

FY2011 ISSSP Report on Salamander Slug* and Secondary Mollusk and Amphibian Species Purposive Surveys on Middle Fork Ranger District of the Willamette National Forest and on the Cascade portion of the Eugene Bureau of Land Management.

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[*Salamander slug in the northern Oregon Cascades is now recognized as an entirely different species, the Cascade axetail slug, as discussed below in this report.]

In 2008, the salamander slug (*Gliabates oregonius*-GLOR) was added to the sensitive species list for the Bureau of Land Management (BLM) and the US Forest Service (USFS) in the Pacific Northwest. This species was first described as *Gliabates oregonia* from specimens collected in north-central Lane County (Webb 1959). The scientific name was subsequently changed to *Gliabates oregonius* by other researchers (Tom Burke personal communication). *Gliabates oregonius* is classified as an S1 species endemic to Oregon and confirmed from a handful of locations in the Cascade Range and the type location in the Coast Range within the Willamette River drainage. When this study began, locations of this species in the Cascades had been reported associated with conifer needle duff and vine maple (*Acer circinatum*) leaf litter in Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) forest habitat. Due to its apparent low abundance and association with forest habitat, there is considerable potential for negative impacts from silvicultural activities, such as logging, fuel treatments and prescribed burning. There is a management need to better understand the abundance and distribution of this species.

Following its inclusion on the sensitive species list, the USFS Region 6 (i.e. Oregon and Washington) Interagency Special Status/Sensitive Species Program (ISSSSP) began funding a series of systematic surveys within the known and suspected range of GLOR to better define its abundance and distribution and to collect incidental information on habitat use and detectability. One study completed in fiscal year 2009 (FY09) resurveyed previously reported but unconfirmed sites in the upper portion of the Blue River drainage on the McKenzie River Ranger District (RD). This study confirmed these locations and found an apparent abundance of GLOR in this area (Doerr and Young 2009). A second study begun in FY09 with contract preparation and award and completed in FY10 surveyed portions of Salem BLM Cascade Resource Area plus the western portion of Detroit RD and the northwestern portion of Sweet Home RD of the Willamette National Forest. The third study done in FY10 surveyed parts of the southwestern Sweet Home RD, the McKenzie RD south of the Blue River area, and the North Umpqua and Cottage Grove RDs of the Umpqua NF. The Umpqua effort also conducted a few surveys on Roseburg BLM District. These latter two studies found additional locations of GLOR on the Cascade side of Salem BLM; throughout the Sweet Home, Detroit, and McKenzie River Ranger District and at one location in the very northern end of the Middle Fork Ranger District of the Willamette National Forest (Young et al. 2010). GLOR was not found on the Umpqua National Forest or Roseburg BLM (ibid.).

This paper reports on continued surveys for GLOR in FY11 throughout the Middle Fork Ranger District of the Willamette NF and on the Cascade portion of Eugene BLM. The Middle Fork Ranger District is the southernmost district on the forest and provides a continuous link between

the McKenzie RD where GLOR has been widely documented and the Umpqua NF were they have not been found to date. In addition, they had not been documented on Eugene BLM District although habitat modeling suggested potential habitat was present. A regional model predicted suitable habitat for GLOR in parts of Eugene BLM was used as an additional tool to determine site selection (Josh Chapman, Forest Biologist Umpqua NF, personal correspondence).

Taxonomy Change in Species from GLOR to CAST:

In the middle of our FY11 study, *Gliabates oregonius* (the salamander slug) in the northern Oregon Cascades was recognized as an entirely new species, *Carinacauda stormi*-CAST (the Cascade axetail slug) (Leonard et al. 2011). Voucher specimens collected by the lead observer (Tiffany Young-TAY) in the FY09 and FY10 ISSSSP GLOR studies played an essential role in this discovery. Therefore, all detections and survey efforts have been changed to CAST detections and surveys in the remainder of this report. It should also be noted that detections of GLOR reported in the past FY09 and FY10 ISSSSP survey effort (Doerr and Young 2009, Young et al. 2010) are instead detections of CAST.

Methods:

The survey protocol followed version 3.0 for terrestrial mollusk surveys (Duncan et al. 2003). A one-hour search, consisting of two 20-minute intensive searches of conifer needle and deciduous leaf litter plus 20 minutes of walk-about spot searching in likely habitat was conducted at each 10-acre site. The field form for reporting fauna and habitat observation followed standard GEOBOB (BLM) and NRIS Wildlife (FS) forms similar to the previous FY09 and FY10 surveys.

Eight watershed areas, consisting of 2–3 sixth field watersheds, were systematically located across the Middle Fork RD. Areas were selected that had road access within the prime elevation range of suitable CAST habitat. This range was identified as 2800'–4200' elevation in previous studies (Doerr and Young 2009), although CAST have been found at lower elevations in some northern areas (Young et al. 2010). The target number of surveys was 5 per watershed area, either in fall 2010 or spring 2011, for a total of 40 sites surveyed. Observers drove the roads in the watershed areas and selected likely habitat dispersed over the watershed areas. Likely habitats include features described in earlier reports such as presence of saturated soil and conifer stands in the western hemlock series dominated by Douglas-fir with a vine maple understory. The surveys sampled a range of stand ages from about 30 years to late successional forest.

Sites on Eugene BLM were also based on presence of suitable habitat in proximity to roads and the objective of dispersing the survey effort over the range of potential habitat in the Cascade portion of the district. The CAST MaxEnt habitat model was used as a preliminary look at suitable habitat, along with elevation and vegetation factors on the ground (Chapman 2012). The target number of surveys for the Eugene BLM area was 20 sites surveyed for one-hour each in the spring of 2011, in an elevation range of 1825 to 3230 feet. In Fall 2011, 15 additional sites were surveyed in an elevation range of 1750 to 3020 feet.

In both study areas, if time permitted and there was abundant downed wood present at the site, a 10 minute spot search was conducted for the Oregon slender salamander (*Batrachoseps wrightorum*-BAWR).

Results:

Middle Fork Ranger District: Fifty four sites were surveyed on the Middle Fork Ranger District with a total of 10 CAST found at 4 sites (7.4% of sites surveyed had detections) (Map 1). The southernmost detection was in the Upper Christy Creek drainage, which extended the documented southern range of the species about 6 miles farther than documented in FY10. No CAST were found south of Highway 58.

Weather conditions affected the fall survey effort and early snow fall arrived in mid-November 2010 ceasing the survey window. Deep snow persisted into late spring at many sites and extended the spring mollusk survey period. The initial CAST detection site that prompted the survey effort occurred in Spring 2010. Fall surveys occurred from 3–17 November 2010. Seventeen sites were surveyed with detections at 2 of them. All the fall survey effort occurred north of Highway 58. Spring surveys occurred from 6 May to 21 July 2011. Thirty-six sites were surveyed with detections at 2 of them. The latest detection occurred on 20 July in the Upper Christy Creek drainage at 3620 feet elevation.

Sites surveyed ranged from 2200 to 4600 feet elevation. The four sites with detections ranged from 3250 to 3810 feet elevation, consistent with the prime elevation range where they have been found during previous survey work.

Ten minute BAWR spot surveys were conducted at 47 of the sites and no BAWR were found. No other sensitive mollusk species were detected. Forest Service data will be entered into NRIS Wildlife. Four voucher specimens will be sent to Oregon State Arthropod Collection (OSAC).

When survey sites were compared with the CAST habitat model it was found that of the 50 sites with no detections, 2 were in “Highly Suitable”, 17 were in “Suitable Habitat”, 8 were in “Marginal” and 23 were in “Not Habitat” classifications.

Of the 4 positive CAST detection sites, 1 was in “Highly Suitable”, 2 were in “Suitable Habitat” and 1 was in “Not Habitat” classifications.

Eugene BLM: Thirty-five sites were surveyed on the Eugene BLM District and no CAST were detected. Spring surveys occurred from 18 May to 1 July 2011 (Map 2). Sites surveyed ranged from 1825 to 3230 feet elevation. Fall surveys occurred from 09 November to 15 November 2011 and sites ranged from 1750 to 3020 feet. The survey effort was divided among 6th field watersheds as follows: Gate Creek (1 site), Deer Creek (16 sites), Leaburg Canal (7 sites), Little Muddy Creek (5 sites), Mill Creek (3 sites) and Shotcash Creek (3 sites). Ten minute BAWR surveys were conducted at sites where suitable habitat existed and no BAWR were found. No other sensitive mollusk species were detected.

No CAST detections occurred in areas where the CAST Habitat Model had identified habitat as some level of suitable. Of the 35 sites surveyed, 6 were in “Highly Suitable Habitat”, 12 were in “Suitable Habitat”, 8 were in “Marginal Habitat” and 9 were in “Not Habitat” as described by the CAST model. On the ground verification of habitat during the survey effort showed that sites considered “Not Habitat” by the model were actually Marginal to Highly Suitable habitat in some cases. The BLM survey efforts and results have been sent to BLM and will be entered into GEOBOB.

Discussion:

We think the low detection rate of CAST in the Middle Fork RD is a result of drier and more marginal habitat for the species. Highway 58 seems to define the southern extent of their range. Soil conditions and needle-duff layers were good to excellent and moisture retention was high in many sites north of Highway 58. Elevation ranges were in the prime range for detecting CAST and vegetation conditions were good to excellent due to the presence of vine maple, salal and Oregon grape. All of these conditions seemed to diminish as the survey effort moved south of Highway 58. These conditions were consistent when compared with the CAST Habitat Model, where it also showed habitat suitability decreasing south of Highway 58.

The lack of detections of CAST on Eugene BLM lands appeared to be a result of a variety of factors. Although, the model predicted suitable habitat of some degree, the habitat on the ground was not high quality habitat due to poor soil conditions and a shallow needle-duff layer. Soil conditions at many of the sites consisted of a fine rock material substrate mixed in the soil composition. In comparison, sites where CAST was detected exhibited soil conditions of a more organic matter composition and where fine rock material or gravel were not dominant. In addition, the soil layer dried out much faster than at known CAST sites and the needle-duff layer was typically less than 2 inches deep at sites with the fine rock material present in the soil substrate. It appeared that intensive harvest over the last 50 years had resulted in a degradation of soil composition and needle-duff layer condition. Elevation also seemed to play a role in low detection, since most of road prism on the District is well below 3500 feet. Vegetation conditions were good to excellent and vine maple, salal and Oregon grape were present in high levels (greater than 10% of the stand). However, a moss ground cover dominated many of the sites under 2800 feet, which also prevented a suitable needle-duff layer from forming. Precipitation levels were moderate in the area and soil moisture levels were better retained on north aspect sites or in areas that were heavily shaded (where canopy cover was greater than 60%). Low down wood levels in the survey area also contributed to poor quality habitat conditions. Although, CAST does not appear to heavily rely on coarse woody debris itself, the presence of such debris does seem to play a role in providing areas for duff and needle litter to collect and buildup over time.

Although CAST was not detected on the Eugene BLM District, considerations should be taken in managing for potential sites based on habitat attributes. Management recommendations should include retaining high quality habitat that is comprised of vine maple and down woody debris in the stand, as well as the needle-duff layer. Pile burning, broadcast burning or heavy thinning that removes or deteriorates soil conditions, vine maple, down woody debris and ground cover vegetation species should be avoided or minimized. High quality suitable habitat that was identified by this study includes areas above 2800 feet in the Shotcash, Little Muddy, Lower

McKenzie River/Deer Creek and Gate Creek Watersheds. Since this study focused on survey site close to roads, additional consideration should be given to surveying areas above 3000 feet that exhibit high quality habitat regardless of road proximity and near the McKenzie River Ranger District boundary North of Highway 126.

Acknowledgements:

Chad Marks-Fife, Dick Davis, and Cheron Ferland, (Willamette NF) assisted with the survey effort. Mike Blow and Chris Langdon (Eugene BLM) helped with the logistics of the BLM survey effort and GEOBOB data entry. Sonja Weber helped enter the FS data into NRIS_Wildlife.

Literature Cited:

Chapman, J. 2012. *Carinacauda stormi* (formerly known as *Gliabates oregonius*) Habitat Model Version 1.0. Unpublished Report, Interagency Special Status Species Program (USDI Bureau of Land Management and USDA Forest Service), Portland, OR. [to be available from <http://www.fs.fed.us/r6/sfpnw/issssp/species-index/fauna-invertebrates.shtml>]

Doerr, J., and T. Young. 2009. FY2009 ISSSP surveys for salamander slug [aka axetail slug] (*Gliabates oregonius*) in the Upper Blue River drainage of the McKenzie River Ranger District, Willamette National Forest. Unpublished Report, Interagency Special Status Species Program (USDI Bureau of Land Management and USDA Forest Service), Portland, OR. [accessed 10/1/2010 from <http://www.fs.fed.us/r6/sfpnw/issssp/species-index/fauna-invertebrates.shtml>]

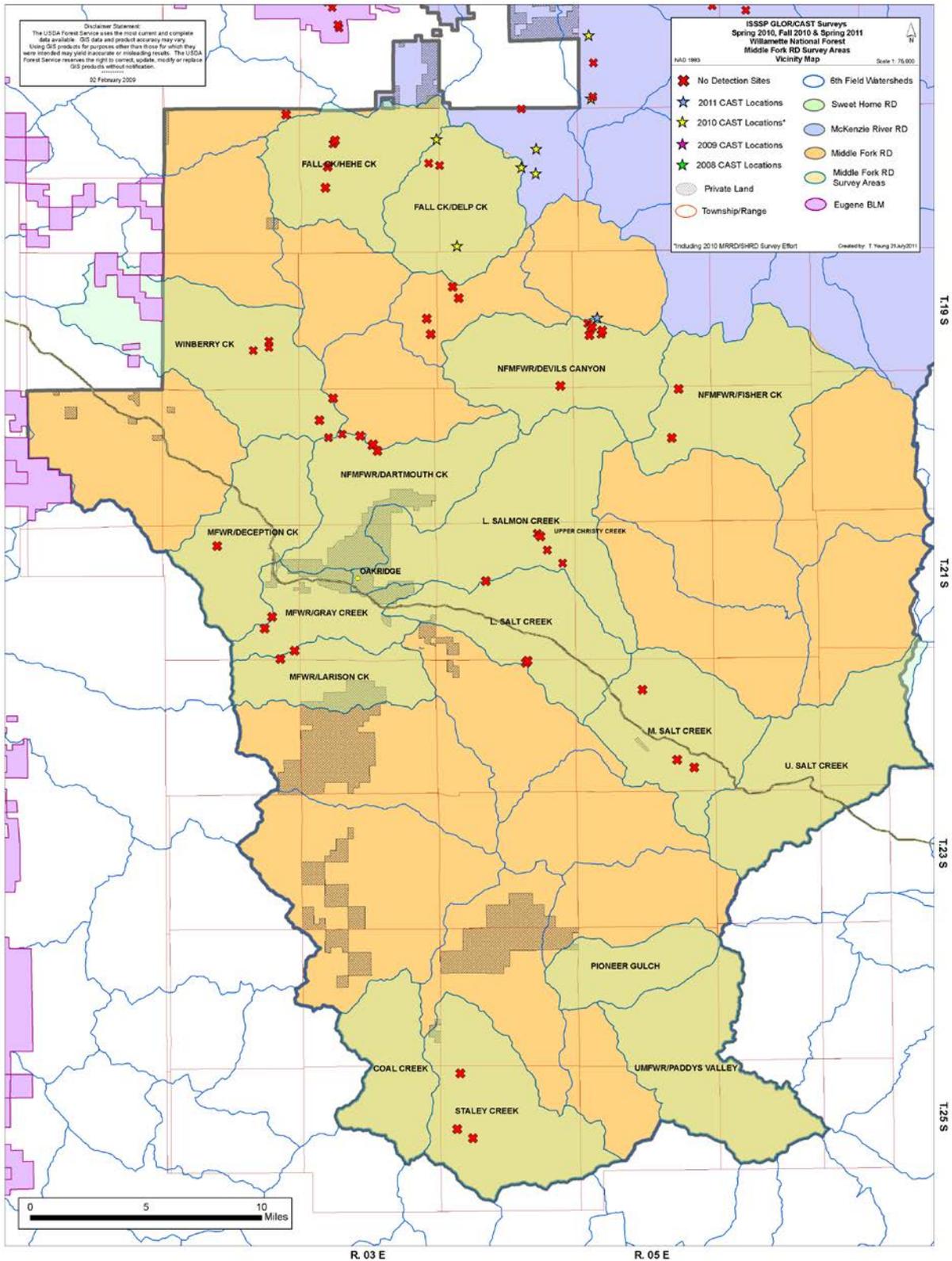
Duncan, N., T. Burke, S. Dowlan, and P. Hohenlohe. 2003. Survey protocol for survey and manage terrestrial mollusk species from the Northwest Forest Plan. Version 3.0. Bureau of Land Management, Roseburg, Oregon.

Leonard, W. P., L. Chichester, C. H. Richart, and T. A. Young. 2011. *Securicauda hermani* and *Carinacauda stormi*, two new genera and species of slug from the Pacific Northwest of the United States (Gastropoda: Stylommatophora: Arionidae), with notes on *Gliabates oregonius* Webb 1959. *Zootaxa* 2746:53-56.

Webb, G. R. 1959. Two new northwestern slugs, *Udosarx lyrata*, and *Gliabates oregonia*. *Gastropodia* 1(3): 22–23.

Young, T., J. Doerr, R. Price and R. Davis. 2010. FY2010 ISSSP report on Two Salamander Slug (*Gliabates oregonius*) survey projects. Unpublished Report, Interagency Special Status Species Program (USDI Bureau of Land Management and USDA Forest Service), Portland, OR. [accessed 10/27/2011 from <http://www.fs.fed.us/r6/sfpnw/issssp/species-index/fauna-invertebrates.shtml>]

Map 1: Middle Fork RD Survey Effort – Spring 2010, Fall 2010 and Spring 2011



Map 2: Eugene BLM Survey Effort – Spring 2011

