Riverine and Ocean Movement of Atlantic Sturgeon

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Saint John River

Adults

- Deployed 44 ultrasonic (Vemco V16; V16P; V16TP) and 14 pop-up satellite archival tags (Wildlife Computers MK-10; MiniPAT) in 2010-2012.
- Adult Atlantic sturgeon were found primarily in Long Reach, with some fish exhibiting upstream migrations to potential spawning areas (Figure 1).
- Larval sampling was conducted using D-frame and bongo nets in potential spawning areas.
  - 5 Atlantic sturgeon larvae were captured on July 23, 2011 at RKM 106 (Figure 1).

Figure 1: Large scale movement of Atlantic sturgeon adults throughout the summer 2010-2012. Red box in July panel indicates location of larval captures at RKM 106.

Juveniles

- Eight juvenile Atlantic sturgeon were tagged with Vemco ultrasonic tags (V13P, V16P) in 2013.
- Small juveniles (57-62cm FL) were distributed throughout the river; Large juveniles (73-103cm FL) were found primarily in Long Reach.
- Stable isotope analysis was conducted on blood samples collected from juvenile Atlantic and adult shortnose sturgeon.
  - Similar levels of δ13C and δ15N indicate both species were foraging in fresh water, at similar trophic levels (Figure 2).

Figure 2: Comparison of mean blood plasma and red blood cell δ13C and δ15N between juvenile Atlantic and adult shortnose sturgeon. Error bars represent ±1 SEM.
Coastal Movement and Over-Winter Aggregation Area

Movement and habitat

- Tagged sturgeon have been detected in the Minas Basin, Minas Passage, Musquash Harbour, Halifax, and south-east Newfoundland.
- Extensive migrations of >1500 km were observed at rates of 44 km/day.
- Sturgeon occupied deep areas from October-March, and shallow, inshore areas from April-September (Figure 4, 5).

Over-winter

- All PSATs released in small area near the Saint John Harbour Feb-Apr (Figure 5).
  - Collaborated with Kyoko Ohashi and Jinyu Sheng (Dal) to use backward particle-tracking to determine initial release location of tags.
- Very little movement was observed through the winter.
  - Occasional surfacing occurred.

Collaborations

Novel techniques

- Collaboration using high-frequency tri-axial accelerometers developed by Franzisca Broell and Chris Taggart (Dal); Shortnose sturgeon angled by fishers at the Lions Club sturgeon derby.
- Developed an attachment technique for PSAT (Desert Star SeaTag) equipped with an ultrasonic tag (Vemco V9) and an accelerometer (50Hz) (Figure 6).
- First field study conducted using high-frequency accelerometers.

Social science and community

- Atlantic region collaboration between sturgeon PI’s, HQP’s and social scientists (VanderZwaag, Apostle (Dal)).
- Annual Lions club sturgeon derby to collaborate with local fishers to aid tagging program and educate the public (Figure 6).

Maritime expansion

- Collaboration on the Miramichi River with the North Shore Micmac District Council’s Aboriginal Aquatic Resources and Oceans Management group.
- Collaboration with local commercial fishers and Fort Folly First Nation on the Petitcodiac River.

Figure 4: Mean depth of 9 of 11 recovered PSATs.

Figure 5: PSAT release locations in the Bay of Fundy.

Figure 6: (A) Franzisca Broell with tagged shortnose sturgeon prior to release and Andrew Taylor with recovered tag. (B) Participants at the Lions Club sturgeon derby. (C) Depiction of Metepenagiag First Nation sturgeon fishing with torches ("saksegwa": Mi’kmaw) and harpoon on the Miramichi River, NB. Painting by Roger Simon.