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RESEARCH SUBGROUP FRAMEWORK AND RECOMMENDATIONS

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EXECUTIVE SUMMARY

We strongly support the substantial improvement in the JDSF management regime that is represented by the Management Plan. We strongly support the goals and the substantial effort to develop a more rigorous harvest planning approach. Our focus in this document is to address a series of recommendations that would establish JDSF as a World-Class Research and Demonstration Forest.

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

We propose that a **World-Class Research Forest** is defined by the ability for an integrated research program to drive forest management activities in a manner that is broadly recognized as a source of quality, rigorously tested, scientific knowledge. It is a forest where management plans and its landscape allocation create the context for testing hypotheses related to science, policy and management. Research efforts extend beyond JDSF to integrate studies and lessons from other relevant forestlands. A World-Class Research Forest uses opportunities on the forest 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. An important product from a World-Class Research Forest is the development of techniques for sustainable forest management practices, policies and knowledge of ecosystem processes that are transportable to other landscapes and that inform key issues. It is a forest where data, maps, and history are well-tracked and well-maintained. Together, these qualities will create a compelling set of conditions that will attract diverse researchers investigating a broad array of disciplines and cooperative funding opportunities.

To put JDSF on a path toward World-Class status, we recommend that the Forest develop a **Research-Oriented Management Framework**. This 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 using **Scientific Models**, focused around **Centers of Excellence**, that range from simple conceptual models to more detailed empirical and/or quantitative models. The models would provide organizational rigor that structures the science and would over time, improve the ability to predict impacts associated with management practices. Over a

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period of a few years, this effort should target the development of formal management systems (combinations of regulations, policies, practices and Adaptive Management) that would provide management models for other landowners.

Centers of Excellence^{*} define a focused, yet multi-disciplinary research program for the Forest that helps resolve critical issues facing forest management within and beyond the Redwood Region. Recognizing that forestry must be based on a fundamental understanding of ecosystem dynamics, research developed around Centers of Excellence will focus on informing applied forest management issues. 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. These Centers of Excellence should be compelling, integrative, and exciting. Criteria for selecting Centers of Excellence are outlined in the detailed discussion.

Recommendation #2: Establish Three Centers of Excellence at JDSF:

1. Coho Salmonid 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 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, and development of older forest conditions.

A critical path for this Research Framework is a **Research-Oriented Landscape Allocation** that reflects a focus on strategic Centers of Excellence and takes a Regional

^{*} asterisks indicate concepts that have formally been approved by JAG during previous interim reports

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perspective. A landscape allocation of forest stand conditions and silvicultural systems defines the experiments and research setting for the forest. Thus, it establishes and defines assumptions and hypotheses that can be used by the research community to evaluate ecosystem response to management activities. The allocation also provides the stability in stand structure that supports long-term research. An inadequate (poorly developed) allocation substantially restricts potential research opportunities, and would compromise the Centers of Excellence. To achieve World-Class status, the allocation must carefully and thoughtfully structure 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.

Recommendation #3: Develop a spatial land allocation on JDSF that supports research to:

- ***improve understanding of underlying processes and functions,***
- ***enable long-term ecological studies, and***
- ***support the Centers of Excellence.***

We suggest that JAG is probably not the appropriate group to develop the spatial allocation for JDSF. The standard practice within the forest products industry is to develop spatial harvest allocations using a planning process that consumes an extensive amount of scientific and analytical effort, often involving growth and yield modeling, spatial harvesting modeling, wildlife modeling, and cumulative effects analysis. The teams developing these planning efforts typically include biometricians, forest analysts, wildlife biologists, watershed scientists, operational managers and others. It would seem that developing a “world-class” allocation would follow a similar approach. Such planning requires systematic processes of gathering data and conducting detailed analyses that requires experienced experts. A review of such approaches by other organizations (e.g. cutting-edge timber companies, other research forests, and other cooperatives) would be desirable.

Such a **Scientific Landscape Analysis & Planning Process*** will effectively inform the development of a Research-Oriented Landscape Allocation. The existing Allocation (Table 1 and 7) described in the Management Plan is generally perceived as directed towards defining a timber harvest approach within important wildlife, ecological, aquatic and aesthetic constraints. To accommodate the various requirements of long-term ecological and managerial research, a more refined harvest management strategy should be substantially informed by a scientifically-rigorous, landscape-scale, analysis that reflects a landscape structure that supports the proposed Centers of Excellence and enhanced

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opportunities for integrating and leveraging research and demonstration opportunities with redwood landowners beyond the immediate JDSF neighbors. This planning process would integrate an analysis of existing conditions using proven scientific methods (e.g. Watershed Analysis & Landscape Ecology approaches) that includes stakeholder outreach, a Redwood Region context, Centers of Excellence, and other key concepts described in this document. The outcome would be an allocation that better supports the research associated with Centers of Excellence, and will have a broader base of support by other stakeholders. An approach for the planning process is described in an Appendix to this document.

Recommendation #4: Establish a Collaborative, Scientific Landscape Analysis & Planning Process to inform JAG and JDSF staff's integration of spatial allocation with forest harvest planning

Until such time as a Landscape Analysis is completed, we recommend proceeding with the existing management Plan (as modified by other JAG recommendations) as an interim management system that will also, in part, generate the revenues needed to fund this effort.

A Research-Oriented allocation should ensure that a **Sufficient Diversity Of Structural Conditions*** exists (and is maintained over time) across the landscape such that current and future researchers will have a complement of varied conditions upon which to conduct research. To accomplish this need for diversity, and to support the Research Framework, the Research-Oriented Allocation should identify **Allocation Classes*** that identify units within the forest that describe stand conditions and/or silvicultural objectives. Units should define classes of treatment types (subject to variability within the units). Units should range from 100 to 500 acres, and should be arranged across the landscape in ways that support scientific models defined within the Centers of Excellence. Developing the allocation classes should be accomplished within the Landscape Management Planning Process.

Recommendation #5: Provide and maintain over time a diversity of stand structural conditions across the landscape to ensure that current and future researchers will have varied conditions upon which to conduct research and demonstrations. This allocation will, at least initially, have similar proportions of structural conditions to those indicated in the JDSF Management Plan Table 1 (Table 7).

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We are primarily interested in ensuring that there are sufficient ranges of diversity to test across a range of continuums. For some management research needs, young, mid & late seral classes should provide sufficient diversity. But for other needs, these simple structural classes may not provide the range of conditions required for quality research, for example:

- for riparian issues, there should be a range from open to closed canopies, as well as high-riparian mortality to low-riparian mortality, etc.
- for ecosystem functions, a key variable is the frequency of entry (from fairly frequent entries to very long entries)
- for some bird species, the continuum may be open understory to extremely dense understory
- for road issues, the variables may be unroaded v. heavily roaded
- for wildlife, vertical as well as horizontal diversity is important

Thus, we favor a short-term constraint that defines stand structure by some young, mid, old seral class definition. We thus recommend that JDSF staff should utilize measures (and practices) that ensure sufficient diversity for a wide range of research continuums both among stands and at a sub-stand (sub-plot?) scale. We also recognize that a science-based landscape planning process would substantially help to inform this issue.

The Research Subcommittee is generally not comfortable with a single default as suggested by the Landscape Committee Proposal. We are concerned it could:

- homogenize stand conditions when we should be acting to maintain and/or increase diversity
- result in micro-managing trained foresters with default prescriptions that are not sensitive to ground conditions
- limit or prevent application of other treatment options. There are many examples of land management systems that collapse because the default scenarios effectively block any alternative treatments (e.g., PALCO lands, President's PNW Forest Plan, Forests & Fish rules, and various HCPs).

The Research Subcommittee could support silviculture guidelines (if not too strictly defined), or perhaps a default *evaluation procedure*. These should be crafted such that there is operational flexibility to apply the appropriate silvicultural strategy given existing ground conditions, while also achieving the aesthetic, wildlife and other objectives.

We see the “natural forestry” concept as a desirable working hypothesis that could be developed and tested within the Center for Sustainable Forest Management Practices. If chosen for testing, then its land allocation requirements should be determined in a similar manner to determining requirements of other research hypotheses.

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In developing the Landscape Allocation and Research-Oriented Management Framework, it is appropriate to consider a **Redwood Regional Context** that can integrate opportunities across the entire Redwood landscape. JDSF is NOT suited for many landscape-scale studies, a deficiency that can be ameliorated with the cooperation of other landowners. By itself, the area and range of JDSF offers too few opportunities for replicates, has too few treatment-sized watersheds, and too little variation. A landscape-based, cooperative approach 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 landbases, silvicultural systems, and management systems will inform this Regional Context, and will support Allocation, Landscape Planning, and a more cooperative approach to Research.

Recommendation #6: Develop Research and demonstration programs on JDSF that integrate and leverage opportunities across the entire redwood landscape.

While considering this Regional context, the 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. Descriptive studies are possible virtually anywhere, yet there are few opportunities for active manipulation on other lands directed at goals other than economic. Other lands are more tightly bound by state Forest Practice Regulations, Habitat Conservation Plans, Federal constraints, or conservation easement constraints. 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.

A Collaborative Research Cooperative is an integral part of implementing the Research Framework. It positions JDSF as an integrative entity that unites efforts across the Redwood landscape by acting as a Hub for collaborative research that includes private lands, parks, conservation forests and federal lands. As such, this Cooperative would differentiate itself from similar cooperatives by primarily drawing its participants from scientists employed by agencies, consultants, landowners and other applied forestry practitioners (as opposed to strictly research-oriented organizations). JDSF can be a resource that provides data, funds and logistical support as a center of research. Similarly, collaborative members can provide support for adaptive management and policy revision efforts, as well as additional funding. Such an approach increases the relevance of JDSF to many stakeholders. Also, the ability to manage at landscape-scales is greatly improved by collaborating with other landowners throughout the Redwood region. CAL FIRE 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.

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Recommendation #7: Establish a collaborative Research Cooperative that integrates research efforts across the Redwood Region and includes diverse land ownerships, agencies, and research interests.

The Research Cooperative should act as a center for **Administration of Research, Adaptive Management** , and possibly **Monitoring** The Cooperative may benefit as an entity that is semi-independent of CALFIRE (e.g. established as a non-profit entity that is substantially funded by JDSF timber revenues) and thus capable of leveraging funding and resources from a broader base of support. Independence also allows the Cooperative to operate outside of the constraints of a State agency, and would thus be able to improve credibility of research results, improve collaboration with other landowners, and promote adaptive management and new management practices outside of a regulatory context. Financial management could also help insulate budgeting swings and enable long-term research. One potential model for such an organization is the California State Parks Foundation.

Recommendation #8: The Research Cooperative should serve as the center for research administration, and adaptive management. The Cooperative should be semi-independent of, but collaborative with CAL FIRE.

The Framework includes developing an **Experimental-Basis for Management*** that would establish protocols so that all significant management activities on JDSF lands are viewed as an experiment (and/or demonstration), and are based on testing one or more hypotheses through formal study designs. The level of effort associated with any individual practice need not require a rigorous scientific method, but should promote systematic thinking that promotes learning from each management action. This Experimental Basis is supported by:

- **An Outreach Framework** – for disseminating information and knowledge gained through activities on the forest.
- **A Monitoring Program Framework*** that inherently outlines existing monitoring approaches, protocols, staffing needs, etc within both the Research-Oriented Management Framework and the Adaptive Management Approach. The Monitoring Framework is tightly coupled with Centers of Excellence, the Research Agendas, Landscape Management Planning, the Adaptive Management Framework, and the Demonstration program.

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- **An Adaptive Management Framework*** that rigorously tests the assumptions around existing policies and practices that occur within the Redwood region (and perhaps beyond). It integrates monitoring, research, and demonstration in ways that improve practices and policies of interest to the forest management community. It includes performance measures, resource objectives, study designs, key questions, and other elements that integrate and direct monitoring and research activities both within the forest and from research cooperators on other lands.
- **A Demonstration Program Framework** outlines how basic information will be compiled and reported for significant management actions on the forest. Such information should 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 Demonstration Program might also oversee the availability of JDSF databases to the research community and general public.

Recommendation #9: Integrate all management treatments and methodologies within JDSF with the over-arching principles of outreach, monitoring, adaptive management, and demonstration.

Additional details for these concepts are being drafted and will be provided in future documents.