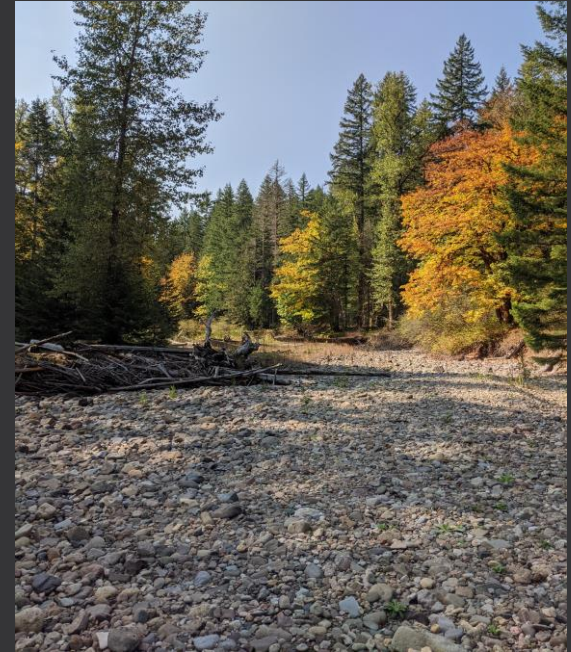




Pacific Northwest Streamflow Duration Assessment Method: Single Indicators – Fish, Amphibians, Aquatic Snakes



Virtual Training
2024



The SDAM PNW is based on 5 indicators:

All indicators are measured
in the **field**

In recommended order of data collection

1. Presence of aquatic macroinvertebrates
2. Presence of 6 or more Ephemeroptera (mayflies)
3. Presence of perennial indicator taxa
4. Wetland plants in or near streambed
5. Slope

} Aquatic
macroinvertebrate
indicators

And 2 “single indicators”:

Can conduct concurrently with macroinvertebrate search

1. Presence of one or more fish
2. Presence of one or more aquatic life stages of certain herpetofauna

Single indicators

- Assessed with a minimum 20-minute search in locations that represent range of habitat types.
- Lateral extent of assessment includes one full channel width from the top of both banks of the assessment reach.
- Search may be conducted at the same time as the macroinvertebrate search for efficiency.
- Vertebrates must be identified at the site and left at the site.
 - Many amphibian and fish species are protected by state/federal laws.



Credit: David Stafford, NOAA

Target all habitat types



Riffles



Pools



Leaf packs



Tree roots



Woody jams



Undercut banks

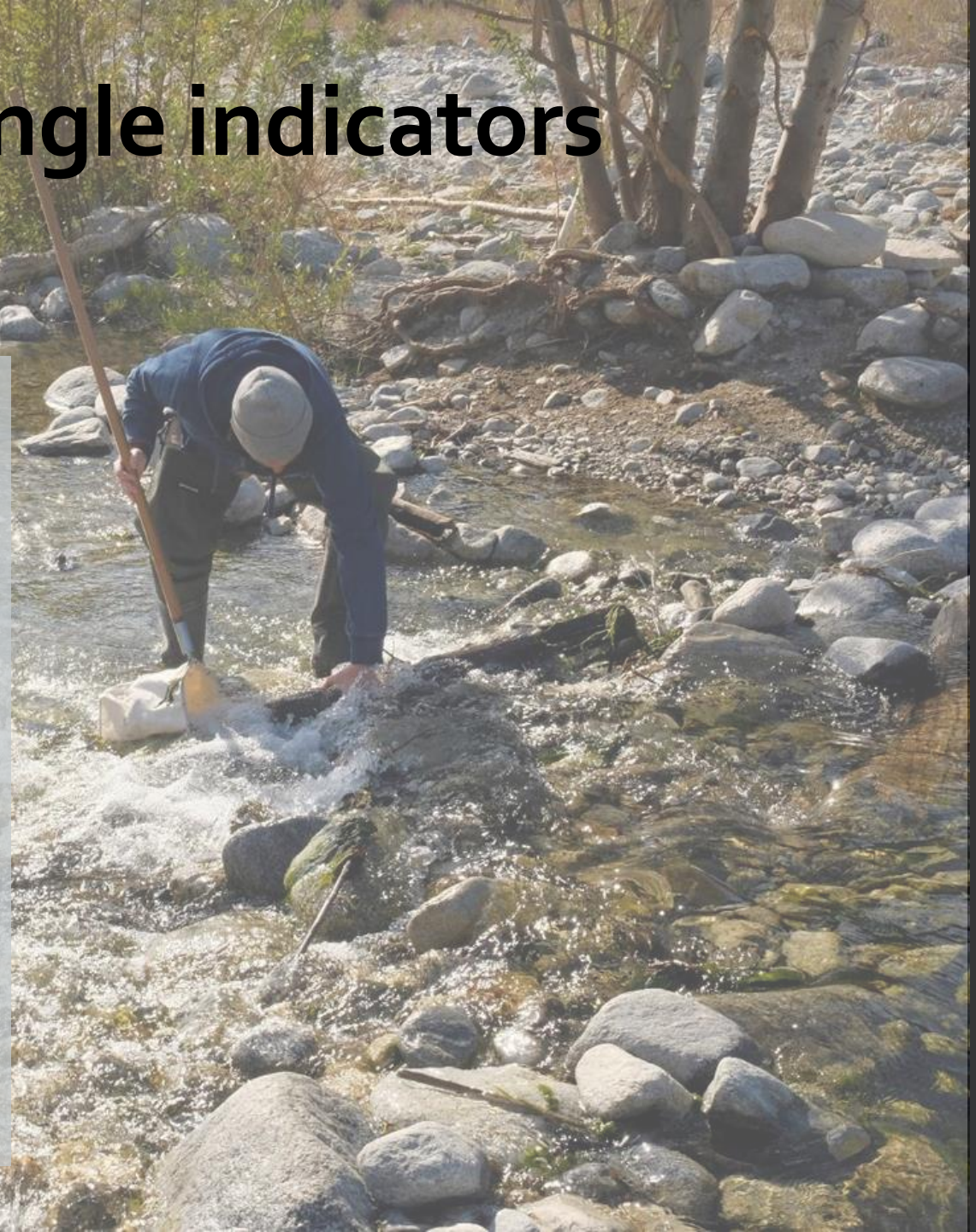


Streamside

Searching for single indicators

In locations with flowing water:

- Start at downstream end and work upstream
- Place D-frame kick-net perpendicular to direction of local flow
 - Keep bottom flush with streambed
 - Make sure net is fully extended and unobstructed
- Stir up substrate with foot or hands in 1-ft² upstream of net opening
- Empty net contents into a white sorting tray with stream water



Searching for single indicators

In woody jams, root mats, and undercut banks:

- Jab with a D-frame net

Presence of fish

Gambusia spp. (mosquito fish)



Source: Oregon Dept. of Fish and Wildlife

- One or more of ANY fish species
- **Except** *Gambusia* spp. placed as mosquito control, which does NOT count

Water dependent life stages of amphibians and snakes

One or more individuals of life stages identified as obligate or facultative wet.

- Vertebrates should be identified at assessment site and left at site.
- Take helpful photos!

Species	Common Name	Water-Dependent Life Stages			
		Eggs	Larva / Tadpole	Juvenile	Adult
Aquatic Salamanders					
<i>Ambystoma gracile</i>	Northwest Salamander	OBL	OBL	FACW	FACW
<i>Ambystoma macrodactylum</i>	Long-toed Salamander	OBL	OBL	FACW	FACW
<i>Ambystoma tigrinum</i>	Tiger Salamander (rare)	OBL	OBL	FACW	FACW
<i>Taricha granulosa</i>	Roughskin Newt	OBL	OBL	FAC	FAC
<i>Dicamptodon copei</i>	Cope's Giant Salamander	OBL	OBL	OBL	OBL
<i>Dicamptodon tenebrosus</i>	Pacific Giant Salamander	OBL	OBL	OBL	FACW
<i>Rhyacotriton</i> spp.	Torrent Salamanders (rare)	OBL	OBL	OBL	OBL
Frogs and Toads					
<i>Ascaphus truei</i>	Tailed Frog	OBL	OBL	OBL	OBL
<i>Spea intermontana</i>	Great Basin Spadefoot	OBL	OBL	FAC	FAC
<i>Bufo boreas</i>	Western Toad	OBL	OBL	FAC	FAC
<i>Bufo woodhousii</i>	Woodhouse's Toad	OBL	OBL	FAC	FAC
<i>Pseudacris regilla</i>	Pacific Treefrog	OBL	OBL	FACW	FAC
<i>Rana aurora</i>	Red-Legged Frog	OBL	OBL	FACW	FACW
<i>Rana boylei</i>	Foothill Yellow-Legged Frog	OBL	OBL	OBL	OBL
<i>Rana cascadae</i>	Cascades Frog	OBL	OBL	FACW	FACW
<i>Rana catesbeiana</i>	Bullfrog	OBL	OBL	FACW	FACW
<i>Rana pretiosa</i>	Oregon Spotted Frog	OBL	OBL	OBL	OBL
<i>Rana luteiventris</i>	Columbia Spotted Frog	OBL	OBL	OBL	OBL
Snakes					
<i>Thamnophis atratus</i>	Western Aquatic Garter Snake (SW Oregon)			OBL	OBL
<i>Thamnophis elegans</i>	Wandering Garter Snake			FACW	FACW
<i>Thamnophis sirtalis</i>	Common Garter Snake			FACW	FACW

PNW SDAM - Table 2: https://www.epa.gov/system/files/documents/2022-03/sdam-pnw_nov-2015-final.pdf

Water dependent life stages of amphibians and snakes



red-legged frog

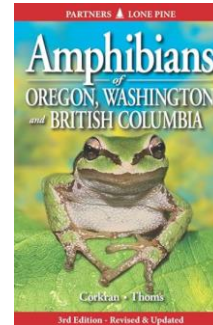
Credit: Don Vandeburg, ODFW



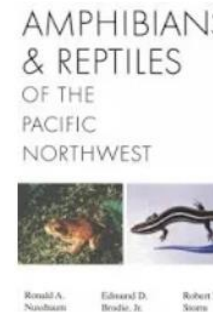
Oregon spotted frog

Credit: Oregon Department of Fish and Wildlife

Field guides



- Corkran and Thoms' *Amphibians of Oregon, Washington, and British Columbia*



- Nussbaum, Brodie, and Storm's *Amphibians & Reptiles of the Pacific Northwest*

Record on the field form

Single Indicators

1. Are one or more fish found in the assessment reach?*
2. Are one or more individuals of an amphibian or snake life stage identified as obligate or facultative wet present in the assessment reach?

**Gambusia* spp. placed as a vector control does NOT count.

Observed Amphibians, Snake, and Fish:			
Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Single Indicators: <input type="checkbox"/> Fish <input type="checkbox"/> Amphibians

Knowledge check!

True or false: The Pacific Giant Salamander and Columbia Spotted Frog are water-dependent for their entire life cycle.

A. True

B. False

Many salamanders and frogs occurring in the Pacific Northwest require aquatic habitat throughout their life cycle.



**For more information about
SDAMs, visit:**

<https://www.epa.gov/streamflow-duration-assessment>