Gulf Sturgeon Surgery Protocol

August 2010

The following protocol was developed at a workshop conducted June 2-3, 2010 at the Panama City FWS Lab by Gulf sturgeon researchers. Special thanks to Mr. Jerre Mohler of FWS for leading the workshop. Dr. Dewayne Fox, Mr. Frank Parauka and Ms. Kate Fleming provided essential information and assistance during the workshop. This protocol was developed to assist Gulf sturgeon researchers in using the best standard practices when deploying tags in Gulf sturgeon and relied on information provided in Fox et al. 2001. Brand names were provided by the researchers to assist others; neither USFWS or NMFS endorses any particular vendor or brand.

This protocol should be cited as: NMFS and USFWS. 2010. Gulf sturgeon surgery protocol. 4pp.

Morphometrics

Captured fish are to be measured (both total length and fork length) to the nearest 1 mm and weighed to the nearest 0.5 kg. Fish are then placed into anesthetic bath made up of bay water and MS-222 or tricainemethane sulfonate (trade name: "Finquel"® by Argent Chemical Laboratories, Redmond, Washington);

Anesthesia

The concentration of MS-222 suggested for surgical implantation of transmitters should be sufficient to anesthetize the fish and eliminate any observable response during the procedure while allowing for rapid post-operative recovery; thereby, minimizing holding time. For surgical implantation of internal tags and procedures requiring similar incisions, sutures, and holding time, a simple anesthetic bath containing ambient water and MS-222 at 50-100 mg/L is recommended (Harms and Bakal 1994, and used on Gulf sturgeon by Fox et al. 2000). It is advisable to check the pH of the anesthesia bath and adjust as necessary with sodium bicarbonate since MS-222 is a hydrochloride, and can acidify water when used in freshwater settings.

Reproductive Status

Gender and reproductive status of individual fish (Huff 1975; Chapman et al. 1996) may be determined via incision made using a surgical scalpel on the mid ventral line about 40–60 mm anterior to the insertion of the pelvic fins. Upon reaching the peritoneum, a retractor can then be placed into the surgical area to spread the musculature and enable a clear view of the area. Gonadal tissue was located with use of a blunt probe. External appearance of the gonad can then be noted and a biopsy (1 cm3 fragment) taken using surgical forceps and a scalpel. Samples should be preserved in a vial containing buffered 10% formalin for histological analysis.

Reproductive stage can then e determined by staining gonadal tissue with hematoxylin and eosin, sectioning (3m) samples and mounting sections on a glass slide to examine using light microscopy. Fish can be classified as either immature, maturing, or ripe (Chapman). According to this classification scheme, maturing fish had spawned in a previous year and were between spawning events at the time of collection

Tags and Receivers

1. Transmitters - VEMCO V-16 6H tags will be used programmed at a 90 second intervals so that tags should last 6.4 years.
2. Receivers - VEMCO VR2W receivers will be used.
3. PIT tags and Readers:
    a. PIT tags – we will standardize to 134.2 kHz tags (12.5 mm x 2.07mm). All fish handled will be re-tagged with a new 134.2 PIT tag. PIT tags will be placed in the soft tissue at the base of the dorsal fin on either side of fish.
    b. A Power Tracker V or VIII will be standard reader.
4. T-bar tags will be placed in the pectoral fins. Each researcher will utilize their own tags with telephone numbers. Tag color and full number (including leading zeros) will be indicated on data sheet. T-Bar tags will be replaced as they are sloughed off or become fouled. It is suggested that the tag number appear twice on each t-bar tag (distal and proximal) in case part of tag becomes broken off.

Surgery

A. Supplies:

1. Tray for tools – use 70% EtOH to sterilize tools, tags and transmitters.
2. Vials for fin clips (ethanol)/gonad samples (10% formalin)
3. Sutures – Ethicon PDS II suture material CP1 -Chromic Gut, with cutting needle instead of tapered. Beware: suture material expires and disintegrates over time.
4. OTC – inject at 20mg/kg of body weight to mark hard parts.
5. Transmitters may be coated with polymer to make them biologically inert. Recommend MDX4-4210, Medical grade elastomer from Dow Corning http://www.factor2.com/MDX4_4210_Replacement_p/a-103.htm
6. Floy Tags

7. PIT tags

8. Tools:

    a. Forceps

    b. Hemostats

    c. Scissors

    d. Scalpels

    e. Blades for scalpels

    f. Egg scooper

    g. PIT tag applicator

    h. FLOY gun

9. Other supplies:

    a. Towel

    b. Syringes/needles

    c. Latex gloves

    d. Betadine/Vaseline mix for topic antibiotic

    e. MS22

    f. Measuring tape and scale

    g. Clipboard/datasheets

    h. Pencils

B. Procedure:

Surgical implantation of transmitters should be conducted using sterilized transmitters and equipment to help minimize post operative infection rates (Mohler 2004).

Lay fish ventral side up on the sling in the anesthetic/surgery box. Allow appropriate time for anesthetic to work. Using the scapel make an incision about 3-5 scutes forward of the pelvic fins. Carefully cut through into the body cavity and elongate incision to accommodate transmitter. A retractor can be used to open the incision to examine internal organs. Insert the sterilized transmitters and close the incision using sterile resorbtive suture material. To ensure

proper closure, a single interrupted suturing technique about 1 cm apart should be used with each suture individually tied.

Apply a thin layer of petroleum jelly mixed with topical Betadine over the incision areas to protect against infection. A mixture of betadine + petroleum jelly will increase longevity of application. The intent of the betadine ointment is to coat the sutures until the fish's mucous has a chance to coat them (Robert Bakal, U.S. FWS, pers. comm.). The betadine has antibacterial properties but also antifungal properties, which may be even more important (Robert Bakal, U.S. FWS, pers. comm.).

Allow the fish to recover before release.