**Northeast (Canada through Delaware) Habitat Working Group Discussion**
**February 9, 2011**
**NMFS Sturgeon Workshop; Alexandria, VA**

## ***Summary of General Discussion:***

The working group session began with a discussion of the habitat matrix. Participants were not comfortable populating the matrix during the working group session and instead the group opted to discuss specific habitat information starting in Canada and working south on a river by river basis. Specific information and data sources were discussed for the rivers in Canada and Maine. Information discussed is captured below.

- Canadian Rivers – Data sources
    - Litvak SNS
    - Curry ASN
    - Dadswell ASN/SNS
    - Ceapa
    - See CAN Report
    - Hatin ASN
    - Bradford ASN/SNS
    - 2003 AFS Symp.
- Maine Rivers
    - Penobscot
        - Data source - Zylewdski
        - ASN Sub-adults have some info
        - Habitat modeling for SNS spawning habitat
        - Documented overwintering habitat
        - SNS Coastal movement and relationship to dams in river systems
    - Kennebec
        - Data source - Wipplehauser
        - 3 known spawning areas SNS
        - Known SNS overwintering
        - Nothing about juv. SNS stages
        - Other data sources - Squiers reports, Kynard student thesis
    - Saco
        - Data source - J. Sulikowsky
        - Juvenile sampling etc. target certain areas/ geographic specific for ASN (time and effort to work out where areas are).
        - Suitable spawning habitat below Cataract

The discussion then departed from a river by river assessment of information and data sources and instead focused on general data gaps. Those data gaps are captured below.

- Salinity tolerance of SNS
- ELS Sampling
    - Difficulty sampling ELS
    - Takes are limited under section 10 permit so makes sampling difficult –constraining sampling abilities at least for SNS (more realistic aspect to take quantities).

    - Difficulty sampling for ASN eggs due to riverine conditions (high volume of shipping going on in river etc.).
- Juvenile Sampling
    - Need to know how defining juvenile
    - Benthic habitat mapping data needed/ if available
    - YOY collection of both species difficult because dispersed unless know where certain aggregations may be. May be able to use tagged fish to try and target where areas might be.
    - How are areas targeted?
        - Prey areas
        - Area specific variables dictate where fish are encountered
        - Similar methods as above used to target trawling effort (K. Dutton)
- Coastal movement (much of the discussion focused on coastal movement data from GOM)
    - Due to habitat preference?
    - What about rivers where they are stopping between Penobscot and Kennebec? SNS seem to be looking for habitat during this movement.
    - Movement documented between the Merrimack-Saco
    - Maybe SNS coastal movement is more a natural thing than originally thought. More telemetry has been able to document movement, may see more and more due to technology.
        - Important to know salinity tolerance at specific developmental stage
            - Stable isotope analysis to look at salinity tolerance.
        - Can fin clips be taken off very small fish? Yes.
        - Effective versus physical movement needs to be understood
    - Coastal areas difficult to put array, may be area for improvement
        - Possible to put array more offshore?
    - Are fish hugging coast? What depths are we seeing these fish at?
        - Some fish do not necessarily hug the coast, though most prefer to if conditions allow (K. Wark)
        - Data source on depth of ASN (Fox and Breece) (44% within 5km of shore in fall; 90% within 5 km of shore)
        - Data source on depth in relation to shore of ASN (K. Dutton) (90% stay within 15-20 m documented)
        - Data source on depth variation in Minus Basin (Stokesbury)
        - Data source for depth info in Delaware Bay (Pickitch, Fisher)
- Geo-location Data
    - Satellite tags may be a great option for geo-location data
        - Depth data available from satellite tags in Hudson River (Pickitch)
        - Light levels may help depict really good picture of depth/ location etc.
        - Tag retrieval may get more data
        - Satellite tags don't need receivers to obtain data
        - Confidence Intervals (CI) may be very large? Shallow waters smaller CI, deeper may be larger?
            - Not big ellipse with depth, but may not know exact location.
        - Acoustic and satellite tags together may be used to reduce light bias with sat. tags. May work well for sturgeon.
    - Lotek geolocation tag in development (Sulikowsky)
        - Collect geolocation data and dump into receiver

        - Will it only work with Lotek receivers?
- What is known about impacts (e.g., dams etc.) and how they may be limiting habitat (e.g., spawning) in certain rivers?
    - Information is limiting factor
    - May not be enough freshwater run off in some river systems
    - Saint John population of SNS originally had spawning habitat above the dam
- Genetics and Telemetry data
    - Data source (King and Wirgin)
    - Need better linkage between genetics and telemetry data
    - Value in partnering genetics and telemetry data to look at spatial and temporal scale
    - NY section 6 grant will be examining these relationships more (K. Dutton)
    - Observer collection of fin clips is essential. However, data is needed along with the clip and currently observers may not be collecting that data, so it is worth revisiting.
        - Could more samples be obtained from fishing vessels taking into consideration various permitting processes (ESA, Magnuson etc., state waters vs. fed.)?
    - ASMFC – development of protocols for Observers, may be useful to obtain
    - SNS – does observer program have a permit to take samples?
- Unique riverine habitat characteristics?
    - GOM – some evidence of SNS and ASN overwintering. Majority of ASN leave system though and go south
        - ASN - GOM component in N. Carolina tagging cruise (Wirgin, King )
    - ASN overwintering seems to vary
        - Lower NY harbor
        - James
        - GA
    - CAN – Litvak work on SNS overwintering
    - Seal predation on SNS documented in GOM, any other rivers?
    - Flow data for nursery areas available in the Delaware (Fisher)
    - Would be good to get flow info on fish location

**Research Questions**

- ELS sampling
    - Could a study be conducted to try and estimate level of mortality when sampling ELS to inform permitting take estimates? Use hatchery fish?
    - Is there a way to approach sampling differently, work with ACOE etc. to allow for sampling in dangerous areas?
- Juvenile Sampling
    - How is juvenile life stage defined for ASN and SNS?
- Coastal movement
    - Due to habitat preference?
    - Can coastal arrays be expanded to more offshore areas?
- What is known about impacts (e.g., dams etc.) and how they may be limiting habitat (e.g., spawning) in certain rivers?
- What flow data do we have for specific rivers?

**Action Items**

- ELS sampling
    - Better agency coordination needed to allow for sampling in dangerous areas, areas that are difficult to access, or simply to maximize research efforts.
- Juvenile Sampling
    - Pursue sources of Benthic habitat mapping data
- Coastal Movement
    - Pursue data on salinity tolerances at certain life stages
    - Investigate feasibility of satellite tags that can be used to collect geo-location data
- Observer program
    - Need to investigate data collection methods and protocols
    - Need to investigate permitting with respect to SNS