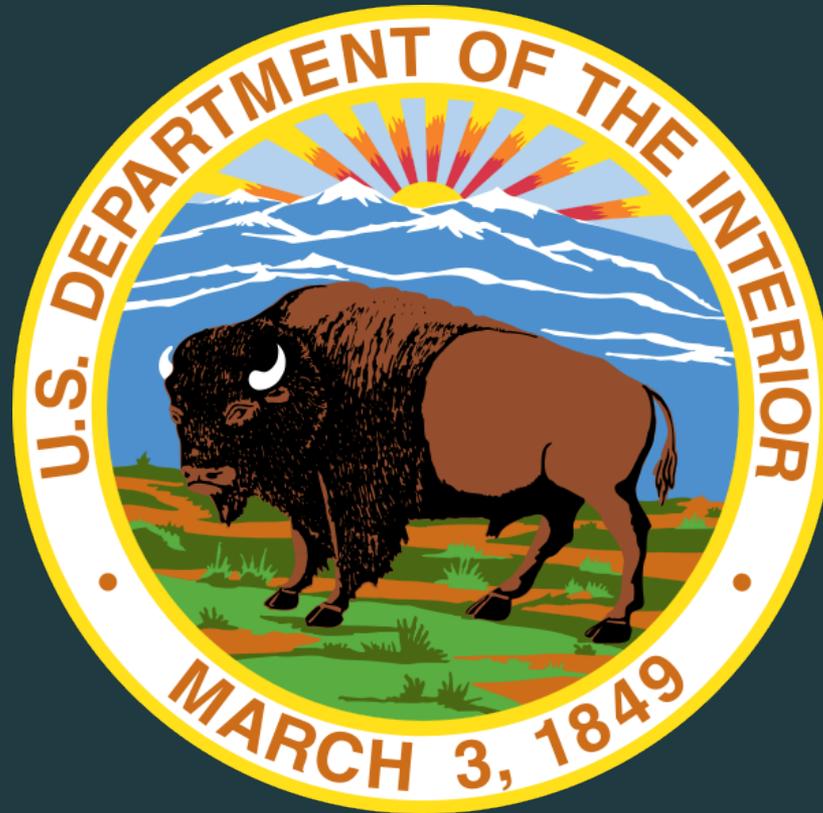


Summary of Department of Interior vulnerability assessments

*Laura M. Thompson, Michelle D. Staudinger, and
Shawn L. Carter*

*USGS National Climate Change
& Wildlife Science Center*

Secretarial Order 3289



High priority performance goals

“By the end of 2012, for 50 percent of the nation, the Department will identify resources that are particularly vulnerable to climate change, and implement coordinated adaptation response actions”

Focal resources



Freshwater resources



Landscapes, including wildlife habitat

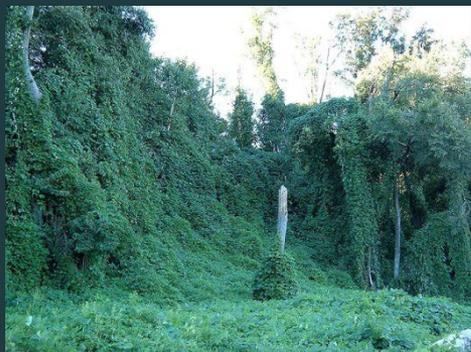


Native and cultural resources



Ocean health

Focal threats



Invasive species



Wildfire risk



Sea-level rise



Melting ice/permafrost

403 projects reported

Bureau(s)	Project Name	Project Location (i.e. identify LCC's and/or CSC's where possible)	Assessment Endpoints				QTRIFY Initiated (or est'd to be initiated)	QTRIFY Completed (or est'd to be complete)	POC – Responsibility for Targeting and Reporting (name, phone, email)	Comments or Queries
			Resource(s) being assessed		Threat(s) being assessed					
			Focal resources ⁴	Other resources ⁴	Focal threats ⁵	Other threats ⁵				
BLM	Climate Change – Subsistence RAWS – BPS# 52671	W. Alaska LCC/Seward Peninsula	Landscapes	freshwater supplies	Melting ice/permafrost	wildfire	3rd/2011	4th/2011	Paul Krabacher, 907-271-3266; paul.krabacher@blm.gov	
BLM	Bering Glacier Partnership	SE Interior Alaska – Bering Glacier (Northwestern Interior Forest LCC)	Landscapes		Melting ice/permafrost		3rd/2011	4th/2011	Beth Maclean, 907-822-3217; beth_maclean@blm.gov	
BLM	Seward Peninsula REA	Seward Peninsula, Nulato Hills, and Kotzebue Lowlands (Northwestern Interior Forest LCC)	Fresh Water Supplies	Landscapes, Native and Cultural Resources, Ocean Health			4th/2010	3rd/2012	Paul Krabacher, 907-271-3266; paul.krabacher@blm.gov	
BLM	NLCS Carrizo Vegetation Change	Carrizo Plain National Monument (California LCC)	Landscapes	blunt-nosed leopard lizard (FE), San Joaquin kit fox (SJKF), giant kangaroo rat (FE), Kern pimrose sphinx moth (FT), longhorn fairy shrimp (FE), vernal pool fairy shrimp (FE), California condor (FE), California jewelflower (FE), and San Joaquin woolly-threads (FE)	Invasive species and wildfire risk.	Changes in plant communities over time	3rd/2010	Ongoing	Tom Pogaeni, 916-978-4637. tpogaeni@blm.gov	
BLM	California SCAN Stations	Various – Throughout CA (California LCC)	Landscapes	Soils, Vegetation, Precipitation, Patterns	Invasive species	Drought, Temperature trends, changes in plant communities	3rd/2010	Ongoing	Tom Pogaeni, 916-978-4637. tpogaeni@blm.gov	
BLM	Mojave Wildlife Corridor	Mojave Desert California (Desert LCC)	Landscapes	30 different wildlife species	Invasive species, wildfire risks	Habitat Fragmentation	3rd/2010	Ongoing	Tom Pogaeni, 916-978-4637. tpogaeni@blm.gov	
BLM	Assessment of High Desert Water Resources and Wetlands	Southern Rookies LCC; New Mexico Arizona Plateau Ecoregion	Fresh water supplies	Ground and Surface Water Resources	Ground Water	Wetlands	1st/2011	4th/2016	Jill Lucero, 719-274-8971, jill_lucero@blm.gov	
BLM	Landscape Assessment of Water Resources Vulnerability to Climate Change	Southern Rookies LCC; Colorado Plateau Ecoregion	Fresh water supplies			Water Shortage	1st/2012	4th/2012	Kelly Palmer, 970-385-1232, kapalmer@fs.fed.us	
BLM; University of Colorado at Boulder; CO Dept of Public Health and Environment; USGS; Dinosaur National Monument (National Park Service)	Dust Emission Sampling in Nw Colorado (BPS 57039)	Great Northern LCC and Co Plateau and Wyoming Basin REAs)	Fresh water supplies.	Landscapes		Sampling to quantify the amount and origin of dust emissions at a temporary and spatial scale.	1st/2012	3rd/2014	Emily Spencer, 970-826-5085, espenacer@blm.gov	Indirect partners (CU Boulder and USGS work in partnership with the following groups at a national dust network level): NASA's Jet Propulsion Lab (Pasadena, CA); The Center for Snow and Avalanche Studies (Silverton, CO)
BLM; USFS; Fort Lewis Community College; U of CO-Boulder; Mountain Studies Institute	Climate Change Monitoring in Alpine Areas (BPS 58193)	Southern Rookies LCC and Colorado Plateau REA	Fresh water supplies.	Landscapes		Monitoring dust on snow related to accelerated snow melt and runoff	3rd/2011	4th/2012	Deesta Lewis, 970-385-1357, dlewis@blm.gov	
BLM; USFS; Fort Lewis Community College; U of CO-Boulder;	Climate Change Monitoring in Alpine Areas (BPS 58196 and 58194)	Southern Rookies LCC and Colorado Plateau REA	Fresh water supplies.	Landscapes		Monitoring GLOFRIA, a comparative study of climate change impacts on mountain biodiversity, especially plants.	3rd/2011	4th/2012	Deesta Lewis, 970-385-1357, dlewis@blm.gov	



403 projects reported

Bureau(s)	Project Name	Project Location (i.e. identify LCC's and/or CSC's where possible)	Assessment Endpoints				QTRIFY Initiated (or est'd to be initiated)	QTRIFY Completed (or est'd to be complete)	POC – Responsibility for Targeting and Reporting (name, phone, email)	Comments or Queries
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BLM - 51
BOR - 10
FWS - 141
NPS - 12
USGS - 189



Scanning the Conservation Horizon

*A Guide to Climate Change
Vulnerability Assessment*



Overarching Conservation Goal(s)

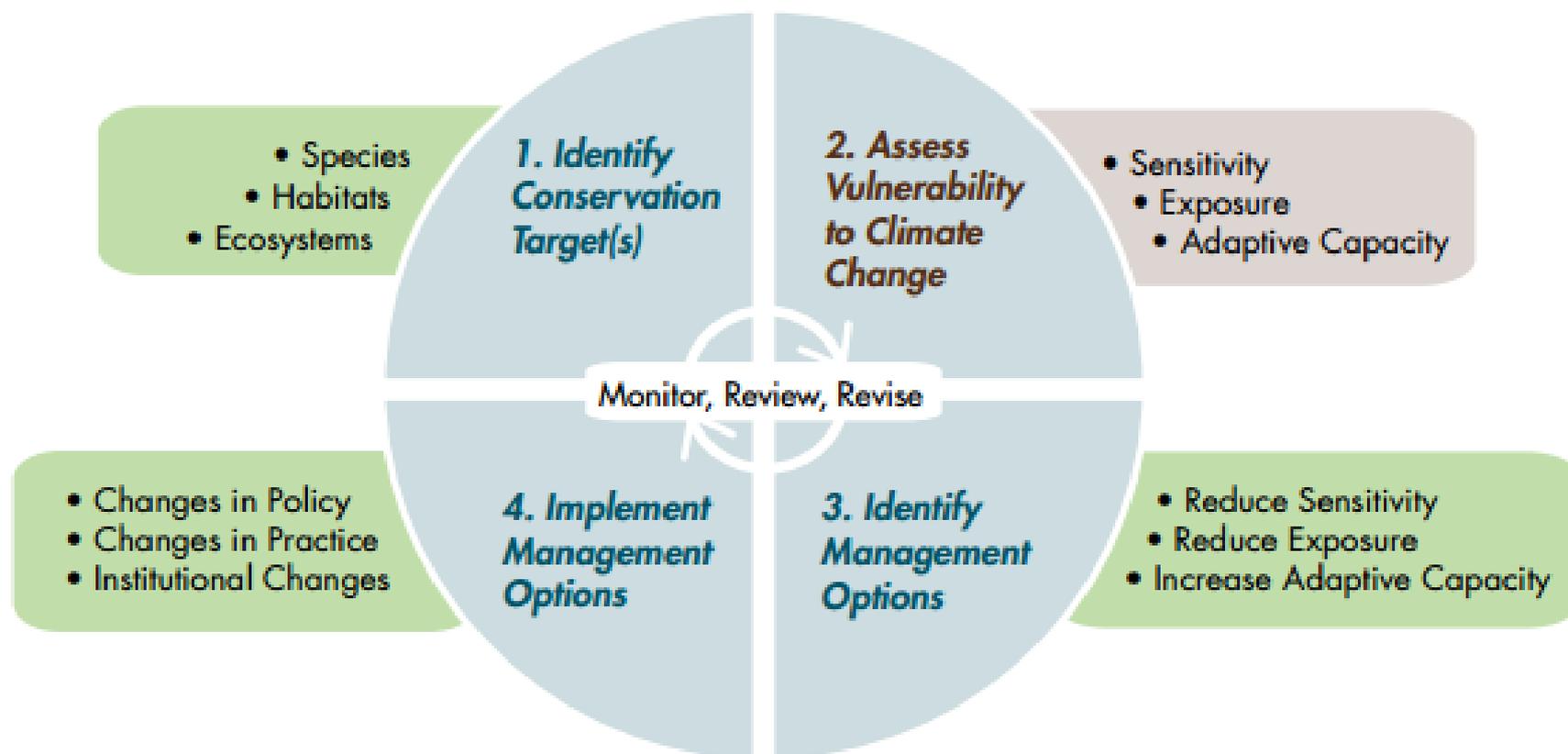
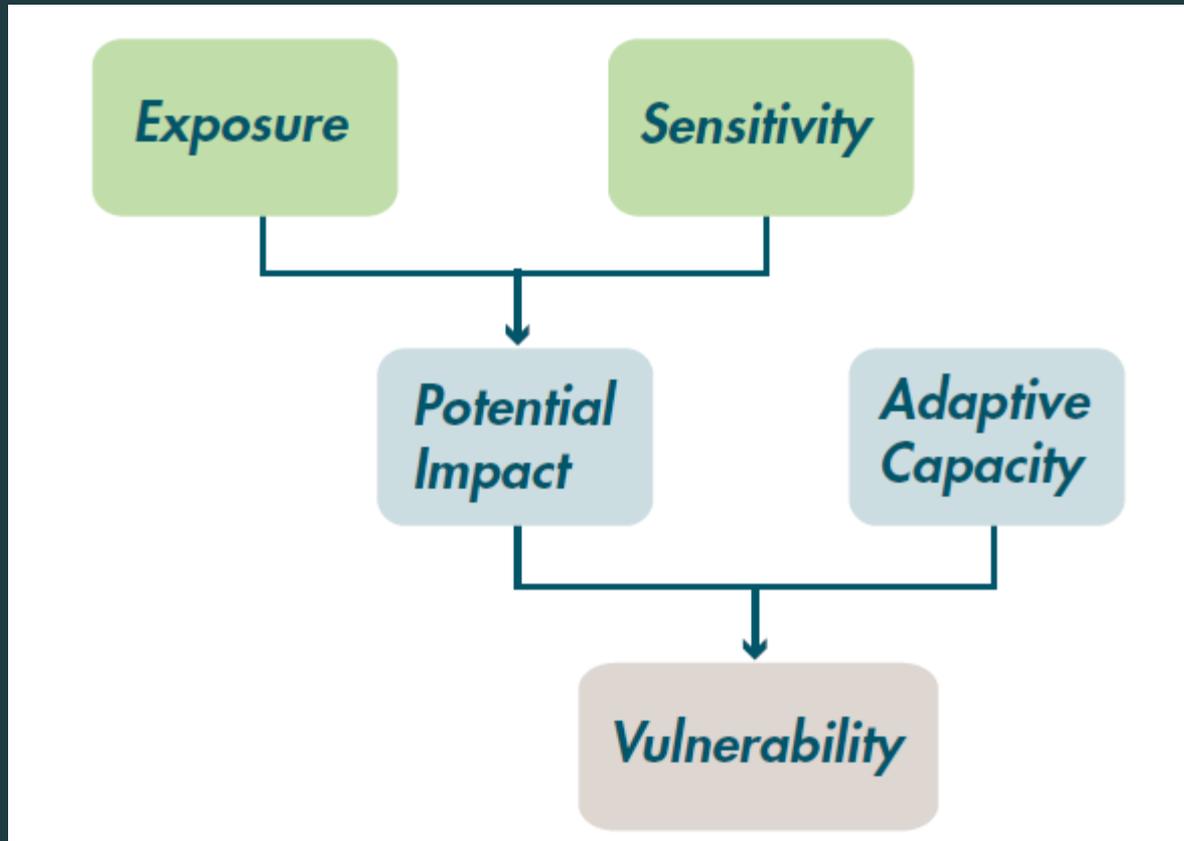


Figure 1.1. Framework for Developing Climate Change Adaptation Strategies

Components of vulnerability assessment



Data collection



Example projects

US FWS - Water Resource Inventory Assessments

Exploring historical temperature, precipitation, and stream flow trends and starting to look at future climate projections



Exposure



Sensitivity



Adaptive capacity

Example projects

BLM – Radio-collaring of Canada lynx

Determine whether collared lynx prefer areas with snow cover



Exposure



Sensitivity



Adaptive
capacity

Example projects

US FWS - Coal reclamation potential in Chuitna watershed of Alaska

Hydrological effects model to project precipitation changes on groundwater and stream flow



Exposure

Impacts of groundwater and stream flow changes on spawning of coho salmon



Sensitivity

Beginning to look into how coho salmon and other fish might adapt to those changes



Adaptive capacity

Example projects

USGS/NPS – Impacts of climate change on Karner blue butterfly habitats

Incorporated downscaled climate projections into a suite of climate envelope models (e.g., Maxent)



Exposure

Identified future habitat shifts from the species distribution models



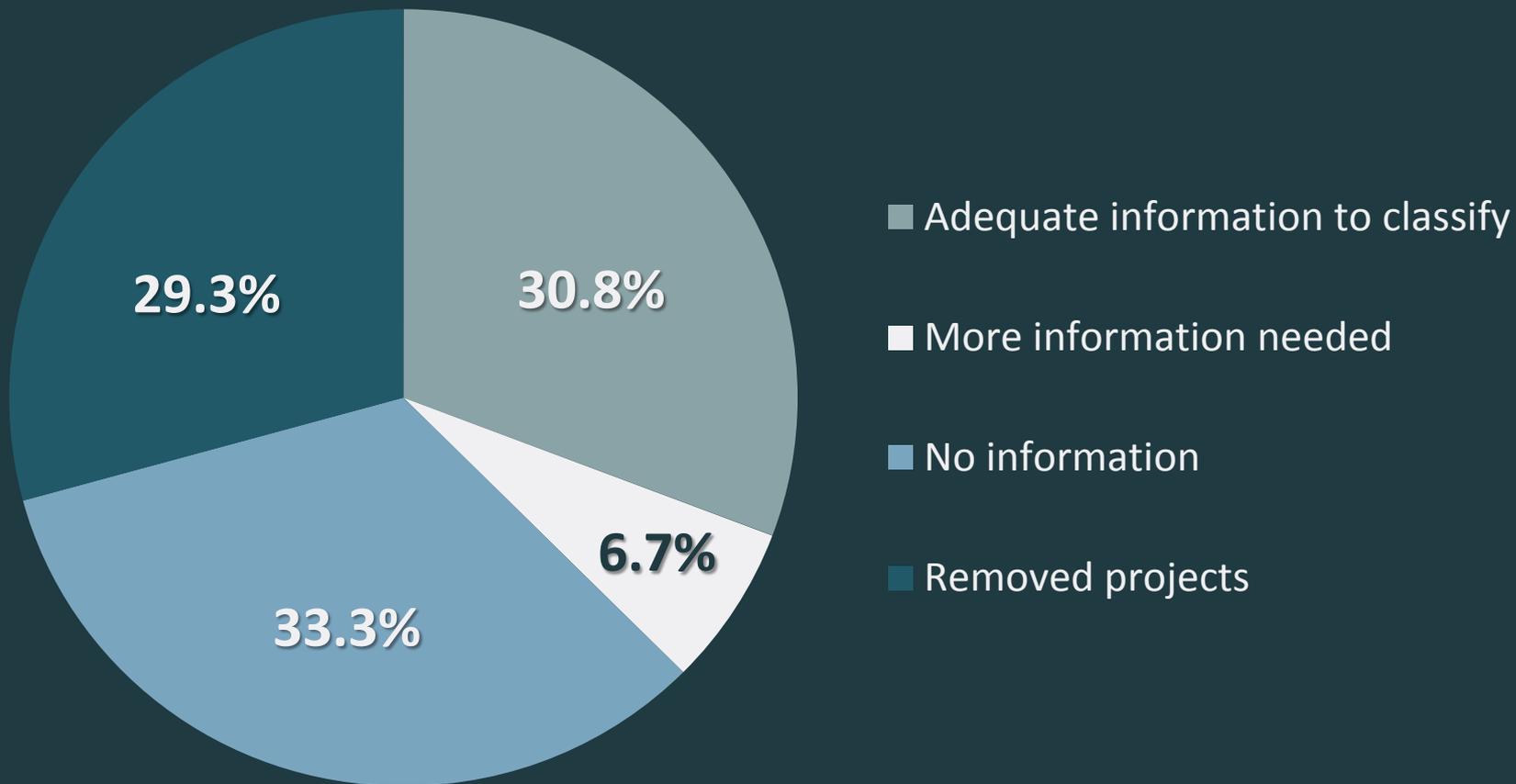
Sensitivity

Considered potential macro climates that may allow the species to find optimal habitats close by

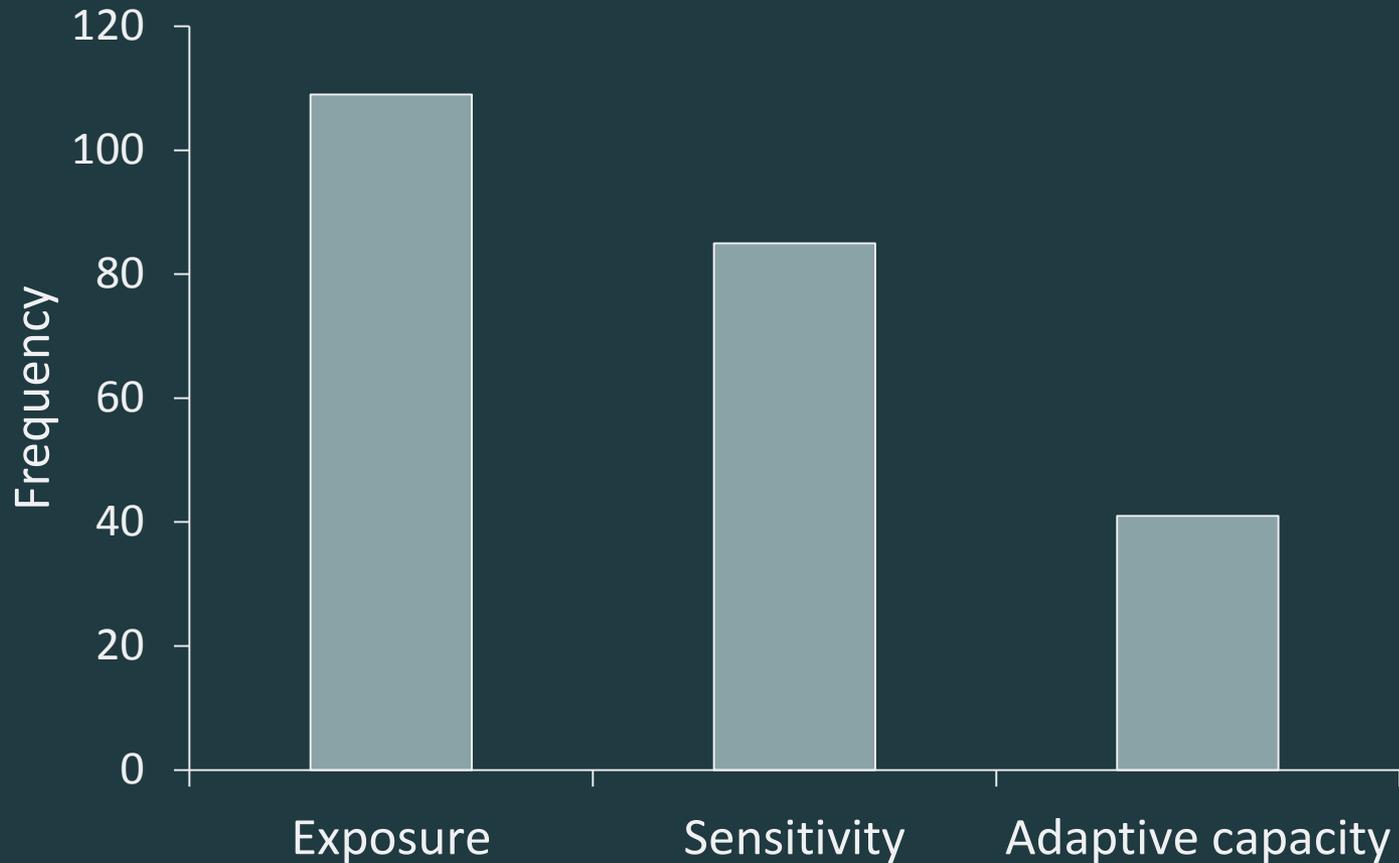


Adaptive capacity

Percentage of data call providing information

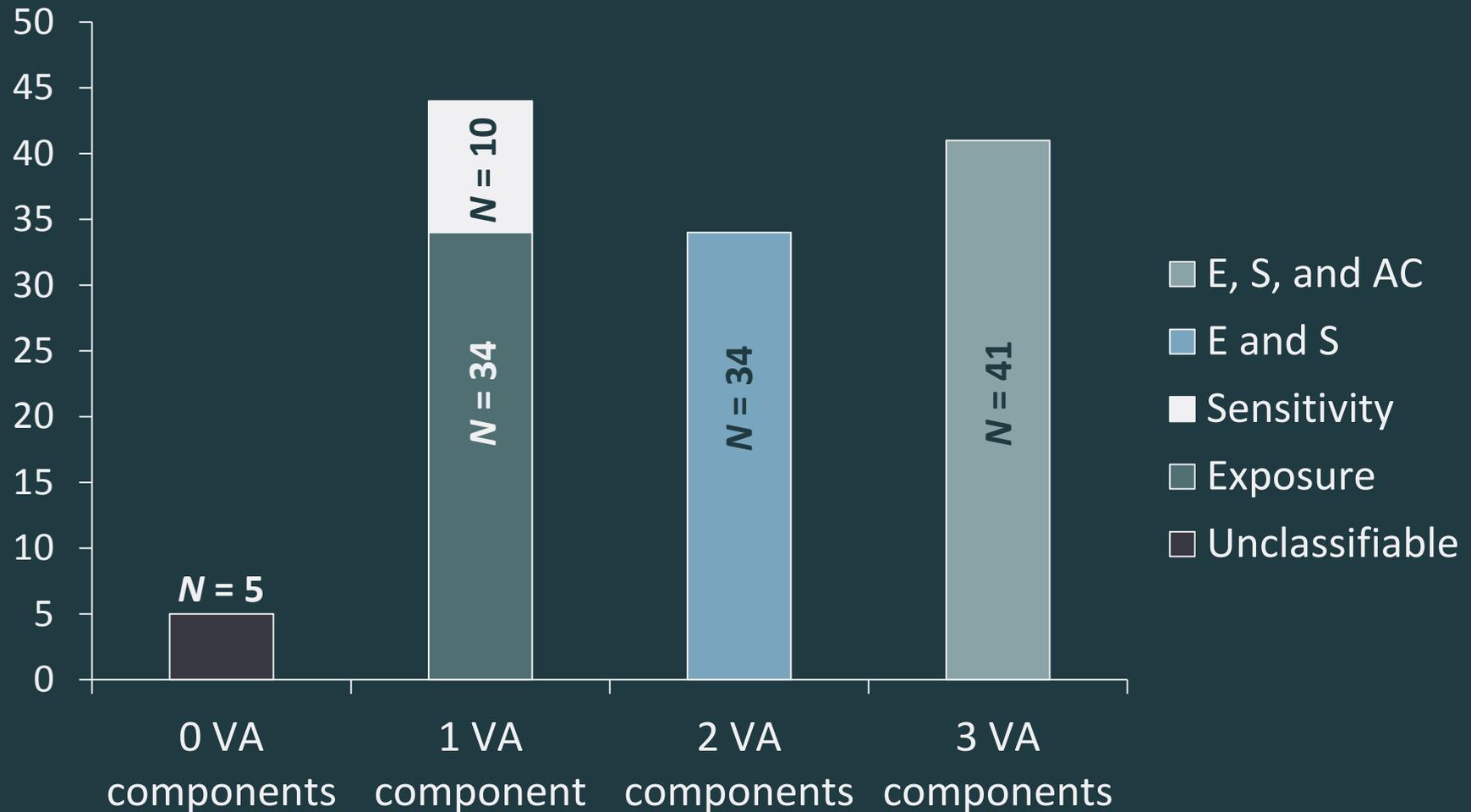


Frequency that VA components were assessed in data call



***N* = 124**

Total number of projects that assessed VA components



Number of projects = 124

	Focal resources					
	Freshwater supplies	Landscapes, including wildlife habitat	Native and cultural resources	Ocean health	More than 1 focal resource	Total
E	24	4	0	0	6	34
S	1	5	0	0	2	8
E and S	0	26	0	1	7	34
E, S, and AC	0	34	1	2	4	41
Unclassified	0	3	0	0	2	5
Total	25	72	1	3	21	122

	Focal resources					
	Freshwater supplies	Landscapes, including wildlife habitat	Native and cultural resources	Ocean health	More than 1 focal resource	Total
E	24	4	0	0	6	34
S	1	5	0	0	2	8
E and S	0	26	0	1	7	34
E, S, and AC	0	34	1	2	4	41
Unclassified	0	3	0	0	2	5
Total	25	72	1	3	21	122

	Focal threats					
	Invasive species	Wildfire risk	Sea-level rise	Melting ice/permafrost	More than 1 focal threat	Total
E	1	0	7	0	1	9
S	0	1	0	0	1	2
E and S	5	0	11	1	7	24
E, S, and AC	0	4	29	0	1	34
Unclassified	0	0	0	0	1	1
Total	6	5	47	1	11	70

	Focal threats					
	Invasive species	Wildfire risk	Sea-level rise	Melting ice/permafrost	More than 1 focal threat	Total
E	1	0	7	0	1	9
S	0	1	0	0	1	2
E and S	5	0	11	1	7	24
E, S, and AC	0	4	29	0	1	34
Unclassified	0	0	0	0	1	1
Total	6	5	47	1	11	70

Focal resources



Freshwater resources



Landscapes, including wildlife habitat

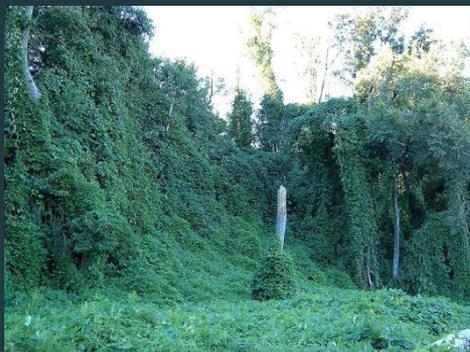


Native and cultural resources



Ocean health

Focal threats



Invasive species



Wildfire risk



Sea-level rise



Melting ice/permafrost

Focal resources



Freshwater resources



Landscapes, including wildlife habitat



More VA work

Native and cultural resources



More VA work

Ocean health

Focal threats



More VA work

Invasive species

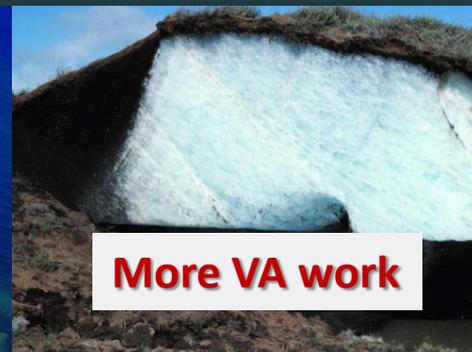


More VA work

Wildfire risk



Sea-level rise



More VA work

Melting ice/permafrost

Focal resources



Freshwater resources



**Adaptation
planning**

Landscapes, including
wildlife habitat



More VA work

Native and cultural
resources



More VA work

Ocean health

Focal threats



More VA work

Invasive species



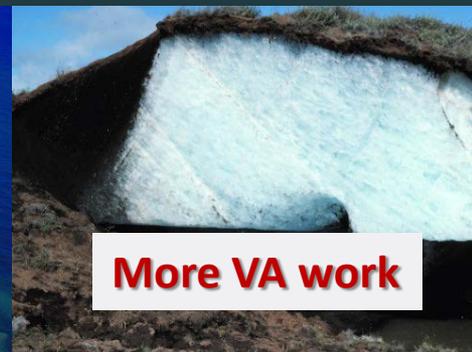
More VA work

Wildfire risk



**Adaptation
planning**

Sea-level rise



More VA work

Melting ice/permafrost

Focal resources



Freshwater resources



Landscapes, including
wildlife habitat



Native and cultural
resources



Ocean health

Focal threats



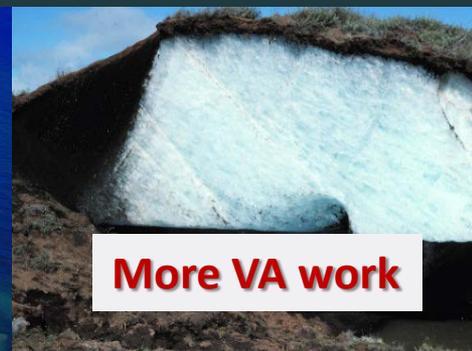
Invasive species



Wildfire risk



Sea-level rise



Melting ice/permafrost



Caveats of study

- Unstructured survey design
- Guidelines on conducting vulnerability assessments were relatively new

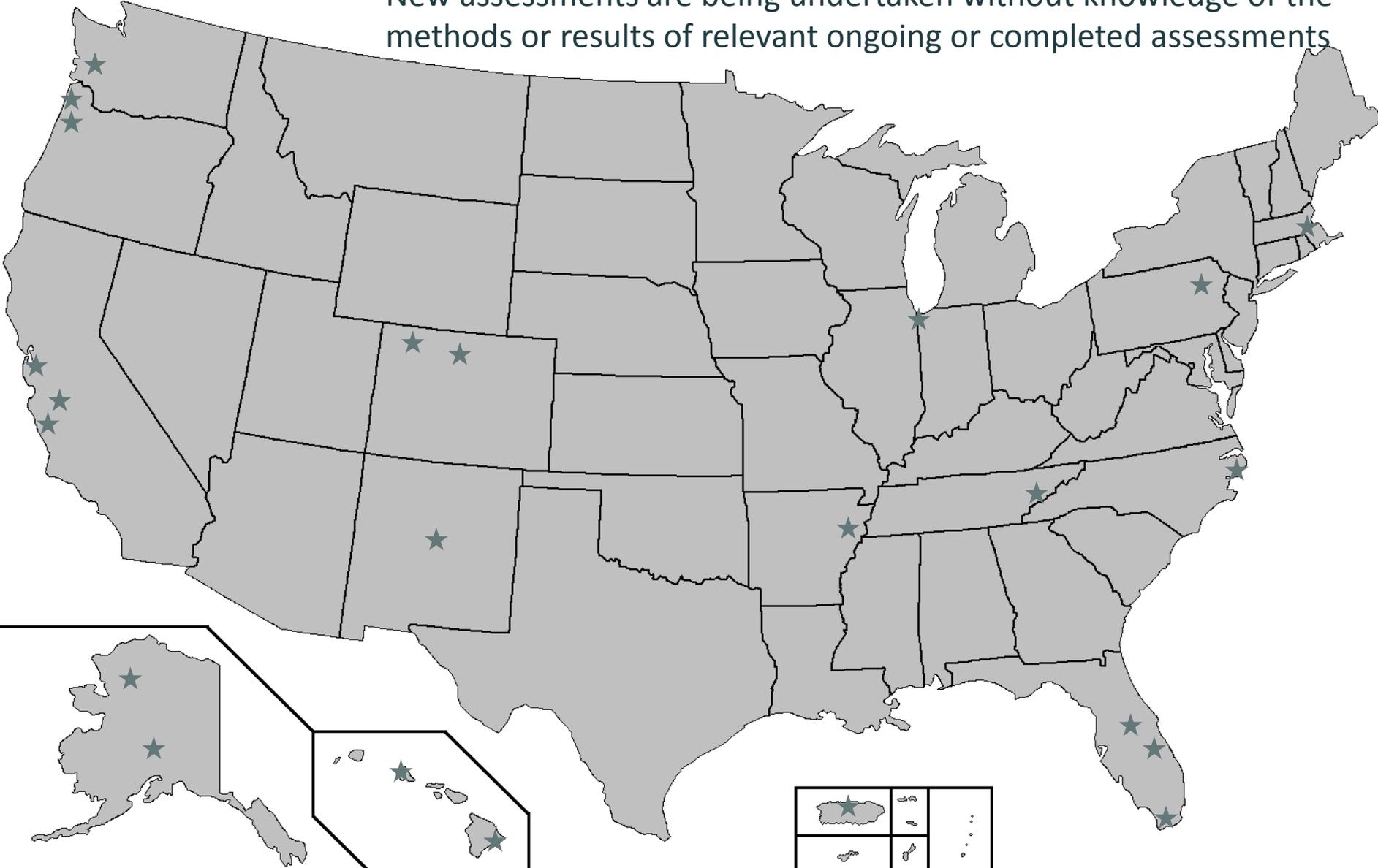
Future work

- Promote VA guidelines for informing climate change adaptation planning
- Develop scientific approach for tracking results of projects

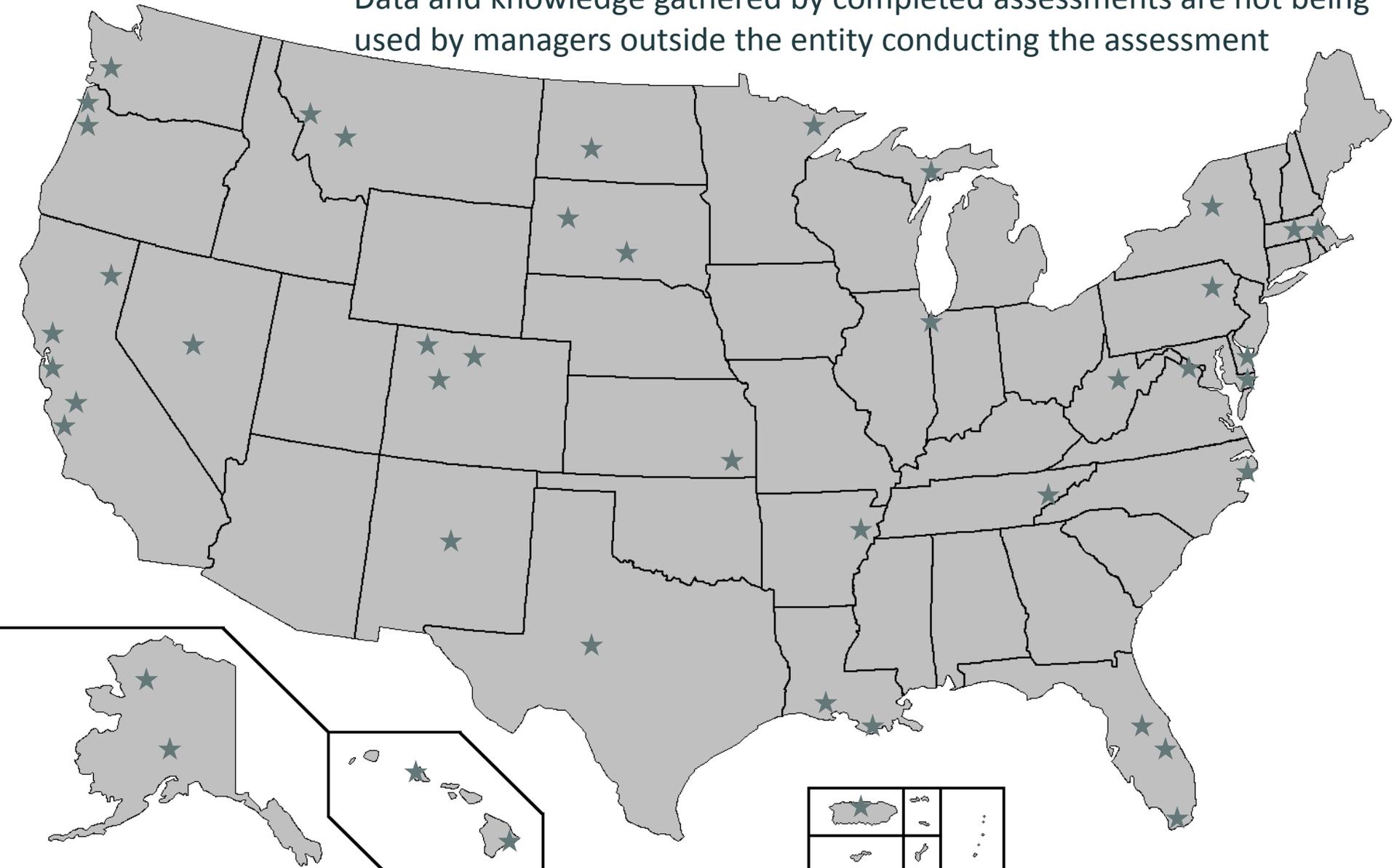
There is no way to know about VAs being conducted for different regions, species, or other ecological elements



New assessments are being undertaken without knowledge of the methods or results of relevant ongoing or completed assessments



Data and knowledge gathered by completed assessments are not being used by managers outside the entity conducting the assessment



Vulnerability assessment registry

- Basic reporting elements
 - Contact information
 - Location
 - Assessment endpoint (target)
 - Vulnerability assessment methodology
 - Vulnerability assessment components
 - Large-scale drivers of change
 - Partners or collaborators
 - Link to a specific decision
 - Abstract

Project timeline

