Fisheries Aide Intern with the
Monterey Peninsula Water Management District

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California State University Monterey Bay
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Executive Summary

I served as a fisheries aide intern for the Monterey Peninsula Water Management District from June 2nd 2012 to August 13th 2012. As a Fisheries Aide Intern I assisted in the capture, aquaculture, treatment, and rearing of endangered Steelhead Trout, *Oncorhynchus mykiss*, on the Carmel River (See Appendix: Figures 1, 2, and 3). I learned the processes of catching steelhead trout using seining nets and backpack shocker-dip net methods (See Appendix: Figure 9). Using the both methods six to seven thousand Steelhead were successfully captured. At the Sleepy Hollow Steelhead Rearing Facility I learned the techniques of aquaculture, treating, and fish rearing utilizing a series of quarantine tanks (See Appendix: Figure 10), rearing troughs (See Appendix: Figure 11), and a holding channel (See Appendix: Figures 12 and 13), including approaches to keep the fish, tanks, and the channel hygienic and clean to lower trout mortality rates. The methods I learned and skills I used are used to keep fish mortality low and the chance for the Steelhead to return to the river and ocean high.

Project Objectives

As a Fisheries Aide Intern I worked with a fish rescue team to capture steelhead trout on the Carmel River and relocate them to the Sleepy Hallow rearing facility. At the Sleepy Hallow rearing facility I assisted in steelhead trout tank cleanings, size separation, habitat engineering, feedings, and bacterial and fungal treatments and management. The experience I have gained from working with the Monterey Peninsula Water Management District as a Fisheries Aide Intern has allowed me the capability of attaining careers in the USDA with the United States Forestry Service as a fish biologist, fish and wildlife biologist, fisheries caretaker, fisheries technician in biological sciences, ecologist, and park ranger; all are career paths that I am highly interested in and working towards achieving one.

The goals of the Fisheries Aide Intern were to rescue as many steelhead trout with the available rescue techniques before reaches of the Carmel River either dried up, or before water quality became too poor for steelhead trout to survive and relocate rescued steelhead trout to the Sleepy
Hollow rearing facility. The steelhead trout are raised at the Sleepy Hollow Steelhead Rearing Facility until they can be released back into the Carmel River, where they will make their journey down the river to the Pacific Ocean.

At the Sleepy Hollow Steelhead Rearing Facility the goals were to process newly captured fish to eliminate disease and fungi, move fish to either rearing troughs or the channel based on size, clean and maintain a standard of cleanliness in the channel, quarantine tanks, and rearing troughs, and to administer different types of disinfectants or antibiotics based on any bacterial or fungal breakouts.

**Project Approach**

Fish rescue and capture was achieved using the two methods of seining nets and the backpack electro-fisher. Fish rescues are done along multiple reaches of the Carmel River at least three times a season or more if water quality allows. The seining net method was used in large pools with a depth of three to four feet. Seining involved two nets, a smaller white net used to chase fish to a larger black net with a deep pocket (See Appendix: Figure 5). The white is walked in to the black net while the two people holding the ends of the black net circle around to meet their ends and close the net to prevent any fish from escaping the net; the two people dragging the white net step over the sides of the black net removing the white net from the ring. After the white net has been removed the black net is pulled ashore (See Appendix: Figure 6) and fish are pulled out of the pocket from the front to the back (See Appendix: Figure 7). All animals in the net are separated; steelhead trout are placed in a five gallon bucket and counted while other aquatic life such as sculpins, sticklebacks, hitches, water bugs, mud, and aquatic plants and residues are replaced back into the river.

The backpack electrofishing method involves an operator for the electrofishing backpack (See Appendix: Figure 8), two fish netters equipped with a dip net each, a bucket holder, and a fish counter. The electrofishing backpack is used in riffles, shallow water areas, and along the shore with rocks and debris that create holes that the trout like to hid in. The electrofishing backpack operator has two electrodes: the wand used as the cathode that draws fish in and stuns them, and the rat tail used as the anode to release electrical output. The two netters are responsible for netting incoming trout, stunned trout, or trout that are caught on the wand; netters then separate trout into the five gallon bucket and all other caught things back to the river. The bucket holder confirms the numbers of fish with the netters as fish are put in to the bucket and relays that information to the counter.

With both methods it is the bucket holder’s responsibility to make sure that the buckets are filled with sufficient water, that the water has enough cover to shade and prevent the trout from jumping out, that the water aerators are working, and to take the bucket to the transport tanks on the truck when the buckets are full of fish (See Appendix: Figure 4). When the rescue portion of the day is completed the truck with the transport tanks is driven to the Sleepy Hallow rearing
facility where the trout are separated into batches of young of the year and one year plus and relocated into the designated quarantine tanks.

At the Sleepy Hollow Steelhead Rearing Facility aquaculture and rearing are achieved through cleaning, treatments, feedings, steelhead separation based on size, habitat building, and facility maintenance. Channel, rearing trough, and quarantine tank cleanings are performed daily. Channel cleanings consist of removing leaves, sticks, food residue, foam, algae, dead trout, and other dead animals from the separation screens between each channel bay. The rearing troughs and quarantine tanks have fecal matter, uneaten food, and dead fish removed as well as the walls of each trough being scrubbed. Tanks are treated with either a diluted salt treatment or antibiotics to kill off any contagions caused by bacteria or fungi when some trout show signs of an infection; treatments are administered to prevent breakouts and mass die offs. Feedings are performed multiple times in a day where the smallest fish are fed krill, the largest are first given pellets then krill. The channel bays with trout in them also have timed feeders that are loaded with pellets to give gradual amounts of food throughout the day. Steelhead separation initially starts in the quarantine tanks where fish are moved directly into the channel if they are large enough or to the rearing troughs if they are too small; the fish in the rearing troughs are then separated every few days to move the fish that are large enough to the channel. Habitat creation is performed before fish are placed into a channel bay; habitat creation involves making water breaks for trout to hide in, placing branches and tree limbs into the channel, and placing rocks to mimic riffles and rock holes that the steelhead prefer to hideout in. Maintenance duties performed are collecting habitat rocks and branches for later use, tank and channel cleanings, rust prevention, deck sweepings, and steelhead food preparation.

**Project Outcomes**

The project and my responsibilities as a fisheries aide intern have been successful; through the course of my internship, the fish rescue crew I participated on worked up the Carmel River 6.7 river miles from the Carmel River Lagoon to Schulte Road Bridge. Working with the fish rescue crew we captured six thousand to seven thousand steelhead trout with a season low of just above forty fish and a season high of four hundred and twenty-two in a day. The rescued steelhead trout were classified in two classes of young of the year and one year plus; with sizes ranging from a quarter of an inch to sixteen inches in length; a majority of the rescued steelhead between two inches to five inches, and a range of weights up to three pounds for the heaviest steelhead rescued. Working fish rescues we caught as many steelhead trout as we saw or were physically able to get understanding that it is impossible to rescue all the trout because of their numbers, because of the lack of water, or water quality.

Success was seen with my duties at the Sleepy Hollow Steelhead Rearing Facility; I assisted in the treatment of any infected Steelhead, processing of Steelhead, and cleaning Steelhead housing areas with minimal steelhead trout mortality. The Sleepy Hollow Steelhead Rearing Facility has a high survival rate with at least ninety percent of all the trout surviving, to date with a typical
daily loss of one trout from two of the eight channel pools, and three to five dead trout removed from the troughs during the initial disinfectant treatment and as low as zero to three removed on successive treatments. Fish mortality has been heavily reduced by keeping pathogen treatments up, cleaning fish housing areas multiple times a day, and quickly removing any dead or infected trout from the tanks. The biggest lesson learned through my experience working with both the fish rescue team on the Carmel River and at the Sleepy Hollow Steelhead Rearing Facility is no matter how hard you try you cannot save all of the steelhead trout; you can save a vast majority of the trout or all the ones you see but there will still be steelhead that will not be saved.

Conclusions

With my time as a Fisheries Aide Intern with the Monterey Peninsula Water Management District I participated in and gained the knowledge of how to conduct fish rescues using the methods of seining and electrofishing, how to care for fish at a rearing facility, and accomplish the necessary tasks involved with prepping tanks and holding areas for endangered species. My USDA internship has furthered my career goals by teaching me how to work with and care for endangered and threatened animal species, how to work on a fish rescue crew, and how to work at and run a fish rearing facility; these skills will allow me to gain positions with the USDA as a fish biologist, a fisheries caretaker and technician, ranger, and ecologist.

Appendix

![Figure 1: Five gallon bucket containing young of the year steelhead trout.](image1)

![Figure 2: Five gallon bucket containing steelhead trout of one year plus.](image2)
Figure 3: Two trout, one young of the year and a one year plus shown side by side in a 12 inch net.

Figure 4: The transport truck showing the two 125 gallon holding tanks.

Figure 5: Fish rescue using the seining method; uses two people on either end to hold and pull the net.

Figure 6: Fish rescue using the seining method; pulling the seining net ashore before removing fish.

Figure 7: Fish rescue using the seining method; separating all aquatic life for steelhead trout rescue.

Figure 8: Backpack electro-fisher set up; the unit in gray, the electro-fisher wand in yellow, and the dip nets in white.
Figure 9: Backpack electro-fisher set up; showing the operator, dip netters, and bucket carrier with trout counter.

Figure 10: Sleepy Hollow Steelhead Rearing Facility; quarantine tanks.

Figure 11: Sleepy Hollow Steelhead Rearing Facility; rearing troughs.

Figure 12: Sleepy Hollow Steelhead Rearing Facility; holding channel, showing feeders and water breaks.

Figure 13: Sleepy Hollow Steelhead Rearing Facility; holding channel, showing habitat and pathogen treatment plumbing.