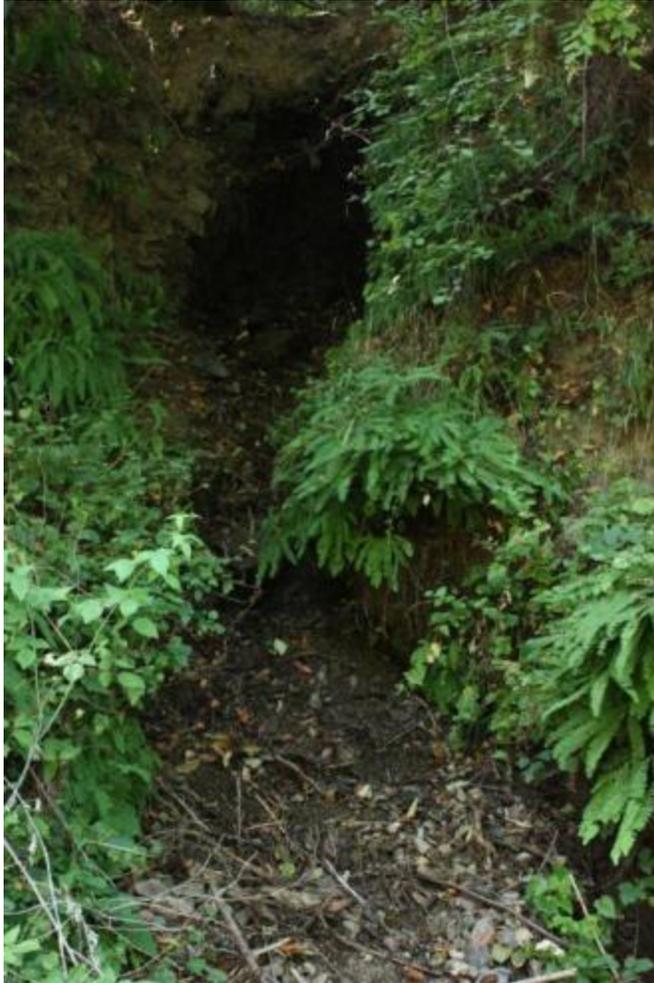


**Final Report to the Interagency Special Status / Sensitive Species Program regarding surveys  
for the marsh walker (*Pomatiopsis chacei*) in southwestern Oregon  
Assistance agreement L08AC13768, Modification 4**



Seep by Elk River Road, Siskiyou National Forest, site of *Vespericola new species A*, photo by Carly Voight, 13 August 2011.

**Report submitted to Kelli Van Norman, Inventory Coordinator  
Interagency Special Status / Sensitive Species Program  
from the Xerces Society for Invertebrate Conservation.**

**Report prepared by Sarina Jepsen, Carly Voight and Sarah Foltz Jordan, The Xerces Society  
September 30, 2011**

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## **I. Introduction**

Surveys for the rare marsh walker, *Pomatiopsis chacei*, were conducted in August of 2010 by Celeste Mazzacano (Xerces Society) as part of a larger survey effort to map the habitat utilized by the Siuslaw hairy-necked tiger beetle (*Cicindela hirticollis siuslawensis*); tiger beetle survey results are reported elsewhere. Since the potential habitat for *P. chacei* is much broader than the potential habitat for *C. h. siuslawensis*, an additional survey was conducted in August of 2011 that specifically targeted *P. chacei*. Surveys in 2011 were conducted by Sarina Jepsen and Carly Voight (Xerces Society). All mollusk identification work was done by Ed Johannes of Deixis consultants. Initial records and survey protocols were collected and a map of the suspected distribution for this species was created by Sarah Foltz Jordan (Xerces Society) for the ISSSSP. Carly Voight created all other maps in this report. All photographs in this report were taken by Carly Voight and Celeste Mazzacano.

*Pomatiopsis chacei* was not observed or collected at any sites during the survey period. However, three new species of snails were collected during this survey. Two of the new species [*Juga (Juga) n. sp.* and *Vespericola n. sp. A.*] were collected from the Siuslaw and Siskiyou National Forests, respectively. The third new species [*Juga (Oreobasis) n. sp.*] was collected on non-federal land from a spring (Hunter Creek Site 3 – Spring 1) approximately 1.8 miles from BLM land. In addition, a juvenile snail in the genus *Helminthoglypta* was collected from the same spring on non-federal land. It is possible that the Oregon Sensitive species *Helminthoglypta hertleini* exists at this spring, since that species occurs in the general survey area. However, because the *Helminthoglypta* specimen that was collected was a juvenile, it was not possible to identify it to species. The invasive New Zealand mudsnail (*Potamopyrgus antipodarum*) was detected at two sites in New River, one of which occurs on BLM land (within the New River ACEC).

## **II. Survey Protocol**

### **Site selection**

Prior to commencing surveys, habitat associations and collection localities were reviewed for *P. chacei* and other western species of *Pomatiopsis* (Berry 1947, Chace and Chace 1967, Global Biodiversity Information Facility no date, and Taylor 1981). Collections of *Pomatiopsis* made by Frest and Johannes in Oregon were unfortunately not obtained until after the Xerces Society survey effort was completed (see Appendix I for a list of Oregon *Pomatiopsis* collections by Frest and Johannes; also see Frest and Johannes 1999).

Surveys in 2010 were conducted on USFS and BLM land at sites near the Pacific Ocean that were already being surveyed for the Siuslaw hairy-necked tiger beetle (*Cicindela hirticollis siuslawensis*). Survey locations in 2011 were selected in consultation with S. Messerle and J. Guetterman of the Coos Bay BLM. Suitable habitat on BLM or USFS land that was in close proximity to the historic *P. chacei* collection at Sixes River (Chace and Chace 1967) was prioritized. In general, sites were only considered that were within 6 miles from the Pacific Ocean, because historic collections of *P. chacei* in California have all been near the coast. Surveyors relied heavily on maps obtained from the BLM including 1) springs on BLM and USFS land and 2) collection sites for the southern torrent

salamander (*Rhyacotriton variegatus*). J. Guetterman of the BLM suggested that *P. chacei* habitat may be very similar to that of the southern torrent salamander, which relies on forested seeps and headwater springs in coastal northern California and southern Oregon (Tait and Diller 2006, Nussbaum and Tait 1977). Thus, a map of southern torrent salamander sites in southern Oregon was provided by the BLM and habitat near some of those sites was surveyed for *P. chacei*.

### **Survey method**

conducted in August of 2010 by Celeste Mazzacano (Xerces Society) as part of a larger survey effort to map the habitat utilized by the Siuslaw hairy-necked tiger beetle (*Cicindela hirticollis siuslawensis*)

Surveys conducted in August 2010 by Celeste Mazzacano were incidental; she looked for gastropods at the edges of water bodies that she encountered. Surveys conducted in August of 2011 specifically targeted *P. chacei*. The survey method for the 2011 surveys is as follows: once survey sites and areas with key habitat features were identified, Jepsen and Voight drove to the sites and would stop when a key habitat feature, such as a spring, seep, marsh, or small creek was spotted. Surveyors looked for gastropods on the undersides of rocks, dead wood and at the base of vegetation in areas with persistent high humidity. If 10-20 minutes was spent at a site without finding any gastropods, then surveyors left the site to search for a new location. A Garmin Rino GPS unit was used to obtain geographic coordinates for each site surveyed. When mollusks were observed, shells and live specimens were collected in vials with 70% ethanol and later mailed to Ed Johannes for identification.

This methodology copied below was used to conduct surveys for *P. chacei*; was prepared by Sarah Foltz Jordan for the ISSSSP (Foltz 2009):

Please refer to the following documents for detailed mollusk survey methodology:

1. General collection and monitoring methods for both aquatic and terrestrial mollusks (pages 64-71):

Frest, T.J. and E.J. Johannes. 1995. Interior Columbia Basin mollusk species of special concern. Final report: Interior Columbia Basin Ecosystem Management Project, Walla Walla, WA. Contract #43-0E00-4-9112. 274 pp. plus appendices.

2. Standard survey methodology that can be used by field personnel to determine presence/absence of aquatic mollusk species in a given waterbody, and to document species locations and habitats in a consistent format:

Duncan, N. 2008. Survey Protocol for Aquatic Mollusk Species: Preliminary Inventory and Presence/Absence Sampling. Version 3.1. Portland, OR. Interagency Special Status/Sensitive Species Program. U.S. Department of Interior, Bureau of Land Management, Oregon/Washington and U.S. Department of Agriculture, Forest Service, Region 6. 52 pp.

[Available at: <http://www.fs.fed.us/r6/sfpnw/issssp/species-index/fauna-invertebrates.shtml>].

3. Pre-disturbance surveys for terrestrial mollusk species, the objective of which is to establish whether a specific mollusk is present in proposed project areas with a reasonable level of confidence, and to document known sites discovered during surveys:

Duncan, N., Burke, T., Dowlan, S. and P. Hohenlohe. 2003. Survey protocol for survey and manage terrestrial mollusk species from the Northwest Forest Plan. Version 3.0. U.S. Department of Interior, Bureau of Land Management, Oregon/Washington and U.S. Department of Agriculture, Forest Service, Region 6, U.S. Fish and Wildlife Service. 70 pp. [Available on ISSSSP intranet site].

Species-specific survey details, including:

1. Identification features
2. Historic and current distribution
3. Federal Units where species is suspected or documented
4. Areas where surveys are recommended
5. Habitat where surveys should take place
6. Commonly associated mollusk species
7. General survey method and instructions (e.g. time of year)

*Pomatiopsis chacei* (Marsh Walker)

*Pomatiopsis* is a genus of very small, semi-aquatic snails in the family Pomatiopsidae, a group of gilled freshwater snails with opercula in the order Prosobranchia. Although *Pomatiopsis chacei* has been used as a synonym for *Pomatiopsis californica* at sites in the northern portion of California and in Oregon, more recent treatments recognize *P. chacei* as a distinct taxon from *P. californica* (Frest and Johannes 1999). This species is similar to *P. californica* but brownish-olive, more slender, and with microscopic spiral striation which is most visible on the last whorl. The shell is high conical (height 4 to 4.2 mm), with 6 to 8 deeply and evenly convex whorls (Frest and Johannes 1999). This species is illustrated on the cover of the 1999 Frest and Johannes report, "Mollusk survey of southwestern Oregon, with emphasis on the Rogue and Umpqua River drainages." If identified specimens are needed for comparison, the Harvard University Museum of Comparative Zoology holds ten specimens of this species (from California), while the California Academy of Sciences holds specimens of *Pomatiopsis californica*.

The type locality for this rare species is six miles north of Klamath, Del Norte County, California, on Hwy. 101. It has also been found in Humboldt County, California (Frest and Johannes 2000, Deixis MolluscDB 2009). There is one historical record of this species at Sixes River in Curry County, Oregon (Chace and Chace 1967). Although T. Frest and E. Johannes did not find this species during any of their extensive survey work in Oregon, Frest believed that, based on the presence of closely related *Pomatiopsis* species, *P. chacei* probably occurred along the coast in southwestern Oregon as

far north as Tillamook County (Frest and Johannes 1999, Johannes 2009, *pers. comm.*). The most likely area of occurrence for this scarce taxon is believed to be the lower western Coast Range, possibly including the Coast proper, north to Curry County, Oregon (Frest and Johannes 1999, Johannes 2009, *pers. comm.*). The species is suspected on BLM land in the Coos Bay District, and on the Siskiyou National Forest. Surveys in a narrow region along the Oregon coast are strongly recommended (Johannes 2009, *pers. comm.*).

The habitat for this species is described as shaded, swampy sites and margins of seeps, springs, stable streams and similar areas with fresh water and persistent high humidity (Frest and Johannes 1999). The Humboldt County, California site (elevation: 12.2 m (40 ft.)) was described as seeps and springs with gravel substrate (schist), with *Mimulus*, *Equisetum*, *Rorippa* present, and a dense cover of *Sambucus* and *Salix* (Deixis MolluscDB 2009).

This very rare species is typically hand collected from the edges of spring runs (Deixis MolluscDB 2009). Surveys are recommended in spring, summer, and fall (*i.e.* when the temperature is above freezing) (Johannes 2009, *pers. comm.*).

### **Identification**

In preparation for these surveys, it became apparent that the marsh walker (*Pomatiopsis chacei*) looks remarkably similar to the invasive New Zealand mudsnail (*Potamopyrgus antipodarum*), which has already been documented in freshwater habitats on the southern Oregon coast. The primary differences between the two species are: 1) the marsh walker will be found in semi-aquatic habitats, whereas the New Zealand mudsnail will be found in entirely aquatic habitats, and 2) the marsh walker has microscopic spiral striation on the last whorl. See table 1 for a comparison of identification characteristics of these two species.

**Table 1.** Comparison of identification characteristics for *Pomatiopsis chacei* and *Potamopyrgus antipodarum*.

<b>Character</b>	<b><i>Pomatiopsis chacei</i></b>	<b><i>Potamopyrgus antipodarum</i></b>
Size	4-4.2 mm	Average 5 mm
Operculum	Yes	Yes- thin and corneous with an off-center nucleus from which paucispiral markings (with few coils) radiate.
Aperture	<i>Pomatiopsis californica</i> : aperture thin, definitely adnate	Oval; its height is less than the height of the spire
shell shape	High conical	elongated
shell features	<b>Microscopic spiral striation (most visible on the last whorl)</b>	Some morphs exhibit periostracal ornamentation such as spines for anti-predator defense
coiling direction	Dextral	dextral
Whorls	6-8 deeply and evenly convex whorls	7-8 whorls with deep grooves between whorls
Color	Brownish olive	Varies from gray to dark brown to light

		brown
Gilled	Yes	yes
Key to family	<p>Order Prosobranchia; Family Pomatiopsidae; Genus Pomatiopsis (key to family &amp; genus)</p> <p>Shell coiled; Shell with raised spire; Shell dextral; Shell without teeth on parietal wall, operculum present or absent; Spire longer; Shell stronger; operculum and gills present; Operculum multispiral or paucispiral, outer margins not concentric; Adults less than 7 mm; Males possess verge (penis) behind right tentacle; <b>Spire high, head-foot region divided on each side by longitudinal groove; eyes in prominent swellings on the outer bases of the tentacles; amphibious or terrestrial; crawls with steplike movement....</b>Family Pomatiopsidae....<i>Pomatiopsis</i> (Brown 2001)</p>	<p>Order Neotaenioglossa; Family Hydrobiidae; Genus Potamopyrgus (key to family only):</p> <p>Shell coiled; Shell with raised spire; Shell dextral; Shell without teeth on parietal wall, operculum present or absent; Spire longer; Shell stronger; operculum and gills present; Operculum multispiral or paucispiral, outer margins not concentric; Adults less than 7 mm; Males possess verge (penis) behind right tentacle; <b>Shell length variable; head-foot region not divided; eyes at same location (as Pomatiopsidae) but not on prominent swellings; totally aquatic....</b>Family Hydrobiidae (Brown 2001)</p>
Habitat	<p><b>Semi-aquatic;</b> found at shaded, swampy sites and margins of seeps, springs, stable streams and similar areas with fresh water and persistent high humidity. Humboldt, CA site described as seeps and springs with gravel substrate (schist) with <i>Mimulus</i> (monkey-flower), <i>Equisetum</i> (horsetail), <i>Rorippa</i> present, and a dense cover of <i>Sambucus</i> (elderberry) and <i>Salix</i> (willow). The similar <i>Pomatiopsis californica</i> is frequently found among wet leaf litter and vegetation beside flowing or standing water.</p>	<p><b>Aquatic;</b> found in disturbed watersheds (tolerates siltation &amp; high nutrients that allow filamentous green algae growth); prefers littoral zones in lakes or slow streams with silt and organic matter substrates, but tolerates high flow environments where it can burrow into the sediment; occupies fresh and brackish water.</p>
Photos / illustration	 <p>Illustration from Chace and Chace 1967</p>	 <p>Photos from Dmitry P. Filippenko &amp; Mikhail O. Son;</p> <p><a href="http://seagrant.wisc.edu/Home/Topics/InvasiveSpecies/Details.aspx?PostID=656">http://seagrant.wisc.edu/Home/Topics/InvasiveSpecies/Details.aspx?PostID=656</a></p>

### III. Sites Surveyed and Survey Results

All sites visited in 2011 were surveyed by Sarina Jepsen and Carly Voight (Xerces). All sites visited in 2010 were surveyed by Celeste Mazzacano (Xerces). All mollusk specimens were identified by Ed Johannes (Deixis). All photographs in this report were taken by Carly Voight and Celeste Mazzacano. Below is a summary (Table 2) of sites visited and species collected, followed by maps of survey sites and additional information for each site visited.

**Table 2.** Summary of sites visited and species collected.

Site Name	Land ownership	County	Species collected	# of specimens	Date surveyed
Sutton Creek 1 – SUT 5	USFS	Lane	<i>Physella gyrina</i>	1	9-Aug-2010
Sutton Creek 2 – SUT 7	USFS	Lane	<i>Juga (Juga) n. sp.</i>	5	9-Aug-2010
Tenmile Creek – TM4	USFS	Coos	<i>Physella gyrina</i> (1 damaged)	2	10-Aug-2010
Lost Lake	BLM	Coos	<i>Pisidium casertanum</i>	3	11-Aug-2011
			<i>Menetus opercularis</i> (juv.)	1	
Lost Lake Marsh	BLM	Coos	<i>Planorbella subcrenatum</i>	3	13-Aug-2011
			<i>Physella gyrina</i>	10	
			<i>Planorbella subcrenatum</i>	11	
			<i>Ferrissia californica</i>	6	
			<i>Menetus opercularis</i>	6	
Muddy Lake	BLM	Coos	No mollusks collected	—	11-Aug-2011
New River 1	BLM	Curry	<i>Potamopyrgus antipodarum</i>	5	20-Aug-2010
New River 2 – NR5	Other	Curry	<i>Physella gyrina</i> (mature)	2	17-Aug-2010
Sixes River 1	OPRD	Curry	No mollusks collected		30-Jun-2011
Sixes River 2 – Marsh	OPRD	Curry	<i>Vespericola n. sp. A?</i> (tooth absent)	1	13-Aug-2011
Elk River Road	USFS	Curry	<i>Vespericola n. sp. A</i>	5	13-Aug-2011
Salal Spring	BLM	Curry	No mollusks collected	—	13-Aug-2011
Hunter Creek 1 – Rd 368-1	USFS	Curry	No mollusks collected	—	12-Aug-2011
Hunter Creek 2 - Confluence	Other	Curry	No mollusks collected	—	12-Aug-2011
Hunter Creek 3 – Spring 1	Other	Curry	<i>Juga (Oreobasis) n. sp.</i>	18	12-Aug-2011
			<i>Vespericola n. sp. A</i>	2	
			<i>Helminthoglypta sp.</i> (juvenile)	1	
			<i>Ancotrema? sp.</i> (juvenile)	1	
			<i>Vespericola sp.</i> (juveniles)	2	
Hunter Creek 4 – Spring 2	Other	Curry	<i>Ancotrema vancouverense</i>	1	12-Aug-2011
			No mollusks collected	—	
NF Chetco 1	BLM	Curry	No mollusks collected	—	12-Aug-2011
NF Chetco 2	BLM	Curry			12-Aug-2011

A map of the suspected distribution of *P. chacei* and the only known record of this species from Oregon is below. In addition, maps of all sites surveyed are displayed below. Individual site maps can be found in Appendix II.

**Figure 1.** Historic record of *P. chacei* from ‘Sixes River’ and suspected distribution of the species in Oregon. The distribution polygon for this species was drawn with the assistance of regional gastropod expert, Ed Johannes. Although this species is most frequently encountered in California, there is one historical record at Sixes River in Curry County, Oregon (Chace and Chace 1967).

## *Pomatiopsis chacei*

- Known Records
- Suspected Distribution
- Bureau of Land Management
- National Forest

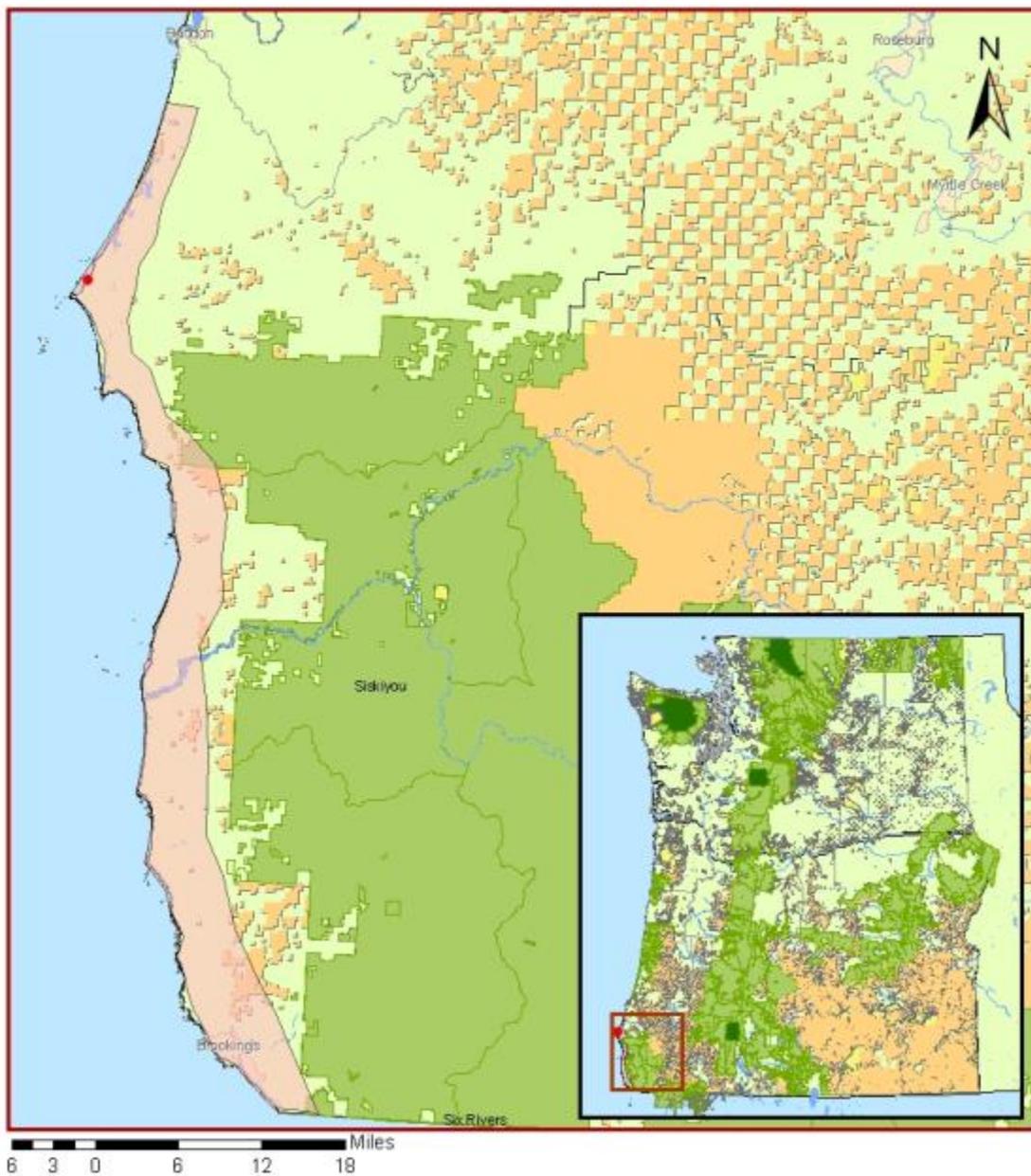


Figure 2. Map of all sites surveyed for *Pomatiopsis chacei* in 2010 and 2011.

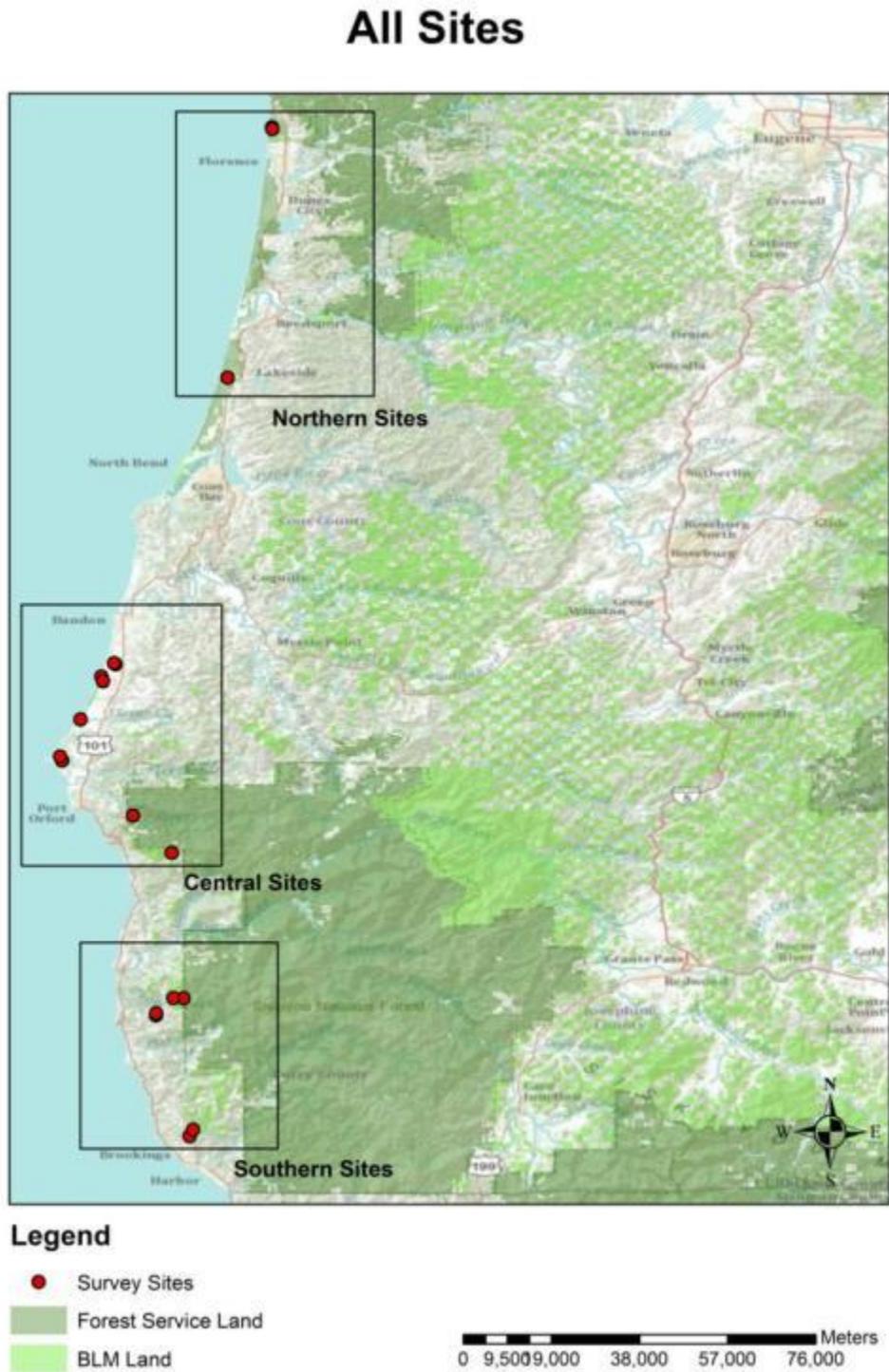




Figure 4. Close up map of central sites surveyed for *Pomatiopsis chacei*.

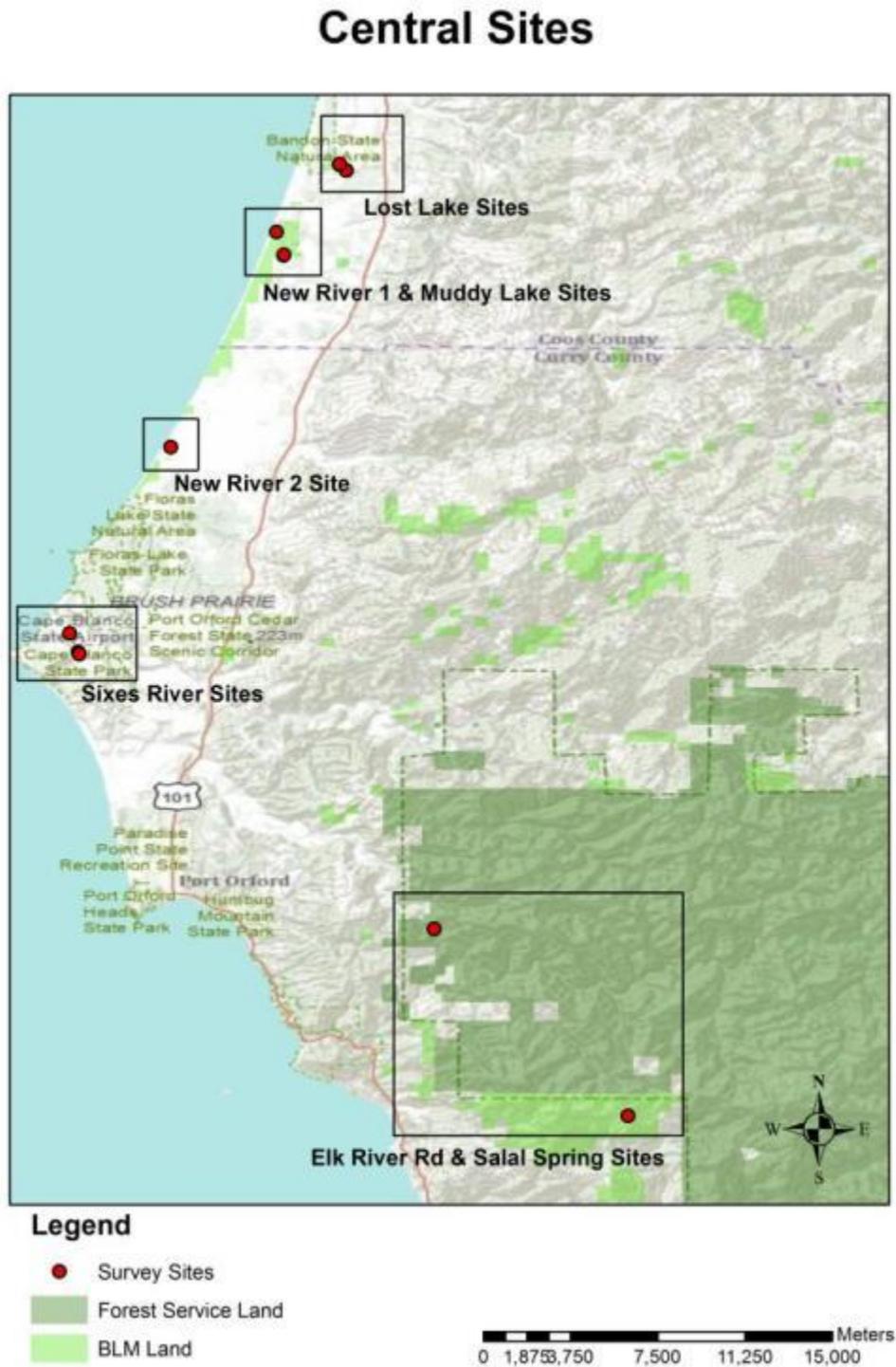
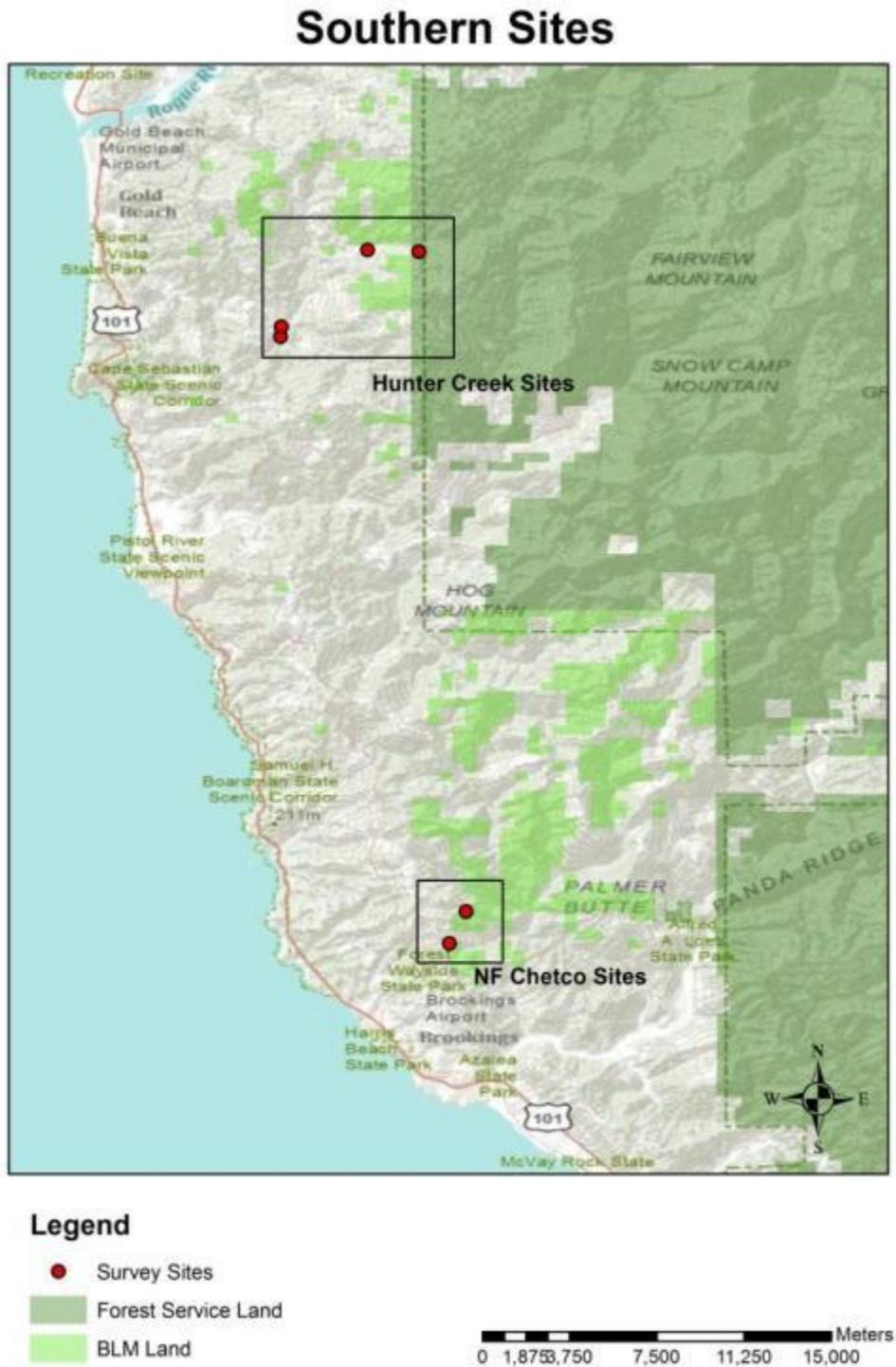


Figure 5. Close up map of southern sites surveyed for *Pomatiopsis chacei*.



## Sutton Creek



Photo of Site 1 (SUT 5) and Site 2 (SUT 7)

### ***Site 1 - SUT 5***

This Sutton Creek site is on USFS land, within the Siuslaw National Forest. Celeste Mazzacano collected gastropods at this site on August 9, 2010, while conducting tiger beetle surveys. Mazzacano surveyed along Sutton Creek for approximately 485 feet, around a curve in the stream.

### ***Site 2 - SUT 7***

This Sutton Creek site is on USFS land, within the Siuslaw National Forest. Celeste Mazzacano surveyed this site on August 9, 2010 and collected gastropods while conducting tiger beetle surveys. She followed the creek south for approximately 200 feet. A new species of snail [*Juga (Juga) n. sp.*] was collected from this site.

## Tenmile Creek



This site on Tenmile Creek is on USFS land, within the Siuslaw National Forest. Celeste Mazzacano conducted surveys at this site on August 10, 2010 in conjunction with tiger beetle surveys. The survey area runs 480 feet south along the creek. This site was along the inland/upstream portion of Tenmile Creek (not at the beach outflow). Numerous *Juga* snails were observed but not collected.

## Lost Lake



### ***Site 1 - Lost Lake***

Sarina Jepsen and Carly Voight surveyed Site 1 at Lost Lake on August 11, 2011. This site is on BLM land. Jepsen and Voight examined the undersides of damp decaying logs and vegetation along the edges of the lake.

### ***Site 2 - Lost Lake Marsh***



Site 2 – Lost Lake Marsh is primarily on BLM land, although part of the area surveyed spilled onto non-federal land. Sarina Jepsen and Carly Voight surveyed a marshy area at the northwestern edge of Lost Lake on August 13, 2011. Jepsen and Voight chose this area to survey because it corresponded with a cluster of springs on a GIS spring layer from the BLM. There was abundant standing water at this site with *Juncus*, *Carex*, alder, nonnative clover, asters, water plantain, duckweed, fern, water lilies, and cattails. Surveyors examined vegetation at the water's edge and in shallow water. Numerous mollusks were observed and collected. Leeches were also observed, but not collected.

### **Muddy Lake**



The portion of Muddy Lake surveyed is on BLM land. Sarina Jepsen and Carly Voight surveyed this site on August 11, 2011. Access was from the trail at New River Education Center. Surveyors examined the north edge of the lake because that portion is on BLM land. They looked under dead branches, in moist vegetation, and on decaying leaf matter within the stagnant water at the edge of the lake. No mollusks were observed.

### **New River**

#### ***Site 1 - New River***



Celeste Mazzacano surveyed this site on August 20, 2010 while conducting surveys for the Siuslaw hairy-necked tiger beetle (*Cicindela hirticollis siuslawensis*). This was the south end of the "gap" area north of the ACEC boat launch that we surveyed for the first time in 2010; survey area runs south from coordinate point about 350 ft.

### **Site 2 – NR5**



Site 2 – NR5 is on non-federal land, approximately 0.4 miles from BLM land. This survey was conducted at ‘Breach 5’ on New River and is sandwiched between BLM land. Celeste Mazzacano surveyed this site on August 17, 2010 while conducting surveys for the Siuslaw hairy-necked tiger beetle (*Cicindela hirticollis siuslawensis*). The survey area runs South/SE approximately 640 feet along a fairly linear part of New River. Most of the river in this area is carpeted with the

New Zealand mudsnail (*Potamopyrgus antipodarum*). Since New Zealand mudsnails were collected at Site 1 on New River, they were not collected again at this site.

### **Sixes River**

#### **Site 1 – Sixes River**



Sarina Jepsen surveyed this site, which is owned by Oregon Parks and Recreation District, on June 30, 2011. This site was surveyed because the only known record of *Pomatiopsis chacei* in Oregon is from the vague locality of ‘Sixes River’ (Chace and Chace 1967). Jepsen surveyed the bank of Sixes River approximately 1/4 mile inland from the Pacific Ocean. Access was from the turnoff to the historic Hughes house in Cape Blanco State Park. No mollusks were observed or collected at

this site.

#### **Site 2 – Sixes Marsh**



Sarina Jepsen and Carly Voight surveyed this site, which is owned by Oregon Parks and Recreation District, on August 13, 2011. This site is very close to Site 1 – Sixes River. The marsh adjacent to Sixes River was also chosen as a survey area because the BLM spring layer indicated that there was a spring in this area, and it was surmised that the marsh may represent the actual historic collection locality of the marsh walker (*P. chacei*) at Sixes River (Chace and Chace 1967). Jepsen

and Voight surveyed two locations within ‘Site 2 – Sixes Marsh’. The first location consisted of a transect survey along a small creek that flows into Sixes River (pictured above); reed canary grass dominates this site. The new species [*Vespericola n. sp. A?* (tooth absent)] was collected from the bank of the small creek, right next to the culvert in the photograph (above, left). Jepsen and Voight

also surveyed a nearby second location within 'Site 2 – Sixes Marsh' with standing water and abundant sedges, horsetail, and rushes. No mollusks were observed at the second location.

### **Elk River Road**



Sarina Jepsen and Carly Voight surveyed this site on USFS land on August 13, 2011. Jepsen and Voight surveyed a seep on the side of Elk River Rd. Water was dripping from the soil. They searched under rocks and in dead leaves. This site is less than 1/4 mile from the fish hatchery on Elk River Rd/ Rd. 5325. The new species *Vespericola n. sp.* A was collected from this site.

### **Salal Spring**



observed.

Sarina Jepsen and Carly Voight surveyed this site on BLM land on August 13, 2011. Jepsen and Voight looked for snails on the moist undersides of logs and at the base of damp vegetation. There was abundant *Carex*, wild ginger, salal, and fern, and there was some *Mimulus*, bedstraw, and mosses. This was a shaded site, surrounded by Douglas fir. There was no standing water, although the ground was damp and there appeared to have been standing water recently. No mollusks were

### **Hunter Creek**

#### ***Site 1 – Rd 368-1***



Sarina Jepsen and Carly Voight surveyed this site on USFS land on August 12, 2011. This site consisted of a dried out seep on the edge of the road with sedges, moss, and cobble. The road is on the edge of a steep ravine with Hunter Creek below. Jepsen and Voight searched for gastropods underneath rocks. No mollusks were observed.

### **Site 2 – confluence**



Sarina Jepsen and Carly Voight surveyed this site on August 12, 2011. The surveyors believed to be on or near federal land while conducting the survey. The surveyors later realized that they were 0.14 miles from USFS land. This site is where a small tributary flows into Hunter Creek. Jepsen and Voight surveyed among wet leaves at the edges of Hunter Creek and the tributary and in damp areas under rocks. No mollusks were observed. Fir, maple, blackberry, and maidenhair fern

were present. The tributary and creek had a rock and cobble substrate. Stoneflies and mayflies were observed but not collected.

### **Site 3 – Spring 1**



Sarina Jepsen and Carly Voight surveyed this site on August 12, 2011. Although this spring is not on federally owned land, it was encountered while driving to a potential site on BLM land. It is approximately 1.8 miles from BLM land. Since it looked like excellent snail habitat and appeared to match the habitat description for *P. chacei*, a quick survey was conducted. Data from this site is included in this report because two new species were found at this site. This site consists of a small spring /

seep on the edge of Hunter Creek Rd (County road 665). The south fork of little Hunter Creek is on the other side of road; just past Metzgas Creek. Plants present include: horsetail, fern, thimbleberry, alder, sedge, unidentified grasses, and maidenhair fern. Large gravel and cobble with moss is present. Numerous mollusks were observed and collected, including two new species [*Juga (Oreobasis) n. sp.* and *Vespericola n. sp. A*]. In addition, a juvenile *Helminthoglypta sp.* was collected from this site. *Helminthoglypta hertleini*, an OR-SEN species, is known from this general area, although this specimen could not be identified to species due to its young age. Many caddisflies, isopods and leeches were also observed but not collected.

### **Site 4 – Spring 2**



Sarina Jepsen and Carly Voight surveyed this spring on August 12, 2011. It is very close to Site 3 – Spring 1. Although this spring is not on federally owned land, it was encountered while driving to a potential site on BLM land. This site is approximately 1.6 miles from BLM land. Because it looked like excellent snail habitat and

appeared to match the habitat description for *P. chacei*, a quick survey was conducted. This site consisted of a small spring with horsetail, alder, fern, aster, unidentified grasses, *Mimulus*, and thimbleberry. Large boulders and cobble were present. Surveyors searched underneath and among the rocks for gastropods and collected all that were observed.

## **NF Chetco**

### ***Site 1***



This site on BLM land was visited by Sarina Jepsen and Carly Voight on August 12, 2011. The site consisted of two small creeks (both crossing Henderson Road / Road 40-14-25.0). Both creeks contained a small amount of water. Surveyors searched under rocks and in damp vegetation. No snails were observed; two banana slugs (*Ariolimax sp.*) were observed but not collected.

### ***Site 2***



This site on BLM land was visited by Sarina Jepsen and Carly Voight on August 12, 2011. The site consisted of a dry creek bed along Henderson Road with horsetail, fir, and maple. Surveyors searched areas of high humidity and damp areas under rocks and among vegetation. No mollusks were observed.

#### **IV. Potential Future Survey Work**

Because the habitat description for *P. chacei* is so broad, only a small fraction of the potential habitat for this species in Oregon was surveyed. Future surveys to detect *P. chacei* could be conducted at additional springs, seeps and lagoons within 6-miles of the Pacific Ocean in Lane, Coos and Curry counties. In addition, sites where Frest and Johannes collected *Pomatiopsis* species could be revisited to look for *P. chacei* (detailed in Appendix I).

#### **V. Acknowledgements**

Funding for these surveys was provided by the Interagency Special Status / Sensitive Species Program (ISSSSP). We are very grateful to Ed Johannes who did the identification of all mollusks collected during this survey effort. He also provided information on historic collections of *Pomatiopsis* in the Deixis Mollusk Database and consulted with Sarah Foltz Jordan about the suspected distribution of this species in Oregon. Stephanie Messerle and John Guetterman of the Coos Bay BLM kindly provided maps, shapefiles, advice on site selection and assistance with site access.

A special thanks is extended to the BLM New River Education Center, which greatly facilitated the 2010 New River surveys by generously allowing Xerces staff to use their kayaks and bunkhouse.

The Xerces Society also greatly appreciates the assistance of the following individuals:

Eleanor Gaines (ORBIC)—Kelli VanNorman (BLM)—Carol Hughes (USFS)—Dave Lauten & Kathy Castelein (ORBIC)—Kip Wright (BLM)—Heather Lester (BLM)—Cindy Burns (USFS)—Laura Todd (USFWS)—Kerrie Palermo (BLM)—Liz Kelly (USFWS)—Kim Garner (USFWS).

#### **VI. References Cited**

Berry, E.G. 1947. On Collecting *Pomatiopsis chacei* in northern California. *Minutes of the Conchological Club of Southern California* vol. 73.

Brown, K.M. 2001. Chapter 10. Mollusca: Gastropoda. *In Ecology and Classification of North American Freshwater Invertebrates*. 2<sup>nd</sup> Edition. [Eds.] Thorp & Covich. Academic Press

Burch, J.B. 1989. *North American Freshwater Snails*. Hamburg, Michigan. 365 pp.

Chace, E.P. and E.M. Chace. 1967. *Conchological reminiscences: Recollections of Emery P. Chace and Elsie M. Chace with the help of our notebooks*. San Diego, California, privately published. 38 pp.

Deixis collection. 2011. An unpublished collection of mollusk records maintained by Ed Johannes.

Duncan, N., Burke, T., Dowlan, S., and P. Hohenlohe. 2003. Survey protocol for survey and manage terrestrial mollusk species from the Northwest Forest Plan. Version 3.0 U.S. Department of Interior, Bureau of Land Management, Oregon / Washington and U.S. Department of Agriculture, Forest Service, Region 6, U.S. Fish and Wildlife Service. 70 pp. [Available on ISSSSP intranet site].

Foltz, S. 2009. Survey protocols for twenty strategic mollusk species from Washington and Oregon. Prepared for the Interagency Special Status / Sensitive Species Program (ISSSSP) by the Xerces Society for Invertebrate Conservation. Available by request from ISSSSP or the Xerces Society.

Frest, T.J. and E.J. Johannes. 1995. Interior Columbia Basin mollusk species of special concern. Final report: Interior Columbia Basin Ecosystem Management Project, Walla Walla, WA. Contract #43-0E00-4-9112. 274 pp. plus appendices.

Frest, T.J. and E.J. Johannes. 1999. Mollusk Survey of southwestern Oregon, with emphasis on the Rogue and Umpqua river drainages. Final report prepared for Oregon Natural Heritage Program, Portland, Oregon. Deixis Consultants, Seattle, Washington. 278 pp. plus appendices.

Global Biodiversity Information Facility. No date. Available online at: <http://data.gbif.org/> (last accessed 29 September 2011).

Nussbaum, R.A. and C.K. Tait. 1977. Aspects of the life history and ecology of the Olympic salamander, *Rhyacotriton olympicus* (Gaije). American Midland Naturalist 98(1): 176-199.

Tait, C.K. and L.V. Diller. 2006. Life history of the southern torrent salamander (*Rhyacotriton variegatus*) in coastal northern California. Journal of Herpetology 40(1):43-54.

Taylor, D.W. 1981. Freshwater mollusks of California: a distributional checklist. California Fish and Game 67 (3): 140-163.

**VII. Appendix I.** List of Oregon *Pomatiopsis* collections made by T. Frest and E. Johannes (Deixis Mollusk Database; *pers. comm.* with E. Johannes).

3351. Spring opposite Ocean Beach Picnic Area. Zone 10: 411,070E 4,893,340N. NE1/4 NE1/4 SW1/4 sec. 10, T16S R12W, Heceta Head 1984 quad., Lane Co., Oregon. Coast Range. Spring on E. side of US101 (Oregon Coast Highway) at MP 173.9, opposite Ocean Beach Picnic Area, Siuslaw National Forest. Elev. 110'. Depth 0-1". Very shallow spring flowing down a gentle slope; cobble substrate; horsetails and grasses; *Rorippa*. Spring not shown on USGS 7.5' map. *Lyogyrus* [now *Cologyrus*], *Pristinicola* and *Pomatiopsis* hand collected off cobbles. *Pomatiopsis* collected off wetted cobbles. 4/29/1998 TFEJ! *Pomatiopsis* collected off wetted cobbles. *Lyogyrus* and *Pristinicola* not recollected. 10/20/1999 TF, EJ!

*This site represents the furthest north that Pomatiopsis has been found.*

3358. Unnamed Twomile Road spring. Zone 10: 386,460E 4,766,730N. NE1/4 NW1/4 NW1/4 SW1/4 sec. 20, T29S R14W, Bandon 1970 quad., Coos Co., Oregon. Twomile Cr., Coast Range. N. side of Twomile Road (County 11) about 1.8 rd. mi. E. of US101 (Oregon Coast Highway) junction, N. side of Twomile Creek. Elev. 70'. Depth 0-1". Small, much modified muddy spring run with *Lysichitum*. Single juvenile *Pomatiopsis*; *Vertigo*. Hand collected. 5/1/1998 TF, EJ!

3484. Spring south of Deep Creek. Zone 10: 406,450E 4,652,060N. SE1/4 SW1/4 SE1/4 SW1/4 NW1/4 sec. 9, T41S R12W, Mt. Emily 1989 quad., Curry Co., Oregon. Winchuck R., Coast Range.

Spring on E. side of abandoned quarry, about 0.5 rd. mi. S. of Deep Creek on N. side of Winchuck River Road (Curry Co. 896). Elev. 120'. Depth 0-1". Spring with sand-cobble bottom (arkose cobbles); no macrophytes or algae; minor wood debris. Spring not shown on USGS 7.5' map. Pomatiopsis common; hand collected. 5/8/1998 TFEJ! Common Pomatiopsis hand collected off wetted cobbles. 10/23/1999 TFEJ!

3491. Seeps south of Big Redwood Creek. Zone 10: 405,960E 4,667,860N. NE1/4 NE1/4 NE1/4 NW1/4 SE1/4 sec. 20, T39S R12W, Bosley Butte 1989 quad., Curry Co., Oregon. Big Redwood Cr.-Chetco R., Coast Range. Seeps S. of Big Redwood Creek on E. side of FS1376, Siskiyou National Forest. Elev. 240'. Depth 0-2". Seeps; mud substrate; no macrophytes. Spring not shown on USGS 7.5' map. Juga (O.) n. sp. and Pomatiopsis binneyi hand collected. 5/9/1998 TFEJ!

3493. Redwood Creek east of FS1376. Zone 10: 405,509E 4,667,340N. NE1/4 SW1/4 NW1/4 SW1/4 SE1/4 sec. 20, T39S R12W, Bosley Butte 1989 quad., Curry Co., Oregon. Redwood Cr.-Chetco R., Coast Range. Redwood Creek E. of FS1376, N. of Little Redwood Campground, Siskiyou National Forest. Elev. 180'. Depth 0-2". Creek with mud-cobble substrate; no macrophytes. Juga (O.) n. sp. and Pomatiopsis binneyi hand collected. 5/9/1998 TF, EJ!

3499. Creek east of Miller Bar. Zone 10: 404,700E 4,665,480N. NW1/4 NE1/4 sec. 31, T39S R12W, Bosley Butte 1989 quad., Curry Co., Oregon. Unnamed Cr.-Chetco R., Coast Range. Unnamed creek on N. side of FS1376, 0.9 rd. mi. E. of FS1107 intersection, 0.6 mi. E. of Miller Bar, Siskiyou National Forest. Elev. 330'. Depth 0-2". Creek with mostly cobble substrate; no macrophytes. Juga (O.) n. sp. and Pomatiopsis binneyi hand collected. 5/9/1998 T, FEJ! Very rare Pomatiopsis hand collected. 10/24/1999 TF, EJ!

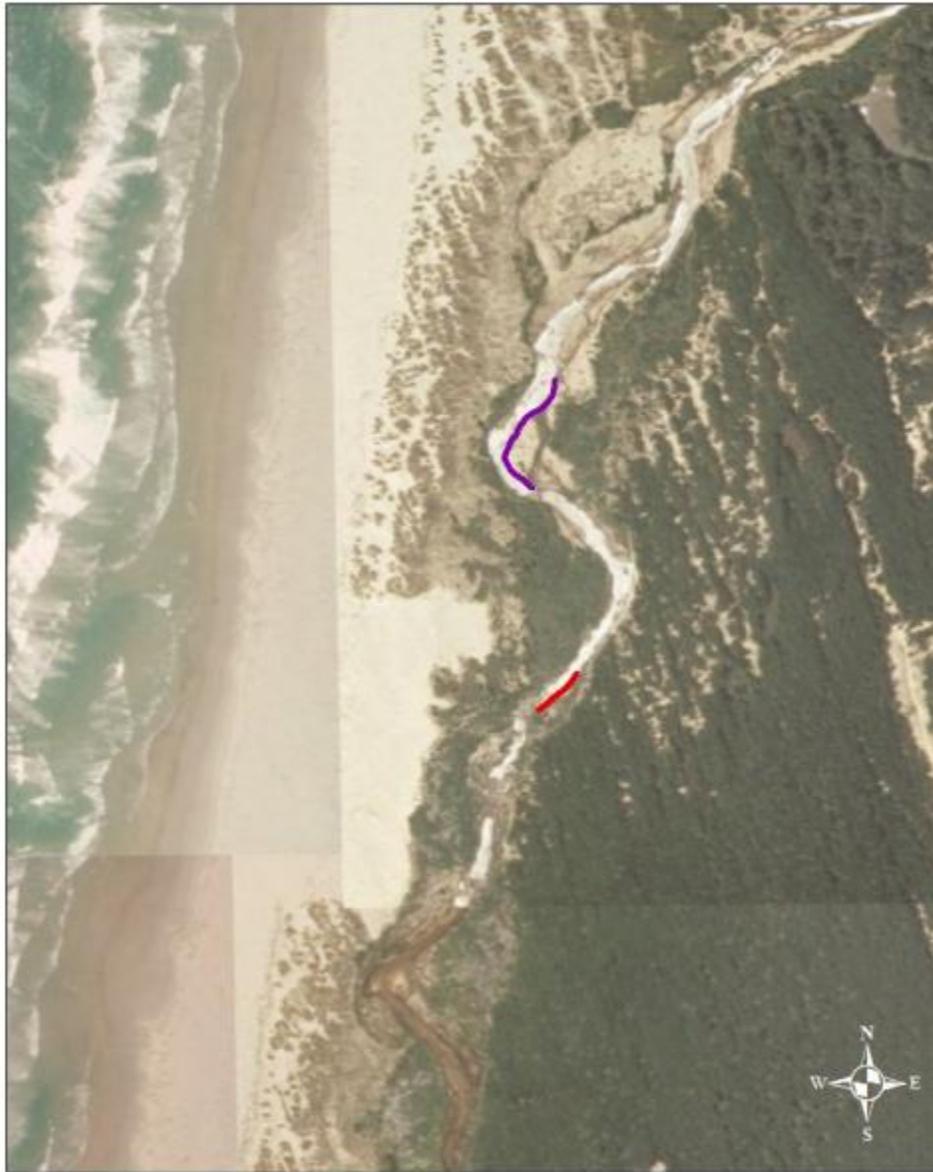
4369. Spring northeast of Allegany. Zone 10: 418,300E 4,809,640N. SW1/4 NW1/4 NW1/4 NE1/4 sec. 4, T25S R11W, Allegany 1971 quad., Coos Co., Oregon. E. Fk. Millicoma R.-Millicoma R.-Coos R., Coast Range. Spring on N. side of East Fork Millicoma Road at MP 17.1, 1.9 rd. mi. E. of bridge over Marlow Creek, 1.4 mi. NE of Allegany. Elev. 120'. Depth 0-1". Spring seep with mud-cobble substrate; Rorippa and very rare Mimulus. Spring not shown on USGS 7.5' map. Juga and Pomatiopsis hand collected. Pomatiopsis collected mostly off cobbles in wetted zone of seep. 10/21/1999 TF, EJ!

4383. Spring east of Nook Bar. Zone 10: 405,140E 4,666,360N. NW1/4 NW1/4 NW1/4 NE1/4 SW1/4 sec. 29, T39S R12W, Bosley 1989 quad., Curry Co., Oregon. Unnamed Cr.-Chetco R., Coast Range. Spring on SE side of FS1376 at MP 4.4, ca. 0.55 rd. mi. E. of road to Nook Bar, Siskiyou National Forest. Elev. 160'. Depth 0-1". Spring seep flowing down steep slope; cobble over bedrock; ditched along road with mud-cobble substrate; no macrophytes. Spring not shown on USGS 7.5' map. Juga (O.) and Pomatiopsis hand collected. Pomatiopsis on wetted cobbles. 10/24/1999 TF, EJ!

4555. Seeps north of Orick. NW1/4 NW1/4 NW1/4 SE1/4 NW1/4 sec. 34, T11N R1E, Orick 1966 quad., Humboldt Co., California. Unnamed Cr.-Redwood Cr. Seeps on W. side of US101 and Redwood Creek, ca. 0.05 rd. mi. S. of Bald Hill Road, N. of Orick. Elev. 40'. Seeps and springs; gravel substrate (schist); Mimulus, Equisetum, Rorippa; dense cover of Sambucus and Salix. Very rare Pomatiopsis hand collected from edge of spring run. 7/4/2000 TF, EJ!

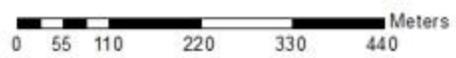
VIII. Appendix II: Maps of individual sites surveyed

## Sutton Creek Sites



### Legend

- Sutton Creek 1 – SUT 5
- Sutton Creek 2 – SUT 7

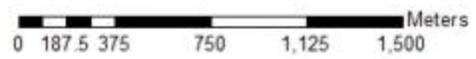


# Tenmile Creek Site



## Legend

 Tenmile Creek – TM4

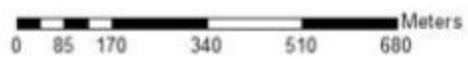


## Lost Lake and Lost Lake Marsh Sites



### Legend

- Lost Lake
- Lost Lake Marsh



## New River 1 and Muddy Lake Sites

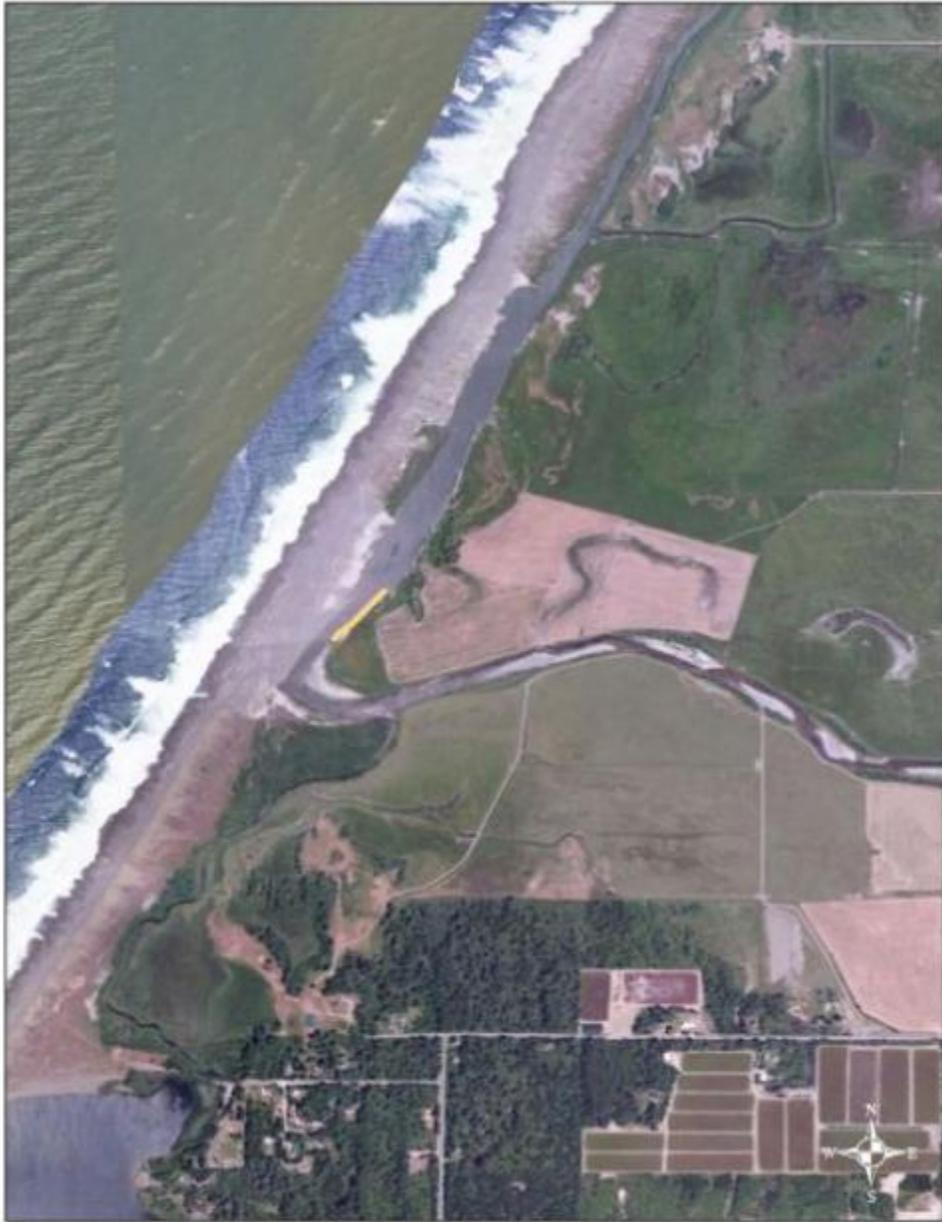


### Legend

- Muddy Lake
- New River 1

0 120 240 480 720 960 Meters

## New River 2 Site



### Legend

— New River 2 – NR5

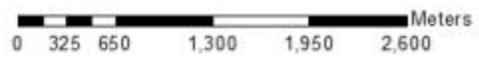
0 140 280 560 840 1,120 Meters

# Sixes River Sites



## Legend

- Sixes River 1
- Sixes River 2 - Marsh
- Sixes River 2 - Marsh

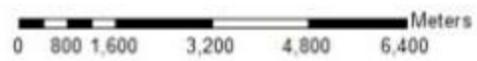


## Elk River Road and Salal Spring Sites



### Legend

- Elk River Road
- Salal Spring

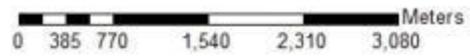


# Hunter Creek Sites

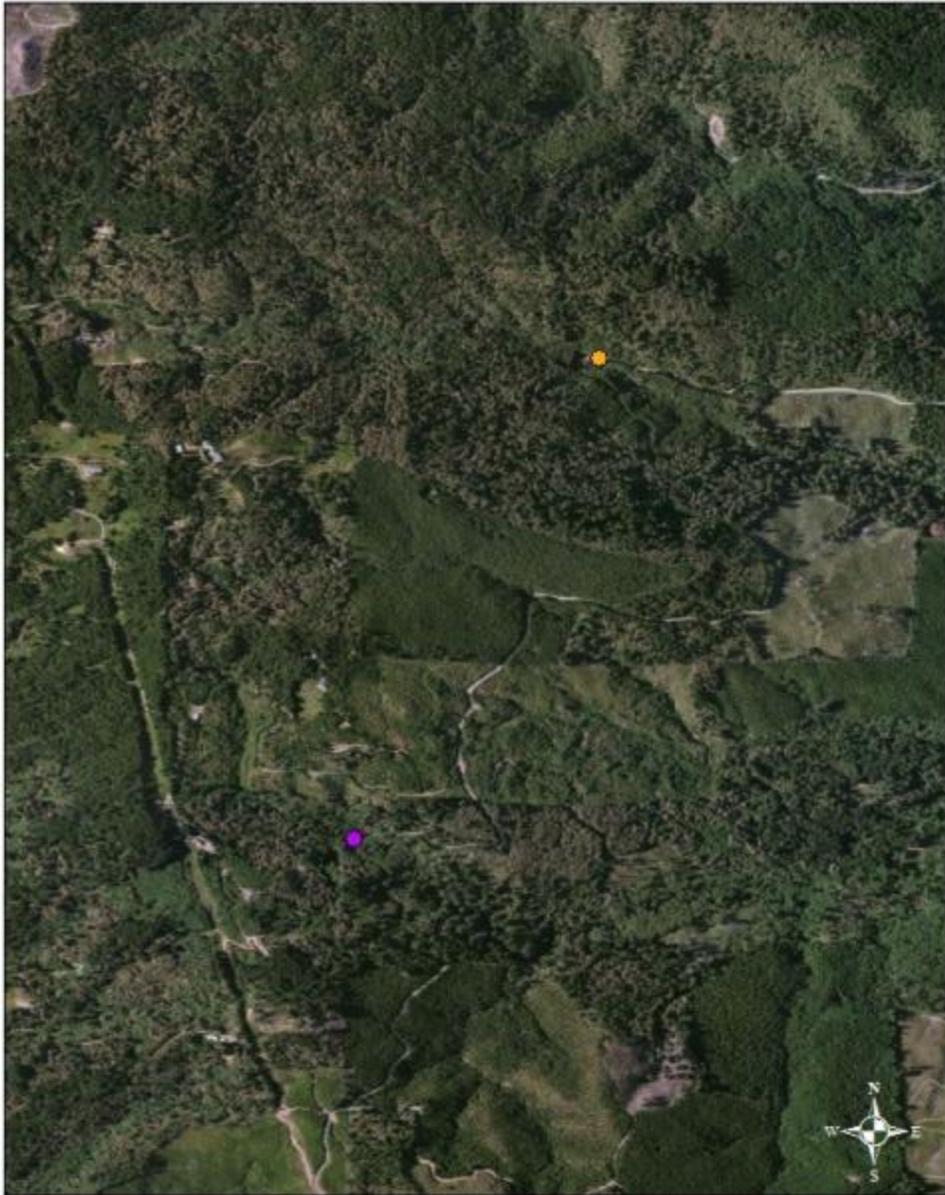


## Legend

- Hunter Creek 1 – Rd 368-1
- Hunter Creek 2 - Confluence
- Hunter Creek 3 – Spring 1
- Hunter Creek 4 – Spring 2



# NF Chetco Sites



## Legend

- NF Chetco 1
- NF Chetco 2

0 137.5 275 550 825 1,100 Meters