Population Assessment of Green Sturgeon in the Sacramento River

U.S. Army Engineer Sacramento District

US Army Corps of Engineers®

Telemetry

Approach
- Green and white adult sturgeon tagged with ultrasonic beacons (life span = 10 years) during in- and out-migrations
- Fish movements tracked by an array of >300 receivers in the Sacramento/San Joaquin watershed
- Fin ray, blood and egg samples collected for population genetics data

Outcome:
- Chronology of migrations
- Percentage of adults migrating upriver to spawn

Investigators: U.C. Davis, Dr. Pete Klimley and Melia Nafus

Figure 1

Figure 2

Figure 3

Endoscopic photographs of immature (Fig. 1), developing (Fig. 2), and mature sturgeon eggs (Fig. 3).

Videography

Approach
- Acoustic and optical imagery (using DIDSON and video cameras) of sturgeon aggregations at/near spawning grounds
- Replicated transects and habitat descriptions (Data collected include; unit depth, width, length, bank steepness, percent riparian cover and riparian vegetation type.)

Outcome:
- Identification of high value habitat areas in upper reaches
- Relative number and size structure of green and white sturgeon populations

Investigators: U.C. Davis, Dr. Pete Klimley and Ethan Mora

Green Sturgeon (Adult and Juvenile)

White Sturgeon (Adult and Juvenile)

Sturgeon illustrations provided by U.C. Davis

Demography

Approach
- Pectoral fin ray samples sectioned and mounted
- Annular rings counted to determine age

Outcome:
- Size and age structure of population
- Growth and mortality rates determined

Investigators: U.S. Army Engineer Research and Development Center

Pectoral fin ray of a 12-year old sturgeon showing annular rings

Alternatives

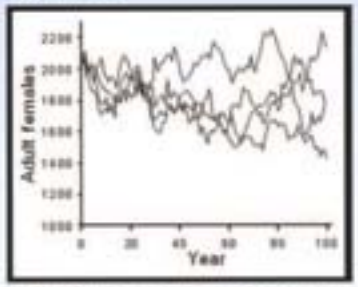
Approach
- Habitat restoration and bank stabilization
- Monitoring and evaluation studies

Outcome:
- Location and extent of project alternatives
- Structure and persistence of restoration and stabilization projects
- Effects on sturgeon populations

Investigators: U.S. Army Engineer Sacramento District

Goal: Population Viability

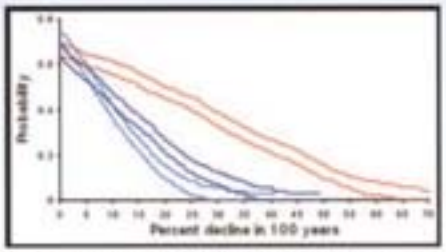
Approach
- Compilation of life history data
- Simulation of population dynamics



Monte Carlo simulation exhibiting varying probabilities of a distribution of outcomes based on variability in green sturgeon survival and/or fecundity

Outcome:
- Population size and persistence of green sturgeon over 100 year period
- Risk assessment based on stochastic variation in life history and changes in habitat
- Adaptive management strategies for conservation and recovery of green sturgeon population

Investigators: Applied Biomathemetics, Inc., U.S. Army Engineer Research and Development Center



Differences in variation predicting viability of green sturgeon decline over 100 years

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