Rahway River, New Jersey

Flood Risk Management Feasibility Study

APPENDIX A4 USFWS

Correspondence

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
Environmental Analysis Branch

22 September 2016

Mr. Eric Schrading
Field Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205-4465

Dear Mr. Schrading:

The Army Corps of Engineers, New York District (District) is conducting a feasibility study to implement flood risk management measures along the Rahway River in Cranford and Millburn Townships, Essex and Union Counties and the Robinson's Branch in the City of Rahway, Union County, New Jersey. The Scope of Work for your office to prepare a Draft and Final Fish and Wildlife Coordination Act Report (FWCAR) was negotiated on 18 April 2016 (Enclosure 1) with the acceptance of a revised Government Order being transmitted to the District on 6 September 2016.

The Tentatively Selected Plan (TSP) has been identified and involves the modification of the Orange Reservoir in Essex County, channel improvements to the Rahway River in Cranford Township and nonstructural measures in the City of Rahway. Per email coordination between Ms. Kimberly Rightler and Mr. Ron Popowski on 12 September 2016, due to staffing constraints, the preparation of the Draft FWCAR is expected to begin around the end of October. The District is currently scheduled to release the integrated draft Feasibility Report/Environmental Impact Statement for public review around the same time. Therefore, the District will provide you with a copy of the draft report to serve as the basis for the Draft FWCAR.

In the interim, enclosed are several attachments that describe the Tentatively Selected Plan (Enclosure 2), summarize key environmental impacts and mitigation measures (Enclosure 3), and figures indicating the locations New Jersey and USFWS National Wetland Inventory mapped wetlands (Enclosures 4 and 5). The District welcomes any initial feedback regarding the effects the TSP may have on fish and wildlife resources, including federally endangered and threatened species, along with any initial recommendations on how to minimize adverse effects to these resources.

The District will continue to coordinate with your agency closely to assist in your preparation of the report. Should any questions arise, or additional information is needed, please contact Ms. Kimberly Rightler at (917) 790-8722.

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

Enclosures

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205
Tel: 609-646-9310 Fax: 609-646-0352
http://www.fws.gov/northeast/njfieldoffice

IN REPLY REFER TO:
16-CPA-0125

Nancy Brighton, Section Chief
Environmental Analysis Branch
New York District, U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York 10278-0090
Attn: Kimberly Rightler

APR 18 2016

Dear Ms. Brighton:

This letter responds to your March 7, 2016 request to the U.S. Fish and Wildlife Service (Service) to provide a Fiscal Year 2016 (FY2016) scope of work (SOW) for services pursuant to the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401; 16 U.S.C. 661 *et seq.*) regarding the U.S. Army Corps of Engineers, New York District's Rahway River Flood Risk Management Feasibility Study, Millburn Township, Essex County; Cranford Township and City of Rahway, Union County, New Jersey.

Enclosed please find a draft FY2016 SOW including the Service's staff time and cost for services, estimated at $16,492. The Service will provide draft and final FWCA 2(b) reports pursuant to Section 2(b) of the FWCA. The reports will contain updated information regarding wildlife resources and an assessment of impacts and benefits to these resources from the proposed project.

If you are in agreement with the draft SOW and the estimated cost for services, please prepare the appropriate transfer funding agreement and send via e-mail to Laura_Perlick@fws.gov.

The Service looks forward to working cooperatively with you and your staff to assess and minimize wildlife impacts from the project. If you have any questions regarding the cost estimate or any other aspect of this SOW, please contact Ron Popowski by email at Ron_Popowski@fws.gov.

Sincerely,

Eric Schrading
Field Supervisor

Enclosure

Fiscal Year 2016 Draft Scope of Work
U.S. Fish and Wildlife Service / U.S. Army Corps of Engineers
Rahway River Flood Risk Management Study
Millburn Township, Essex County,
Cranford Township and City of Rahway, Union County, New Jersey

I. SUBJECT:

The scope of work (SOW) between the U.S. Fish and Wildlife Service (Service)'s New Jersey Field Office (Service) and the U.S. Army Corps of Engineers, New York District (Corps) to prepare a draft and final 2(b) reports pursuant to Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401; 16 U.S.C. *et seq.*) for the Corps' Rahway River Flood Risk Management Feasibility Study (FRM), Millburn Township, Essex County; Cranford Township and City of Rahway, Union County, New Jersey (Study Area). Transfer funding from the Corps to the Service is authorized pursuant to the Economy Act (96 Stat. 933; 31 U.S.C. 1535).

Agency Financial Information

Service:
DUNS: 151157950
Tax ID: 53-0201504
Agency Locator Code: 14160006

Corps:
DUNS: 068112791
Tax ID: 62-1642142
Agency Locator Code: 00008736
Business Event Type Code: DISB
Treasury Account Symbol: To be determined

If the Corps cancels the agreement, the Service may collect costs incurred prior to the cancellation of the agreement plus any termination costs.

II. PROJECT NAME:

Rahway River Flood Risk Management Feasibility Study (FRM)

III. CORPS DISTRICT AND CONTACTS:

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

Chief, Watershed Section:	Nancy Brighton	Nancy.Brighton@usace.army.mil
Project Biologist:	Kimberly Rightler	Kimberly.A.Rightler@usace.army.mil
Financial Point of Contact:	Rifat Salim	Rifat.Salim@usace.army.mil

IV. SERVICE OFFICE AND CONTACTS:

U.S. Fish and Wildlife Service
New Jersey Field Office
Ecological Services
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205

Field Supervisor	Eric Schrading	Eric_Schrading@fws.gov
Project Biologist	Dennis Hamlin	Dennis_Hamlin@fws.gov
Financial Point of Contact	Laura Perlick	Laura_Perlick@fws.gov

V. DESCRIPTION OF PROJECT:

The Feasibility Study involves formulating and evaluating the feasibility of implementing flood risk management measures within the 500-yr floodplain of the portion of the Rahway River located in the Towns of Millburn and Cranford (Cranford Component) in Essex and Union counties and the Robinson's Branch in the City of Rahway (Robinson's Branch Component) in Union County, NJ.

Alternatives being evaluated include No Action and Non-Structural for both the Cranford and Robinson's Branch Component. In addition, structural flood risk management measures that will be evaluated for the Cranford Component may consist of modification of the Orange Reservoir, modification of the Lenape Park dam and embankment's, and channel modifications. Structural flood risk management measures that will be evaluated for the Robinson's Branch may consist of channel modification and levees/floodwalls.

VI. STATUS OF STUDY:

The Corps is conducting a feasibility study to evaluate Federal participation in FRM in the Rahway River Basin, New Jersey as authorized by the U.S. House of Representatives Resolution Docket 2548, dated March 24, 1998.

Flooding within the Rahway River Basin is caused principally by the rapid development of the area, which has resulted in a large increase of storm water runoff. Floods have caused damage to houses, businesses, municipal facilities and public infrastructure.

The Corps is currently evaluating FRM alternatives to determine the Tentatively Selected Plan (TSP). Identification of a TSP is anticipated to occur in May/June 2016 with the Draft Integrated Feasibility Report and Environmental Impact Statement being issued for public/agency review in August 2016.

The Service prepared a Planning Aid Letter dated February 20, 2015 to provide recommendations on preliminary alternatives in support of the Feasibility Study. The FWCA report to be prepared under this SOW is required to comply with the Fish and Wildlife Coordination Act and will focus on providing recommendations for the TSP.

VII. COORDINATING AND SCOPING:

The Corps and the Service will coordinate routinely as necessary.

VIII. DATA AND INFORMATION NEEDED FROM THE CORPS:

1. Signed SOW

2. Completed and signed transfer funding agreement via Military Interdepartmental Purchase Request (MIPR).

IX. SPECIFIC WORK TO BE ACCOMPLISHED BY THE SERVICE:

1. Review the conceptual plan of the TSP and any other supplemental information provided by the Corps.

2. Provide Corps with information on fish and wildlife resources (including endangered and threatened species) in the Study Area.

3. Conduct a site visit.

4. Coordinate with the Corps and the New Jersey Department of Environmental Protection (NJDEP), including New Jersey Division of Fish and Wildlife (NJDFW), and other agencies/organizations regarding project area resources, project related impacts, and means and measures that should be adopted to prevent the loss of or damage to fish and wildlife resources, as well as to provide for the development and improvement of such resources.

5. Conduct a technical review of the preliminary alternatives that have been developed to date to evaluate impacts of the alternatives on fish and wildlife resources.

6. For any alternatives proposed by the Service that deviate significantly from the proposed plan or include experimental techniques, the Service shall provide a discussion of benefits gained by the proposed alternative, along with case studies, photographs and/or typical details in order to assist the Corps in considering incorporation of the alternative into the overall alternative evaluation process.

7. Provide a draft FWCA 2(b) report addressing the overall potential impacts to fish and wildlife resources from the FRM project, including recommended measures that should be adopted to prevent the loss or damage to those resources.

8. Provide a final FWCA 2(b) reports addressing and incorporating comments received from Corps, NJDEP, and NJDFW on the draft FWCA 2(b) report.

X. CORPS INPUT TO SERVICE:

The Corps will provide project documents and technical information developed during the course of study, secure and provides other existing Corps documents that the Service may request, and coordinate routinely as project plans are refined.

The Corps will provide comments or concurrence with the Service's written products within 30 days of submission. Once any comments are addressed and the Corps provides concurrence, Service products will become public documents available to outside parties upon request.

XI. SERVICE INPUT TO CORPS:

Service submits Draft FWCA 2(b) report	September 30, 2016
Service submits Final FWCA 2(b) report	January 30, 2017

XII. CORPS AND SERVICE SUBMISSION SCHEDULE:

	Target Date
Corps provides current plans, documents and information; and transmits funding.	Within 7 days after receipt of MIPR.
Service submits draft FWCA 2(b) report to the Corps, NJDEP and NJDFW.	Within 60 days after receipt of project plans.
Corps, NJDEP and NJDFW provide comments on draft FWCA 2(b) report.	Within 15 days after receipt of draft FWCA 2(b) report
Service addresses Corps, NJDEP, and NJDFW comments and submits final FWCA 2(b) report.	Within 20 days after receipt of Corps, NJDEP, and NJDFW comments.

XIII. SERVICE EFFORTS AND COSTS

Service Effort	Task Days
Investigate fish and wildlife resources within the vicinity of the project area, including review of available literature and coordination with the NJDEP and NJDFW	4
Conduct a site visit	1
Provide section 7 consultation pursuant to the Endangered Species Act (87 Stat.884; 15 U.S.C. 1551 et seq.) (not charged to project transfer funds)	—
Conduct technical review of the preliminary alternatives that have been developed to date	6
Prepare draft FWCA 2(b) report	6
Prepare final FWCA 2(b) report	2
Total Service Task Days	**19***
***Biologist Day Rate ($629) x Overhead Rate (38% or $239)**	**$868**
19 Service Task Days x $868	**$16,492**
Total:	**$16,492**

Rahway River Basin, New Jersey
Flood Risk Management Feasibility Study
Tentatively Selected Plan

U.S. Army Corps of Engineers
New York District

New Jersey
Department of Environmental Protection
Non-Federal Sponsor

US Army Corps of Engineers
BUILDING STRONG®

Photo By The Cranford Chronicle

Rahway River Basin Flood Risk Management Study
Tentatively Selected Plan

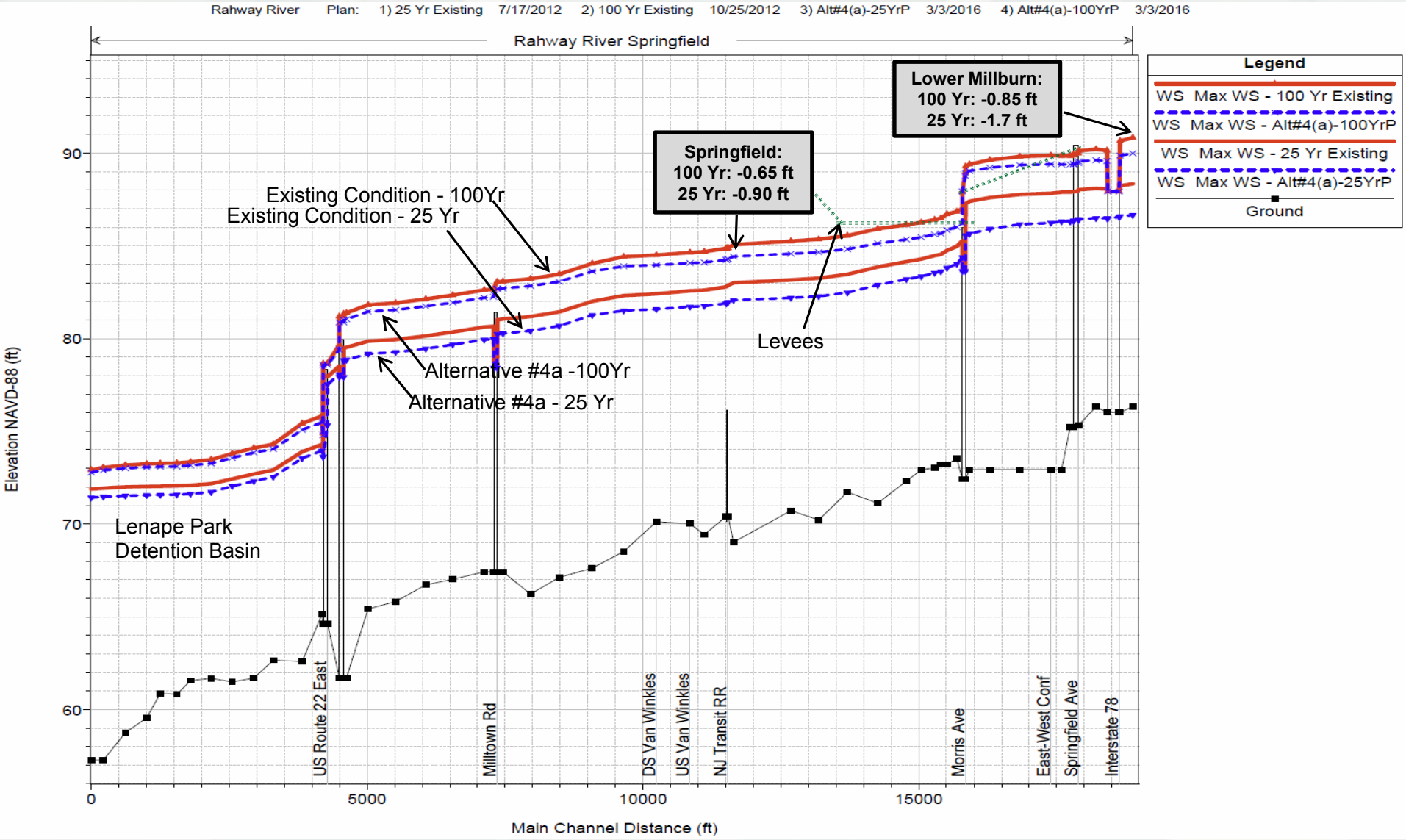
- Install 2 new 36” outlet pipes, possible replacement in-kind* of Orange Reservoir.
  *Replacement in-kind of Orange Reservoir is a worst case scenario. Investigations and analysis during design phase may indicate rehabilitation, not replacement. Cost estimate assumes complete draining of reservoir for replacement during construction.
- Approximately 8,930 ft. of trapezoidal channel improvements (35-45 ft. width) along the Rahway River (end of Nomahegan Park to South Ave.) in Cranford Township.
- This alternative is likely to contain less than the 4% chance of annual exceedance flood in Cranford Township (25 Yr.).
  - Better use of the flow detention capacity of Orange Reservoir will mitigate the increase in downstream flow caused by deepening and widening the channel.
- 21 structures in City of Rahway to receive nonstructural treatments
  - Measures examined will include dry and wet floodproofing, ring walls, elevation and buyouts.

Nonstructural Flood Proofing Measure	10% (10-yr) Annual Exceedance		
	Residential	Non-Residential	Sub Total
Dry Flood proofing	0	0	0
Wet Flood proofing	1	1	2
Ringwalls/Levees	2	4	6
Raise	13	0	13
Buyout	0	0	0
Total of Structures	16	5	21

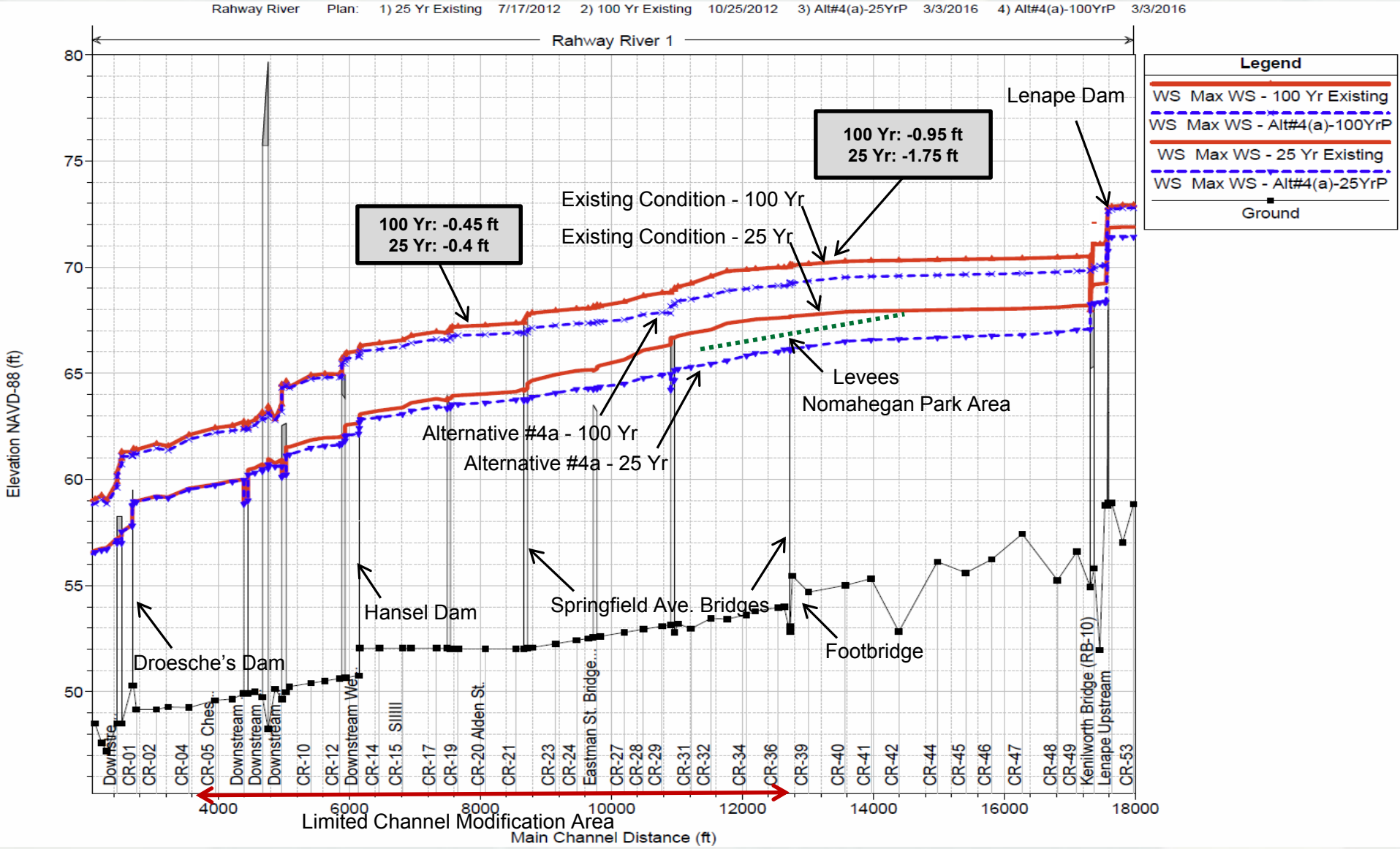
TSP: Cranford Channel Improvement and Orange Reservoir Replacement & Outlet Modification

TSP: Approximate Inundation Mapping 4% (25-Yr) Flood Cranford, Kenilworth and Springfield

TSP: Springfield and Lower Millburn
Reduction in 1% and 4% chance (100 Yr & 25-Yr) floods



TSP: Cranford
Reduction in 1% and 4% (100 yr & 25 yr) floods



TSP: Orange Reservoir Dam Details

- Orange Reservoir Dimensions and Use

Details	Existing	Improved	Units
Height	34	34	ft
Length	900	900	ft
Capacity	774	774	ac-ft
Hazard Classification	High Hazard (NJDEP)		
Condition	Good/Fair		
Usage	Recreational	Recreational / Flood Risk Management	

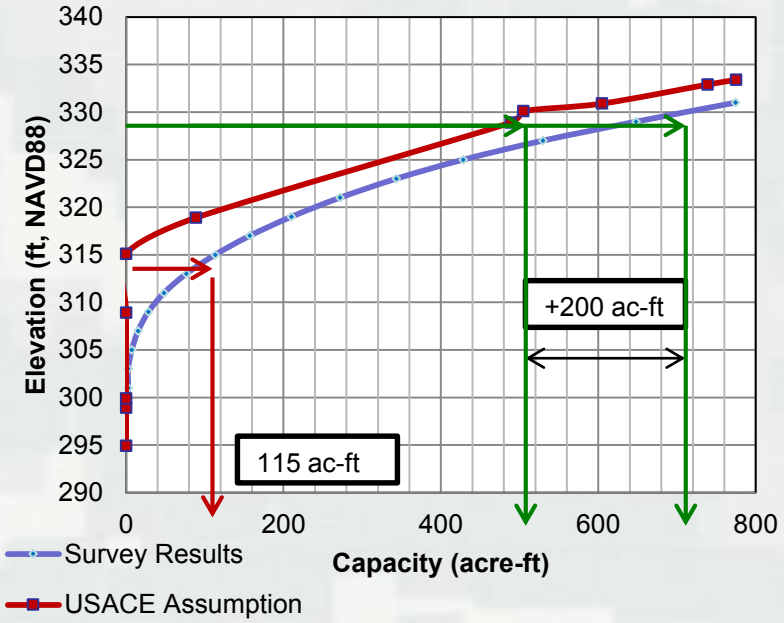
- Pre-storm drawdown will be approximately 15 ft from spillway elevation (330 ft)
  - At elevation 315 ft there will be about 22 acres under as much as 16 ft of water.

- Orange Reservoir Re-fill Times:

Events	Time
Drawdown Time	2 days
25 yr	30 hrs to re-fill
1 yr	One week to re-fill
Base Flow	Two weeks to re-fill
*Maximum drawdowns and re-fill depth = 15 ft	

Orange Reservoir Survey Results

Orange Reservoir Capacity vs. Elevation

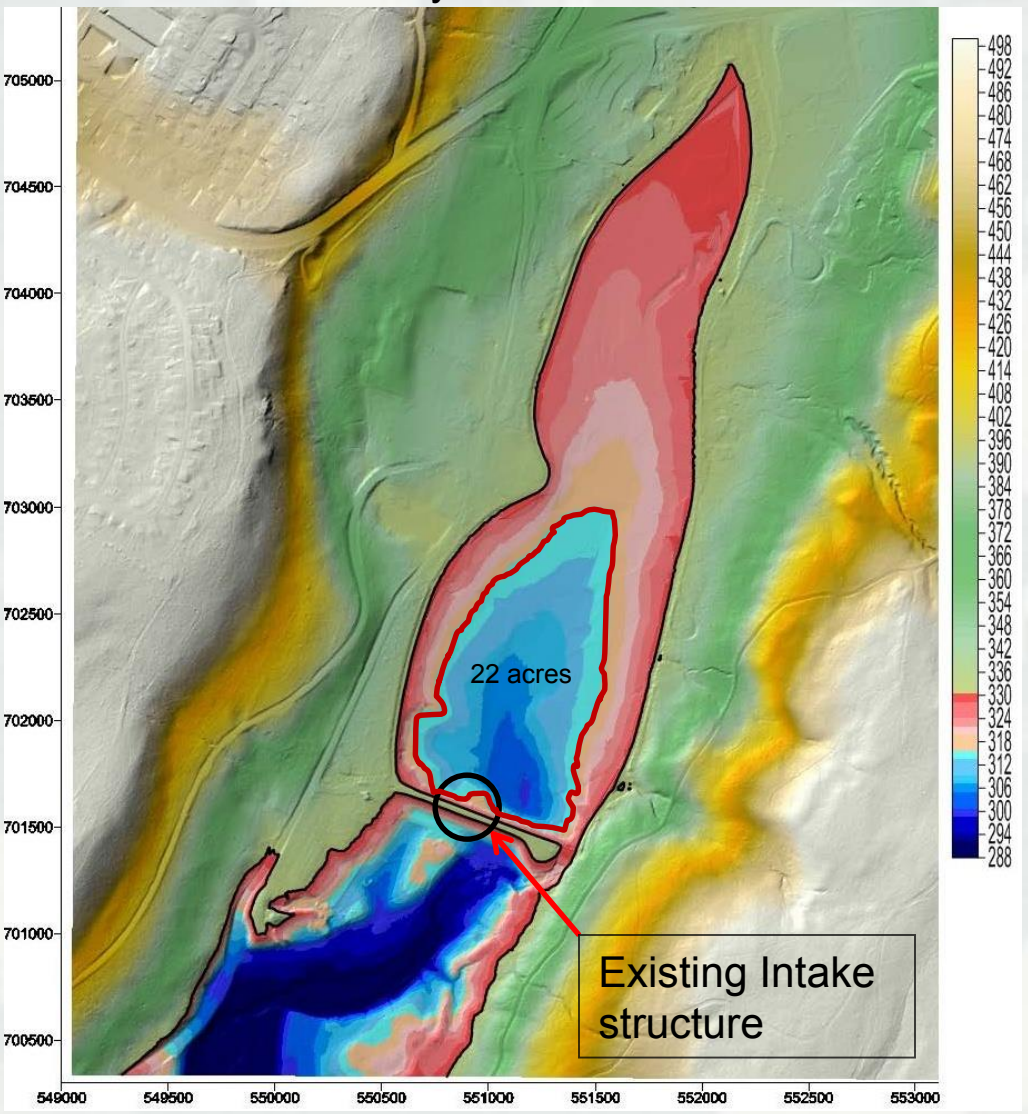


At the spillway elevation (330 ft NAVD), USACE assumed approximately 500 acre-ft of storage. The survey indicated that there is approximately 700 acre-ft of storage.

Orange Reservoir re-fill times:

Events	Time
Drawdown Time	2 days
25 yr	30 hrs to re-fill
1 yr	One week to re-fill
Base Flow	Two weeks to re-fill
*Maximum drawdowns and re-fill depth = 15 ft	

Bathymetric Data



Orange Reservoir Concerns

- Reservoir is over 100 years old
- New Corps PMP/PMF* is significantly larger than the State's current value.
- Main Spillway is undermined.
- Overflow Spillway maybe under designed and the energy dissipation could be insufficient.
- Orange Reservoir Dam must meet the Corps' design standards & regulations once it's part of the Corps project.
- Geotech/structural data is not available, a cost estimate will be developed with worst case assumption.
- Full dam assessment will be performed during design phase such as:
  - H&H analyses;
  - Failure mode analysis;
  - Structural analysis;
  - Seepage analysis;
  - Geotechnical evaluation;
  - Seismic Analysis

*Probably Maximum Precipitation (PMP) and Probably Maximum Flood (PMF)

Orange Reservoir – Downstream Face

Orange Reservoir – Downstream Toe

Orange Reservoir – Main Spillway

Enclosure 3: Summary of Key Impacts and Mitigation

1.0 Summary of Impacts

1.1. Water Resources: Approximately 8,930 linear ft of Rahway River associated with channel improvements in Cranford Township; complete drawdown of the Orange Reservoir to construct dam replacement; partial drawdown prior to storm events.

1.2. Vegetation

1.2.1. Uplands: Approximately 1.09 acres associated with creating the 50 ft vegetation free zone around the Orange Reservoir dam

1.2.2. Riparian: Approximately 15 acres associated with the Cranford Township channel improvement construction.

1.2.3. Wetlands: Approximately 0.13 acres of forested deciduous wetlands assocatied with creating the 50 ft vegetation free zone around the Orange Reservoir dam.

2.0 Summary of Mitigation

2.1. Water Resources

- Constructing from one side of bank with preference to keeping vegetation on the western bank to optimize thermal impact reduction.
- Constructing the channel in a manner that contains baseflows, accentuates meanders within the channel, creates pool and riffle complexes and maintains velocities to sustain maintain transport. This may be achieved either through the excavation of a low flow channel or contouring the bottom of channel to direct flows in a certain direction within the channel.
- Restoring the existing substrate by stockpiling the gravel/cobble substrate excavated from the channel during construction and re-installing it once grading is completed.
- Native herbaceous material will be applied to the riverbanks in order to maintain the hydraulic efficiency of the channel during storm events. Native shrubs and trees will be planted on the top of bank.

The specific mitigation type and location will be identified during the Preconstruction Engineering Design Phase. Open water and vegetation mitigation will be monitored for a period of five years. The District will utilize using the Northern New Jersey Fish Index of Biological Integrity and the New Jersey High Gradient Macroinvertebrate Indices and the companion Environmental Protection Agency Rapid Bioassessment Protocol Stream Habitat Assessment Form to evaluate stream recovery.

Adaptive management measures will be implemented as necessary to achieve mitigation goals.

2.2. Vegetation

2.2.1. Uplands: Restore or enhance existing upland forest at 1:1 mitigation ratio

2.2.2. Riparian: Per New Jersey Department of Environmental Protection Flood Hazard Area Control Act Rules, riparian mitigation can be accomplished as follows:

- Creation (e.g. restoring a regulated water by removing a structure such as a pipe or culvert): 1:1 mitigation ratio
- Restoration (e.g. removal of impervious surface from top of bank): 2:1 mitigation ratio
- Enhancement (e.g. removal and replacement of invasive plant species with native species): 3:1 mitigation ratio
- Purchase of mitigation credits from a New Jersey Department of Environmental Protection mitigation bank.

2.2.3. Wetlands: Per the NJDEP Freshwater Wetlands Protection Act Rules, wetland mitigation can be accomplished as follows:

- Purchase of mitigation credits from a NJDEP wetland mitigation bank: 1:1 mitigation ratio;
- Wetland creation/restoration: 2:1 mitigation ratio
- Wetland enhancement: minimum 3:1 mitigation ratio

The specific mitigation type and location will be identified during the Preconstruction Engineering Design Phase. All mitigation will be monitored for a period of five years and adaptive management measures will be implemented as necessary to ensure mitigation success.

2.3. Fish and Wildlife

2.3.1. Fish

- Per NJDEP requirements, will implement an in-water restriction from 1 May through 30 June to protect spawning species;
- As per NJ Division of Fish and Wildlife Water Lowering Permit, the District will perform a fish salvage prior to the complete drawdown of the Orange Reservoir
- As per NJ DFW Water Lowering Permit, the District will perform the drawdown of the Orange Reservoir between mid-September through October.

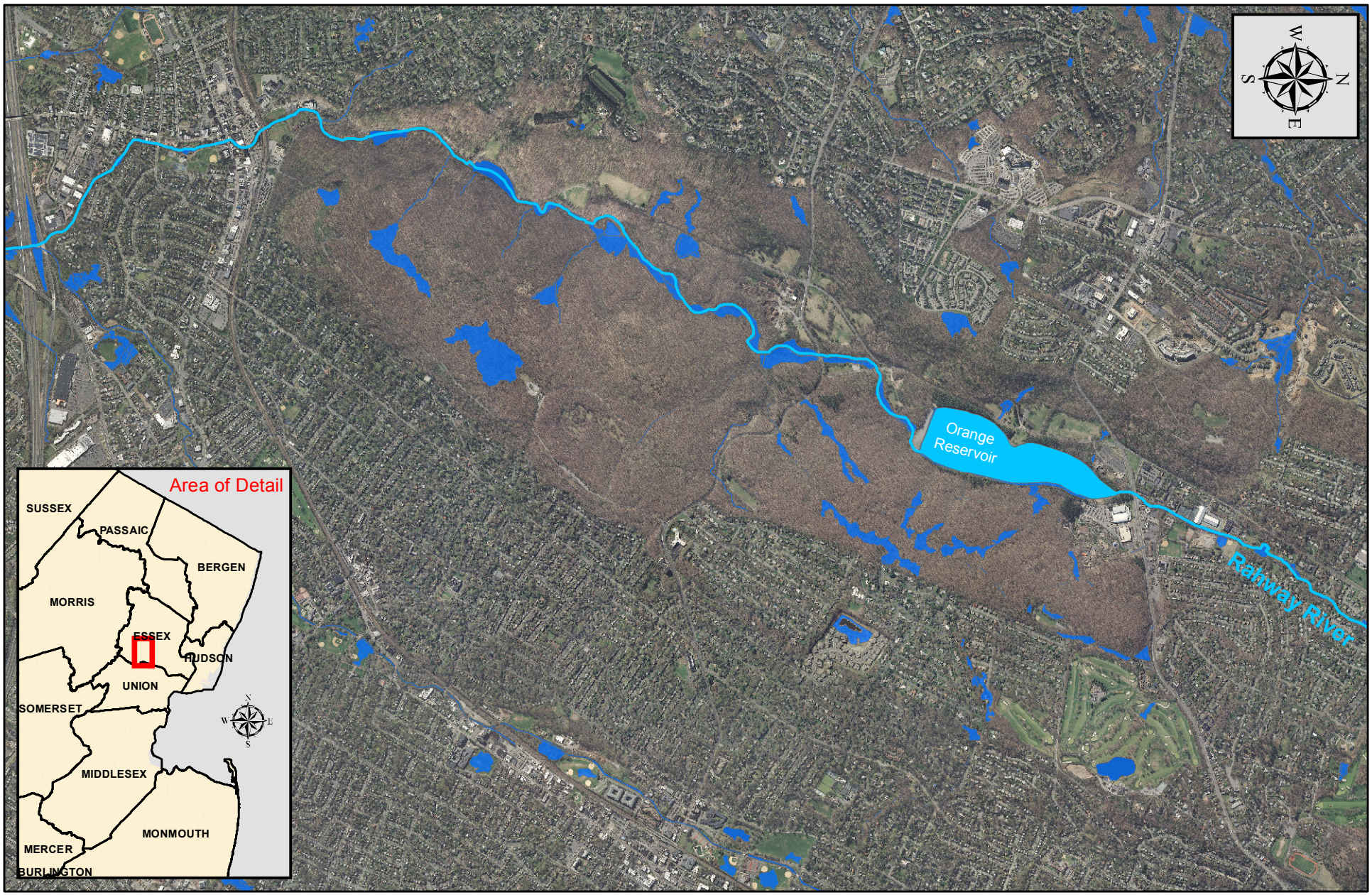
2.4. Endangered and Threatened Species

2.4.1. Indiana and Northern Long Eared Bat:

- Implementation of tree clearing restriction from 1 April through 30 September
- Conduct presence/abasence surveys if the tree clearing restriction cannot be implemented.
- Utilize tree species preferred by these species for summer roosting as part of upland, riparian and upland mitigation.

2.4.2. American Bald Eagle

- Implementation of shrub and tree clearing restriction from 15 March through 31 July in accordance with the Migratory Bird Treaty Act
- Continue coordination with USFWS during construction and implement additional protective measures as outlined in the National Bald Eagle Management Guidelines as necessary.

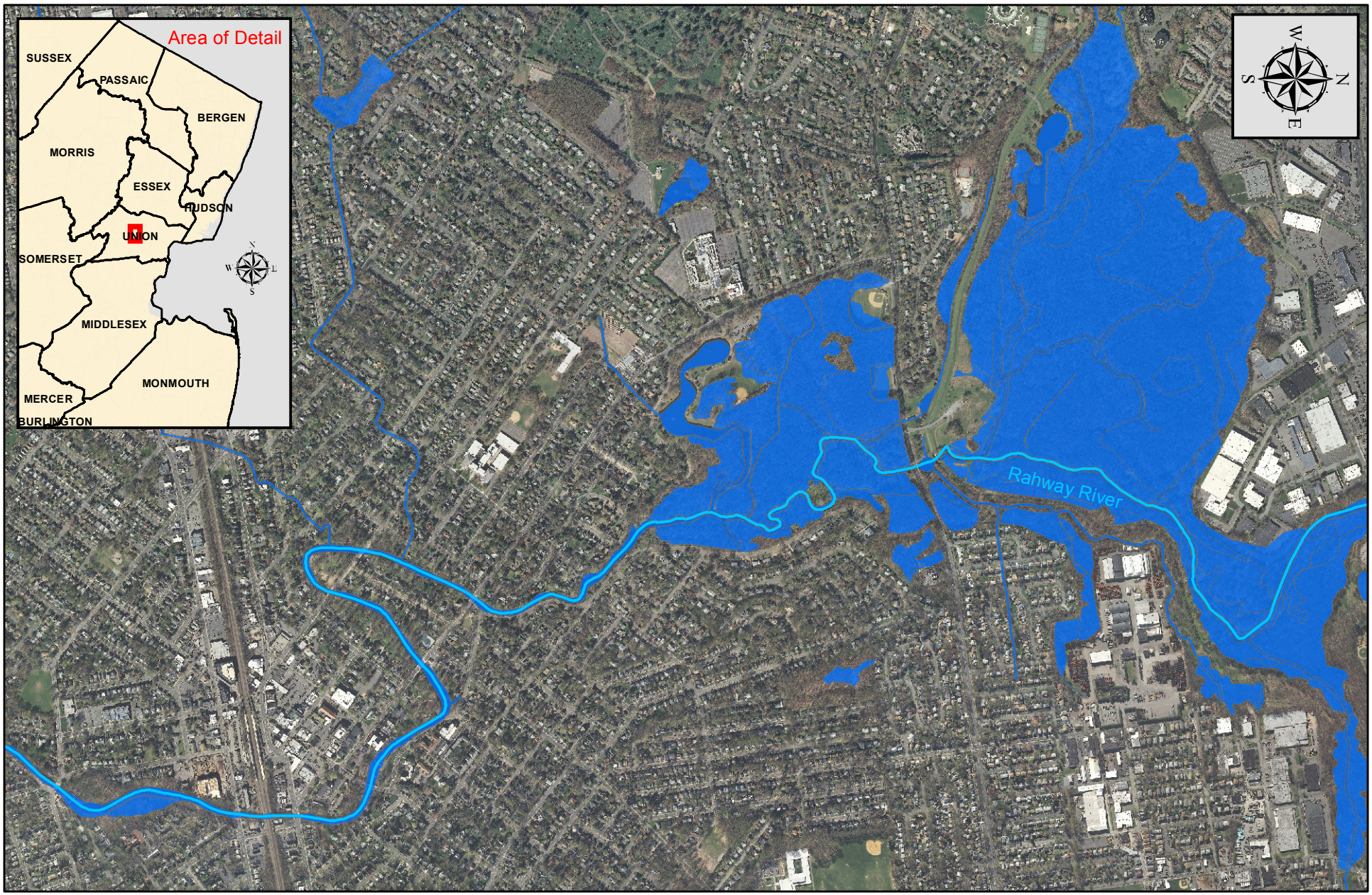


US Army Corps of Engineers
New York District

South Mountain Reservation Area
Rahway River Flood Risk Management Study
Essex County, New Jersey

0 0.45 0.9 1.35 1.8 Miles

Wetlands (US Fish & Wildlife NWI wetlands and NJ Department of Environmental Protection 2012 LULC wetlands)



US Army Corps of Engineers®
New York District

Cranford Area

Rahway River Flood Risk Management Study
Union County, New Jersey

0 0.25 0.5 0.75 1 Miles

Wetlands (US Fish & Wildlife NWI wetlands and NJ Department of Environmental Protection 2012 LULC wetlands)

Moyle, John

From: Moyle, John
Sent: Tuesday, January 05, 2016 3:45 PM
To: Moyle, John
Subject: FW: Rahway

From: Davis, Kelly
Sent: Tuesday, January 05, 2016 3:26 PM
To: Shaffer, Darin; Moyle, John
Cc: Hatala, Sarah
Subject: Re: Rahway River - Request for NJ Endangered and Nongame Species Program POC

I spoke with Fisheries and Endangered & Non-game Species Program - no huge red flags.

A time restriction from 5/1 thru 6/30 is recommended on any sediment generating activities associated with the project in order to protect warm-water fish nest building and spawning.
Species Occurrence Area (v11) and Landscape mapping (v3.1) indicates valued habitat and threatened / endangered (T / E - *Federally listed*) and "species of concern" in the area. (*Indiana Bat, Northern Long-eared Bat*, Red-shouldered Hawk) "Great Blue Heron, Little Blue Heron, Snowy Egret, Glossy Ibis, Wood Thrush."

For Indiana Bats and/or Northern Long-eared Bats:
-Seasonally restrict clearing of trees greater than 5 inches dbh from April 1 to September 30 within the geographic summer range of the Indiana or Northern Long-eared bat. Extend the seasonal restriction to November 15 if within 10.0 miles of a hibernaculum. *This location is within 10 miles of a Hibernaculum*
-Minimize tree clearing, especially of highly suitable roost trees including snags (dead trees), shagbark hickories (*Carya ovata*), other trees with shaggy or exfoliating bark, and trees of any species over 26 inches dbh
The Endangered and Non-game Species Program (ENSP) would generally concur with conditions imposed by USFWS.

For Red-shouldered Hawk: (western end of project area)
For activities within the nest buffer that might disturb the nest a timing restriction from March 1 to July 15 is recommended.

For nesting birds:
A general timing restriction on mechanical trimming or removal of trees (using heavy equipment) from 3/15 – 7/31 is recommended to protect nesting birds covered under the Migratory Bird Treaty Act. Non-mechanical tree trimming or removal (using chainsaws) may be permitted once the tree is checked for nesting activity.

General concerns:
The slope of the berm should be less than 45 degrees to allow turtles and other small animals to move over it.
BMP's for prevention of sediment movement should be used at all times and maintained for function.
Mitigation may be requested and/or required.

Kelly Davis, Biologist - Fisheries
N.J. Division of Fish and Wildlife - Office of Env. Review
P.O. Box 394, 1255 County Rt. 629

Moyle, John

From: Moyle, John
Sent: Tuesday, January 05, 2016 3:45 PM
To: Moyle, John
Subject: FW: Rahway

From: Davis, Kelly
Sent: Tuesday, January 05, 2016 3:26 PM
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Cc: Hatala, Sarah
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Mitigation may be requested and/or required.

Kelly Davis, Biologist - Fisheries
N.J. Division of Fish and Wildlife - Office of Env. Review
P.O. Box 394, 1255 County Rt. 629

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://www.fws.gov/northeast/njfieldoffice

IN REPLY REFER TO:
15-CPA-0063

FEB 20 2015

Peter Weppler, Chief
Environmental Analysis Branch, New York District
U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278-0090
Attention: Kimberly Rightler

Planning Aid Letter for the Rahway River Basin Flood Risk Management Feasibility Study, Essex, Middlesex and Union Counties, New Jersey.

Dear Mr. Weppler:

The U.S. Fish and Wildlife Service (Service) has prepared this Planning Aid Letter (PAL) for the Rahway River Flood Risk Management Feasibility Study, Cranford, Union County, New Jersey (Feasibility Study) in accordance with a fiscal year 2012 Scope of Work (SOW) and interagency agreement pursuant to the Fish and Wildlife Coordination Act of 1958 (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) (FWCA). This PAL does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. The purpose of this PAL is to provide input, guidance and recommendations to the U.S. Army Corps of Engineers (Corps) regarding resource conservation issues for the planning stages of the Feasibility Study. Comments provided in this PAL are based on information the Corps provided to us, site visits, field notes, site photographs, maps, and analysis of Geographic Information Systems data sets (ArcGIS® version 10.0). As identified in our SOW for this Feasibility Study, this PAL assists the Corps in formulating and evaluating the feasibility of implementing flood risk management measures within the 500-year floodplain portion of the Rahway River Basin located in the Township of Cranford.

AUTHORITY

The Corps and the Service coordinate during project planning to conserve, protect, and enhance fish, wildlife, and plants and their habitats. Legislation relevant to natural resource protection for this project includes the FWCA, the Endangered Species Act of 1973 (87 Stat. 884, as amended; (16 U.S.C. 15.31 *et seq.*) (ESA), the National Environmental Policy Act of 1973 (83 Stat. 852; as amended, 42 U.S.C. 4321 *et seq.*) (NEPA), the Migratory Bird Treaty Act (40 Stat. 755; 16 U.S.C. 703-712) (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250 as amended; 16 U.S.C. 668-668d). In addition, several Executive Orders have also established guidance to Federal agencies, including the Service, relative to fish and wildlife protection and conservation. For projects authorized under Water Resource Development Act (33 U.S.C. 2201 *et seq.*), the ESA and the FWCA represent the primary authorities under which

the Service cooperates and coordinates with the Corps. The following comments constitute planning aid and 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 or recommendations on any documents prepared pursuant to NEPA. Any NEPA document (Environmental Assessment or Environmental Impact Statement) will be prepared in accordance with the Council on Environmental Quality's regulations for implementing NEPA (40 CFR Parts 1500-1508), and Corps regulations and policies.

INTRODUCTION

This Feasibility Study is designed to identify flood risk management measures that will reduce the incidence and severity of flooding in the Rahway River Basin, particularly in Township of Cranford. It was authorized by Section 204 of the Flood Control Act of 1965 (P.L. 89–298) and U.S. House of Representatives Resolution Docket 2548, adopted March 24, 1998. The goal of the Feasibility Study is to identify opportunities for future flood damage reduction and associated environmental restoration. During preliminary review, the Corps has evaluated approximately 10 different alternative plans and determined that three meet cost/benefit criteria required for further consideration. One of these plans, identified as *Alternative 6: South Mountain Regional Detention Basin*, has been withdrawn by the Corps due to widespread public and municipality opposition (K. Rightler, personal communication, September 18, 2014). The two proposed plans currently under consideration are *Alternative 4: Channel Improvements and minor modification to Orange Reservoir*, and *Alternative 7a: Non-Structural Plan for10-year Floodplain* (Corps 2014a).

Primary elements of the proposed Alternative 4 include channel modification of approximately 15,500 feet of the Rahway River in Cranford; the removal or replacement of up to 2,000 feet of existing floodwalls (Corps 2014b); the removal of two dams; the reconstruction of two bridges; and the installation of new outlet pipes at Orange Reservoir located approximately 10 miles upstream (Corps 2014a). The proposed channel would extend downstream from Kenilworth Avenue to the site of Droescher's Dam. It would have trapezoidal side slopes ranging from one vertical on two horizontal (1:2), to one vertical on two and a half horizontal. Under this plan, the river channel would be deepened to attain a downstream slope of approximately 2.6 feet per mile, with a maximum excavation of about 3.7 feet near Hansel Dam. The river channel would be reconstructed to a final width of 60 feet. Channel modifications would also include the construction of diversion channels at two locations, where meanders would be isolated to straighten the river. Together these diversions would create approximately 250 feet of new channel and eliminate approximately 1,300 feet of existing channel. The Union Avenue and North Avenue bridges over the Rahway River in Cranford would be removed and replaced by bridges of design that open the river channel to greater flow. Also in Cranford, both Droescher's Dam (above Lincoln Avenue East) and Hansel Dam (above Union Avenue North) will be removed to increase river flow. At Orange Reservoir, located in West Orange Township approximately ten miles upstream from Cranford, two manually operated 30 inch outlet pipes would be installed to allow drawdown of the reservoir in advance of predicted rainfall events. It

is anticipated that the flow detention capacity of the Orange Reservoir would mitigate the increase in flow conveyance capacity obtained by deepening and widening the channel (Corps 2014a). Implementation of Alternative 4 will require mitigation measures due to the permanent loss or alteration of approximately 15,500 feet of Rahway River channel, 27 acres of riparian zone, and 7.25 acres of wetlands. Estimated cost for Alternative 4 is $68.9 million (Corps 2014b).

Alternative 7a proposes non-structural flood damage reduction measures in Cranford within the 10% annual exceedance (10-year event). Implementing Alternative 7a would affect a total of 66 structures (elevate 62, buyout two, wet flood proof one, and ringwall one) at a cost of approximately $15.3 million (Corps 2014b).

The Corps is also evaluating the feasibility of two other proposed flood control measures not included in the cost/benefit analysis (K. Rightler, personal communication, September 18, 2014). One would utilize elements of Alternative 4 (the new Orange Reservoir outlet pipes) and the rejected Alternative 1 (extending the height of levees and floodwalls in Lenape Park). This proposed plan would remove the channel modification component included in both Alternatives 1 and 4. A second proposed plan would utilize elements of a plan proposed in 1985 for flood control measures on Robinsons Branch above its confluence with the Rahway River in the City of Rahway. It includes the channelization of approximately 6,600 feet of Robinsons Branch; 800 feet of dike along St. Georges Avenue; 5,000 feet of levee; and a 200-foot segment of floodwall.

STUDY AREA

The Rahway River basin covers approximately 83-square miles of Essex, Middlesex and Union Counties of New Jersey (Fig. 1). From its source at Crystal Lake, at an elevation of approximately 520 feet, the Rahway River flows for 24 miles before terminating at sea-level in Arthur Kill, the tidal strait separating Staten Island, New York City, New York from mainland New Jersey. The Rahway River basin encompasses 24 municipalities in ten sub-watersheds and, according to the 2010 United States Census, is one of the most densely populated areas in the U.S. Suburban and urban land use in the basin was well established with development occurring well prior to enactment of New Jersey's Stormwater Management rules (N. J. A. C. 7:8) in February 2004, which requires stormwater management measures for development activities. The considerable amount of impervious surfaces in the basin -- such as streets, parking lots, rooftops and compacted soil -- have greatly reduced the amount of rainfall infiltration and capacity for stormwater retention. The steep gradient of the sub-watersheds above Cranford, combined with increased runoff from development, adds to the potential for severe flooding during periods of heavy rainfall. For the proposed flood risk management activities, the Feasibility Study area is defined as being upstream from the confluence of Robinsons Branch and the Rahway River in the City of Rahway, approximately five miles downstream from Cranford.

Communities along the Rahway River been effected in recent years by flooding from events such as Tropical Storm Floyd in September 1999, the April 2007 Nor'easter, and Hurricane Irene on August 27-30, 2011 (Corps 2014a). The U.S. Geological Survey recorded up to 9.9 inches of rainfall in the Rahway River basin during Hurricane Irene and a total of 20 inches for the month of August (USGS 2013). The resulting flooding peaked at greater than the 500-year recurrence

interval (< 0.2% annual-exceedance probability) in the City of Rahway, where the river crested at 2.5 feet higher than the previous peak for 90 years of record; and at greater than the 100-year recurrence interval (1% annual-exceedance probability) at Springfield, located 2.5 miles upstream from Cranford, where the river crested at its highest peak for 74 years of records (Watson *et al.* 2014). While there is no official flood gauge in Cranford, it was the site of some of the worst flooding that occurred during Hurricane Irene (Corps 2014a).

ENVIRONMENTAL CONDITIONS

Geography

The Rahway River Basin lies entirely within the Piedmont physiographic province of northern New Jersey. The Piedmont includes low mountains, ridges, and hills, but is primarily lowland with smooth, rounded hills that slope gently toward the Coastal Plain. The ridges of the Watchung Mountains that form the western border of the Rahway River Basin (and the West Branch watershed) are made of hard, erosion resistant volcanic basalts. The rest of the basin consists of a gently rolling plain that is part of a glacial moraine of a late-Wisconsinan ice sheet. The highest points in the basin are near 630 feet in elevation along the crest of First and Second Mountains, while the plain that forms most of the basin ranges from 150 feet at the eastern side of the Watchungs to sea level on the eastern boundary of the county at the Arthur Kill.

Hydrology/topography

The Rahway River basin encompasses 12 sub-watersheds. Upstream from the confluence of Robinsons Branch in the City of Rahway, runoff from nine sub-watersheds totaling 62 square miles flow to the Rahway River. The primary area of focus for the Feasibility Study includes 36 square miles within 4 sub-watersheds upstream from Cranford. Three major tributaries enter the Rahway River above Cranford, including Nomahegan Brook, and the East Branch and West Branch of the Rahway. All three of these tributaries originate at highest elevations of the basin: over 500 feet in the Nomahagen sub-basin and over 600 feet in the East and West Branch sub-basins. Waterways in these sub-watersheds descend steeply down to the Cranford area, where the stream gradient decreases dramatically (Fig. 2). From Orange Reservoir downstream to Springfield the Rahway River gradient averages 41 feet per mile. From Springfield to Cranford the gradient is approximately 2.6 feet per mile, then below Cranford the gradient increases to about 8.2 feet per mile downstream to the City of Rahway and Arthur Kill.

Soils

Soils in the Rahway River Basin are dominated by Booton and Haledon series soils. These soils account for over 70 percent of the land area in sub-watersheds above the City of Rahway. Both are sandy loam soils formed in glacial till. Booton series soils are generally coarser and located further upslope than Haledon series soils. Both Boonton and Haledon series are Hydrologic Group C soils. Group C soils are described as sandy loam soils having low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure (Natural Resources Conservation Service 2002). The Booton series are described as "well drained" to "moderately well-drained" soils with water table at a depth of more than 80 inches. Runoff rates may be slow or rapid. Water storage capacity is rated low (5 inches) because of an impermeable fragipan

layer at 24 to 36 inches. The fragipan results in a perched water table between November and May most years. Haledon Series soils are classified as "somewhat poorly drained", have medium to very high runoff rates, and a water storage capacity rated as low (5 inches). Soil permeability is slow to moderately rapid above the fragipan layer (at a depth of 20 to 36 inches) and moderately rapid to rapid below. Haledon soils also have a perched water table between November and May most years.

Soil conditions within the basin have been altered greatly by development. Over 68 percent of the soils above Rahway are described as urban (covered by hard surfaces) or urban complex (at least the top 12 inches have been disturbed) soils. The underlying soils are predominately of the Boonton and Haledon series, retaining their deeper soil horizon characteristics.

Wetlands and Vernal Pools

As is the case with upland areas of the Rahway River Basin, wetlands and waterways have been significantly altered over the years. GeoWeb mapping indicates that in its 24 mile course, only about three miles of original channel exists today (NJDEP 2015). Most of that channel is located in the South Mountain Reservation, and all is above the municipality of Milburn, some five miles upstream from Cranford. Most of the basin's remaining wetlands lie along the Rahway River and its tributaries.

The largest wetland areas in the Study Area are located in the Rahway River floodplain adjacent Lenape and Nomahegan Parks. The proposed channel modifications included in the proposed Alternative 4 would run through palustrine forested wetlands in Nomahegan Park. These wetlands are classified by National Wetland Inventory Mapping Convention as PFO1A (seasonally flooded), PFO1C (temporarily flooded), and PFO1E (seasonally flooded/saturated). Description of Alternative 4 components contained in a document titled "Formulating Alternative Plans" provided by the Corps (K. Rightler, personal communication, September 18, 2014), state that 1400 feet of modified channel would be within Nomahegan Park. However mapping indicates that approximately 3,300 feet of the proposed channel would be in Nomahegan Park, a number that excludes about 1,000 feet of river channel within the park that would be lost due to channel realignment. The majority of Nomahegan Park, and all lands near the river, are mapped as wetlands. Deepening the river channel will have a negative impact on the park's wetlands due lowered water table and reduced seasonal and temporary flooding into the floodplain, not only adjacent to the river channel, but also to wetlands along small tributaries flowing into the river within the park.

There are two vernal pool habitat areas are noted along the Rahway River, one above Lenape Park and the other within South Mountain Reservation. Vernal pools are unique ecological systems supporting distinctive plant and animal species. Typically inundated in the spring and dry during the summer, vernal pools provide safe habitat for amphibian and insect species unable to tolerate competition or predation by fish. Given the scarcity of wetland and vernal pool habitat within the Rahway River Basin, maintaining these hydrologically sensitive areas is imperative for the protection of fish and wildlife resources.

Environmental Contaminants

A review of existing government data bases identified a total of 55 active or pending contaminated sites within the project area, defined as 1/8 mile on either side of Robinsons Branch and the Rahway River south from State Route 22 to their confluence. The total area reviewed totaled 1,650 acres, including 383 acres of Lenape Park and 119 of Nomahagen Park in Cranford. Looking at the entire watershed above the confluence of Robinsons Branch and the Rahway River, a New Jersey GeoWeb database review identified a total of 374 known contaminant and an additional 54 locations that have active ground water contamination. Six of these sites are located on or adjacent to levees/dike/floodwall sites included in the 1985 proposal for Robinsons Branch. Along the east side of the Rahway River in Union, just upstream from the Lenape Park area, is an approximately 18 acre contaminated groundwater area that may be discharging into the river.

New Jersey's surface water quality standards (SWQS) establish stream classifications and the designated uses for all waters of the State. Designated uses include aquatic life support (maintenance, migration, and propagation), recreation, fish consumption, shellfish harvest for consumption, drinking water supply, industrial water supply, and agricultural water supply. The SWQS makes a determination at the sub-watershed level that water quality either "fully supporting" of the use, "not supporting" of the use, or lacking sufficient information to make an assessment. The most recent assessment of the Rahway River found that water quality in the sub-watershed between Robinsons Branch and Kenilworth Avenue, which includes the Feasibility Study area, was "not supporting" of aquatic life (total phosphorus, dissolved oxygen, total dissolved solids), fish consumption (mercury in fish tissue), industrial water supply (total dissolved solids), primary water contact (fecal coliform), or public water supply (arsenic) (NJDEP 2010). Sources of contaminants were identified as: 1) combined sewer overflows; 2) industrial point source discharge; 3) urban runoff/storm sewers; 4) agriculture; 5) atmospheric deposition – toxics; and 6) natural sources. Water quality was "fully supporting" of agricultural water supply (NJDEP 2010). An average of 5.3 million gallons of water per day is collected from this stretch of river to provide drinking to about 26,500 residents in the City of Rahway.

Testing of fish tissues has identified levels of contaminants that have led NJEDP to issue consumption advisories for fish throughout the Rahway River system. The general population is advised to eat only one meal per week for largemouth bass (*Micropterus salmoides*), bluegill sunfish (*Lepomis macrochirus*), and brown bullhead (*Ameiurus nebulosus*), and only four meals per year for common carp (*Cyprinus carpio*). High-risk individuals, including infants, children, pregnant women, nursing mothers and women of childbearing age are advised not to eat largemouth bass or common carp, and only one meal per month of bluegill sunfish or brown bullhead. Statewide, the general population are advised to eat only one meal per week of trout, smallmouth bass (*Micropterus dolomieu*), and pickerel (*Lepomis macrochirus*), while high-risk individuals are advised to eat only one meal per week of trout and sunfish, and only one meal per month of smallmouth bass, pickerel, and yellow bullhead.

Federally Listed Species

Bog Turtle

The Study Area contains wetlands that could support populations of the federally listed (threatened) bog turtle (*Clemmys muhlenbergii*), specifically the large wetland area known as the Ash Brook Swamp Reservation, located along Robinsons Branch in Scotch Plains Township, Union County, approximately four miles upstream from its confluence with the Rahway River. 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 shrub/scrub wetlands and spring-fed fens. For more information, please refer to the enclosed narrative on the biology and threats to bog turtle.

Indiana Bat

Potential summer habitat for the federally listed (endangered) Indiana bat (*Myotis sodalis*) is present throughout the project area. Hibernacula are located approximately 20 miles northwest from Lenape Park and maternity colonies have been identified within seven miles. Indiana bats utilize loose bark or crevices in trees for daytime roosts and forage on flying insects below the forest canopy and along riparian corridors. In areas of potential habitat for Indiana bat, seasonal restrictions for tree removal are recommended from April 1 through September 30. For more information, please refer to the enclosed narrative on the biology and threats to Indiana bat.

Northern Long-eared Bat

Potential summer habitat for the federally proposed listed (endangered) northern long-eared bat (*Myotis septentrionalis*) is present throughout the project area. Under Section 7(a)(4) of the ESA, a Federal agency must confer with the Service on any agency action that is likely to jeopardize the continued existence of any species that the Service has proposed to be listed, or that is likely to result in the destruction or adverse modification of critical habitat proposed to be designated for such species. The northern long-eared bat has a similar life history as the closely related Indiana bat, roosting in trees and foraging on flying insects. In areas of potential habitat for northern long-eared bat, seasonal restrictions for tree removal are recommended from April 1 through September 30. For more information, please refer to the enclosed narrative on the biology and threats to northern long-eared bat.

Species under Review for Federal Listing

The Service is evaluating the little brown bat (*Myotis lucifugus*), tri-colored bat (*Perimyotis subflavus*), and American eel (*Anguilla rostrata*) to determine if listing under the ESA is warranted. American eel is known to be present in the project area and the bat species may be present. These species do not currently receive any substantive or procedural protection under the ESA, and the Service has not yet determined if listing of any of these species is warranted. However, the Corps and other Federal action agencies should be aware that these species are being evaluated for possible listing and may wish to include them in field surveys and/or impact assessments, particularly for projects with long planning horizons and/or long operational lives.

Other Federally Listed Species

Except for bog turtle, Indiana bat and northern long-eared bat, no other federally listed or proposed threatened or endangered flora or fauna are known to occur in the vicinity of the project site. If additional information on federally listed endangered or threatened species becomes available, this determination may be reconsidered.

State-Listed Species and Species Protected by Other Laws

Bald Eagle

Nesting and foraging habitat for the bald eagle (*Haliaeetus leucocephalus*) may occur in the Project's area. The bald eagle was removed from the Federal List of Endangered and Threatened Wildlife effective August 8, 2007. The bald eagle continues to be protected under the BGEPA and MBTA. The bald eagle also remains a State-listed species under the New Jersey Endangered and Nongame Species Conservation Act (N.J.S.A. 23:2A *et seq.*) (NJENSPCA), These Federal and State laws prohibit take of bald eagles.

A known nest site of the bald eagle is located within 3 miles of the project site and suitable foraging areas exist throughout the proposed project area. Bald eagles occur in New Jersey throughout the year and have been expanding their range in recent years. For more information, please refer to the enclosed narrative on the biology and threats to bald eagles. For the continued protection of bald eagles, and to ensure compliance with Federal and State laws, the Service recommends minimizing impacts on bald eagles in accordance with the National Bald Eagle Management Guidelines and all applicable State regulations. Links to State agencies and the Guidelines are available on this office's web site at http://www.fws.gov/northeast/njfieldoffice/endangered.

State-Listed

Several avian species that are afforded protection under the NJENSPCA have been documented in the Rahway River basin area. State-listed endangered species include the pied-billed grebe (*Podilymbus podiceps*), short-eared owl (*Asio flammeus*), and northern goshawk (*Accipiter gentilis*). State-listed threatened species include the red-shouldered hawk (*Buteo lineatus*), barred owl (*Strix varia*), red-headed woodpecker (*Melanerpes erythrocephalus*), grasshopper sparrow, (*Ammodramus savannarum*), osprey, (*Pandion haliaetus*), horned lark (*Eremophila alpestris*), American kestrel (*Falco sparverius*), bobolink, (*Dolichonyx oryzivorus*), cattle egret (*Bubulcus ibis*), and black-crowned night heron (*Nycticorax nycticorax*). Regional priority species include the glossy ibis (*Plegadis falcinellus*) and little blue heron (*Egretta caerulea*). Species of concern in the project area that warrant special attention because of inherent vulnerability to environmental deterioration or habitat modification include the great blue heron (*Ardea herodias*), nighthawk (*Chordeiles minor*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), and eastern meadowlark (*Sturnella magna*). Please contact the New Jersey Division of Fish and Wildlife's (NJDFW) Endangered and Nongame Species Program (ENSP) for additional information regarding State-listed species.

Migratory Avifauna

The riparian forests, wooded wetlands, marshes, and grasslands along the Rahway River and Robinsons Branch corridors, including the Lenape Park and South Mountain Reservation areas, provide nesting and foraging habitat for over 100 different migratory avian species. Completion of the project may require removing trees, shrubs, or other vegetation. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Neither the MBTA nor its implementing regulations at 50 CFR Part 21 provide for permitting of "incidental take" of migratory birds.

Tree cutting and/or shrub removal can adversely affect migratory birds if conducted during the nesting season. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Neither the MBTA, nor its implementing regulations at 50 CFR part 21 provide for permitting of "incidental take" of migratory birds. According to the New Jersey Division of Fish and Wildlife Guidance Manual for the protection of Fish and Wildlife Resources dated July 2008, the appropriate timing restriction to protect nesting migratory birds from tree or shrub/scrub removal is March 15 to July 31. While nests without birds or eggs are not protected under the MBTA, nest destruction that results in the unpermitted take of migratory birds or their eggs and unfledged chicks is illegal. The Service recommends implementing the aforementioned seasonal restriction to any proposed tree/shrub removal.

Fisheries and Invertebrates

The Rahway River and its tributaries are classified by NJDFW as FW2 Non-Trout Waters (NJDEP 2005). The Fish Index of Biological Integrity (FIBI) classifies water pollution levels based on assessment of fish assemblages present in waterways. During 2000, 2005, and 2010 NJDFW conducted sampling in the Rahway River. The FIBI score calculated from each sampling rated Rahway River water quality as "fair" (NJDEP 2011). Fish species collected during these sampling periods include largemouth bass, bluegill, green sunfish (*Lepomis cyanellus*), pumpkinseed (*Lepomis gibbosus*), redbreast sunfish (*Lepomis auritus*), American eel, black crappie (*Pomoxis nigromaculatus*), redfin pickerel, white sucker (*Catostomus commersoni*), yellow bullhead (*Ameiurus natalis*), common shiner (*Luxilus cornutus*), banded killifish (*Fundulus diaphanus*), spottail shiner (*Notropis hudsonius*), blacknose dace (*Rhinichthys atratulus*), mummichog (*Fundulus heteroclitus*), tessellated darter (*Etheostoma olmstedi*), golden shiner (*Notemigonus crysoleucas*), creek chub (*Semotilus atromaculatus*), and mosquitofish (*Gambusia affinis*). The Rahway River system provides the public with recreational fishing opportunities, as largemouth bass, bluegill, green sunfish, pumpkinseed, redbreast sunfish, black crappie, redfin pickerel, white sucker, and American eel are all identified as sport fishing species. While listed as non-trout water, each year NJDFW releases several thousand trout, including brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*) into the Rahway River upstream from the City of Rahway.

No anadromous species or ocean migrant species that spawn inshore, such as herring (*Alosa spp.*) or striped bass (*Morone saxtilis*), are located in the Rahway River Basin above the City of Rahway. One catadromous species (*i.e.*, a species that moves from freshwater to the ocean to

breed), the American eel, occurs within the waters of the basin. Although portions of the lower Rahway River support anadromous species, they would not be currently expected to occur in the Feasibility Study area due to several dams blocking upstream migration. Unlike anadromous fishes, the highly mobile American eel has the ability to move over land and around impediments to migrate to the sea for reproduction.

The NJDEP utilizes the Environmental Protection Agency's Rapid Bioassessment Protocols (RBPs) to help monitor the health of streams and watersheds. One protocol, termed Ambient Biological Monitoring Network (AMNET), examines dynamics of benthic macroinvertebrate populations to determine taxon present. Ratings of the stream condition are based on the biodiversity of the system and the level of pollution tolerance of the families collected, the ratio of pollution tolerant to pollution intolerant families such as members the insect orders Ephemoptera (mayflies), Plectoptera (stoneflies), and Trichoptera (caddisflies), often referred to as EPTs. The AMNET scoring system rates stream conditions as either "excellent", "good", "fair", or "poor'. Invertebrate sampling at three Rahway River sites (Rahway, Kenilworth, Springfield) during the most recent assessment in 2009 failed to detect any EPTs and scoring for each location rated as "poor" (NJDEP 2012).

A second RBP, used to determine riparian habitat quality evaluates in-stream substrate, channel morphology, bank structural features, and riparian vegetation at the sample site and the adjacent area within a 100 to 200 foot radius to calculate a habitat score. Compilation of a qualitative rating score of each parameter yields a habitat score of "optimal", "suboptimal", "marginal', or "poor'. Habitat scores calculated during the 2009 stream assessment rated each of the three Rahway River locations as "suboptimal" (NJDEP 2012).

Prior to adopting the AMNET protocol, the NJDEP macroinvertebrate bioassessment protocol utilized a single statewide index the New Jersey Impairment Score (NJIS), which assigned one of three assessment ratings: "non-impaired", "moderately impaired", and 'severely impaired". The NJIS protocol was replaced with AMNET in 2004 because it utilizes different indices for coastal, Pinelands, and high-gradient ecoregions, thus yielding more meaningful assessments (NJDEP 2012). While the NJIS and AMNET rating systems are different, some conclusions can be drawn in comparing data collected under each protocol. During the 1992 macroinvertebrate sampling, the Rahway River rated as "moderately impaired" (NJDEP 1994). This was due to the presence of substantial numbers of EPT pollution intolerant family Hydropsychidae (Trichoptera). The absence of EPT species in more recent sampling indicates water quality in the Rahway River has likely diminished in recent years.

SERVICE COMMENTS AND RECOMMENDATIONS

For the protection of fish and wildlife resources, the Service prefers non-structural options over channel modifications for flood risk management. While *Alternative #7a: Non-Structural 10-year Plan* calls for the buyout of only two properties, there is history of strong support from local municipalities and non-government organizations to purchase at-risk properties along the Rahway River and convert them to green space. The Service recommends the Corps to coordinate with the local municipalities, non-government organizations, and land owners in supporting buyout programs for at risk properties located beyond the 10% annual exceedance area (10-year event). Additionally, Alternative 7a is by far the least costly alternative.

The Service recommends close coordination among the Corps, National Marine Fisheries Service, NJDEP, NJDFW, ENSP, and New Jersey Natural Heritage Program to avoid potential adverse impacts of construction alternatives in association on fish and wildlife resources and habitats that may result should the Corps pursue any projects within this Study Area.

The Corps should pre-coordinate a project activities plan (*i.e.,* construction activities, operation windows, and equipment movement to include access/egress the project sites) with Federal and State resource agencies to avoid or minimize disturbance to fish and wildlife habitats associated with the target flood control and restoration areas.

In order to avoid and minimizing potential adverse impacts on sensitive natural resources and State-listed or Federally-listed species within the Study Area, the Service recommends incorporating the following measures into project planning.

- Forward results of any sediment testing to the Service for review. The Service understands that contaminants testing will be conducted on Project site sediments once plans have been finalized. The Service recommends that future project designs include information on sediment sources and disposal sites where fill or excavation may be required.

- The Corps preliminary impact assessment estimates that implementing channel modifications associated with Alternative 4 would result in the permanent loss or alteration of approximately 15,500 feet of Rahway River channel; 27 acres of riparian zone; and 7.25 acres of wetlands (Corps 2014b). It appears that channel modification within Nomahegan Park would not be 1,400 feet as described by the Corps, but close to 3,300 feet (plus an additional loss of about 1,000 feet of channel), so the total amount of affected wetlands would likely be considerably more than 7.25 acres. The Service recommends the Corps reevaluate its calculations of impacted wetlands and river channel and provide mitigation plans accordingly.

- The Service recommends mitigation measures for activities that result in the alteration of Rahway River channel that may include: excavation of a meandering low-flow channel within flood control channel, incorporating pool/riffle/run flow sequences that provide multiple habitat features and encourage colonization by diverse populations of aquatic organisms; extract any gravel/cobble components from excavated river channel materials and replace into channel after removing fine sediments; or the removal of downstream dams or creating fish passage structures for downstream dams to provide additional spawning habitat for diadromous fishes.

- The Service generally supports the removal of dams from streams and rivers. Alternative 4 calls for the removal of the Hansel and Droescher's Dams, which would open approximately two and one half miles of the Rahway River to fish passage. Because there are still at least three dams below Hansel Dam blocking upstream movement of anadromous and other fishes, the impact on diadromous fish of removing the dams would be minimal. However, dam removal does benefit many other riverine-dependent fish and wildlife.

- The Service recommends mitigation measures for project activities that result in the loss or alteration riparian habitat that may include: removal of any impervious surface within 100 feet of streambank and replanting with native shrub/tree species; invasive species management and replanting riparian zone with native shrub and tree species; or planting native shrub and tree species within 100 feet of streambank.

- Mitigation options that could be considered for wetland impacts should include establishment of wetlands at a 1:1 ratio and/or restoration or enhancement of existing wetlands. All of these measures must occur within the watershed. Alternatively, wetland impacts could be offset by purchase of credits through a mitigation bank.

- The 1,000 feet of river channel that would be lost due to the stream realignment proposed in Alternative 4 includes two reaches of long sweeping U-shaped meanders. Stream morphology in such meanders includes shallow areas of slow current and sediment deposition on the inside edges of the channel and deeper areas of faster current on the outside edges. This type of habitat is not present in most of the channel within the Study Area. The Service recommends that any plans for mitigating impacts to palustrine resources include strategies that increase stream habitat diversity.

- New Jersey's No Net Loss Reforestation Act (NNLRA) requires the applicant to plant one tree for every tree removed. The Service will recommend that the New Jersey Division of Land Use Regulation ensure that that full compensation be met to comply with the NNLRA. Please visit http://www.state.nj.us/dep/parksandforests/forest/community/No_Net_Loss.htm for more information.

- Consult the scientific literature and use the best available information regarding planting elevation, depth, soil type, and seasonal timing to ensure best results when revegetating sites. Include subsurface conditions such as soil and sediment geochemistry and physics, groundwater quantity and quality, and infauna when designing riparian, wetland, and instream restoration.

- Develop and implement a long-term management and monitoring plan for the alternatives. The plan should provide adequate evaluation of habitat restoration success. Information obtained will contribute to the science of in-stream and riparian habitat restoration, particularly in urban settings. The plan should include contingencies that would provide for further Corps action during post-construction monitoring, if necessary, as part of an adaptive management strategy to be implemented in coordination with affected municipalities and private landowners. Corps mitigation interventions may include regrading, re-planting, or other actions to correct for unexpected conditions, including deposition, erosion, failure of vegetation establishment, and/or re-invasion of undesirable species.

- Construction or other activities in or along waterways in the project area may impact bald eagles. Tree clearing or other disturbances to dead snags or mature timber, particularly adjacent to the Rahway River or Robinsons Branch, may affect eagles roosting or

- foraging in the area. NJDEP Landscape Project mapping shows foraging habitat for the bald eagle within the project area and a nest three miles from the project area. The Services recommends that the Corps carry out all project activities in accordance with the National Bald Eagle Management Guidelines. Please contact this office for technical assistance if the Guidelines cannot be followed; please note that pursuant to the BGEPA, a Service permit will be required if eagles will be disturbed.

- Any activities associated with a proposed alternative that could alter the hydrology of Robinsons Branch and the Ash Brook Swamp Reservation should be avoided, as such activities could result in "take" of bog turtle. Suitable habitat for bog turtle is present in this area. If any project activities are proposed for this area, a Phase Two survey should be conducted to determine the presence or absence of bog turtle, and further consultation must take place pursuant to Section 7 of the ESA.

- Proposed alternatives that include levee construction or widening of the river channel may require the removal of mature trees and shrubs from riparian corridors. These areas provide excellent foraging and roosting habitat for Indiana bat and northern long-eared bat. To avoid "take" of the Indiana bat and northern long-eared bat, the Service recommends a seasonal restriction on tree cutting and shrub removal from April 1 to September 30. If the selected alternative includes the removal of trees or shrubs within the project area, consultation must take place pursuant to Section 7 of the ESA.

- Alternatives other than *Alternative #7a: Non-Structural 10-year Plan* will likely require removing trees. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Neither the MBTA nor its implementing regulations at 50 CFR Part 21 provide for permitting of "incidental take" of migratory birds. According to the New Jersey Division of Fish and Wildlife Guidance Manual for the Protection of Fish and Wildlife Resources dated July 2008, the appropriate timing restriction to protect nesting migratory birds from tree or shrub/scrub removal is March 15 to July 31. The Service recommends including seasonal restrictions into any project documents or contracts. Failure to do so may result in the illegal destruction of nests with eggs or unfledged chicks.

- Coordinate with local municipalities, non-government organizations, and land owners to promote incorporation of "green infrastructure" stormwater management systems such as residential rain barrels, rain gardens and other stormwater retention measures that increase infiltration and recharge to groundwater, and reduce peak flows of stormwater runoff.

The Service looks forward to working cooperatively with the Corps to maximize benefits to our public fish and wildlife resources from proposed activities undertaken through the Rahway River Basin Flood Risk Management Feasibility Study. Please contact Dennis Hamlin at 609-383-3938, extension 14, if you have any questions or require further assistance regarding federally listed threatened or endangered species, or migratory birds.

Sincerely,

Eric Schrading
Field Supervisor

Enclosures: 4

CC: Kelly Davis: Kelly.Davis@dep.nj.gov
Kimberly Rightler: kimberly.a.rightler@usace.army.mil

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Rightler, K. Project Biologist. Email of September 18, 2014. U.S. Army Corps of Engineers, New York District. New York, New York.

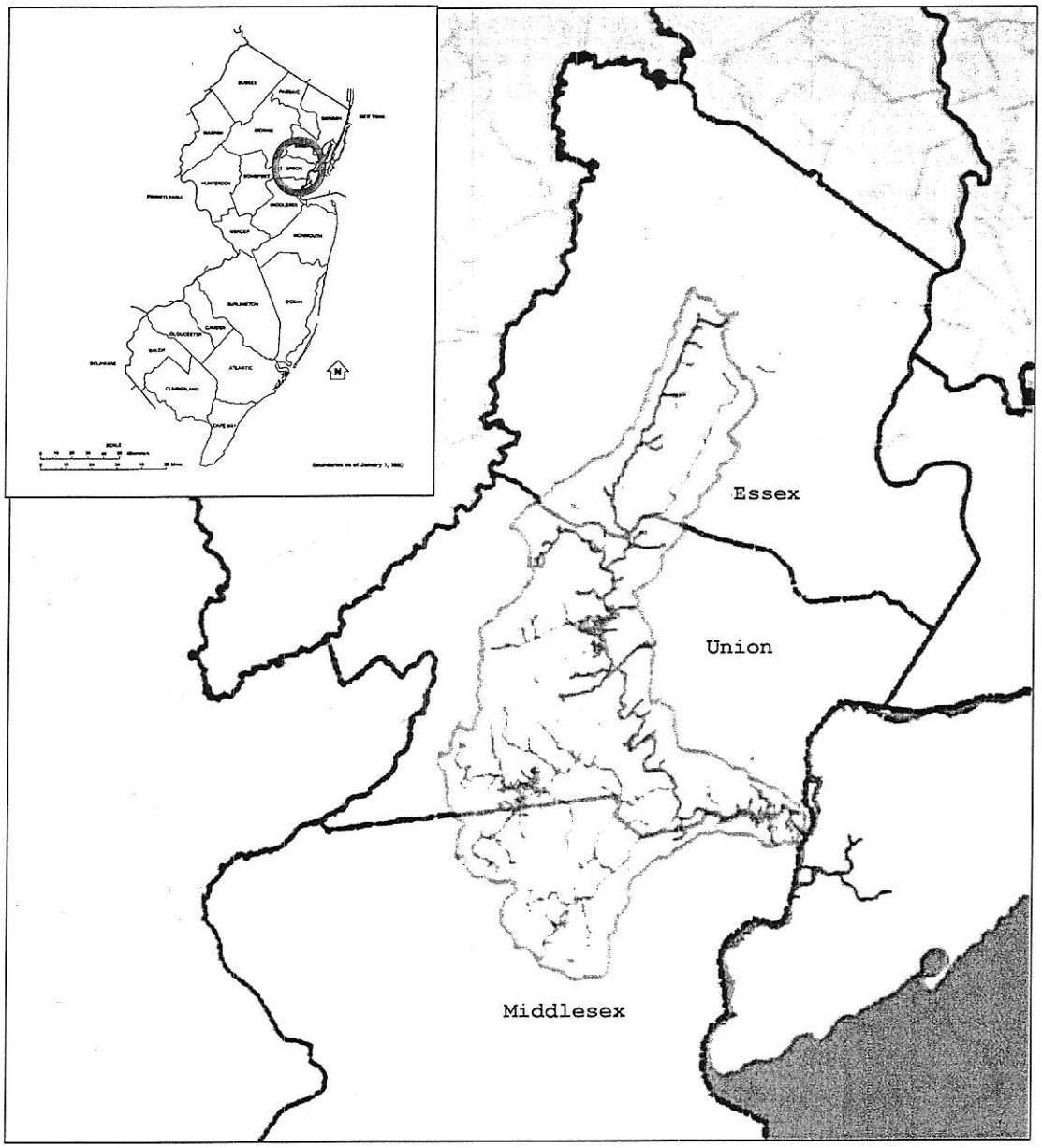

Figure 1. Rahway River Basin. Essex, Middlesex and Union Counties, New Jersey.

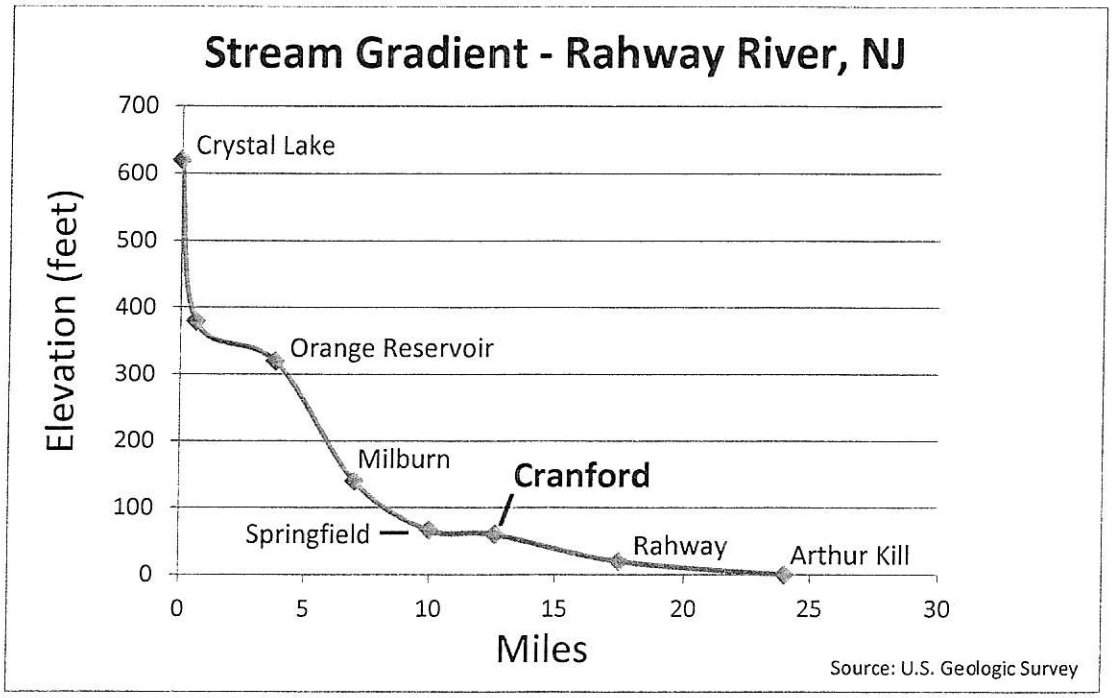

Figure 2. Stream gradient of the Rahway River from its source at Crystal Lake in Essex County to its termination at sea level in Arthur Kill (USGS 2013b, 2014a, 2014b, 2014c, 2014d).

U.S. FISH AND WILDLIFE SERVICE SPECIES NARRATIVES:
Biology and Threats of Federally Listed Species in New Jersey

Bog turtle (*Clemmys muhlenbergii*)

The bog turtle was federally listed as a threatened species in 1997.

At only about 4 inches long, the bog turtle is one of North America's smallest turtles. This species typically shows a bright yellow, orange, or red blotch on each side of the head. The nearly parallel sides of the upper shell (carapace) give bog turtles an oblong appearance when viewed from above. These small, semi-aquatic turtles consume a varied diet including insects, snails, worms, seeds, and carrion.

Bog turtles usually occur in small, discrete populations, generally occupying open-canopy, herbaceous sedge meadows and fens bordered by wooded areas. These wetlands are a mosaic of micro-habitats that include dry pockets, saturated areas, and areas that are periodically flooded. Bog turtles depend upon this diversity of micro-habitats for foraging, nesting, basking, hibernating, and sheltering. Unfragmented riparian (river) systems that are sufficiently dynamic to allow the natural creation of open habitat are needed to compensate for ecological succession. Beaver, deer, and cattle may be instrumental in maintaining the open-canopy wetlands essential for this species' survival.

Bog turtles inhabit open, unpolluted emergent and scrub/shrub wetlands such as shallow spring-fed fens, sphagnum bogs, swamps, marshy meadows, and wet pastures. These habitats are characterized by soft muddy bottoms, interspersed wet and dry pockets, vegetation dominated by low grasses and sedges, and a low volume of standing or slow-moving water which often forms a network of shallow pools and rivulets. Bog turtles prefer areas with ample sunlight, high evaporation rates, high humidity in the near-ground microclimate, and perennial saturation of portions of the ground. Eggs are often laid in elevated areas, such as the tops of tussocks. Bog turtles generally retreat into more densely vegetated areas to hibernate from mid-September through mid-April.

The greatest threats to the bog turtle are the loss, degradation, and fragmentation of its habitat from wetland alteration, development, pollution, invasive species, and natural vegetational succession. The species is also threatened by collection for illegal wildlife trade.

U.S. FISH AND WILDLIFE SERVICE SPECIES NARRATIVES:
Biology and Threats of Federally Listed Species in New Jersey

Indiana bat (*Myotis sodalis*)

The Indiana bat was federally listed in 1967 and classified as an endangered species in 1973.

The Indiana bat is a small, brown mammal about 1.5 to 2 inches long. This species closely resembles the little brown bat, from which it can be distinguished by small differences in fur coloration and the structure of the feet. As with all eastern U.S. bat species, Indiana bats feed almost exclusively on insects.

Each fall from late August through October, Indiana bats migrate from their summer habitats to congregate in the vicinity of their hibernation sites, which include caves and abandoned mine shafts. During this time, the bats engage in mating activity and feed in the surrounding area to build the fat reserves needed during hibernation. The bats then hibernate from late October to April, the precise timing dependent on climatic conditions. After emerging from hibernation, Indiana bats forage in the vicinity of the hibernation site before migrating to summer habitats. Studies indicate that Indiana bats typically forage within 10 miles of hibernacula before and after hibernation.

When not hibernating, Indiana bats roost under loose tree bark by day, and forage for flying insects in and around the tree canopy at night. A variety of upland and wetland habitats are used as foraging areas, including flood plain, riparian (along rivers), and upland forests; pastures; clearings with early successional vegetation; cropland borders; and wooded fencerows. Preferred foraging areas are streams, associated flood plain forests, and impounded bodies of water such as ponds and reservoirs.

During the summer months, numerous female bats roost together in maternity colonies under the loose bark of dead or dying trees within riparian, flood plain, and upland forests. Maternity colonies use multiple roosts in both living and dead trees. Female Indiana bats raise a single offspring each year. Adult males usually roost in trees near maternity roosts, but some males remain near the hibernaculum and have been found in caves and mines during the summer.

Protection of Indiana bats during all phases of their annual life cycle is essential to preserving this species. Threats to the Indiana bat include disturbance or killing of hibernating and maternity colonies; vandalism and improper closure of hibernacula; fragmentation, degradation, and destruction of forested summer habitats; and use of pesticides and other environmental contaminants. In recent years, White Nose Syndrome has also emerged as a major threat to the Indiana bat and many other bat species.

U.S. FISH AND WILDLIFE SERVICE SPECIES NARRATIVES:
Biology and Threats of Federal Proposed Species in New Jersey

Under Section 7(a)(4) of the Endangered Species Act, a Federal agency must confer with the U.S. Fish and Wildlife Service on any agency action that is likely to jeopardize the continued existence of any species that the Service has proposed to be listed, or that is likely to result in the destruction or adverse modification of critical habitat proposed to be designated for such species.

Northern Long-Eared Bat (*Myotis septentrionalis*)

The northern long-eared bat (*Myotis septentrionalis*) is a medium sized bat weighing approximately 5 to 8 grams with females slightly larger than males. The northern long-eared bat is distinguished from other *Myotis* species by its long ears.

The northern long-eared bat overwinters in caves and abandoned mines. Hibernacula are typically large with constant temperatures, high humidity and no air currents. Within hibernacula, northern long-eared bats are found in tight crevices and cracks with only nose and ears visible. The northern long-eared bat congregates in the vicinity of their hibernacula in August or September and enters into hibernation in October and November. The bat shows a high degree of philopatry (using the same site multiple years) to hibernaculum, although they may not return to the same hibernaculum in successive years. Movement between hibernacula throughout the winter has also been observed. There are eight known hibernacula in Northern New Jersey.

In April northern long-eared bats emerge from hibernation and migrate to summer habitat. Migratory movements are short compared to the Indiana bat, with movement typically between 35 miles and 55 miles. Once at summer habitat, the northern long-eared bat is comparable to the Indiana bat in terms of summer roost selection, but appears to be more opportunistic. Northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Maternity colonies generally consist of 30 to 60 individuals. Males and non-reproductive females may roost in cooler places, like caves and mines. Roosting northern long-eared bats have also been observed in humanmade structures, such as buildings, barns, sheds, cabins, under eaves of buildings, and in bat houses. In southern New Jersey the northern long-eared bat is known to roost in Atlantic white cedar.

Preferred foraging areas are in forested habitats. The northern long-eared bat emerges at dusk and feeds on moths, flies, leafhoppers, caddisflies, and beetles approximately 3 to 10 feet above the ground. Gleaning arachnids and other insects from foliage is also a foraging technique used by northern long-eared bats.

The distribution of the northern long-eared bat includes the Midwest and Northeast of the United States, and all Canadian provinces west to the southern Yukon Territory and Eastern British Columbia. In New Jersey, the northern long-eared bat is found statewide.

U.S. FISH AND WILDLIFE SERVICE SPECIES NARRATIVES:
Biology and Threats of Federally Delisted Species in New Jersey

Bald eagle (*Haliaeetus leucocephalus*)

The bald eagle was federally listed in 1967, and classified as an endangered species in 1973. With increasing numbers, bald eagle populations in the coterminous 48 States were re-classified from endangered to threatened in 1995, and delisted on August 9, 2007. The bald eagle continues to be protected under Federal laws including the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle also remains a State-listed species under the New Jersey Endangered and Nongame Species Conservation Act, which carries protections under the State land use regulation program. These Federal and State laws prohibit unauthorized take of bald eagles. For the continued protection of bald eagles, and to ensure compliance with Federal and State laws, the U.S. Fish and Wildlife Service (Service) recommends managing bald eagles in accordance with the National Bald Eagle Management Guidelines and all applicable State regulations. The Service and its partners are monitoring the bald eagle for a 20 year period to ensure populations remain stable following delisting.

With a wingspan that can exceed 7 feet, the bald eagle is the second largest bird of prey in North America. The bald eagle is our National symbol and unmistakable in appearance, featuring a white head and tail that contrast with a dark body. Juvenile birds lack the white head and tail, and are mottled in appearance until their fifth year. Eagles are opportunistic feeders and will eat carrion or live prey, primarily fish, but also small mammals, reptiles, and waterfowl.

Bald eagles occur in New Jersey throughout the year. The breeding season in New Jersey begins in late December to early January. During this period, mating pairs will work diligently to build or repair their nest. First-year nests can measure 2 feet high and 5 feet across. Eagles may use the same nest year to year, adding sticks and other nesting material, making the nest larger and larger each year. By the middle of February, most bald eagles in New Jersey have begun to lay their clutch of one to three eggs. Young eagles learn to fly (fledge) 11 to 12 weeks after hatching. Adults continue to provide food for the juvenile eagles for as long as 3 months after they fledge. During this period, the fledglings learn to fly proficiently and begin to hunt for themselves.

Bald eagles prefer forested or open habitats with little human disturbance near large bodies of water, such as lakes, large rivers, reservoirs, and bays. Eagles are often attracted to a water body as they search for food, and frequently roost in dead or mature trees adjacent to water. In winter, bald eagles gather in large numbers near coasts and inland water bodies that remain ice-free, allowing access to fish and other prey.

Threats to the bald eagle include environmental contaminants, habitat destruction and degradation, and disturbance of nesting and feeding birds.

From: Markuson, Jeremy
To: Rightler, Kimberly A NAN02
Subject: Re: [EXTERNAL] Re: ESA Coordination for Indiana bat and Northern Long-Eared Bat
Date: Friday, December 18, 2015 9:03:06 AM

Got it!

I think this would qualify as a linear project. When I calculated the total distance shown on the map I came up with 3.6 km. So, I would say let's try to get at minimum of 20 net nights completed. After looking at aerials I agree that some effort may need to focus on the travel corridors near the river and tribs. Focusing in some of these areas probably provide the greatest success of capturing bats while they are foraging for prey.

Cheers,

Jeremy

Please Note Our New Address!

Jeremy Markuson
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205-4465
Phone: 609-382-5266
Fax: 609-646-0352

On Thu, Dec 17, 2015 at 7:02 PM, Rightler, Kimberly A NAN02 <Kimberly.A.Rightler@usace.army.mil <mailto:Kimberly.A.Rightler@usace.army.mil> > wrote:

Hi Jeremy,

Yes, the clearing would occur within the yellow portions of the dam embankment. There is also a floodwall in the northeast corner that would be modified and we were told that would also have to have the 50 ft zone because it also acts as a dam. It's hard to see in the wetland map, so I placed a note indicating it's location.

Not that I'm a bat expert, but I would anticipate some nets being set up along the embankment, down within the proposed 50 ft zone and then just outside the 50 ft zone close to the river and tribs. Feel free to correct my assumptions.

Thanks,
Kim

-----Original Message-----
From: Markuson, Jeremy [mailto:jeremy_markuson@fws.gov <mailto:jeremy_markuson@fws.gov>]
Sent: Thursday, December 17, 2015 4:54 PM
To: Rightler, Kimberly A NAN02 <Kimberly.A.Rightler@usace.army.mil <mailto:Kimberly.A.Rightler@usace.army.mil> >
Subject: Re: [EXTERNAL] Re: ESA Coordination for Indiana bat and Northern Long-Eared Bat

Hi Kim,

Is the tree clearing going to be restricted to the yellow portions of the dam embankment map (RahwayFluvial_LenapeDamEmbankment_Wetlands.pdf) or does the 32 acres also include other clearing activities?

Thanks,

Jeremy

Please Note Our New Address!

Jeremy Markuson
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205-4465
Phone: 609-382-5266
Fax: 609-646-0352

From: Rightler, Kimberly A NAN02
To: "Markuson, Jeremy"
Subject: RE: [EXTERNAL] Re: ESA Coordination for Indiana bat and Northern Long-Eared Bat
Date: Thursday, December 17, 2015 12:33:00 PM

Hi Jeremy,

Thanks for the information. Good to see Jon Chenger is on the list; he's the one who conducted the survey for Green Brook Segment B1 several years ago.

We're not going to mess around with the acoustic survey, we'll just go straight to mist netting which leads me to a question. Would you consider this a linear project? The embankments are linear, but with the amount of trees, the river and the multiple small tribs within the park, I'm thinking that the needed net nights would be closer to non-linear minimum of 42 net nights. I'm trying to develop a rough estimate for the cost of the survey so we can get a sense of how much this will be.

Also, I was so focused on bats, I forgot to ask whether you feel there are any other Fed E&T species that we should be concerned about within this area. The IPAC website didn't note any, just the bats.

Thanks and you have a Merry Christmas as well!
Kim

From:	Markuson, Jeremy
To:	Rightler, Kimberly A NAN02; Brighton, Nancy J NAN02
Subject:	Re: [EXTERNAL] Re: ESA Coordination for Indiana bat and Northern Long-Eared Bat
Date:	Thursday, December 17, 2015 10:07:49 AM
Attachments:	NJ_MYSO_MYSE_Surveyors_List July 9_2015.pdf

It was nice speaking with you Kim and Nancy. Attached is a list of qualified Indiana bat/northern long-eared bat surveyors. The summer survey season I'd recommend is June 1 through August 15. Also, here is the current survey protocols: Blockedhttp://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html. Although I didn't mention it on the phone, you can choose to conduct acoustic surveys or mist net surveys to determine presence or absence. Because acoustic surveys can at times provide results that are difficult to analyze and interpret, I'd suggest the mist netting option rather than acoustic. Mist netting can also be beneficial because if you capture federally listed species a radio transmitter will be immediately placed on the bat and tracking activities will begin. However, if you choose to do acoustics and detect (or if there is a probable detection) of federally listed bats the next steps I'd recommend is try and capture the bats by mist netting and then tracking. Rather than do an extra step, if federally listed bats are detected using acoustic bat detectors, I'd suggest going straight to mist netting. The only downside with mist netting is that it's more costly and takes more time to complete. Anyhow, once you choose the bat surveyor and the survey methodology, please provide me a summer bat survey work plan that I can review and approve.

Thanks and have a Merry Christmas!

Jeremy

Please Note Our New Address!

Jeremy Markuson
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road, Unit 4
Galloway, New Jersey 08205-4465
Phone: 609-382-5266
Fax: 609-646-0352

From:	Rightler, Kimberly A NAN02
To:	"Markuson, Jeremy"
Cc:	"Popowski, Ron"; Brighton, Nancy J NAN02; "Hamlin, Dennis"
Subject:	ESA Coordination for Indiana bat and Northern Long-Eared Bat
Date:	Wednesday, December 09, 2015 2:00:00 PM

Hi Jeremy,

I hope you had a nice Thanksgiving and a successful office relocation. I have another project that I would like to coordinate with you on regarding the Subject species. The New York District is currently conducting a Feasibility Study to determine Federal interest in implementing flood risk management measures within the Rahway River Basin.

Two of the flood risk management alternatives we are evaluating include increasing the height of existing embankments at Lenape Park, located in Cranford Township, Union County (refer to attachments 1, 2 and 3). I would like to note that this is a dry dam and would remain a dry dam under our alternatives.
For dams (dry and wet), the Corps has a policy requiring the maintenance of a vegetation management zone comprised of maintained lawn only (no trees/no shrubs) from a minimum of 50 ft outward from the embankment toe.

For a dry dam, such as the Lenape Park Dam, this would be required on both sides. Through coordination with our Headquarters and Dam Safety Center of Expertise, this minimum 50 ft vegetation management zone is strictly enforced. Therefore, we have estimated that approximately 32 acres of forest could be removed as a result of increasing the footprint of the existing embankments and creating the 50 ft zone on either side.

In looking at the list of NJ Municipalities with Hibernation or Maternity Occurrence of Indiana bat or northern long eared bat (4th attachment), Cranford is within eight miles of multiple municipalities having maternity colonies of one or both species (e.g. Millburn, Summit, Berkeley Heights, etc.).

The team is currently evaluating how this vegetation requirement effects the costs and feasibility of implementing these alternatives. As part of this evaluation, I would appreciate your feedback on whether you feel the amount of acreage impacted raises us to a level where we may need to conduct presence/absence surveys or the preparation of a biological assessment.

Dennis had prepared a Planning Aid Letter (5th attachment) back in February of this year for this study, but the two alternatives that include Lenape Park were formulated subsequent of the PAL was submission so it doesn't include a full evaluation of impacts/recommendations in regards to clearing in Lenape Park.

It may be beneficial to have a call to discuss this further. If you could let me know when you may be available for a call, I would appreciate it.

Thank you,
Kim