

CBC Indicators Work Group

Developing a Common Framework for
Indicator Systems



PROPOSED COLLABORATION

Develop, assess, and report on environmental indicators using a shared framework.

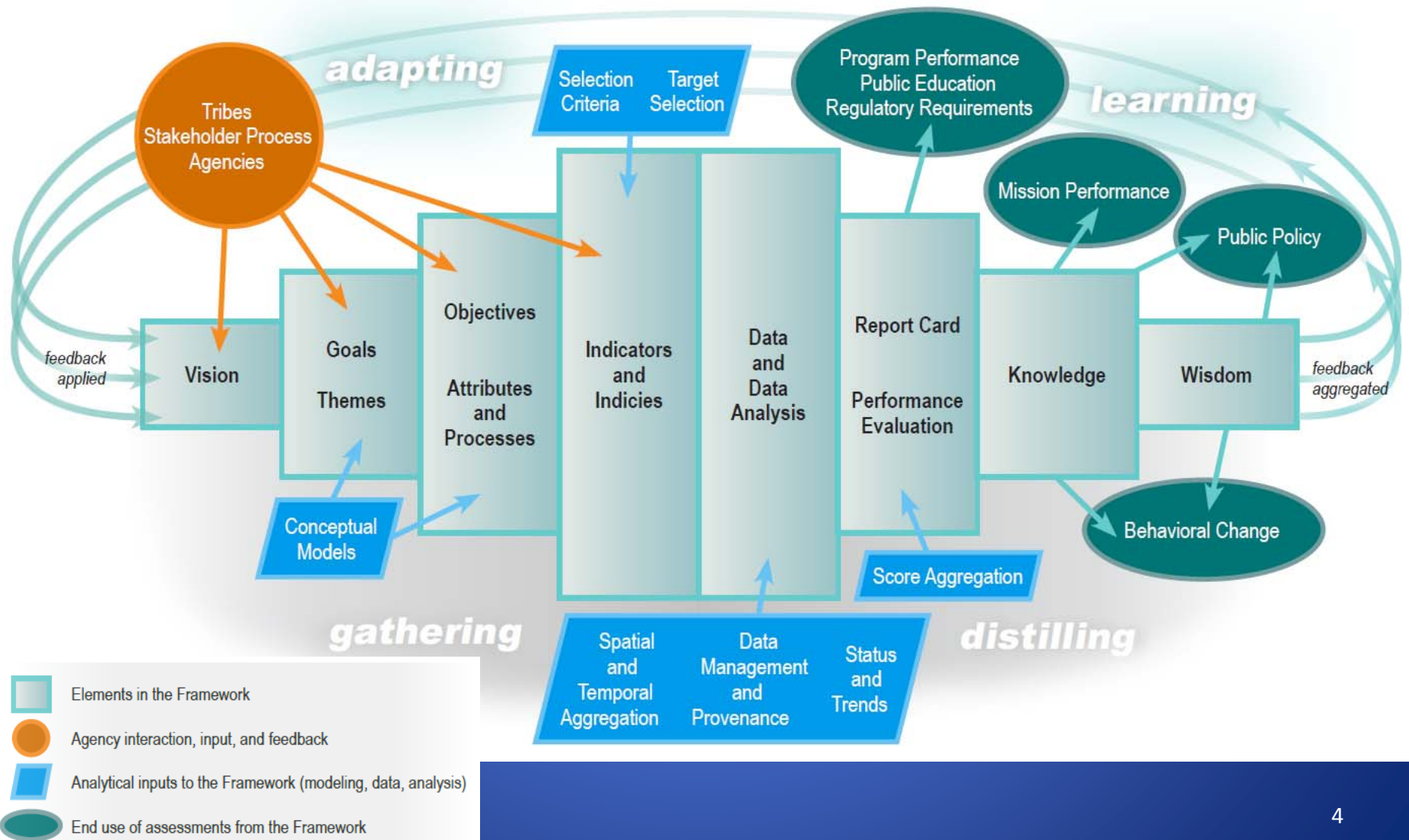
- California Forest and Range Assessment Report (CAL FIRE)
- California Water Plan (CDWR)
- California State Wildlife Action Plan (CDFW)
- USFS Region 5 Monitoring Program

LEVERAGING EXISTING RESOURCES

Project Objectives:

- Develop common glossary of terms
- Identify and report on cross cutting goals
- Identify and report on connections between program needs
- Develop catalog of data
- Develop catalog of indicators
- Location specific pilot project to develop cross cutting indicators (pending funding)

DWR Water Plan



Water Sustainability Goals

Water Plan Update 2013

Goal 1. Manage and make decisions about water in a way that integrates water availability, environmental conditions, and community well-being for future generations.

Goal 2. Improve water supply reliability to meet human needs, reduce energy demand, and restore and maintain aquatic ecosystems and processes.

Goal 3. Improve beneficial uses and reduce impacts associated with water management.

Goal 4. Improve quality of drinking water, irrigation water, and in-stream flows to protect human and environmental health.

Goal 5. Protect and enhance environmental conditions by improving watershed, floodplain, and aquatic condition and processes.

Goal 6. Integrate flood risk management with other water and land management and restoration activities.

Goal 7. Employ adaptive decision-making, especially in light of uncertainties, that support integrated regional water management and flood management systems.

SAWPA One Water One Watershed 2.0

Goal 1: Maintain reliable and resilient water supplies and reduce dependency on imported water

Goal 2: Manage at the watershed scale for preservation and enhancement of the natural hydrology to benefit human and natural communities

Goal 3: Preserve and enhance the ecosystem services provided by open space and habitat within the watershed

Goal 4: Protect beneficial uses to ensure high quality water for human and natural communities

Goal 5: Accomplish effective, equitable and collaborative integrated watershed management in a cost-effective manner

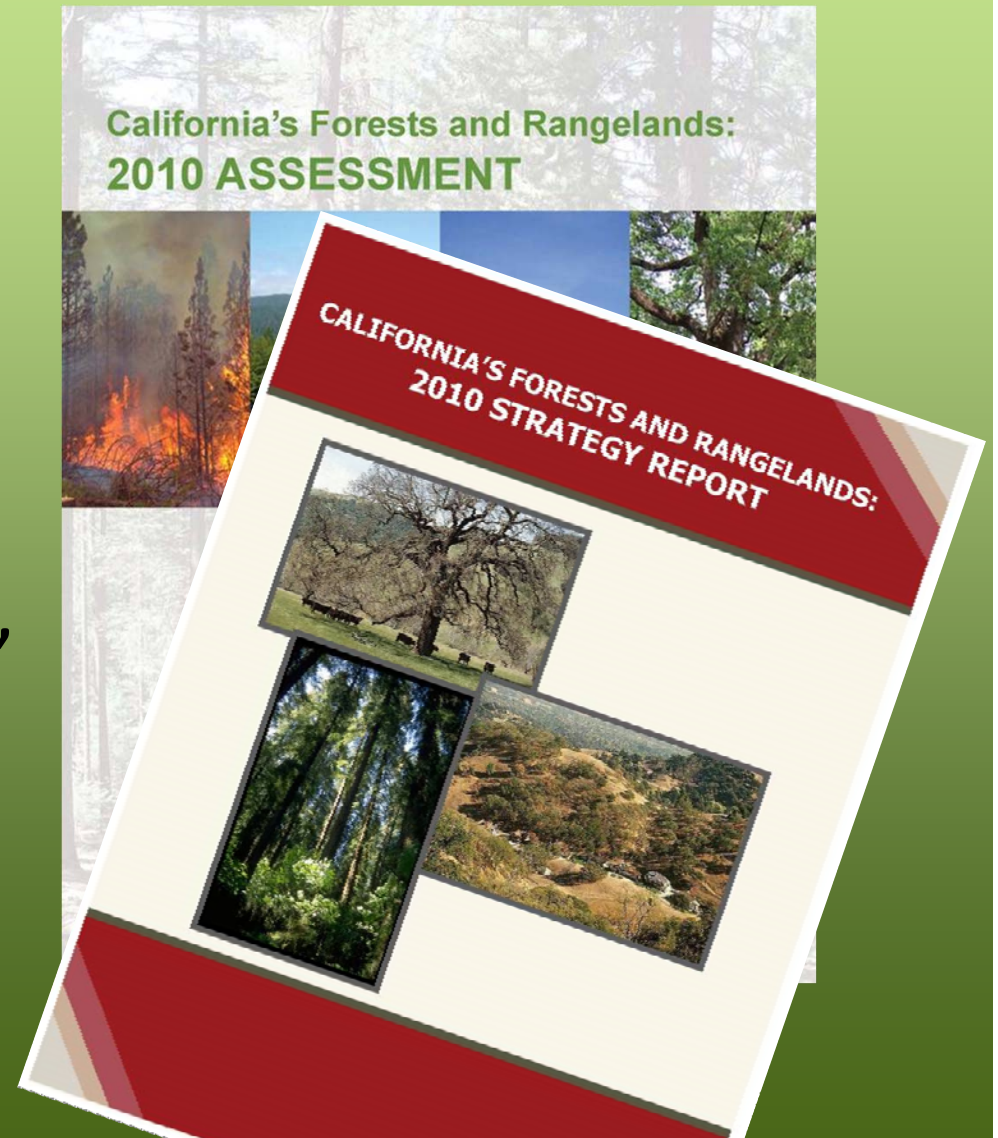
Selecting Indicators

- ✓ Availability of high-quality data
- ✓ Data affordability
- ✓ System representation
- ✓ Ability to detect change over time
- ✓ Independence of indicators from one another
- ✓ Supports management decisions and actions
- ✓ Can be reported & understood in public arenas

CAL FIRE

Forests and Rangelands Assessment

- Forest Assessment Update - 2015
- Indicators – Follow Montreal Process, Board of Forestry goals, and are organized by Assessment Chapter topic



Montreal Process - Purpose

The Montreal Protocol identifies a framework of criteria and indicators that provide a common definition of what characterizes sustainable management of forests.



Seven MP Criteria

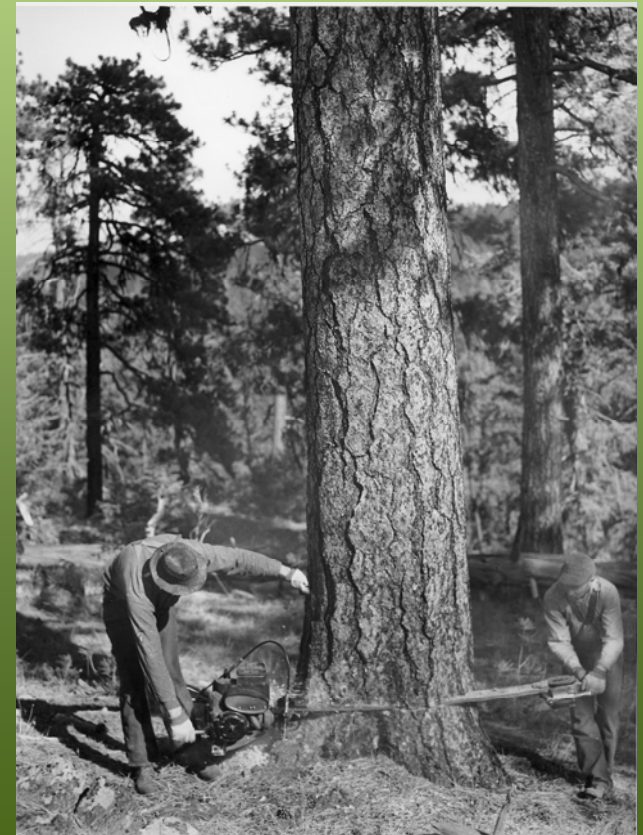


Interesting!

1. Conservation of biological diversity
2. Maintenance of productive capacity of forest ecosystems
3. Maintenance of forest ecosystem health and vitality
4. Conservation and maintenance of soil and water resources
5. Maintenance of forest contribution to global carbon cycles
6. Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies
7. Legal, institutional and economic framework for forest conservation and sustainable management

Forest and Rangeland Assessment Topics

- Population Growth and Development
- Sustainable Forests
- Wildfire Threat
- Forest Pests
- Water Quality and Quantity
- Urban Forests
- Community Wildfire Planning
- Emerging Markets - Biomass
- Wildlife
- Green Infrastructure
- Climate Change



Criterion

- A category of conditions or processes by which sustainable forest management may be assessed.
- Characterized by a set of related indicators which are monitored periodically to assess change.



Indicators

- Measure and evaluate progress towards forest sustainability in California
- Provide objective measures that can be reported on with each update of the Forests & Rangelands Assessment.



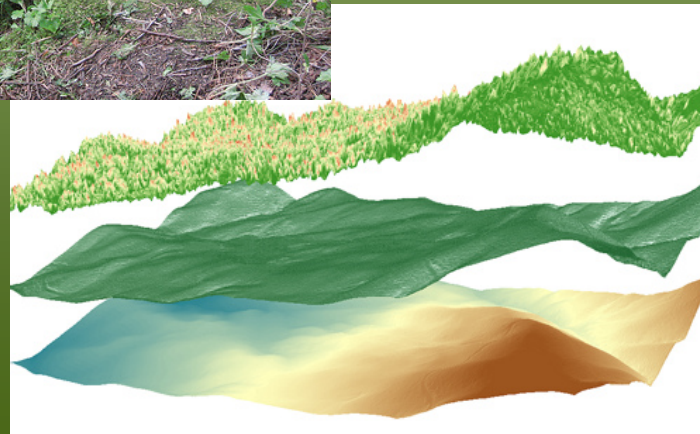
Metric



Quantitative (stream temperature)



Qualitative (well-being)



Spatial (invasive species distribution)

Example

- **Montreal Criteria and Board of Forestry Goals:**
 - Maintenance of forest contribution to global carbon cycles
 - AB32 goals for the forest sector
- **Assessment Chapter: Climate Change**

Indicator:
Net Carbon
Sequestration

Indicator:
Snow Pack

Indicator:
Days over 100
degrees

Metrics:

- Emissions from Natural Processes, Harvesting, other management actions
- Carbon Sequestration in Live Trees
- Storage in wood products and landfill

Metric:

Emissions from Natural Processes, Harvesting, other management actions

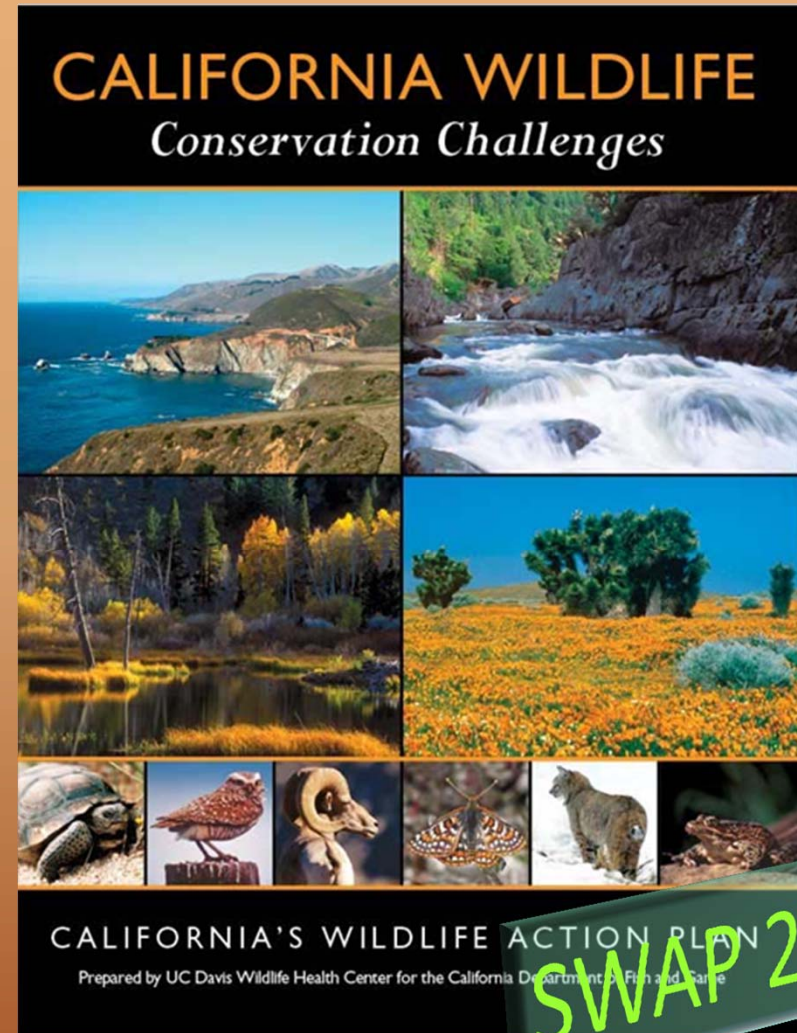
Source	Type	C (tonnes)	CO2e (tonnes)
Growth	Storage	-16,367,285	-60,067,936
Model Mortality	Emission	5,455,351	20,021,137
Wildfire	Emission	1,719,915	6,312,087
Harvest (merch)	Emission	565,315	2,074,706
Harvest (non-merch)	Emission	791,776	2,905,819
Wood Products (in-use)	Pool	-389,436	-1,429,231
Wood Products (landfill)	Pool	-48,796	-179,081
Net		-8,273,161	-30,362,499

Source: 2010 Forest and Range Assessment, FIA data (2001 – 2007)

CDFW

State Wildlife Action Plan *2015 Update*

- ❖ Create a conservation vision for CA
- ❖ Address the highest priorities of conservation
- ❖ Create a “green-print” for conservation actions
- ❖ Prioritize enhancing partnerships and public awareness & involvement



SWAP 2015 - Document Structure

❖ 2-tier Spatial Structure

- Tier 1: Statewide
- Tier 2: 39 conservation units

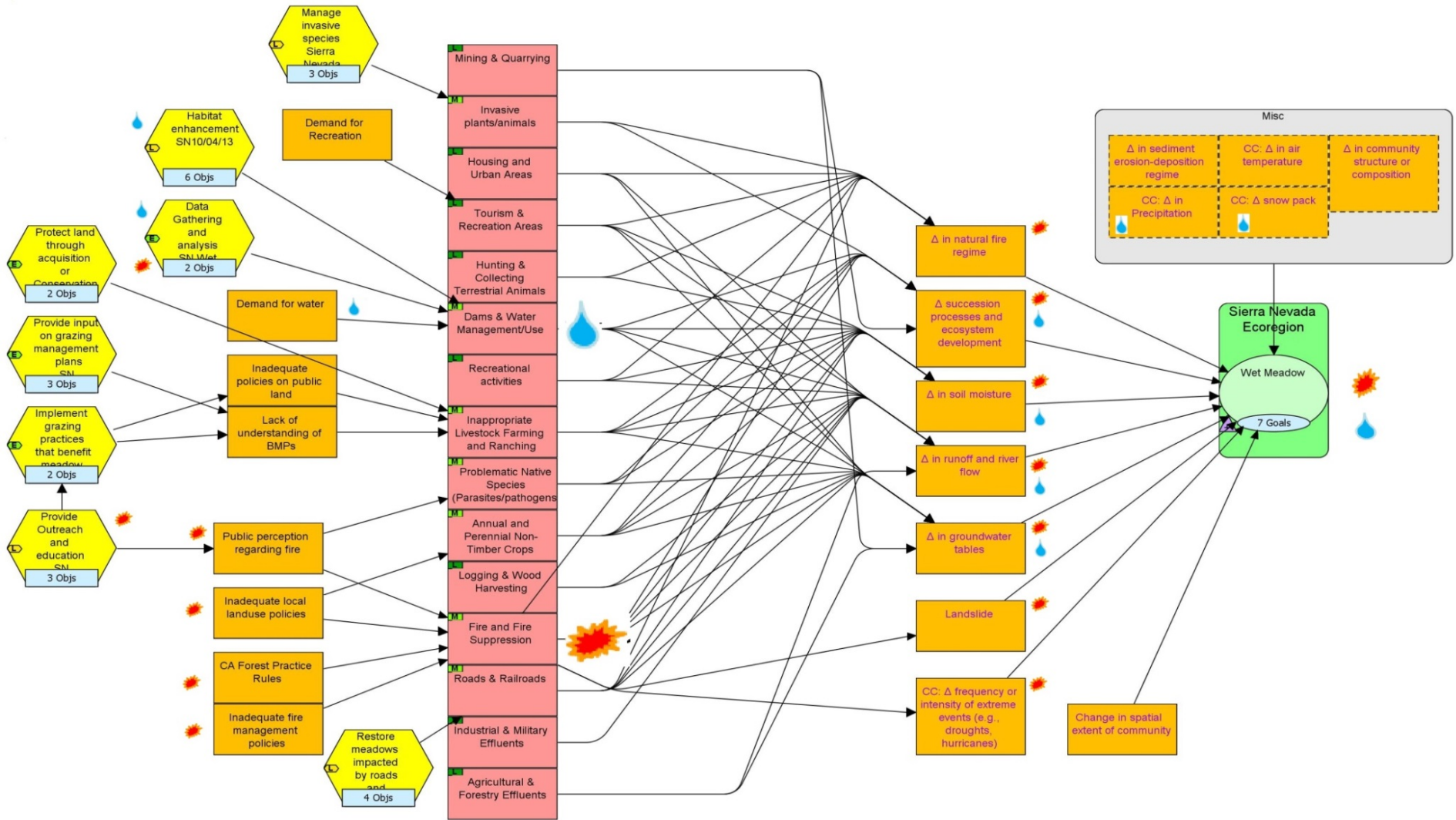
❖ Each unit has identified conservation actions with **SMART** goals and objectives:

Specific
Measurable
Attainable
Relevant
Time-bound



Indicators quantify the progress and success of SWAP 2015 implementation.

- Example - High Sierra Wet Meadow



High Sierra SWAP 2015 *Draft* Goals

- excerpt -

Fire Goals

- Allow natural mixed intensity fires in the ecosystem as appropriate defined by the criteria identified below.
- (Objective) Collaborate with fire control agencies to define criteria to allow natural mixed intensity fires to burn.

Water Goals

- Maintain hydrologic connectivity within meadow complexes as appropriate.
- Design and implement plan to slow or restore the flow of runoff through meadows as appropriate.

(All the timeline is by 2025.)

**Essential Ecological Factors to Measure
for High Sierra Fire and Water Goals
- excerpt -**

Fire Type

Fire Timing
Fire Frequency
Fire Intensity
Fire Extent
etc.

Climate Type

Precipitation pattern
Precipitation amount
Snow period
Snow volume
Air temperature
etc.

Aqua Type

Flow volume
Flow pattern
Hydro-period
Groundwater level
etc.

SWAP needs to identify *indicators* for each key ecological factor.

Indicator development

High Sierra Wet Meadow in Progress

We need to fill this table!

Item	Viability Mode	Status	Type	Poor	Fair	Good	Very Good	Source	Progress
Wet Meadow	Key	Not Specified							
Area and extent of community		Not Specified	Not Specified						
Area/ extent of community		Not Specified	Landscape						
Encroachment		Not Specified						Not Specified	Not Specified
Community structure or composition		Not Specified	Not Specified						
FIA plot assessment		Not Specified		Decrease in willows or hydro...	Current conditi...	Increase prese...		Rough Guess	Not Specified
SGCN presence in meadow		Not Specified		Decrease presece of SGCN s...	Current conditi...	Increase prese...		Rough Guess	Not Specified
Connectivity among communities & ecosystems		Not Specified	Not Specified						
Riparian connectivity		Not Specified			Current conditi...			Not Specified	Not Specified
Fire regime - (timing, frequency, intensity, extent)		Not Specified	Not Specified						
		Not Specified						Not Specified	Not Specified
Hydrological regimes		Not Specified	Not Specified						
		Not Specified						Not Specified	Not Specified
Soil/sediment structure & chemistry		Not Specified	Not Specified						
		Not Specified						Not Specified	Not Specified



Monitoring Plans & Monitoring Strategies

US Forest Service

- Monitoring questions flow from Desired Conditions and Objectives
 - Watershed conditions
 - Ecological conditions
 - Focal species
 - T&E species
 - Visitor use, satisfaction, recreation
 - Climate change
 - Desired conditions
 - Productivity of land

Summary

- Proposed collaboration will encourage sharing and reliance on partner agencies when reporting on environmental conditions, reducing duplication and improving quality
 - » Augment, don't reinvent!
- Developing the common framework leverages existing resources
- Applying framework in pilot study is unfunded.

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Discussion

- Leveraging existing knowledge, datasets, efforts already underway
- Augment instead of reinvent
- Coordination with existing indicator projects or project development
- Identifying priorities for Indicators

