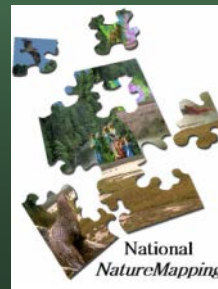


The *NatureMapping* Program

NEW TOOLS FOR CITIZEN SCIENTISTS

Karen Dvornich

NatureMapping Program, Director
NatureMapping Foundation



Washington *NatureMapping*

Agencies needed data:

WA-GAP data (dates 1800's – 1996):

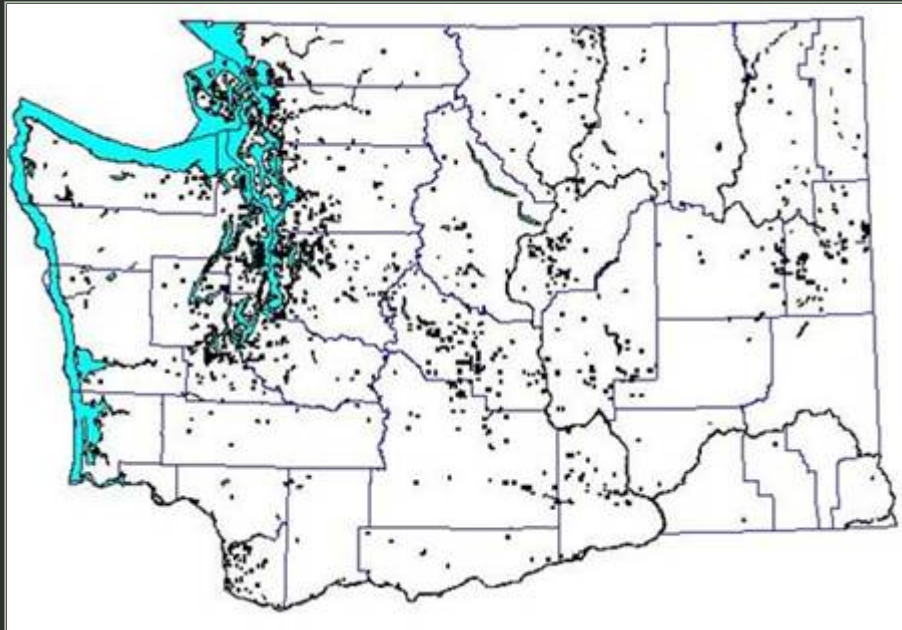
- Collected over 360,000 records
- Used 62% of expert data
- **Mammals (126 species) – 50% species < 100 records**
- **Amphibians (27 species) – 50% species < 100 records**
- **Reptiles (25 species) – 50% species < 100 records**
- **Birds (403 species) – 72 species with 0 records**

NatureMapping (1992 -)

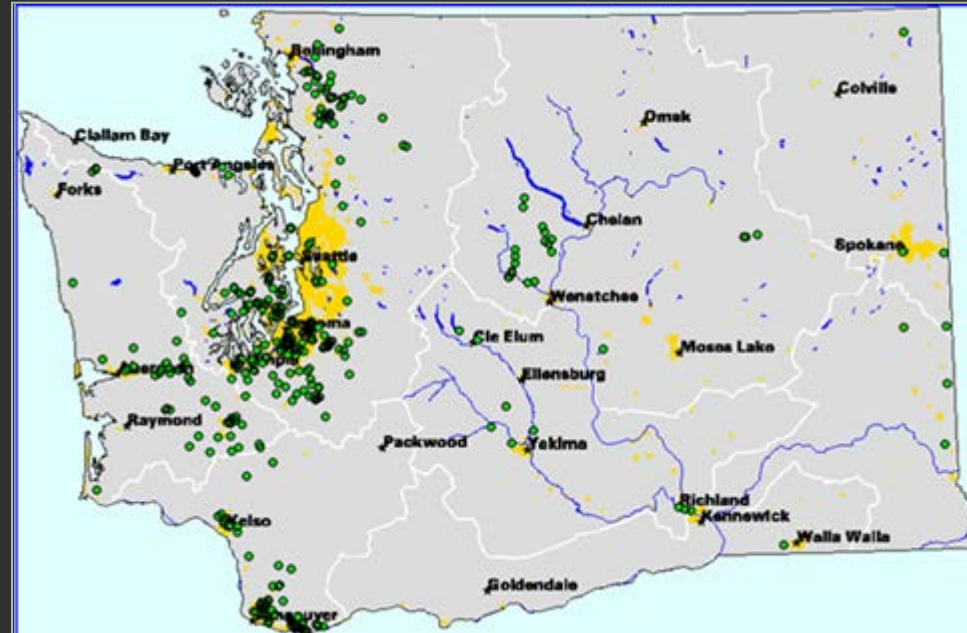
Asking the public for help

“Tell us what you see and where you see it”

NatureMapping Public Database (1906 -)



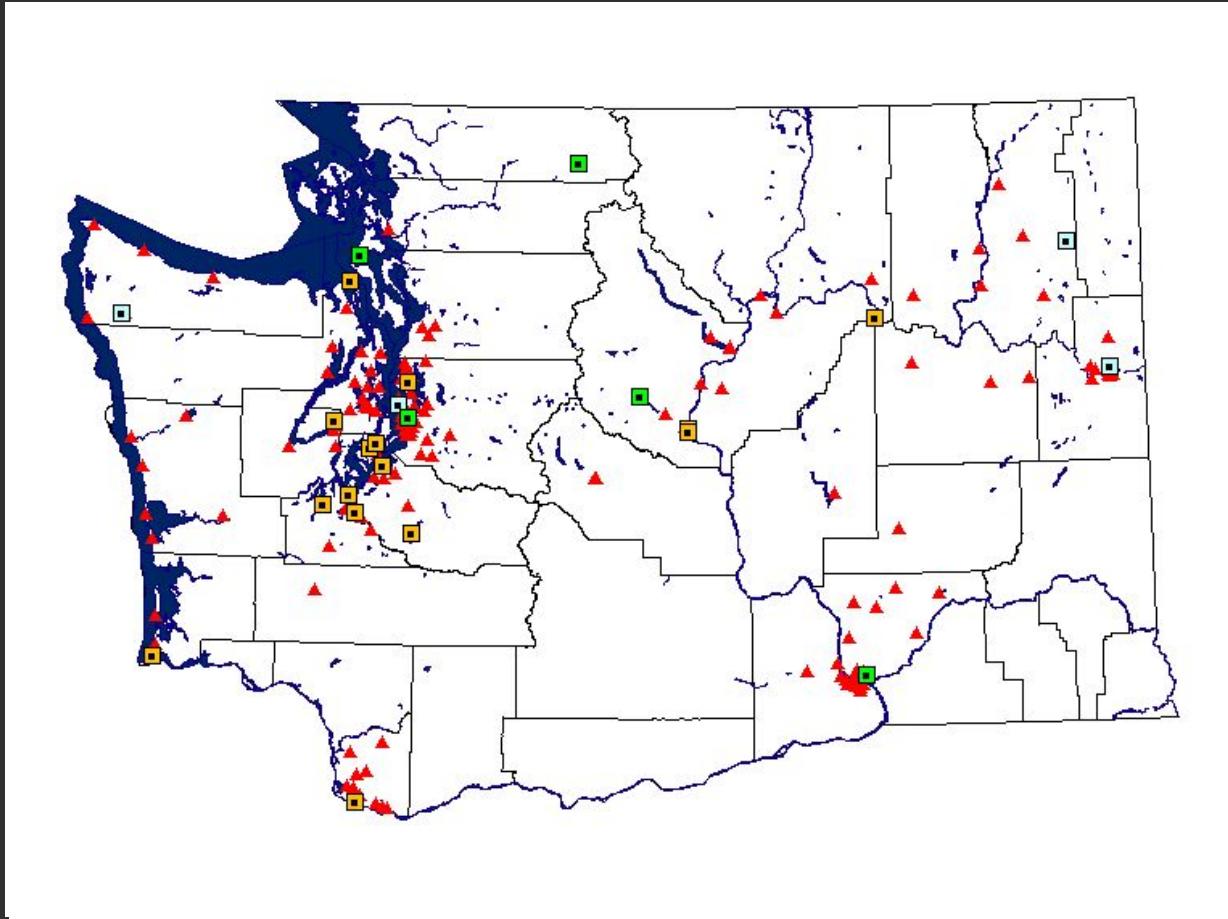
110,000 records for 420
vertebrate species reported in
36 of the 39 counties
submitted to PNW Re-GAP



435 water quality data
collection sites in 27
counties

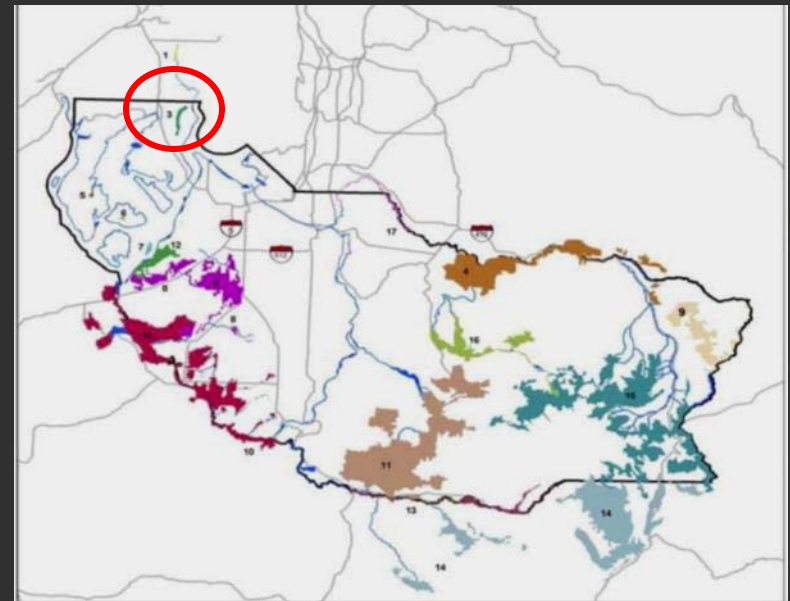
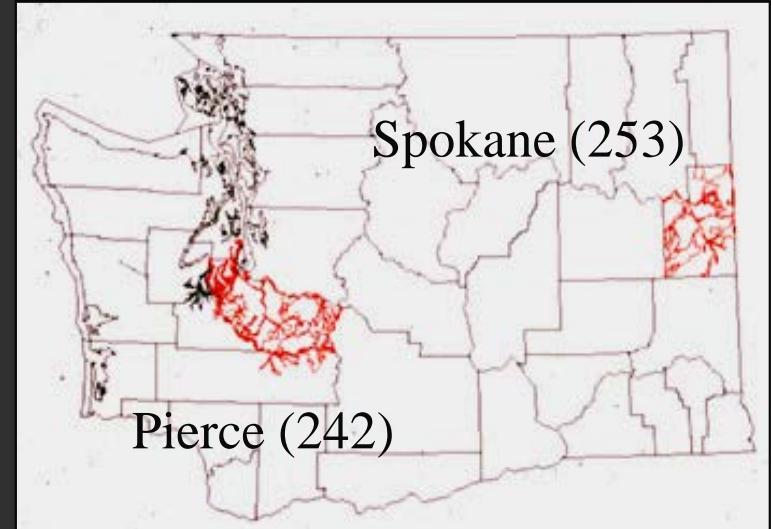
The *NatureMapping* Program

- Develop a *Network* of Informal Education Centers to train and mentor schools and communities



The NatureMapping Program

- Train NatureMappers how to *apply their research data* for local conservation efforts



What is Community Remote Sensing?

LOOSE DEFINITION

Community reflects the role of *decentralized* individuals rather than *centralized* systems - either common citizens or volunteer professionals

Remote Sensing reflects use or collection of data from a distance - activities that differ from strict mapping or in-situ data collection

RELATED FIELDS

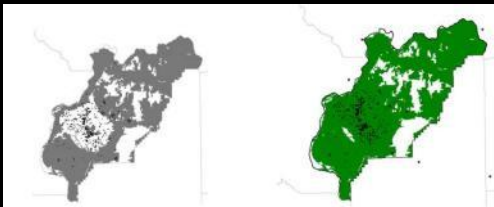
- Volunteered Geographic Information (VGI)
- Participatory GIS
- **Citizen Science**
- **Citizens as Sensors**
- **Community Mapping**
- Geo-Social Networking

Driving Technologies

- Global high-bandwidth internet access
- Social networks
- Digital cameras
- Location-based (GPS) mobile phones
- Mobile phone cameras
- Low-cost data storage
- Cloud computing



Applications For Biodiversity



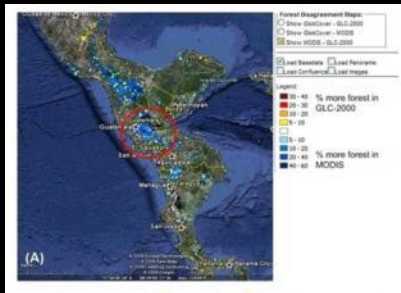
Inventory Validation
NatureMapping - UW



Systematic Monitoring
Picture Post - UNH



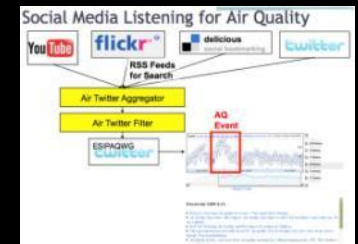
Invasive Species ID
What's Invasive! App - UCLA



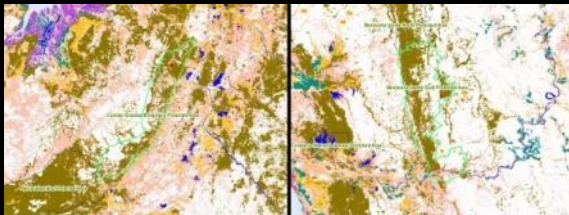
Forest Inventory
World Forest Observatory - RFF



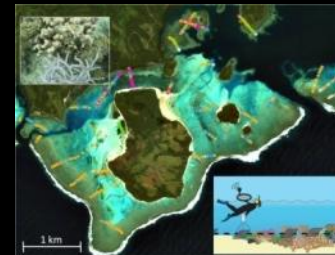
Tool Validation
Yaqui Valley Wheat Farming - Stanford



Event Detection
Air Twitter – Washington U



Habitat Management
Fire Alert System – Conservation International



Detailed Assessment
Coral Reef Habitat Mapping – U Queensland

Grassroots Mapping Tools

Helium

\$30 per cylinder,
2-3 flights



2 Trash bags

95 gallons, \$2 each



Kite

Sutton Flowform 16, \$100
or build your own for <\$1



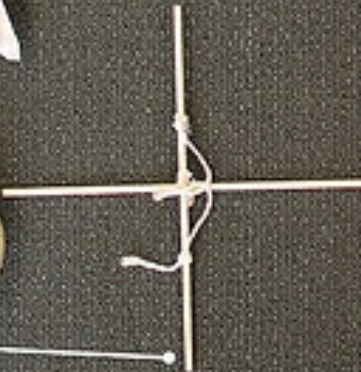
Tape

Duct and clear
packing tape, \$3



Sticks

1/2 cm, 15 cm long



A complete grassroots mapping kit

Make your own 'satellite' for as little as \$100: GrassrootsMapping.org »

Clips

Carabiners or
key rings, <\$3



String

Cotton, \$1



Scissors

Or a knife



Canon camera

\$45 on eBay



Reel

For electric cables, \$15
Or use a stick



Kite String

200-400 meters, medium-
weight nylon, \$6

Community Participation





← Kite

← Camera

Monitoring while Mapping



Finished and Stitched Products



Lake Borgne, Louisiana

Contribution to Google Earth Imagery



NatureMapping Public Database (Nearshore 2009 -)



2,500 records from schools and informal education centers

Photo Monitoring – Univ. of New Hampshire



Home | Stuff You Can Do | Educators | Buy | Build | Help | My Page | Login

picture post

Featured Picture Post panorama: [Field Post, Harpswell Road, Brunswick, Maine.](#)

| N | NE | E | SE | S | SW | W | NW | UP |
|---|----|---|----|---|----|---|----|----|
| | | | | | | | | |

Use the navigation buttons on the left of the map to zoom. Click and drag to pan around.

picture post

Picture Post is a part of the Digital Earth Watch (DEW) network. DEW supports environmental monitoring by citizens, students and community organizations through digital photography and satellite imagery.

You can...

- contribute photographs to any Picture Post
- add your own Picture Post
- measure environmental change in your neighborhood, and
- contribute to science networks.

[Learn how!](#)

WE ARE PICTURE POSTS

Click on one of the icons on the map to see pictures ...and more!

© Copyright 2010, The University of New Hampshire, Durham, NH 03824 | About | ADA Disclaimer | Terms of Service | Contact | Picture Post is supported by NASA

1. Choose your site
2. Install your post
3. Register on the website
4. Photograph away!



The Nature Conservancy – McCarthy Creek

Learn about Location


HOME EXPLORE PARTICIPATE SUBMIT PHOTOS IRIS

Witnessing Change

EXPLORE MCCARTNEY CREEK MEADOW


- Select a Monitoring Location
- Learn about Location
- Explore Photo Points

About McCartney Creek Meadow




McCartney Creek Meadow is a shrub steppe and freshwater habitat in Moses Coulee, managed by The Nature Conservancy, with 3 photo points monitored in spring and fall for changes in native vegetation.

About the Land Manager



Chuck Warner, *Moses Coulee Conservation Area Program Director* for The Nature Conservancy. Chuck may be reached at 509-665-9920 or by email.

At the Trailhead



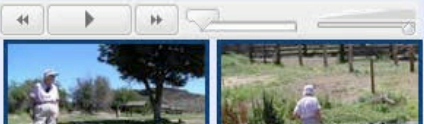
Description of trailhead coming soon.

You are standing in the riparian area of McCartney Creek, within a meadow in Moses Coulee, part of the vast Columbia Basin shrub steppe ecosystem. The landscape you see was formed by a series of lava flows that laid down layer after layer of thick basalts. The coulee was carved by massive ice age floods, the largest floods known to science.

This landscape has been inhabited by humans for at least the last 10,000 years, tribes known today as the Wanapum, Yakima, Umatilla, and others. These meadows were homesteaded and farmed by a European American family, the McClures.

"The Conservancy is working to restore a healthy riparian system at this 35-acre site that will provide habitat for a diverse array of native plants and animals and opportunities for community learning."

Mary O'Brien tells about growing up near McCartney Creek Meadow



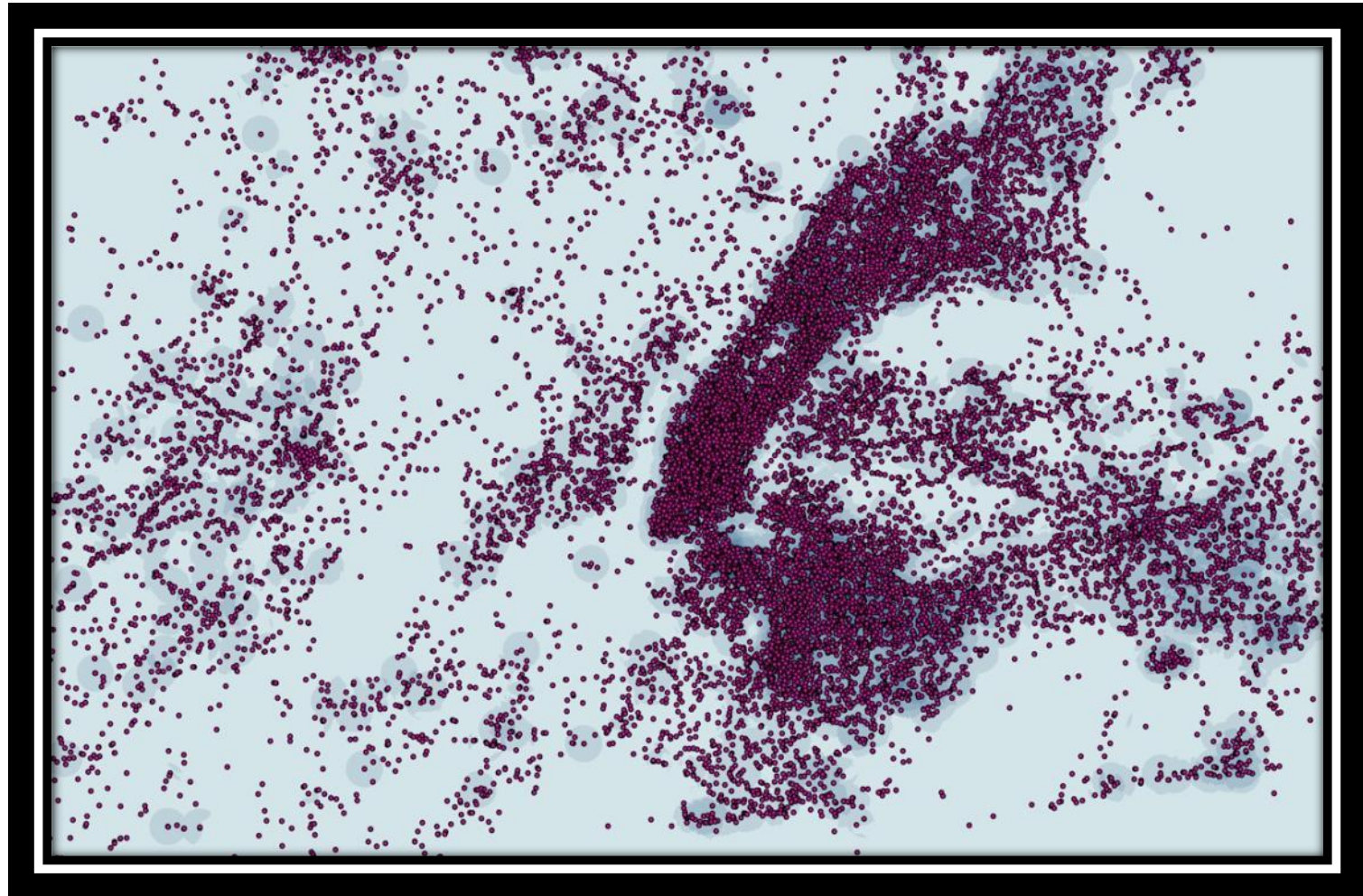
Preparing for Your Trip

- Walk-in access
- April - August
- Daylight hours
- Please leave dogs at home.

Driving Directions

- From Wenatchee, follow US-2 North to Waterville.
- From Waterville, go East on US-2 about 20 miles to Moses Coulee Rd SE.

Locating the messages



New York

University of Washington eScience Institute Students

App for *NatureMapping*

Field work

8 interviews

13 questionnaires

43 surveys

We found that:

- 1) Being able to learn more about animals from the application and having fun through a competition or social feature are equally wanted incentives.
- 2) Users want to know how and where their data submissions are being used to benefit nature and organizations.

Species are ranked: Most common higher ranking
Highest points: Free download of a song for iPod



Washington NatureMapping Program

About Us

How to Participate

Bioblitz Results

Biodiversity Modules

Maps

News

Projects

Publications

Resources & Products

Teachers

Workshops



© Tim Knight

Our goal is to keep common animals common and to maintain our quality of life. Our approach is to train individuals to become aware of their natural resources and to provide the tools to inventory and monitor their resources. [Read more »](#)

- Home
- Post Data
- View Data
- Map of Records
- Forum
- Contact Us
- Administrator

User Menu
My Observer Info

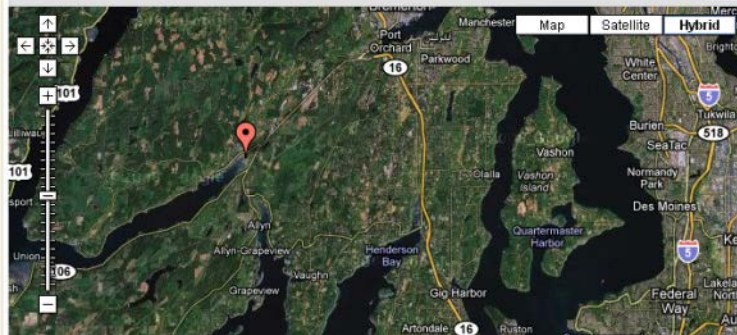
CB Login

Hi, karend

Logout

Standard Select

| NatureMapping Data | | Clear |
|---------------------------------|---|-------|
| all | <input type="text"/> | |
| Observer ID | 513 | |
| Observation Date | Between <input type="text"/> And <input type="text"/> | |
| Site Name | All | |
| Advanced search | | |
| | | Go |



2008

3.7 million hits
390,000 visits

2009

4.4 million hits
446,000 visits

2010

8 million hits
837,000 visits

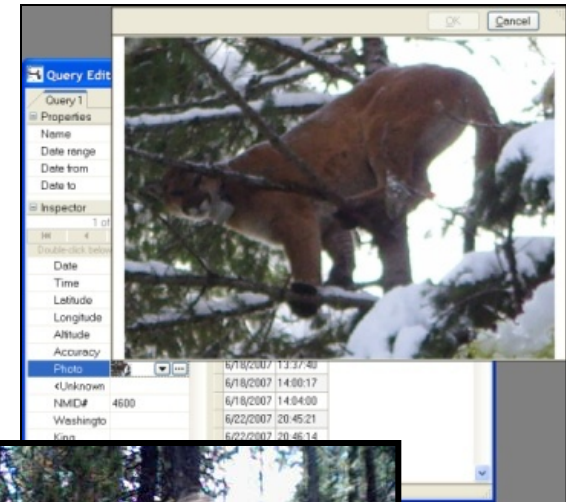
2011

1 million hits per
month

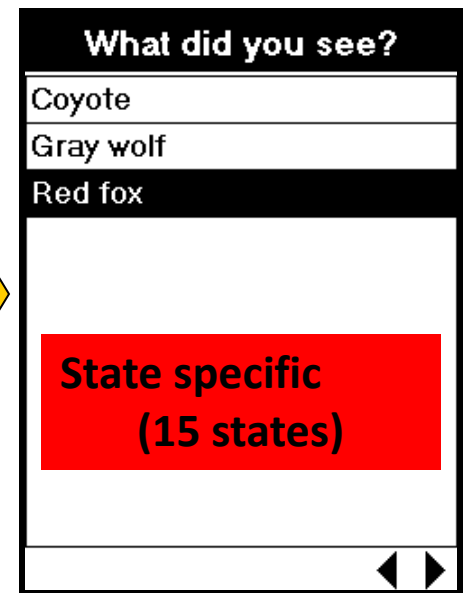
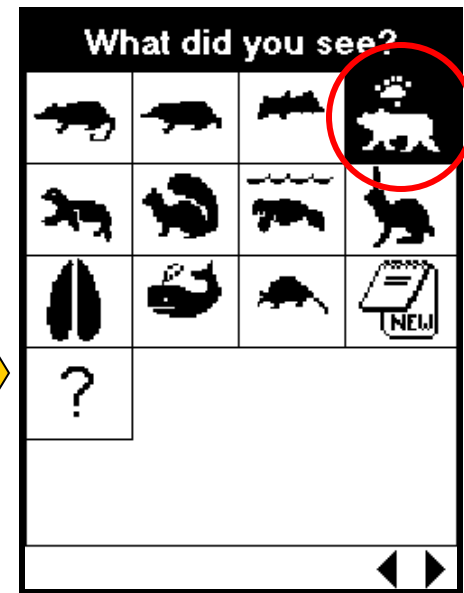
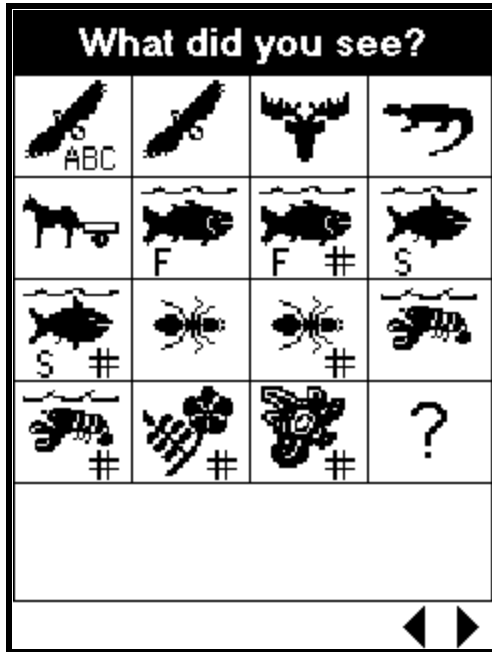
~35,000 unique
visitors each month

NatureTracker (2001)

- Mobile units/ Smart phones /Androids
- Icon driven
- Attach digital photos
- Use plant/invertebrate lists
- See data on own PC immediately



Mammals



- Birds*
- Reptiles & Amphibians*
- Domestics*
- Fresh and Saltwater Fish*
- Terrestrial/Aquatic*
- Invertebrates*
- Plants*
- Other misc. lifeforms*

NatureTracker vs Other Apps



Teaches novices how to select correct species

Flexible - A complete field notebook allowing novices/experts to record other variables such as weather, signs/behaviors, habitats, for ALL taxa.

Can use a PC with screen simulator with stored online maps to seize the GPS coordinates without internet or cell towers.

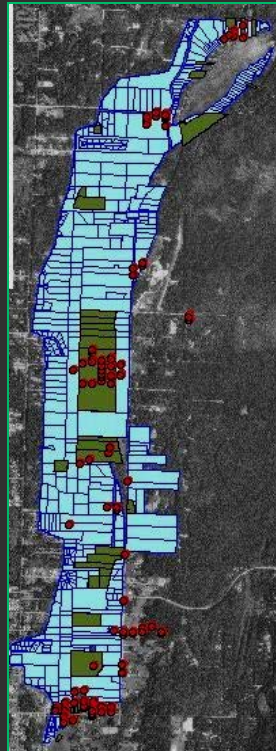
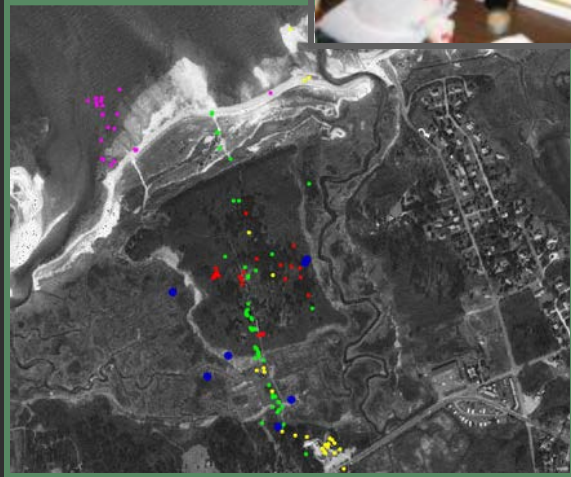
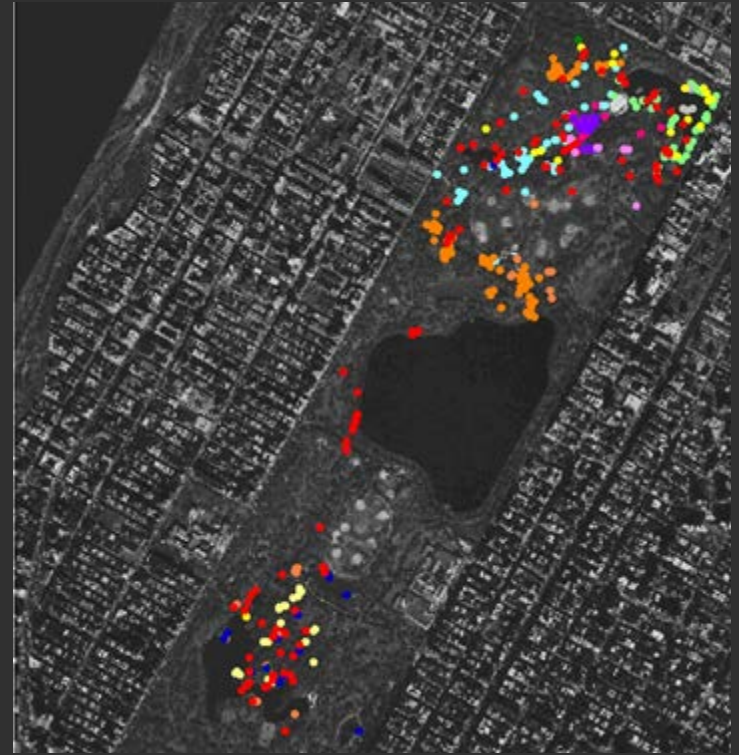
Expects user to know their species

Specific to a taxonomic group such as eBird, BudBurst

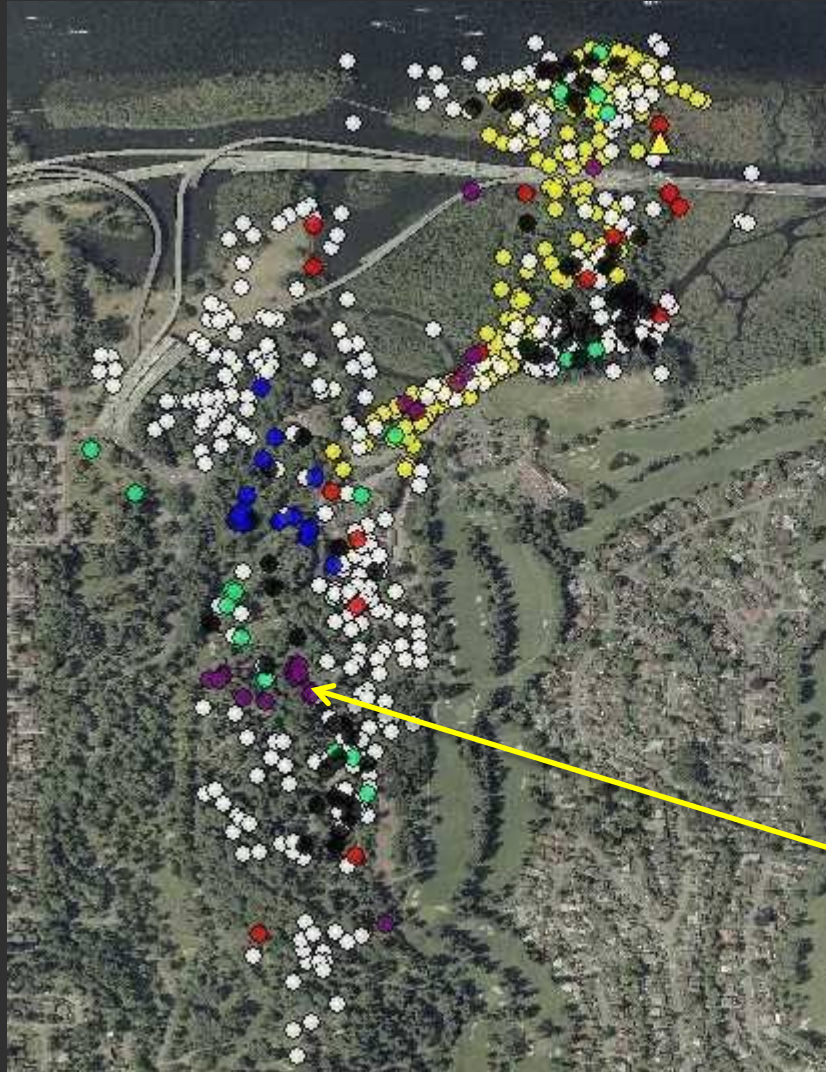
Need a phone and cell tower connection

We don't have enough experts, so let's give novices the tools to become experts.

Bioblitz: 24-hour Rapid Assessment



Washington Park Arboretum Bioblitz



- Plants
- Birds
- Mammals
- Reptiles/Amphibians
- Fungi
- Bats (none found)
- Invertebrates
- Lichen

- Point
- Point
- Point
- Point
- Point
- Point
- Point
- Point

Washington Park Arboretum Bioblitz May 21-22, 2010



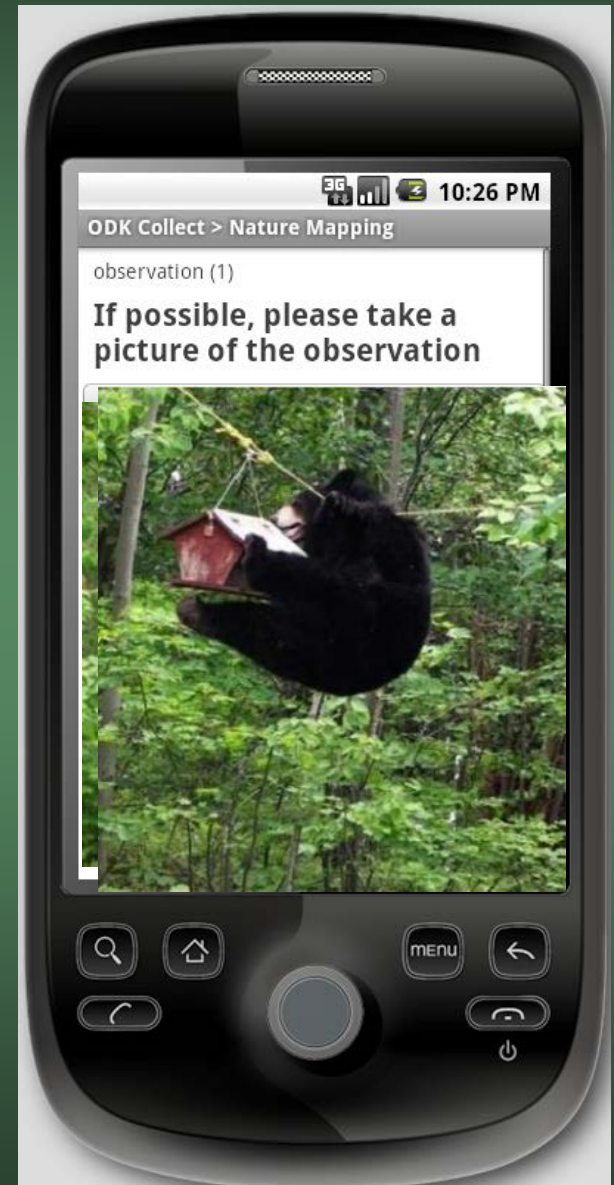
Species Report for Foster Island and Duck Bay
by Karen Dvorach



NatureTracker and ODK

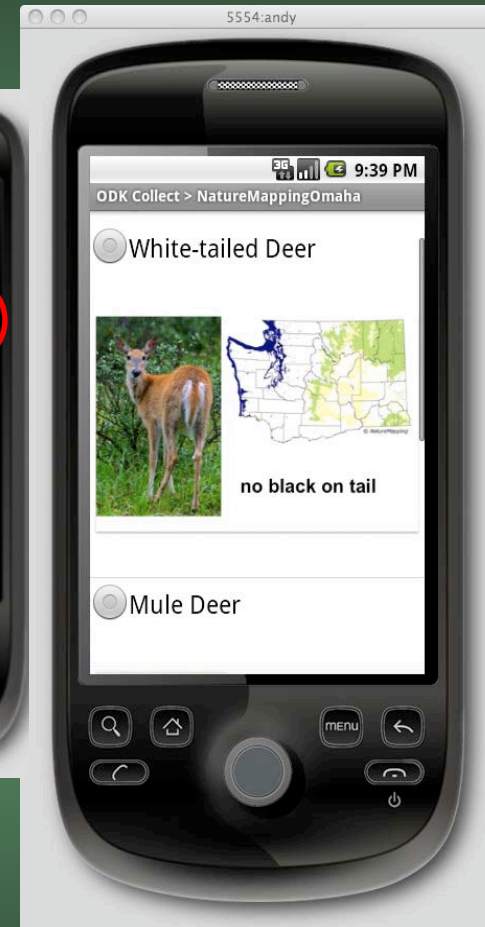
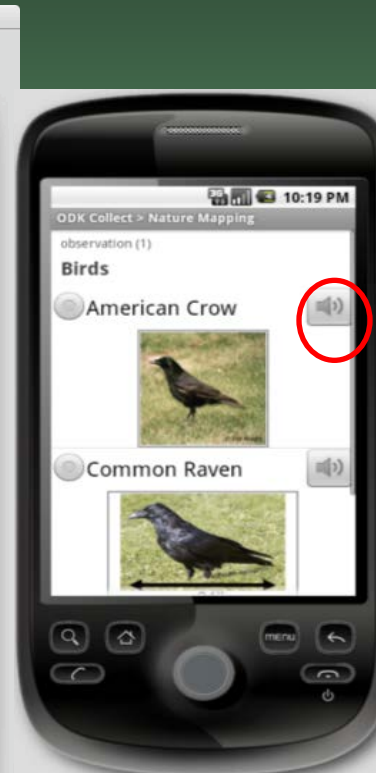
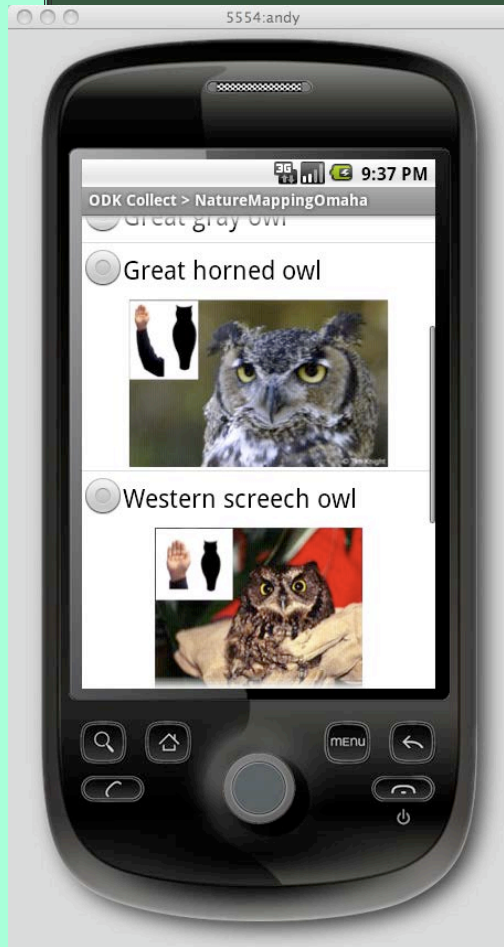
Open Data Kit (ODK) is an open source project to develop flexible mobile data collection tool based on open standards and capabilities on Android smartphones

Developed at University of Washington and UCLA



New Tools for *NatureMapping*

1. Prevent common mistakes (e.g., *Screech owls identified as baby Great-horned owls*)
2. Vocalizations & size differences
3. Range maps for similar species



New Tools for *NatureMapping* (Cont'd)

Turtles

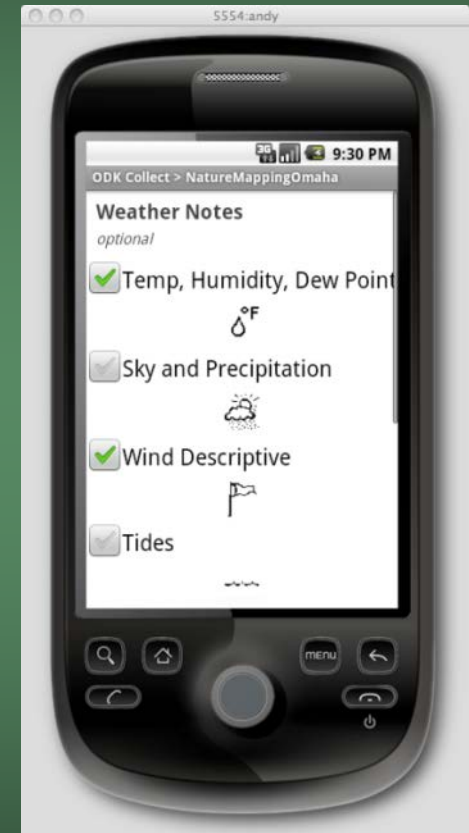
| | |
|--------------------------------|---|
| Unknown turtle | |
| Florida spiny softshell turtle | |
| Green sea turtle | |
| Leatherback sea turtle | |
| Loggerhead sea turtle | |
| Olive ridley sea turtle | |
| Painted turtle | Photo  |
| Red-eared slider | Photo  |
| Snapping turtle | |
| Spiny softshell turtle | |
| Western pond turtle | |

Painted turtle
(red on belly and sides)



Red-eared (Pond) slider
(red on neck) – **Non-native**

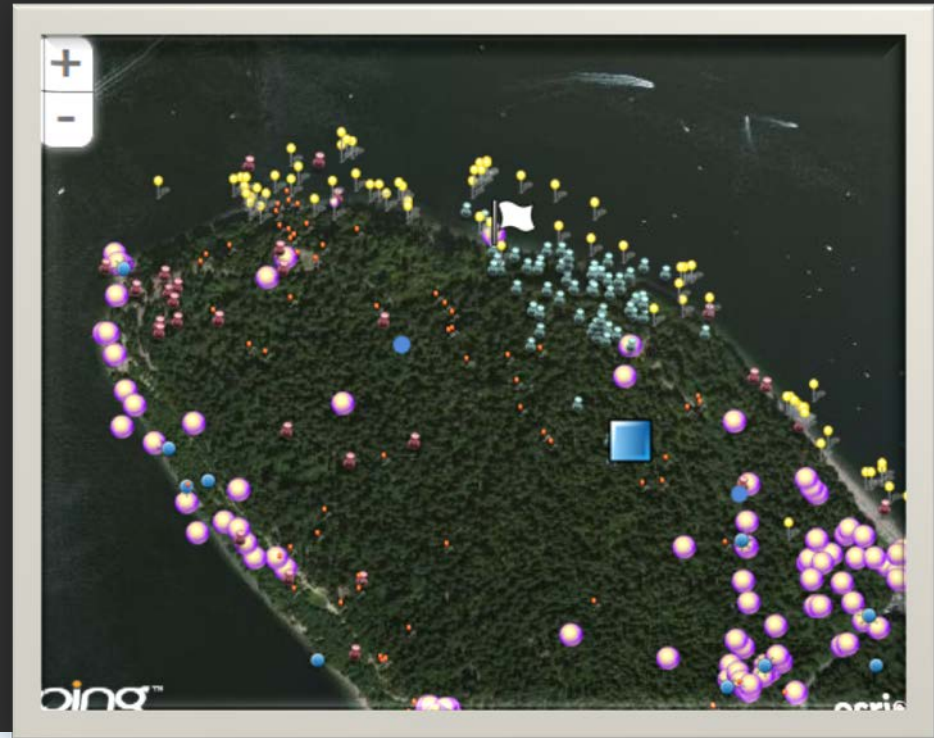
Weather
Climate change



ArcGIS Online

Free!
Public or Private
Link to websites
NatureMapping 1-day
training workshop

Spreadsheet



| Observer_Species_Id | Species_name | Questions | Date | State | County | Latitude | Longitude | Source | Quantity | Estimate | Habitat | Comment |
|---------------------|--------------------------------|-----------|------------|-------|--------|----------|-----------|--------|----------|----------|--------------|------------------------------------|
| 513.5 RACAT | Bullfrog | | 5/4/2007 | WA | 13 | 47.0561 | -119.331 | 5 | 1 | | 613 | |
| 513.53 RACAT | Bullfrog | | 5/4/2007 | WA | 13 | 47.0561 | -119.331 | 3 | 6 | | 522 | |
| 4923.53 RACAT | Bullfrog | | 7/23/2011 | WA | 27 | 46.86943 | -122.342 | 3 | 2 | | 324 tadpoles | |
| 4923.53 RACAT | Bullfrog | | 7/23/2011 | WA | 27 | 46.86906 | -122.345 | 3 | 2 | | 324 tadpoles | |
| 2011 PSRE | Pacific treefrog (Chorus frog) | | 5/16/2009 | WA | 21 | 46.96493 | -122.556 | 3 | 1 | | 500 | |
| 2018 PSRE | Pacific treefrog (Chorus frog) | | 5/16/2009 | WA | 21 | 46.9924 | -122.495 | 2 | 1 | | 500 | |
| 2020 PSRE | Pacific treefrog (Chorus frog) | | 5/16/2009 | WA | 21 | 46.99382 | -122.492 | 3 | 1 | | 500 tadpoles | |
| 324 PSRE | Pacific treefrog (Chorus frog) | | 10/12/2008 | WA | 27 | 46.86636 | -122.345 | 2 | 1 | | 324 | |
| 5016 PSRE | Pacific treefrog (Chorus frog) | | 3/18/2007 | WA | 27 | 47.35277 | -122.579 | 3 | 1 | | 231 | fleeing lawn mower near maple tree |
| 4923.53 RAAU | Red-legged frog | | 10/1/2011 | WA | 27 | 46.85875 | -122.46 | 3 | 1 | | 324 | |
| 513.5 RAAU | Red-legged frog | | 9/9/2003 | WA | 27 | 47.08809 | -122.708 | 3 | 1 | | 520 | |
| 2020 BUBO | Western toad | 1 | 5/16/2009 | WA | 21 | 46.99382 | -122.492 | 3 | 1 | | 500 tadpoles | |
| 5085 BUBO | Western toad | | 10/10/2009 | WA | 27 | 46.915 | -122.287 | 2 | 1 | | 236 | centroid of section |
| 4747.53 ENES | Ensatina | | 6/4/2005 | WA | 27 | 47.34573 | -122.583 | 3 | 1 | | | |
| 5016 AMMA | Long-toed salamander | 1 | 7/1/2009 | WA | 27 | 47.35277 | -122.579 | 3 | 1 | | | below garden, maybe long-toed |
| 1011 AMGR | Northwestern salamander | 1 | 5/15/2009 | WA | 21 | 47.0007 | -122.555 | 3 | 1 | | 500 | |
| 2010 TAGR | Roughskin newt | | 5/16/2009 | WA | 21 | 46.96336 | -122.555 | 3 | 100 | Y | 900 | |
| 2010 TAGR | Roughskin newt | | 5/16/2009 | WA | 21 | 47.00024 | -122.555 | 3 | 1 | | 500 | |

www.naturemappingfoundation.org