



# Timberland Ecosystem Monitoring and Assessment Initiative

JUNE 2019

*Development of Ecological Performance  
Measures for California Timberland  
Ecosystems under Assembly Bill 1492*





# **Overview and Objectives of AB 1492 and Ecological Performance Measures**

# AB 1492 Ecological Performance Measures

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## Vision

Develop a statewide ecological performance measures (EPM) approach as an **accountability measure** for the **multiple State programs** that regulate management on **nonfederal timberland ecosystems**.

# AB 1492 Ecological Performance Measures

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## Goal

Harnessing data from existing monitoring programs across State and Federal resource agencies, establish a spatially explicit, consistent monitoring approach to track forest ecosystem condition over time at a regional scale.



Inform decision making to adaptively manage timberland ecosystems and track efficacy of State-led timberland management associated with policy, programs and regulations.



Beyond AB 1492, the EPM approach may also assist in the evaluation of State and Federal programs to invest in forest health and resilience.

# Ecological Performance Measures Working Group

## Chair:

Loretta Moreno,  
CNRA

## Intergovernmental Membership:

Dr. Matthew Vandersande, USFS  
Sandra Jacks, CDFW  
Caroline Petersen, CDFW  
Dr. Pete Ode, CDFW  
Bill Short, DOC  
Pete Cafferata, CAL FIRE  
Michael Baker, CAL FIRE  
Drew Coe, CAL FIRE  
Dr. Rich Walker, CAL FIRE  
Jim Burke, SWRCB  
Ali Dunn, SWRCB  
Matt Dias, BOF  
Forest Schafer, Tahoe Conservancy  
Dr. Adam Moreno, CARB

## Public Membership:

Dr. Sue Britting, Sierra Forest Legacy  
Cedric Twight, Sierra Pacific Industries  
Greg Suba, California Native Plant Society  
Gary C. Ryneason, Green Diamond  
Resource Company

# EPM Working Group Role

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Provide **technical expertise** to support all stages of EPM Program including:

**Methods development**

**Data acquisition**

**Data processing**

**Assessment**

**Reporting**

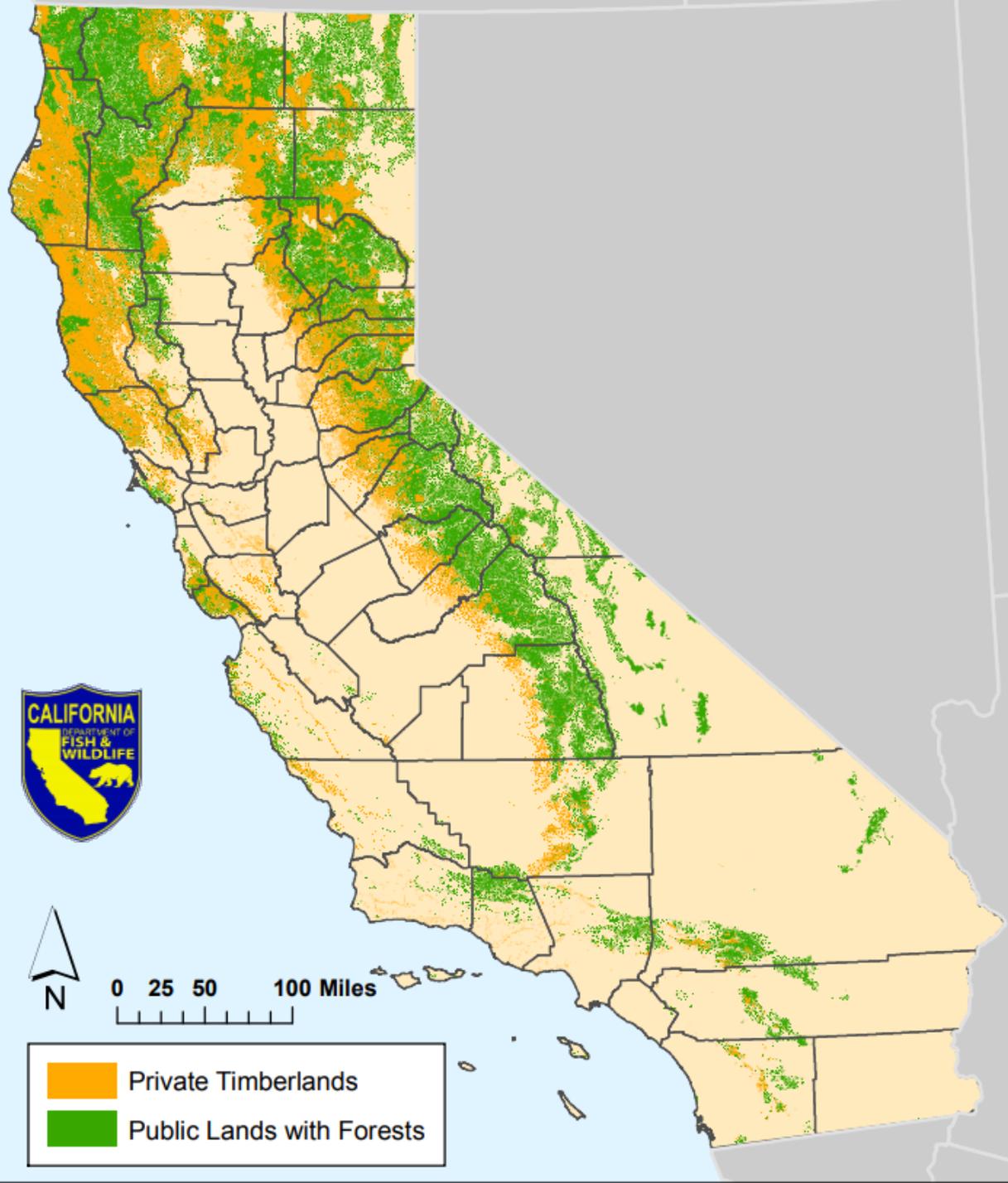
**Management  
recommendations**

# Focus on Timberlands

Forest is considered **timberland** if it is growing on ground capable of **significant annual tree growth** and considered **available for timber management (FIA)**.



**Coniferous** and **mixed-coniferous** forest ecosystems



# Focus on (non-Federal) Timberlands

**33**  
million  
acres

total **forest**  
**land** in  
California



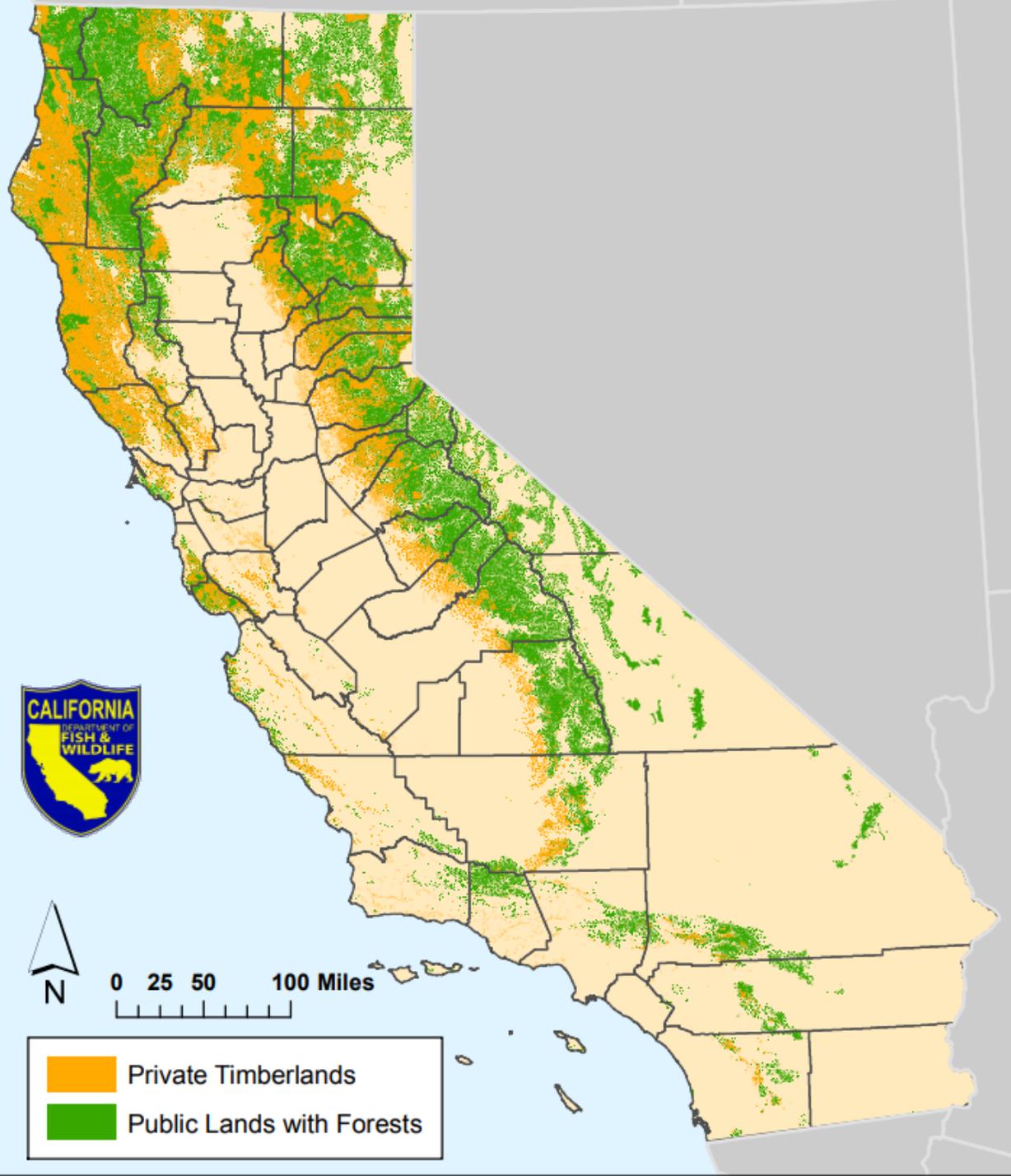
**17**  
million  
acres

forest land  
considered  
**timberlands**



**8**  
million  
acres

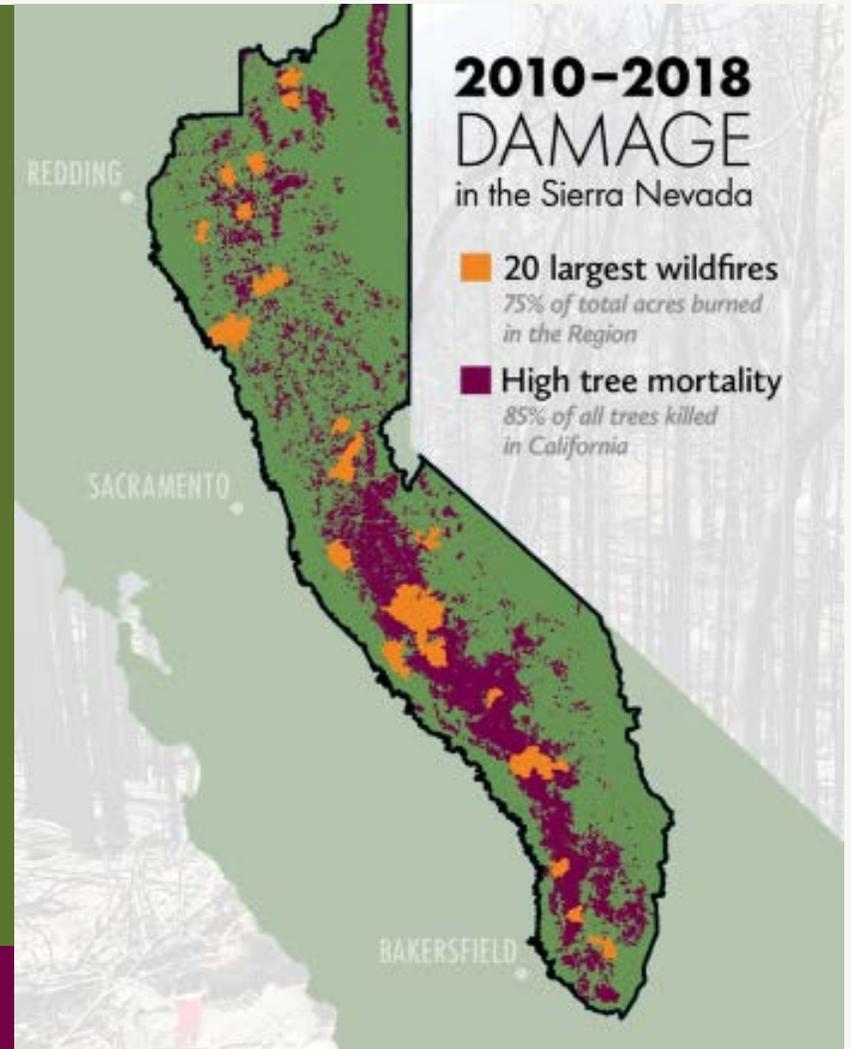
timberlands  
under **non-**  
**federal**  
**ownership**



# Context for EPM Program

- Rapid changes and stressful conditions facing forests statewide.
- Significant and growing investment and action in forest management across the State

Example showing Sierra Nevada tree mortality and forest fires (2010-2018. Figure from Sierra Nevada Conservancy.



# AB 1492 Timber Regulation and Forest Restoration Program

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“The Legislature further finds that the state’s forest practice regulatory program needs to develop **adequate performance measures to provide transparency** for both the regulated community and other stakeholders.”  
Public Resources Code (PRC) § 4629.1

“...shall submit to the Joint Legislative Budget Committee a[n annual] report on the activities of all state departments, agencies, and boards relating to forest and timberland regulation. This report shall include, at a minimum, all of the following:...

(8) In order to assess efficiencies in the program and the effectiveness of spending, **a set of measures for, and a plan for collection of data on, the program**, including, but not limited to:...

(F) **Evaluating ecological performance.**” PRC § 4629.9(a)

# AB 1492 Timber Regulation and Forest Restoration Program

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## Summary:

**Need for adequate performance measures to provide transparency for regulatory community & stakeholders**



**State will create a report with:**

- a set of **measures**;
- a plan for **collection of data**;
- and
- a program for **evaluating ecological performance**

# Timber Regulation & Forest Restoration Program

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## Ecological Performance Measures will account for management including:

- Standard commercial timber harvest
- Restoration
- Biomass removal
- Fuels management
- Carbon offset projects
- Conservation
- & More...

## Looking forward:

- In addition to supporting hindcasting and program evaluation, the ecological performance measures also will be useful in a **forward-looking mode** for project **planning/adaptive management**.

# Timber Regulation & Forest Restoration Program

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## Linkages with other governmental planning or assessment activities:

- State Wildlife Action Plan
- Forest and Rangeland Resource Assessment
- California Biodiversity Council indicators project
- State Water Plan
- Healthy Watersheds Partnership
- Nature Conservancy's Freshwater Conservation Blueprint
- US Forest Service "Broader Scale Monitoring Strategy"
- Effectiveness Monitoring Committee
- Tahoe Central Sierra Initiative
- Forest Management Task Force

Ecosystem  
Functions/Performance

### Conceptualizing Levels of Environmental Performance Measurement for AB 1492

High-Level,  
Statewide Goals

Example: CA Environmental Goals and Policy Report (indicators)

High-Level  
Indicators

Example: Collaboratively Developed Sustainability Indicators for Forests, Water, and  
Wildlife [project of the California Biodiversity Council]

Sectorial Plans  
or Assessments

Example: FRAP  
Assessment  
(indicators)

Example: State  
Wildlife Action  
Plan (indicators)

Example: State  
Water Plan  
(indicators)

Example:  
Climate  
Adaptation Plan

Ecoregion or  
Watershed  
Assessments

Example:  
Redwood Creek  
Watershed  
Assessments

Example: Sierra  
Nevada Bio-  
Regional  
Assessment (US  
Forest Service)

Example: North  
Coast Watershed  
Assessment  
Program

Example:  
Basin Plans  
(RWQCBs)

Small-Scale  
Assessments

Planning  
Watershed  
Pilot Projects

Small Watershed  
Assessment

THP Cumulative  
Effects Analysis:  
Wildlife

THP Cumulative  
Effects Analysis:  
Watershed

Lead: CNRA & CalEPA—TRFR Program

Forest Practice  
Rule  
Effectiveness

FP Rule A

FP Rule B

FP Rule C...

FP Rule Z

Lead: BOF Effectiveness Monitoring Cmte.

Individual  
Harvesting Plans

Plan 1

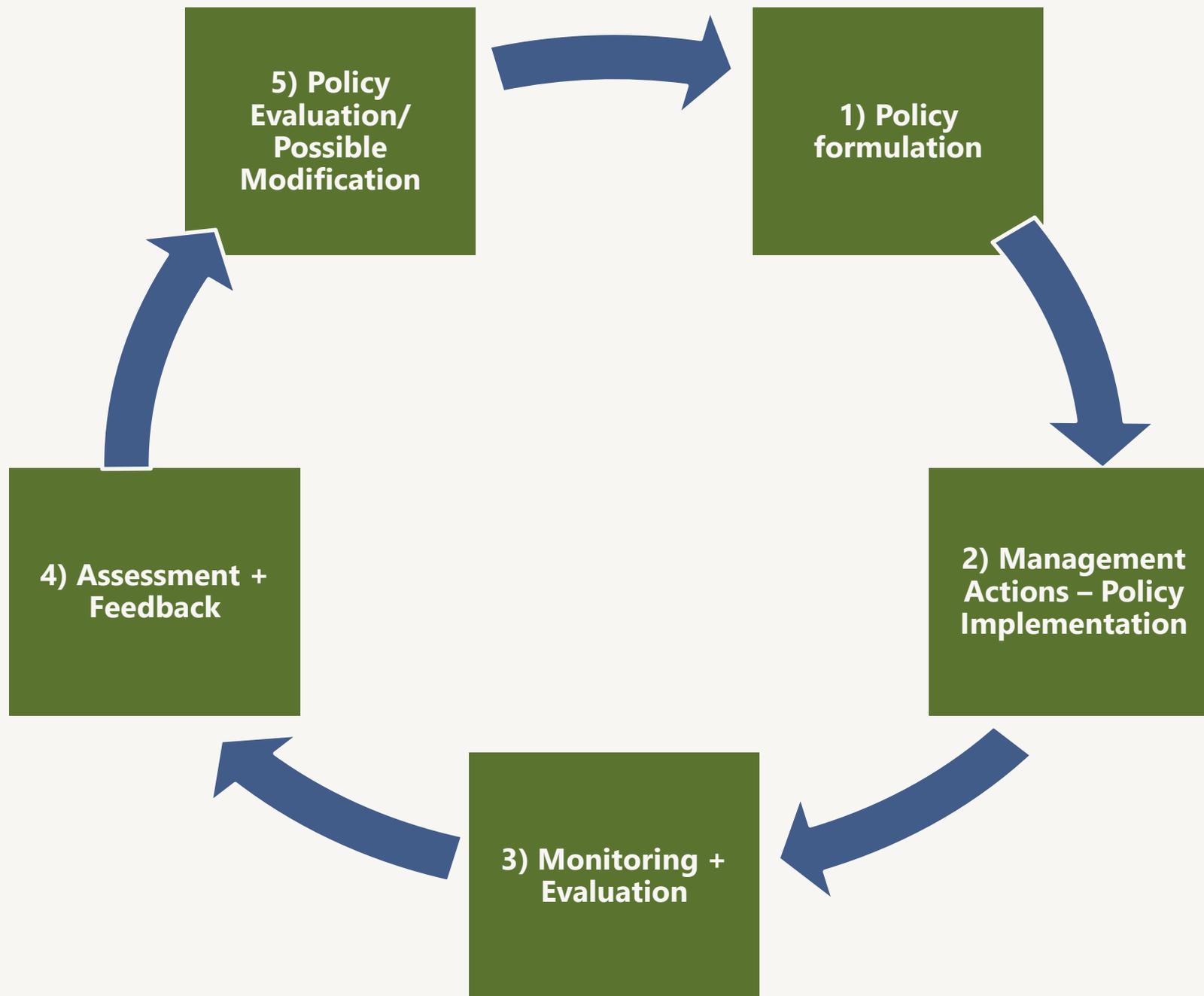
Plan 2

Plan 3...

Plan n

Lead: Review Team Agencies

Zone of Concern for  
TRFR Program



# Setting Common Definitions

## Ecological Monitoring:

- **Repeated, systematic, consistent** collection of measurements at one or more locations to determine the current state and trends of abiotic and/or biotic indicators in the environment.
- **Various types** of monitoring occurs (baseline, implementation, trend, effectiveness, validation, and compliance).

# Setting Common Definitions

## Assessment:

- The use of monitoring data to:
  - **Evaluate or appraise a resource of concern**, and/or
  - Determine the **condition and provision of ecosystem services** and support decision-making and planning processes.

# Setting Common Definitions

## Ecosystem Services (or criteria or values):

- **Benefits** obtained from ecosystems whether for their **intrinsic value** or for **human wellbeing**.
- These include:
  - **Provisioning** services such as food and water;
  - **Regulating** services such as flood and disease control;
  - **Cultural services** such as spiritual, recreational, and cultural benefits; and
  - **Supporting services**, such as nutrient cycling, that maintain the conditions for life on Earth.

# Setting Common Definitions

## Indicators:

- A **measurable variable** relating directly to one or more ecosystem services and refers to a site-specific condition at a given moment.
- Using **multiple indicators taken together** can approximate a **process**, physical **entity**, or **condition**.
- Indicators are used to measure the degree to which **ecosystem services are being delivered**.

# Setting Common Definitions

## Metric:

- Measuring an indicator implies identifying an appropriate unit of measurement (a "*metric*" be it biological, physical or chemical), and then creating or utilizing a corresponding data set.

# Setting Common Definitions

## Ecological Performance Measures:

- Used to **evaluate ecosystem services** against a **suite of indicators** and associated **metrics** to help determine an ecosystem's **state** and **level of function** and represent a method of ecological monitoring.

# Ecological Performance Measures



**Carbon sequestration**  
Kg/ha/year,  
net carbon  
flux

**Water quality**

pH, temperature, flow,  
suspended sediment

**Fire resilience**

Fire severity, fire frequency,  
vertical and horizontal  
continuity, loading vegetation  
fuels, insect and/ or disease  
patterns

**Biodiversity**

Species abundance, species  
richness species' habitat  
fragmentation

**KEY**

**Ecosystem Services**  
**Indicators**



**Flexible Assessment:**

Process may change with user or with new science/ needs

**Management/  
Policy Response**

**Assessment**

**Ecoregion Maps**

**Modeling**

**Static Monitoring:**

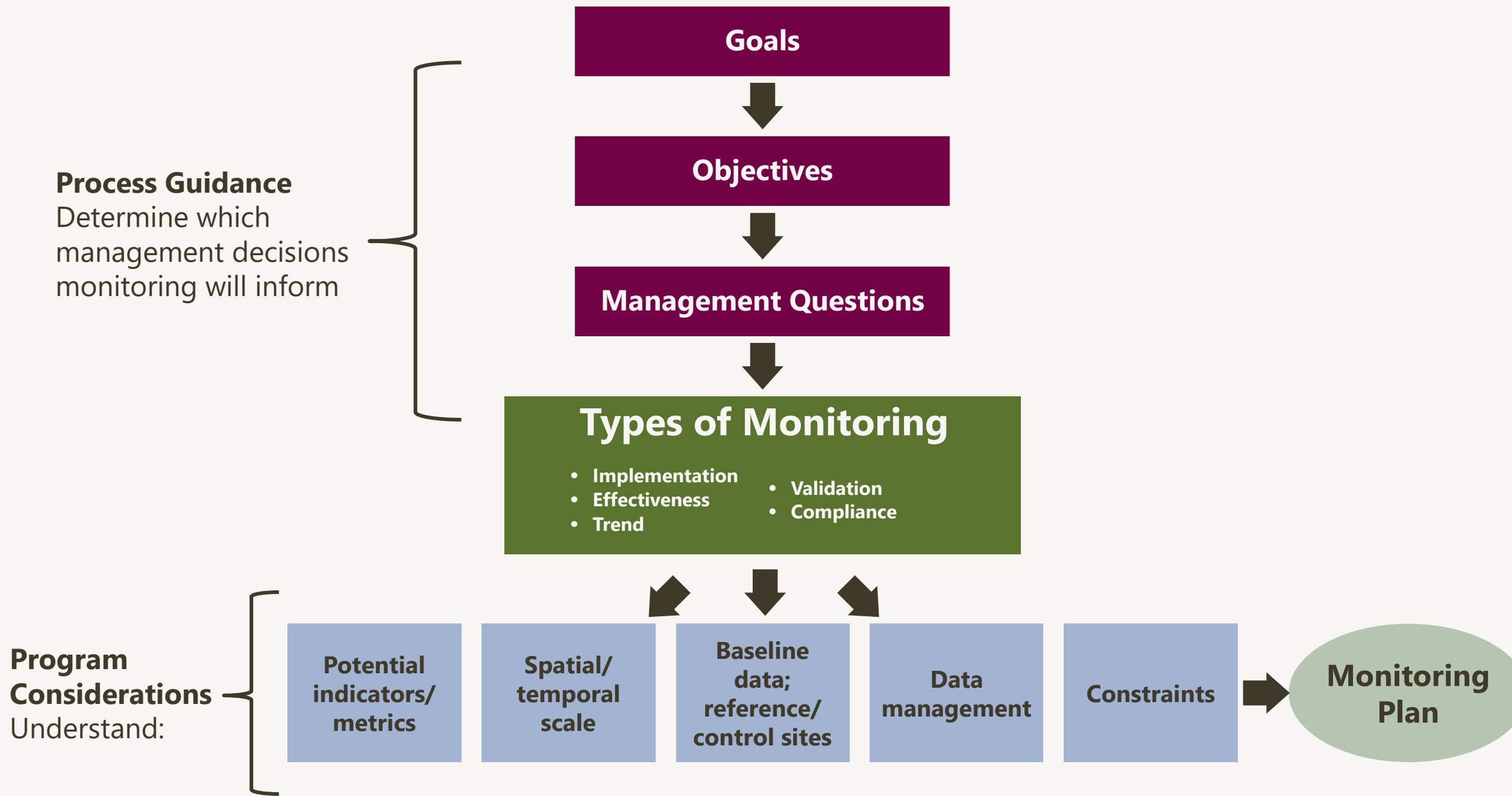
Data collection is standardized and temporally and spatially consistent

**Ecological Performance (Monitoring)**  
Indicator(s)  
↕  
Ecosystem Service(s)



**Management needs/questions**





# Proximate Next Steps

 <p><b>October 2018 – April 2019</b> Develop EPM Methods</p>	<p>White Paper review by WG and stakeholders (workshop). Assemble all input and finalize methodology for EPM development process.</p>
<p><b>April 2019 - July 2019</b> Working Group and Public Screening of EPMs</p>	<p>Commence EPM selection screening in consultation with EPM WG. Stakeholder workshop to solicit input on EPM screening results (candidate indicators). By July select final candidate EPMs for further analysis.</p>
<p><b>July – October 2019</b> EPM Data Availability Evaluation</p>	<p>Work through EPM data availability and technical challenges in consultation with WG. Develop recommended final eligible (feasible) EPMs for monitoring and assessment.</p>
<p><b>October 2019</b> Final EPM Selection</p>	<p>Present draft final EPMs to stakeholders (workshop)</p>
<p><b>November- December 2019</b> Next Steps of Data Gathering, Processing, etc.</p>	<p>Commence technical steps of accessing and processing data, etc. Begin to refine plan for Assessment stage of EPM program.</p>

# Summary of Suggested 7-step approach to Selecting Ecological Performance Measures

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1) Review existing forest management programs statewide/ develop management questions

2) Identify & refine preliminary indicator list

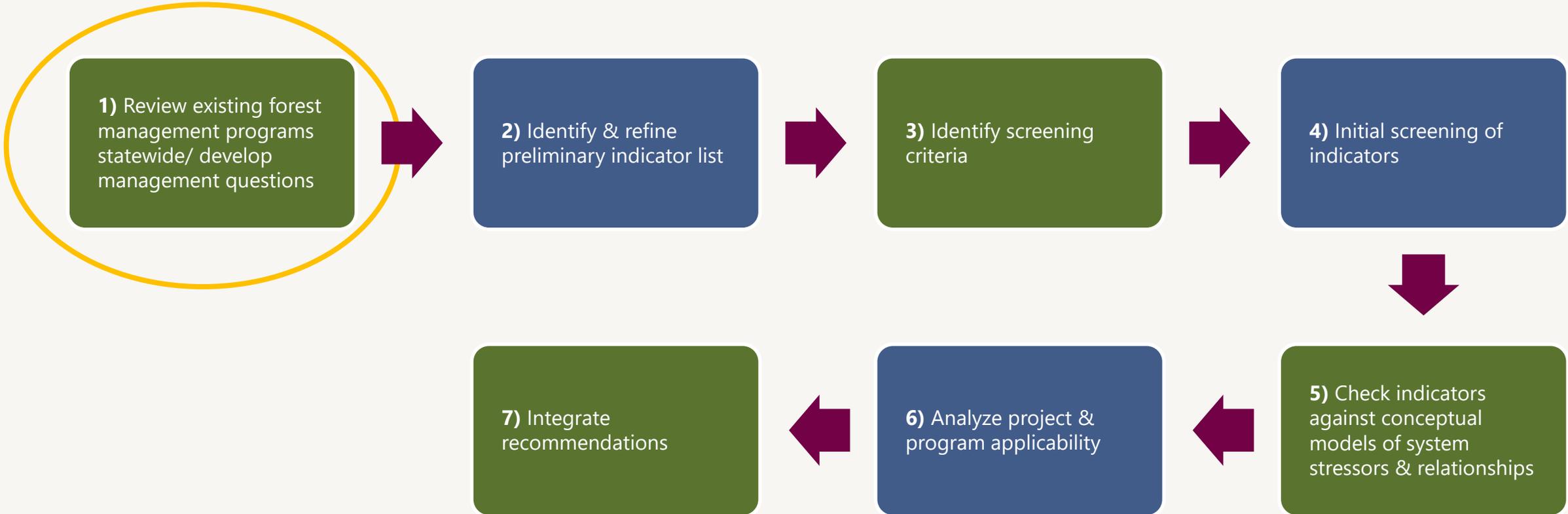
3) Identify screening criteria

4) Initial screening of indicators

5) Check indicators against conceptual models of system stressors & relationships

6) Analyze project & program applicability

7) Integrate recommendations



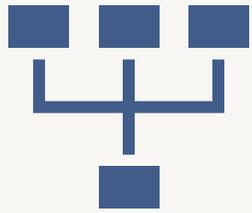
# Data

- Access existing datasets/leverage existing monitoring efforts
- While EPM program will use existing data/monitoring, program initiative may spawn expanded or new monitoring



# Products

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**Aggregate** ecological **data** to inform regulatory **program evaluation**



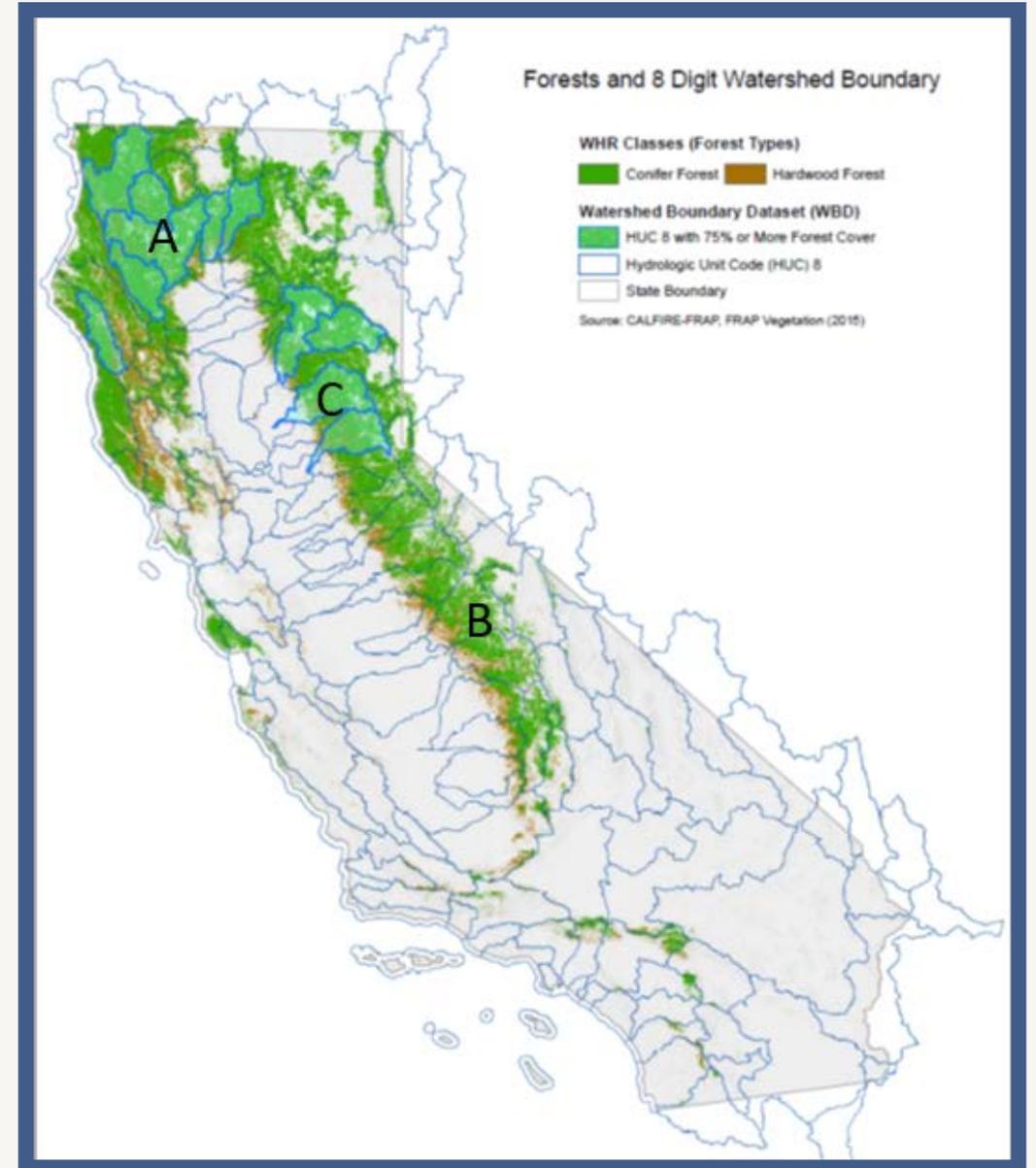
Produce interactive **dashboard/ data story** to display monitoring results, descriptions of indicators, geospatial maps, etc.



Assessment results inform **recommendations** to support **adaptive management**

# Potential Sample Product of EPM Program

EPM	Region A	Region B	Region C
i	50	89	X
ii	20	76	X
iii	90	56	X
iv	100	X	12
v	5	45	x



# Thank you!

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## Contact:

Loretta Moreno | [Loretta.Moreno@resources.ca.gov](mailto:Loretta.Moreno@resources.ca.gov)

<http://resources.ca.gov/forestry/epm/>