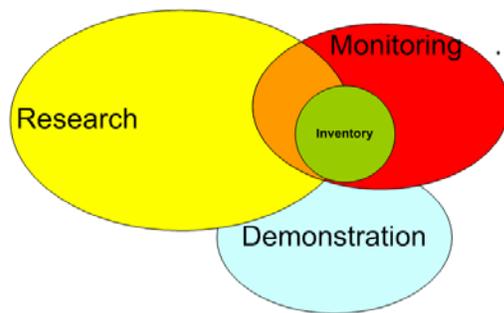


JAG RESEARCH, DEMONSTRATION & MONITORING FRAMEWORK**1. INTRODUCTION**

The purpose of this document is to:

- Describe an integrated monitoring, demonstration & research framework for use on JDSF
- Identify gaps in the existing scientific basis for management
- Outline integration between monitoring & research activities
- Distribution of forest structures needed over space and time to provide varied research opportunities?
- What are we doing now that we should continue/not continue?



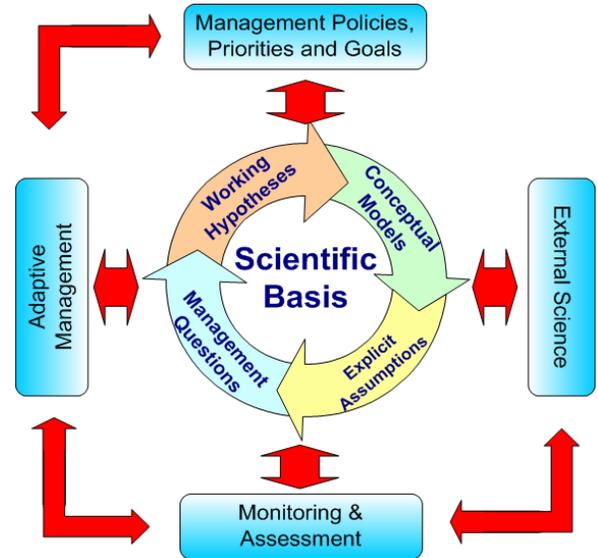
Our intention is to build off existing work by the Montreal Protocol and the Board of Forestry's 2008 Report on Forest Research, which identifies goals, objectives and potential research projects focused on the following areas:

1. Biological Diversity
2. Productive Capacity
3. Forest and Range Ecosystem Health
4. Soil Conservation and Water Quality
5. Forests & Climate
6. Socio-Economic Well-Being
7. Governance

2. FRAMEWORK

Scales of interest (regional/local, state, national, international)
 What are the existing data resources for the Forest?

- Identify key stakeholders and their research and demonstration needs
- Coordination/collaboration with other research forests
- Develop external research inputs
- Identify core external research associations



TASK: Review and establish buy-in to the following:

The long-term objective for research, demonstration and monitoring is to provide a transparent and objective analytic basis for forest management in California's redwood region. An analytic basis describes a rational system of technical information that informs policy and management, and collectively describes the sustainable economic, ecologic, and social stewardship of the forest.

Issues:

No hope of framing these issues in scientific terms. Should be couched in broader terms.
 Is 2nd sentence necessary? (some yes/some no) – does reflect Board's mission statement [does sustainability capture the issue]
 DP: something about enhancing general understanding of redwood forest [applied]
 LP: "helps inform"

Key Definitions

Research activities include rigorous scientific studies that are designed to test working hypotheses through experimentation, sampling, or other forms of analysis. Research types include:

- Mission-oriented research
- Issue-oriented research
- Ad-hoc research

Demonstration is described within this framework as those management treatments that provide examples for forestland owners, managers and the general public.

Monitoring activities will develop, compile and analyze data that supports the management systems that addresses management issues and questions. Monitoring activities work in combination with research and demonstration activities to provide comprehensive scientific information that supports a robust management system.

Adaptive Management is a dynamic management planning approach that recognizes that changes in management environment will occur during the life of a management plan, and that provides a system to assess the effects of change and to modify management activities in response. Adaptive management can be either informal (through feedback through casual monitoring) or formalized through a specific management system. Formal approaches typically include:

- Desired Future Conditions
- Resource Objectives
- Performance Measures
- Ecological and Management Indicators
- Analytical Strategies
- Feedback Mechanisms

3. PRINCIPLES

Task: to define principles, mission-oriented research priorities, and associated criteria, including:

- a) define the conditions/criteria for ad-hoc research, and
- b) define the mission themes

	1	2	3	4	5	6	7	8	9	10	
Management Focus											
Research Objectives											Volume Objectives
Restoration											Research
Recreation/Public Values											Research
Regional Knowledge Development											JDSF Focus
JDSF Mgmt Plan											Mendocino Working Group
Landscape Distribution											
Values-Based											Information-Based
OFSZ/Late-Seral											Research Objectives
Research Agenda											Value-based Allocations
Research Agenda											
Applied											Academic/Theoretical Research
Experimentation											Demonstration
Monitoring											Research
Mission-Oriented											Ad-Hoc
Mission-Oriented											Policy/Issue Oriented
Ad-Hoc											Policy/Issue Oriented
State-Wide Scale											Redwood Region
Redwood Region											PNW Region
Monitor Every Harvest Unit											Monitor Experimental Units

Clusters 
 Outliers 

Principles for Research, Demonstration & Monitoring

- All forestry activities will be demonstrations
 - Brief summary reports for each activity should be developed that document essential information
 - Pre-treatment conditions
 - Treatment goals
 - Treatment justifications
 - Methods
 - Results
 - Relevant economic data (costs, revenues, etc)
- All research is welcome on the forest and will be considered as resources are available
- Mission-oriented priorities should be focused on specific objectives
 - JDSF will actively promote a program directed toward mission-oriented priorities
- Ad-hoc science priorities will be categorized by topic
- Priorities will be influenced by the needs of policy, science and stakeholder issues

ADDITIONAL DRAFT PRINCIPLES FOR DISCUSSION AND CONSIDERATION

- Operational and/or Science constraints
 - Research, demonstration and monitoring shall be conducted within the constraints of the management plan OR
 - The management plan will be modified in response to research OR

- Modification of forest operations will be considered on a case-by-case basis by JAG and/or JDSF Management Staff
- Allocation to Research
 - All areas available to research OR
 - Only XXX areas allocated to research activities, OR

4. SCIENTIFIC OUTREACH

Objectives

The objective of scientific outreach is to...

Criteria for Outreach Priorities

What do we want to learn from stakeholders that will influence our decisions regarding research, demonstration and monitoring?

- What are the areas of focus.
- How do they allocate lands to support research
- How do they administer research programs
- what are their priorities
- Funding joint ventures opportunities
- Synergies/Collaboration opportunities
- Landscape/ecosystem-level research. Spatial/temporal scale issues. Do we want to focus on long-term landscape levels or not? Inherent in selection of issues?
- How are other forests addressing this structure
- How do others fund their mgmt/research/staffing, etc
- What are their functional capacities relative to our potential functional capacities (functional areas of excellence)
- How do they handle inventory/monitoring
- How do others optimize funding between various priorities
- Information needs for NIPF

Other Notes & Comments:

- VT: seek external peer review *after* we have a draft document (DP: validation, alignment, upgrades)
-
- MJ: think of it like a transaction: we need to facilitate between consumers and researchers/managers.

- KB:
- Local/State/National/International scaling
- VT: recognize the long-term scale
- Consider the timeline of acquiring the knowledge (e.g. sediment studies v. Late-Seral studies)
- VT: Advantage to cross-sectional research (e.g. external to JDSF) too.
- MJ: ergodic principle
- JH: re: landscape level (elaboration) – our 50K acres make us particularly unique. What should we be focusing on that leverages this unique opportunity
- JH: Which is the ecosystem closest to redwood ecosystem.
- ML: which are most relevant from mgmt structure
- role for fundamental information on the forest too. Can't anticipate all the needs in the future.

Non-Industrial Private Landowners
Policy Interests & Decision-Makers
JDSF Management Staff
Academia
Research Cooperatives
Conservation Groups
General Public
Private Industry
Regulators
Federal Researchers
Operators & Contractors
State & County Lands
Federal Managers

Outreach Plan

Short-Term Information Resources

1. Casper Ck
2. Blodget (Rob York)
3. NIPF
 - a. Forest (either directly or as resource)
 - b. Linwood
4. Large Landowner
 - a. Dave Bishell - CFA (or staff)
5. Regulatory
 - a. Russ (

Move Conservation Groups up to first tier??

Provide context to invitees that they need to come prepared to provide a list of priority issues that we could help inform.

3 sessions:

Casper/Cafferata
Blodget
NIPF/Industry

Get focused on key questions

Information Dissemination Plan

Stakeholder Input List (Preliminary)

Research Forest Managers

- **Managers of other research forests**
 - Western Research Forester Managers (Pacforest, Carnation Ck, Olympic Experimental Forest, others)
 - Where are there other State Forests in the US that share our mission?
 - Others (outside west)
 - NCASI
- **Blodget**
 - Focus here given their
- Swanton Pacific
- Blue River Framework

Key Researchers

- **Tom Lisle (Caper Creek Team Leader)**
 - Are there other issues beyond CC associated with PSW
 - Focus on Redwood Sciences Lab
- **Pete Cafferatta**
- John Munn??
- PSW Research Station
- UCB
- Cal Poly
- Humboldt State

- CLAMS Group (Oregon State)
- List of active research project (see if NSF can support us here with lists)

Consumers

- Policy
 - Gary Nakamura (Board Liason?)
 - California Forestry Association
- General Public
- Landowners
 - Campbell/Hawthorn
 - MRC
 - Non-Profit Landowners
- Technical Experts
 - Extension Foresters
 - Conservation Groups (NGOs)
 - Resource Conservation Districts
 - Forest Landowners of California (NIPFs)
 - **Forest Tilly**
 - **Don Williams? (President)**
- Agencies
 - NOAA
 - Cal Fish & Game
 - CALFIRE
 - Others
- **Greg Guisti (to represent Cooperative Extension folks)**
- **Bill Stewart?**
- K-12 Educators
- Environmental NGOs

Existing Research Cooperatives

- CMUG – Cooperative Mensuration Users Group
- Sierra Intensive Mgmt Coop
- CA Growth & Yield Coop
- Stand Management Cooperative
- Rural Technology Initiative (WA State)

5. JDSF SCIENCE PRIORITIES

Mission-Oriented Priorities

Objective

Identify a select number of Mission-Oriented research theme areas to focus research, demonstration and monitoring. Mission-Oriented themes are intended to focus efforts and resources in a concentrated area of key policy and management importance

Criteria for Mission-Oriented Priorities

Priority Selection for Areas of Focus:

- Focused on solving applied forest management issues and problems
- Potential for leading to cutting-edge innovations
- Politically and/or socially important and of interest
 - From local to international levels
 - Recognizing values-based controversies v. knowledge-based uncertainties
 - Preference toward those that are knowledge-based constraints
- Relevance to:
 - Relevant to forestry regulations and/or policy
 - Stakeholders (from Nov-08 list)
 - Redwood Region Forest and Conservation Issues
- Represents a significant research area that offers continuity and long-term research opportunities (e.g. research results should be relevant for several decades)
- Considers the capacities available from the research **(and consulting?)** community

{pass thru UC Berkeley sociologist for comment}

Mission-Oriented Research Themes

[These are a work in progress. Put a sharper focus here. What are the forward thinking concepts that need to be prioritized]

TASKS:

describe each draft priority in terms of forward-looking objectives, opportunities, constraints from the perspective of scientific issues, key management and policy issues, and stakeholder issues

Then pursue multi-voting process. Objective is to identify ~ 3 Mission Themes

Strongest consensus items become mission-Oriented
Others shift to “ad-hoc” priorities

1. Sustainable Production Forestry

Relevant BOF Policy Programs:

#2 – Productive Capacity

#6 – Socio-Economic Well-Being

- a. Developing tools for predicting forest response to management activities
 - i. Growth & Mortality
 - ii. Plant community dynamics
- b. Comparison of alternative silvicultural systems (various forms of uneven-aged, even-aged, variable retention, and other innovative systems)
 - i. Incorporating various quantitative biological, economic, and social aspects (see monitoring study section)

2. Watershed Science, Restoration & Aquatic Habitat Recovery

Relevant BOF Policy Programs:

#1 – Biological Diversity

#4 – Soil Conservation and Water Quality

#7 – Governance

- a. Erosion & sedimentation models
- b. Wood recruitment modeling
- c. Riparian restoration strategies
- d. Salmon Population Dynamics

3. Forestry Influences on Carbon Sequestration & Climate Change

Relevant BOF Policy Programs:

#5 – Forests & Climate

#6 – Socio-Economic Well-Being

- a. Adaptation & Mitigation Strategies for Climate Change
 - i. Resilience & resistance to climate change
 - ii. What can/should management do in response?
- b. Carbon pools, wood products & life-cycle analyses
 - i. Commonly accepted 6 (or 7) pools (including below ground) [LIST]
- c. Carbon Markets & Forest Offsets

4. The Social Aspects of Forestry

Relevant BOF Policy Programs:

#6 – Socio-Economic Well-Being

- a. Recreation & Aesthetics
- b. Decision-making in the context of community forestry
- c. the influence of social values in preferences for forest structures

5. Late-Seral Restoration & Management

Relevant BOF Policy Programs:

#1 – Biological Diversity

#2 – Productive Capacity

#3 – Forest and Range Ecosystem Health

#6 – Socio-Economic Well-Being

- a. Identify structural elements and their rate of development as they relate to objectives for managing toward late-seral conditions
- b. Relationship between the late-seral structure and late-seral community (i.e. if we build it, will they come?)

6. Landscape Ecology & Dynamics and/or

7. Species-level response studies

Add cross-walk to JDSF Mgmt Goals & Objectives

Within each of these areas, what are some of the key issues & questions that should direct research?

Ad-Hoc Priorities

[insert statement about how Mgmt Plan priorities will be addressed within the Research, Demonstration & Monitoring agenda – consider classifying by topic (e.g. watersheds, late-seral, etc) and method (e.g. research or monitoring)]

[use categories from BOF report/Montreal for consistency]

Priorities from the Management Plan (page 139-140):

Existing Resource Monitoring Priorities

- 9 Forest Resources
- 3 Sediment Sources
- 4 Instream Conditions & Fisheries
- 6 Wildlife Resources
- 1 Plants Resources
- 1 Recreation Resources
- 1 Minor Forest Products
- 1 Heritage Resources

Watershed Research

- Fisheries studies that include channel habitat, population dynamics, and off site conditions.

- Watershed management that includes sediment yield, stream discharge, sediment sources, road abandonment, watershed rehabilitation, and harvest reentry studies.

Wildlife Research

- Quantitative assessment of the effectiveness of the delineated upland and riparian corridors in providing habitat and expanding the forest occupancy for identified species of concern.
- Riparian zone wildlife habitat relationship studies that include topics such as stream buffer enhancement and maintenance, and relationships between forest cover and wildlife.
- Upland zone wildlife habitat relationships including modeling, forest fragmentation, edge effects, connectivity, forest corridors and population trends.
- Role of basal hollows in improving habitat including methods to create these structures without fire.

Social Research

- Research on the short-term and long-term costs and effectiveness of various forest resource protection measures.
- Social science research on the structures, functions, processes, success, and failures of advisory entities associated with the management of JDSF.
- Public education on forest resources, technologies and issues.

Ecology

- Research on forest ecology, forest biological processes, and measurement of ecological health.
- Investigation of optimal element and spatial configurations of structural elements retained during timber harvesting activities.
- Vegetation management that includes control of invasive weed species, competition in plantations, and prescribed fire.
- Examinations of a range of plant habitat and community interactions.

Silviculture Studies

- Young stand management that includes stocking level and precommercial thinning studies.
- Approaches to accelerate or enhance development of older forest or late seral forest characteristics in second-growth stands.
- Silvicultural systems that include even and uneven-aged management systems.
- Forest growth model development that includes gathering data for and improving existing models (e.g., CRYPTOS).

Carbon Sequestration & Climate Change

- Carbon sequestration as a management option, including the economic and social benefits in mitigating the greenhouse effects.

Others

- Develop partnerships and fund research giving priority to information gaps such as below-ground carbon cycles, fog drip utilization by tree and understory plants, methods to hasten development of older forest structure, and climatic tolerances of species.
- Forest data systems development for creating, improving and maintaining a data bank on existing and new data that includes both database and GIS data layers.

Existing Studies

[copied from JDSF Management Plan. See pages 140-142 for brief project descriptions.]

Watershed Studies

- Caspar Creek Watershed Project
- Parlin Fork LWD Study
- Hare Creek/Caspar Creek LWD Study
- Road Surface Erosion Study

Silviculture Studies

- Caspar Creek Cutting Trials (Control Area)
- Caspar Creek Precommercial Thinning Study
- Middle Fork Caspar Creek Advanced Regeneration Study
- Whiskey Springs Commercial Thinning Study
- Hare Creek Sprout Stocking Study
- Railroad Gulch Selection Silviculture Study
- Asymmetrical Coast Redwood Growth Model Study
- A Long Term Precommercial Thinning Study in Coast Redwood

6. IMPLEMENTATION

Research

KEY CONSIDERATION: who determines the research, demonstration & monitoring agenda?

JAG?

Stakeholders?

Research Community?

JDSF Management?

Others?

Think of it like a business plan

Roles & Responsibilities

JAG

JDSF Management Staff

Other Committees

Data Management

Outreach

Funding

Administration

Committee structures

Demonstration

Demonstration is described within this framework as those management treatments that provide examples for forestland owners, managers and the general public. Demonstration information shall typically include:

- pre-treatment and post-treatment data
- economic costs & value data
- operational consideration information
- effectiveness evaluations
- etc.

Information will be compiled and reported for **every significant management** action on the forest. Such information will be developed into a series of brief reports (Forestry Notes and Forestry Reports) that will be available to the public via a website or other available communication media. The reports will be compiled for the following activities (including but not limited to):

- Harvest Treatments
- Reforestation and Restocking
- Road Construction, Maintenance and Abandonment
- Burns (both Prescribed and Wildfires)
- Restoration and Enhancement Treatments
- Invasive Weed Control

Each report will summarize relevant information, including (but not limited to):

- location maps
- a discussion of the treatment design
- a description of the justification for selected management treatment
- relevant treatment quantities (e.g. volumes, areas, lengths, etc)
- planned costs and actual treatment costs
- revenues generated
- a list of monitoring and/or research activities associated with the treatment
- availability of more detailed data and resources

Consider subsets of Demonstration for which JDSF staff will develop more detailed information and educational resources.

Roles & Responsibilities

JAG

JDSF Management Staff

Data Availability

Outreach

Funding

Monitoring & Assessment

Monitoring activities will develop, compile and analyze data that supports the management systems that addresses management issues and questions. Monitoring activities work in combination with research and demonstration activities to provide comprehensive scientific information that supports a robust management system. Monitoring activities are generally follow 4 primary types, and the information needs and monitoring approach varies according to each type. These include:

- Compliance
- Effectiveness
- Validation
- Status & Trend

A forest inventory is a subset of monitoring that focuses on data that is directly related to the stand characteristics (e.g. tree characteristics, structures, etc) within the forest.

Driven by Scientific Basis

Leverages resources

Working Hypotheses

Study design

Key Questions

Clear scientific basis

Supported by analysis & synthesis strategies

Improve consistency between goals, parameters, etc

Clarify monitoring modes

Compliance

Effectiveness

Status & Trends

Validation

Clarify links to Research Agenda

Clarify study design factors

Roles & Responsibilities

JAG

JDSF Management Staff

Data Availability

Outreach

Funding

**Compliance Monitoring
Protocols**

Rapid verification that actions comply with intended designs and standards

**Effectiveness Monitoring
Protocols**

Systematic and statistically detailed sampling protocols designed to evaluate the overall effectiveness of a suite of actions that have been implemented to specific design specifications

**Validation Monitoring
Protocols**

Statistical sampling strategies that are designed to test working hypotheses or assumptions (e.g. validate conceptual models)

Status & Trends Monitoring Protocols

Statistical sampling strategies that are designed to track existing status and long-term trends associated with a given species or ecological function

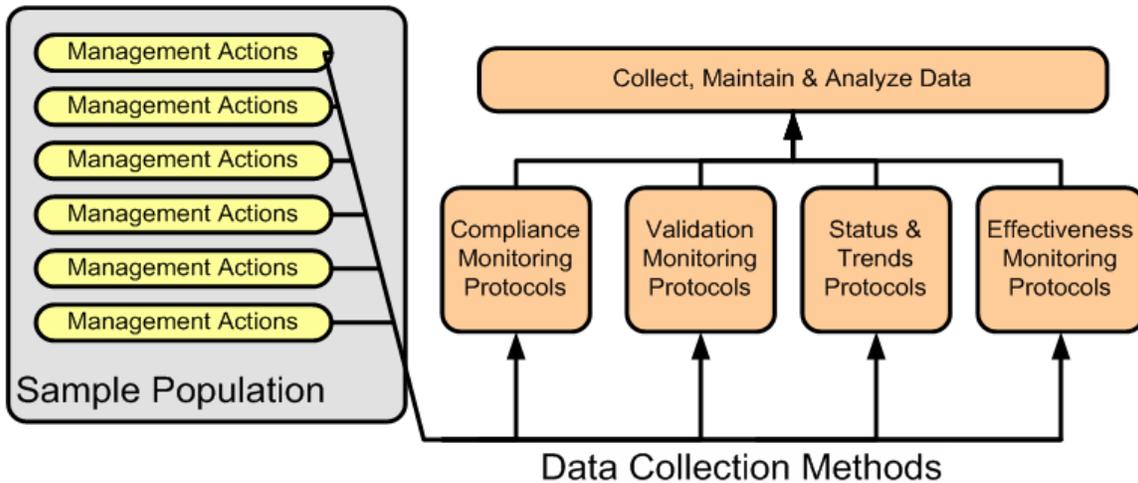
Monitoring Administration

Staff Roles & Responsibilities

Data Availability

Outreach

Funding



7. TIMELINE

8. MISC.

9.

JM: Need discussion of funding in #6

JH: # 6 needs facilities & staffing

Mechanism for communication outreach of r/d/m

Tech transfer & researcher attraction

VT: mgmt structure (who are decision makers, how is contracting administered, operational mgmt, etc)

LP: dialog for outreach (two way, not just input)

RH: MOUs with CalPoly/UCB/RSL

VT: Priorities up front

3) Implementation Considerations

Specific data needs (monitoring and inventory)

Administration of research and demonstration

Role of timber harvest & other management activities

core information for research or demonstration

What's missing in the Plan related to these framework items

Resources (internal & external)

staff

facilities

Funding

Approach

Develop background information & context

Coordinate with stakeholders

Systematic

Workshop/Symposium???

Refine organizational structure for scientific basis

Building on the existing Mgmt Report

Establish framework

Identify Key Science Issues & Questions

JDSF-Oriented Management

Broader Forest Management Issues

Set Priorities

Today's Tasks

Level of Buy-in on Framework Concept (10 min)

Check-in on Scales of Interest (10 min)

Discuss Draft Definitions (30 min)

Stakeholder Group Process (20 min)

Immediate Information Needs (10 min)

Preliminary List of Research Monitoring & Demonstration

Stakeholders

Clarifications

Focus: Research & Monitoring & Demo

Are the priorities different for each?

Do we target one or more focus areas, or distribute objectives across many areas?

JDSF "Modes" for Research & Monitoring

Operational Forestry Focus?

Industrial and/or NIPF areas of interest

Issues/Policy Focus?

Implementation Focus?

Contractors and operators

General Research Focus?
Academia, research cooperatives, etc