FISH LIFE HISTORY ANALYSIS PROJECT

SCALE COLLECTION PROCEDURES

November 2025

Pre Collection & Data Management

A critical aspect in the process of collecting, analyzing and reporting data from fish scales is the management of the data associated with the scale samples. For example, information on drainage **basin, location, survey date, fin-clip status, Snout ID, survey type (e.g., creel, hatchery collection, spawning ground, seine, trap, etc.), and fish length (units; MEPS, FL, or TL – Appendix 1) is essential**. Many projects have established data collection procedures that usually include all this information along with the fish scale samples.

Because data management is critical, it is imperative that protocols be in place for data collection before the scale samples are collected. The protocols must include a method to keep data for each fish sampled clearly associated with its scales, from collection in the field through scale analyses and data dissemination.

- Assign a **Scale ID Number** to each sample prior to OR at the time of scale collection. The Scale ID Number should be written on the scale sample envelope and be included in any field data collected at the time the scale is taken.

- Data for each scale sample includes associated location and biological data. **Follow the protocol of your project (Examples: Appendix 2).**

- **Follow Fish Life History Analysis Project (FLHAP) protocol for scale collection (below)**

Scale Collection

Scale collection is often done in less-than-ideal field conditions. Most salmon species are returning to the river during cold and wet weather. Even with difficult conditions, the FLHAP is better able to serve the needs of the project providing the scales if care is taken in collecting scales.

- The "key area," or anatomical location for cool water fish, like salmonids, is based upon where scales first generate during development (Figure 1).

- The correct 5-step procedure for obtaining scale samples is as follows:

1. **Locate key area (Figure 1).**
2. **Scrape slime off with non-serrated portion of knife.**
3. **Pluck 4-5 scales with forceps and place in between the fold of the paper insert in the scale envelope, using care to not stack scales (Appendix 3).**
4. **Repeat on other side of fish.**

5. **Allow scale envelopes to dry and keep them organized in a well-ventilated container**.

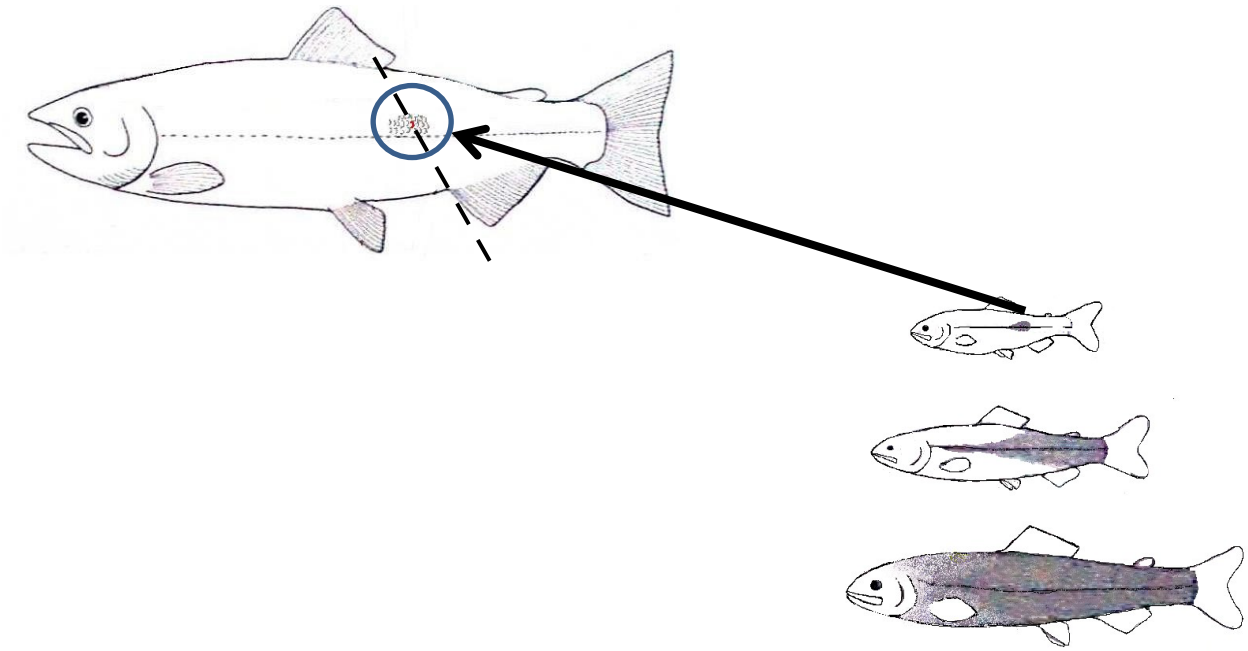


Figure 1. The key area is where scales form first on juvenile fish. These scales contain the most complete life history information. The key area is located above the lateral line, on a trajectory transcribed by an imaginary line passing between the posterior insertion of the dorsal fin and the anterior insertion of the anal fin.

Variations:

- **If scales are absent from the key area on one side of the fish, sample twice as many scales from the key area on the other side of the fish.**

- **<u>Live fish</u>: If live fish are to be sampled, and then potentially re-sampled later, only pluck scales from one side, so that key area scales will be available if the fish is re-encountered.**

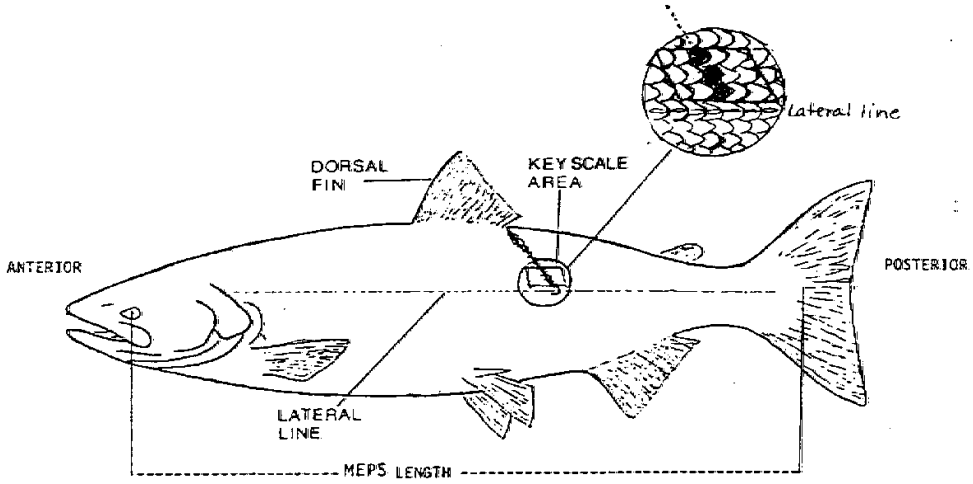
- **<u>Steelhead and cutthroat</u>: Tend to have high scale regeneration rates (i.e. lose and regenerate scales frequently), so a few more scales should be taken to ensure we get quality scales.**

- **<u>Warm water fish</u>: Key area is just under the distal tip of the pectoral fin.**

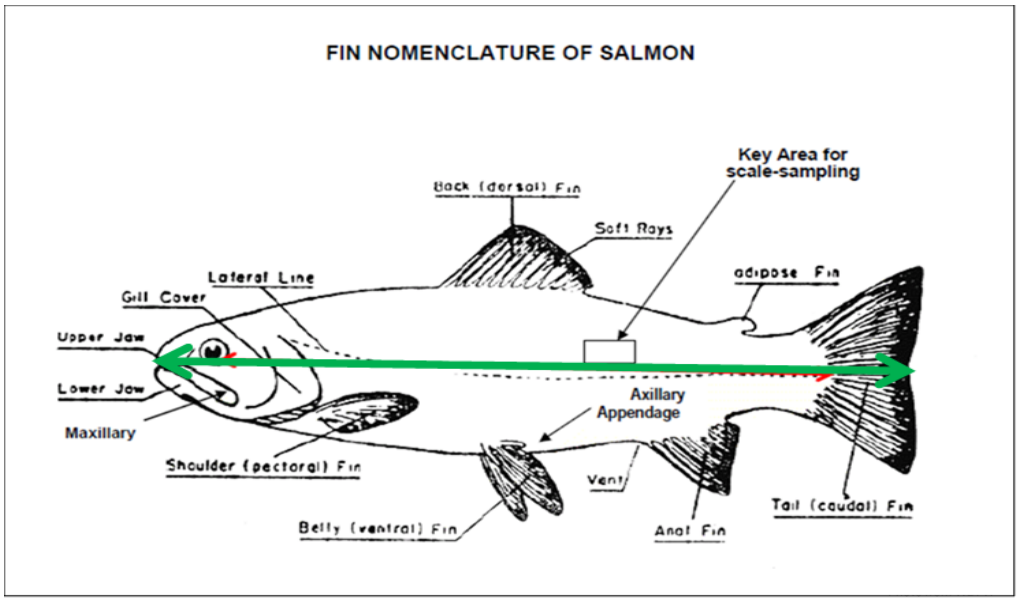
- Make sure that the biological data associated with the fish scales is clearly written down on the scale envelope and on data sheets or entered in a data device. There must be a scale ID # written on the envelope and contained in the data that is collected for the scale sample (Appendix 2).
- Scale samples are most easily processed by the FLHAP if there is a scale ID # and an electronic data file.
- Allow scale envelopes to dry and store them in a well-ventilated container.
    - Scale envelopes will develop mold and mildew if stored in closed containers.

APPENDIX 1

MEPS: Mid-eye to posterior scale
Fork length (FL) – Tip of snout to V-notch in fork of tail
Total length (TL) – Tip of snout to end of longest tail fin lobe



MEPS Length



Fork Length

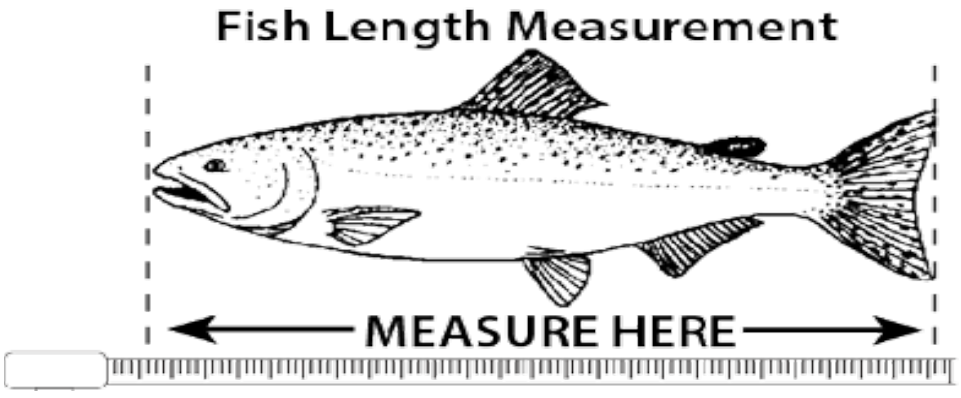
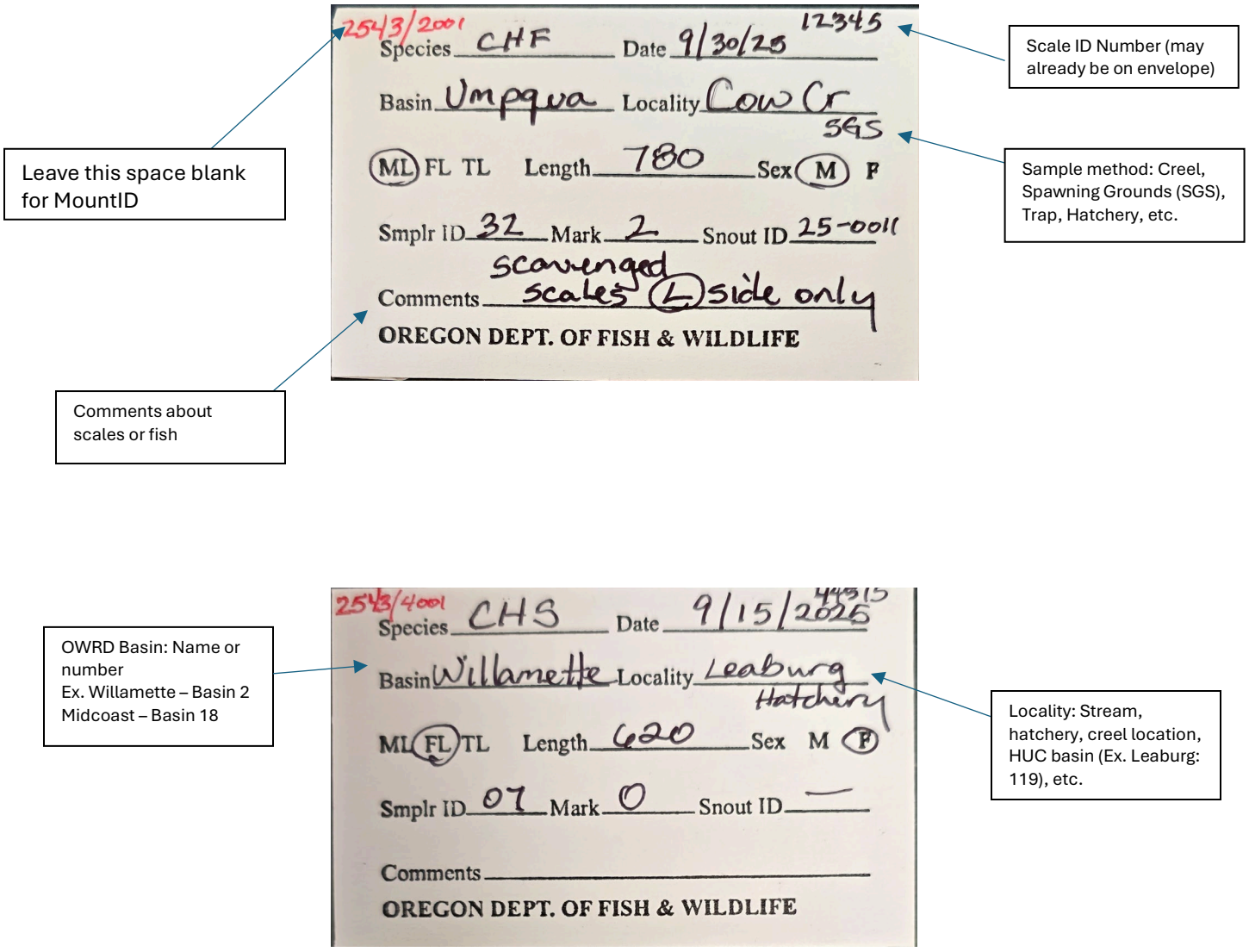


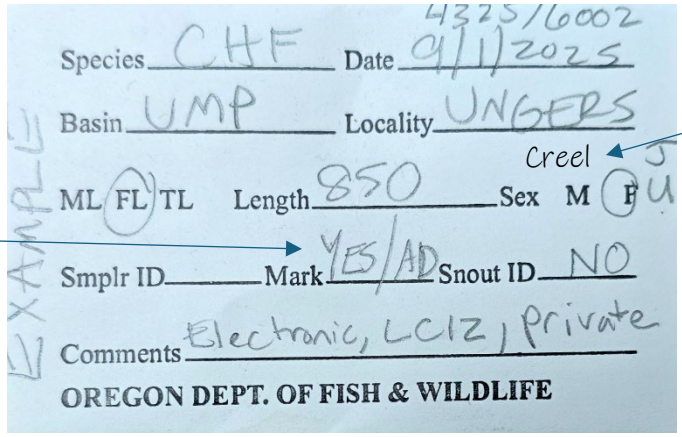
Photo from WDFW

Total Length

APPENDIX 2

Scale Card Examples (not actual data)

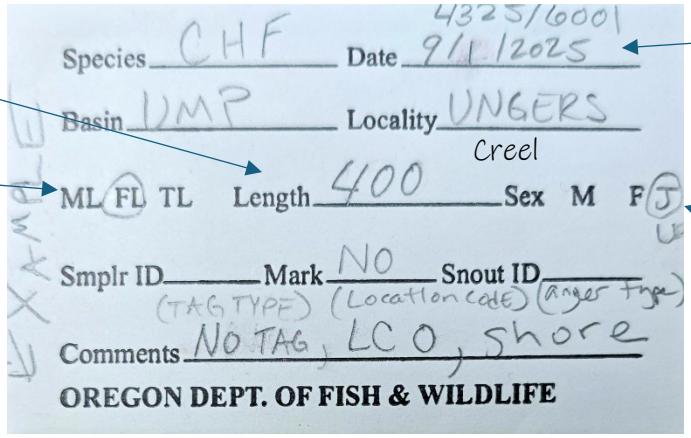




Sample method: Creel, Spawning Grounds (SGS), Trap, Hatchery, etc.

Enter Y/N/AD/LV, etc. For clip status codes refer to project manuals

Comments about scales or fish



Length In MM (millimeters)

Length: MEPS, FL, TL See Appendix 1

Date, including year

Add in J for jacks, U for unknown.

APPENDIX 3

Scale images

Figure 2: Properly placed scales

Figure 3: Scrape and Smear results

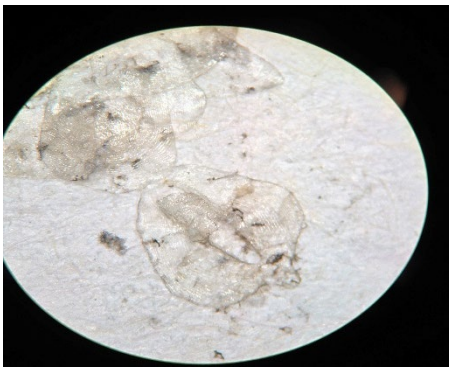


Figure 4: Lateral line (magnified)