**DUNGENESS SONAR PROJECT**

**Objectives**

* Estimate adult steelhead escapement in the Dungeness River
* Characterize adult steelhead migration timing and fish size distribution

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**Technician SONAR duties**

**Operate stationary SONAR unit, and review and manage SONAR imagery data.**

* Operate, maintain, clean, and adjust settings for stationary SONAR unit.
* Ensure imagery data is properly downloading to external hard-dives; keep data hard drives organized and inventoried.
* Review SONAR imagery data daily and enumerate, measure, and record fish. Enter data into spreadsheet, and edit and proof SONAR data as necessary.
* On jointly scheduled work day review weekly data with other technician, and complete any needed sonar maintenance, cleaning, or adjustments together.

**Daily SONAR inspection**

1. Check that sonar imagery is recording
   1. Ensure computer is ON and running, and sonar is connected and recording.
   2. Ensure one day’s worth of recorded imagery files were created since the previous day, and check that the file size is <65GB, if too big adjust the image capture settings.
   3. Ensure file naming convention is correct- see *Record* instructions below.
   4. Ensure the files are being saved to the external hard-drive (F drive) not the laptop itself.
   5. Check space on external hard-drive and determine if need to switch it out.
   6. Check real-time imagery for clarity and adjust as needed- see *Adjust* instructions below.
   7. Refer to ARISScope manual for trouble-shooting.
2. Check water level to ensure sonar plate is just below surface of the water and ADJUST IF NECESSARY. Update recording sequence settings on computer if you make adjustments.
3. Clear debris from upstream t-posts and downstream deflection weir.
4. Check large diameter vertical pole to ensure it is stable and not quivering.
5. Check hex screws attaching sonar to plate to ensure they are secure.
6. Check silt plugs to ensure they are secure.
7. Check cleanliness of sonar and determine if need to remove unit and clean. Unit should be cleaned approximately once per month. Clean on jointly scheduled work day with other technician- see *Cleaning* instructions below.
8. Walk length of black ARIS cable; inspect for damage or fallen branches.

**To Record SONAR imagery**

1. Open Settings(gear icon located in upper right of ARISScope screen)

*Sonar Connection*:

-*Automatically connect to available sonar* should be checked

*Sonar File Storage Path*:

-set storage path to the external hard-drive (F drive).

*-Use Sub-folders* box should be checked

*Sonar File Naming Convention*:

*-Base Name*: ARIS

-the *yyyy-mm-dd* box should be checked.

*-Sequence Identifier Style*: select hhmmss.

*Global Application Settings:*

-*Enable smoothing* should be checked

-*Show range labels* should be checked

*Advanced Recording Options*

Click *Manage Timer Recording*

*Timing*

*-Mode:* set to continuous

*-Duration:* 30

1. Sonar Control button

*Frequency:* Auto is default

*Transmit:*  Max is default, should not need to change

*Pulse:* Auto is default, should not need to change

*Frame Rate:* Max is default, Max box should be checked

*Gain:* Max is default

*Detail:*  Auto should be checked. Otherwise if the Range is adjusted a new file will be automatically started, leading to many files being created over a short period.

Hit “*Get Settings from Sonar*”

Select appropriate job with settings above and hit “Activate All”

If you adjust the sonar settings make sure to reinitiate recording sequence and hit “Get settings from sonar” button. This is very important to ensure that the sonar records the current settings.

**To Adjust SONAR**

1. Metal plate with sonar should be just below the water surface. Adjust as needed by manually rotating the handle on the mount, and/or adjusting the pitch using ARIS Scope controls on the laptop.
2. Visual imagery on computer:
   1. Want to see the river bottom across entire width of channel
   2. Adjust position of sonar using ladder controls (manual or in ARIS Scope) to achieve this
   3. *Pitch:* should be 3.5 to -8 degrees
   4. *Focus:* should be ½ channel width. Set focus by double-clicking in visual image on laptop.
   5. if the image isn’t sharp you can also try to adjust this by adjusting the *Gain* and/or *Detail*
      1. *Gain:* default = max. If image is too bright you can reduce the Gain
      2. *Detail:* default = auto box checked. If increase Detail will increase the samples/beam, which will increase the frame size and file size. Be careful not to increase Detail by too much.
      3. Refer to ARIS Scope user guide for trouble-shooting and more detail on settings
3. Record any adjustments to sonar/ladder in Rite in the Rain notebook, including sonar removal or re-installation, moving the ladder or adjusting the ladder mount or pitch. Record when you switch out hard-drives.
4. If you adjust the sonar make sure to reinitiate recording sequence and hit “Get settings from sonar” button. This is very important to ensure that the sonar records the current settings.

**To Clean SONAR**

1. Sonar should be cleaned approximately once per month or as needed
2. Clean on jointly scheduled work day with other technician
3. Locate large black pelican case (in trailer) which has ARIS Explorer manual with instructions and tools for cleaning sonar.
4. Items needed for cleaning:
   1. ARIS Explorer Getting Started manual
   2. Small black pelican case, which has the tools for disassembling the sonar.
   3. Stiff bristled brush and DAWN for cleaning outside of sonar
   4. Soft cloth for cleaning inside of sonar
   5. Ziplock bag to hold hex screws
5. Stop recording data on the laptop before removing sonar unit for cleaning.
6. Maintenance instructions are on pages 27-32 in the Getting Started manual.
7. Working together, carefully detach the sonar unit from the ladder mount for cleaning
8. Take the sonar over to a shallow spot on the bank, remove the silt plugs, and use the stiff bristled brush and Dawn to scrub the outside of the sonar
9. Disassemble the sonar following the instructions in the manual and clean the inside carefully with the soft cloth
10. Reassemble sonar, including reinstalling the silt plugs, remount sonar on ladder, and restart recording on laptop