



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

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

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

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

Methods development

Data acquisition

Data processing

Assessment

Reporting

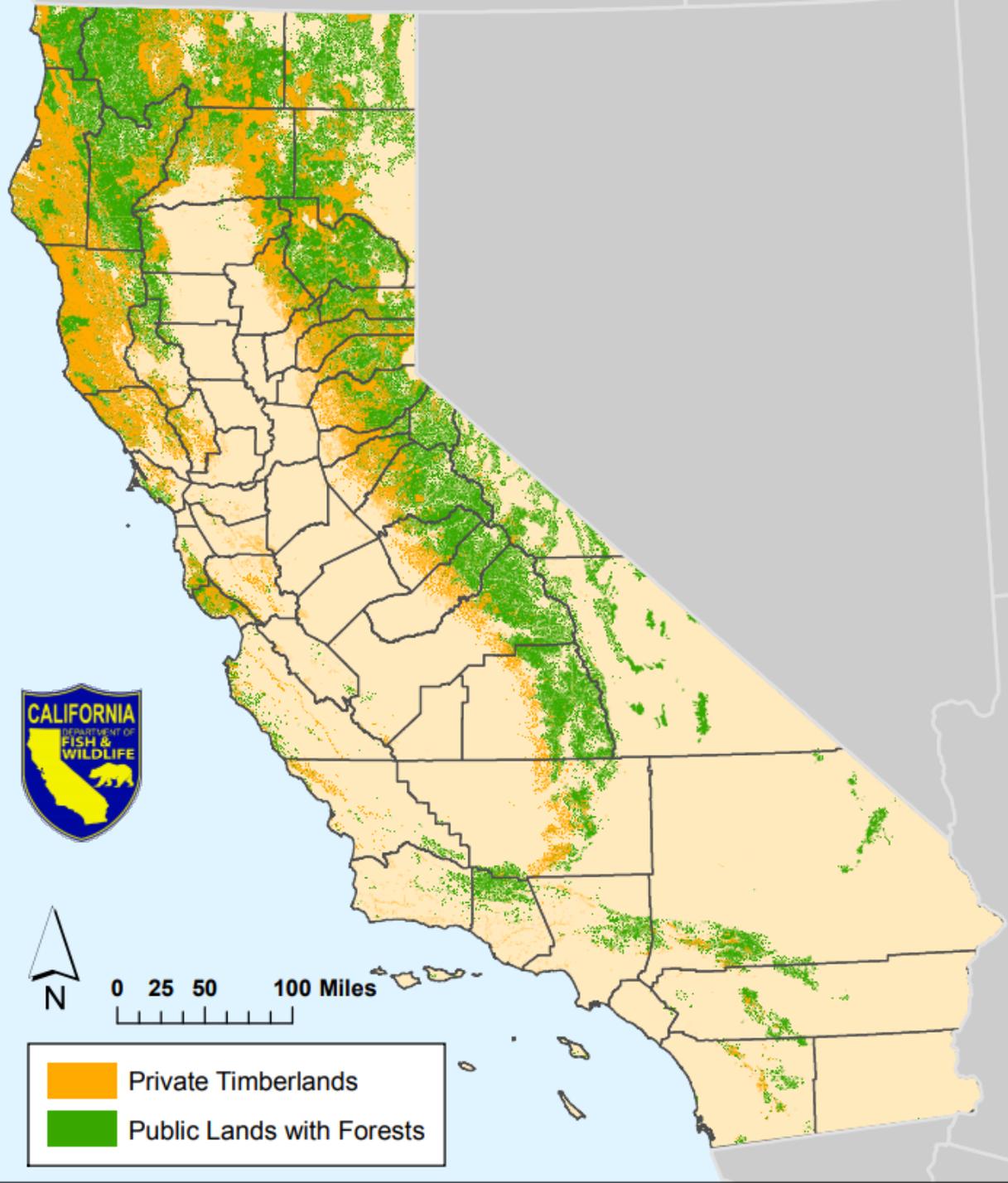
**Management
recommendations**

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

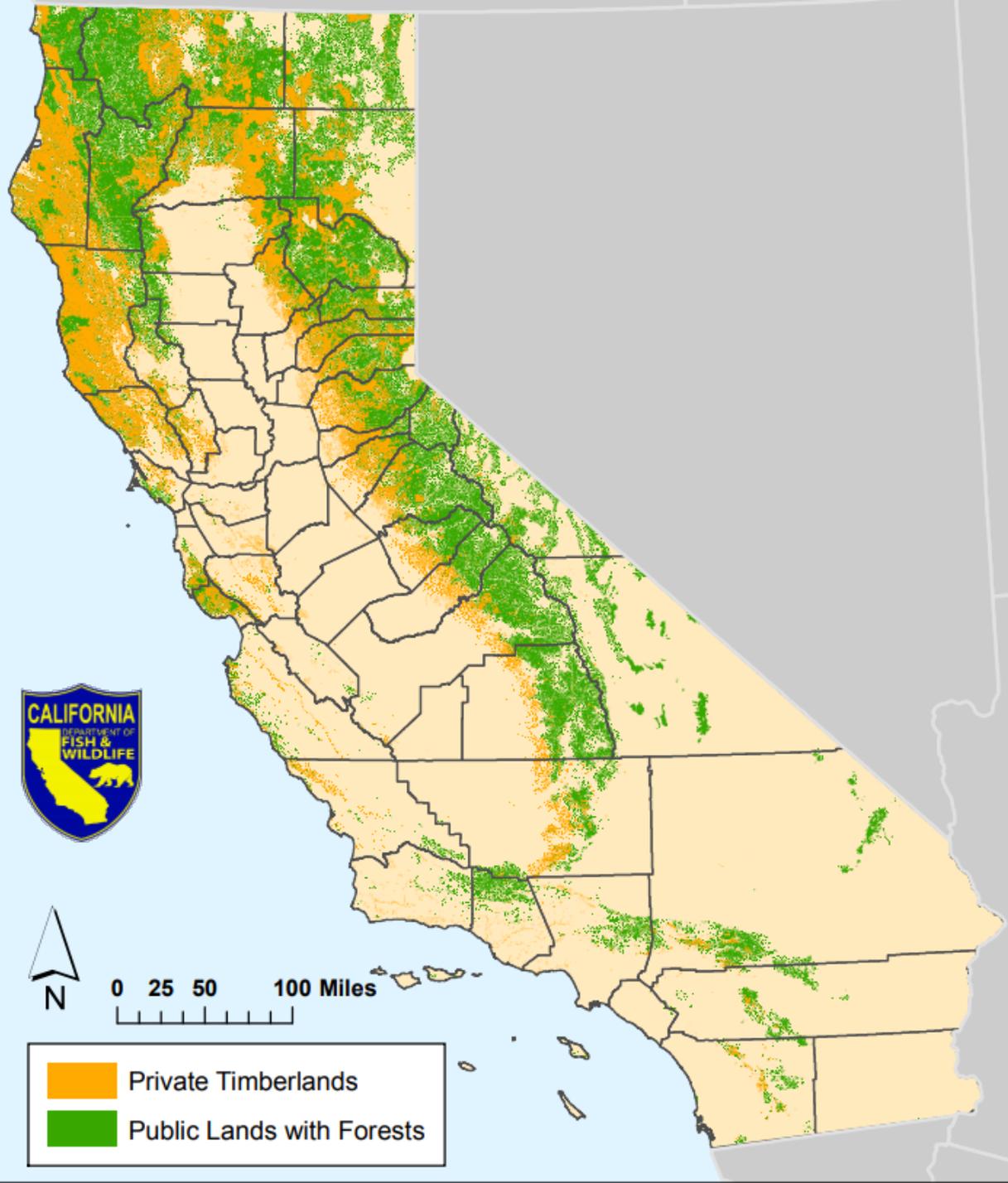
total **forest**
land in
California

17
million
acres

forest land
considered
timberlands

8
million
acres

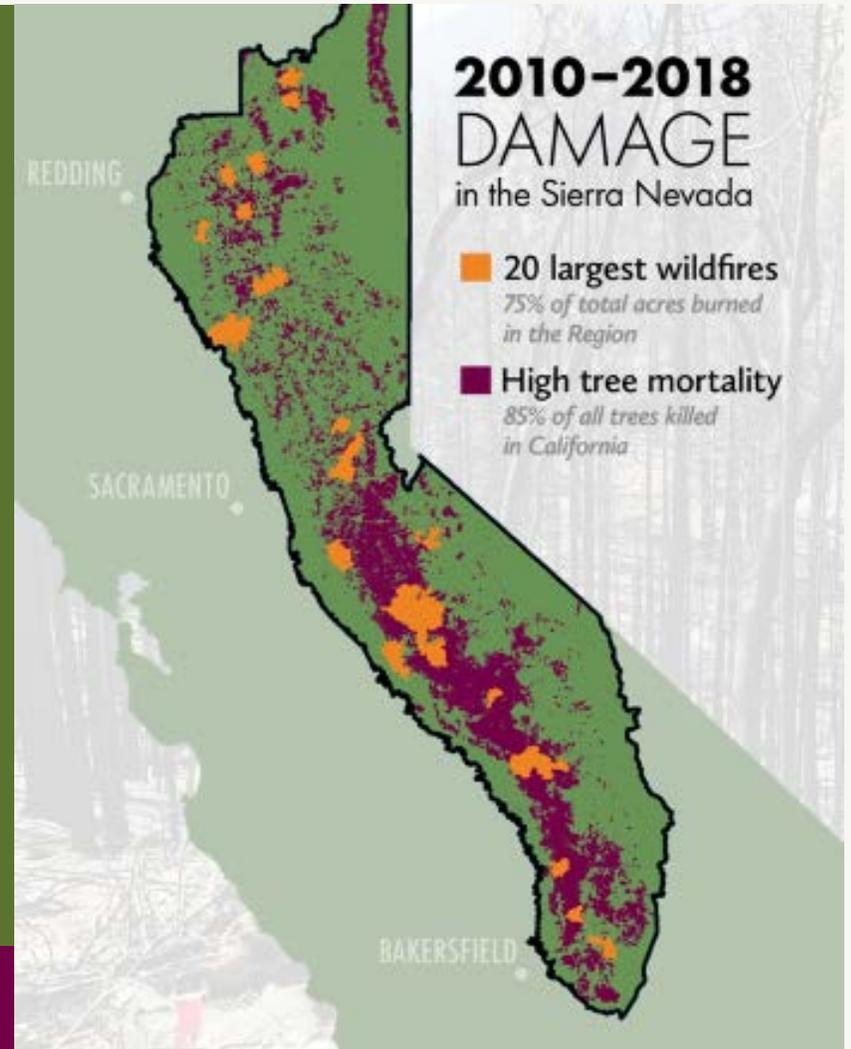
timberlands
under **non-**
federal
ownership



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

“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

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

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**.

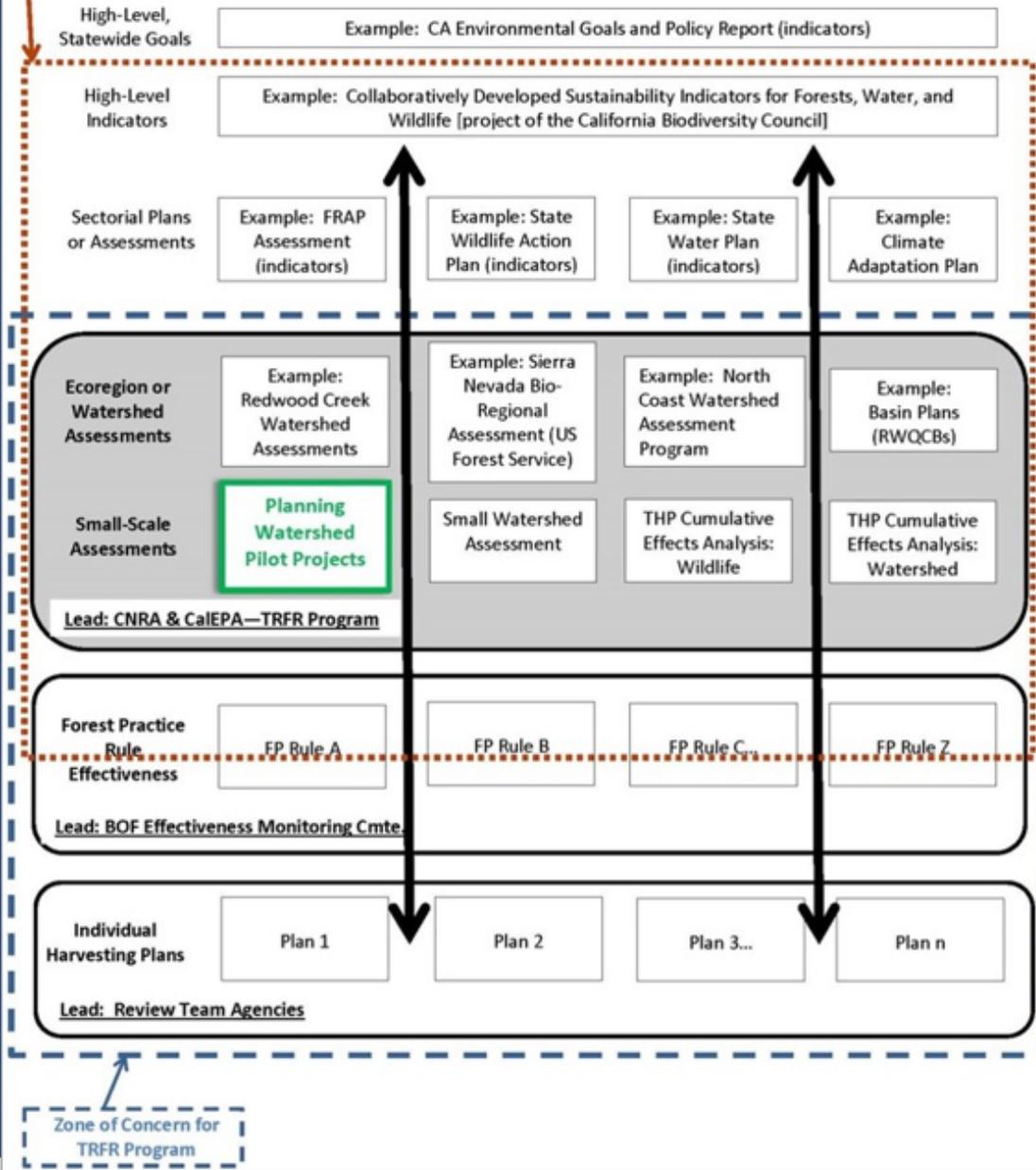
Timber Regulation & Forest Restoration Program

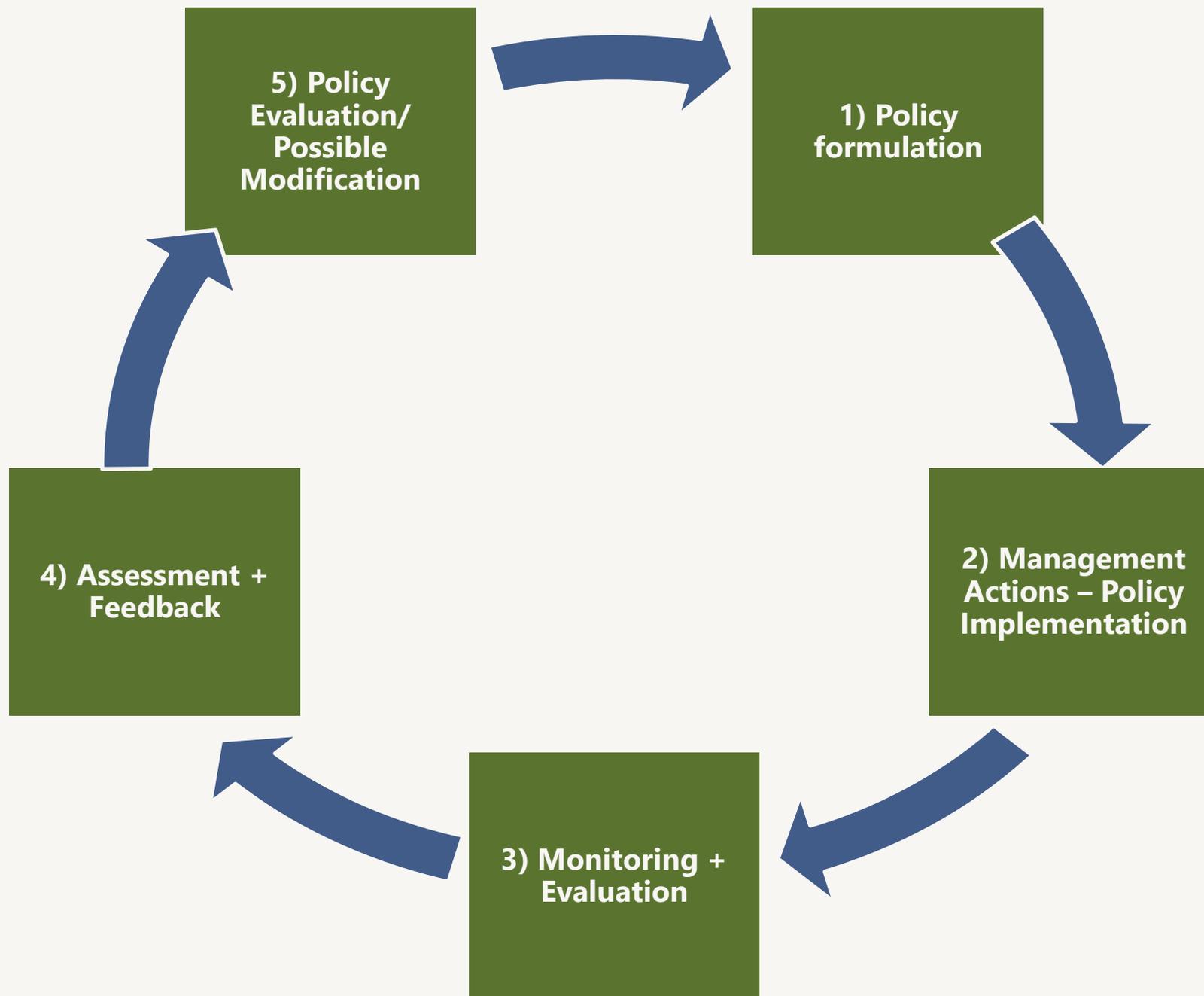
Linkages with other governmental planning or assessment activities:

- 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





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

Static Monitoring:

Data collection is standardized and temporally and spatially consistent

**Management/
Policy Response**

Assessment

Ecological Performance (Monitoring)

Indicator(s)

↕

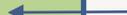
Ecosystem Service(s)

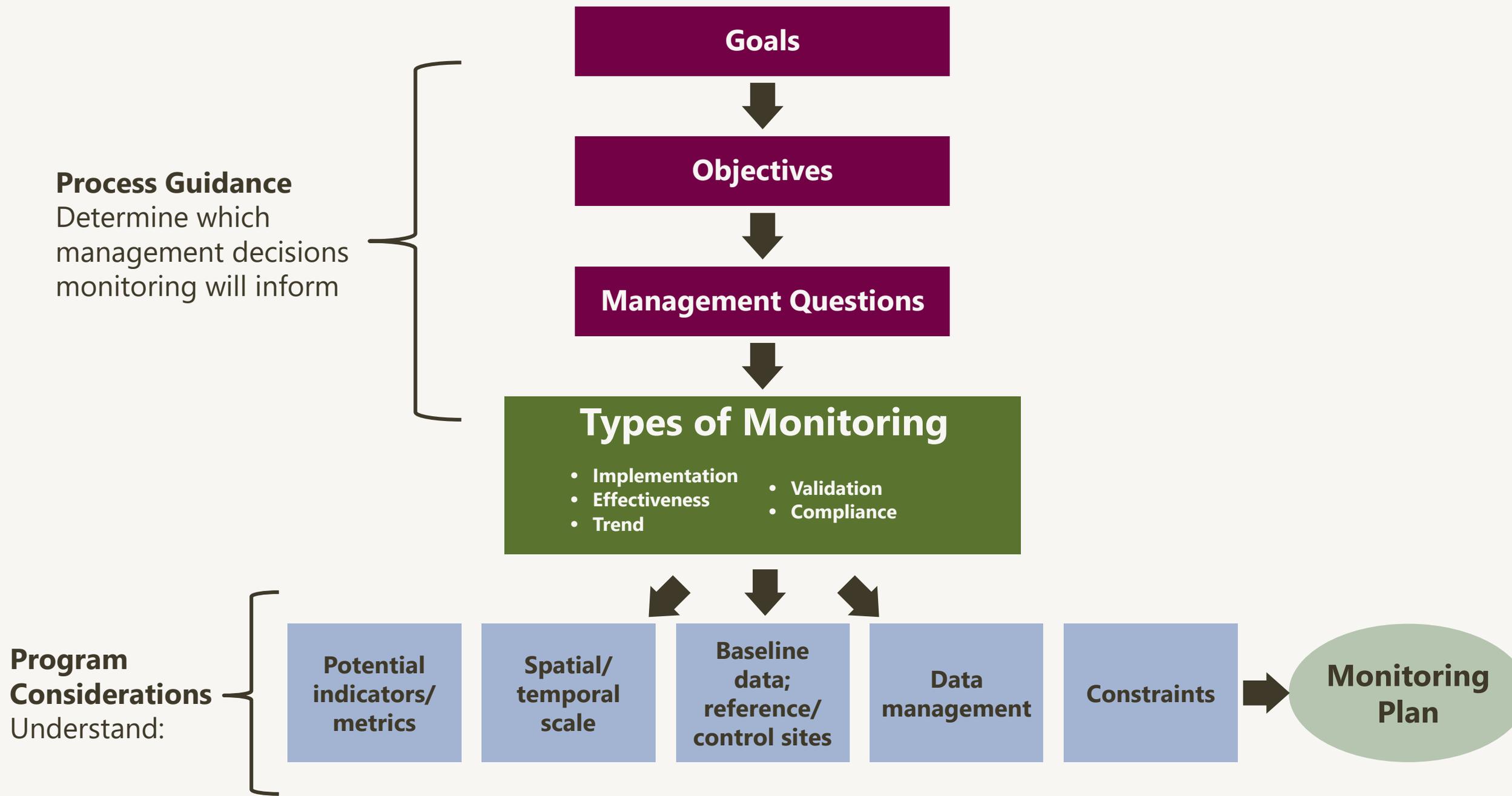


Ecoregion Maps

Modeling

Management needs/questions





Proximate Next Steps

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

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

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

2) Identify & refine preliminary indicator list

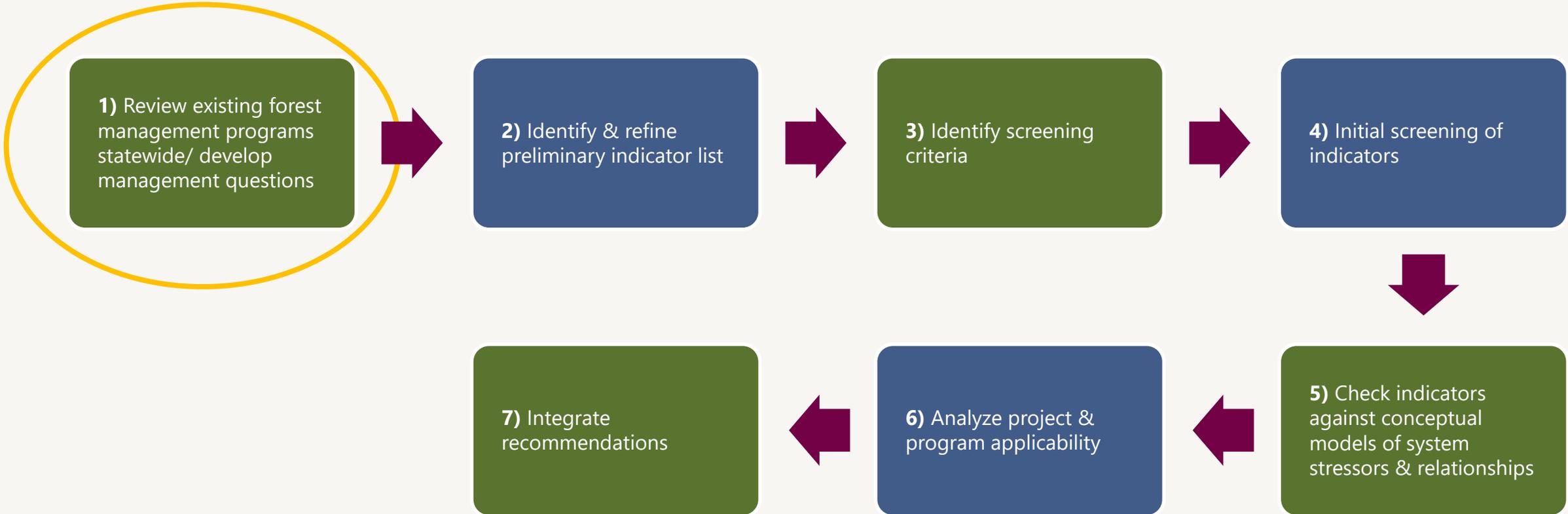
3) Identify screening criteria

4) Initial screening of indicators

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

6) Analyze project & program applicability

7) Integrate recommendations

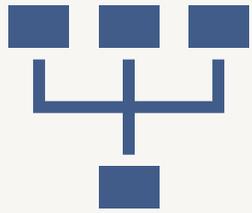


Data

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



Products



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



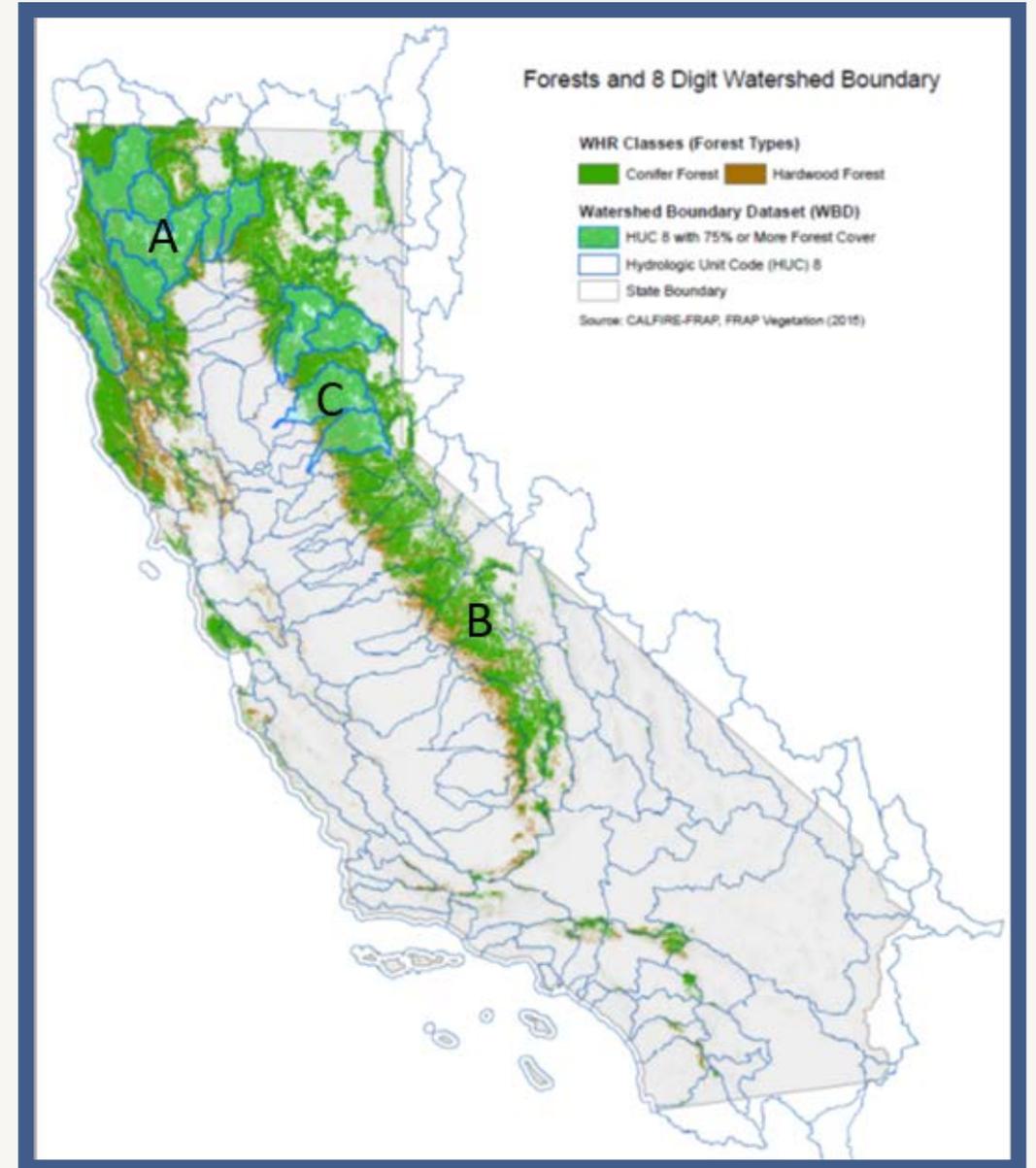
Produce interactive **dashboard/ data story** to display monitoring results, descriptions of indicators, geospatial maps, etc.



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!

Contact:

Loretta Moreno | Loretta.Moreno@resources.ca.gov

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