

Developing Performance Measures for State Wildlife Action Plans



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Challenges

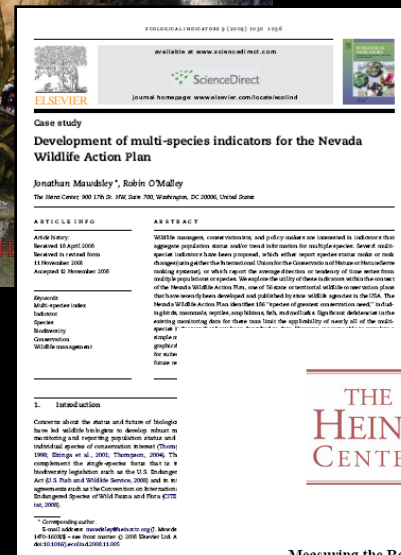
- **Lack of resources** for implementing plans
- **Lack of resources** for monitoring all species included in plans
- **Inadequate scientific knowledge** of many species included in plans
- **Time lag** between activities, outcomes
- Much implementation work is being done by partners, other **intermediaries**
- *Our old performance measures (e.g. acres protected, restored) no longer acceptable*

The Project

- What are the steps and process for developing performance measures for wildlife conservation activities?
- Funding from Doris Duke Charitable Foundation, through the Wildlife Habitat Policy Research Program of the National Council for Science and the Environment

Project Activities

- Two meetings of project steering committee
- Two meetings with the State Wildlife Diversity Managers group
- Three workshops with Nevada Department of Wildlife, to develop monitoring and evaluation system for NWAP
- Peer-reviewed publication, final project report

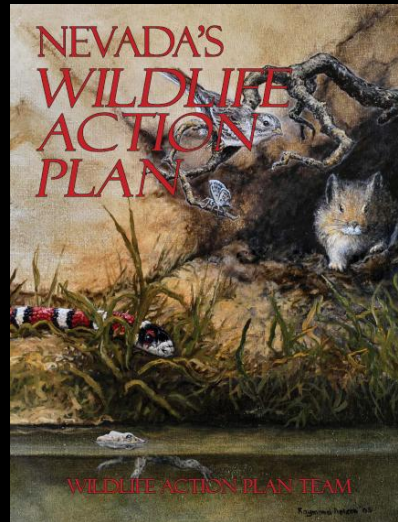


Measuring the Results of
Wildlife Conservation Activities

A Report of the
H. John Heinz III Center for Science, Economics and
Environment

How to Develop Performance Measures for Your SWAP

- Pick **targets** for management & monitoring
- Develop a **conceptual model** that shows the links between your target and its threats, stressors, and conservation opportunities
- Identify short-term, intermediate, and outcome **indicators**
- **Measure and track** indicators as implementation proceeds; **adjust** activities and model as needed (*Adaptive Management*)



A Real-World Test:

Nevada Wildlife Action Plan

First Workshop

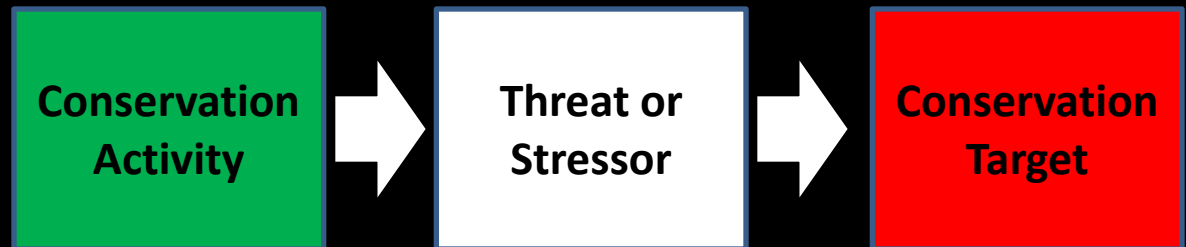
Partners present:

- USFWS, BLM, USGS, USDA Forest Service, EPA
- NDOW, Nevada State Land Agency
- TNC, Nevada Audubon, Great Basin Bird Obs.
- UNV-Reno, Colorado State

Our monitoring targets:

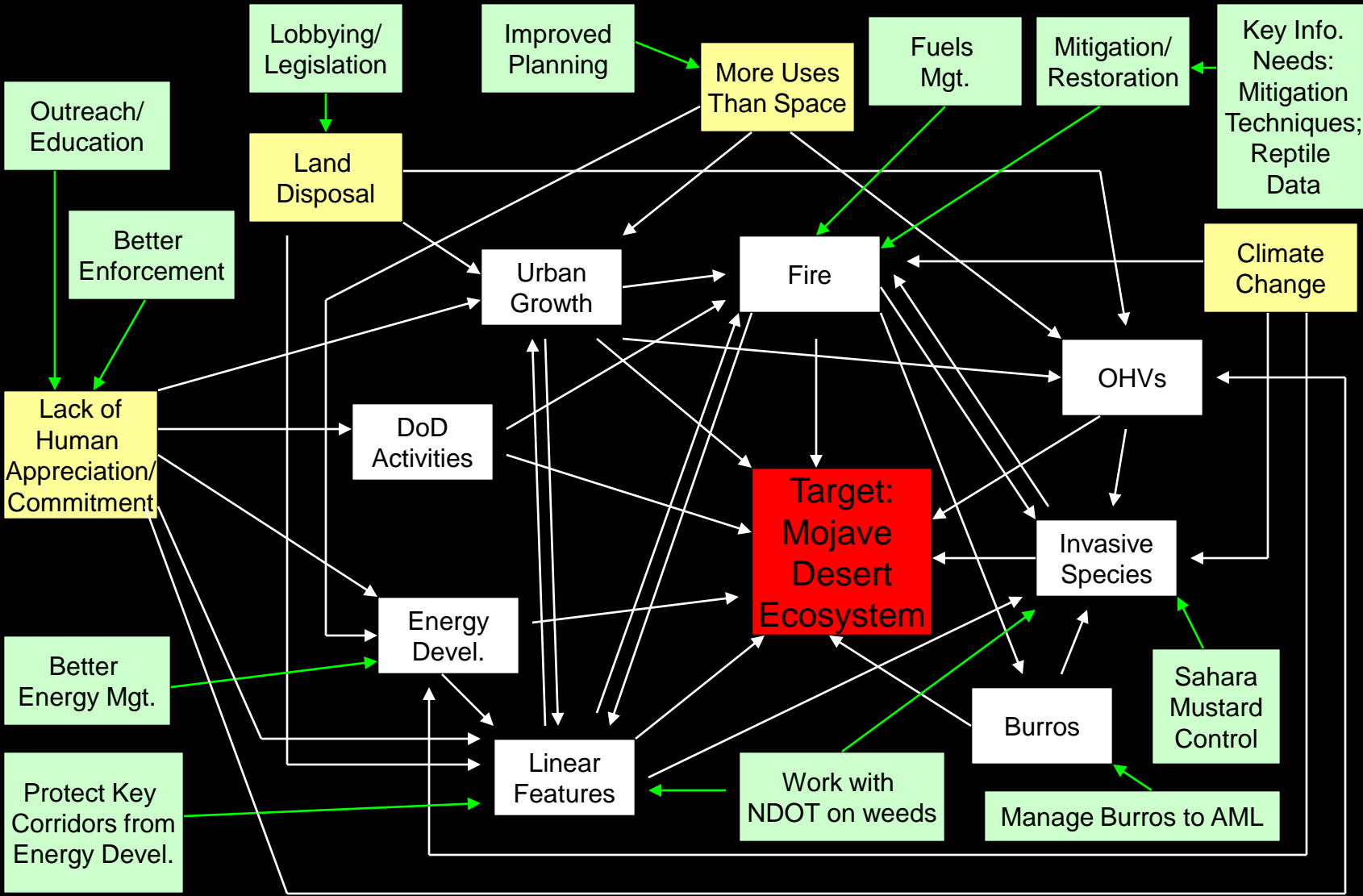
- Sagebrush / Sage Grouse
- Springs and Springbrooks
- Mojave Desert

We developed simple conceptual models for each target:



Mojave Desert Ecosystem:

Relationships between targets, direct factors, indirect factors, and actions/opportunities



Workshop Two: Indicator Selection

- Focused on **Sagebrush Ecosystems** (*large extent in state, had to start somewhere*)
- Technical working group developed lists of potential **indicators**:
 - **Species** (SGCN associated with ecosystem)
 - **Vegetation** (site characteristics, remote sensing)
 - **Stressors** on system (fire, climate, human activities)

For each species, we determined its relationship(s) to the key attributes and stressors of the target ecosystem.



Species	Status	Sagebrush Dependence	Relative Density	Shrub		Shrub				Surface		
				Height Density	Understory	Species Diversity	Patch Size	Seral Stage	Configuration	Water	Soils	Rock
kit fox	Priority	mod	low	0	0	0	0	0	yes	0	yes	0
desert horned lizard	Priority	low	mod	0	0	0	0	0	yes	0	yes	0
sagebrush lizard		mod	mod	0	0	0	0	0	0	0	0	+
Gray Flycatcher	Stewardship	mod	low	+	0	+	0	+	yes	0	yes	0
sagebrush vole	Priority	high	high	0	+	0	0	-	0	0	yes	+
ground squirrel	Priority	high	high	0	+	0	0	0	yes	0	yes	+
white-tailed jackrabbit		mod	mod	0	+	0	0	-	0	0	0	0
mule deer	Priority	mod	mod	0	+	+	0	-	yes	+	0	+
pygmy rabbit	Priority	high	high	+	+	0	0	+	0	0	yes	0
Preble's shrew	Priority	mod	?	?	+	0	0	-	?	0	0	0
Merriam's shrew	Priority	mod	mod	?	+	+	0	-	?	0	0	0
Ferruginous Hawk	ESA petition	low	low	-	+	0	0	-	yes	0	yes	0
Western Burrowing Owl	Priority	low	low	-	-/0	0	0	-	0	0	yes	0
Black-throated Sparrow	Stewardship	mod	low	0	-	0	0	0	yes	0	0	0
greater short-horned lizard	Priority	low	mod	0	-	0	0	0	0	0	0	0
pygmy short-horned lizard	Priority	mod	mod	0	-	0	0	0	0	0	0	0
Loggerhead Shrike	Priority	low	mod	+	0	+	+	+	0	0	0	0
Greater Sage-grouse	ESA petition	high	high	+	+	0	+	?	yes	?	?	0
Brewer's Sparrow	C-PIF MA	high	high	+	-	0	+	+	0	0	0	0
Sage Thrasher	Stewardship	high	high	+	-	-	+	+	yes	0	yes	0
Columbian Sharp-tailed Grouse	Priority	mod	mod	+	+	+	?	-	?	0	?	0
Green-tailed Towhee	Stewardship	mod	high	+	+	+	-	-	yes	0	0	0
Vesper Sparrow	Stewardship	mod	mod	-	+	0	-	-	yes	0	0	0
Mountain Bluebird	Stewardship	low	low	-	+	+	-	-	yes	0	0	+
Sage Sparrow	Priority	high	high	+	-	0	-	+	yes	0	0	0
Inyo shrew	Priority	mod	mod						yes	0		+

Workshop Three:

From Indicators to Sampling Design

- Further narrowing of list to 10 candidate indicator species:
 - *Surrogate for environmental condition?*
 - *Surrogate for status of other species?*
 - *Tractability as a monitoring target ?*
 - *Historical time-series data available, to put observations in context?*
- Discuss and select a design for an integrated monitoring pilot study that incorporates all 10 species

Priority Species List

- Greater Sage Grouse
- Vesper Sparrow
- Sage Sparrow
- Brewer's Sparrow
- Lark Sparrow
- Sage Thrasher
- Mule Deer
- Pygmy Rabbit
- Sagebrush Vole
- Least Chipmunk
- Horned Lizard
- Sagebrush Lizard

Each of these species is associated with one or more key ecosystem attribute(s), can be monitored efficiently and effectively with available resources, and has historical time-series data available

Lessons Learned

- We can do this!
- Can't measure everything – better to measure a few things well
- Important to engage monitoring experts, existing monitoring programs
- Summary statistics are available for reporting on SWAP accomplishments, overall status of species and ecosystems

Where Next?

Looking for New Opportunities and
New Partners!

<http://www.heinzcenter/wildlife>