Phone: (609) 646-9310

FEDERAL CANDIDATE SPECIES IN NEW JERSEY

CANDIDATE SPECIES are species that appear to warrant consideration for addition to the federal List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the U.S. Fish and Wildlife Service encourages federal agencies and other planners to give consideration to these species in the environmental planning process.

SPECIES	SCIENTIFIC NAME
Bog asphodel	*Narthecium americanum*
Hirst's panic grass	*Panicum hirstii*

Note: For complete listings of taxa under review as candidate species, refer to Federal Register Vol. 64, No. 205, October 25, 1999 (Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species).

Revised 11/99

APPENDIX B

State-listed endangered and threatened species in New Jersey

New Jersey Division of Fish and Wildlife

Conserve Wildlife

N.J. Division of Fish & Wildlife
Endangered & Nongame Species Program

Endangered and Threatened Wildlife of New Jersey

Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New Jersey.

Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

List updated 3/18/02

BIRDS			
Endangered		**Threatened**	
Bittern, American	*Botaurus lentiginosos**	Bobolink	*Dolichonyx oryzivorus*
Eagle, bald	*Haliaeetus leucocephalus* BR **	Eagle, bald	*Haliaeetus leucocephalus* NB **
Falcon, peregrine	*Falco peregrinus*	Hawk, Cooper's	*Accipiter cooperii*
Goshawk, northern	*Accipiter gentilis**	Hawk, red-shouldered	*Buteo lineatus* NB
Grebe, pied-billed	*Podilymbus podiceps**	Night-heron, black-crowned	*Nycticorax nycticorax**
Harrier, northern	*Circus cyaneus**	Night-heron, yellow-crowned	*Nyctanassa violaceus*
Hawk, red-shouldered	*Buteo lineatus* BR	Knot, red	*Calidris canutus*
Owl, short-eared	*Asio flammeus**	Osprey	*Pandion haliaetus**
Plover, piping	*Charadrius melodus***	Owl, barred	*Strix varia*
Sandpiper, upland	*Batramia longicauda*	Owl, long-eared	*Asio otus*
Shrike, loggerhead	*Lanius ludovicianus*	Rail, black	*Laterallus jamaicensis*
Skimmer, black	*Rynchops niger* BR	Skimmer, black	*Rynchops niger* NB
Sparrow, Henslow's	*Ammodramus henslowii*	Sparrow, grasshopper	*Ammodramus savannarum**
Sparrow, vesper	*Pooecetes gramineus* BR	Sparrow, Savannah	*Passerculus sandwichensis**
Tern, least	*Sterna antillarum*	Sparrow, vesper	*Pooecetes gramineus* NB
Tern, roseate	*Sterna dougallii***	Woodpecker, red-headed	*Melanerpes erythrocephalus*
Wren, sedge	*Cistothorus platensis*		
*Only breeding population considered endangered or threatened			
**Federally endangered or threatened			
BR - Breeding population only; NB - non-breeding population only			

REPTILES			
Endangered		**Threatened**	
Rattlesnake, timber	*Crotalus h. horridus*	Snake, northern pine	*Pituophis m. melanoleucus*
Snake, corn	*Elaphe g. guttata*	Turtle, Atlantic green	*Chelonia mydas***
Turtle, bog	*Clemmys muhlenbergii*	Turtle, wood	*Clemmys insculpta*
Atlantic Hawksbill	*Eretmochelys imbricata***		
Atlantic Leatherback	*Dermochelys coriacea***		
Atlantic Loggerhead	*Caretta caretta***		
Atlantic Ridley	*Lepidochelys kempi***		
**Federally endangered or threatened			

AMPHIBIANS			
Endangered		**Threatened**	
Salamander, blue-spotted	*Ambystoma laterale*	Salamander, eastern mud	*Pseudotriton montanus*
Salamander, eastern tiger	*Ambystoma tigrinum*	Salamander, long-tailed	*Eurycea longicauda*
Salamander, Tremblay's	*Ambystoma tremblayi*		
Treefrog, pine barrens	*Hyla andersonii*		
Treefrog, southern gray	*Hyla chrysocelis*		

INVERTEBRATES			
Endangered		**Threatened**	
Beetle, American burying	*Nicrophorus mericanus***	Beetle, northeastern beach tiger	*Cincindela d. dorsalis***
Copper, bronze	*Lycaena hyllus*	Floater, triangle (mussel)	*Alasmidonta undulata*
Floater, brook (mussel)	*Alasmidonta varicosa*	Elfin, frosted (butterfly)	*Callophrys irus*
Floater, green (mussel)	*Lasmigona subviridis*	Fritillary, silver-bordered (butterfly)	*Bolaria selene myrina*
Skipper, arogos (butterfly)	*Atrytone arogos arogos*	Lampmussel, eastern (mussel)	*Lampsilis radiata*
Skipper, Appalachian grizzled (butterfly)	*Pyrgus wyandot*	Lampmussel, yellow (mussel)	*Lampsilis cariosa*
		Mucket, tidewater (mussel)	*Leptodea ochracea*
		Mussel, dwarf wedge	*Alasmidonta heterodon***
		Pondmussel, eastern (mussel)	*Ligumia nasuta*
		Satyr, Mitchell's (butterfly)	*Neonympha m. mitchellii***
		White, checkered (butterfly)	*Pontia protodice*
		**Federally endangered or threatened	

MAMMALS	
Endangered	
Bat, Indiana	*Myotis sodalis***
Bobcat	*Lynx rufus*
Whale, black right	*Balaena glacialis***
Whale, blue	*Balaenoptera musculus***
Whale, fin	*Balaenoptera physalus***
Whale, humpback	*Megaptera novaeangliae***
Whale, sei	*Balaenoptera borealis***
Whale,sperm	*Physeter macrocephalus***
Woodrat, eastern	*Neotoma floridana*
**Federally Endangered	

FISH	
Endangered	
Sturgeon, shortnose	*Acipenser brevirostrum***
**Federally Endangered	

The lists of New Jersey's endangered and nongame wildlife species are maintained by the DEP's Division of Fish and Wildlife's Endangered and Nongame Species Program. These lists are used to determine protection and management actions necessary to ensure the survival of the state's endangered and nongame wildlife. This work is made possible through voluntary contributions received through Check-off donations to the Endangered Wildlife Conservation Fund on the New Jersey State Income Tax Form, the sale of Conserve Wildlife License Plates, and donations. For more information about the Endangered and Nongame Species Program or to report a sighting of endangered or threatened wildlife, contact the Endangered and Nongame Species, NJ Division of Fish and Wildlife, P.O. Box 400, Trenton, NJ 08625-0400, or call 609-292-9400.

APPENDIX C

Coordination with the New Jersey Division of Fish and Wildlife

State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection

Bradley M. Campbell
Commissioner

Division of Fish and Wildlife
P.O. Box 400
Trenton, NJ 08625-0400
Martin J. McHugh, Director

July 7, 2003

U.S. Fish and Wildlife Service
New Jersey Field Office
927 North Main Street, Bldg. D
Pleasantville, NJ 08232

Attn.: Clifford G. Day, Supervisor

Dear Mr. Day:

I am writing to inform you of the NJ Division of Fish and Wildlife's [DFW] concurrence with the US Fish and Wildlife Service's Draft Fish and Wildlife 2(b) Coordination Act Report entitled: *Assessment of the Upper Passaic River at Long Hill Township Flood Damage Reduction and Ecosystem Restoration Project, Morris County, New Jersey*. This assessment details the potential impacts to fish and wildlife that can be expected to result from the Army Corps of Engineers [ACOE] proposed flood control plan. The DFW concurs with the draft USFWS' assessment of the ACOE plan and, in particular, with the conclusions and recommendations.

Sincerely,

Martin J. McHugh, Director

c. A. Didun, OER
R. Papson, BFF
M. Valent, ENSP