



Species Data Gaps: Research and Monitoring Needs

In addition to the “data gaps” identified for individual Strategy Species, the following data gaps apply to multiple species across Oregon:

Species management and monitoring:

- Determine baseline conservation status, estimated population size and trends for Strategy Species. Develop and implement survey and monitoring methodology for species lacking protocols, such as woodpeckers, some owls, snails, and many salamanders.
- Estimate Strategy Species carrying capacities based on current and restorable habitat conditions in Oregon and determine population goals. Monitor species periodically to compare status against population goals.
- Develop measurable indicators of high quality habitat. For example, develop framework for using species and habitat indicators to assess habitat status and trends
- Determine relationships between population dynamics and habitat dynamics
- Refine methodology to evaluate and rank the health of plant populations for monitoring via occurrence databases (e.g., ORNHIC’s efforts to develop occurrence ranks).
- Evaluate effectiveness of providing passage around barriers for fish and wildlife (including amphibians, reptiles, mammals) to enhance migration or habitat connectivity.
- Determine the status and preferred habitat of aquatic macroinvertebrates and freshwater mussels. Further investigate impacts of channelization, sedimentation, and passage barriers on aquatic invertebrates. Determine factors controlling the distribution and abundance of mussels.
- Develop and evaluate propagation methods for native plants (Strategy Species and species needed for habitat restoration).
- For Strategy Species dependent on habitats that have high degrees of fragmentation or isolation, determine patch sizes and configuration for maintaining viable populations
- Determine the utility of indicator species or “umbrella species” to manage habitat for associated species. For example, if you manage for high quality greater sage-grouse habitat, will other sagebrush-dependent species’ populations be maintained or increase?
- Understand fish habitat needs for resident fish species to improve the effectiveness of restoration and enhancement activities that support these species

Interactions between species

- Determine population dynamics and impacts of native predators that increase with human activity on native species (e.g., crows, gulls, jays, ravens, and raccoons).
- Evaluate impacts of invasive animals on priority native animals.
- Determine appropriate management actions. Examples:
 - Invasive squirrel species on native squirrels (western gray, Douglas, and flying squirrels) and cavity-nesting birds.
 - Invasive turtle species on northwestern pond turtle and western painted turtle.
 - Bullfrogs on native amphibians, reptiles, and fish.
 - Carp on native plants, invertebrates, fish, and amphibians.
- Determine the habitat or limiting factors that keep cowbird parasitism and nest predation on Strategy species to a minimum.
- Determine whether introduced wild turkeys compete with native species (for example with native grouse and quail or with species that use acorn resources in oak habitats).

Species-landscape interactions:

- Evaluate the effects of patch size, configuration, and distribution on populations of Strategy Species.
- Increase understanding of how to manage species and habitats at multiple scales. For example, improved methods for manag-

ing stream and pond amphibians at landscape and watershed scales.

- Landscape-level habitat relationships between water levels and species that move in response to water levels, especially birds: (1) Identification of landscape-level breeding and post-breeding habitat needs for species; (2) Thresholds of use or non-use by breeding birds; and (3) Distribution of aquatic habitats across landscape as influenced by annual variation in precipitation and evaporation.
- Participate in ongoing evaluations of the effects on wildlife and other ecological values of forest management practices that reduce the risk of uncharacteristic fire
- Participate in efforts to develop decision-making tools to help land owners and land managers assess and compare the short-term risks to wildlife of forest management practices to reduce the risk of uncharacteristic fire against the long-term risks to wildlife and habitat posed by uncharacteristic fire.

Data management and information sharing:

- Create and maintain centralized database to track occurrence data for Strategy Species. Standardize database formats to ensure compatibility and facilitate information sharing between organizations and researchers. Facilitate greater interactions between researchers and data users and decision-makers. For more information on data management, see the Monitoring chapter.

Determining status:

- For some animals, basic information such as where they occur and basic habitat associations is not known. It isn't possible to determine whether they are truly at risk or what should be done about it. Basic surveys for distribution, habitat associations, and general abundance are needed. More information is needed to determine the conservation status of the following species:
 - **Blue Mountains:** California wolverine, Preble's shrew, white-tailed jackrabbit, white sturgeon, Blue mountain-snail, Columbia pebblesnail, Johnson's hairstreak, southern tightcoil (snail). In addition, there are four birds, eight invertebrates and 39 plant species on ORNHIC's Heritage List 3 (=unknown conservation status).
 - **Coast Range:** fisher, Gold Beach pocket gopher, Pistol River pocket gopher, ringtail, white-footed vole, river lamprey, and crowned tightcoil, marsh walker, Nerite ramshorn (snails). In addition, there are 11 invertebrate species and 25 plant species on Oregon Natural Heritage Program's Heritage List 3.
 - **Columbia Plateau:** hoary bat, spotted bat, white-tailed jackrabbit, Woodhouse's toad, and Columbia pebblesnail. In addition, there are two invertebrates and nine plant species on ORNHIC's Heritage List 3.
 - **East Cascades:** California wolverine, fisher, Preble's shrew, spotted bat, white-tailed jackrabbit, flammulated owl, blotched tiger salamander, Dalles juga (snail), Puget Oregonian (snail), and salamander slug. In addition there are two birds, three invertebrates, and 16 plant species on ORNHIC's Heritage List 3.
 - **Klamath Mountains:** flammulated owl, white-footed vole, marsh walker (snail). In addition, there are eight invertebrates and 38 plant species on ORNHIC's Heritage List 3.
 - **Northern Basin and Range:** Preble's shrew, white-tailed antelope ground squirrel, white-tailed jackrabbit, black rosy finch, blotched tiger salamander, Great Basin spadefoot toad, Woodhouse's toad, Harney Basin duskysnail, and Donner und Blitzen pebblesnail. In addition, there is one bird, four invertebrates and 56 plant species on ORNHIC's Heritage List 3.
 - **West Cascades:** California wolverine, white-footed vole, barren juga (snail), Columbia sideband (snail), Mardon skipper (butterfly), Nerite ramshorn (snail), Puget Oregonian (snail), and salamander slug. In addition, there are two birds, 22 invertebrates, and 24 plant species on ORNHIC's Heritage List 3.
 - **Willamette Valley:** hoary bat, pallid bat, sandroller, stickleback, white sturgeon, barren juga (snail), Columbia pebblesnail, Nerite ramshorn (snail), Oregon giant earthworm, and Puget Oregonian (snail). In addition, there is one bird, five invertebrates and 12 plant species on ORNHIC's Heritage List 3.
- In other cases, it is not clear whether a group of animals are a population of one species or are a distinct other species. Information is needed to help determine the taxonomic status of these species. If they are determined to be distinct species, then data on range and habitat associations are needed to determine conservation status.
 - **Blue Mountains:** Blue Mountains dusky snail, Blue Mountains juga, Crooked River juga, Deschutes sideband, Disc Oregonian, Hells Canyon mountainsnail, and Opal Springs juga.
 - **Columbia Plateau:** Information is needed to help determine the taxonomic status of these snails: Columbia duskysnail, Columbia springsnail, Crooked River juga, Deschutes mountainsnail, Deschutes sideband, Oak Springs

- Hesperian, purple juga, three-band juga, and Tuscan pebblesnail. If they are determined to be distinct species, then data on range and habitat associations are needed to determine conservation status.
- **East Cascades:** Modoc sideband, Modoc peaclam, Klamath tailedropper, and these snail complexes: duskysnails (genus *Colligyrus*), pebblesnails (genus *Fluminicola*), jugas (genus *Juga*), and springsnails (genus *Pyrgulopsis*). Determine whether Silver Lake tui chub warrants species status. If warranted, implement conservation actions for this species. Shortnose sucker, Lost River sucker, Klamath Largescale sucker and Klamath smallscale sucker can be difficult to distinguish morphologically. Develop and refine identification methods, possibly using the tools of molecular genetics. Need more detailed information

about the taxonomy and systematics of these four species. Are species reproductively isolated?

- **Klamath Mountains:** Keene Creek pebblesnail and the Klamath tail-dropper.
- **Northern Basin and Range:** species in the *Pyrgulopsis* complex (Lake Abert springsnail, Malheur springsnail, Owyhee hot springsnail), and hot spring physa (snail) and Malheur pebblesnail.
- **West Cascades:** Columbia duskysnail and species in these snail species complexes: *Fluminicola* (Diminutive, Fall Creek, Keene Creek, Lake of the Woods, Nerite, Pinhead, and Toothed pebblesnails); and *Juga* (Basalt, Brown, and Three-band jugas).
- **Willamette Valley:** bald hesperian (snail) and Columbian duskysnail.



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