



INTERIM REPORT
OCTOBER 15, 2018

western pond
TURTLE
survey



Prepared by Samara Group • samarapdx.com

INTERIM REPORT

Prepared for the Oregon Department of Fish and Wildlife by Samara Group, LLC

Introduction & Scope of Work

Currently under review for federal listing by the US Fish and Wildlife Service (USFWS), the Western Pond Turtle (*Actinemys marmorata*; WPT) is a State Sensitive-Critical species in Oregon and is identified as a Species of Greatest Conservation Need (SGCN).

Recommended conservation actions for the WPT include identifying population centers, establishing priority areas for protection and management, and implementing Oregon Department of Fish and Wildlife's (ODFW) Turtle Best Management Practices. In 2017, Washington, Oregon, and California received a federal Competitive State Wildlife Grant to address these conservation actions in order to fill critical knowledge gaps while improving habitat conditions and reducing threats at known priority sites.

In Oregon, the WPT Competitive State Wildlife Grant includes the following two objectives:

- 1) Habitat restoration at three sites with pre- and post-treatment monitoring, and 2) Data compilation, analysis, and standardized occupancy surveys. In March 2018, the Oregon Department of Fish and Wildlife (ODFW) hired Samara Group to be the WPT Project Coordinator responsible for supporting the completion of these objectives during the 2018, 2019, and 2020 field seasons.

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1. Habitat Restoration Sites

SITE VISITS

Samara Group joined ODFW staff and local partners on site visits to Minto-Brown Island Park in Salem (April, 19th 2018), Talking Water Gardens in Albany (April 4, 2018), and Golden Gardens Park in Eugene (April 4, 2018). During each site visit, a walkthrough of the areas under consideration for restoration was completed. Restoration plans, if already drafted, were also reviewed. Input on methods for documenting restoration action were provided, as requested, and support offered to facilitate documentation.



Site visit to Minto-Brown Island Park in Salem, OR on April 19, 2018.

DEVELOPMENT OF HABITAT ASSESSMENT

Samara Group worked with ODFW and Washington Department of Fish and Wildlife (WDFW) staff to develop protocols that could be used to describe pre- and post-treatment habitat conditions using a qualitative

habitat assessment at the three restoration sites. The habitat assessment was adapted from Appendix E: Turtle Habitat Assessment Tools from the [Oregon Conservation Strategy Guidance for Conserving Oregon's Native Turtles Including Best Management Practices](#) and updated to include more detail on non-native vegetation cover.

PRE RESTORATION HABITAT ASSESSMENTS

Using the aforementioned habitat assessment, Samara Group conducted pre-treatment assessments at the three restoration sites. Each of the sites were visited and each body of water was evaluated individually, documenting the conditions of the habitat according to the habitat assessment form (see example in Appendix A). Items of focus included: the number and location of basking logs, location and approximate size of potential nesting areas, actual turtles observed, aquatic and terrestrial species of vegetation present, average litter layer and distance from the water body, anthropogenic disturbances including trails and fishing activity, and the presence of connectivity to other habitat.

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FACILITATE CAMERA SETUP AND MONITORING

Remote cameras were made available to the restoration site partners as a tool to monitor basking sites, nesting activity and/or depredation events. Talking Water Gardens (TWG) decided to deploy cameras to monitor areas where nesting and basking habitat treatments were planned. Monitoring in these areas is intended to provide a baseline of use and activity to compare pre- and post-treatment. Samara Group purchased cameras and supporting equipment and worked with ODFW staff and TWG partners to install and maintain that equipment. Three cameras were ultimately installed at TWG during the 2018 monitoring season. One timelapse camera was set to observe an area where new basking structures will be added. A second timelapse, in conjunction with a camera set to trigger on motion, was positioned to observe a potential nesting site for turtle activity and/or depredation events. Cameras were deployed from July to October 2018. At the conclusion of the season, TWG returned the collected data and monitoring equipment back to Samara Group for review and recording.



Setting up a remote camera at the Talking Water Gardens restoration site.

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OTHER ACTIVITIES

Samara Group also designed a “Don’t Let It Loose” educational poster (see Appendix B) to be displayed in the kiosks of the three restoration sites to inform visitors about the impacts of releasing pets into the wild. The final version of the poster was the product of several rounds of feedback and edits from ODFW to ensure that the most accurate information was being used. The final poster was shared with the Oregon Native Turtle Working Group (ONTWG), as well as with the following agencies/organizations:

- Cascade Environmental
- CASM Environmental LLC
- City of Eugene Parks & Open Space Division
- City of Portland Parks & Recreation
- Forests Forever / MAP Inc.
- Multnomah County Animal Services
- North Clackamas Parks & Recreation District
- Oregon Department of Fish & Wildlife - Clackamas Office
- Oregon Parks & Recreation Department
- Tualatin Hills Park & Recreation District
- Willamette Riverkeeper

western pond **TURTLE** survey

Can't handle your pet anymore?
Be responsible and...



DON'T LET IT LOOSE!

Species sold by local and online pet stores are not native to Oregon, so it is important that you do not release these plants and animals into the environment. Many can survive and reproduce, becoming invasive quickly and displacing our native fish, wildlife, and plant species. If you have a pet that you can no longer care for, contact your local pet store, veterinary clinic or licensed wildlife rehabilitation facility, or contact the Oregon Department of Fish and Wildlife at (503) 947-6301 or odfw.info@state.or.us.

RELEASING ANIMALS AND PLANTS CAN HAVE UNINTENDED, YET VERY SERIOUS CONSEQUENCES WHEN ANIMALS OR PLANTS REPRODUCE AND BECOME INVASIVE!

THINK TWICE BEFORE YOU BUY A PET
AND NEVER RELEASE THEM INTO THE WILD!



The red-eared slider is a common pet turtle native to the eastern U.S. that outcompetes our native turtles, like western pond turtles, for food, nesting, and other resources.



The red swamp crayfish is the most invasive crayfish in the world and it aggressively competes with Oregon's native signal crayfish (*Pacifastacus leniusculus*) for food and resources.



Even a goldfish can become invasive when released into the wild. These domesticated carp grow into voracious bottom-feeders, eating everything in their path including the eggs of our native, pond-breeding amphibians. They reproduce rapidly and can lay 40,000 eggs a year, quickly overtaking ponds.



Bullfrogs will eat anything they can fit in their mouths, including baby turtles, birds, and native amphibians. Bullfrogs can also be a carrier of the chytrid fungus that affects other amphibians and is a contributor to many dwindling native amphibian populations around the world.



HAVE YOU SEEN AN INVASIVE SPECIES IN THE AREA? REPORT IT!

By reporting suspected invasive species in your area, you'll be contributing vital early detection information to the experts best able to stop the spread of invasives. To report suspected invasive species, call our Invasive Species Hotline at 1-866-INVADER (1-866-468-2337) or go to oregoninvasiveshotline.org to submit an electronic report.

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2) Standardized Occupancy Surveys

SURVEY PROTOCOL EDITS AND FINALIZATION

Prior to Samara Group’s involvement in the WPT project, several members of the ONTWG had been developing a Visual Encounter Survey (VES) protocol. In March of 2018, as the protocol was reaching finalization, Samara Group solicited and then compiled feedback from ONTWG members on the draft VES and discussed key decision points with the group at a meeting on March 22, 2018. While the group agreed that some adjustments may ultimately need to be made to the protocol, the group also agreed to move forward with testing the VES during a pilot season in 2018.

DEVELOPMENT & IMPLEMENTATION OF SURVEY123 FORM

With the finalization of the VES protocol, Samara Group was able to adapt that protocol into a [Survey123 collection form](#). This form allows field biologists and technicians to collect the VES data and submit it directly into a GIS platform. Data fields include Observer Information, Survey & Site Information, Turtle Field Guides, Turtle Observations, Environmental Variables, Habitat Variables, Disturbance Variables, and Landscape Variables, as well as easy ways to upload photos taken at the survey site.

TRAININGS FOR SURVEYORS

Samara Group trained ODFW field biologists, external agency personnel, and volunteers on proper survey protocols and species identification to ensure that consistent data was collected by all field personnel. Four trainings were held in regions across the range of the WPT, including the upper Willamette, lower Willamette, and Rogue drainages. Three of these trainings were focused on the VES survey protocol with one additional training provided to Oregon Zoo Volunteers to assist with positive detections (see more below in section “Presence detections”). Field-based trainings were supplemented



Leslie Bliss-Ketchum showing surveyors how to identify turtles during one of the trainings.

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with ODFW-approved materials that focused on turtle life history, natural history, and keys to identification, including a PowerPoint presentation, field guide, and turtle ID guide (see Appendix C & attached PPT file). Trainees were given turtle identification cards and information on the proper use of spotting scopes and binoculars was offered.

FACILITATING AND TRACKING COG ADOPTION

Samara Group conducted outreach, then facilitated and tracked cog adoptions by regional surveyors. For each cog that was adopted, contact information of the surveyor was collected for tracking and each surveyor was sent a packet of information specific to their adopted cog. Each packet included a regional and cog-specific map with land ownership details to aid in survey site selection.

OCCUPANCY SURVEY TRAINING AND FEEDBACK ON PROTOCOL

In May of 2018 the USFWS offered an Occupancy Modeling training held at the Columbia River Fisheries office in Vancouver, WA. Samara Group attended this training in order to enhance our understanding of occupancy modeling and confirm that the current VES protocol would be sufficient to accomplish the goal of conducting an occupancy model for the WPT. The statisticians teaching the course were consulted and they provided feedback on the VES and responded positively that we would be able to conduct the analysis as intended with the data collection methods developed thus far.

TROUBLESHOOTING/ASSISTANCE WITH SURVEY SUBMISSIONS

Samara Group provided assistance via phone and email to surveyors needing additional support, such as those that experienced difficulties in the field and/or had questions about submitting data through Survey123. Due to isolated issues with Survey123 and/or personal preference of the surveyor, several surveys were received via email as scanned paper data sheets, or mailed as hard copies. This data was entered manually into Survey 123 by Samara Group.

QA/QC OF SUBMITTED DATA

Samara Group has carefully reviewed all data received to date through the Survey123 app and in paper forms to ensure accuracy. This has included verification of Cog IDs, identification of 'Historic' vs. 'Modeled' Cogs when surveyor did not include the information, and confirmation of survey site coordinates, among others.

DATA COMPILATION, SUMMARY, AND ANALYSIS

Between the start of the 2018 survey season on May 15th, and the close of the monitoring season on September 15, 2018, 60 sites were surveyed for WPT. Of those, 39 sites were Historic and 21 were Modeled.

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Presence Detections (Citizen Science Data)

DEVELOPMENT & IMPLEMENTATION OF iNATURALIST PROJECT

Samara Group developed an [iNaturalist project](#) building on those previously developed by members of the ONTWG. The objective of this project is to collect any incidental observations made by professionals in the field and/or citizen scientists. As of October 8, 2018 citizen scientists submitted 16 WPT sightings in Oregon through iNaturalist.

OUTREACH EFFORTS

Samara Group conducted limited outreach efforts in 2018 to encourage use of the iNaturalist application to collect turtle sightings. A priority was placed on conducting occupancy survey in 2018, but this effort is expected to increase during the 2019 season.

TRAINING WITH ZOO VOLUNTEER STAFF

One major outreach event that Samara Group conducted was organizing and facilitating a training session with volunteer staff at the Oregon Zoo. Zoo volunteers and staff were instructed in proper survey techniques, turtle identification, and use of iNaturalist to report turtle sightings. Additionally Samara Group and ODFW staff then worked to identify water bodies in the Metro region that would be suitable for the Zoo volunteers to survey. Feedback was provided by Zoo volunteers that they would like even more specific instructions on locations to survey. Additional information and training effort will be provided in the 2019 season.

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Other Tasks / Events

DATA DISCUSSION & COORDINATION WITH CALIFORNIA

Samara Group attended phone conversations with ODFW and California Department of Fish and Wildlife (CDFW) and provided support information and documentation to facilitate coordination across Oregon and California regarding the VES protocol and data collection methods.

ATTENDING & PARTICIPATING IN NATIVE TURTLE WORKING GROUP MEETINGS

Samara Group has been actively engaged with Turtle Working Group partners, including the Upper Willamette, Lower Willamette, and Southern Oregon/Northern California Native Turtle Working Groups. These groups have proven to be a robust resource of regional knowledge and have provided connections to resources that have been essential to support monitoring efforts.

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Turtle Field Guide & ID Guide 15

APPENDIX A

Example Habitat Assessment

GOLDEN GARDENS PARK

		South Pond 6/1/2018	Main Pond 6/1/2018	North Pond 6/1/2018
Location:				
Date:				
Water body	Lotic or Lentic	Lentic	Lentic	Lentic
	Inlet or outlet present: Y/N	Y	Y	Y
	Site is man-made or altered: Y/N	Y	Y	Y
	Intermittent or Perennial	Perennial	Perennial	Perennial
	Acreage			
Bottom Substrate	% Mud	95%	95%	95%
	% Rock	5%	5%	5%
	% Sand	0%	0%	0%
	Water clarity < 2ft	< 2ft	< 2ft	< 2ft
Basking Habitat	Emergent logs surrounded by water:	5	12	1
	Emergent logs connected to shore:	0	12	3
	Longs on or near shore, not in water:	0	1	0
	Boulders, man-made surfaces, sandy/ rocky shoreline present: Y/N	Y	Y	-
	Microbasking (<6 in wide) structures:	3	10	1
Vegetation:	% Open Water	95%	95%	95%
	Aquatic	% Floating Veg (native)	5%	5%
% Floating Veg (nonnative)		0%	0%	-
% Emergent Veg (native)		5%	0%	-
% Emergent Veg (nonnative)		0%	0%	5%(RCG)
Terrestrial		Native Trees/Shrubs (>2ft)	5	10
	Distance from shore	10	5m	40
	Nonnative Trees/Shrubs (>2ft)	0	-	0
	Distance from shore	-	-	10
	Native Forbs/Grasses (<2ft)	40	40	30
	Distance from shore	3m	10	10
	Nonnative Forbs/Grasses (<2ft)	40	40	40
	Distance from shore	3m	10	10
	Bare ground/moss	5	10	5
	Distance from shore	3m	10	10
	Litter Layer: Distance from shore	3m	10	-
Depth of litter	4in	6in	4in	

APPENDIX A

Example Habitat Assessment

GOLDEN GARDENS PARK (CONTINUED)

Location:		South Pond	Main Pond	North Pond
Date:		6/1/2018	6/1/2018	6/1/2018
Nesting/Juvenile	Estimate area (sq. ft)	800	1500	500
Habitat	Degree of Slope	45	15	40
Applies if bare/ mossy ground or vegetation < 1ft tall is present and has no canopy	Aspect	EW	W	N
	Estimate area (sq. ft)	100	2000	100
	Degree of Slope	45	30	10
	Aspect	N	E	S
	Estimate area (sq. ft)	650	100	400
	Degree of Slope	45	20	0
	Aspect	S	N	E
	Estimate area (sq. ft)	-	200	500
	Degree of Slope	-	25	45
	Aspect	-	S	W
	% Nesting area within floodplain	-	50%	30%
	Elevation at highest point	2m	10ft	10
	% Shoreline water <2ft deep	100%	95%	95%
	% with aquatic vegetation	5%	5%	5%
Connectivity	Fencing	-	-	-
	Trails	X	X	X
	Roads	-	-	-
	Vertical Slopes	-	-	-
	Entrapments	-	-	-
	Other (describe)	-	-	-
	Connected to other aquatic habitat out- side of site? Y/N	Y	Y	Y
	If N, distance to nearest aquatic habitat outside site boundary ____ ft/mi	-	-	-

APPENDIX A

Example Habitat Assessment

GOLDEN GARDENS PARK (CONTINUED)

	South Pond 6/1/2018	Main Pond 6/1/2018	North Pond 6/1/2018
Location:			
Date:			
Notes & Comments	At least 2 turtles, Pond and RES, dogs, fishermen	At least 20 turtles: jur WPT & RES LICA, fishing	3 pond turtles
Aquatic Vegetation Types Present	algae	Very little, algae	-
Terrestrial Vegetation Types Present:			
Native	alder cascara, willow, lupine	ninebark, cascara, willow, cottonwood, lupine, dock, nootka rose, OR ash, rushes, snowberry, horse-tail, alder	alder, willow, rushes, horse-tail, nootka rose, cascara, madrona, ash
Nonnative	tansy, RCG	tansy, RCG, blackberry, teasel	RCG, blackberry, hawthorne
Sources of Disturbance:			
Aquatic:	dogs	dogs	dogs
Terrestrial:	dogs	dogs, fishermen	dogs, walking, people

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APPENDIX C

TURTLE ID GUIDE (PAGE 1 OF 4)

Western Pond Turtle

Identifying Features of the Western Pond Turtle.



Head, neck and leg color same as top shell with flecking pattern

Carpace dark brown to olive



Carapace has smooth edge

Plastron creamy yellow usually with dark staining

Photo Credit: Ben Power

Photo Credit: ODFW

Images taken from: ODFW. 2015. Guidance for Conserving Oregon's Native Turtles including Best Management Practices. Oregon Dept. of Fish and Wildlife. 99 pp.

APPENDIX C

TURTLE ID GUIDE (PAGE 2 OF 4)

Western Painted Turtle

Identifying Features of the Western Painted Turtle



Photo Credit: ODFW

Yellow, orange, or red stripes on neck and legs

Carpace dark green-black

Carapace has smooth edge

Plastron red with unique black pattern



Photo Credit: Dan Lake

Images taken from: ODFW. 2015. Guidance for Conserving Oregon's Native Turtles including Best Management Practices. Oregon Dept. of Fish and Wildlife. 99 pp.

APPENDIX C

TURTLE ID GUIDE (PAGE 3 OF 4)

Common Snapping Turtle

Identifying Features of the Common Snapping Turtle



Photo Credit: ODFW

Long serrated tail

Very small plastron
compared to body size

Very large claws

Carpace brown to black,
serrated edge

Very large head and thick legs

Bumpy skin

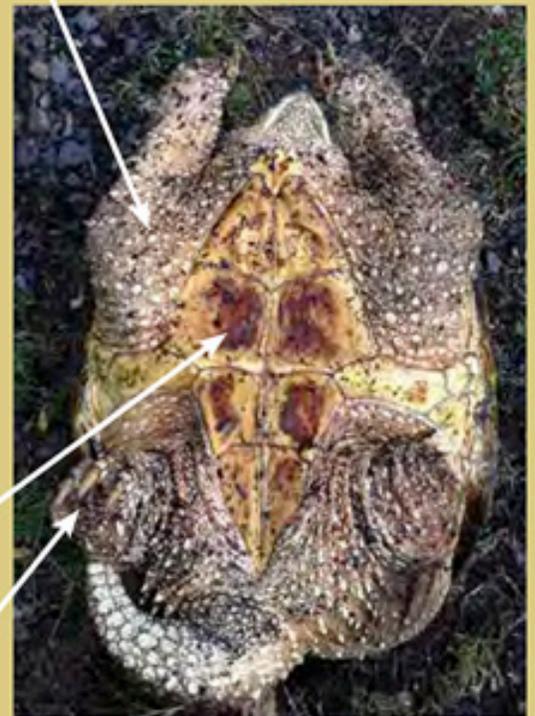


Photo Credit: ODFW

Images taken from: ODFW. 2015. Guidance for Conserving Oregon's Native Turtles including Best Management Practices. Oregon Dept. of Fish and Wildlife. 99 pp.

APPENDIX C

TURTLE ID GUIDE (PAGE 4 OF 4)

Red-eared Slider

Identifying Features of the Red-eared Slider



Photo Credit: Myron Wells

Red stripe behind eye

Yellow stripes on head, neck and legs

Carpace dark brown
with a serrated edge

Bridge yellow with dark blotches

Plastron yellow with dark blotches

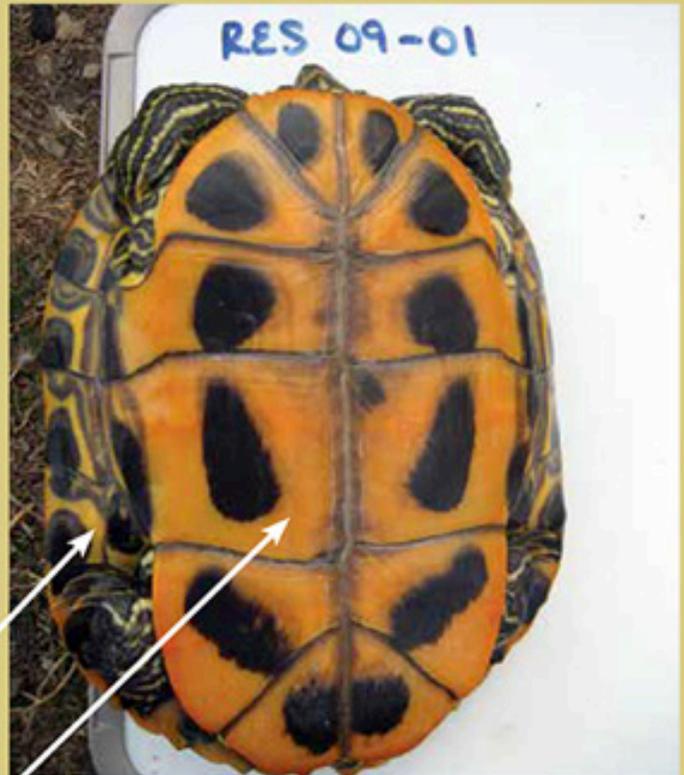


Photo Credit: Laura Guderyahn

Images taken from: ODFW. 2015. Guidance for Conserving Oregon's Native Turtles including Best Management Practices. Oregon Dept. of Fish and Wildlife. 99 pp.

TURTLE FIELD GUIDE

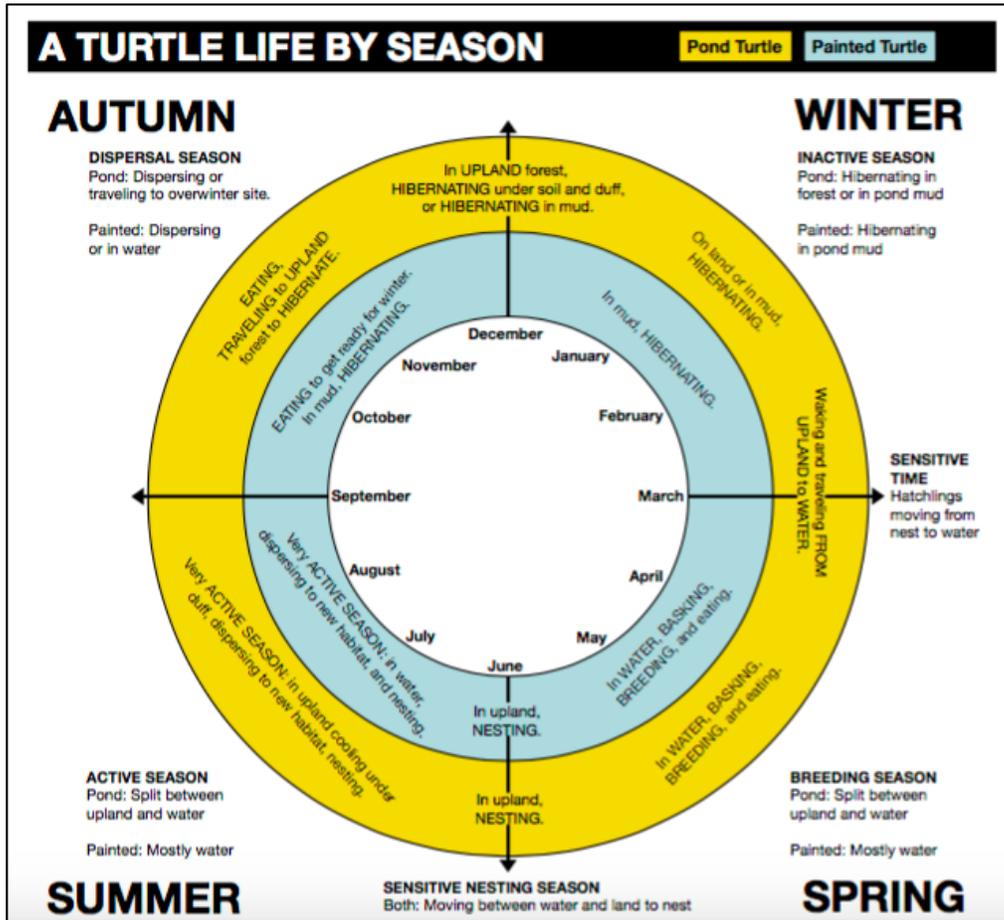


Western Pond Turtle Surveyor Field Packet

Prepared by: Samara Group



TURTLE FIELD GUIDE (CONTINUED)



Annual Activity Cycle of Oregon's Native Turtles

Source: https://www.dfw.state.or.us/wildlife/living_with/docs/ODFW_Turtle_BMPs_March_2015.pdf

TURTLE FIELD GUIDE (CONTINUED)**Before heading into the field****Check Weather Conditions**

Target days and times where the temperature is between 55 & 85 degrees Fahrenheit (13 and 30 degrees Celsius) and it is at least partly sunny with light/no wind

Field Equipment Checklist

- Binoculars (8x32) or Spotting Scope (20-60x)
- Handheld device or smartphone for data entry and photos
- Clipboard with maps and paper data sheets
- GPS unit & camera (if not using smartphone)
- Stopwatch or timer
- Thermometer (air and water in degrees C)
- Meter tape or yard stick
- Personal floatation device for water-based surveys
- Tan or dark clothes; plain hat
- Muck boots/waders
- Personal items such as: water bottle, folding light chair, etc.

Know your site**Look at aerial photos of the area you are going to survey.**

- Note the basic shape of the water body and areas with high sun exposure.
- Note potential observation points to view a large area of the lake including the sunniest locations and large basking logs.
- Note potential access points, preferring existing roads and trails

Setting up in the Field

When you arrive:

Silence your phone. Decide on an observation point where you can see the majority of the basking sites with sun exposure. These are usually those with a few of the northern edge of the water body and minimal vegetation that could block your view (now and later in the season).

Make sure the equipment is as prepared as possible before approaching site to limit disturbance to turtles. (i.e. scope set up and adjusted, binoculars removed from case, etc.) Also setup at least 10 m away from actual turtles to avoid disturbing them and stay on established trails and roads if possible

TURTLE FIELD GUIDE (CONTINUED)

Survey Instructions

- Scan the area as you quietly approach to detect any movement, particularly around or on basking structures or shorelines
- Start the timer
 - Record first 5 minute observation
 - Scan basking structures, shore lines, and water surface for turtle heads, noses, or exposed carapaces using eyes, binoculars, and then spotting scope
 - As soon as you think you've located a turtle, observe closely (scope) to confirm species & approximate age (based on size)
 - Document the number of WPT and size/age class of each using Survey123
 - Also record the number of other turtle species observed
 - Before conclusion of survey period, re-scan prominent basking perches for turtles that may have emerged during the survey period
 - Repeat 5-minute observation period 5 more times for a total of 30 minutes of observation
- Additional observation tips
 - Wakes and moving vegetation can alert the observer that a turtle may be beneath the surface, but the turtle must be seen to confirm a sighting and species identification
 - A small amount of movement around an observation point (10-20 m) may be necessary to see around obstructions; this should be done quietly, and while watching for signs of disturbance to animals.
 - Some high use areas (e.g., recreation sites) may experience heavy disturbance on weekends or other times of high human-use. These areas may need to be surveyed during low human-use periods.

* If for whatever reason you are unable to collect data in the field using the Survey123 app on your smartphone, you will need to collect data on the paper data collection sheets and enter the information into Survey123 from your computer as soon as you are able.

Post-Survey Data Collection

- Use this time to fill out remaining fields on the Survey123 Form including:
 - Site information
 - Air and water temperature
 - Weather
 - Habitat variables
 - Basking Structures
 - Disturbance factors

Contact Information

Any questions or concerns please call Leslie Bliss-Ketchum at 503-481-6753
[ESRI's Survey123](#)

TURTLE FIELD GUIDE (CONTINUED)



To access the online data entry form, please download the Survey123 App onto your smartphone device. Then scan the QR code or search in the Survey123 app for the project “Western Pond Turtle – 2018 Oregon Pilot Survey” to access the project.

You can also upload data into Survey123 from your computer using this link:
<https://survey123.arcgis.com/share/b40a65e4b69147eaa555d155a940366e>

If unable to access the online data portal, please contact Leslie Bliss-Ketchum at Leslie@samarapdx.com for assistance, or mail completed paper data sheets to:

Samara Group
1430 SE Water Ave Suite 209
Portland OR 97214

Incidental observations: iNaturalist



To record turtle observations in additional locations outside of assigned cogs and observation points please use the “Western Pond Turtles in Oregon” iNaturalist project. Access the project using your smart phone device and the QR code or this link: <https://www.inaturalist.org/projects/western-pond-turtles-in-oregon>

TURTLE FIELD GUIDE (CONTINUED)

FAQs & Tips

Q: What to do if I'm not sure what species of turtle I see?

A: Keep watching it to see if it moves and you can get more detail. If the survey ends and you are still uncertain, mark it as unknown (UNK). Do not guess or assume. If possible, take a photo and include it with your data.

Q: What if a turtle is spooked before I can identify it?

A: Keep watching the immediate area. They will often emerge and poke their heads back up to try and observe the danger. Remain still and quiet. Turtles will often resume basking after about 15 minutes if they believe it is safe.

Q: I saw a head, should I call it a turtle?

A: No, unless you can positively identify it. It was likely a bullfrog. Turtle heads are more pointed. Bullfrog heads are more rounded with eyes on top.

Q: What if people approach me during the survey?

A: Quietly, tell them you're performing a scientific survey and will answer their questions afterward.

Q: Are there things I should look for to help me find turtles?

A: A turtle's wet shell may have a glint reflecting sunlight similar to a glass bottle or aluminum can. Turtles prefer vegetation to open water.

Tips:

- Keep the scope zoomed all the way out as the default while scanning for turtles. Zoom in only when trying to identify turtle to species or determine what the bump on the log is.
- Use the tripod to scan the pond/river edges smoothly
- Adjust the scope so that it is comfortable. Your survey will be more effective if you are comfortable and able to focus on the task at hand.
- Stay focused on searching for turtles. Make note of the birds, mammals, and dragonflies but remember your purpose.

APPENDIX C

TURTLE FIELD GUIDE (CONTINUED)

Data Sheets

Tier 1 Survey Turtle Counts

Observer Name and Contact: _____

Date of Survey: _____

Survey Time: Start: _____ End: _____

Observation Time: Start: _____

**Note that for water based surveys the 5 minute observation periods will mostly likely not be consecutive as the surveyor will need time to travel between observation areas.*

Observation Period	Number of turtles observed	Western Pond Turtles Age Class
0 - 5 min	# ___ Western Pond Turtle # ___ Western Painted Turtle # ___ Red-eared Slider # ___ Common Snapping Turtle # ___ Other turtle: _____	# ___ Adult # ___ Juvenile # ___ Hatchling # ___ Unknown
6 - 10 min	# ___ Western Pond Turtle # ___ Western Painted Turtle # ___ Red-eared Slider # ___ Common Snapping Turtle # ___ Other turtle: _____	# ___ Adult # ___ Juvenile # ___ Hatchling # ___ Unknown
11 - 15 min	# ___ Western Pond Turtle # ___ Western Painted Turtle # ___ Red-eared Slider # ___ Common Snapping Turtle # ___ Other turtle: _____	# ___ Adult # ___ Juvenile # ___ Hatchling # ___ Unknown
16 - 20 min	# ___ Western Pond Turtle # ___ Western Painted Turtle # ___ Red-eared Slider # ___ Common Snapping Turtle # ___ Other turtle: _____	# ___ Adult # ___ Juvenile # ___ Hatchling # ___ Unknown
21 - 25 min	# ___ Western Pond Turtle # ___ Western Painted Turtle # ___ Red-eared Slider # ___ Common Snapping Turtle # ___ Other turtle: _____	# ___ Adult # ___ Juvenile # ___ Hatchling # ___ Unknown
26 - 30 min	# ___ Western Pond Turtle # ___ Western Painted Turtle # ___ Red-eared Slider # ___ Common Snapping Turtle # ___ Other turtle: _____	# ___ Adult # ___ Juvenile # ___ Hatchling # ___ Unknown

TURTLE FIELD GUIDE (CONTINUED)

Location and Site Information		
CATEGORY	VARIABLE	RESPONSE
LOCATION	Name of this observation point (Determined by Observer)	
	GPS coordinates lat/long or specify UTM and datum	
	Cog number	
	Access notes (Include vehicle parking location and specific description from vehicle to observation point. Include additional notes as needed to access other observation points)	
	Landscape Variables (within 250m buffer around water body surveyed, sourced from GIS)	_____ % Road Density _____ % Impervious surfaces _____ % Protected Areas database (PAD) _____ Vegetation (type and %) _____ Vegetation (type and %) _____ Vegetation (type and %)
SURVEY AREA	Site description	
	Size of survey feature (GIS sourced)	____m Length ____m Width ____m ² Area
	Percent of survey site observed	_____ %
	Photo from observation point & additional photos	(attach and email to leslie@samarapdx.com along with completed observation sheet)

TURTLE FIELD GUIDE (CONTINUED)

Environmental Variables		
CATEGORY	VARIABLE	RESPONSE
WEATHER	Sky (Clear, few clouds, mostly cloudy, stormy, overcast, smoky)	
	Wind (Beaufort Wind Scale values [see below*] 1-10)	
	Precipitation (Dry, fog, drizzle, light rain, heavy rain, hail, sleet, snow)	
TEMPERATURE	Air Temp (shade at 1 m above ground)	____ °C
	Air Temp (sun at 10 cm above ground)	____ °C
	Water Temp (high – no vegetation) if accessible	____ °C 4 cm below water surface. Water column depth = approx. 45 cm
	Water Temp (low – no vegetation) if accessible	____ °C 30 cm below water surface. Water column depth = approx. 45 cm
	Water Temp (aquatic vegetation) if accessible	____ °C 4 cm below water surface under algal or vegetation mat
Invasive Species	Bullfrogs observed	Yes/No
	Warm water fish observed	Yes/No
	Aquatic vegetation	Yes/No Identify/describe:

TURTLE FIELD GUIDE (CONTINUED)

Habitat Variables		
CATEGORY	VARIABLE	RESPONSE
Water Type	Lentic (wetland, marsh, pond, lake, reservoir)	
	Lotic (creek, stream, river)	
Shoreline	Open	Yes/No Type: (Silt, sand, gravel, cobble, boulder/bedrock, concrete)
	Mixed (open & vegetated)	Yes/No Estimate percent open: ____%
	Vegetated	Yes/No Type: (Grasses, Herbs/forbs, shrubs, trees)
	Slope	Describe: (flat, gentle, steep, vertical, undercut)
Habitat Suitability	Number of Basking structures present (At least 6" wide, 1 ft long, and less than 50% decomposed)	# ____ Wood # ____ Rock # ____ Vegetation # ____ Other _____
	Nesting habitat present (Bare ground or vegetation <1 ft tall and without canopy cover)	Yes/No if yes, Describe: Distance from water and location relative to the survey site (e.g. 50m from SW corner)
	Hatchling refugia habitat (floating or emergent vegetation in shallow water (<2 ft) along shoreline)	Yes/No

APPENDIX C

TURTLE FIELD GUIDE (CONTINUED)

Disturbance Factors		
CATEGORY	VARIABLE	RESPONSE
Invasive Species	Bullfrogs observed	Yes/No
	Warm water fish observed	Yes/No
	Aquatic vegetation	Yes/No Identify/describe:
Survey Site Disturbance Factors	Human aquatic recreation	Yes/No Type: (Motorized/non-motorized watercraft, fishing from boat/shore, swimming, waterskiing, other)
	Human traffic seen or heard from the observation point.	Yes/No Type: (Hiking, cycling, boating, motorized vehicles, horse riding, low aircraft, other)
	Domestic animals	Yes/No Type:
	Natural/other disturbance	Yes/No Describe:
Disturbance Notes		

APPENDIX C

TURTLE FIELD GUIDE (CONTINUED)

Resources

Beaufort Wind Scale

For Wind Conditions, use this Beaufort Scale

(source: <http://www.unc.edu/~rowlett/units/scales/beaufort.html>)

Beaufort Scale

FORCE	NAME	Miles/hr	WIND CONDITIONS
0	Calm	< 1	Smoke rises vertically.
1	Light Air	1-4	Smoke drifts and leaves rustle.
2	Light Breeze	5-7	Wind felt on face.
3	Gentle Breeze	5-11	Flags extended, leaves move.
4	Moderate Breeze	12-18	Dust and small branches move.
5	Fresh Breeze	19-24	Small trees begin to sway.
6	Strong Breeze	25-31	Large branches move, wires whistle.
7	Near gale	32-38	Whole trees in motion, inconvenience in walking.
8	Gale	39-46	Difficult to walk against wind. Twigs blown off trees.
9	Strong Gale	47-54	Minor structural damage occurs (shingles blown off)
10	Storm	55-63	Trees uprooted, structural damage likely.