Forest Plan Information Needs Assessment

Tongass National Forest

June 14, 2012

Summary

The Tongass completed an assessment of the Forest Information Needs in 2012. The Forest Information Needs Assessment applied the framework outlined in the 2008 Amended Tongass National Forest Land and Resource Management Plan, Appendix B. High priority information needs and current areas of interest have been identified, and the Forest intends to cooperate with the State of Alaska, other federal agencies, and internal and external partners in order to pursue this information.

As stated in the Forest Plan, addressing the information needs will contribute to the scientific information needed to support future planning efforts to inform and validate the response to management actions. Focused information collected on high priority needs will strengthen the science base for assessment of resource management and future actions. This information is a critical component of the adaptive management of the Forest Plan, and provides feedback to address economic, social, and environmental concerns. Some of the information needs identify questions associated with emerging issues that were not evident at the time of the Forest Plan development. Through addressing these new questions as well as continuing to explore ongoing items, the need for the studies, monitoring and inventory work will be validated. The information needs assessment provides the rationale to uphold the interpretation and scientific credibility of the Forest Plan.

The Tongass Information Needs Assessment was developed from several years of investigation and evaluation. This information needs assessment initiated shortly after the 2008 Forest Plan Amendment Record of Decision was signed in an effort to implement the information needs framework from the Forest Plan. The initial work was completed by resource specific groups. The wildlife information needs work was completed in 2009. The vegetation information needs was initiated in 2010 and completed in 2011. Other resource input was collected in 2011. This effort included an extensive work to collect wilderness information needs on the various wilderness areas. The wilderness character information needs assessments were initiated in 2011 and completed in 2012. In 2012, the information needs were reviewed, the data updated and consolidated into a unified information needs document. The information needs assessment document was edited in 2012; however, the wilderness information needs assessments data was summarized in individual wilderness assessments that respond to the wilderness challenge.

Overview

The Forest developed this Information Needs Assessment (INA) through examining the Forest Plan, Forest resource status and knowledge, potential changes to the resource status or stressors, and potential management actions considered or changes that may occur. A brief outline of the information needs assessment procedures and methods are included in the appendix. Also included in the appendix are the specific information needs questions and the respective scores for each item or question. These scores provide a relative sense of the significance of the need across the management issues or stressors.

The Tongass INA is organized by management issues or stressors that relate directly to the Tongass Forest Plan as well as the national INA framework themes. The Tongass management issues/ stressors include:

- Young Growth - Sustainable Forest Management
- Vegetation Biodiversity - Soil Sustainability - Wetlands Sustainability/ Invasives
- Stream Habitat - Biodiversity
- Fish & Wildlife Biodiversity/ Invasives/ Pathogens
- Wildlife Habitat Fragmentation/ Rarity of Critical Habitats
- Restoration/ Watershed Condition
- Climate Change/ Carbon release & Sequestration/ Snow Pack/ Habitat changes
- Human - Wildlife Interactions
- Wilderness Character
- Recreation - Hydro Forest Management - Roads Use Interactions

Forest INA Tools

Information needs were scored according to five categories of criteria: degree of risk, degree of uncertainty, likelihood of success, extent of knowledge need, and role in ongoing program. Each of these five categories was assigned a score from 1 (low priority) through 5 (high priority). The ratings were then totaled up to a maximum total score of 25 for each key question identified. These total scores can serve as a method to suggest priority. A score of 25 suggests highest priority, and a score of 5 suggests lowest priority.

Follow Up

The INA shows a number of stressors or management issues that the Forest needs to further explore as the Forest works to: transition to young growth management and of stream restoration. The stressors and issues in the area of young growth relate to both the response of young growth vegetation to prior vegetation management and to environmental factors as defined by the underlying response of the soil. The stressors and issues regarding aquatic organisms and fish to stream restoration are indicated by the response of the aquatic habitat variables. Subsequent to the vegetation response of young growth propagation and change is the availability and quality of the habitat for wildlife species.

The Forest separated the information needs into two categories: research related, and inventory and monitoring. The research related needs will be shared with the Pacific Northwest Research Station (PNW) to provide input on program development and research interest. Research needs will also be used to identify work that may be considered for agreements or contracts with universities, the State of Alaska, other federal agencies and outside organizations. The Forest inventory and monitoring needs will be followed up on by the Forest as funding allows through the programs and priorities defined by the Tongass Leadership Team.

A number of ongoing research and Forest inventory and monitoring projects will provide some of the vital information identified in this INA. Collection of understory vegetation data and data on the response of vegetation to young growth management is currently occurring through the TWYGS study that is co-sponsored by the Forest and PNW. Continued soils inventory is underway this fiscal year as well. Wildlife habitat studies and model development is currently underway through a contract with Lowell Suring. Studies of mammal endemics are underway through an agreement with the University of New Mexico. Response of wildlife to young growth is being explored through an agreement with the University of Wyoming. Ongoing fish habitat, stream habitat, biotic parameters monitoring tracks changes in fish, riparian vegetation, and stream characteristics in response to restoration. Application of the Netmap model will provide the ability to forecast and evaluate a variety of landscapes to project level scenarios associated with watershed prioritization for restoration and management optimization. Continued emphasis is needed on these projects to complete information collection, inventory updates and associated assessment, model updates and evaluation.

The INA identified a significant need associated with data to define the biodiversity, species abundance, and distribution of rare species. There is some data about species abundance and distribution in the areas managed for timber; however, there is very little data outside those locations. Revised vegetation inventory data layers with more detailed representation of old growth and young growth, and the associated species composition and structural attributes are needed. In response to the vegetation mapping need, a remote sensing mapping field trial is being piloted in Yakutat. Some work in mapping habitats associated with rare plant occurrence has already been completed and will be continued as funding is available.

Through the INA, the need to assess potential impacts of climate change on fish, wildlife and the ecosystem was recognized. Predictions of potential change and ecological effects associated with climate change are important to effectively manage biodiversity and vitality of species. Select watersheds for vegetative and aquatic attributes, as well as for monitoring, need to be defined. Resource vulnerability needs to be defined and cumulative effects from management, climate and natural variation needs to be quantified. Predicted changes need to be modeled at the landscape and watershed scales. Lichen has been identified as a key indicator of resource vulnerability and changes in air quality. Some work on yellow cedar in response to climate change has been initiated by PNW; continued inventory and monitoring of lichen is necessary.

The identified information needs will be shared with the Tongass Leadership Team to assist with program prioritization. These needs will be used to inform the Five Year Review of the Tongass Land and Management Resource Plan. Feedback on the status of the needs will occur through direct communication with the Forest Staff Officers, Forest Program Managers, District Rangers, and Forest Leadership. Formal feedback will occur in a report following leadership review and will be documented in the Five Year Review of the Forest Plan.

Appendix 1: Information Needs Assessment Definition

According to the USDA Forest Service Ecosystem Management Coordination Resource Information Group (USDA 2007), an Information Needs Assessment (INA) is a structured approach for determining data collection, storage and analysis needs by first identifying and prioritizing local management requirements. Based upon this definition, local subject matter experts and information managers who can identify and prioritize local management requirements should participate in the development of the INA.

The INA process proposed for a Land Management Plan is summarized as follows:

1. Identify the high priority monitoring questions that will be used to assess trends and conditions associated with the desired conditions of the Forest Plan.
2. Identify the performance measures that will be assessed as part of achieving the local objectives of each monitoring question.
3. Identify the information needs and uses associated with the assessment of each performance measure.

The process includes the collection and examination of information needs in support of forest planning, resource and ecosystem assessment and program management, and then utilizes that information to determine standards and protocols for collection or acquisition of the information. The results of an INA may provide information to the leadership team and program managers that should help guide in setting priorities for project planning and provide input to the Forest Five Year Review.

There are several key steps in conducting an INA:

1. Clarify the purpose
2. Identify who will participate in the process
3. Describe methods to be used
4. Develop tools to complete the information needs assessment.
5. Collect the information needs
6. Analyze data
7. Analyze the results

Forest INA Purpose

The purpose of this INA is to evaluate the status of the Tongass inventories and monitoring, to identify information necessary to meet our Forest Plan desired conditions, goals, objectives, standards, guidelines, and to address monitoring questions. This INA suggests approaches to meeting the most highly prioritized needs identified in this assessment.

Forest INA Team

This assessment was prepared using input from a team of Tongass National Forest resource specialists representing a variety of Forest Resources. The team consists of the following members:

Mary Friberg, Wildlife Biologist
Brian Logan, Wildlife Biologist
Cynthia Sever, Timber Planner
Ben Case, Silviculturist
Sheila Spores, Forest Silviculturist
Dennis Landwehr, Forest Soil Scientist
Rick Turner, Ecologist
Patti Krosse*, Forest Ecology, Botany, Invasive Species and Air Resources Program Manager
Karen Dillman, Ecologist
John Autrey, Tribal Relations Liaison
Bill Tremblay, Recreation Program Manager
Steve Kimball, Wilderness Manager
Steve Paustian, Forest Hydrologist and Watershed Program Manager
Cindi Lagoudakis*, Environmental Coordination Specialist
Sandy Powers, Timber Resources and NEPA specialist
Carol Seitz Warmuth*, Inventory & Monitoring Coordinator
*Synthesized information

INA Framework – Methods used

There are several ways to conduct an INA. The framework developed for the USDA Forest Service Ecosystem Management Coordination Resource Information Group in 2007 is the format selected for this effort and should help organize the many facets of interconnected resource needs that use vegetation information.

This framework is intended to help organize and guide the determination of needs that are both common across the agency and unique to the Tongass N.F, with specific emphasis on key resource groups who need and use resource information. The Framework focuses on strategic-level monitoring questions related to conditions and trends of ecological, social, and economic vegetation attributes in order to identify information relevant to Forest-level planning.

The foundational step in developing the INA was to focus on the Forest resource needs as defined through the Forest Plan. Desired conditions are the pathway for planning and the ultimate reference point for assessing progress towards sustainability. The overall national desired condition is that Forest Service lands contribute to sustaining social and economic systems within each Forest as well as to sustaining ecological systems that support the diversity of native plant and animal species within the Forest.

Six themes have been identified in the National INA Framework that summarize key forest management legislation guiding and regulating management of the Forest Service; and that reflect the interrelated and interdependent social, economic, and ecological elements of sustainability. The six themes fall into four general categories:

- Vital Ecological Functions and Attributes
    - Biodiversity
    - Land Health
    - Soil and Water Protection
- Social Values and Benefits
- Economic Values and Benefits
- Infrastructure and Capacity

Collectively, these categories provide a unifying, multi-scale monitoring and evaluation framework for gauging Forest Service progress towards sustaining the multiple uses of its renewable resources in perpetuity, and for assessing contributions to social, economic and ecological systems in the plan area.

These four categories are similar to the three categories identified in the Environment and Effects section of the Tongass Forest Plan (FEIS Plan Amendment Volume I), and the Monitoring section (Tongass Forest Plan, Chapter 6):

- Physical & Biologic Environment
- Human Uses & Land Management
- Economic & Social Environment

In addition to the national themes, the framework establishes and conveys a vital set of social, economic, and ecological sub-element priorities to be considered in respective Forest/Grassland LMP monitoring programs:

- Conservation of Biological Diversity
    a. Wildlife Habitat
    b. Ecosystem Diversity
    c. Species Diversity
        i. Invasive Species
        ii. Rare Species
- Maintenance of Soil, Water and Air Resources
    a. Resilience to changing climate
        i. Baseline Vegetation Types
        ii. Air Resources
- Maintenance and Enhancement of Economic Systems
    a. Sustainable Forest Products

Several of these common sub-element priorities were the foundation from which this INA was prepared. The themes and sub-elements of the framework suggest an implicit definition of the conservation and sustainable management of NFS landscapes at the Land Management Plan level, and work to guide and evaluate on-the-ground management. No single theme or sub-element alone is a sufficient indicator of progress towards the sustainability goal. Rather, individual themes and sub-elements should be considered in the context of the entire set of themes and sub-elements.

The Tongass Forest Strategic Plan (2012-2016) provides guidance on the Forest and focuses on five priorities, which include:

- Integrated Approach to Restoration and Enhancement
- Our Role in Addressing Climate Change
- Recreation and Wilderness Management
- Sustainable Forest Management for Community Stability & Economic Diversity
- Telling Our Story

Appendix 2: Research Information Needs

Young Growth- Sustainable Forest Management

Stressor: Emphasis on young growth harvest with little experience with anticipated vs. actual outcomes

- Key Question: What are young-growth understory responses to stand treatments on different soil types? (Score: 23) research/ inventory
- Key Question: What are the soil conditions detrimental to growth of woody vegetation in young-growth stands? (Score: 23) research
- Key Question: What is the overstory and understory species composition (TWYGS assessment)? (Score 23) research/ monitoring

Stressor: Past management activities affecting the site's ability to support historic vegetation

- Key Question: What is the causal agent for lack of growth response of conifers on floodplain soils (hypothesis is that soil organic matter is lacking)? (Score: 22) research

Stressor: Proposed management of different techniques and logging systems will have an effect on soils that we currently do not understand

- Key Question: What are the effects to soils from different logging systems used to manage YG stands? (Score: 24) research

Stressor: Continued timber harvest on steeper slopes and the use of partial cut prescriptions in those areas & mass movement hazard

- Key Question: What is landslide response to timber harvest on slopes over 72% gradient, particularly in partial cuts and avoidance areas under the 1997 and 2008 Forest Plans? Need to update the mass movement index interpretation with real inventory data. (Score: 21) research/ inventory

Stressor: Changes in understory vegetation which serves as habitat for prey of old-growth associated species

- Key Question: What is the response of the prey of old growth associated wildlife within varying age classes of thinned and un-thinned stands? (Score: 21) research

Vegetation Biodiversity- Soil Sustainability- Wetlands Sustainability/ Invasives

Stressor: Continued road construction on wetlands, and the ability to maintain our silvicultural exemption

- Key Question: What are the effects of forest road construction on wetland resources? This need has decreased in recent years due to less road construction on wetlands (potential of partnering with EPA and the COE). (Score: 15) research

Stressor: Changes to soil conditions as a result of land-disturbing activities, particularly in young-growth stands

- Key Question: What are the effects of different logging systems on the soils within treated young growth stands? (Score: 24) research/ monitoring

Stressor: Fish habitat fragmentation as a result of road crossings

- Key Question: What are the effects of habitat fragmentation on resident populations as a result of road crossings? What are the risks of not providing fish passage sooner than later, or not at all? (Score: 15) research/ monitoring

Fish & Wildlife Biodiversity/ Invasives/ Pathogens

Stressor: Invasive animals and plants

- Key Question: What species of invasive plants and animals pose a risk to wildlife in the region? (Score: 9) research/ monitoring
- Key Question: How do management and other human activities facilitate the spread of invasive species that affect wildlife? (Score: 9) research/ monitoring
- Key Question: What steps can be taken to reduce the presence and spread of invasive species that affect wildlife? (Score: 7) research/ monitoring
- Key Question: Are there reproducing populations of Atlantic salmon on the Tongass (particular emphasis in wilderness nearest to net pen sites)? (Score: 7) research/ monitoring

Stressor: Pathogens (indigenous and introduced)

- Key Question: How do management and other human activities facilitate the spread of parasites and diseases that affect wildlife? (Score: 7) research/ monitoring
- Key Question: What steps can be taken to reduce the presence and spread of diseases and parasites species that affect wildlife? (Score: 5) research/ monitoring

Wildlife Habitat Fragmentation/ Rarity of Critical Habitats

Stressor: Fragmentation of habitat, which can result from both natural and anthropogenic processes; this stressor is primarily related to landscape pattern

- Key Question: What are the effects of fragmentation on wildlife populations and endemism at different scales (e.g., watershed, biogeographic province, island, archipelago)? (Score: 15) research/ monitoring
- Key Question. How can the permeability of a landscape be quantified? Do any management actions create complete barriers to wildlife movements? (Score: 10) research/ monitoring

Stressor: Rarity of critical habitat types (e.g. marine mammal haulouts, brown bear salmon foraging sites)

- Key Question: What are critical habitat types, where are they located, and what species use them? (Score: 17) research/ monitoring

- Key Question: What are the main threats to critical habitats? (Score: 17) research/ monitoring
- Key Question: What critical habitats are at risk? (Score: 17) research/ monitoring

Restoration/ Watershed Condition

Stressor: Understanding natural processes to assess cumulative effects of vegetation management on stream flow regime

- Key Question: What is the role of forest canopy density and structure on rainfall interception and runoff processes? (Score: 16) research/ monitoring

Climate Change/ Carbon release & Sequestration/ Snow Pack/ Habitat changes

Stressor: Climate change effects on wildlife

- Key Question: How might climate change affect winter survival of year-round resident wildlife species (especially those for which winter survival is a limiting factor)? (Score: 16) research/ monitoring
- Key Question: How might climate change interact with other stressors to affect wildlife in the Tongass? (Score: 15) research/ monitoring
- Key Question: How can the Forest be managed to enhance resilience of wildlife populations to effects of climate change? (Score: 15) research

Stressor: Climate change /carbon release and sequestration; paludification is affecting soil productivity on some sites

- Key Question: Under changing climates, which soils are poised to release or store carbon and under what management scenarios? Which soils are undergoing paludification? (Score: 15) research

Stressor: Climate change effects on fish

- Key Question: What are the potential impacts of climate change on fish? Select key watersheds and aquatic values for collection of long-term data such as fish growth rates, stream temperatures, and migration timing. (Score: 20) research/ monitoring

Stressor: Changes to snowpack, stream temperature and regime, other downstream ecological and social consequences

- Key Question: How can predicted changes and ecological effects of climate change at the watershed scale in focus watersheds help to prioritize restoration efforts? Use NetMap to model predicted changes at the watershed scale in order to prioritize restoration efforts based on predicted “effect” locations. (Score: 22) research
- Key Question: What are subregional climate change trends and responses, i.e. Juneau ice fields research, NRCS snow courses, and USGS stream gage and stream temperature stations? Determine by coordination of hydrologic research and monitoring efforts. (Score: 21) research

Stressor: Air pollution & climate change: lichens, rare plants & Alaska yellow cedar are key indicators and have been identified as indicators of resource vulnerability

- Key Question: What is resource vulnerability to air pollution and climate change? Determine by lichen bio-monitoring data (community and tissue analysis). (Score 19) research/ monitoring

Human- Wildlife Interactions

Stressor: Direct interactions between humans and wildlife

- Key Question: How have roads influenced patterns of human use of wildlife? (Score: 16) research
- Key Question: How have those uses (hunting, viewing, etc.) and the modes of access (vehicle, boat, aircraft) affected wildlife populations and behavior? (Score: 12) research

Recreation- Hydro- Forest Management- Roads Use Interactions

Stressor: Direct interaction between humans and wildlife

- Key Question: How have hunting, viewing, and other activities, along with various modes of access affected wildlife populations and behavior? (Score: 12) research/ monitoring

Stressor: Invasive plants and animals

- Key Question: What species of invasive plants and animals pose a risk to wildlife in the region? (Score: 9) research
- Key Question: How do management and other human activities facilitate the spread of invasive species that affect wildlife? (Score: 9) research/ monitoring
- Key Question: What steps can be taken to reduce the presence and spread of invasive species that affect wildlife? (Score: 7) research

Stressor: Indigenous and introduced pathogens

- Key Question: How do management and other human activities facilitate the spread of parasites and diseases that affect wildlife? (Score: 7) research/ monitoring
- Key Question: What steps can be taken to reduce the presence and spread of parasites and disease species that affect wildlife? (Score: 5) research

Stressor: Rarity of critical habitat types (e.g. marine haulouts, brown bear salmon foraging sites)

- Key Question: What are critical habitat types, where are they located, and what species use them? (Score: 17) research/ monitoring

Appendix 3: Forest Plan Inventory & Monitoring Information Needs

Young Growth- Sustainable Forest Management

Stressor: The existing soil resource inventory data is at too coarse a scale to meet YG management needs. The FPS model relies heavily on soils information to calculate site index and determine treatments.

- Key Question: How can an improved soil resource inventory help to better manage our YG stands? (Score: 19) inventory

Stressor: Management activities affecting fungi in soils in YG stands

- Key Question: What is the abundance, species and functions of the fungi species in our soils? Fungi are the primary decomposers and nutrient converters in our ecosystem. (Score: 17) inventory

Stressor: Models run from incomplete / unfinished data.

- Key Question: How could completion of S. Kruzof and Yakutat IRIs improve in running Forest Plan models? Data also needs to be correlated with NRCS. (Score: 24) inventory

Vegetation Biodiversity- Soil Sustainability- Wetlands Sustainability/ Invasives

Stressor: Legacy Data Capture

- Key Question: How can transition of soil resource inventory data (particularly soil and vegetation plat data) from paper format into electronic databases assist in forest management? (Score: 20) inventory

Stressor: Scale of soils information is too coarse or outdated for young growth management needs and for running Forest Plan models.

- Key Question: How could improved soil mapping assist the FPS model for young growth management? (Score: 19) inventory
- Key Question: How could completion of S. Kruzof and Yakutat IRIs improve in running Forest Plan models? Data also needs to be correlated with NRCS. (Score: 24) inventory
- Key Question: How could an updated soil resource inventory on northern POW help to meet young growth management information needs? (Score: 22) inventory

Stressor: Timber harvest, road building, hydroelectric projects, recreation projects

- Key Question: What are the structural attributes and associated species composition of productive and unproductive old growth? Revise vegetation data layers to include accurate representation. (Score 21) inventory
- Key Question: How could the development of habitat maps and/or terrestrial ecological units (at the land-type or land-type phase level) which include moderate scale landforms, soils and vegetation community complexes assist in forest management? (Score 17) inventory

- Key Question: What is the status of invasive plant infestations on maintenance level 1 and 2 road systems within wilderness areas and rec sites? Infestations need to be accurately mapped, as current inventory did not do so. (Score 11) inventory
- Key Question: What are the structural attributes and associated species composition of productive and unproductive old growth? Revise vegetation data layers for accurate representation. (Score 17) inventory

Stressor: Maintenance of biodiversity from natural variation, climate change, road building, timber harvest, hydro projects, recreation, and subsistence use

- Key Question: What is the species abundance and distribution of rare species relative to stressors on biodiversity? Additional surveying is needed Forest-wide; current inventory is biased toward forested habitats within timber sale areas. (Score 21) inventory
- Key Question: What is the potential for special use collecting relative to the abundance of special forest products? Baseline overstory and understory vegetation data is needed to determine potential collecting sites as part of the revised SFP policy. (Score 12) inventory
- Key Question: What are the structural attributes and associated species composition of productive and unproductive old growth? Revise vegetation data layers for accurate representation. (Score 21) inventory

Stream Habitat – Biodiversity

Stressor: Effectiveness of stream structures

- Key Question: Is the natural range and frequency of aquatic habitat conditions being maintained? There is a need for continued assessment of new and reconstructed stream crossing structures installed to meet fish passage standards. (Score: 16) monitoring
- Key Question: Are reference stream habitat measures effective? Update and review reference stream habitat measures (fish habitat management objectives). (Score: 20) monitoring

Fish & Wildlife Biodiversity/ Invasives/ Pathogen

Stressor: Old growth and young growth management cumulative effects

- Key Question: What are fish abundance trends across the forest on a watershed scale? This is a continuation of past monitoring with a larger focus, including cumulative effects. (Score: 20) monitoring

Wildlife Habitat Fragmentation/ Rarity of Critical Habitats

Stressor: Fragmentation of habitat, which can result from both natural and anthropogenic processes; this stressor is primarily related to landscape pattern

- Key Question: How does habitat fragmentation on managed lands differ from natural fragmentation? (Score: 14) monitoring

Stressor: Timber harvest, road building, hydroelectric projects, recreation

- Key Question: How do forest management activities affect the quality of wildlife habitat? Create habitat maps and/or terrestrial ecological units (at the land-type or land-type phase level). This includes moderate scale landforms, soils and vegetation community complexes. (Score 21) inventory
- Key Question: How could forest fungi inform wildlife habitat management? Key habitat features include forest fungi. Conduct a comprehensive inventory of forest terrestrial and soil fungi needed to assess site productivity; wildlife food sources, and association between old-growth and young growth forests. Certain fungi species may be an indicator of climate change. (Score 21) inventory

Restoration/ Watershed Condition

Stressor: Stream restoration activities

- Key Question: What are the quantitative fish and other key biotic responses to large wood and channel engineering treatments? (Score: 21) monitoring

Stressor: Past timber harvest

- Key Question: What is the ecological condition of young growth dominated riparian management areas and how effective are restoration strategies? (Score: 21) monitoring

Climate Change/ Carbon release & Sequestration/ Snow Pack/ Habitat changes

Stressor: Air pollution and climate change: lichens, rare plants & Alaska yellow cedar are key indicators and have been identified as indicators of resource vulnerability

- Key Question: What is the status of air quality relative to climate change? Conduct lichen biomonitoring (data from community and tissue analysis) in order to assess air quality and to measure against standards. (Score 15) monitoring
- Key Question: What information do non-forest and young forest areas yield about air pollution and climate change? Complete a vegetation classification system for the Tongass for non-forest and young forests community types. (Score 23) inventory

Wilderness Character

Stressor: Information gap on what soils values wilderness provides

- Key Question: How could wilderness manage for soil quality? Conduct a coarse scale or variable scale ecological soils inventory for management of wilderness areas (Score: 15) inventory

Stressor: Impacts of human activities—visitors, administrative use, and development

- Key Question: What are the impacts? (Score: 19) monitoring

Recreation- Hydro- Forest Management- Roads Use Interactions

Stressor: Management activities including hydro projects, road management activities, and fisheries projects

- Key Question: What is the availability of recreation settings and experience that are consistent with land use designations in the Forest Plan? (Score: 19) monitoring
- Key Question: What is the status of recreation, hydro, forest management, and roads use interactions? Conduct a baseline inventory with national scenery management goals and objectives identified. (Score: 21) inventory

Appendix 4: Forest Project Information Needs

All information needs are Forest Plan needs.

Appendix 5: Criteria Categories and Rankings

The five categories of information needs assessment ratings are: degree of risk, degree of uncertainty, likelihood of success, extent of knowledge need, and role in ongoing program. For each of these categories a rating of 1 through 5 is assigned.

Degree of risk addresses how much risk there is for impact to a resource if management does not address the information need. Risk could arise from either management issues or externally imposed stressors.

5—Significant information gaps appear to put the resource at potentially high risk for impact. There may be management issues or stressors in a landscape where resource sensitivity has not yet been studied. Potential risk of impact seems very likely.

4—It is hypothesized that there could be unknown resource sensitivity in a landscape that may encounter modification. There may be a chance of immediate risk to the resource. If so, potential risk of impact seems likely.

3—There is a moderate chance for potential risk of impact. There is not necessarily an immediate risk, but management issues or stressors that could impact the resource may become factors in the near future. Knowledge gaps could render impact assessment incomplete.

2—There is a slight chance of potential risk of impact. Resource sensitivity is hypothesized to be relatively low, however significant knowledge gaps exist which introduces some uncertainty.

1—No management issues or stressors for the resource have been identified and conditions are considered to be relatively stable. There is considered to be little to no chance of potential risk of impact at this time, and thus no pressure to immediately address this information need.

Degree of uncertainty determines how much is information about this question already exists. Sources may include prior studies done by other agencies or universities. Existing information may be only peripherally relevant, or it may be directly relevant. Scores are assigned according to volume of existing information, and also according to relevance.

5—This question has never before been studied. Little to no relevant information exists. No useful inferences can be made from any existing information.

4—Limited amounts of information exist, but are likely not relevant enough to the questions at hand to be useful in answering the current information needs questions.

3—Some information exists, may not be directly relevant. Available information may be related peripherally to current information needs, but there may not be enough relevance or overlap to accurately project from one data set into another. Any projections made from existing data sets could have a moderate degree of uncertainty.

2—Some relevant information already exists. Most necessary resource information can be gleaned from existing sources. A few information gaps may exist, but certainty is still high and answers to remaining questions can likely be inferred by existing information.

1—A great deal of highly relevant information already exists. This information related directly to the resource at hand. Remaining information needs diverge from existing information only slightly.

Likelihood of success determines how likely a question can be answered satisfactorily within constraints of funding and time frame. A factor in this category is the scope of research that would be necessary to answer information needs questions. A question that requires only modest amounts of time and money to answer satisfactorily is more likely to earn a high score. Level of complexity may also play a role in scoring in this category. A simpler project may be more likely to earn a higher score than a complex project.

5—This question appears to be well suited in scope, cost, and time frame to current time and budget restrictions. It is a relatively simple question with a short time frame and is answerable at a minimal and practical cost.

4—This question might be able to be answered satisfactorily under current budget and time frame constraints, but it is possible that the question may need to be modified or scaled back to some extent in order to be fully addressed under current constraints.

3—It is likely that this question may be able to be partially addressed under the current budget and time constraints, but it will probably require future investments of time and money in order to be fully addressed.

2—There is a small chance of being able to address this question under current budget and time frame restrictions, but it is more likely that that this question will require more resources than are currently available.

1—The scope of this project requires more time and funding than are currently available. Under current constraints there is little to no chance of being able to satisfactorily answer this question.

Extent of knowledge need determines how significant the information need is to current, ongoing management activities. A knowledge need that is required for development or refinement of a model that is currently in use, required for use in the next Forest Plan revision, or needed to fill in an information gap for ongoing management evaluation may receive a high score in this category.

5—Adaptive management goals require this information need be addressed immediately. This information is essential for assessment of management actions and future planning activities.

4—Need is significantly related to ongoing management objectives. Information could be very helpful in addressing current priorities.

3—The information need could be helpful in providing assessment of management activities. Need is fairly related to current priorities.

2—This knowledge need is somewhat related to current management activities, but is not essential to specific priorities.

1—Need is not directly related to ongoing projects or management priorities. This information need is not currently a priority although it could possibly become one in the future. It could be reassessed at a future date.

Role in ongoing program determines extent of overlap between proposed projects and existing programs of work. Information needs that have significant overlap with ongoing projects may receive a high score in this category. Information needs with little to no overlap may receive a lower score.

5—Ongoing projects require this particular information needs question to be answered.

4—There is significant overlap between information need and ongoing projects. It is probable that any investment in fulfilling this information need would likewise be an investment in existing projects.

3—Information needs are at least peripherally related to ongoing projects. It seems likely that any investment in answering this information needs question would also be an investment in existing, ongoing projects.

2—There is some limited overlap in which aspects of the information needs question could possibly inform portions of existing programs of work.

1—No overlap exists between the proposed information needs question and ongoing programs of work at this time.