

## **Jemez Mountains Salamander Survey Techniques**

**15 July 2015 Version:** These survey techniques are based on techniques developed jointly between New Mexico Department of Game and Fish and U.S. Fish and Wildlife Service.

The following techniques are for Visual Encounter Surveys (VES) consist of 3-person hour surveys or until first detection to be used with the associated data form, dated: 15 July 2015. When possible, repeat surveys should be conducted at the same site within the same year so that data can be used in an occupancy model. Repeat surveys should be conducted at least twice within a single season.

The techniques and training only prepare you to conduct detection surveys; they do not permit you to conduct surveys in New Mexico including public and private lands. For those intending to conduct Jemez Mountains salamander surveys, **federal and state permits are required**. In addition to federal and state issued permits, additional permits may be required by other agencies such as the USDA Forest Service, the Valles Caldera National Preserve, and/or by the National Park Service.

Both the Data collection form and these survey techniques are working drafts and are subject to change<sup>1</sup>. Please contact Michelle Christman at U.S. Fish and Wildlife Service at [michelle\\_christman@fws.gov](mailto:michelle_christman@fws.gov) or Mark Watson at [mark.watson@state.nm.us](mailto:mark.watson@state.nm.us) for the most current version subsequent to this 15 July 2015 version. Feedback on improving techniques, the form, or instructions are encouraged and can be sent to the above contacts. Additionally, please check regularly for updated protocols, techniques, and forms posted to the Fish and Wildlife Service, New Mexico Ecological Services Field Office website at: <http://www.fws.gov/southwest/es/newmexico/>

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1. Prior to departure to site, be sure field equipment and footwear are clean and disinfected following disinfection protocols. Disinfection protocols are presented at the one-day classroom training. Written disinfection protocols will be posted soon at <http://www.fws.gov/southwest/es/newmexico/>
2. Upon arrival to site to be surveyed begin filling out data form up to “Moisture Assessment”.
3. Assess moisture conditions and enter on data form:
  - a. Visually assess whether the area has had recent rain and overall appears moist or wet looking. This is not a criterion but will help determine if conditions are suitable for salamander surface activity. Weather information regarding precipitation from online or observed can be entered on the form (e.g. data from Los Posos RAWs weather station indicates rain from July XX-XX, 2015)
  - b. Collect and enter on data form current weather, soil moisture, soil pH, and soil temperature data. If you do not have instrumentation for soil moisture, pH, or temperature, enter N/A.

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<sup>1</sup> 2015 will likely have updated versions of protocols and data form; if you are permitted and plan to conduct surveys in 2015, please visit <http://www.fws.gov/southwest/es/newmexico/> or contact Michelle Christman at [michelle\\_christman@fws.gov](mailto:michelle_christman@fws.gov) prior to conducting surveys to get the most up to date protocols and procedures.

- c. If decomposing coniferous logs are present, open a small portion of the log (or several logs) with your hands and squeeze; significant water should come out. If water does not come out, conditions are too dry and do not survey. If water comes out, proceed to step 4.
  - d. If few or no decomposing coniferous logs are present, then check moisture under 10 cover objects (rocks, logs, bark slabs); soil under cover objects should be “moist to the touch”. If soil is not “moist to the touch” and is “dry to the touch” do not survey. If soil under cover objects is “moist to the touch” then proceed to step 4.
  - e. If you find a salamander while checking moisture conditions, you are lucky, and you should capture the salamander and notify your co-workers (see 4.d). It is recommended to yell “SALAMANDER!!” to avoid confusion. Collect remaining data, fill out the data form, and you are finished.
4. Start Surveying for 3-Person Hour Survey.
- a. One individual is the center point and lead for the survey; the remaining surveyors are spaced approximately 30 ft apart in a line.
  - b. The lead surveyor is responsible for tracking time and recording data on the data form.
  - c. The lead surveyor will initiate the survey, will indicate the half-way point to pause and collect GPS coordinate data, resume the survey, and end the survey.
  - d. Survey specifics are listed under 6.
  - e. When a salamander is found, the person who finds it captures it, places it in a plastic ziplock baggie with a very small amount of water (remember they breathe through their skin so too much water will drown them and no water will severely stress them potentially causing death). Either at the moment of observation or after capture that person notifies the remaining survey crew. Yelling “SALAMANDER!!” is an effective way to communicate to the entire crew that one has been found and everyone should immediately stop surveying. With baggie zipped place salamander in shaded area (or shade with your body) and either record microhabitat or replace the cover object while retrieving thermometer to then record microhabitat temperature. It is important to keep the salamander cool, moist, shaded, and safe.
  - f. The lead surveyor records the time collects their current GPS coordinate, then joins the surveyor with the salamander.
  - g. Other surveyors collect their GPS coordinates and joins the surveyor with the salamander. Proceed to step 6 and finish filling in the data form.
5. If no Salamanders are observed:
- a. Stop searching after 3-person hours of searching.
  - b. Fill out data form, record NO SALAMANDERS OBSERVED clearly on the data form.
6. Survey Specifics:
- a. Follow this **salamander rule** for sites that have never been surveyed: “Take a log, leave a log, never destroy more than 50% of any one log”. Meaning you can survey inside no more than half of the available logs on the ground, and only up to 50% of those that are looked inside. The purpose is to leave as much high quality habitat in tact while still detecting a salamander when present.

- b. For sites that are being re-visited, follow the **modified salamander rule**: “Take a log, leave 2 logs, never destroy more than 50% of any one log”.
  - c. Looking inside logs should be done judiciously and only when logs are very wet. If logs are not very wet (significant moisture when squeezed) and you proceed with surveys, you will unnecessarily destroy high quality habitat. To look inside a log, you should carefully peel and flake open a portion of the log while closely looking for a shiny brown salamander. Often, the salamander will make one of two movements: a quick movement into a curled position or a very fast wriggle escape. You must move fast and grab at first sight. Remember, looking inside logs should be a delicate process, not a vengeful tearing process. Also remember that it’s the quality of looking inside logs, not the quantity of logs that are searched.
7. Collect Bd sample. Label vial with date, location, species (PLNE), and a number. To swab, take a sterile cotton swab and rubbing it on the ventral (bottom) side of the salamander approximately 30 times and the bottom of the feet approximately 10 times. Be sure to get around the cloaca (vent) well. Break the handle off by partially inserting the swab end into the vial containing 70% ethanol and breaking the stick off using the side of the vial. If you insert the swab all the way to the bottom before breaking, the cap will not close all the way. (record data)
8. Measure the salamander and inspect tail condition (record data)
9. Release the salamander by first replacing the cover object as best you can as how you found it, then place the salamander next to an opening next to the cover object so it can crawl back under on its own. NEVER place a cover object on top of a salamander. Sometimes you might need to gently encourage the salamander to crawl in the right direction for cover.
10. Complete data form.
11. If going to a different site (not in immediate vicinity; either traveling by car or into a different drainage by foot) then clean and disinfect equipment and footwear at vehicle.
12. Wash and scrub hands with soap and water before leaving site or handling another salamander.