

# *Engineering With Nature*

## *Case Examples of Practice*

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# *Organizational Perspective*

- NOAA-NMFS-GARFO-PRD-Section 7
- PRD is dedicated to managing, conserving, and rebuilding populations of marine mammals and endangered and threatened marine and anadromous species in rivers, bays, estuaries and marine waters
- ESA Section 7 consultations assist Federal agencies in fulfilling their duty to ensure Federal actions do not jeopardize the continued existence of a species or destroy or adversely modify critical habitat
- Biological opinions document NMFS' opinion as to whether the Federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of critical habitat



# *Current Projects*

- Sea Bright Offshore Borrow Area:  
Beach Nourishment
- James River Federal Navigation  
Project (FNP)
- Delaware River: Philadelphia to the  
Sea FNP Deepening and  
Maintenance



# *Sea Bright Offshore Borrow Area: Project Elements*

- Three beach nourishment projects located in New Jersey
- Removal of over 16 million cubic yards via hopper dredge equipped with UXO screens
- Construct structures along the shoreline that aim to reduce damages from future storm events



# Challenges

- Estimating and monitoring incidental take of ESA-listed species from hopper dredges utilizing UXO screens
- Determining if other entry points exist for take on hopper dredges
- Developing BMPs to minimize incidental take



# *Future Opportunities*

- Continue beach nourishment while minimizing take of ESA-listed species
- Research and develop monitoring systems for hopper dredges
- Implement pilot projects to test new developments for ESA take mitigation (e.g., tickler chain, cameras)



# *James River: Project Elements*

- Removal of shoal sediments via cutterhead dredge
- Material disposed of at Craney Island
- Biological Opinion in place for project since 2012
- Dredging occurs in spawning, rearing, and staging habitat for Atlantic sturgeon



# *Challenges*

- Atlantic sturgeon spawning river—fall spawning is confirmed to occur and time of year restrictions need amendment.
- Atlantic sturgeon critical habitat has been proposed for the James River and may shift analysis of the project in the future.
- Management of incidental take as well as habitat disturbance for fish that are not directly affected by dredging activities



# *Future Opportunities*

- Continue dredging shoals for safe navigation while working around important time of year segments for various life stages of Atlantic sturgeon
- Reduce impacts to Critical Habitat to inform analyses in other less studied river systems.



# *Delaware River: Project Elements*

- Deepening from 40 to 45 feet, almost complete, but second season of blasting remains.
- Mechanical, cutterhead, and hopper dredging
- In-water disposal & beach nourishment



# Delaware River: Challenges

- DE River, from the top of the Bay to the Trenton-Morrisville Bridge, has been proposed as Atlantic sturgeon critical habitat
- Blasting occurs in an expected spawning area
- Deterrents ineffective
- Relocation trawling
- Warm/dry season & unknown winter conditions upcoming



Downlines that are connected to explosives are pulled from the water by workers aboard the drillboat Apache after a morning blast off Chester, Pa., as part of the Army Corps' Delaware River deepening project, Wednesday, Jan. 20, 2016. (Tim Hawk | For NJ.com)

# *Future Opportunities*

- Study impacts to Critical Habitat (e.g., sturgeon usage before, during, and after blasting/dredging)
- Continue to study deterrence mechanisms
- Improve climate change analyses

