

Research Committee

DRAFT Report v5.1

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PREFACE

This document presents another DRAFT Research Committee Report that reflects the cumulative results of nearly 2 years of work within the Research Committee. The DRAFT document integrates and summarizes the core recommendations and supporting elements. The Core Recommendations are intended to be concise – additional detail and discussion is provided in the Appendices (which will be provided to JAG in a future meeting).

All of the concepts reflected by the colored text have been discussed and are consistent with prior approved documents and/or JAG discussions. The vast majority of the content in this document should be familiar as it has been seen before. The language used in this document was compiled by several sources of previously reviewed, edited, and (where noted) approved documents, including:

- *The nearly approved May 24th Draft Research Recommendations Document (v. 3.1)*
- *The JAG Approved October 2009 Research Document*
- *The JAG Approved February 2009 Mission-Oriented Priorities Documents*
- *The Science Workshop Notes (as vetted by invited participants) – text here is often paraphrased, but consistent with the concepts*
- *Notes from the June 2010 JAG meeting – to incorporate appropriate changes (again, text is usually paraphrased and wordsmithed)*
- *The Extended Draft Research Recommendations Document (v 1.1) from the integration effort - this working Research Committee document was not previously reviewed by JAG as a whole, but represents nearly 4 days of effort compiling elements from over 40 meeting notes & other associated documents, much of which has been informally presented to JAG for discussion. It represents a more complete discussion of core elements and includes important detail that will be essential toward implementation. The Executive Summary from this document was extracted by the Integration Team, and has been used as the basis for a consensus document.*
- **Black Text** *reflects entirely new language, most of which is consistent with discussions within JAG and/or necessary transition text.*

Modest word-smithing has maintained the substantive content. In places, the text is slightly changed, mostly to provide effective narrative transitions, clarify intent, or to address verb tense, grammar, etc. Such minor changes are not distinguished so as to keep the document as clean as possible. The recommendations in yellow boxes have been revised to reflect changes to the underlying document structure.

Happy Reading, Mike

CORE RECOMMENDATIONS

We propose that a **World-Class Research Forest** is fostered by its integrated research program and is realized by the ability of that program to drive forest management activities in a manner that is broadly recognized as a source of quality, rigorously tested, scientific knowledge. A World-Class Forest is one where:

- The management plan and its landscape allocation create the opportunities for testing important hypotheses related to forest science, policy and management.
- Research efforts extend beyond the forest to integrate studies and lessons from, and inform management decisions on, other relevant forestlands.
- The forest uses opportunities, both on the forest and regionally, to seek answers that are relevant to a broad cross-section of stakeholders and other landowners.
- Research results are published and cited widely, in a breadth of professional and scientific journals, especially those highly regarded within and among disciplines.
- Techniques are actively developed that support sustainable forest management practices and knowledge-based policies, both of which are transportable to other landscapes and inform key issues.
- Data, maps, and history are well-tracked and well-maintained.

Together, these qualities will create a compelling set of conditions that will attract cooperative funding opportunities and diverse researchers investigating a broad array of subjects.

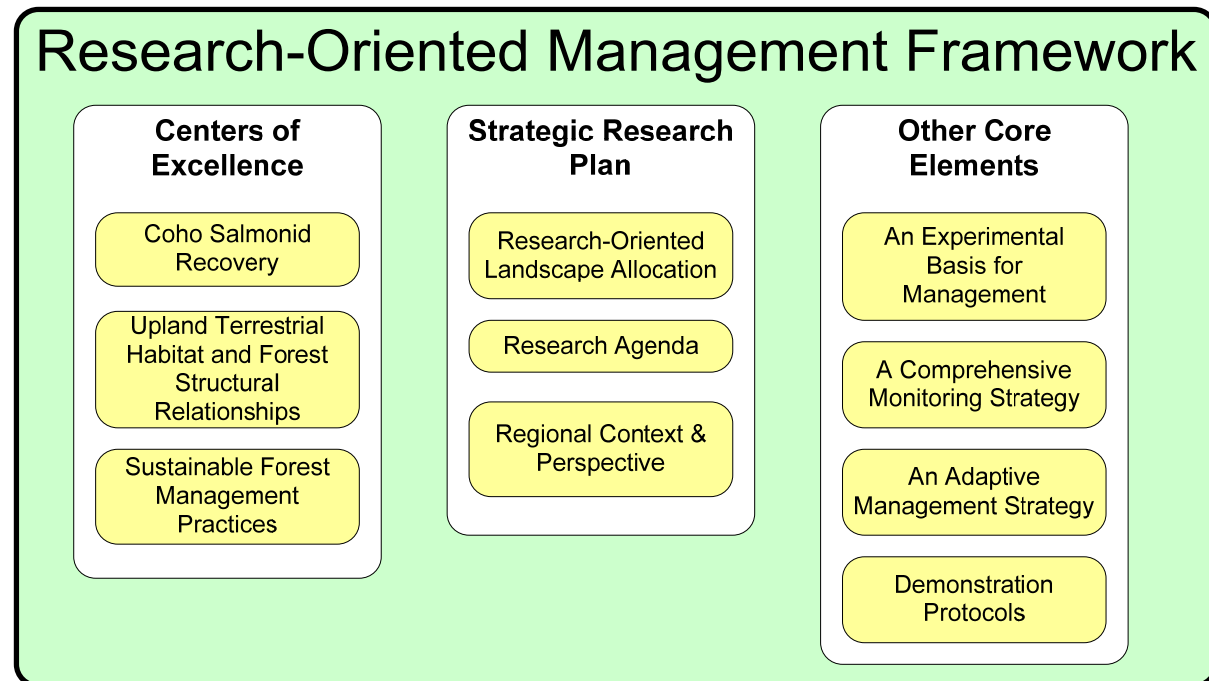
The following JAG proposal represents our best effort to develop a management framework that would fit within the existing Management Plan framework and the other JAG recommendations.

A Research-Oriented Management Framework

Recommendation #1: A Research-Oriented Management Framework should be developed that leads to JDSF being regarded as a World-Class research and demonstration forest.

To put JDSF on a path toward World-Class status, we recommend that the Board adopt and implement a **Research-Oriented Management Framework**, as described in this document.

The long-term objective for a Research-Oriented Management Framework on JDSF is to provide a transparent and objective scientific basis for forest management in California's redwood region. A scientific basis describes a rational system of technical information, models and other tools that inform policy and management, and collectively describes the methods for achieving sustainable economic, ecologic, and social stewardship of the forest.



The proposed Framework would integrate several key concepts (each described below) that together provide an organizational structure for testing and improving forest policies and practices both within JDSF and throughout the Redwood region (and perhaps beyond). This Framework should be organized around **Centers of Excellence** that describe the state-of-the-art science using models that range from simple conceptual models to more detailed empirical and/or quantitative models. Such models would provide organizational rigor that could provide a structure for scientists and would over time, improve the ability to predict impacts associated with management practices and enable management to achieve ecological goals.

The framework should also consider a **Strategic Research Plan** that leverages the forest's resources to the benefit of core management issues. Such a Strategic Research Plan would integrate the efforts related to Centers of Excellence with the operational management of the forest. It would identify and implement a landscape allocation that better supports research activities, and would provide a structure for organizing relevant research at a regional and/or state-wide scale.

Over a period of a few years, this Research-Oriented Management Framework should lead to the development of formal management systems (combinations of regulations, policies, practices and Adaptive Management) that would provide important tools and management models for other landowners.

Centers Of Excellence

Centers of Excellence define a focused, yet multi-disciplinary research programs for the Forest that help resolve critical issues facing forest management and forest resources within and beyond the Redwood Region. The Centers of Excellence will focus on informing applied forest management issues while recognizing that sustainable forest management is best ensured by an underpinning based on a fundamental understanding of ecosystem dynamics. Centers of Excellence should be drawn from issues that are politically and socially important and of likely continuing interest to stakeholders and researchers. Centers should be aimed at obtaining information that will help develop a greater understanding between important forest outputs and management by informing policies, practices, and associated consequences. The Centers of Excellence will be compelling, integrative, and exciting, drawing researchers from broad national and international professional networks. The Centers will also be durable, focused on solving complex challenges, the solutions to which will likely be iterative and for which Jackson Demonstration State Forest, at the center of the redwood region, is well-positioned to answer.

To avoid spreading resources too thin, the number of Centers should be constrained, with an initial JAG recommendation tentatively set at three. In addition, Centers should be focused enough to prevent the largely ad-hoc approach to forest management JAG believes exemplifies R&D activities on JDSF to date. The recommended Centers of Excellence listed below evolved from discussions within JAG, science workshop participants, and limited external outreach. We recommend that additional outreach and more detailed consideration by the Board of Forestry and the Research Planning Team (see Implementation Section) should help to refine and/or revise the finally selected centers. JAG recognizes that adopting Centers of Excellence may have some undesirable consequences such as over-riding R&D on other important topics. Thus, JAG believes that allowances for these should explicitly be acknowledged in subsequent considerations by bodies discussed further in this document. With explicit recognition of other important research, these risks are off-set by the value of the focus brought by the Centers of Excellence.

Additional detail regarding development of Centers of Excellence are discussed in [Appendix X](#).

Recommendation #2: Establish Three Centers of Excellence at JDSF:**1. Coho Salmon Recovery**

To rapidly recover aquatic communities by understanding the integration of watershed process and functions using both active and passive restoration processes.

2. Upland Terrestrial Habitat and Forest Structural Relationships

To understand habitat and population processes and develop predictive models of animal/plant/ habitat dynamics of upland species on a continuum from younger to older forests.

3. Sustainable Forest Management Practices

To understand and develop improved stand development pathways that integrate sustainable timber harvesting in the context of aesthetics, ecosystem management, timber growth and yield, forest product quality, carbon sequestration, and development of older forest conditions.

A Strategic Research Plan (formerly several subsections compiled into a single new section)¹

Recommendation #3: JDSF should develop a Strategic Research Plan that supports the Centers of Excellence and Research-Oriented Management Framework.

A Strategic Research Planning process would integrate an analysis of existing and desired future conditions using proven scientific methods with other key concepts and goals described in the Management Plan and JAG Recommendations. The primary components of our recommended Strategic Research Plan include:

¹ This proposed re-organization allows us to consolidate 3 recommendations into 1.

- A **Research-Oriented Landscape Allocation** process that carefully and thoughtfully apportion the forest to support rigorous testing of key working hypotheses and assumptions, as it will establish the context by which research is crafted and documented.
- A **Research Agenda** that works collaboratively with scientists and stakeholders to develop a list of key issues and management questions related to each Center of Excellence. The Research Agenda will provide a framework for identifying desired research projects, monitoring requirements, and management activities needed to support desired research projects..
- A **Regional Context & Perspective** that considers JDSF in the context of management regimes and practices available on other lands, so as to extend the Research Program's relevance to stakeholders throughout the entire Redwood region.

Research-Oriented Landscape Allocation

A critical step in creating a Research-Oriented Management Framework is aligning the contemporary and future landscape allocation of stand-level characteristics (e.g. age, structure, composition) in ways that provide a landscape that supports research and demonstration that are directed towards the Centers of Excellence. Equally important is the recognition of the Regional Context in which work at JDSF is conducted, which is to say JDSF is one of handful of large, consolidated ownerships where forest management experiments and adaptive management can take place in the redwood region.

JAG's recommendations for Landscape Allocation and Matrix Silviculture (see Section X) provide a management system² that will generate the revenues needed to help fund the Research and Demonstration Program while preserving and advancing many of the unique stand structures within JDSF. JAG has compiled *Guidelines for Interim Research* (Appendix X) that we believe would provide appropriate constraints during the period required by the Strategic Research Planning process and the transition toward implementation of the overall framework. We anticipate that JAG's recommendations should be subject to appropriate scientific peer-review and comment as described by the scope of work in Appendix X.

The existing Allocation (Table 1 and 7) described in the Management Plan describes silvicultural allotments designed to support a more ad-hoc approach to research opportunities, and are not necessarily in alignment with the Centers of Excellence concept. The proposed revisions to the landscape allocation (offered elsewhere in this document³) are a first step toward a landscape

² The May 24th document describes this as an interim management system, but doesn't identify the interim period nor the gap in information that would lead to revisions. These revisions seek to clarify.

³ Refers to the Landscape Committee's recommendations

allocation that promotes all the goals of the Management Plan while preserving options for integrating a research focus more fully into forest operations. The future iteration of landscape allocation should also be informed by JAG's Landscape Recommendations, the Strategic Research Planning process, and broader coordination with the Board's Research and Science Committee.

We recognize that a diversity of forest and stand conditions maintained and created over time is a common feature of research and demonstration forests and that such conditions are best created as a result of a well-organized, well supported, and focused research program described by this Research-Oriented Management Framework. Additionally, we recognize that the current approach for allocation that relies upon seral stage definitions may not provide a sufficient range of conditions required for high quality research. Seral stages can imply certain structural conditions, but that for some management research needs, seral classes alone will not suffice. Thus, we favor the adoption and/or development of stand classification systems that better describe the range of structural and habitat conditions that can support the research program. Additionally, we recommend that JDSF staff should utilize measures (and practices) that ensure sufficient diversity for a wide range of research. We also recognize that a science-based landscape planning process would substantially help to inform this issue.

The landscape allocation of forest stand conditions and silvicultural systems defines the research setting for the forest. Thus, it enables and constrains assumptions and hypotheses the research community can apply to evaluate ecosystem response to management activities. The allocation can also provide stability in stand structure that supports long-term research. A poorly considered or unstructured allocation substantially restricts potential research opportunities, and would compromise the Centers of Excellence.

Because the research focus is derived from pursuing scientific Centers of Excellence, we suggest that JAG is not the appropriate group to develop the final spatial allocation for JDSF. The preferred approach to develop spatial harvest allocations on large productive forestlands uses a planning process that requires considerable scientific and analytical effort including growth and yield modeling, spatial harvesting modeling, wildlife modeling, and cumulative effects analyses. The teams necessary to develop these planning efforts include biometricians, forest analysts, wildlife biologists, watershed scientists, operational managers, and others. Developing a "world-class" landscape allocation for JDSF with the intent of improving management practices in the redwood region should be consistent with this approach. A review of approaches used by other research forests, and other cooperatives would benefit this effort. Our Recommendation 5 should address this issue.

An approach for implementing a Research-Oriented Landscape Allocation is described in [Section X](#).

A Research Agenda

A Strategic Research Plan requires that priorities are clearly assigned so that resources can be identified and integrated into the management plan and overall management infrastructure. The Research Agenda is an effort to compile the relevant issues and priorities for each **Center of Excellence**, in a manner that is supported by stakeholders, updated regularly, and accurately reflects knowledge gained (both within and external to JDSF research).

A Research Agenda works collaboratively with stakeholders and scientists to develop the programmatic focus for each Center of Excellence, including the key science questions/issues, monitoring needs, synthesis opportunities, methods of study, funding requirements, desired outcomes, etc.

A Regional Context & Perspective

A landscape-based, cooperative approach to developing the Research and Demonstration Program increases the relevance of JDSF to many stakeholders. Also, the ability to influence management at regional scales is greatly improved by collaborating with other landowners throughout the Redwood region. An extensive evaluation of existing land bases, silvicultural systems, management systems, and information needs will inform this regional context, and will support allocation, landscape planning, and a more cooperative approach to research.

While considering this Regional context, a Research-Oriented Management Framework should also consider how to **Leverage JDSF's Unique Qualities** – both in terms of what is special to JDSF as well as what is common to other lands. Studies are possible virtually anywhere, opportunities for active manipulation on other lands are often incidental to and supportive of achieving economic goals. One of the unique qualities of JDSF is its capacity for Research and Demonstration that allow for manipulations that foster the goal of learning and teaching about forest management as opposed to a focus primarily on revenue generation. JDSF supports independent and / or geographically distinct areas for replicates of land management and associated studies. Other lands may be more tightly bound by Habitat Conservation Plans or conservation easement constraints, and have less stability of ownership and purpose. By providing a contrast to these land-bases, JDSF can expand the range and depth of experimental study designs that may yield new innovations in forest management. Also, focus on common features will encourage more interest by other landowners and will expand the influence of JDSF. Recommendations 5, 6 and 7 can be used to provide such a regional context and perspective.

Other Core Framework Elements

Recommendation #4: Integrate all management treatments and methodologies within JDSF with the over-arching principles of hypotheses testing, monitoring, adaptive management, and demonstration.

Other core concepts that should be explicitly integrated into this Research-Oriented Management Framework include:

- **An Experimental Basis For Management** - is a management philosophy that views every significant management activity as an opportunity for research, experimentation, and/or monitoring activities that can inform management practices and/or policies. It is a philosophy in which the perpetual quest for resolving core management issues drives the management orientation of the forest. An Experimental Basis is driven by testing as many hypotheses as practicable, within a range of scientific rigor appropriate to the issue. An Experimental-Basis for Management improves the ability to predict responses to management activities by encouraging hypothesis testing at every opportunity, and providing the infrastructure to engage the resources to provide conclusive resolution to these hypotheses. An Experimental Basis supports repetitions of treatments and analysis over time can help minimize spurious results derived from short-term variability (e.g., climatic), and will be critical in long-term understanding of forest ecology/management in the face of novel environments (e.g., global climate change, new pests/pathogens, etc.). That is, long-term studies can circumvent problems with the more standard practice of substituting space for time.
- **A Comprehensive Monitoring Strategy** – that outlines necessary monitoring approaches, protocols, staffing needs, access, etc., and is tightly coupled with Centers of Excellence, the Research Agendas, Landscape Management Planning, the Adaptive Management Framework, and the Demonstration program. The Monitoring Strategy should extend beyond timber stand measurements to include other important ecological and scientific data related to wildlife, water resources, air quality, carbon, etc.
- **An Adaptive Management Strategy** – that identifies performance measures, resource objectives, study designs, key questions, and other elements that integrate and direct monitoring and research activities within the forest (and beyond). The Adaptive Management Strategy is an integral component of the overall Framework and should inform practices both on JDSF and throughout the Redwood Region
- **Demonstration Protocols** – that outline the types of appropriate demonstration projects and how information is compiled and distributed to stakeholders

The proposed Research-Oriented Management Framework should provide more than sufficient opportunities to generate substantial revenues while meeting all the other goals of the forest (as described in both the Management Plan and these JAG recommendations). Additional Core Elements are described in greater detail within the **Appendix**.

Recommended Implementation Approach

We recommend that the Board consider implementing this proposed Research-Oriented Management Framework by:

- A **Research Planning Team** that will develop strategies for aligning the Centers of Excellence with the Landscape Allocation and Research Agenda
- A **Redwood Research Group** that would be responsible for developing the Centers of Excellence and overall research, monitoring, demonstration, adaptive management and outreach programs
- A **Regional Research Consortium** that promotes collaboration and outreach among all stakeholders, and
- Developing an **Administration and Governance** structure that fits within the existing resources of CALFIRE and the Board of Forestry

Research Planning Team

Recommendation #5: Convene and support a Research Planning Team responsible for developing a working Strategic Research Plan.

A Research Planning Team should be compiled to provide important technical review, analysis and recommendations that will help JDSF develop a Strategic Research Plan that will guide the transition toward a Research-Oriented Management Framework. This team would have a limited scope, and would be expected to produce its deliverables within 4-9 months. The Team (working in coordination with the Board's Research and Science Committee, JDSF Staff, CALFIRE, and other stakeholders) would be responsible for several tasks, including:

- **Synthesizing information for the existing landscape** – using existing studies and data to begin to develop simplified (cartoon) conceptual models that could be used (over time) to build toward more quantitative models using to test what we think we know and don't know about the key relationships in each Center of Excellence, and how the forested landscape (both within and beyond JDSF) can be used to leverage our collective understanding

- **Providing comments on the identified Centers of Excellence** – including a more complete description of the mission for each Center of Excellence, how it will look like on the landscape; what the key research questions would be for each center; and the associated research activities.
- **Formulating testable working hypotheses** (including peer-review from cooperators) that could form the basis for a research program, including limiting factors models, desired future condition trajectories, experimental approaches etc.
- **Identify Allocation Classes** that represent management / allocation units within the forest that generate and/or maintain the desired stand conditions. The Planning Team should identify the size and distribution of units and how the units are arranged to support enquiry with focus on the Centers of Excellence
- **Developing a Research-Oriented Landscape Allocation** –building on the approaches described within the Management Plan and JAG Recommendations, and providing rationale for deviations from these approaches, the Team should provide maps and/or criteria for allocating stands into management units that would support the Centers of Excellence and other goals for the forest (as described in the Management Plan).
- **Informing and prioritizing key research questions for the Research Agenda within each Center of Excellence** – by providing recommendations down to the level of working hypotheses based on the key questions within each COE and provide guidance on the research agenda. In addition, identify the scientific gaps.
- **Comment on the financial requirements for implementing the research program** – including any influences on timber harvest, and estimated costs for research recommendations

Given the detailed technical rigor necessary for these tasks, this team will need to be sourced by professional staff, consultants and academics who can be paid for their efforts. A voluntary team will not be able to provide the amount of time and attention to detail necessary to complete these critical tasks. The Team’s work should also be subject to appropriate review.

The envisioned Research Planning Team would integrate across existing conditions using scientifically based methods (e.g. Watershed Analysis & Landscape Ecology), stakeholder needs, a Redwood Region context, and the Centers of Excellence. The outcome will be a Strategic Research Plan that better supports the research associated with Centers of Excellence, and will have a broad base of support by stakeholders. We also expect the Research Planning Team to operate within specific sidebars so as to build on the work done to date and ensure that the goals of the Management Plan and JAG’s Landscape Recommendations are recognized. Such sidebars and other considerations for a scope of work are discussed in Appendix X.

More detailed description of these tasks, including Principles for a Research-Oriented Landscape Allocation, a scope of work, necessary resource requirements, etc are provided in Appendix X.

Redwood Research Group

Recommendation #6: Establish and support a Redwood Research Group responsible for implementing the Strategic Research Plan.

The effective implementation of the Research-Oriented Management Framework and the overall Research Program should be led by an organization whose mission is to establish and maintain the Centers of Excellence through research, coordinated monitoring, advocacy, education, outreach, and policy advisement.

We recommend that research, demonstration, and monitoring programs at JDSF should be managed, administered and staffed by a broadly-based research organization that is affiliated with, but semi-independent from, CALFIRE and JDSF operations. This will enable JDSF Management to focus on the day-to-day management and operations on the Forest, while developing the organizational infrastructure to support the Centers of Excellence and other research tasks.

The organization should consist of professional staff of interdisciplinary scientists dedicated solely to a research and/or monitoring mission (e.g. not directly associated with JDSF operations). It could be led by senior scientist(s) and/or Executive Director team, and it would substantially benefit by seeking funds beyond JDSF revenue sources (e.g. research grants, foundations, partnerships, etc). The organization should seek to coordinate research activities beyond JDSF properties where it serves a Center of Excellence, and it should provide extensive outreach and educational roles to all stakeholders (including academic scientists). It should collaborate closely with academic researchers, but as an applied research organization, may benefit by being outside of an academic institution.

The roles of the Redwood Research Group could include:

- **Acting as Scientific Stewards for each Center of Excellence** – by developing internal staff and external research partners who can integrate expertise, develop models, and otherwise coordinate the “brain-trust” that will facilitate the development of each Center
- **Staffing all Field Monitoring and Data Management Activities** – for JDSF lands, by providing the technical staff capable of collecting core monitoring data, developing standard protocols, maintaining data inventories, developing quantitative models, and other research-oriented tasks

- **Acting as a Facilitating Agency** – to ensure relevance to the broader forestry community by coordinating and funding research activities throughout the redwood region
- **Acting as Staff for Regional Cooperatives** – to help facilitate greater coordination of scientific and analytical tasks among landowners, agencies, and others
- **Administering Research on JDSF** – including grants to outside research organizations (e.g. consultants, academics, etc), development of requests for proposals, acceptance of projects, review of requests for research and demonstration, etc.
- **Leading Outreach Efforts** – which could include both educational and fund-raising functions that seek to build a broad base of support and resources from multiple stakeholders and partners, including foundations, grant agencies, universities, etc
- **Leading Adaptive Management** – by acting as advocates for new practices and policies that are developed as a result of JDSF research, the Research Group could help the dissemination of new technologies, **and working to advance those recommendations thru the appropriate administrative and/or collaborative bodies**

This organization could exist in various forms (e.g. An independent 3rd-party entity, independent CALFIRE center, within JDSF, within a University Extension, as a multi-agency cooperative, etc). The advantages and disadvantages to these various structures are discussed in **Appendix X**.

We recognize that the implementation of the Redwood Research Group may take several years to occur. Thus several of the governance and administration functions may require additional oversight during the interim. To address this issue, the JAG has provided *Guidelines for Interim Research* (**Appendix X**).

Redwood Regional Research Consortium (Long-Term)

Recommendation #7: Establish Redwood Research Consortium that integrates and leverages research and demonstration efforts across the Redwood Region and includes diverse land ownerships, agencies, universities, and research interests.

Formation of a Redwood Region Research Consortium is an integral part of implementing the Research Framework. It positions JDSF within an integrative entity that unites efforts across the Redwood landscape by acting as a Hub for collaborative research that includes private and public lands. As such, this Consortium would differentiate itself from similar cooperatives by primarily drawing its participants from scientists employed by agencies, consultants, landowners, research scientists and other applied forestry practitioners (as opposed to strictly

research-oriented organizations). Within the Consortium, JDSF's role can be a resource that provides data, funds and logistical support as well as part of the land base for research. Similarly, Consortium members can provide support for advancing research implications through adaptive management and policy revision efforts. In addition, members can provide financial support through in-kind services and additional funding. JDSF's lead in forming and sustaining a Consortium also increases the relevance of JDSF to stakeholders. Finally, the ability to manage and conduct meaningful research at landscape-scales is greatly improved by collaborating with other landowners throughout the Redwood region. CALFIRE could look to Washington (e.g., Washington's TFW) and Oregon (H.J. Andrews Forest) for models of functioning Research Cooperatives that involve a broad group of stakeholders.

The consortium would differ from the Redwood Research Group in that the Consortium would exist as a collaborative group of stakeholders and partners, while the Group would consist of paid staff dedicated to implementing the Research-Oriented Management Framework.

Administration & Governance

Recommendation #8: The Board should establish appropriate administration and governance for the Research Oriented Management Framework that integrates these recommendations with existing committees and structures.

The administration and governance of the Research-Oriented Management Framework could be developed in coordination with the Board's Research and Science Committee, as well as the groups described above. Additional JAG thoughts are discussed in [Appendix X](#).

APPENDICES (TO BE DEVELOPED)

NOTE: Language for much of this is available from multiple sources, but needs substantial efforts at editing. A very rough working draft is available.

- **General Principles**
- **Guidelines for Interim Research**
- **Expanded Discussion: Research-Oriented Management Framework**
- **Expanded Discussion: Centers of Excellence**
- **Expanded Discussion: Defining the Research Planning Team Scope & Sidebars**
- **Expanded Discussion: Additional Core Elements**
- **Expanded Discussion: Redwood Research Group**