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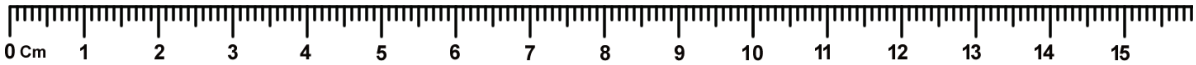
OREGON DEPARTMENT OF AGRICULTURE GUIDES

Slugs and Snails in Oregon

A guide to common land molluscs and their relatives

Joshua Vlach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The terrestrial molluscs of Oregon

There are 124 species of terrestrial molluscs (slugs and snails) in Oregon. Except for the beloved banana slug, most native snails and slugs go unnoticed as they feed on plants, fungi, or an array of decaying organic material. A few are predators. Their alien nature can be fascinating — legless hermaphrodites, love darts, tails that can be lost like a lizard's, and plenty of mucus.

Due to western Oregon's fame as excellent slug and snail habitat, most people don't realize that a huge proportion of our fauna is exotic (mostly introduced from other continents, but a few are from eastern North America). Twenty-eight of Oregon's species (22%) are exotic, which includes all of our pest species. Of 29 species of slug, 15 are exotic, which is pretty incredible when you consider the concern there would be if over half of our bird species were non-native!

How to use this guide

This guide is designed to help identify the most commonly encountered slugs and snails in Oregon. Where possible, species are identified. The intent is to enable picture-based identification, but there is also an identification guide starting on page 4. For each genus or species, a brief description is provided that includes information about size, pest status, and whether it is native or exotic. Exotics will be indicated by ☹ . Keep in mind that only 20 of Oregon's 62 known genera are included. If you look more intensively in natural areas or at small (5mm or less) snails, you will likely encounter species not covered here. Also be aware that snail and slug identification can be difficult and many species can only be confidently identified by differences in genitalia (requiring dissection).

When pests are known that are not yet established in Oregon, but are similar to others in the guide, identification information is provided when possible. For some species, we request that you save the specimen and contact the Oregon Department of Agriculture (ODA, see below).

Oregon Department of Agriculture
Insect Pest Prevention and Management
gypsymoth@oda.state.or.us
503-986-4636

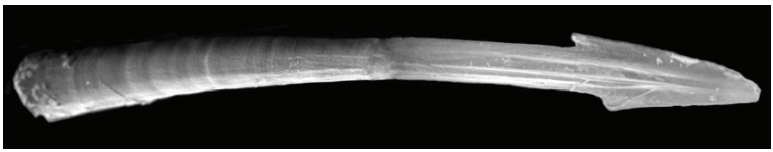
Behavior

Most people notice slugs and snails when they damage garden plants or because they are large and cross their path. However, there is considerable diversity both in form and behavior of terrestrial molluscs in Oregon. For example, most native species do little or no damage to plants and many are quite small.

Many slugs and snails have a homing behavior. They typically have a refuge to which they return to each day. Most are active at night, although many species can be active on wet, cloudy days.

Slugs and snails are hermaphrodites (they have both male and female genitalia). Some species can even self-fertilize.

During mating, many species use love darts. These are calcium carbonate darts (some are more like spears or arrows) with which they try to stab each other prior to mating. The successful individual (the "stabber") will typically fertilize more eggs than the "stabbed" mollusc, due to hormones delivered with the dart.



Love dart of *Monachoides vicinus* from Joris M. Koene and Hinrich Schulenburg, 2005, "Shooting darts: co-evolution and counter-adaptation in hermaphroditic snails" in *BMC Evolutionary Biology*. Crop of Figure 2.

Snail or Slug?

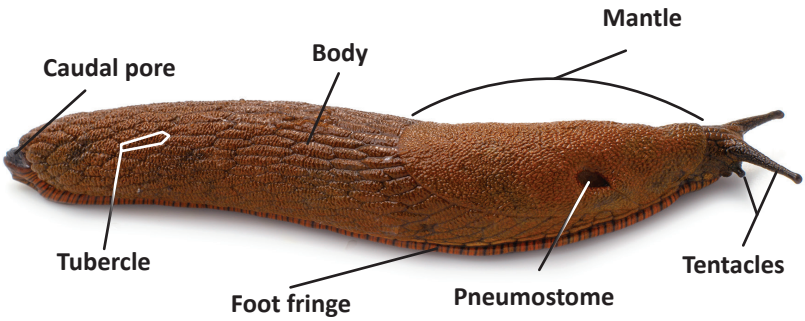
Slugs have:

- No visible shell or a small shell that cannot contain their body (page 6).

Snails have:

- Coiled shell that can contain most or all of their body (page 22).

Parts of a Slug



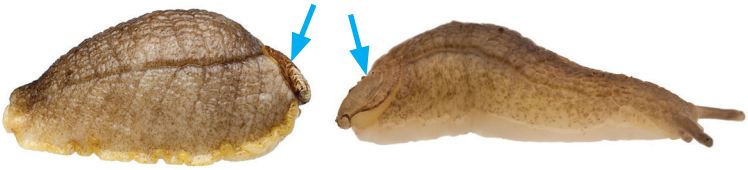
Keel: (This refers to the state where the dorsal tail is not rounded but has an angled peak.)

External shell: (the mantle is underneath the shell)

Common Slug Identification Guide

Measurements listed for slugs refer to their extended, live length.

1. With visible shell.....page 21



***Testacella haliotidea*, earshell slug**

2. No visible shell
   A. Pneumostome in anterior half of mantle.....page 7

   B. Pneumostome in middle or posterior half of mantle.....page 8

Slugs with anterior pneumostome

1. No line where tail can be shed. Caudal pore present. Body tubercles uneven ovoid in shape with no apparent pattern.

***Arion*, roundback slugs, page 12**

2. Line where tail can be shed (can be difficult to see). This can be an impressed line or indicated by a change in the skin texture. No caudal pore. Body tubercles typically diamond shaped in diagonal rows.

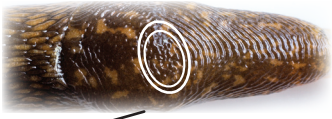
***Prophysaon, taildroppers,* page 20**

Slugs with pneumostome posterior

1. With bands or spots.....2
   No bands or spots (may have small, pigmented speckles).3

2. Foot fringe with vertical stripes, mantle without wrinkles...
   .....***Ariolimax columbianus,*** **page 11**

Foot fringe without stripes, mantle with wrinkles.....
.....***Ambigolimax, Limacus,*** **and** ***Limax***



Ambigolimax valentiana, **threeband garden slug, page 10**

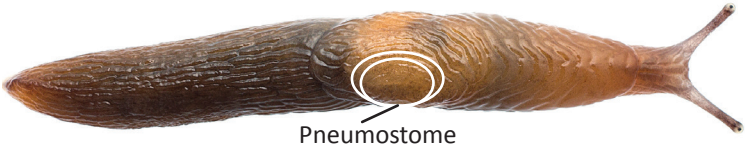
Limacus flavus, **yellow garden slug or house slug, page 17**

Limax maximus**, leopard slug, page 18**

3. Mantle rounded posteriorly. Body of typical slug proportions.....4

Mantle pointed posteriorly. Long and worm-like.....
.....***Boettgerilla pallens,*** **page 16**

4. Mantle with wrinkles centered on pneumostome. Keel 1/3 tail length or less.....***Deroceras*****, page 14**



Mantle without wrinkles, smooth or bumpy. Keel from tip of tail to mantle or nearly so (can be difficult to see).....5

5. Mantle with U-shaped groove. Foot fringe without vertical stripes. Less than 70mm (2.75”).....***Milax gagates*****, page 19**

Mantle without U-shaped groove. Foot fringe with vertical stripes. Adults over 180mm (7”) .....
.....***Ariolimax columbianus*****, page 11**

Species: *Ambigolimax valentianus*

Common name: Three-band garden slug ☹
Family: Limacidae

Three-band garden slugs are commonly seen around homes and in gardens. They are soft bodied and have a clear watery mucus. They are known to climb trees, but not as readily as *Lehmannia marginata* (the tree slug), another European exotic not yet documented in Oregon.

Origin: Spain
Diet: Live and dead plants. Can be a garden and greenhouse pest.
Behavior: Moderate climbers.
Where in Oregon: Widespread in and around urban areas.
Similar exotics to look for: *Lehmannia marginata*, the tree slug. The keel, or center line running down the tail, is pale (it is dark on the three-band garden slug). Report suspect tree slugs to ODA.

50-80mm

Species: *Ariolimax columbianus*

Common name: Banana slug
Family: Ariolimacidae

Banana slugs are an iconic species for the Pacific Northwest. They come in a variety of colors: yellow, green, gray, reddish brown, and even white. All color forms are found with and without spots.

Origin: Pacific Northwest
Diet: Dead plant material and fungi.
Behavior: Known for gnawing their mate's penis off after mating.
Where in Oregon: West side of the Cascades to the coast, and Umatilla county.
Similar exotics to look for: None

180-260mm

Genus: *Arion*

Common name: Roundback slugs ☹
Family: Arionidae

Arion distinctus, brown slug

Origin: Europe
Diet: Live and dead plants. These are some of the most significant crop and garden pests.
Other species in Oregon: *Arion intermedius, A. circumscriptus circumscriptus* and *A. circumscriptus silvaticus*
Where in Oregon: Widespread.
Similar exotics to look for: There are at least 19 additional species of *Arion* in Europe. They are difficult to differentiate from species already present in Oregon. Dissection and inspection of internal organs is required to confirm identification.

Arion distinctus, brown slug

Arion hortensis, garden Arion

30-140mm

Arion rufus, red or chocolate Arion, contracted

Arion subfuscus, dusky slug

Arion rufus, red or chocolate Arion

Quick key (lengths refer to mature specimens)

1. Sole yellow, less than 40mm long

   A. Less than 20mm long.....***A. intermedius***
   B. 20 mm or more long.....***A. distinctus and hortensis***

2. Sole is not primarily yellow, length variable
   A. With dorsal stripes
      i. Clear mucus, no vertical stripes on foot fringe, less than 45mm..... .....***A. circumscriptus***
      ii. Yellow mucus, vertical stripes on foot fringe, adults 50mm or greater..... .....***A. subfuscus***

B. No dorsal stripes and large (60mm+).....***A. rufus***

Genus: *Deroceras*

Common name: Field slugs ☹
Family: Agriolimacidae

Deroceras reticulatum, gray field slug

Origin: Europe
Diet: Live and dead plants and almost any decaying organic material. These are some of the most significant crop and garden pests, *D. reticulatum* in particular.
Where in Oregon: Widespread.
Similar exotics to look for: Oregon has 3 species. With over 100 species worldwide, this is a difficult group, requiring dissection for definitive species identification.

Deroceras lavae, meadow field slug

15-50mm

Deroceras reticulatum, gray field slug
Defensive posture.

Deroceras reticulatum, gray field slug

Deroceras invadens, longneck field slug

Quick key

1. Mantle less than half of body length

   A. From the side, tail slopes gradually; rim of pneumostome pale or body color; defensive mucus white (35-50mm).....***D. reticulatum***

   B. From the side, tail is steeply truncate; rim of pneumostome paler than body; defensive mucus clear (25-35mm)..... ***D. invadens***

2. Mantle half as long as body or longer (15-25mm) ....***D. laeve***

Species: *Boettgerilla pallens*

Common name: Worm slug ☹
Family: Boettgerillidae

Worm slugs were found in Oregon during 2015. This is the third known occurrence of this species in North America. It was previously known from one site in California and several in British Columbia. The long and skinny body shape is unique among slugs in Oregon.

Origin: Europe
Diet: Decaying animal, fungi, and plant material. Reported as a pest of seedlings in greenhouses.
Behavior: Spends most of its life underground. It can burrow as deep as 2 feet (about 60cm).
Where in Oregon: Hoyt Arboretum in Portland. ODA is interested in learning of new locations for this slug.
Similar exotics to look for: None

With keel raised defensively

35-55mm

Species: *Limacus flavus*

Common names: House slug, Yellow garden slug, Yellow cellar slug ☹
Family: Limacidae

Origin: Europe
Diet: Fungi and plant material.
Behavior: Often enters homes, leaving slime trails. Will feed on available human and pet food.
Where in Oregon: Scattered in urban areas in western Oregon.
Similar exotics to look for: *Limacus maculatus* is not known from Oregon, it has dark brown or gray tentacles (*L. flavus* has gray tentacles with a blue tint). Report suspect *L. maculatus* to ODA.

80-130mm

Species: *Limax maximus*

Common names: Giant garden slug, Leopard slug
Family: Limacidae ☹

The leopard slug is one of the most commonly encountered species in Oregon. Fortunately, they are not usually garden pests, although they will occasionally enter homes

Origin: Europe
Diet: Primarily fungus, but also decaying plant and animal material, and occasionally green plants.
Behavior: While mating, they hang upside down from a string of mucus with their genitalia intertwined below them.
Where in Oregon: Widespread.
Similar exotics to look for: There are two additional species of *Limax* in Europe. These lack markings on the mantle and are typically paler.

100-150mm

Species: *Milax gigates*

Common name: Greenhouse slug
Family: Milacidae ☹

Supposedly sensitive to frost, their underground foraging behavior may offer some protection. Western Oregon's mild winters may allow them to persist in field situations for long periods.

Origin: Europe
Diet: Plant material. Can be a pest of root crops and seedlings.
Behavior: Commonly subterranean. Reported as an important greenhouse pest in Oregon in the 1940s.
Where in Oregon: Apparently widespread in western Oregon with a spotty distribution associated with sheltered environments such as greenhouses.
Similar exotics to look for: There are at possibly 12 more species of *Milax* in Europe, but another genus, *Tandonia*, is of more concern. *Tandonia* species will usually have a distinct pale stripe along the tail (keel) and dark pigmented areas. Possible *Tandonia* should be reported to ODA.

45-70mm

Genus: *Prophysaon*

Common name: Taildroppers
Family: Anadenidae

Prophysaon foliolatum, yellow-bordered taildropper

There are seven species of native Oregon taildroppers. They are not commonly seen since they tend to be more restricted to natural habitat than many of the exotic slugs. Only *P. andersoni* has been reported as an occasional pest.

Origin: Pacific Northwest
Diet: Decaying plant material and fungus.
Behavior: When attacked by a predator they can lose a portion of their tail, which distracts the predator while the slug gets away.
Where in Oregon: Widespread in western Oregon.
Similar exotics to look for: Most likely to be confused with species of *Arion.*

Prophysaon andersoni, reticulate taildropper

Prophysaon andersoni, reticulate taildropper

15-100mm

Species: *Testacella haliotidea*

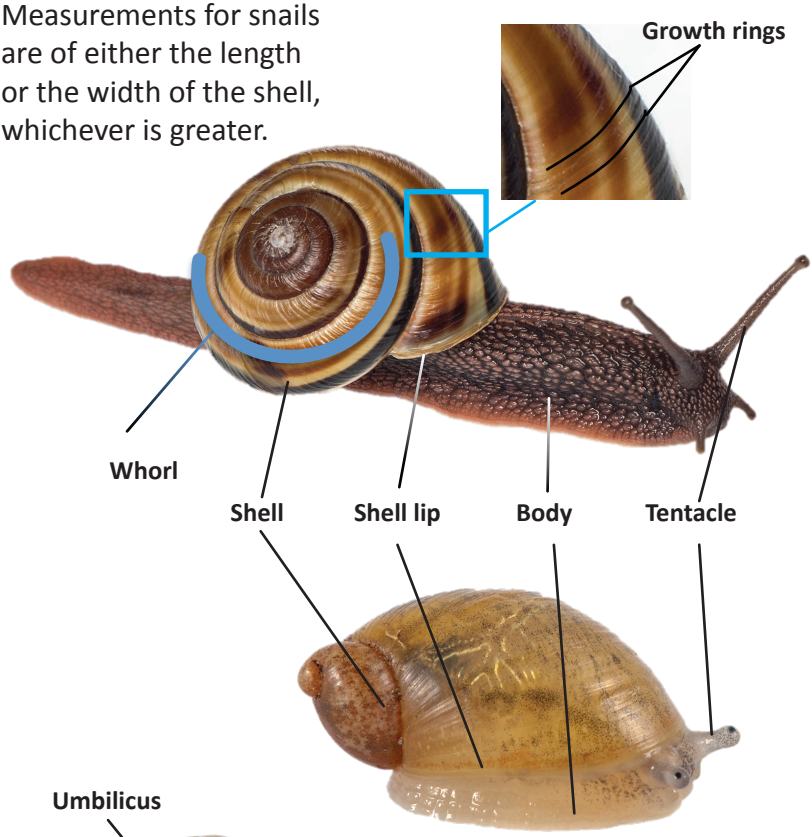
Common name: Earshell slug ☹
Family: Testacellidae

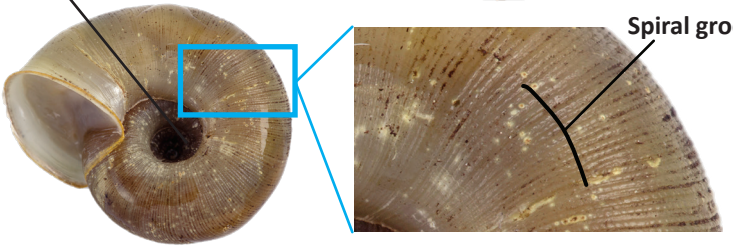
Origin: Europe
Diet: Earthworms and other soft bodied invertebrates.
The earthworms found in urban, suburban, and agricultural settings in Oregon are also European.
Behavior: Mostly subterranean species, so they are rarely seen.
Where in Oregon: Scattered in urban areas in western Oregon.
Similar exotics to look for: There are 3 additional species of this genus in Europe. The others have darker pigmentation and other subtle differences.

60-120mm

Parts of a snail

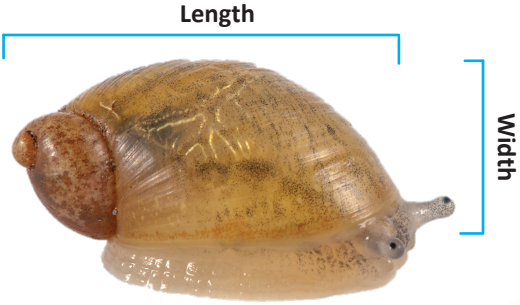
Measurements for snails are of either the length or the width of the shell, whichever is greater.

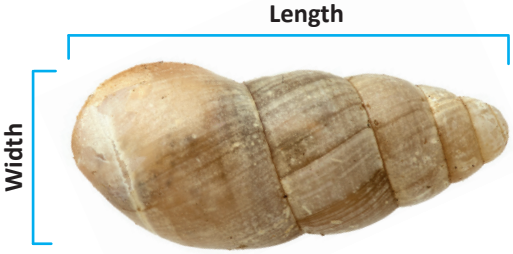




Common snail identification guide

- Shell length greater than width.....page 24





- Shell wider than long.....page 25

Shell longer than wide

- Shell opening less than half the length of the shell.

***Cochlicopa lubrica,* glossy pillar, page 30**

- Shell opening half or more the length of the shell.

Succineidae, amber snails, page 35

Shell wider than long

- Mottled, striped or banded, **page 26**

- Without mottling, stripes or bands, shell basically of one color, **page 27**

Mottled, banded or striped shell

1. Edge of shell angled or narrowly rounded.

Shell with distinct raised growth rings

***Candidula intersecta,* wrinkled dune snail, page 28**

2. Edge of shell evenly rounded.

A. Body cream to tan. Umbilicus partially to completely covered.

***Cepaea nemoralis,* grove snail, page 29**

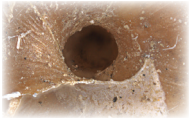
B. Body brown. Umbilicus partially to completely covered.

Shell brown with lighter brown broken bands and some irregular cream-yellow streaks.

***Helix aspersa,* European brown garden snail, page 32**

C. Body reddish brown. Umbilicus open.

Shell yellow-brown to dark red-brown with yellow and black stripes.



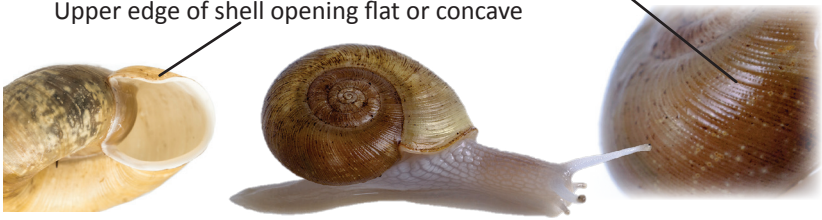
Umbilicus open.

***Monadenia columbianus*, Pacific sideband, page 33**

Shell of one color, no bands or stripes

1. Spiral grooves on at least inner whorls of shell (results in a “beaded” appearance).

Upper edge of shell opening flat or concave

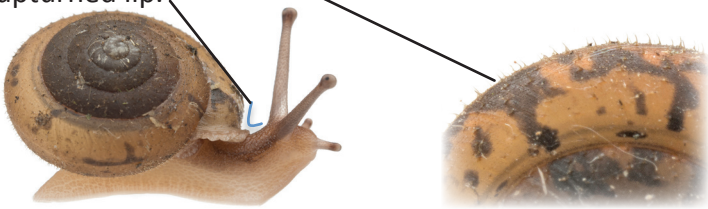


Ancotrema and Haplotrema, **lancetooth snails, page 31**

2. No spiral grooves on whorls of shell.
   A. Shell shiny and smooth and never with “hairs.” Lip of shell convex.

Oxychilus, **glass snails, page 34**

   B. Shell usually with “hairs.” Edge of shell of adults with upturned lip.



Vespericola species, **hesperian snails, page 36**

Species: *Candidula intersecta*

Common name: Wrinkled dune snail ☹
Family: Hygromiidae

The wrinkled dune snail is known from Coos Bay to Roseburg, apparently following rail lines. It is a good climber. This pest is spreading and poses a risk to a number of crops.

Origin: Europe
Diet: Plant material. This species is a pest of apples, pears, plums, and peaches, as it feeds directly on the fruit.
It also feeds on small grains, where it not only causes damage, but when the field dries, the snails climb and attach themselves to the stems. This can clog and damage harvesting equipment.
Behavior: Climb on objects during dry periods.
Where in Oregon: Coos and Douglas counties.
Similar exotics to look for: *Cernuella virgata*, which has a more broadly rounded shell and usually well-defined spiral bands.

7-13mm

Species: *Cepaea nemoralis*

Common names: Banded wood snail, grove snail ☹
Family: Helicidae

This is a highly variable snail. Shells range from brown to yellow to pink, with or without stripes.

Origin: Europe
Diet: Dead, usually dry, plant material.
Behavior: Good climber. Uses love darts to improve reproductive success. We've found that they really like eating paper.
Where in Oregon: Scattered from the Portland metro area to Canby.
Similar exotics to look for: *Cepaea hortensis*, the white lipped snail, which is smaller. When mature, *C. hortensis* typically has a pale lip while *C. nemoralis* has a brown lip. Suspected *C. hortensis* should be reported to ODA.

18-25mm

Brown lip of adult *Cepaea nemoralis*

Species: *Cochlicopa lubrica*

Common name: Glossy pillar
Family: Cionellidae

These small, but common, snails are often found around homes, especially in low-lying areas where the ground stays moist. They typically self-fertilize.

Origin: Probably the Pacific Northwest.
Diet: Decaying plant material, occasionally live plants.
Where in Oregon: Widespread.
Similar exotics to look for: There are 22 (questionable) species of *Cochlicopa* listed from Russia and surrounding countries. Western Europe has two species, *C. lubrica* and *C. lubricella* which only differ in size (maximum length of *C. lubricella* is 6.8mm).

5-7.5mm

Family: *Haplotrematidae*

Common name: Lancetooth snails

Haplotrema vancouverense, robust lancetooth

Origin: Pacific Northwest

Diet: Predators of slugs, snails and other soft bodied invertebrates.

Where in Oregon: Widespread.

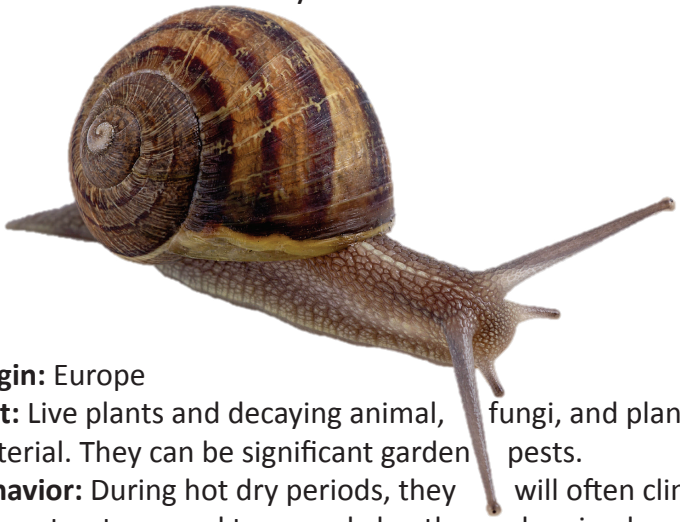
Similar exotics to look for: There are three species of lancetooths in Oregon. Another species, *Haplotrema concavum*, inhabits the eastern US but is small (16-22mm) and has fine spiral striae. The native *H. vancouverense* has fine spiral striae but is larger (22-32mm). *Ancotrema sportella* and *A. hybridum* overlap with *H. concavum* in size, but have deep spiral striae that that cut through the growth rings and can give the the shell a “beaded” appearance.

11-32mm

Ancotrema sportella, beaded lancetooth

Species: *Helix aspersa*

Common name: European brown garden snail ☹
Family: Helicidae



Origin: Europe
Diet: Live plants and decaying animal, fungi, and plant material. They can be significant garden pests.
Behavior: During hot dry periods, they will often climb up on structures and trees and glue themselves in place.
Where in Oregon: Widespread in association with human activity.
Similar exotics to look for: *Helix pomatia,* the commercial escargot snail, is very similar and could also become a pest. These are both used as food. It has a larger shell, adults are over 35mm and can be over 45mm. The base color of the shell is white. It is not known from Oregon and should be reported to ODA.

27-38mm

Genus: *Monadenia*

Common name: Sideband snails
Family: Bradybaenidae

Monadenia fidelis, Pacific sideband

Origin: Pacific Northwest
Diet: Fungi and decomposing plant material.
Behavior: This is Oregon's largest native snail. Good climbers.
Where in Oregon: Widespread.
Similar exotics to look for: None. A native species, *Monadenia chaceana,* or the Siskiyou sideband, occurs in the Umpqua River watershed. Six subspecies of *M. fidelis* are found in Oregon.

18-38mm

Monadenia fidelis, Pacific sideband

Genus: *Oxychilus*

Common name: Glass snails ☹
Family: Oxychilidae

Oxychilus draparnaudi, dark bodied glass snail

Oxychilus alliarus, garlic snail

Origin: Europe
Diet: Live and dead plants and other invertebrates and their eggs when available. *O. draparnaudi* is a predator on other invertebrates.
Behavior: When threatened or crushed, the garlic snail releases a garlic odor as a defense.
Where in Oregon: Widespread.
Similar exotics to look for: There are many similar snails in Oregon. Another less common species, *O. cellarius*, is known from Oregon. There are possibly six additional species of *Oxychilus* in Europe.

5-17mm

Oxychilus alliarus, garlic snail

Family: *Succineidae*

Common name: Amber snails

Succinea concordialis

The amber snails are notoriously difficult to identify. DNA analysis is the only reliable identification method for most species. There are several genera that may be encountered: *Catinella, Novisuccinea, Oxyloma,* and *Succinea.*

Origin: There are both native and exotic species in Oregon. For example, *Succinea concordialis* ☹ is from the eastern US.
Diet: Algae and decaying plant material in damp environments. They aren't plant pests, but they can contaminate nursery stock and interfere with shipping.
Behavior: These are amphibious snails. They are always found near wet habitats.
Where in Oregon: Widespread.
Similar exotics to look for: Many similar species.

6-21mm (shell length)

Succinea sp., typical amber snail

Genus: *Vespericola*

Common name: Hesperian snails

Family: Polygyridae

Origin: Pacific Northwest

Diet: Plants, lichens, and algae.

Behavior: Most common around wet areas, wetlands, rivers, etc.

Where in Oregon: Widespread.

Similar exotics to look for: There are a number of hairy-shelled snails around the world that would be challenging to distinguish from Oregon natives. *Cryptomastix germana* is a similar native species. There are five species of *Vespericola* native to Oregon. Outside of southwestern Oregon, *V. columbianus*, the Northwest hesperian is the most common.

Additional resources

The Land Snails and Slugs of the Pacific Northwest
T. E. Burke, 2013, Oregon State University Press

Land Snails of British Columbia
R. G. Forsyth, 2004, the Royal BC Museum

Slugs of Britain and Ireland
B. Rowson, J. Turner, R. Anderson, and B. Symondson, 2014, The Dorset Press

Terrestrial Mollusc Tool
J. A. White-McLean, 2011, at http://idtools.org/id/mollusc

How to Know the Eastern Land Snails
J. B. Burch, 1962, W. C. Brown Company Publishers

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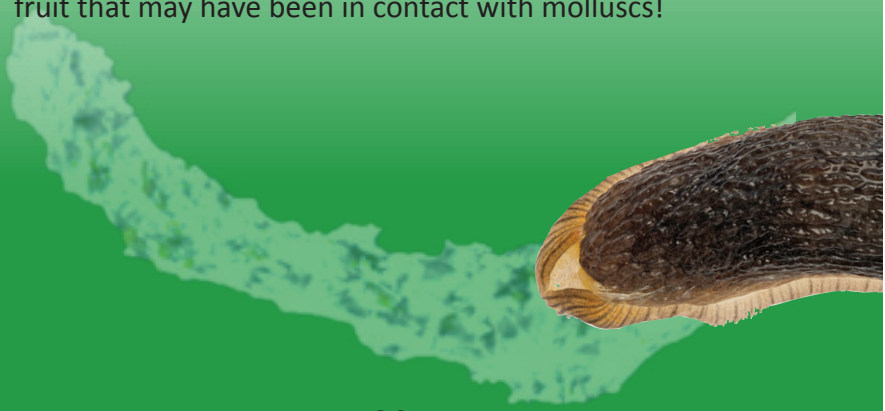
Photographs by Thomas Shahan and Chris Hedstrom

Caution

Terrestrial snails and slugs are themselves harmless, but caution should be exercised when handling them. Around the world, slugs and snails are vectors for a variety of parasitic worms. Typically these are acquired by eating (accidentally or otherwise) slugs or snails, their eggs, and in some cases their slime trails.

Of particular concern are the two species of the disease called rat lungworm. These dangerous parasites have been moving around the world and could be introduced to Oregon by rats or molluscs, both of which take advantage of the volume and speed of modern trade. Rat lungworm has been found in the United States in Florida, Hawaii, and Louisiana. It is a good idea to thoroughly wash your hands after handling molluscs (or wear rubber gloves– the experts do) and vegetables and fruit that may have been in contact with molluscs!



Slugs and Snails in Oregon

Text by Josh Vlach
Images by Thomas Shahan and Chris Hedstrom

There are 124 species of terrestrial molluscs (slugs and snails) in Oregon. Except for the beloved banana slug, most native snails and slugs go unnoticed as they feed on plants, fungi, or an array of decaying organic material. A few are predators. Their alien nature can be fascinating — legless hermaphrodites, love darts, tails that can be lost like a lizard's, and plenty of mucus. This guide is designed to help identify the most commonly encountered slugs and snails in Oregon. For each genus or species, a brief description is provided that includes information about size, pest status, and whether it is native or exotic.

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