PNW-FIA Field Work: Rewards and Challenges

Tangible Rewards of Fieldwork with PNW-FIA

Part of what makes a position on a PNW-FIA field crew so great are the challenges described in this document. It will be an experience that you will never forget. You will be challenged physically and mentally, but the rewards of successfully completing a field season are incredible. The skill-sets you will build from this position will be very useful for enhancing your career path in the natural resources field.

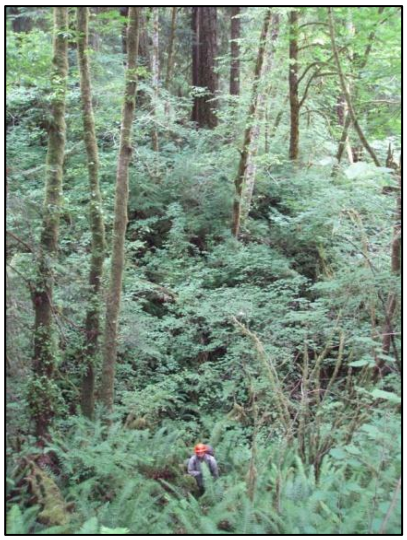
Sense of accomplishment: PNW-FIA field staff often claim that they have never felt such an amazing sense of accomplishment as they do with this position. Field crews generally complete one plot per day. Other natural resources field jobs require you do the same task for days or weeks on end, with little sense of completion at the end of each day. With this position, almost every day you will be able to say that you completed another field plot, and cross it off the list. It feels really good, and completing the tough plots feels even better, especially because it took a team effort to complete it!

Affiliation with a nation-wide program: Our program is national in scope and is very well known. Not only are there 18 field crews completing plots in our three-state region, there are crews completing FIA plots across the entire United States. It is mind boggling to think of the size of the forest resource dataset that you are helping to build. There are teams of scientists and analysts working with these data, and our data products are sought after by a wide variety of groups both inside and outside the federal government.

Building useful skill-sets and setting yourself up for future success: After completing a field season with PNW-FIA you will add some impressive skills to your resume. This position will be a hands-on learning experience, and you will work side by side with well-trained professionals in the field. After completing a field season in our program, you will be competent in forest mensuration techniques, the same techniques that are used by many other research and land-management agencies, as well as in the private sector. You will have an opportunity to learn to recognize and identify hundreds of trees, shrubs, forbs and grasses. You will be learn to identify common forest pathogens and you will become a stronger and safer backpacker, camper, map and compass navigator, back road driver, and off-trail hiker.

Observing a wide array of natural beauty: In this position, you will have the opportunity to work and travel in some incredibly beautiful places. You will get to work in many different types of ecosystems, traveling to a new spot on the map every day. You will see some incredibly large trees, and get to measure some of them. You will see wildlife, beautiful mountain vistas, and incredible mountain streams and rivers.

Overview of Field Work



Working in lush coastal forest

A seasonal position with the PNW-FIA program could be one of the most challenging, yet rewarding, field jobs that you will ever experience. While many field research programs involve small research sites, FIA involves sampling field plots that are located on a systematic grid that is laid out across the entire United States. The intensity of the grid is approximately 3 miles x 3 miles which equates to one plot for every 6,000 acres of land. This is one of the main reasons that our field work is both challenging and rewarding; you are going to a totally random spot on the map! Plots can and do fall just about anywhere, from idyllic open forest stands deep in the woods, to a clump of trees behind someone's house. While traversing to plot you may need to cross steep slopes or bushwhack through brush that is so thick that you may need to crawl on your hands and knees. At times plots fall in areas where recent logging has occurred or in areas of blow down and there are large piles of slash and/or downed logs scattered which make it difficult to maneuver around the plot area. Not only is it tough to move, these are some of the things that we take measurements on!

Our new employees have expressed that this job was more difficult than they realized when they signed up for it. We want all of our new team members to be aware of the rewards and challenges of this position before they come on board. It takes a positive attitude and a desire to be challenged, both physically and mentally, to excel at this position. We want to ensure that you are well informed and excited to work out in the woods!

Most of the employees that work with PNW-FIA love their job. Some people in the program that have been doing FIA field work for decades! Completing FIA field work is incredibly rewarding. The sense of accomplishment that comes with successfully and safely completing a tough plot is amazing. The places that we get to explore and understand through our measurements can be incredibly beautiful, yet unknown due to their remoteness (except to a lucky few).

Safety is the number one priority of our program, and despite the potential hazards that can be encountered when working in the field, our program has an excellent safety record. We have an extensive safety system, and all of our personnel are committed to completing our work in a safe manner. To learn more about our safety protocols, check out http://www.fs.fed.us/pnw/rma/fia-topics/data-collection/dc-topics/safety.php.

A position on the PNW-FIA data collection team involves completing field-based forest inventory plots within one of 18 duty stations in California, Oregon, or Washington. Each duty station has a 2-4 person FIA field crew based within it, and this crew completes field plots within a region surrounding the duty station. Each duty station and region is different and has some unique challenges. Additionally, each field crew operates a bit differently. For instance some crews prefer to car camp

while others stay in motels more frequently. It is important to find a duty station and crew that are a good fit for you. While each duty station is unique, there are some commonalities that will be highlighted.

Terrain

California, Oregon, and Washington are more rugged than some people realize. Plots can be found on steep mountain slopes with loose footing. Sometimes you feel like you take one step forward but slide back three steps. Completing a plot on steep terrain can be challenging, as you have to move around regularly to take measurements. It is also possible to dislodge loose rocks, which you have to be careful about. This is one reason we wear hard hats in the field. If a plot or a portion of a plot is too steep to safely work on, crews may call the area hazardous and avoid working there. We never put our staff in a position where they fear for their personal safety or the safety of others.

Weather and Climate

PNW-FIA field crews work in all weather conditions. Rain is common in Western Oregon and Western Washington, especially in the spring and fall seasons. It can be rainy and foggy year-round when working on the coast and summer thunderstorms in the Sierra and Cascade Mountains is typical. It is imperative to have good rain gear and a synthetic or wool base layers to work in the rain. Crews occasionally have to work in the snow in the early or late season and below freezing temperatures are possible, so bring warm clothing that can be layered.

It can also get incredibly hot within our tri-state region, and not just in California (temperatures can exceed 100 degrees F). Typically crews make season plans to work at higher elevations or in coastal areas during the hottest part of the year, but it is not possible to avoid the heat entirely. Crews must be adequately prepared with plenty of water, electrolytes, and sunscreen every day in the field.

One weather condition that is often overlooked is smoke. During fire season, large swaths of our region can become smoky due to wildfires. Crews must always be aware of the location of wildfires and avoid working in areas where fire closures are in effect. This often means rearranging season plans to avoid fire and thick smoke. However, in big fire years, it may not be possible to avoid working in smoke all together.

While crews are always prepared to work in inclement weather conditions, more often than not we have beautiful clear sunny days across all of our duty stations!

Biotic Hazards

Poison oak and other poisonous plants: The forests in our region can contain poisonous plants, and crews must plan accordingly. The most notorious of these in our region is poison oak (*Toxicodendron diversilobum*). Poison oak is common in the lower elevations of California and southwest Oregon. Some duty stations in California report that up to 50% of their plots contain poison oak! Oregon and Washington duty stations also report running into poison ivy on occasion. Plants such as poison oak and poison ivy cause a rash when oils from the plants come in contact with the skin. This rash can be quite severe, and some individuals are more susceptible than others. Some people are immune and do not get a rash at all. Toxic oils can remain on gear and clothing and cause a secondary contamination of the skin. One of the tricky things about poison oak is that there is generally a lag of 12 to 72 hours from the time of exposure to when the rash develops. The rash can last anywhere from one to four weeks. Crews that work in areas of heavy poison oak have come up with steps to minimize the contamination of their clothing, field gear and work vehicle. When the plot or hike into plot has too much poison oak to sample the plot safely, crews can call the plot or portions of the plot hazardous to avoid exposure.

Thick poison oak in a California forest

Tanoak allergies: Tanoak (*Lithocarpus densiflorus*) is a tree common to southwestern Oregon, the California coast and the western slope of the Sierra Nevada Mountains in California. Some of our plots can be thick with tanoak trees, including seedlings and saplings. Many people are allergic to the pollen and also to the dense hairs found on young twigs and leaves. Tanoak is a respiratory irritant and can cause sneezing, hay fever, and runny nose.

Working in Brush: Some plots and hikes into plots can be thick with brush, such as manzanita, *Ceanothus*, huckleberry, blackberry, rhododendron, salal, scrub oak and chamise. Shrubs can be very thick in areas that have recently burned. It can be very difficult to move and work in these areas, especially when they are coupled with steep slopes. Thick clothing is a must to avoid getting scratched. Moving through the brush can be incredibly slow going, especially with a 35 pound pack on. Some of the brush species we work in are actually considered tree species, so you may find yourself measuring the stems of it!

Examples of working in thick brush

Working in slash

Downed logs and slash piles: Some of the forests we work in have experienced disturbances and treatments such as wildfire, blow down, insect attacks, a variety of diseases, and logging operations. These events can create a large amount of downed logs on the ground that can become quite clustered. It is sometimes very difficult to move through and work in these areas. Our protocol involves measuring the diameters and lengths of these downed logs and the dimensions of the debris piles.

Animals: Wildlife sightings are as exciting perk of this job, but employees need to be aware of potential hazards. Black bears are generally non-threatening (it is usually exciting to see a bear out there); however, precautions for storing food must be taken when camping in bear habitat. A few crews have seen mountain lions in the field. Feral hogs reside in much of the lower elevations of California and can be aggressive. Rattlesnakes are encountered regularly by some field crews. Many crews will complete plots in areas utilized for livestock grazing and will need to work safely in the presence of cattle. However, insects are probably the most common irritable encounter in the woods. Almost all crews report running into areas with stinging wasps, bees, and yellow jackets. Those with allergies to stings will need to be prepared. Blood sucking insects such as mosquitos, biting flies and, no-see-ums are the norm. Ticks are also very common, and some of them can carry Lyme disease and Rocky Mountain spotted fever. It is important for employees to regularly check for ticks when working in the field. Perhaps the most dangerous thing out in the woods is other humans, and crews must always be very alert for the presence of potentially dangerous people who may be conducting illegal activities.

Western Diamondback Rattlesnake

Work Schedule and Travel

Since our field plots are located over a large geographic area, travelling to and from these sites is a big part of this job. In fact, FIA crews sometimes spend more time travelling to and from a plot than they do actually measuring the plot! Travel involves a mix of driving and hiking, and occasionally the use of helicopters, pack animals, or boats.

Backpacking to a plot

Driving: No matter which duty station you are in, expect to spend a lot of time in the work truck. Crews report that they generally spend from 2 to 8 hours in the vehicle each day. Expect a mix of driving conditions as well: urban areas with traffic, windy mountain highways, dirt roads, logging roads, and four-wheel drive roads. Driving in poor conditions can sometimes be unavoidable – including wet and snowy roads and blinding light conditions, especially late in the season. All staff are required to complete a defensive driving course as well as hands-on training to prepare them for local conditions.

Hiking and Backpacking: This position involves a lot of hiking, and in some cases overnight backpacking. The amount of hiking and backpacking is quite variable depending on the duty station. Many duty stations have large wilderness areas that do not contain roads, so longer hikes and overnight trips are needed to access plots. Some crews may hike up to 20 miles in one day! Other duty stations may generally have only short hikes (less than one mile). Work at all duty stations involves off-trail hiking and bushwhacking to access plots. It is not

uncommon to have to descend and ascend several thousand feet of elevation to access a plot, and this could be on a steep loose slope or in thick brush. You will also be required to carry a backpack every day to plot. You will not only be carrying your own personal gear but also instruments and tools to take measurements. On day trips expect to carry up to a 30 pound pack. On overnight trips your pack could weigh up to 60 pounds.

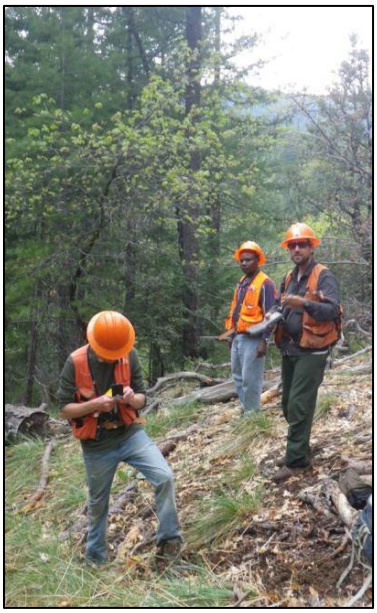
Lodging and camping: All crews must travel overnight away from the duty station or "home base" in order to complete a portion of the plots. Some crews travel more than others, but expect to be away overnight from 30-70% of the time, depending on your duty station. Some crews tend to do short (less than one week) trips whereas other crews may travel away from the duty station up to a month or more at a time. Each crew does this differently – some crews stay almost exclusively in motels whereas others do a lot of car camping in both developed campgrounds and undeveloped dispersed campsites. Most duty stations have camping gear that can be provided for use.

Car camping with the work truck

Daily and Weekly Schedule: Since every plot is in a different location, the time that it takes to travel to a plot and to complete a plot varies greatly. Plots with more trees and downed wood generally take longer, as well as plots on steeper slopes. You will generally leave in the early morning to do a plot not knowing the exact time that you will be done that day. Frequently on field days you will be required to work more than eight hours. You should expect to work a variable schedule that will change throughout the summer. Some crews will work several long days followed by several days off, while other crews may work Monday through Friday. Adaptability is key to succeeding in this position.

Working on plot

You are probably wondering what it is like to be on a plot, taking field measurements. Our protocol may change a bit from year to year, and different crews often utilize different strategies to obtain their measurements in the most efficient way. However, the suite of data we collect remains consistent from one plot to the next. Most of our plots have been measured before, with the last visit occurring 10 years ago. On these plots you will see monumentation such as silver and yellow metal tags nailed into trees and small metal pins marking the center of subplots.



You will suit up with gear and tools when arrive on plot. Most field staff wear an orange cruiser vest with a variety of instruments attached to it, such as a compass and clinometer. Other tools and supplies will be located in the pockets of your vest – like a carpenter's tape, your field manual, writing utensils, and a notebook for jotting data down. You will likely be wearing a tool belt with several items on it, generally a logger's tape, a hatchet or hammer, an increment borer, and a pouch for nails and tree tags. You'll be wearing a hard hat and safety glasses, long sleeves, pants and work boots. These items are quite bulky and can be heavy, which makes navigation throughout the plot tricky at times.

Transects:

You will pull out a tape from the center of the plot for 24' horizontal distance at a specified azimuth. You need to account for slope, and on steep slopes you may end up pulling out your tape much farther than this. The tape will have to be pulled out really straight, which can be tricky when the vegetation is thick. Then you will measure and record various items along that transect, including diameters and lengths of downed logs, counts of smaller pieces of wood, duff and litter depths, and ground cover.

Measuring downed wood on a transect

Tree diameters: We measure the diameter of trees at 4.5 feet above the ground on the uphill side of the tree. Usually the previous crew placed a nail at this spot, and you stretch your logger's tape around the bole of the tree and back to the nail to take the measurement, keeping it as level as possible. Large trees and steep slopes combined make keeping the tape level very challenging. The tape may be at 4. 5 feet high on the uphill side, but it could be at 8 or 9 feet up on the downhill side! We also nail number tags into the base of trees which requires stooping or kneeling down.

Tree Lengths: We also measure the height (length) of trees. The proper and most common tool for this data item is a Laser Range Finder but we also use tape measures for shorter trees. We usually do this by moving uphill from the tree to where we can get a good vantage point of the top and bottom of the tree. This can be tricky in a thick forest and sometimes you need to move around a lot to find a good view of the tree. We also assess the position of the tree in the canopy relative to other trees, how much of the tree's length is occupied by foliage, and damages such as dead or broken tops.

Measuring a tree's diameter

Shooting the length of a tree

Running the data recorder

Running the data recorder: We use an Allegro data recorder to enter all of our field data. This is a pretty large device, and you will have it strapped around your neck. When you are entering data, other people on your crew will be firing off numbers for you to enter. If someone is shooting lengths, they may be 100 or more feet away from you, shouting out numbers to you. Often the person running the data recorder will be standing at plot center and helping out with distance measurements and azimuths (we record an azimuth and distance to each tree we measure from plot center). Sometimes the plot center is located in a place that isn't very pleasant to stand due to brush or a steep spot. If you are "occupying" plot center you may find yourself in an awkward stance for a long duration.

There are many other data items we collect on plot. You will often be boring trees and counting rings to determine age and growth increments. You might be taking vegetation cover estimates, or assigning stand level

variables. You may help with mapping boundaries between different conditions. You can read more about the FIA methods at http://www.fs.fed.us/pnw/rma/fia-topics/data-collection/dc-topics/methods.php.

Quality Assurance

Part of PNW-FIA's mission is to collect high quality data. Our field crews are held to vary high standards for the data we collect. We have an extensive field manual that describes the data we collect and how it is to be collected. This manual is over 400 pages long and the language in it is very specific. You will be expected to learn bits and pieces, starting with the most basic but continuing to become more proficient with the more challenging aspects of data collection as the season progresses. During intern orientation you will receive training on the basics and your crew leader will continue with on the job training throughout the field season.

We also have a quality assurance (QA) program to help us collect high quality data following the protocols described in the manual. Each crew is assigned a "QA", generally an ecologist, who is very knowledgeable of our sampling methods. The QA will work with the crew on plot a few times a year, to help you and your crew learn the methods. This is called a "hot check". The QA will also independently field check about 5 plots for each crew per year after the crew completes the plot. This is called a "cold check". These plots are graded and the crew is assigned a score for the plot. Crews sometimes complete "blind checks". This is where a crew does a plot that another crew has recently done without seeing their data. The data from both crews is then compared to help gauge the precision of our measurements. You can learn more about the quality assurance program at: http://www.fs.fed.us/pnw/rma/fia-topics/data-collection/dc-topics/quality-assurance.php.

Office Work

While most days you will be in the field, you should expect to have some days working in the office. It varies by crew, but expect 1-2 office days every two weeks. These days can be nice breaks from the field. Another part of assuring the quality of the data we collect are plot edits. You will scrutinize a printout of the data collected on the plot and go through a checklist to ensure that the data look accurate. You will also be filling out a "plot card" that covers directions to get to the plot, drawing an access map to the plot, labeling boundaries on a plot diagram, and a narrative of the plot that describes changes, conditions, or issues that the next crew and data analysts might need to be aware of.

Other office day activities include gear and vehicle maintenance, administrative tasks, and landowner contacts. Many of the plots are located on private land, and there is a lot of coordination with landowners and land management agencies to obtain permission to access plot locations.

Crew Dynamics

FIA field crews have very unique working relationships. Few other jobs immerse their employees in such intense interpersonal environments as FIA does. Your crew will work side-by-side all day, nearly every day. You will be spending a lot of time together in the vehicle, and often camping out and eating together. During the field season, you will likely spend more time with your crew than you do with anyone else. Very strong relationships form, and just like any relationship there can be smooth patches and rough patches. In order to succeed in this

Working together on a plot

close knit environment, it is imperative to have a positive attitude even when situations get tough. It is important to always be respectful of others, and to watch out for each other. Most important is good communication. The sense of camaraderie gained from working in a tight knit group can be incredible.

Field gear you need to provide

PNW-FIA will supply most of the gear that you need to get your job done, including tools, instruments and supplies needed to measure field plots, as well as camping equipment. You will need to provide a few personal items listed below:

Sturdy boots: It is imperative to have good footwear in the field. Many crew members wear all leather hiking boots, and some choose to wear 8" high work boots. Boots should have a lug sole for ample traction. Having a waterproof boot such as one with a Gore-Tex layer is a plus. It is important to get high quality boots and to break them in for several weeks before you begin. Low quality boots might not last a whole season! While it is common nowadays for hikers to wear shoes on-trail, for the off-trail nature of this position it is imperative to have a taller, sturdier boot that can protect your foot and ankle from sticks and brush. Some crews use caulk boots (corks). These are provided by the program if your crew requires them.

Example of typical hiking boot

Rain Gear: You will need to provide your own rain jacket and rain pants. Many of the California crews can get away with lighter breathable rain gear, but those in the wetter duty stations of Western Washington and Oregon may need the rubberized kind. Make sure to check with your state coordinator or crew leader before making any purchases to ensure that the gear is suitable for the conditions you will be working in.

Field Clothing: You will need to wear long pants and long sleeve shirts in the field. Thick work pants, like Carhartts, are great for brush. On wet days you will want to wear synthetic, or quick dry material under your rain gear rather than cotton. In terms of shirts, many like to wear long sleeve shirts with a collar. You could buy a bunch at a thrift store so it doesn't matter if they get ripped up. It is good to have 3-4 sets of field clothing, especially if you are working in areas with poison oak. Once clothing is exposed to poison oak you don't want to wear it again until after it has been washed. You will want to bring a change of clothing for the ride home if you were working in poison oak so you don't contaminate the vehicle!

Warmth layers: You will want to have non-cotton synthetic or wool base layers (tops and bottoms) for the cold days. You will probably want a fleece jacket, a shell (might just be your rain jacket) and maybe a down jacket if you are doing some cold weather camping. You will also want a winter hat and gloves for the cold days and nights. Good socks can be the difference between a good and bad day; wool or synthetic blends (not cotton) are preferred.

Sunscreen and Insect Repellant: These are products you will likely want to use in the field. Since everyone has personal preferences on these, they are provided by the individual rather than the program.

Food and water for the day: You will be responsible for bringing your own food for the day, or if travelling overnight, for the duration of the trip. Keep in mind that your body is likely going to burn a lot of calories, and you will likely need more food than you would normally require. Our program will provide standard Forest Service water bottles, but you will be responsible for filling them up every morning before heading to the field.

Field Gear that PNW-FIA provides

Camping and carrying gear
Backpack (daypack)
Backpack (overnight)
Sleeping bag
Tent
Sleeping pad
Camp stove and fuel bottle
Mess kit/pots and pans
Bear safe food container (if needed)
Headlamp
Water bottles
Water filter
Cruiser vest
Tool belt
Nail pouch
Trekking poles

Inventory tools and instruments
100’ or 50’ logger’s tape
25’ or 12’ carpenter tape
100’ Cloth tape
Compass
Clinometer
Stereoscope
10x loupe
Laser range finder
Laser reflector
Hatchet or hammer with sheath
Increment borer and sheath
Pocket calculator
Allegro data recorder and case
Digital camera
GPS
Ruler
Plumb bob and gammon reel

Plot supplies you will carry each day
Green seedling wire
Flagging
Mechanical pencils
Rite-in-the rain notebook
Red sharpie
Paintstick marker
Nails
Tree number tags
Square flashers
Yellow rounds
Cedar stake
Metal pins
Extra batteries

Safety equipment
Hard hat
Safety glasses
Work gloves
Safety whistle
Space blanket
Poison oak kit
SPOT satellite messenger
Satellite phone
Snake bite kit
1st aid kit (vehicle)
1st aid kit (backpack)
Bug head net