



# **Friends of Auburn Ravine**

**AuburnRavine.org**

## **A Guide to Salmon Surveys for Citizen Scientists who volunteer with Friends of Auburn Ravine**

### **“How to be a Salmon Survey Super Star!”**

This document will give you important info about the Salmon Surveys that we do along Auburn Ravine, and what you will be doing as a Salmon Survey Volunteer.

(Note: For brevity, we call these surveys “Salmon Surveys”, but we also look for Steelhead and Lamprey during these surveys.)

When we do the surveys, we try to get two types of information about the Salmon of Auburn Ravine:

1. The locations and quantities of live Salmon.
2. The locations and quantities of the nests that the Salmon dig into the gravel of the stream bed. (These nests are often called “redds”.)

We also try to get two bits of physical evidence from the Salmon:

1. A tissue sample for DNA analysis from any Salmon carcasses that we find.
2. The head from the carcass of any Salmon that is missing an adipose fin. (This will be explained below.)

Our permit from CDFW only allows us to collect physical evidence from dead Salmon, but if we see a dead Steelhead, we will get it out of the creek, measure it, take some photos, and return it to the creek. When we see Steelhead, or Lamprey whether living or dead, we will take note of the locations and quantities of them and their redds just as we do for Salmon.

### **Why We Do These Surveys (The Small Stream Strategy.)**

Auburn Ravine is one of many small streams that flow into the Sacramento River and once provided spawning grounds for thousands of Salmon and Steelhead every year. Luckily, some Salmon can still spawn in some of these streams, like Auburn Ravine, but in many of the other streams, Salmon cannot get upstream to spawn due to various impediments such as antiquated water diversion systems, and poorly designed culverts. And those same impediments to upstream migration are often dangerous to juvenile Salmon as they move downstream toward the ocean. Many irrigation pumps and canals are not screened to keep out baby Salmon, so they die before they even get to the Sacramento River.

Over the last hundred years, the damage to Salmon populations caused by the loss of these small stream spawning areas was dwarfed by the damage done by large dams on large rivers all up and down the valley. In total, those dams blocked Salmon from accessing hundreds of miles of excellent spawning areas. To try to compensate for the loss of spawning grounds, a few hatcheries were built below some of those dams. Those hatcheries have saved California Salmon from extinction, but they have also, over time, led to reduced vitality and reduced genetic diversity among the Salmon. This has been described as “unintended domestication” which is reducing the ability of Salmon to survive threats from climate change, and predators.

To counteract this “domestication” process, more natural spawning is needed. There are still some natural spawning areas below some of the big dams, but there is also a great potential to restore wild spawning in small creeks like Auburn Ravine.

Our “Small Streams Strategy” is to use Auburn Ravine as an example of how wild spawning can be re-established or increased in small streams at reasonable cost, and in reasonably short time frames while protecting or even improving the reliability of water delivery for agriculture, and other beneficial uses.

But to build a case for that, we need data.

What you do on these surveys will give us that data:

Now that the Hemphill Dam has been removed, how many Salmon are spawning below the location of the old dam, and how many are spawning above there?

Where are their preferred spawning areas?

Are some Salmon able to swim upstream all the way to the base of the Gold Hill Dam (six miles upstream from the site of the old Hemphill Dam) or are they all blocked by natural barriers below there.

If some Salmon are able to get to the base of Gold Hill Dam, how many get there and when?

And what percentage of adult Salmon each year in Auburn Ravine are the sons or daughters of Salmon that spawned in Auburn Ravine in previous years?

This is important because some community members and agencies tend to dismiss the value of Salmon in small creeks by saying “they are all strays”. By which they are suggesting that the Salmon that come up Auburn Ravine, or other small creeks, just made a mistake and came up Auburn Ravine when they really should have gone back to the river, creek, or hatchery where they were born.

With the DNA samples that you collect, we will be able to prove whether or not Auburn Ravine is supporting a full natural life cycle for Salmon – from egg to juvenile, and then to an adult returning to spawn years later.

If the data shows that we have a high rate of natural spawning success and returns of adults in subsequent years, we will be able to make a strong case to protect and enhance that process.

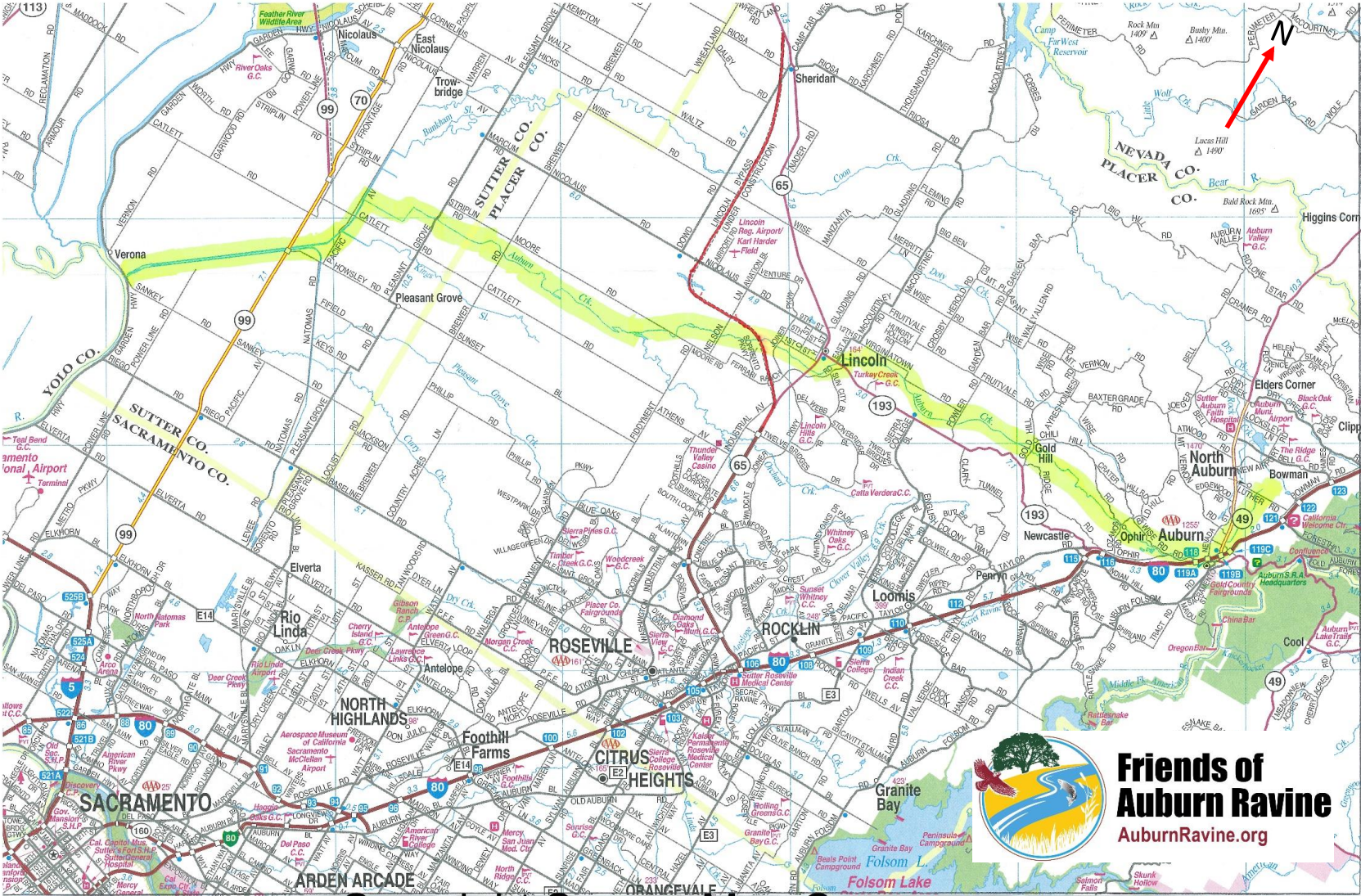
If the data shows that our adult Salmon are not the sons and daughters of Salmon that spawned here years before, that will prove that straying is a significant factor, but it will also prove that something is killing the baby Salmon before they get to the Sacramento River. That will give us a strong case to identify and mitigate whatever is killing the baby Salmon.

### **Auburn Ravine Overview**

Auburn Ravine flows from the foothills around the town of Auburn in a westerly direction down through Ophir, Newcastle, and Lincoln, and into the Sacramento River near Verona – a total of about 34 miles.

The map on the next page shows the course of Auburn Ravine highlighted in yellow:

Auburn Ravine (aka Auburn Creek) is highlighted in yellow on this AAA map of the area.



Copyright Seeger Map Company



Salmon can now access 4 times more spawning area than they have for decades.

For almost 100 years the dam was a major problem for the salmon that swim up Auburn Ravine to spawn every fall and winter. In wet years, on average, 7 to 10 percent were able to get over the dam to reach good spawning areas upstream. In years with less rain, none made it.



Hemphill Dam during a recent irrigation season (April 15 to October 15). After the upper steel and wood structure was removed in mid-October every year, it still blocked most fish that tried to get over it to the good spawning areas upstream.

The good news is that this dam has been removed. The site is now called the Hemphill Fish Passage Project. The salmon now have access to about eight miles of streambed. And they are using it!

The dam was replaced by a modern water diversion system that will allow fish like salmon, and steelhead to migrate upstream with ease while also allowing water delivery via the Hemphill Canal to continue as normal.



In this early-December photo, the old dam has been removed and replaced with a new "nature-like" system. The concrete walls of the canal intake can be seen in the distance just to the right of center. (Friends of Auburn Ravine Photo.)

The new system is called a Roughened Rock Ramp. It was installed in the streambed where the old dam used to be. It provides a gentle slope for the fish to swim up, and at its upper end it keeps the water high enough that water can still flow into the Hemphill Canal during irrigation season. A screen at the entrance to the canal will keep baby fish out of the canal so they can continue their trip down to the ocean. They will no longer die in the canal. To keep water flowing to customers along the Hemphill Canal, the screen is designed with mechanical wipers to keep itself free of leaves, sticks, other debris, and sediment that might clog it up.

The project was managed by Nevada Irrigation District (Headquartered in Nevada County, CA) and Westcon Construction of Newcastle, CA. They completed the project before the first big rains came in this fall. When the rains did come in, and the creek water rose, salmon began swimming up into Auburn Ravine from the Sacramento River. In early November, we started seeing them on the Salmon Cameras that we operate near downtown Lincoln.

To find out where those salmon went, our volunteers conducted wading/walking surveys along many sections of the creek. Based on those observations, we can say that the Hemphill Fish Passage Project is clearly a success!

Before the dam was removed no more than 10% of the salmon that tried to get past the dam succeeded. Now that the dam is gone, 80% of the fish are getting past the old dam site, significantly improving the likelihood of Salmon and Steelhead population growth!

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### **Safety of Volunteers (This means YOU!)**

The safety of all volunteers is **the most important aspect** of every survey.

**No project is so important or urgent that we cannot take time to proceed safely.**

If you encounter any unsafe situation on the bank or in the creek, do not press on ahead. Make a U-turn and seek a better, safer, path forward. It is OK to bypass a part of the creek if trying to survey it will be unsafe. When wading, if the water gets higher than the middle of your thigh, make a U-turn. If you go any deeper than that, you may not be able to keep your feet firmly planted on the streambed. Each volunteer will be given a walking stick. Having this third “leg” to steady you while wading, walking, or climbing up the bank is a big help. Each pair of volunteers should have one actual walking stick, and one extension pole that can also be used as a walking stick (more on extension poles below).



## Safety

**No project is so important or urgent that we cannot take time to proceed safely.**

Here are two plants to avoid:



**POISON OAK**

(May be red or red/yellow  
in the fall and winter.)



**STINGING NETTLE**

**Snakes:** Snakes should be dormant in the fall and winter, but may be hiding under rocks, brush, etc. Do not reach in where you cannot see.

**Wading:** Wading staffs will be provided. Use them. If the water gets up to the middle of your thigh, go back the way you came, and find a better route in the water or on the bank. If you find a salmon carcass in swift water, deep water, or other risky situation and cannot retrieve it with the frog gig, please note its location on your data sheet, take a photo if you can, leave the salmon where it is, and move on.

**Insect repellent:** Good brands are in the backpack. Check your clothes and body for ticks as soon as possible after the survey.

**Quicksand:** We have encountered some along the creek. If you sink in, sit down, or lay down so you will not sink in any further. Slowly extricate one of your boots at a time using a rocking motion. If you cannot get the boot(s) out of the sand, get your feet out of the boots, and leave the boots in the sand.

**First Aid:** Basic first aid kits are in the Collection Kits. Call 911 for any emergency.

**Safety with Sharp Stuff:** Always cut away from your body, and away from your free hand. Make sure that your partner is not standing or sitting in the direction that the knife is moving.

**Frog Gigs:** To pull carcasses out of snags, or deep water, carefully place the frog gig on the end of the extension pole, secure it with a bolt. The points of the gigs are sharp! Use the pole to slowly move the gig down into the water until it touches the side of the salmon and then give it a quick jab to sink the gig into the salmon. Then lift and pull the salmon until it is in shallow water. Step on the salmon next to where the gig is embedded and pull it out. Do not use your hands.

**DNA Collection:** Watch the DNA Collection video.

**Homeless Folks:** Walk on by. If they speak to you, say a friendly hello, and keep moving. So far, we've never had trouble with homeless people.

**Property Owners:** You might get some questions. We have mailed info about Friends of Auburn Ravine (FAR) to all of them over the years, but some may have forgotten. And some may have moved in after the most recent mailing. Let them know that you are with FAR and that we have a permit to do Salmon Surveys along Auburn Ravine. In California, if you are in the water or right along the bank below the average high-water level, you are legal to proceed. However, some property owners do not know this, and some who know it do not like it. So, stay friendly. Do not argue. Comply with their wishes. If they want you to go back the way you came, do so.

**No project is so important or urgent that we cannot take time to proceed safely.**

## The Salmon Survey Backpack

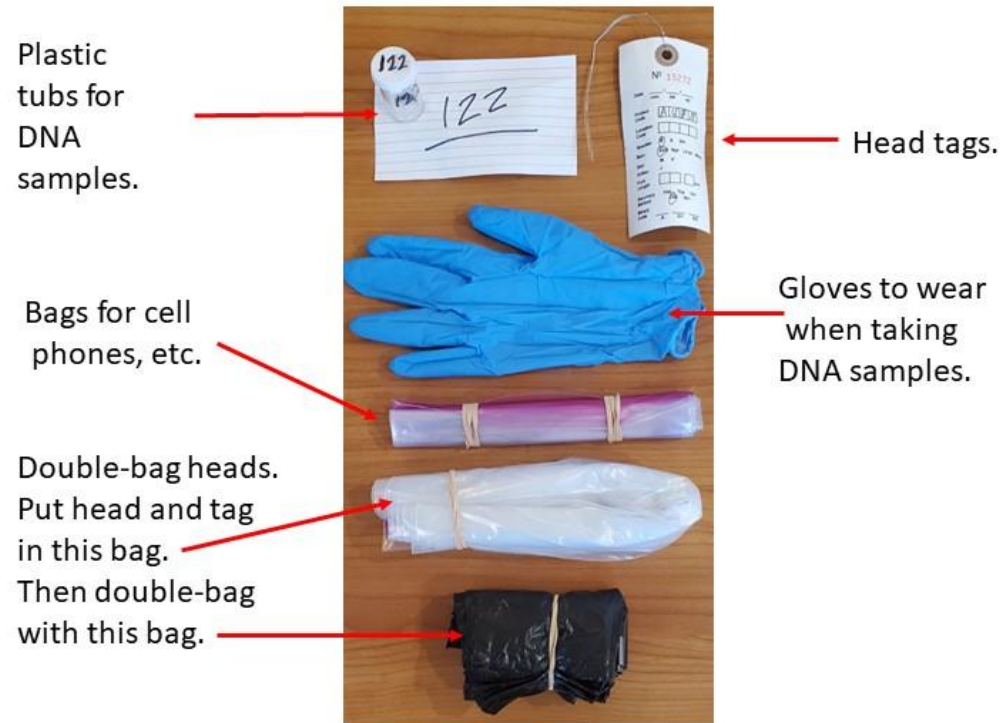
On survey days, we assign at least 2 volunteers to each section that we will be surveying that day. On some days we might not do all sections. For example, we might not do all of Section 10 if the water has been so low that it is unlikely that any Salmon got that far upstream. Or, if we do not have enough volunteers to cover all sections, we might skip some of the lower sections so we can still have 2 volunteers per section for the upper sections. Each pair of volunteers is given a small backpack with the equipment and supplies that they will need during the survey.

Here are six photos of what is in each backpack. Don't worry, it looks like a lot, but you might not be using all this gear everyday.

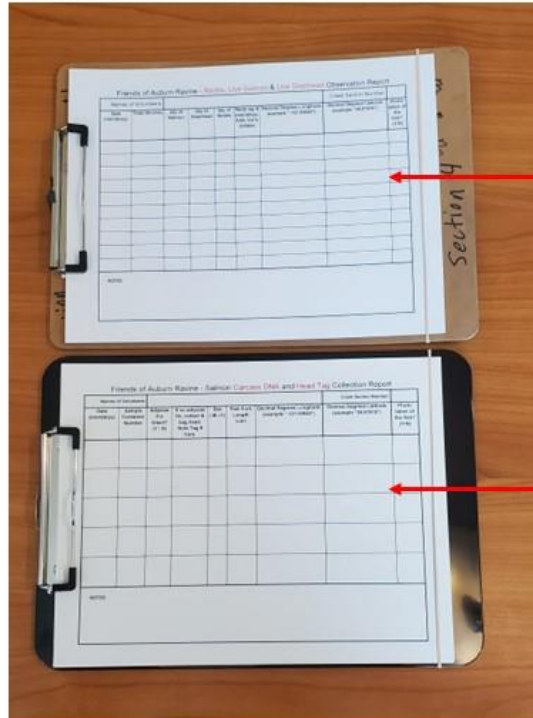
Auburn Ravine Salmon Survey Backpack  
(Don't worry. It is not as big, full or heavy as it looks.)



Backpack Section 1:  
(In the big part of the big part of Section 1)



Backpack Section 1:  
(In the thin sleeve that would be against  
your back if you were wearing the backpack.)



Data sheet to fill  
out for redds (nests)  
and live salmon or  
live steelhead.

Data sheet to fill  
out for DNA samples,  
and heads of tagged  
salmon. There are only  
five rows on this sheet.  
If you collect any combo  
of DNA samples and/or  
heads that add up to five,  
that is enough for one day.

## Backpack Section 2

Tape to measure “fork length” of salmon in centimeters.

Biodegradable tape for marking redds.

Sharp 4-pronged gig. Place on extension pole to get salmon out of deep water.

Compass to read heading from orange tape to redds.

Cover for body cavity tools.

Cork to cover end of sharp wire.

Body cavity tools.

Sharp stiff wire with loop for pulling head-tag wire through jaw.



Sharp knife for cutting off heads of tagged salmon carcasses. Also may be used to open body cavity to access the heart.

Scrub brush to clean knife and other tools after each salmon carcass is processed.

Black Sharpie to note redd locations on orange flagging tape, and fill out head tags.

Pencils to fill out data forms.

Scissors to cut small piece of the heart to put in DNA sample tub.

Alcohol to cover DNA sample in plastic tub.

## Small pocket in Backpack Section 2

References:

GPS Operation  
and  
Redd Marking

DNA Samples  
and  
Head Tag Data

CDFW Permit  
and  
GPS Manual



### Backpack Section 3

Hand cleaner.

Insect repellent

Tick remover



Gauze pads and  
Adhesive tape.

Special hand and body  
cleaner if exposed to  
poison oak.



### **“A form, a form. My kingdom for a form!”**

That is not exactly what King Richard said but he might have if he had been a Scientist!

So, yes, we have forms to fill out on this project. By recording some basic information about our observations and the samples we collect, we add credibility to the data and enhance its value when we use it to advocate for protection and improvement of wildlife habitat.

We have two forms:

- One form for recording our observations of live Salmon and/or Steelhead and their redds, and
- Another form for recording the collection of DNA samples and/or heads from Salmon carcasses.

You should make sure that you have 2 blank copies of each in your backpack before you start a survey. The forms are printed on “Write-in-Rain” paper so you can use them on a rainy day. The forms are fairly self-explanatory with plenty of room to fill in your data.

These two forms are shown on the next two pages.

If you see any live or dead Lamprey, make note of that in the Notes section of the form along with the time, quantity, and location of each Lamprey sighting.

## Friends of Auburn Ravine - **Redds, Live Salmon & Live Steelhead** Observation Report

| Survey Date:                |                         | Volunteers:                |                                  | Creek Section #:                            |   |  |  |
|-----------------------------|-------------------------|----------------------------|----------------------------------|---|---|--|--|
| Start Time:                 |                         | GPS for Start Point:       | Latitude: _____ Longitude: _____ |   |   |  |  |
| End Time:                   |                         | GPS for End Point:         | Latitude: _____ Longitude: _____ |   |   |  |  |
| Time of Observation (hh:mm) | Quantity of Live Salmon | Quantity of Live Steelhead | Quantity of Redds (nests)        | Redd tag ID (mm/dd/yy, FAR, Vol's Initials) | Decimal Degrees Latitude (example "38.57670") | Decimal Degrees Longitude (example "-121.52643") | Photo or video taken of the fish or redd? (Y/N). Taken by (Volunteer Name) |
|                             |                         |                            |                                  |   |   |  |  |
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**NOTES:**

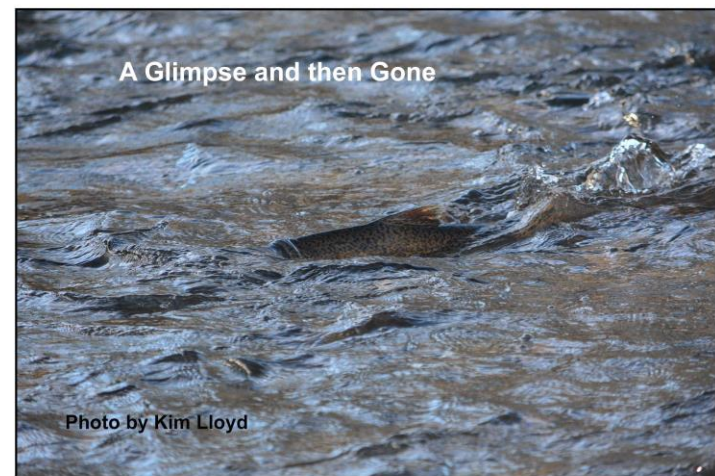
## Friends of Auburn Ravine - Salmon **Carcass DNA** and **Head Tag Collection** Report

| Survey Date:                |                             | Volunteers:                 |   |                   |   |   | Creek Section #:                                 |   |
|-----------------------------|-----------------------------|-----------------------------|---|-------------------|---|---|--|---|
| Start Time:                 |                             | GPS for Start Point:        | Latitude: _____ Longitude: _____  |                   |   |   |  |   |
| End Time:                   |                             | GPS for End Point:          | Latitude: _____ Longitude: _____  |                   |   |   |  |   |
| Time of Observation (hh:mm) | DNA Sample Container Number | Adipose Fin Intact? (Y / N) | If no adipose fin, collect head, attach head tag, and bag the head. Note Head Tag # here. | Sex ( M / F or ?) | Fork Length (cm) (Nose to where the tail splits.) | Decimal Degrees Latitude (example "38.57670") | Decimal Degrees Longitude (example "-121.52643") | Photo taken of the fish? (Y/N). Taken by (Volunteer Name) |
|                             |                             |                             |   |                   |   |   |  |   |
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NOTES:

## Seen any Salmon Lately?

Yes, that is a common question among fishermen and Citizen Scientists, but what do Salmon look like in Auburn Ravine? Here are some photos of Salmon in Auburn Ravine to help you program that powerful computer between your ears so you will “know one when you see one”.





## **Seen any Salmon Redds Lately?**

The nests that Salmon and Steelhead dig into the streambed gravel are called “redds”. The word “redd” comes from the same root as the word “ready”, so it implies that an area has been made ready for the eggs. Salmon dig these depressions in the streambed gravel with their tails. Redds are usually oval in shape, 4 to 6 feet long (upstream to downstream), a few feet wide, and 6 or 8 inches deep. After the female deposits the eggs, and the eggs are fertilized, the female covers the eggs with gravel. The area where the redd has been dug usually appears to have a lighter color than the surrounding gravel because the algae has been washed off the gravel in the digging process.

This link will give you a good overview of what redds look like.

<https://fishbio.com/field-notes/fish-monitoring/spotting-redds-art-biology>

An internet search for “Salmon redds” will give you many more examples.

If you see a redd, do not wade through it. It may already have eggs in it under the gravel. If you only suspect that you are seeing a redd, do not wade through it. Better safe than sorry.

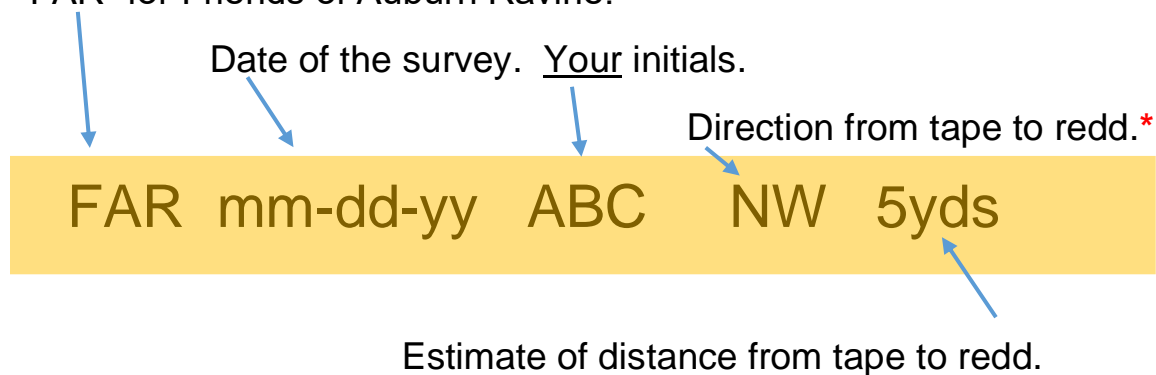
An important part of the data we collect is the quantity of redds we see each season. To make sure that we do not count the same redd more than once, we need to mark each redd with a long piece of red tape.

In your Salmon survey backpack you will find a laminated card like this that shows how to mark any redds that you see. You will tie the tape to a bush or tree on the bank near the redd.

## Redd Marking Process and Format

When you see a salmon nest (a redd) in the creek, look at nearby trees and bushes to see if it has already been marked with an orange/red marking tape. If not, record the redd on your data sheet. Then cut a 3 foot long piece of marking tape and write the following info on one end of it using the Sharpie marker from your kit. Then tie the tape to an easily accessible nearby branch at eye level.

“FAR” for Friends of Auburn Ravine.



\* N, NE, E, SE, S, SW, W, or NW is precise enough for direction.

## **And what about those carcasses?**

First of all, watch this 7-minute video about how to collect a DNA sample from a Salmon's heart.

[https://drive.google.com/file/d/1jxPovSJxaK8UXvoxyPVr5uThRqU7ksHu/view?usp=drive\\_link](https://drive.google.com/file/d/1jxPovSJxaK8UXvoxyPVr5uThRqU7ksHu/view?usp=drive_link)

The video also shows how to collect the head from any dead Salmon that is missing an adipose fin (a small fin that is located between the back fin and the tail fin). About 25% of all the Salmon that are raised in hatcheries have that small fin removed to indicate that a tiny coded-wire tag has been placed in their heads before they were released from the hatchery. If we collect a head from such Salmon, we give the head to the California Department of Fish and Wildlife (CDFW). They will locate, extract, and read the coded-wire tag to find out which hatchery that Salmon came from and when it was released.

One thing that the video does not show is a new step that we added to the process in 2019 – that is adding enough ethanol to the small plastic container to cover the DNA sample. The ethanol will help to better preserve the sample until we can get it into a freezer. Each backpack has a vial with about 4 ounces of ethanol in it. You will only need to use about ½ oz. for each sample.

You can see many examples of what dead Salmon look like by doing an internet search on “Salmon carcasses”.

The main thing to know when looking for Salmon carcasses is that they do not always wash up on a nice clean gravel bank. Some may be snagged underwater on tree roots or hung up by high water in tree branches. Some may be floating in muddy pools, and some may have been dragged up on the bank and partially eaten by otters, or raccoons, etc. If you see one underwater where you cannot reach it, you can try using the extension pole and “gig” that is included in each backpack. The gig consists of 3 or 4 sharp, barbed, spikes. The gig can be attached to the end of an extension pole and used to stab a Salmon carcass and pull it from underwater.

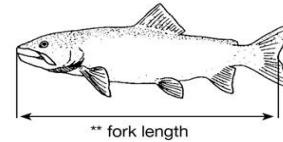
In each backpack, there is a laminated card that shows the process for getting a DNA sample from the Salmon's heart. If the heart is missing, look for the least decayed section of flesh or fin that you can find and collect a sample of that.



## How to Collect the DNA Sample

1. Move fish to a safe spot if possible. Some carcasses may have decayed too much to move.

2. Determine the fork length (in cm) of the fish.



3. Make incision on underside of salmon as shown by dotted line. Hold the tail and cut away from your hand. Cut from anus towards head being careful to not cut deeply into the fish.



4. Before locating and touching the heart, put on a clean pair of latex gloves.

5. Use scissors to remove heart and cut out a pinky-nail sized piece and place in numbered container. \*\*

6. Place numbered tag next to the fish and take a picture.

7. Record the GPS coordinates and other details on the data form.

8. Determine the sex of salmon. Look in the body cavity. The males will have long white sacks (testes). The females will have egg sacks. In both cases, if the salmon has spawned, these sacks will be long and thin. There may be only a few eggs left in the females.

9. If no adipose fin is present, remove head and place in a one-gallon zip lock bag and then in a black trash bag.



If this small fin (the adipose fin) is missing, it means that the fish came from a hatchery and has a coded wire tag in its head.

10. If the head has been removed, tie a 2-foot long piece of red flagging around the base of the tail. If the head is not removed run the red flagging in through the mouth and out from behind the gill plate and tie off.

11. Clean equipment in stream.

**\*\*If unable to obtain a heart sample due to deterioration or absence, obtain a clip of the best looking (least decayed) flesh or fin.**

There is also a card in the backpack showing how to fill out the head tag that needs to be attached to any heads that we collect. The tag is attached by running one end of the wire up behind the gill plate, out the mouth, and twisting it with the other end of the wire.

## How to fill out a Head Tag\*.

The image shows a salmon head tag form with the following fields and handwritten entries:

- Date:** mm / dd / yy (blank)
- Project Code:** AUBN
- Location Code:** (blank)
- Species:**  K,  S,  SH
- Run:** Fall,  Spr,  LFall,  Wntr
- Sex:**  M,  F
- Grilse:**  J
- Fork Length:** [ ] [ ] . [ ] cm
- Recovery Method:** Hat,  Car, Trp, Cri,  Net
- Binary Code:** A, D1, D2

Blue arrows point from the following text boxes to the corresponding fields on the form:

- Date the salmon's head was collected.
- Always use " AUBN " for heads collected from Auburn Ravine.
- Use the Section number along Auburn Ravine where you collected the head. (1, 2, 3, 4 , etc.)
- The Chinook Salmon in Auburn Ravine are also known as King salmon so always circle the letter K.
- Do not mark any of these options. The salmon in Auburn Ravine are probably all Fall run or Late Fall run fish. CDFW will tell us which run this fish was from.
- Circle **M**ale or **F**emale.
- Circle J if the fork length is less than 61 centimeters (cm).
- Fill in the fork length using centimeters.
- Our samples are taken from **C**arcasses so circle "Car".
- Leave the Binary Code section blank.

\* For salmon surveys on Auburn Ravine.

**And.....where the heck am I?**

**How to get the GPS coordinates to put on the data forms when you see a live Salmon, or steelhead, or a redd, or a carcass.**

That is what the GPS units in the backpacks are for. Yes, you can get GPS info from your cell phone, but we have found them to be somewhat unreliable along Auburn Ravine. Cell phones tend to have weak GPS antennas, so they also “reverse engineer” GPS coordinates by triangulating cell phone towers or sensing the location of Wi-Fi hot spots. In our tests over the last 2 years, cell phones often misstated the GPS coordinates of locations along Auburn Ravine by up to a half mile.

In each backpack there is a laminated card that shows how to work the GPS units.

We have two models of GPS units both made by Garmin.

We use the Garmin eTrex10 units for the sections of the creek in Lincoln and upstream to the Hemphill Fish Passage project. For the sections of the creek further upstream where the creek begins to earn the “Ravine” in its name, we had to get GPS units with a stronger antenna so we could get good GPS readings despite being surrounded by high hills or canyon walls. For those sections, we will be using the Garmin 67s units.

Each GPS unit has been pre-programmed to make it easy to see the GPS coordinates.

So, if you follow the simple steps described on the card in your backpack, you will get the GPS coordinates without having to be an expert on how to use that particular GPS unit.

# Garmin eTrex 10

## Three Easy Steps to Get GPS Coordinates



1. Press the Light button to turn the unit ON.

Leave it ON throughout your survey.

Main page is displayed.



2. Press this button to select the "Map" page. Just push it in. Do not move it from side to side.

See other side.



3. Map page is displayed showing GPS coordinates in decimal format.

If the screen goes dark, there are spare batteries in the backpack. Twist the metal loop on the back, pull off the back cover and replace the batteries. Press the Light button to turn the unit back on.

4. When you are done with your survey, press and hold the Light button until the unit turns OFF.

## Garmin GPSMAP 67

### Two Easy Steps to Get GPS Coordinates



**1.** Press the On/Off button on top of the unit to turn the unit ON.

Leave it ON throughout your survey.



**2.** Map page is displayed showing GPS coordinates in decimal format. The screen will go dark after 2 minutes. Press Enter to display the Map/GPS screen again.

**3.** When you are done with your survey, press and hold On/Off button until the unit turns **OFF**.

Always turn on your GPS unit at the beginning of your survey and wait a few minutes until it gives a stable reading. Then record the GPS coordinates for the Start Point of your survey on your data form. Leave the GPS unit ON throughout your survey. That way you will not need to restart it each time you need to record an observation on the data forms.

Each time you see a redd, a live Salmon, or a Salmon carcass, record the GPS coordinates for that sighting on the appropriate data form. Then when you reach the end point of your survey along the creek, record the GPS for the End Point on your data form. If you are doing a section of the creek that is divided into separate portions due to access problems, you will need to record the Start Point and End Point for each separate portion of the section. That will allow us to calculate exactly how many miles of the creek we surveyed on each survey day. When you are done with your survey for that day, turn the GPS unit OFF>

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