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Intersection of Science Education & Natural Resource Management

- Science Education & Citizen Science (Tudor)
- NatureMapping Tools and Network (Dvornich)
- Vision to Conserve Biodiversity (Grue)

Washington's Biodiversity

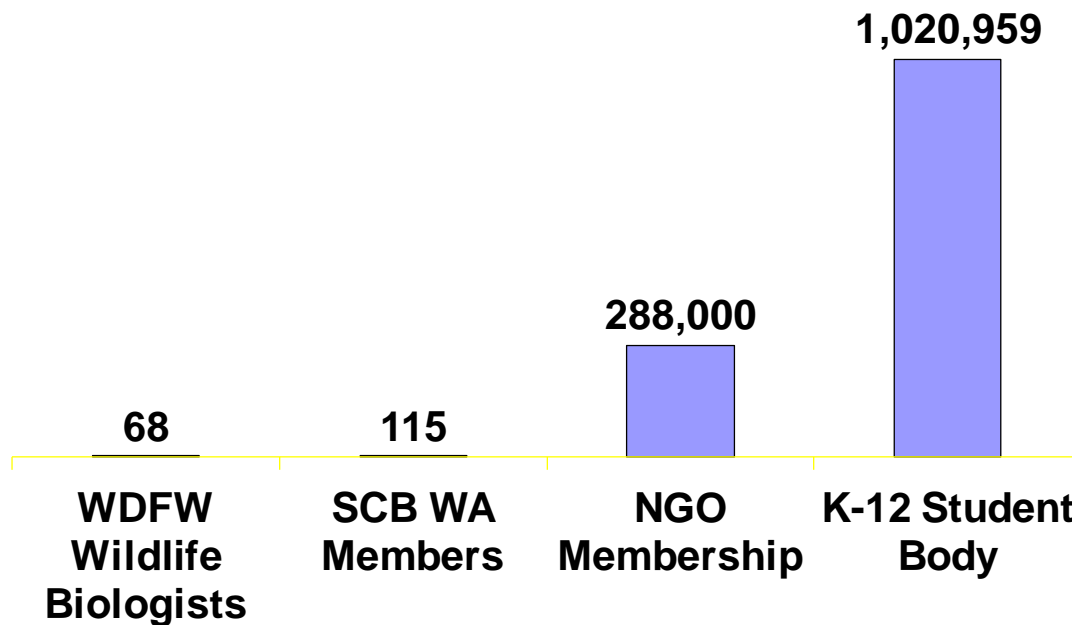


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71k mi²
4 Biomes
9 Ecoregions
98 Ecological Systems
782 Habitat Associations
1000+ Vertebrate Fish and Wildlife Spp
4500 + Species/Varieties of Vascular Plants
100,000 + Invertebrates and Non-vascular Plants.
6 + million Homo Sapiens Living In Washington State

How is this monitoring going to get done ?



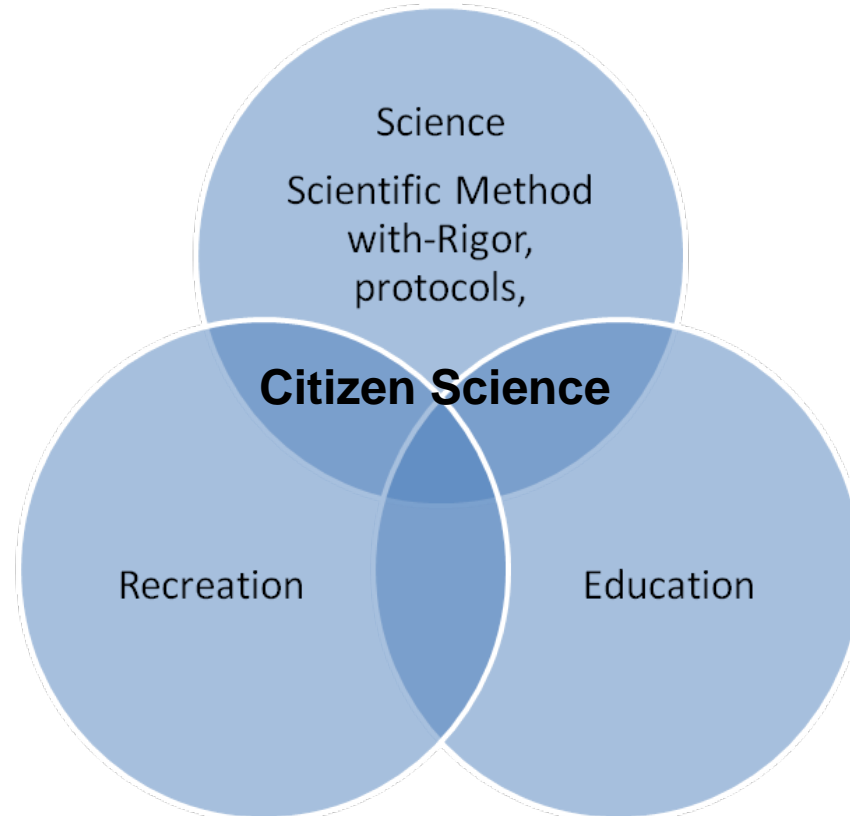
Monitoring Biodiversity of Washington



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Citizen Science: Adaptive Monitoring Approach



Need a pipeline of K-12 students to build an informed citizenry for participation in citizen science



Citizen Science for K-80

Benefits to K-80 students & adults as citizen science volunteers

- Conduct high quality science
- Experiential value where citizen scientists
 - Learn field study skills
 - Aspire to natural resource science careers
 - Develop a lifelong interest or hobby
 - Get outside!

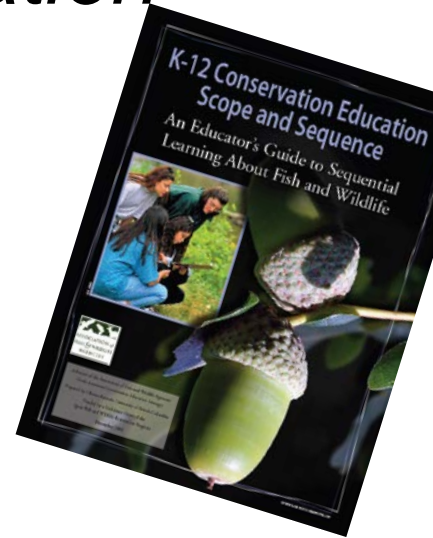
Bringing Citizen Science to Schools

Association of Fish & Wildlife Agencies (AFWA)

The North American Conservation

Education Strategy

**Top 11 Core Concepts for
Conservation Education**



Conservation Education = Conservation

Overcoming Barriers in Schools

❑ **Field methodologies** not in state standards

➤ **Result: Outdoor observation skills not taught** in science

❑ **Geography not taught** in schools

➤ **Result: Lack of Mapping - GIS skills**



Accomplishments AFWA & partners

☐ Described & published “Field Investigation” methods

- Descriptive
- Comparative
- Correlative

☐ Revised State and National Science Education Standards



Citizen Science Resources



Field Investigation



Fostering Outdoor Observation Skills

fishwildlife.org

Adds value to Project
WILD



NatureMapping Lessons

Online: Edutopia.org

Awakening Inquiry

[NatureMapping Foundation](http://NatureMappingFoundation.org)

Species Recognition

Field clues for ID

Size ID & Numbers estimates

Directions, maps

Reporting observations



Washington
NatureMapping Program

Learning from experience

NatureMapping Models

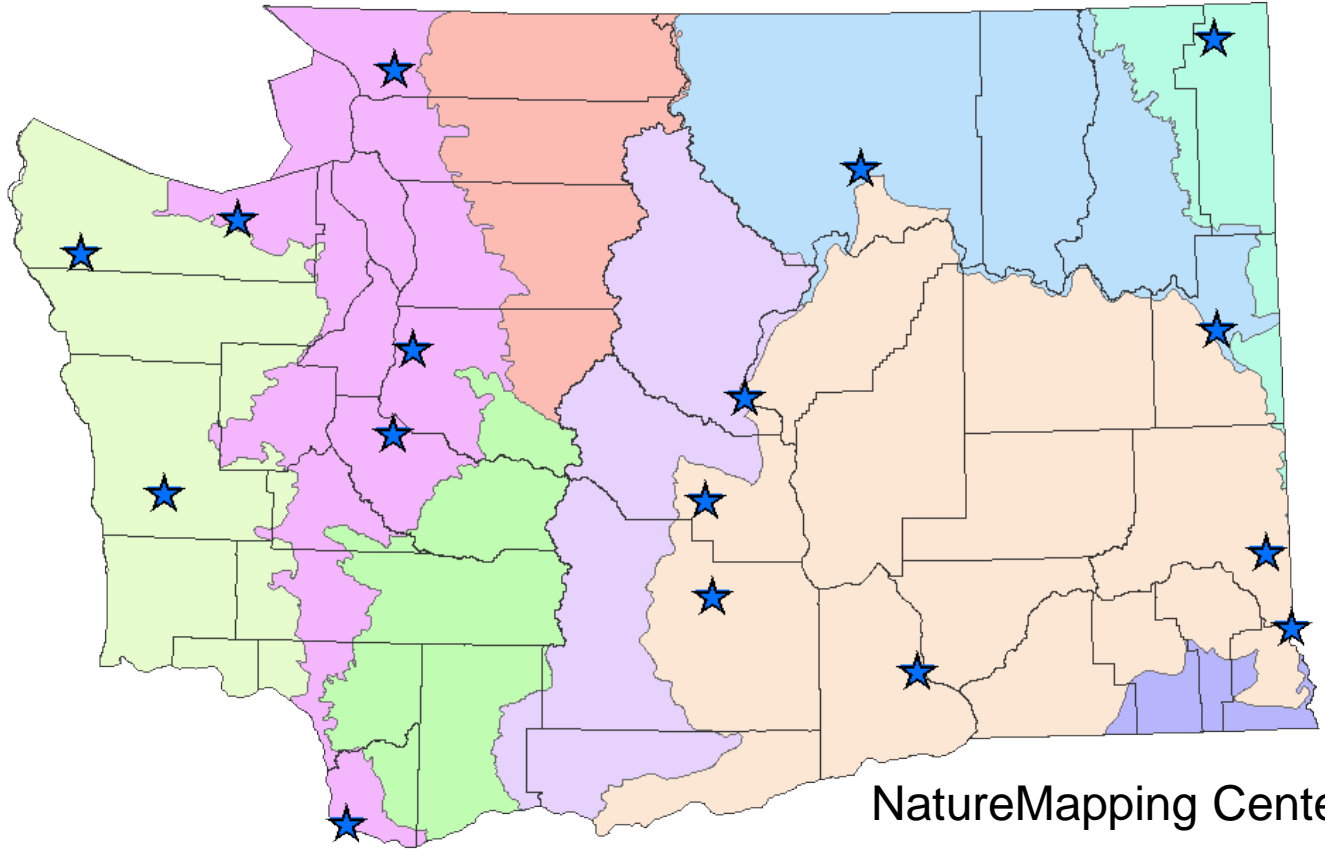
- Oak Creek Wildlife Area NatureMapping Project for Yakima regional schools
- Project CAT Cle Elum: 8 years
- Waterville Horned Toad Project

NatureMapping Protocols

- NatureMapping for Nearshore
- Reporting incidental species



Citizen Science Network Ecoregion Centers



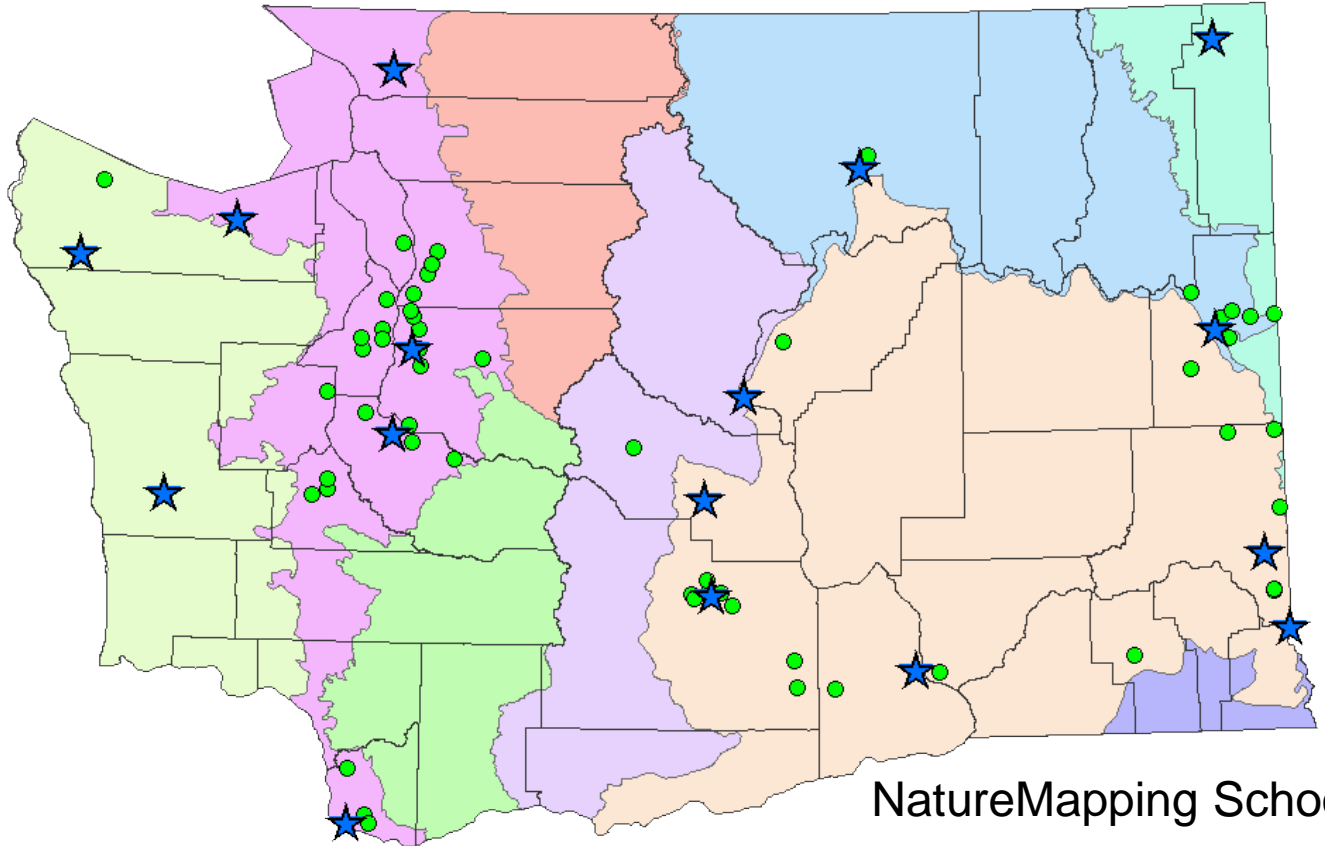
NatureMapping Centers

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Citizen Science Network Ecoregion Centers



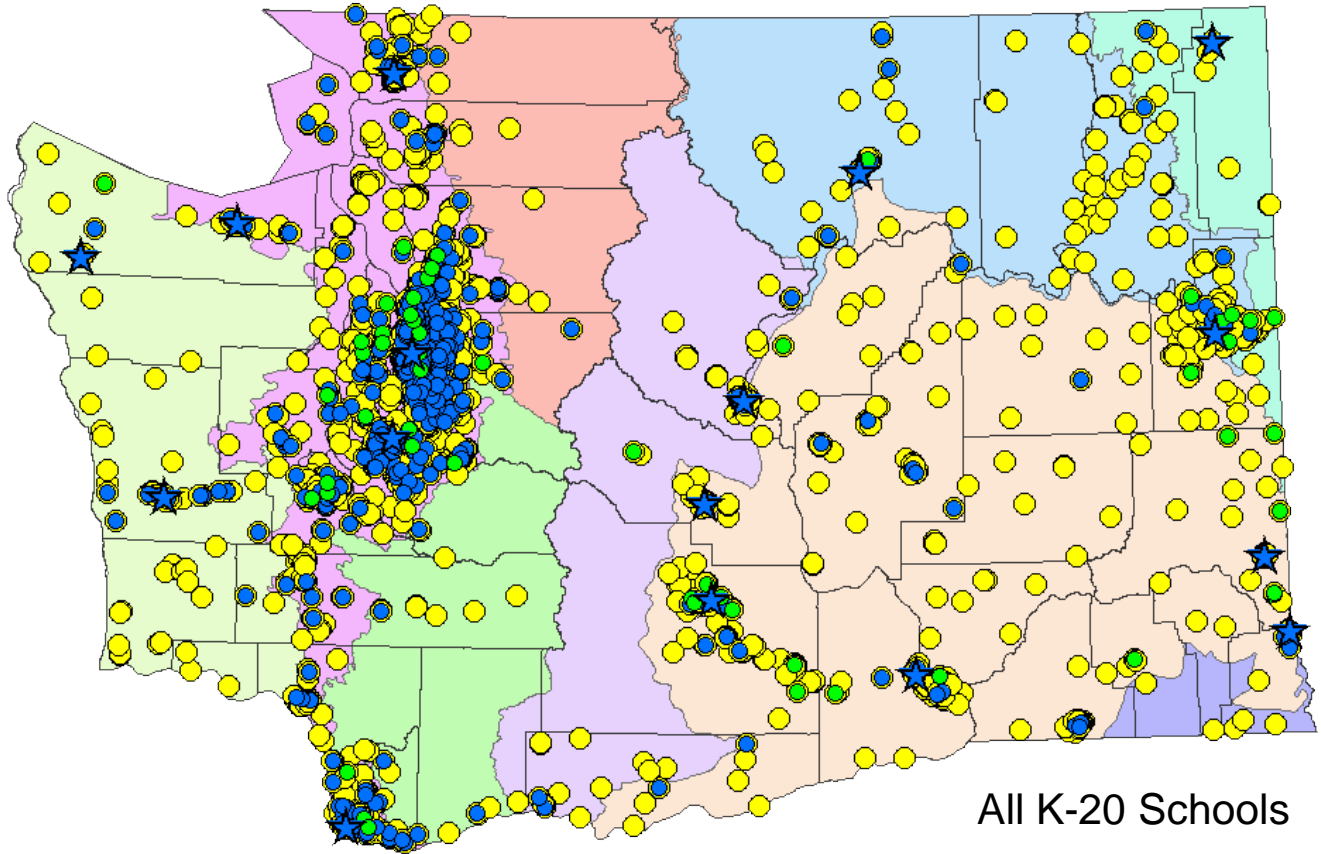
NatureMapping Schools

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Citizen Science Network Ecoregion Centers



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Washington School's (K-20)

Biodiversity Monitoring Study Area - 2020





WDFW is ready to scale up citizen science

- WDFW with UW has **established a foundation** for success:
 - Changed science education
 - Teachers seek fish & wildlife field projects
- WDFW has **elevated citizen science** through
 - Ecological Integrity Monitoring
 - Hoof Rot Reporting Tool: Online
 - Wolf Reporting Tool: Online
 - Biodiversity Monitoring *currently in development*



2013 Agency Request Legislative Proposal

**Thank You for Your Support
Of
Citizen Science**

