

American Pika Monitoring at CRMO, CRLA, LABE, LAVO and NEWB: Progress Report



Photo: Diana Popp

Road map

- ◆ Monitoring project background
- ◆ Accomplishment highlights
- ◆ Summary of results
- ◆ Interpretation and future direction



Photo: Diana Popp

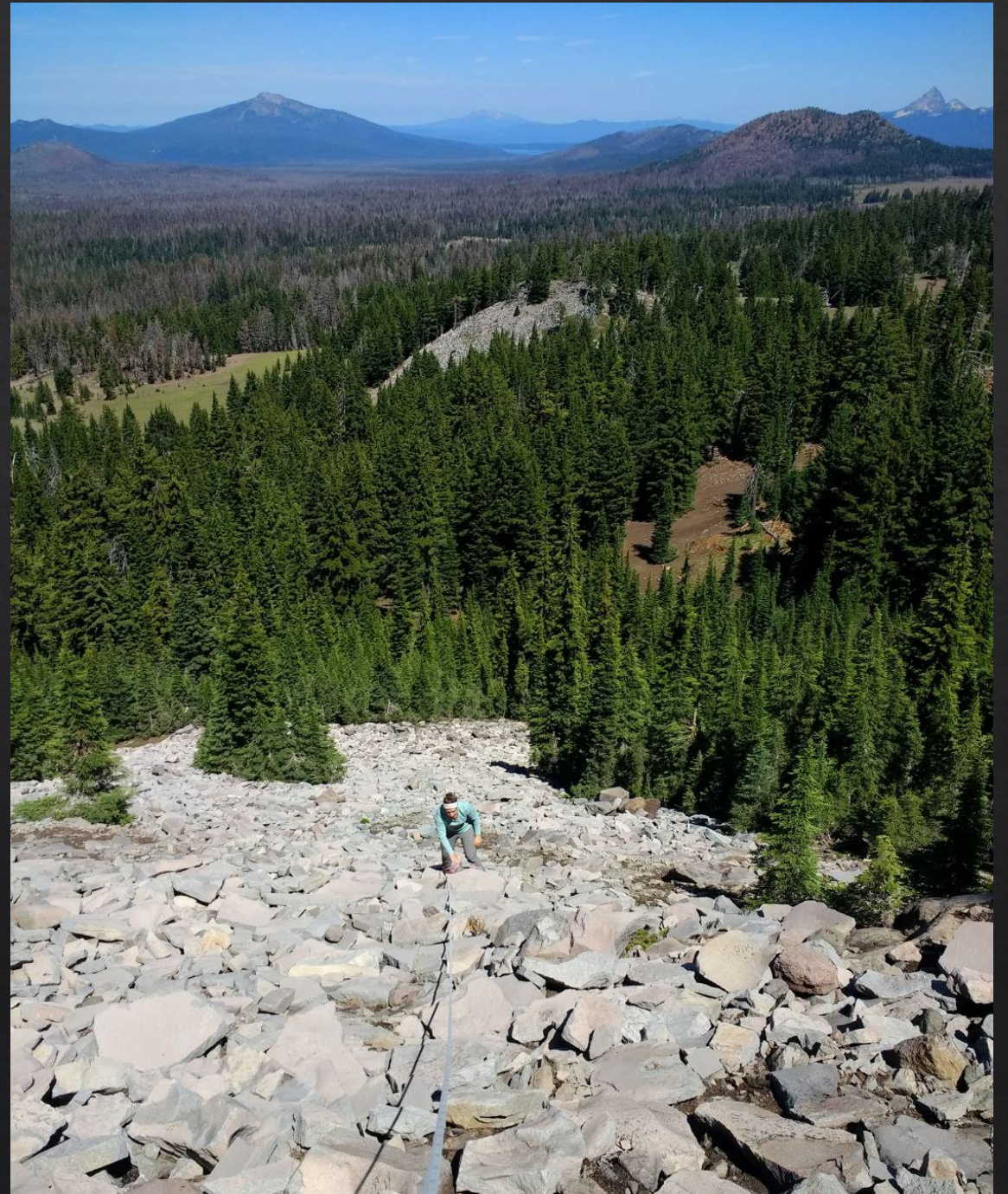


- ◆ Vital sign species with approved protocol
- ◆ 1st monitoring phase 2010-2014
- ◆ 2nd phase 2017-
- ◆ 5 and 10-year trend analysis forthcoming



Protocol Details

- ◆ Systematic random sample (100/park)
- ◆ Resurveys of 30 sites at each park
- ◆ Surveys consist of..
 - ◆ Observation of pika/pika calls
 - ◆ Searches for sign within established plots
- ◆ Occupancy determined as a function of direct observation or “fresh” sign



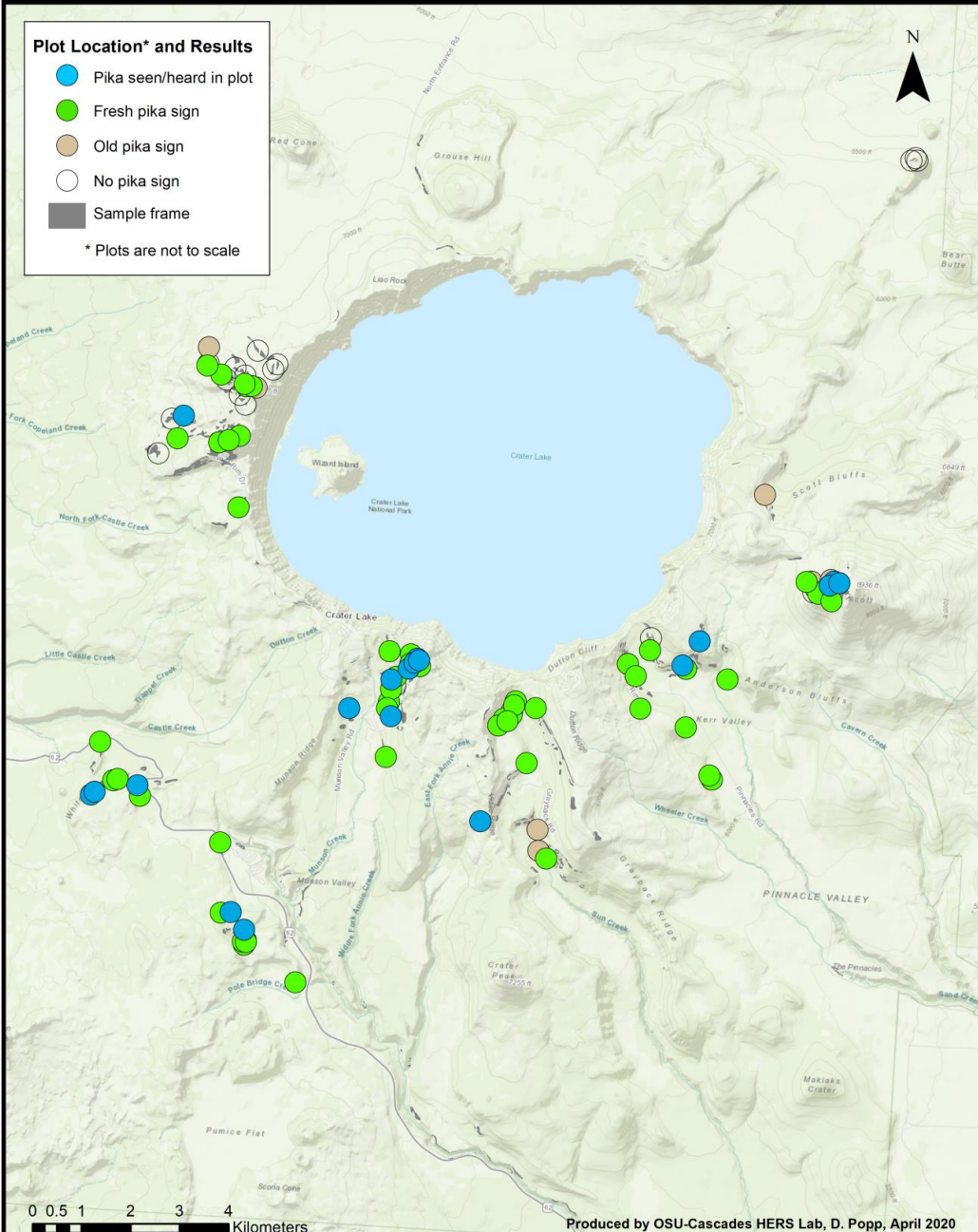
Crater Lake National Park, Oregon

2019 Pika Occupancy Survey Results

Plot Location* and Results

- Pika seen/heard in plot
- Fresh pika sign
- Old pika sign
- No pika sign
- Sample frame

* Plots are not to scale



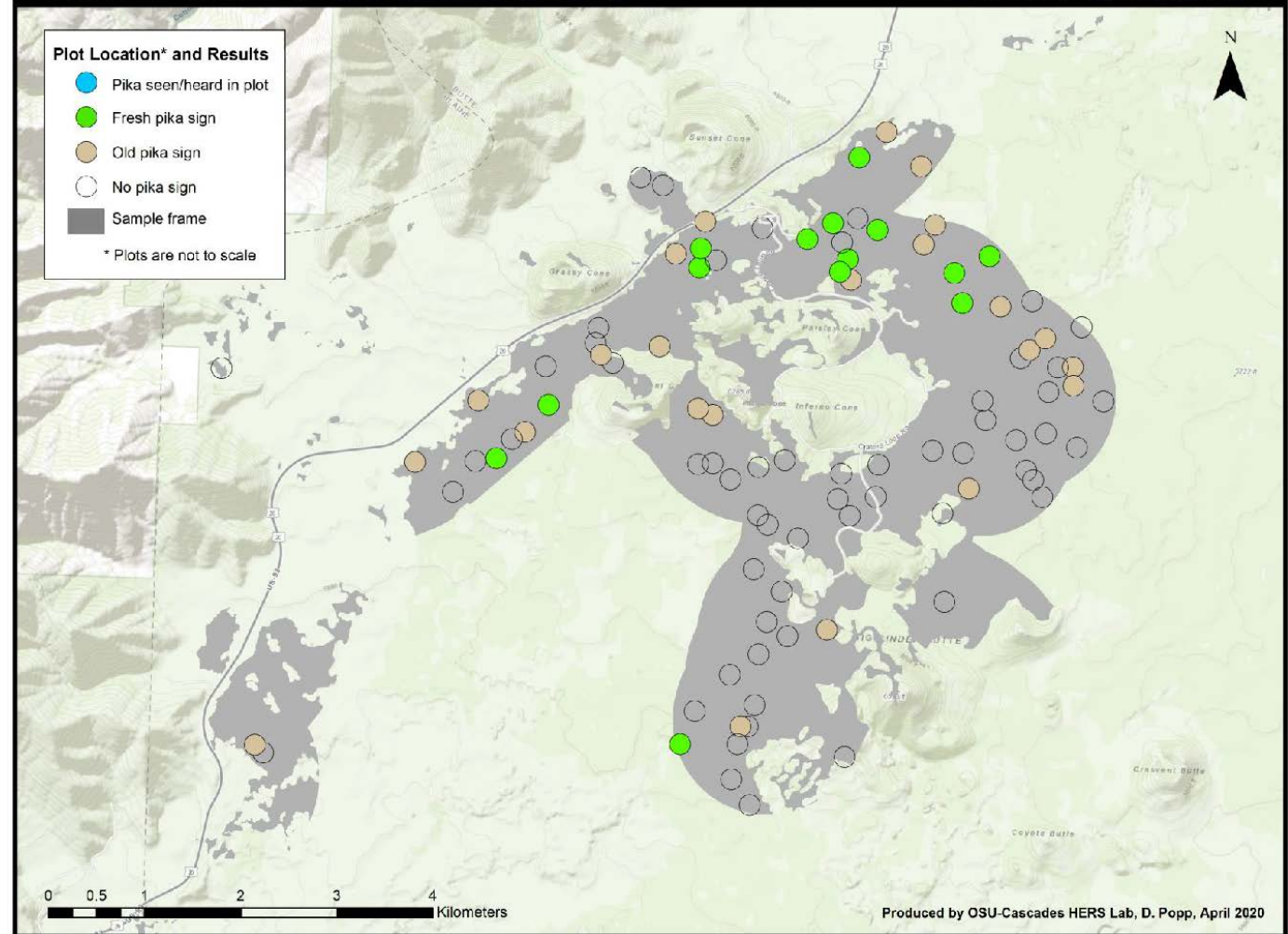
Craters of the Moon National Monument and Preserve, Idaho

2019 Pika Occupancy Survey Results

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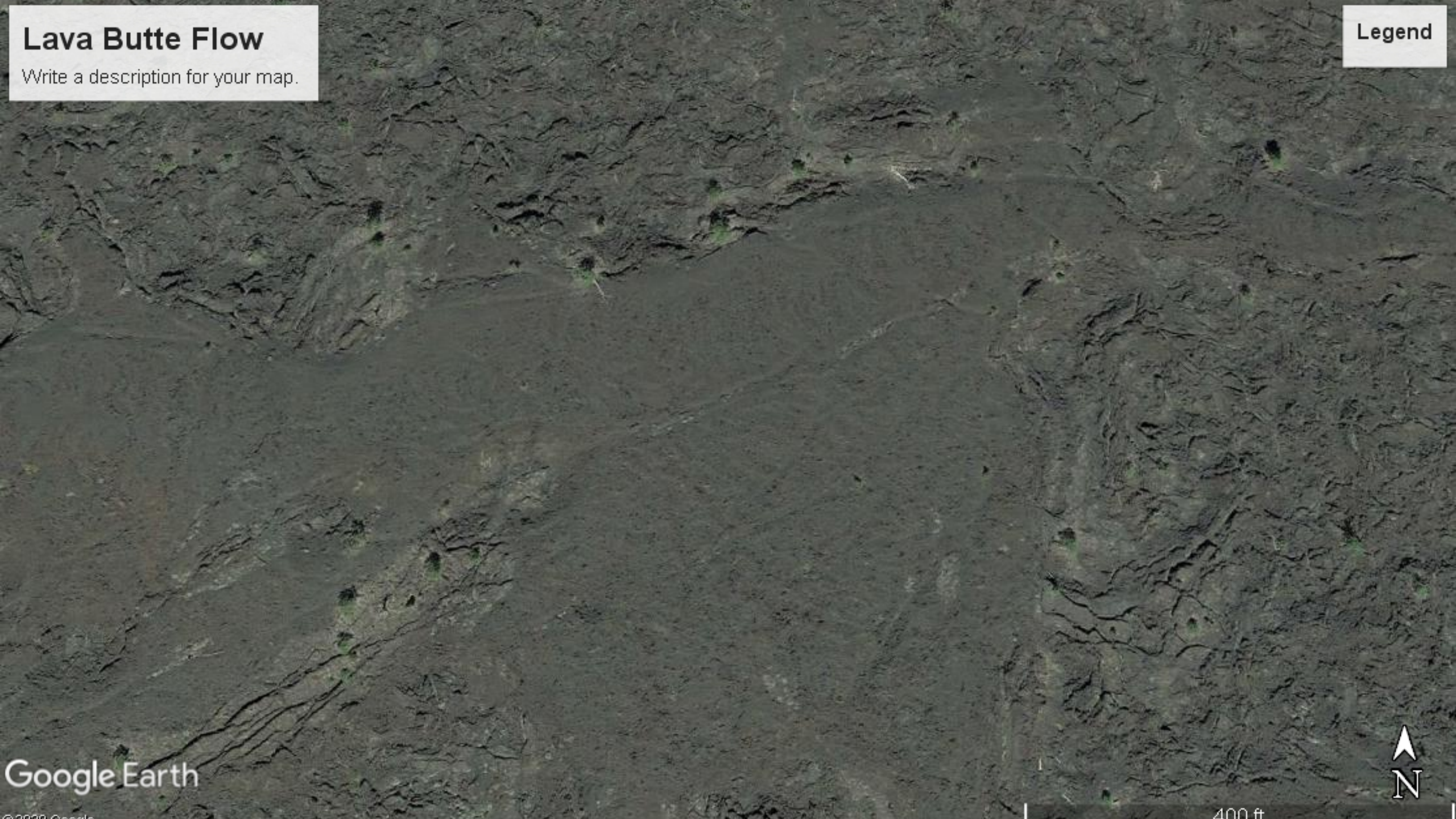
* Plots are not to scale



Lava Butte Flow

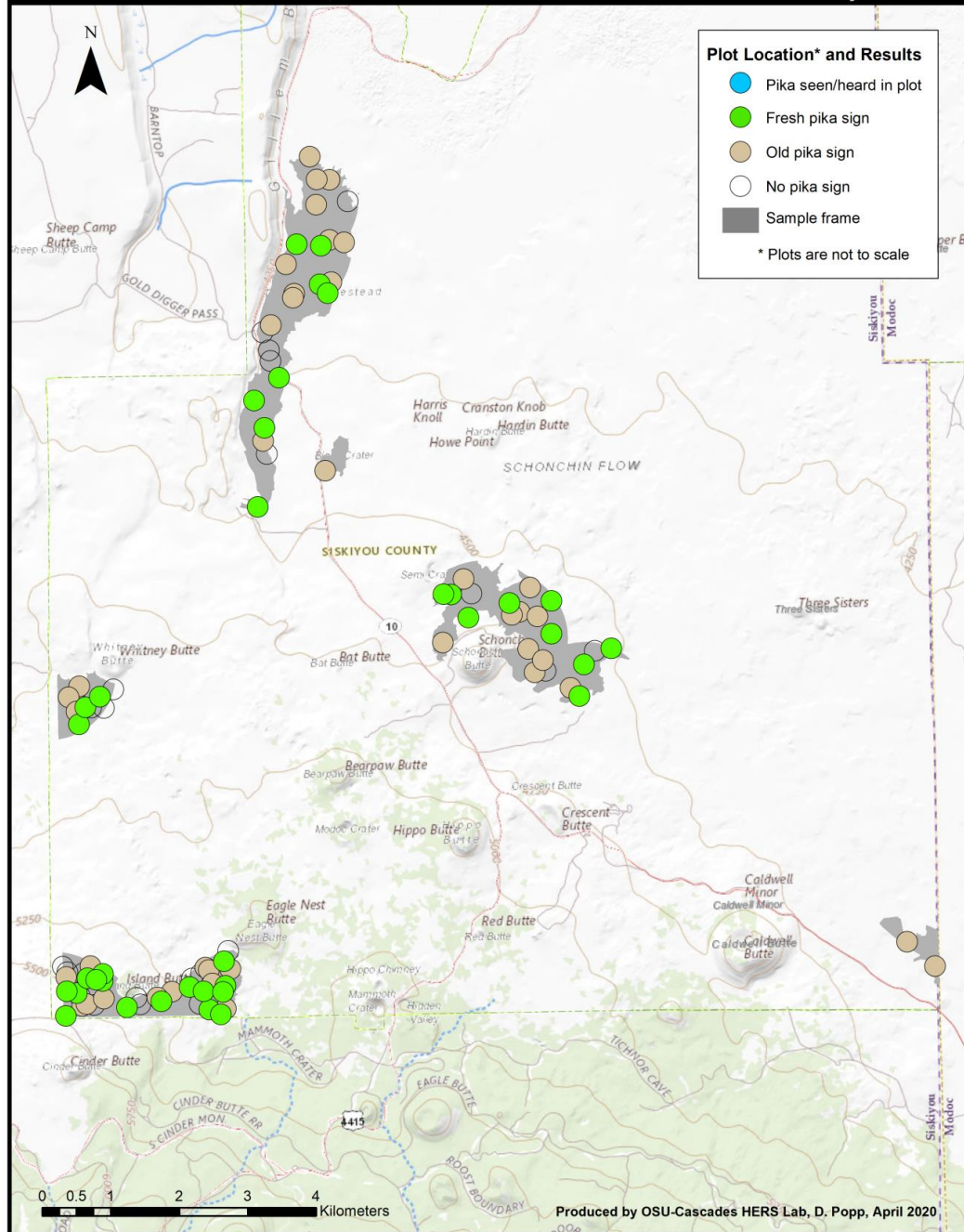
Write a description for your map.

Legend



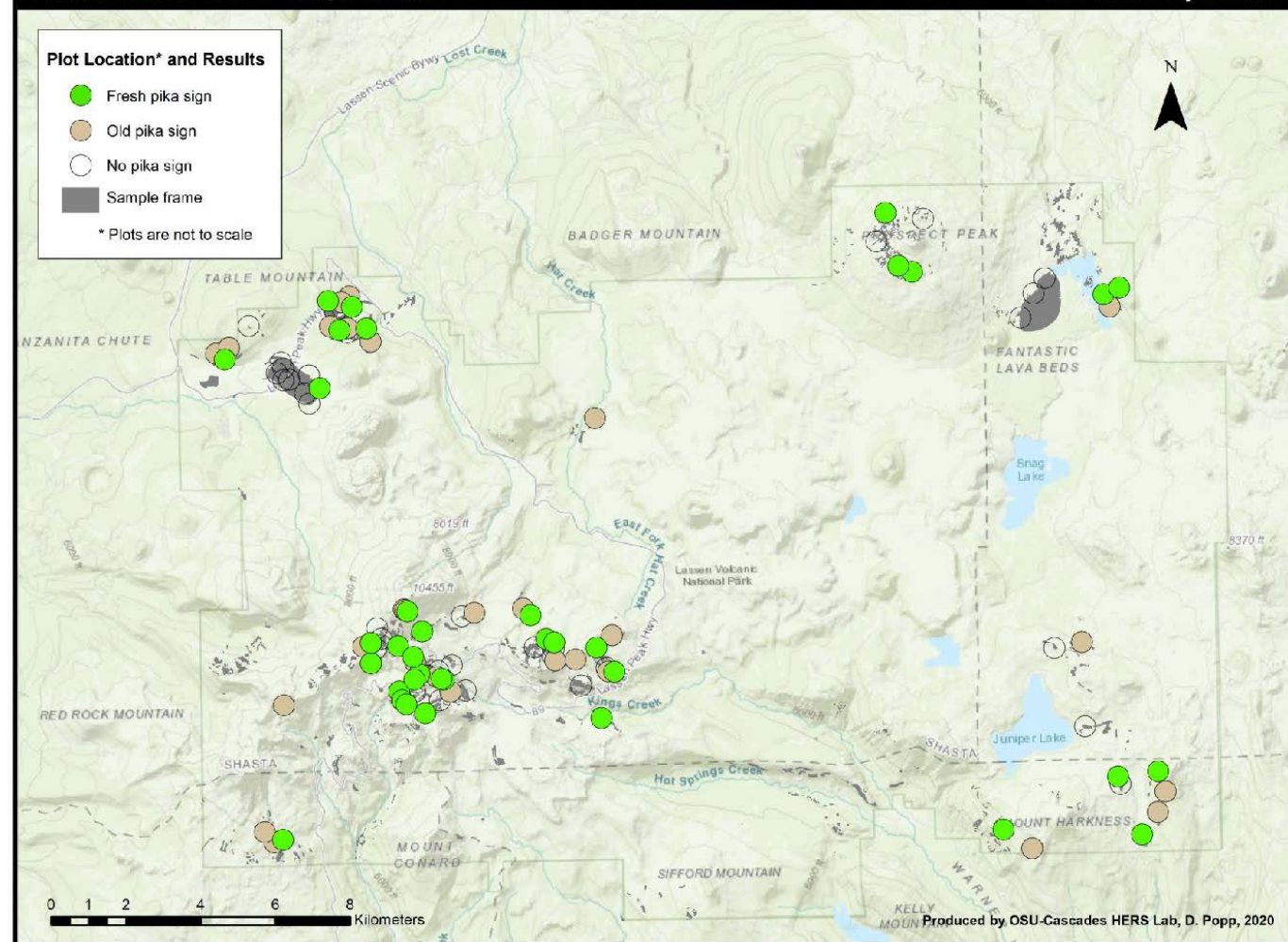
Lava Beds National Monument, California

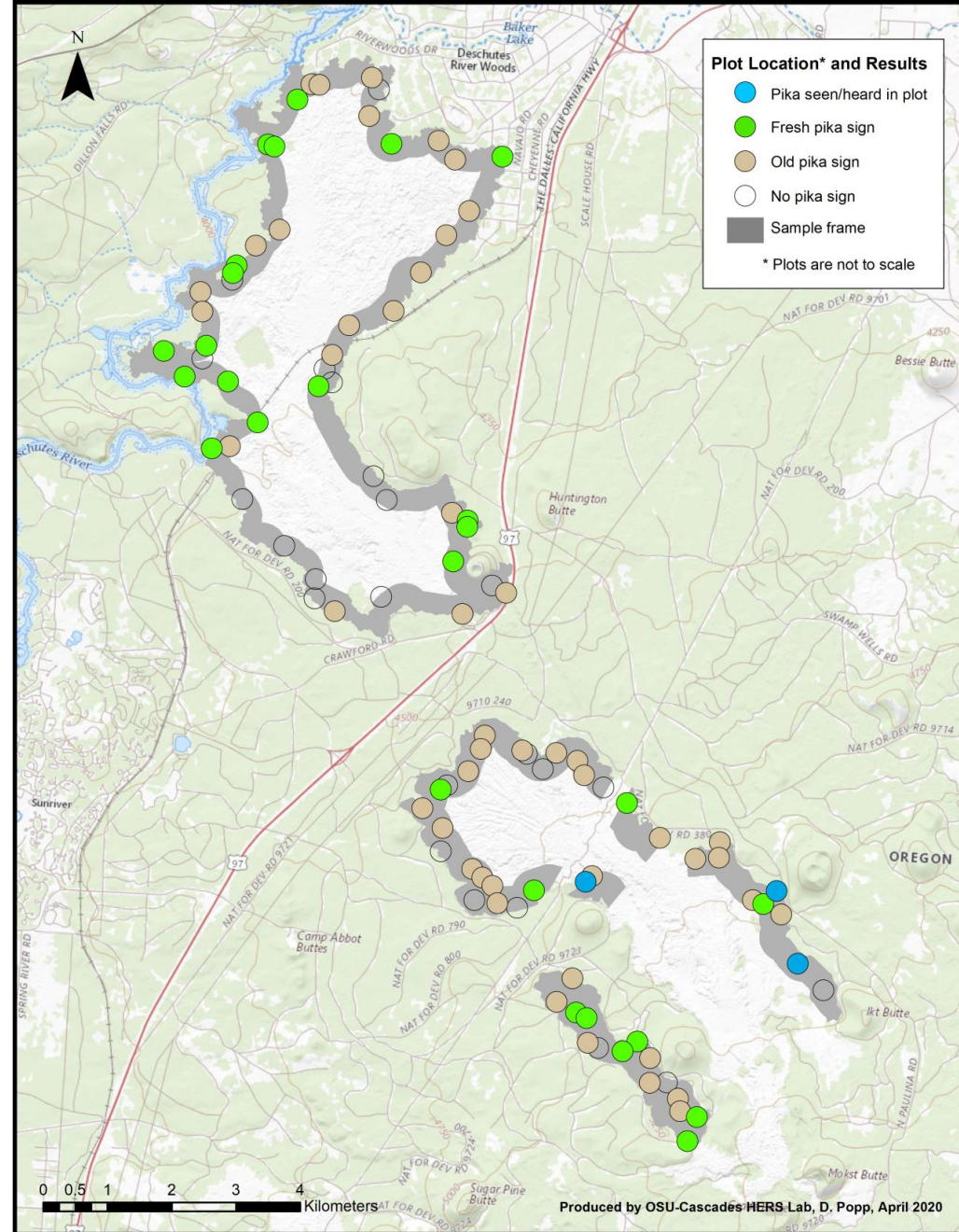
2019 Pika Survey Results



Lassen Volcanic National Park, California

2019 Pika Survey Results





Accomplishments



- ◆ 400 surveys in 3 parks in 2017, 500 surveys in 4 parks in 2018, 500 surveys in 4 parks in 2019, 89 surveys in 2020
- ◆ Hired/mentored 14 undergraduate and/or early career technicians
- ◆ Sponsored 2 ASE interns
- ◆ Annual reports 2017, 2018, 2019
- ◆ Field crew continuity
- ◆ Adoption of NPS field safety and comm protocol by OSU

Key Results from Phase I Monitoring (2010-2014)

- ◆ Pikas persisting in all parks across a broad elevation gradient
- ◆ Site characteristics (e.g. site complexity) appear to mitigate ambient climate conditions
- ◆ Forb cover and site complexity were the strongest predictors of occupancy, with variation between parks
- ◆ Annual patterns of occupancy vary within and between parks

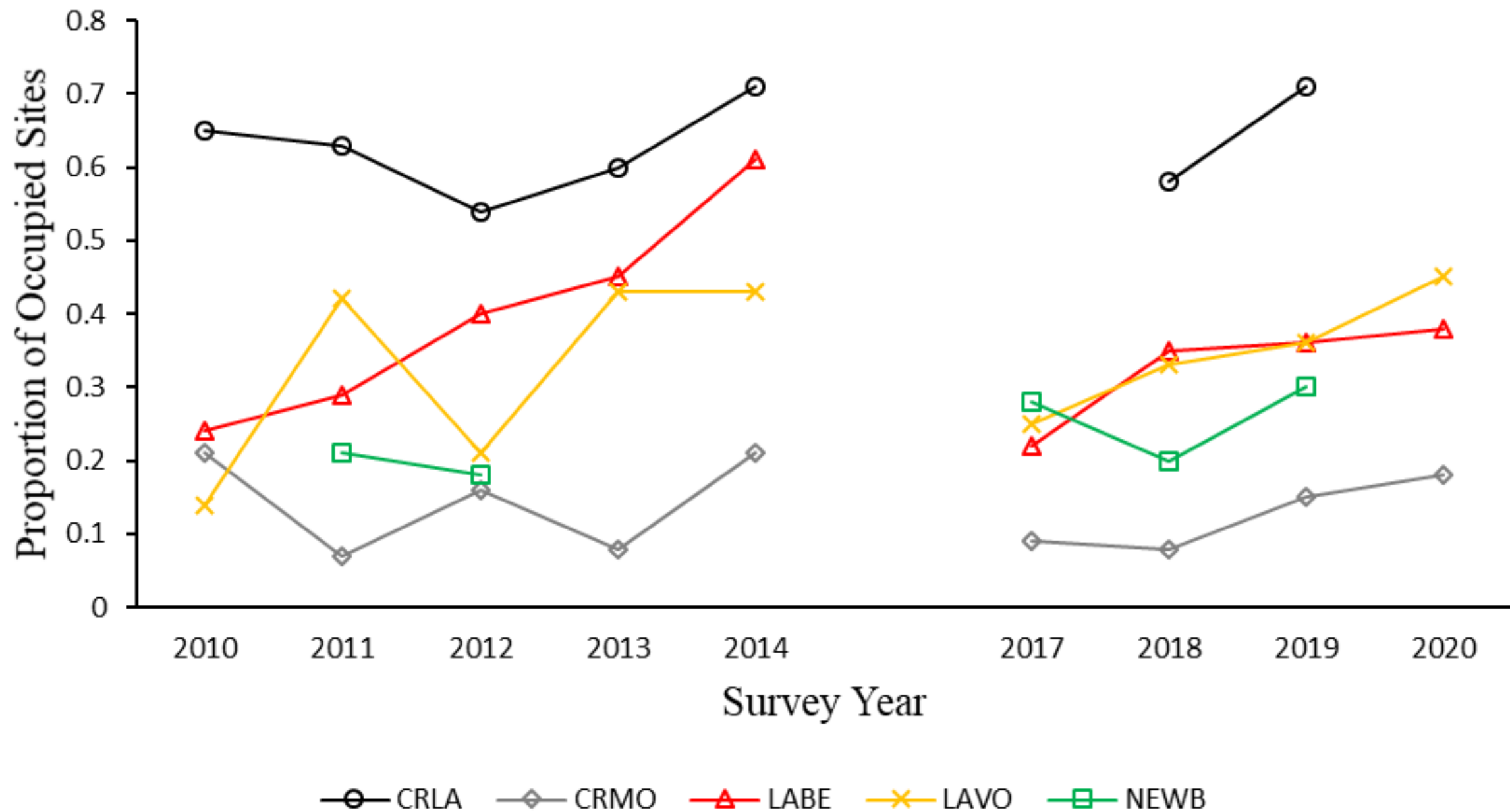
Table 2. Summary of pika survey activity in CRLA, CRMO, LABE, LAVO and NEWB, 2010-2014* and 2017-2019.

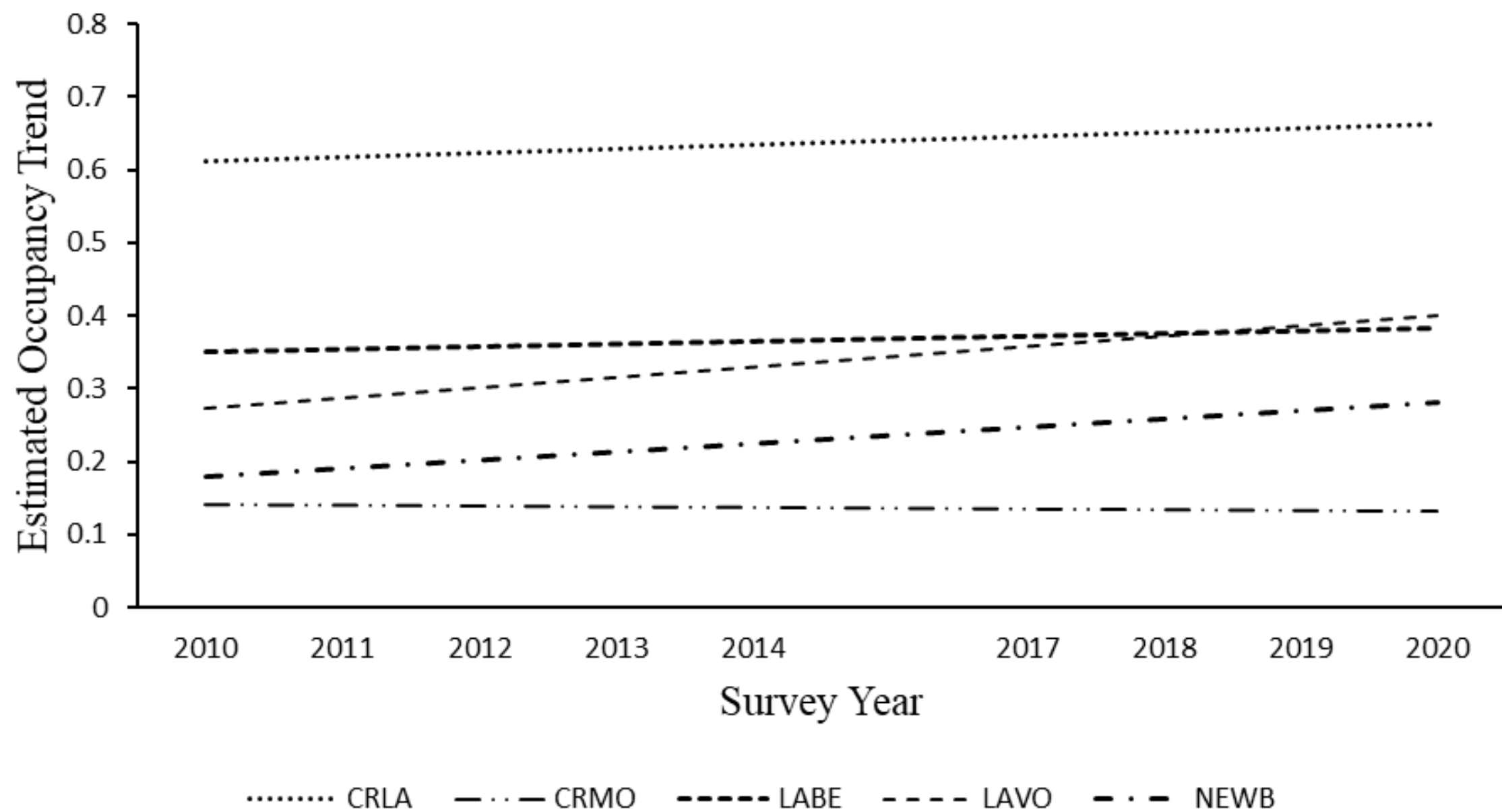
Total Number of Sites Surveyed									
Park	2010	2011	2012	2013	2014	2017	2018	2019	2020
CRLA	85	107	145	100	100-		95	100	
CRMO	56	135	146	103	103	103	99	96	100
LABE	101	102	100	100	100	98	99	100	89
LAVO	76	112	75	103	103	101	100	100	49
NEWB	-	96	76-	-		100	100	101	
Total Number of Sites Resurveyed									
CRLA	50	30	30	41	30-		29	29	
CRMO	50	35	30	20	29	29	30	30	30
LABE	50-		30	14	50	27	31	30	
LAVO	41	30-		21	20	27	30	30	
NEWB	-	-	-	-		30	30	30	
Proportion of Sites with Fresh Pika Sign **									
CRLA	0.65	0.63	0.54	0.6	0.71-		0.58	0.71	
CRMO	0.21	0.07	0.16	0.08	0.21	0.09	0.08	0.15	0.18
LABE	0.24	0.29	0.4	0.45	0.61	0.22	0.35	0.36	0.38
LAVO	0.14	0.42	0.21	0.43	0.43	0.25	0.33		0.45
NEWB	-	.21***	.18***	-		0.28	0.2	0.3	

*From Rodhouse and Hovland (2015) and Shinderman (2015).

** Using highest ranked sign of surveys and resurveys.

*** Survey data only.

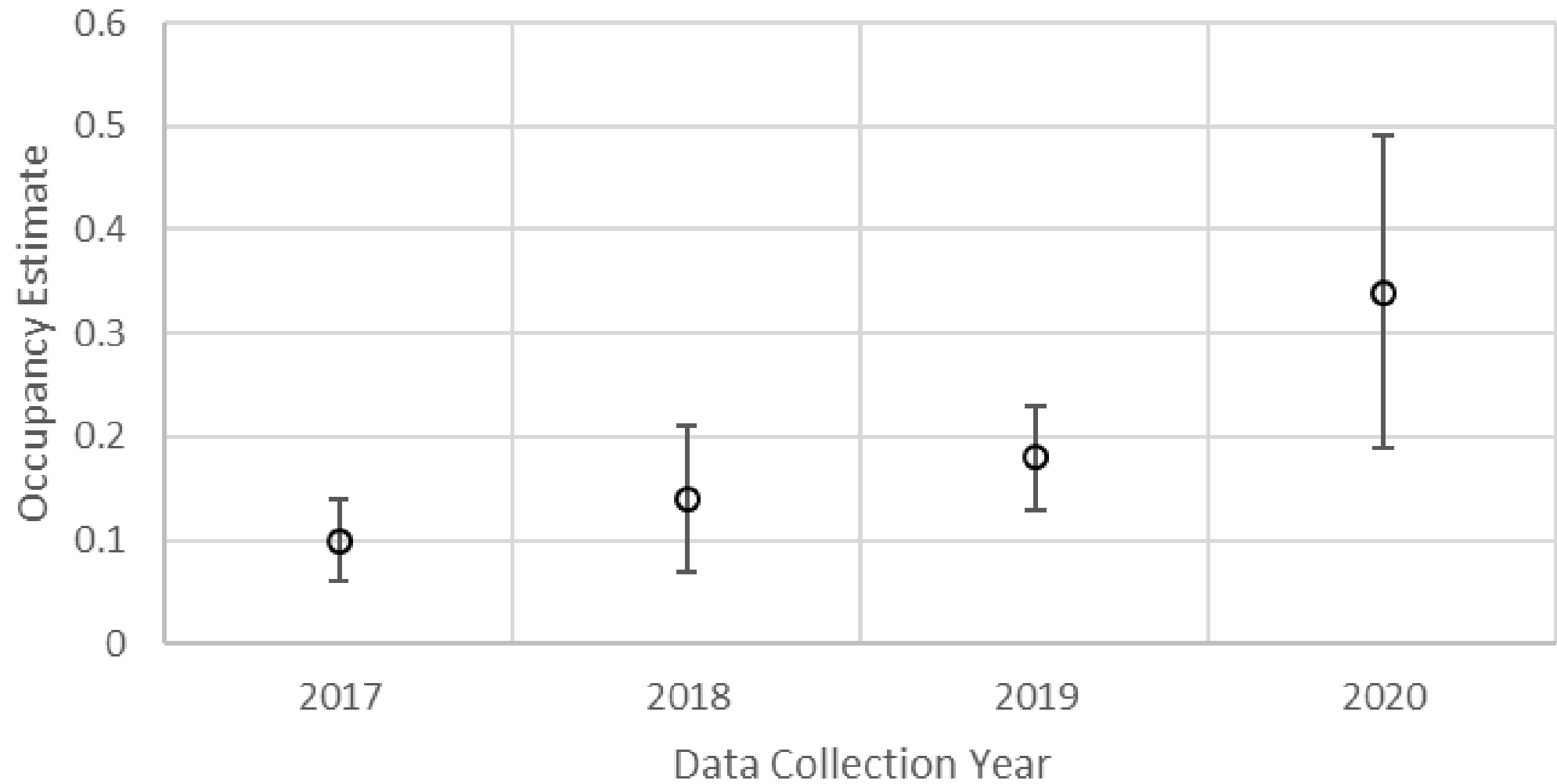




Detection Probabilities 2017-2019

PARK	2017	95% CI	2018	95% CI	2019	95% CI	2020	95% CI
CRLA			0.91	.75-.97	0.72	.56-.84		
CRMO	0.83	.34-.98	0.5	.14-.85	0.75	.35-.94	0.45	.15-.80
LABE			0.59	.35-.80	0.78	.55-.91		
LAVO	0.38	.15-.77	0.38	.12-.71				
NEWB	0.53	.26-.78	0.3	.06-.75	0.52	.27-.76		

Craters of the Moon Occupancy 2017-2020



2018-2019 Occupancy Patterns

Park	ψ	SE	Site Colonization	Site Extinction	Site Turnover
CRLA	.71	.045	14 (.16)	2 (.02)	18%
CRMO	.15	.036	3 (.06)	2 (.04)	9%
LABE	.36	.048	12 (.12)	11 (.11)	23%
LAVO	.32	.046	14 (.14)	11 (.11)	25%
NEWB	.30	.045	13 (.14)	5 (.05)	19%

Remaining questions

- ◆ If pikas continue to persist in low-elevation lava habitat, should it be a conservation priority?
- ◆ How does accounting for false-positive and false negative detection error influence occupancy estimates?
- ◆ What are the tradeoffs between increasing the number of revisits and reducing the number of sites visited?
- ◆ How often should surveys be conducted?
- ◆ Do occupancy estimate trends at CRMO indicate a closer examination is warranted?

Special thanks!

HERS Lab Staff

UCBN Staff

KLMN

Park Staff

Deschutes National Forest



Photo credit: Diana Popp