An Assessment of Indian Forests and Forest Management in the United States

December 2003

By the Second Indian Forest Management Assessment Team
For the Intertribal Timber Council

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ACKNOWLEDGEMENTS

We note, as this IFMAT-II report goes to press, the sad news of the passing of Ed Williston, member of IFMAT-I and widely known expert and author of books on wood products manufacturing, as well as consultant to a number of tribes over the years. Ed was also a wounded combat veteran of World War II. He will be sorely missed by all who knew him, including those of us who worked with him on IFMAT.

As in IFMAT-I, our heartfelt thanks go to the tribes who allowed the Certification Scoping Teams and IFMAT-II to visit their lands. These tribal governments, by opening their land, data and plans to us, and by allowing us to work with their dedicated employees, made this assessment possible. At every site, we met with cooperation, hard work, and good information. Tribal and BIA employees made their time, views and wisdom available to us at every turn.

Alabama-Coushatta
Blackfeet
Cheyenne
Chugachmiut, Inc.
Coeur d'Alene
Colville
Eastern Band of Cherokee
Flathead
Fond du Lac
Fort Bidwell
Grand Ronde
Leech Lake
Lummi
Makah
Mescalero Apache
Metlakatla
Mississippi Choctaw
Nez Perce
Penobscot
Quinault
Red Lake
Round Valley
Siletz
Southern Ute
Spokane
Tanana Chiefs Conference
Tule River
Warm Springs
White Earth
White Mountain Apache

BIA employees at the area offices and the Central Office, as well as the Branch of Forest Resource Planning, Geographic Data Service Center provided critical data and views.

The Intertribal Timber Council, through Don Motanic and its staff, provided invaluable support and input. The ITC Oversight Review Committee of Jim Erickson, Paul DeClay, Edwin Lewis, Gary Morishima, Meredith Parker, Mark Petruncio, and John Vitello provided insight and data as well as excellent reviews, as did Hal Salwasser, and Mark Phillips. We must single out, doubtless to his great embarrassment, Gary Morishima, the world's best reviewer of technical documents. Without his dedicated review and ideas, the final outcome would have been less than it could have been. Many others helped us in the preparation of this report and we thank them all. Special thanks are due to Michael Sterner, who kept track of things and kept us on track, as well as contributing materially and effectively to the report itself.

We also wish to acknowledge those who helped to conduct the certification scoping visits:

Dave Wager, and consultants from Scientific Certification Systems. Oakland, CA.

Mike Morgan, and his audit team. Seattle, WA.

LIST OF ABBREVIATIONS

ANCSA	Alaska Native Claims Settlement Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CFI	Continuous Forest Inventory
FSC	Forest Stewardship Council
FTE	Full Time Equivalent
FY	Fiscal Year
GIS	Geographic Information System
IFMAT	Indian Forest Management Assessment Team
ITC	Intertribal Timber Council
MBF	Thousand Board-feet
MMBF	Million Board-feet
NHPA	National Historic Preservation Act
NIFRMA	National Indian Forest Resources Management Act
P.L.	Public Law
SFI	Sustainable Forestry Initiative
USFS	U.S. Forest Service

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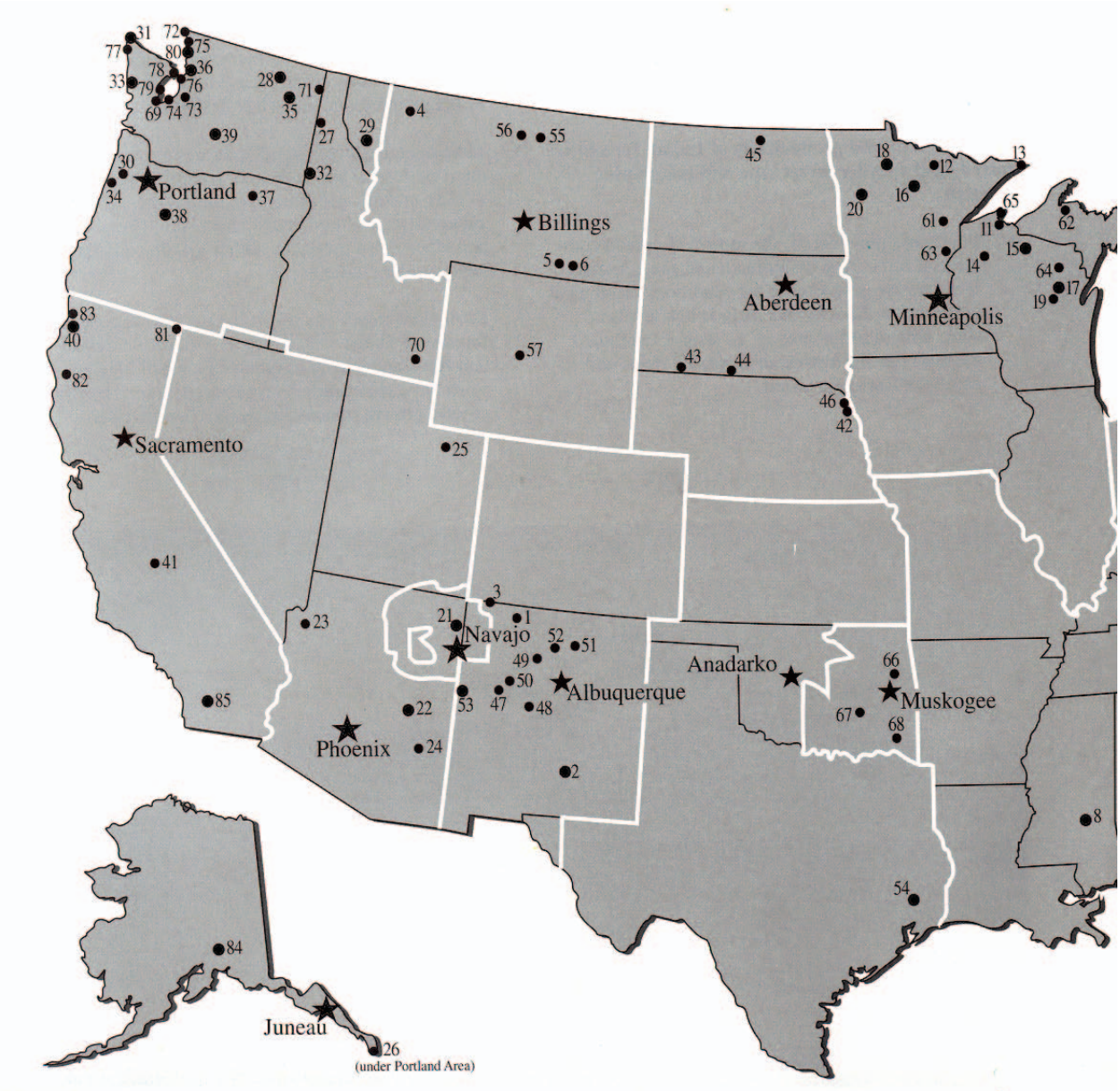

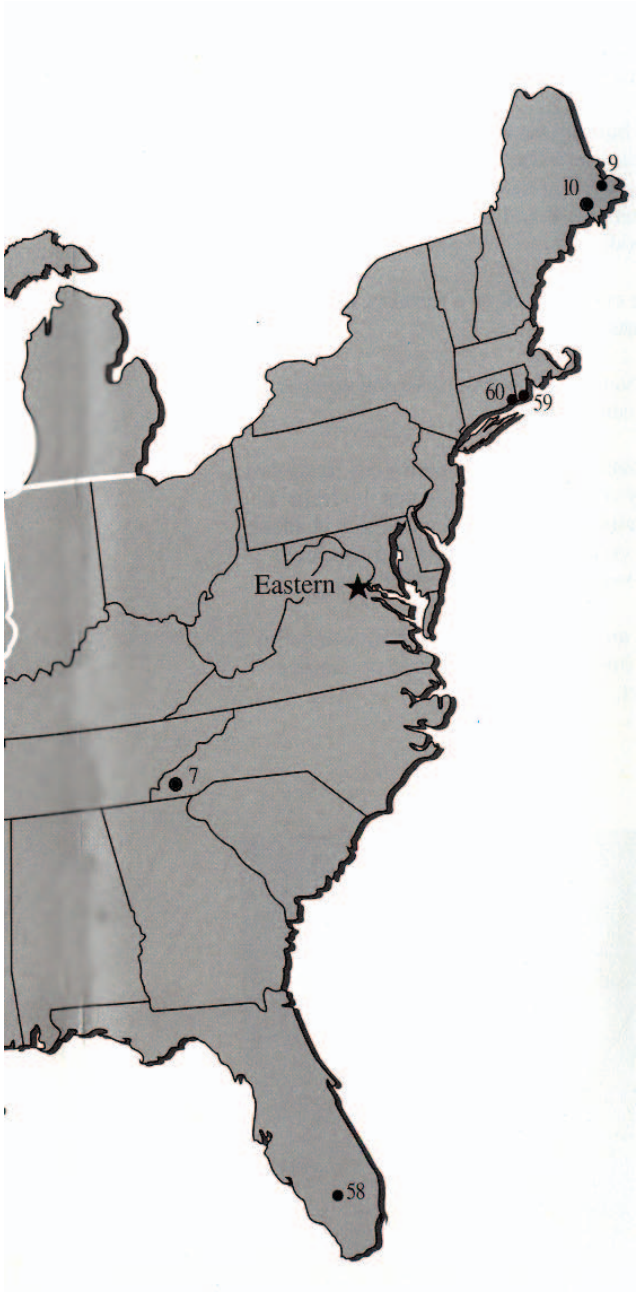

Other Trust Lands Visited

*84. Alaska Trust Properties**
Chugachmiut
Metlakatla
Tanana Chiefs Conference

Bold: Visited by IFMAT-II or its resource team in 2001-02
Italics: Visited by audit team in 2001
* Visited by IFMAT-I in 1991-92

Major Timberland Resources (Category 1)

(Over 10,000 acres of commercial timberland or over 1 millions BF allowable cut)

1. Jicarilla
2. Mescalero Apache*
3. Southern Ute
4. Blackfeet
5. Crow
6. Northern Cheyenne
7. Eastern Band of Cherokee*
8. Mississippi Choctaw
9. Passamaquoddy
10. Penobscot*
11. Bad River
12. Bois Fort
13. Grand Portage
14. Lac Courte Oreilles
15. Lac du Flambeau*
16. Leech Lake*
17. Menominee*
18. Red Lake*
19. Stockbridge/ Munsee
20.White Earth*
21. Navajo*
22. White Mtn. Apache*
23. Hualapai
24. San Carlos
25. Uintah and Ouray
26. Annette Islands
27. Coeur d'Alene
28. Colville*
29. Flathead*
30. Grand Ronde
31. Makah*
*32. Nez Perce**
33. Quinault*
34. Siletz
35. Spokane
36. Tulalip*
37. Umatilla
38. Warm Springs*
39. Yakama*
40. Hoopa Valley*
41. Tule River

Minor Timberland Resources (Category 2)

(Other reservations with economically viable timberlands)

42. Omaha
43. Pine Ridge
44. Rosebud
45. Turtle Mountain
46. Winnebago
47. Acoma
48. Isleta
49. Jemez
50. Laguna
51. Picuris
52. Santa Clara
53. Zuni*
54. Alabama-Coushatta*
55. Fort Belknap
56. Rocky Boy's
57. Wind River
58. Big Cypress
59. Narragansett
60. Pequot
61. Fond du Lac
62. L'Anse
63. Mille Lacs
64. Potawatomi
65. Red Cliff
66. Cherokee
67. Chickasaw
68. Choctaw
69. Chehalis
70. Fort Hall
71. Kalispel
72. Lummi
73. Muckleshoot
74. Nisqually
75. Port Gamble
76. Port Madison
77. Quileute
78. Skokomish
79. Squaxin Island
80. Swinomish*
81. Fort Bidwell
82. Round Valley
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EXECUTIVE SUMMARY

Flathead Reservation J. Franklin

Introduction

This report is the second independent, Congressionally mandated report on the state of Indian forests and forestry. The National Indian Forest Resources Management Act (NIFRMA), Public Law (P.L.) 101-630, directs the Secretary of the Interior (Secretary), in consultation with the affected Indian tribes, to obtain an independent assessment of the status of Indian forest resources and their management every ten years. For the second time, the Secretary has contracted with the Intertribal Timber Council (ITC) to oversee the assessment. The first report, *An Assessment of Indian Forests and Forest Management in the United States*, done by a group of nationally recognized forestry experts (Indian Forest Management Assessment Team, IFMAT), was published in November, 1993. This, the second report, is now completed and available through ITC to tribal and other publics.

Process

The ITC turned to a group of nationally recognized experts (IFMAT-II), including many of the same individuals as IFMAT-I, to carry out the second assessment. The strength of the process lies in the continuity of IFMAT membership and the comparative potential of periodic assessments in which the same eight tasks were specified (NIFRMA, Section 312) and addressed:

A. An in-depth analysis of management practices on, and the level of funding for, specific Indian forestland compared with similar federal and private forestlands (IFMAT-II included state lands also because of their somewhat similar "in trust" status and because of major shifts in the management of federal forest lands);

B. A survey of the condition of Indian forestlands, including health and productivity levels;

C. An evaluation of staffing patterns of forestry organizations of the Bureau of Indian Affairs (BIA) and of Indian tribes;

D. An evaluation of procedures employed in timber sale administration, including preparation, field supervision, and accountability for proceeds;

E. An analysis of the potential for reducing or eliminating irrelevant administrative procedures, rules, and policies of the BIA consistent with the federal trust responsibility;

F. A comprehensive review of the adequacy of Indian forestland management plans, including their compatibility with applicable tribal Integrated Resource Management Plans and their ability to meet tribal needs and priorities;

G. An evaluation of the feasibility and desirability of establishing minimum standards against which the adequacy of the forestry programs of the BIA in fulfilling its trust responsibility to Indian tribes can be measured;

H. An evaluation of the effectiveness of implementing the Indian Self-Determination and Education Assistance Act (P.L. 93-638, as amended) in regard to the Bureau of Indian Affairs forestry program; and

I. A recommendation for any reforms and increased funding levels necessary to bring Indian forestland management programs to a state-of-the-art condition.

This, the second assessment, was more limited in scope and resources than the first assessment, and differed greatly in some ways. Due to difficulties in obtaining necessary Congressional appropriations to perform the second independent assessment of the status of Indian forests, ITC worked with the Pinchot Institute to secure funding from private foundations. The Ford and Surdna Foundations agreed to sponsor a study to determine the readiness of Indian tribes to undertake forest certification under the two leading systems, Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI). Thirty tribes volunteered to participate in the study. The information gathered during the pre-certification readiness review was designed to provide much of the information available to IFMAT-II.

At the same time, additional information was gathered about the eight NIFRMA tasks. The field teams that gathered this information had limited time on site at each tribal location, and the overlap between the information relevant to pre-certification review and the NIFRMA tasks was not complete. The information thus gathered was made available to IFMAT-II, along with the information gathered in questionnaires and in six field visits to reservations by IFMAT-II. Two of the largest timber tribes chose not to be visited by IFMAT-II. Available funding constraints and schedule conflicts resulted in fewer on-site visitations by IFMAT-II than were possible by IFMAT-I. Despite this more limited and changed process, IFMAT-II believes it has a valid picture of the main elements of the eight tasks, which we present comparatively with IFMAT-I in our report.

Each participating tribe was provided with three reports for its reservation which conveyed the results of the site visits: (1) a FSC Preliminary Evaluation Report; (2) a SFI Gap-Analysis; and (3) a report addressing five questions mandated by NIFRMA. Copies of the reports were provided to IFMAT-II, ITC, and the Pinchot Institute.

IFMAT-II in Brief: Progress, Increased Risk

On the whole, the management of Indian forests is different and better than it was ten years ago, largely through the efforts of tribal organizations and dedicated BIA staff. There has been substantial progress toward sustainability in Indian forests since the time of IFMAT-I, but significant gaps remain.

The four major gaps that were identified in IFMAT-I still exist, but major progress is evident for three of them. The first gap, between the visions that Indians express for their forests and the way, in terms of direction, they are managed, is narrowing. This is due to greater tribal participation in forest management and greater alignment between tribal and BIA approaches to management. The second gap, in funding between Indian and other comparable lands, is closing due to increased funding to address fire in Indian forests, and a redirection of emphasis on federal forests. The third gap, in integrated management planning, has improved markedly, but inadequate resources are available for the preparation of Integrated Resource Management Plans. The least progress has been made in the fourth gap, in the area of trust responsibility. There is still no independent assessment of the federal government's effectiveness in fulfilling its trust obligation based on expressed tribal goals.

Improvements in forest management planning are evident, and some progress has been made in the preparation and implementation of Integrated Resource Management Plans. However, even now only 40 percent of the tribes have current Forest Management Plans, and 28 have current Integrated Resource Management Plans (IRMPs) while 46 are currently under development.

Progress has been made in responding to forest health problems, in implementing innovative silviculture, and in forest certification. Forest certification under Forest Stewardship Council rules is being sought by several tribes, and a comparative study of forest certification systems as applied to tribal lands has been completed. Several tribes have also engaged in carbon sequestration credit transactions. The Intertribal Timber Council continues to provide information, visibility, and coordination for tribal forestry on a regional and national scale.

New funding has been available through fire-related appropriations, but needs to be better integrated with forestry. Rigid categories and rules for fund expenditures tend to separate forest management activities that should be carried out in integrated ways.

Innovative management of Indian forests under the principles of adaptive ecosystem management is apparent in many places. Unfunded mandates given tribes by federal sources are barriers to better ecosystem-based management. Most of these unfunded mandates are in the form of habitat protection measures that reduce timber harvest and revenue to tribes and allotted ownerships.

The quantity and quality of tribal forest management staff is increasing, but the supply of new Indian professionals is insufficient to meet demand. Key personnel within BIA forestry are retiring or getting ready to retire. Increased fire funding has caused personnel shifts from forestry to fire that have not been entirely redressed.

At the same time that this progress has been made, a variety of risks are increasing. There is considerable risk that efforts to combat forest health problems and institute sustainable management for all forest resources will be overwhelmed by a combination of funding shortfalls, personnel shortages, and ecosystem-based problems (insects, disease, and fire). Immediate and focused action is needed to improve the rate of forest health treatment response, utilize small and low quality logs, and strengthen staffing.

Some actions can be taken without additional funds (for example, funding for fire and other forestry activities could be better integrated to reduce administrative costs and improve the efficiency and effectiveness of silvicultural treatments to accomplish management objectives), but some require substantial and immediate investment. If the promise of Indian forestry as a model of sustainability described in IFMAT-I is to be realized, increases in investment, reduced burden from unfunded mandates, and immediate action are needed (see recommendations, below and Chapter V, section I).

Red Lake Reservation D. Stepanauskas

Indian forests

Indian forests remain a vital part of tribal life on many reservations in every part of the contiguous United States and Alaska. Timber production, non-timber forest products, grazing, and wildlife management provide revenues and jobs for tribal members and enhance the economic life of surrounding communities. Subsistence lifestyles and forest-derived foods and medicines are important to many tribal members, and Indian forests often play a role in religious observance and artistic expression. Forest protection and use remain core values on forested reservations. A number of tribes are increasing their forest holdings through fee purchase of forests, and others are increasing their forest holdings, or endeavoring to do so, by reclaiming tribal lands.

There are approximately 18 million acres of forestland on Indian reservations in the United States, of which 5.7 million acres are classified as commercial timberland and 3.5 million acres as commercial woodland. Most of the economic return ($85.9 million in stumpage revenue for timber in 2001) is derived from the industrial harvest of commercial timberland, although harvest volume and stumpage values have decreased over the last ten years. In 2001, the Northwest region accounted for over 70 percent of the harvested timber volume and more than 85 percent of the revenue, followed by the Lake States at 13.5 percent of the harvested timber volume and over seven percent of the revenue.

As pointed out in the first IFMAT report, Indians live more intimately with forest change brought about by management, fire, and natural processes than most other Americans. Over the past decade, wildfire, insects, and disease have had an especially strong role in shaping Indian forests and their management. Extensive fires have altered not only the composition of Indian forests, but also their watershed and wildlife habitat characteristics, particularly in the West. Tribes have launched aggressive management programs to reduce the density of forests and to salvage stands damaged by fire, insects, and disease.

Increasing tribal roles

Tribal organizations are increasingly participating in the management of their forests through tribal, rather than BIA, forest and natural resource management organizations. The number of tribes contracting or compacting, partially and fully, with the federal government to provide management services for their own forests has increased from 64 in 1991 to 121 in 2001. The BIA, however, remains a vital force in the management of Indian forests. Dedicated BIA professionals continue to contribute significantly to Indian forest management in spite of budget limitations, vague and shifting federal policies, and key staff losses through retirement. Cooperation between strengthened tribal forest management organizations and the BIA has improved on-the-ground forest management on many reservations, although problems of coordination and inadequate resources remain. Progress has been made in providing funding for Indian forestry, largely through federal "fire" funds allocated to reducing forest fire risk or amelioration of fire effects. However, both BIA and tribal forest management activities remain poorly funded in comparison to state, private, and federal forest management, and in comparison to the potential of Indian forests to meet tribal economic and social objectives.

Round Valley Reservation M. Sterner

Trust oversight

The BIA continues to carry out most of the United States government's trust responsibility for Indian forests, although other federal agencies, such as the USDA Forest Service, have increased their tribal participation. Little progress has been made in overcoming the major shortcoming of trust oversight of Indian forests by the federal government. The BIA still serves as both the deliverer and auditor of trust responsibility. IFMAT-I pointed out that this left the BIA in the untenable position of both pitching and umpiring in a very high stakes and contentious game, and suggested a specific reform that we reiterate in IFMAT-II. Although improvement in the mechanics of trust oversight through the Office of American Indian Trust has occurred, the fundamental flaw remains. Indeed, in some respects the BIA is less fit for this role than a decade ago, in that it has fewer technical specialists in fewer critical fields delivering technical support to Indian forests.

J. Franklin

Blackfeet Reservation

Prospects for the future

Tribal forests still have great potential to demonstrate sustainable forestry and to increase their benefits to tribal members. If several key funding and organizational problems can be solved, Indian forestry has a bright future and an important role in informing American and world forest management policies and practices.

Increased investment in Indian forestry is needed. Such investments would yield immense future dividends in healthy forests, environmental protection, and available timber that would benefit all Americans, as well as in flourishing tribal enterprises and governments. Congress appropriates considerably less per acre for management of Indian forests than for the federal forests held in trust for all Americans. Even greater funding is provided by states and private industry. In addition to the level of funding, the constraints attached to certain sources of funding, such as fire, reduce the capacity to make the most efficient use of available dollars. The fire problem is a forest health problem and the most efficient way to address this problem is in the context of overall forest management.

The main organizational impediment to realizing the promise of Indian forestry would require minimal expenditures - the establishment of effective trust oversight.

Our specific findings and recommendations regarding Indian forestry at the beginning of the 21st century are summarized below and presented fully in the report that follows.

FINDINGS

Funding

Comparison to IFMAT-I

IFMAT-I identified a large gap between funding provided by the federal government for national forests and federal government funding provided for Indian forests (Table 1). In 1991 Indian forestry (including fire) received only about one-third the amount per acre as was invested in the national forests. In 2001, Indian forestry received about two-thirds the amount per acre as was invested in the national forests, or 68 cents on the dollar. This gap has closed for two major reasons: (1) a large reduction in federal funding for forest management on the National Forests, and (2) a significant increase in funding for fuels management, fire preparedness, and emergency stabilization activities on Indian forests.

	2001	1991	Change
Indians			
Forest Management	$2.83	$3.29	-$.046
Fire	$6.55	$1.80	$4.75
Total	$9.38	$5.09	$4.29
National Forest			
Forest Management	$9.51	$15.18	-$5.67
Fire	$4.19	$2.16	$2.03
Total	$13.70	$17.34	-$3.64

Table 1. Per acre federal funding for Indian Forestry and National Forests 1991 and 2001. (See also Table 8b). (IFMAT-I 1993. BIA Funding & Position Analysis for 2001, Dec. 2002. USFS 2002.)

Current Assessment

Although the funding gap is closing, the USFS may no longer be a useful comparator for funding levels for Indian forestry in some regions due to a change in management emphasis, which has reduced the relative importance of timber harvest. State or private agencies are now a more useful comparator where timber production is an important emphasis. In the Pacific Northwest, where the majority of the highly productive Indian forestlands are located, funding is substantially less than that available to adjacent state and private owners (table 2). As a lower bound we have used the National Forest allocation to estimate the additional forest management funding to reach parity even though we recognize the national forests are organized into larger land units that are more efficient to manage, do not have the special management problems associated with allotments, and are themselves under-funded to address the forest health problem in fire-prone forests.

Funding for fire management has increased sharply over the last 10 years in recognition of the fuel buildup on Indian forests due to past management practices and forest health needs. In large part, restrictions on the use of fuels management funding limit the ability to integrate these monies into a comprehensive program that addresses wildland fire hazard and risk abatement with silvicultural treatments and fire prevention education. Protecting forest health will be an ongoing effort that is most efficiently addressed through integrated management. Specifically, (1) we recommend making fire funding a permanent part of the base and (2) removing barriers that reduce the ability to integrate fire funding into the total forest management program.

J. Franklin

White Mountain Apache Reservation

Federal Forestry Allocations for Indian Forests (2001)	Comparator: U.S. Forest Service Lands (FY2001)	Difference	Additional Funding Needed (million $)	Total Funding Needed (million $)
$2.83/acre	$9.51/acre	$6.68/acre	$119.6	$170.3
	Comparator: Regionally Adjusted State and Private Lands			
$2.83/acre	$10.11/acre	$7.28/acre	$130.3	$181.0

Table 2. Comparison between federal funding (exclusive of fire) for Indian Forestry, National Forest System Lands, and Regionally Adjusted State and Private forests, with required additional funding to reach parity. (BIA Funding & Position Analysis for 2001, Dec. 2002. USFS 2002.)

Staffing

Comparison to IFMAT-I

The number of tribes that compact or contract to provide forestry services and functions has nearly doubled since 1991.

Staffing for the forestry program (exclusive of fire) has declined 26 percent; overall staffing for Indian forestry including fire increased slightly from 1991 levels.

The percentage of professionals in the workforce has increased.

BIA staffing to provide technical support has significantly declined over the last decade. Tribes are receiving less assistance for forest inventory, management planning, marketing, and economics.

More tribes now employ specialists in wildlife biology, hydrology, and landscape analysis.

		Percentage Shortfall				
Function	**Rec'd Pos.**	**Prof**	**Tech**	**Supp**	**Temp**	**Total**
Administration	170.5	13%	4%	15%	0%	11%
Support	91.6	64%	57%	25%	50%	29%
Intentory & Planning	270.0	53%	49%	31%	46%	51%
Sales	555.1	32%	28%	34%	11%	27%
Forest Development	410.8	32%	30%	37%	29%	30%
Protection	1,747.7	41%	35%	44%	18%	27%
Multiple Use	261.7	66%	61%	52%	87%	73%
Research	3.4	89%	93%	100%	0%	91%
Education	49.0	65%	45%	6%	36%	41%
Technical Assistance	9.0	68%	100%	100%	0%	73%
Other	86.6	31%	8%	10%	22%	18%
Total	3,655.4	40%	33%	34%	25%	32%

Table 3. Forestry Staffing Shortfall by Function and Position. (BIA Funding & Position Analysis for 2001, Dec. 2002)

Blackfeet Reservation

J. Franklin

Current Assessment

The decline in staffing is adversely affecting integrated forest management and will result in less healthy and productive forests if allowed to continue.

The percentage of professionals employed in the management of Indian forests is well below federal and state agencies. The 2001 BIA Forestry Funding and Position Analysis indicates that, overall, professional staffing is 40 percent below the level believed to be "adequate" to service Indian forests. This could signal deficient attention to the federal trust responsibility by the federal government.

The lack of adequate technical support is impacting and will continue to impact the ability of tribes to achieve and maintain the state-of-the-art management that should be at the heart of the effective discharge of the federal trust responsibility.

With shrinking resources, the BIA has focused its attention on inventory analysis and greatly reduced assistance to tribes in forest planning and inventory support. Some technical service gaps can be filled through cooperative agreement with the Forest Service, as outlined by the USFS National Tribal Relations Program Implementation Team (2003). The Renewable Resources Extension Act (RREA) provides funding for technology transfer, as well as for development of educational programs through the USDA. Increased RREA appropriations could lead to greater tribal participation.

Tribes continue to move toward self-determination and continue to assume forestry and resource management functions previously done by the BIA. This movement toward self-determination has increased both the focus on tribal goals and the diversity of Forest Management Plans.

Although tribes are increasingly employing specialists in wildlife biology, hydrology, and landscape analysis, there is still a tendency for disciplinary specialists to operate independently, particularly foresters and wildlife biologists.

The 2001 BIA Forestry Funding and Position Analysis reported an overall shortfall of 32 percent (40 percent for professional positions) from staffing levels that are believed to be "adequate" to perform responsibilities (table 3). These shortfalls are summarized by function for professional, technical, support and temporary staff. The most pressing staffing needs by function appear to lie in the areas of forest protection, forest inventory and management planning, multiple use, forest development, and timber sales administration. The BIA Funding and Position Analysis identified an additional funding need of $61.7 million to increase staffing to adequate levels.

Management planning

Comparison to IFMAT-I

The gap between values and goals between Indians and forest managers has closed significantly. Forest Management Plans are focused much more on achieving the tribal vision than in the past.

In general, tribes are moving closer to the Vision for Indian Forests presented in IFMAT-I.

Considerations of fundamental ecological processes, delineation of the future forest, linkage to operation plans, and development of an adaptive management approach have improved.

The management of woodlands, a large component of tribal forests overall, still receives less funding and attention than the ecological and landscape values of woodlands demands.

Current Assessment

Forest Management Plans appear in many forms, reflect many different approaches and vary tremendously in their content, depth, and coverage. This diversity is appropriate in so far as it is necessary to serve specific tribal goals, but makes monitoring and comparison of plans and their implementation more difficult.

The concept of sustainability remains elusive and is given its clearest definition through traditional sustained yield calculations. However, a broader interpretation is needed that includes a multiplicity of tribal values and consideration of ecological processes.

	Timberlands	Woodlands
Number of Reservations	199	185
Millions of Acre, Forest Land	7.7	10.2
Number of Reservations with Inventories	140	93
Number of Reservations with Current Forest Mangement Plans	85	34
Addtional Annual Funding Needed for Inventory	**$2.97 million**	**$0.96 million**
Remote Sensing	$0.42 million	$0.07 million
Mapping	$0.67 million	$0.17 million
Field Inventory	$1.28 million	$0.32 million
Inventory Analysis	$0.62 million	$0.24 million
Additional Annual Funding Needed for Planning	**$2.46 million**	**$0.43 million**
Forest History	$0.27 million	$0.02 million
Integrated Management	$0.69 million	$0.12 million
Environmental Assesment	$0.76 million	$0.10 million
Implementation Plan	$0.75 million	$0.24 million

Table 4. Status of Forest Management Plansand Funding Shortfalls. (BIA Funding & Position Analysis for 2001, Dec. 2002)

Fort Bidwell Reservation M. Sterner

Development of Integrated Resource Management Plans proceeds slowly, but the spirit of the IRMP process can be found in much of forest management planning.

Some problems persist in the consideration of fundamental ecological processes, delineation of the future forest, linkage to operation plans, and development of an adaptive management approach.

Tribes remain opportunistic in obtaining planning resources and the issues they address; currently fire planning has the most resources.

The level and sophistication of resource information management appears to be trailing substantially behind that of other governmental organizations. Databases, including GIS layers, that would typically be available to stakeholders on-line, are generally not available for Indian forestlands.

The BIA's Continuous Forest Inventory (CFI) system for planning and policy analysis continues to compare favorably with that of other agencies. However, two overlapping efforts exist to do the CFI analysis.

The status of management plans for Indian forestlands can be summarized from statistics presented in the 2001 BIA Status of Forest Management Inventories and Planning Report as depicted in table 4. Current funding is projected to be only 11 percent of the need. Unless adequate funding is provided to complete and maintain Forest Management Plans, the ability of Indian tribes to harvest timber and manage their forests will be jeopardized under current guidance from the Solicitor of the Department of the Interior.

Condition of Indian forests

Comparison to IFMAT-I

The Indian forest land base has increased by 2.1 million acres since 1991.

There are 302 forested Indian reservations which encompass 17.9 million acres of Indian forest lands (7.7 million acres of timberlands and 10.2 million acres of woodlands). There are 199 reservations containing timberlands and 185 reservations containing woodlands.

Leech Lake Reservation D. Stepanauskas

The 2001 BIA Funding and Position Analysis reported substantial changes in the Indian forest land base. Forest lands increased significantly, while commercial timberlands remained relatively stable and commercial woodlands decreased by nearly 60 percent because of land classification changes. The total allowable annual cut from commercial timberlands and commercial woodlands decreased by 16 percent and 47 percent, respectively. The percentage of the allowable annual cut that was not harvested decreased slightly to 31 percent in 2001 compared to 35 percent in 1991. The value of forest products harvested from Indian forests decreased by 27 percent (inflation adjusted).

BIA forestry regulations, as described in the current 25CFR163, are much improved over those in force at the time of IFMAT-I.

There has been overall improvement in the silvicultural practices and management of forest health issues on Indian forests in the decade since IFMAT-I. This is resulting in innovative silvicultural prescriptions and improved integrated management on the ground.

Indian forest managers have made significant strides to begin to address wildfire risk during the last decade. However, acreage treated for hazardous fuels reduction remains lower than needed.

A comparison of wildlife management assessments made between seven tribes reviewed in 1991 and again in 2001 revealed little change over ten years.

Increased year-round human occupation of Indian forestland was noted on almost all of the reservations visited during the IFMAT-II assessment.

Good progress has been made on some Indian forests in road location, construction, and maintenance because tribes themselves have made transportation system investments.

There has been no improvement in trust oversight of Indian forests, with BIA still "pitching and umpiring," an untenable position for the Agency and the tribes.

Current Assessment

Indian forestlands have particular ecological value as an essential component in the mosaic of forested landscapes which includes federal, private, and industrial forestland in the U.S.

Forest health issues related to insects, disease, and wildfire risk represent some of the largest continuing challenges on Indian forests.

Firewood harvest from tribal forests and woodlands represents a small percentage of the biomass and value removed through management, but significantly impacts sensitive sites and favored species.

Indian woodlands are in many places repositories of key ecological and habitat values, as well as sources of firewood and non-timber forest products (and some timber), but their management is poorly funded and poorly integrated with the management of other forest lands.

Much work on forest transportation systems remains to be done given the key nature of roads in relation to forest values from timber harvest to watershed protection.

The administration of allotments is still complex and an impediment to modern integrated management of Indian lands.

A clear and flexible set of management planning standards does not yet exist.

Confusion exists in the BIA about how it can discharge its stewardship responsibilities for guiding Forest Management Plans.

The concept of trust responsibility in relation to Indian forestry has not been clearly defined in law or regulation, although draft trust standards exist for several forest resources and activities.

Until truly independent oversight of the trust responsibility is established, the effective discharge of the trust responsibility will be hampered.

	2001	1991	Change
Total Acreage on Federal Reservations	56,471,218	49,069,227	15%
Forest Lands (acres)	17,902,658	15,848,256	13%
Commercial Timberland (acres)	5,710,852	5,663,500	1%
Commercial Woodlands (acres)	3,519.276	8,263,400	-57%
Total Allowable Annual Cut Timberlands	779.3 MMBF	929.7 MMBF	-16%
Total Allowable Annual Cut Woodlands	95.9 MMBF	189.0 MMBF	-47%
Harvest Volume	605.5 MMBF	729.7 MMBF	-17%
Harvest Value (inflation adjusted)	$85.9 million	$117.4 million	-27%

Table 5. Land Classification and Timber Harvest on Forested Reservations. (BIA Funding & Position Analysis for 2001, Dec. 2002)

Marketing and timber sales

Comparison to IFMAT-I

Timber sale practices overall have improved.

Current Assessment

Tribes have accepted federal constraints to protect fish and wildlife habitat. The imposition of federal measures to protect fish and wildlife habitat for species listed under ESA has effectively reduced the size and value of timber revenues on tribal lands.

New values have emerged, such as the potential market for carbon credit trading.

The current state of international lumber and log trade affects Indian forestry through price effects and market access.

There is less market competition for Indian timber. The reduction in harvest from the National Forest system has caused someU.S.mills to buy more imported logs, and other mills have closed.

Timber sale policies generally encourage efficient use of raw material and are effectively enforced during timber harvests.

Competitive bidding is not universal, with about half of tribes selling timber using open bidding. Timber sales prepared for bidding appear to be of a size that allows for competition.

Stumpage receipts appear to be low compared to those on other ownerships.

Forest certification

An interest on behalf of timber tribes to learn more about impacts of forest certification on market opportunities and how certification would affect operational costs of timber production contributed to this portion of this assessment.

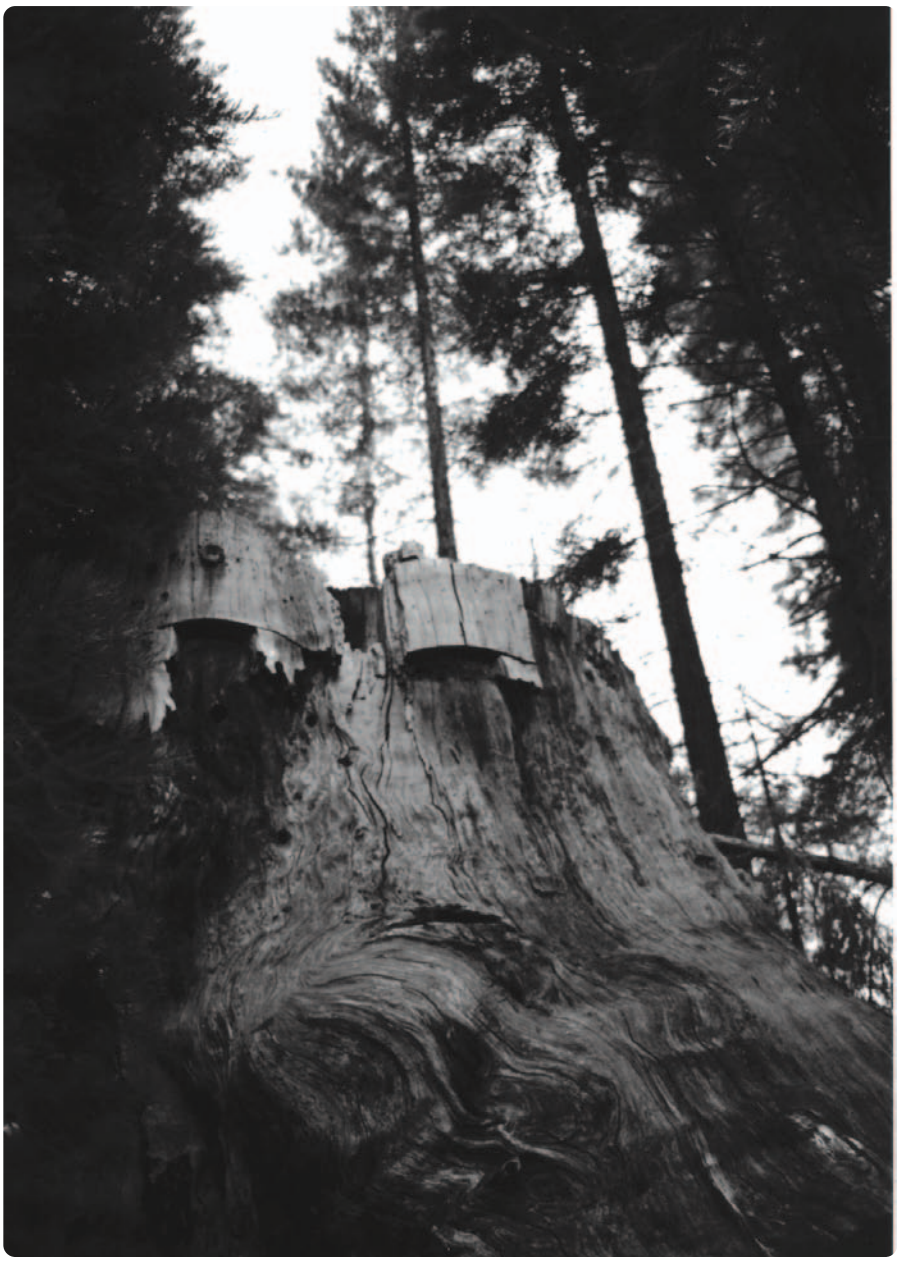
Neither SFI or FSC Certification programs, as presently conducted, match well with most tribal needs or programs.

Primary Recommendations

Numerous recommendations require increased funding when, in fact, available funding will not meet all needs. Our primary recommendations for funding and trust oversight are presented in order of priority from the perspective of IFMAT-II.

(1) Bring per acre investment in Indian forestry to levels comparable to that available for similar federal, state, and private forests over a ten year period. At current levels of federal investment ($167.9 million including forest management plus fire funding), an additional annual appropriation of $119.6 million would be required to bring investment in Indian timberlands and woodlands to parity with funding provided for National Forests. To provide parity with investments in state and private forestlands managed for timber production, supplemental investment above the additional $119.6 million would be needed, particularly in the Pacific Northwest region where the majority of these highly productive lands are located.

Investments in Indian forest lands would yield immense future dividends in healthy forests, environmental protection, and available timber that would benefit all Americans, as well as contributing to flourishing tribal enterprises and governments. It would provide the funds to effectively produce the Integrated Resource and Forest Management plans called for by regulations including the interdisciplinary specialists and other technical specialists required to backstop the planning efforts. Funding through federal appropriations should serve as a clear indicator of the degree to which the federal trust responsibility is being effectively discharged. The rigid distinction between fire money and forestry money needs to be eliminated. The "fire money" addresses a forest health problem and can be most efficiently addressed in this context of overall forest management. Funding should be integrated so as to facilitate the most cost efficient and effective means of attaining management objectives for forest health, silviculture, fire management, timber production, and ecological services.



Tule River Reservation M. Sterner

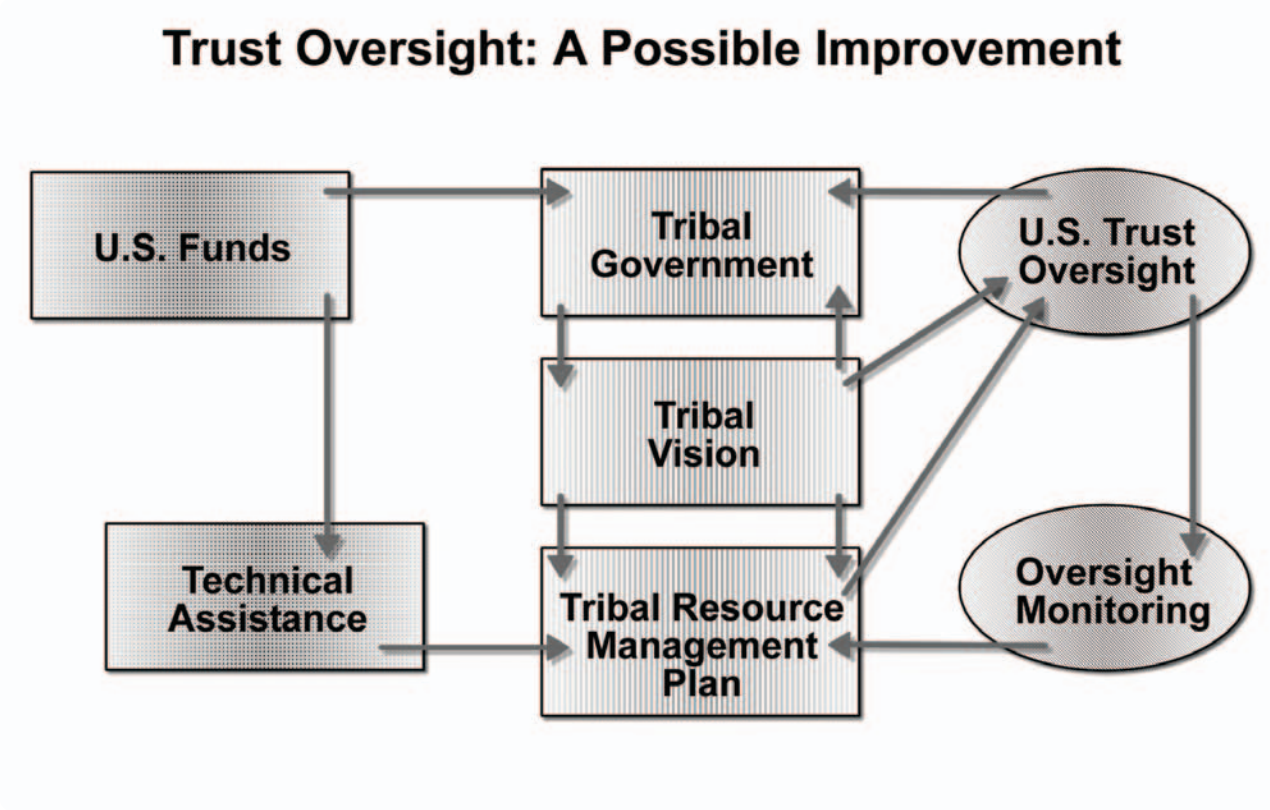


Figure 1. Proposed Structure for United States Trust Oversight of Indian Forests.(IFMAT-I 1993).

(2) Implement a management and oversight structure to insure effective trust oversight in implementing plans that reflect the visions of individual tribes for forest sustainability. IFMAT-II believes that the triangulated model recommended by IFMAT-I continues to be appropriate (figure 1). Under this system, tribes would create management plans based on tribal goals with the support of BIA technical specialists. These plans would be negotiated with the Secretary of the Interior, and when in place, form the basis for evaluation of trust performance. BIA and, where applicable, tribal performance under the plan would be monitored by a commission independent of the Secretary and BIA, in a manner consistent with tribal sovereignty and federal law and responsibility. Responsibility for delivering the natural resource program would be placed under a single manager for each tribal forest. This recommendation is of even greater importance now as managers face increased forest health and other challenges. In the complex forest management setting, where actions taken today have long-term effects on many resources, we believe the trustee (U.S. government) must: (1) require that specific information from each tribe (e.g., integrated resource plans, cumulative effects analysis) be developed, and (2) assure that the beneficiary (tribe) clearly understands the possible consequences of forest management activities.

(3) Maintain BIA technical services capacity at least at the 1991 level. Investment to provide adequate technical services is critical to more effective forest management planning, which is necessary to trust reform and to support the forest health initiative. Tribal management for tribal goals should be assisted by robust technical assistance and backup from BIA. All tribes, particularly those on small reservations with limited forestry and natural resources staff, need improved access to technical expertise. One option is the creation of a Small Tribe Technical Center based in the West, near the greatest concentration of tribes. The technical assistance capacity of the BIA should be rebuilt by adding regional specialists in economics, marketing, public involvement, inventory and planning, scaling, road design, silviculture, and forest health. BIA attrition through retirement should be offset by recruiting, retaining, and replacing staff before institutional knowledge is irretrievably lost. Continuous Forest Inventory (CFI) analysis should be consolidated and integrated with GIS support. Investment far beyond the 1991 level is warranted.

(4) Accelerate development of Integrated Resource Management Plans. If the requirements now in place for integrated resource planning are to be observed and effective, it must be fiscally and technically possible for more than one tribe per year to do an IRMP, as is now the case. We recommend that: (a) an aggressive planning program be implemented that will develop FMPs/IRMPs for all relevant Indian timberlands and woodlands within ten years; (b) the BIA Manual be amended to allow for plans to be considered current until amended in order to avoid conflict and costly tribal impacts as the BIA attempts to enforce the guidance that it has received from the Department of the Interior Solicitor that would prevent Indian tribes from harvesting timber or managing their forests without a current FMP; and (c) sufficient financial and staff resources be available to support periodic review on a ten-year cycle.

(5) Fund a "willing buyer-willing seller" program to enable tribes to consolidate tribal and allotment lands. Fragmentation of ownership now hampers or prevents integrated management of Indian forests at many locations. If integrated management of natural resources is to become more prevalent on tribal forests, consolidation of ownership and management is a high priority.

(6) Continue the ten-year cycle of Indian Forest Management Assessments, with improved, continuous, and coordinated interim data collection techniques and provide adequate funding for a consistent monitoring process. In order to evaluate progress towards improving the management of Indian forests, investments must be made in monitoring systems. Two steps should be taken to vastly improve this capacity. First, the primary responsibility for doing the assessment should rest with a specifically designated group so it is not lost in the shuffle of priorities and loss of institutional memory. Second, data collection should be continuous and conducted in a similar way and to a similar set of standards over time. This would allow the construction of a living database in a continuing organization dedicated to Indian forestry. Independence could be provided by review of the periodic report by an independent commission comprised of outside experts similar in composition to IFMAT-I and -II. While this appropriately limits public access to critical information, it also limits tribal members and agencies with trust oversight responsibilities. Our recommendation is that ITC be funded to carry out the creation of the database and the continuous assessment using their own staff, with five- and ten-year periodic review by an independent body.

M. Sterner

Fort Bidwell Reservation

Additional Recommendations

In addition to the primary recommendations above, the following recommendations should be part of an implementation plan for the BIA and tribes.

(A) Develop tribal Visions to guide forest management objectives and practices through inclusive and continuing tribal public involvement programs. It is clear that, although there has been progress, tribal members outside the natural resource management organizations still have questions about forest management activities and feel the need for greater communication from and with resource managers. As part of its management planning process, each tribe should establish a continuing public involvement program meeting its own needs. These programs should receive technical support from tribal, BIA, or ITC public involvement specialists funded through increased appropriations for management planning.

(B) Fund a series of regional workshops through the ITC to determine the reason for the difference in stumpage revenues between tribes and neighboring public and private lands. This should have a strong outreach component, to contact forest managers and gather information directly from them as to how stumpage prices are determined. There could be a variety of reasons for the difference, but the causes are currently not apparent and should be understood in the context of federal trust responsibility and tribal goals.

(C) Bring woodlands into the mainstream of forest management planning. Because of their extent and ecological function as wildlife habitat and watershed protection forests, and their production of range, fuelwood, and non-timber forest product values, woodlands should receive more professional management attention. Increased investment should be directed at enhancing research, planning, inventory, and monitoring of their basic condition and of practices, such as grazing and firewood harvest, that heavily impact the condition of woodlands. A better understanding of their contributions to tribal and national welfare should be sought through studies of their economic and social value. Some important and well-conceived research is currently being done on woodlands, but it is not sufficient in scope or continuity to provide the needed basic understanding of woodlands throughout tribal holdings.

(D) Analyze the condition and effectiveness of education-funding programs for tribal forest and natural resource managers, with particular attention to reasons for the deficit in engineering professionals. As tribes assume greater responsibility for more broadly conceived management of their forests, their success will be determined by the availability and quality of the professional resource managers they attract and retain. The current rate of increase in the training and continuing education of tribal resource managers must be maintained and increased. A study to determine the adequacy of current professional and continuing education programs should be done, and on the basis of its results, adequate professional development and continuing education programs for all tribal resource staff should be implemented. Incentives should be established to recruit and retain natural resource professionals. Existing programs offer some funding options. Limited funds may be available through the Cooperative State Research, Education and Extension Service (CSREES) of the U.S. Forest Service. The Renewable Resources Extension Act provides funding to land grant institutions, including Indian colleges. We recommend that these funds be substantially increased to enable a much higher level of tribal participation.

(E) Periodically review timber-sale policies to verify that sale procedures lead to maximum benefits for the tribe. At a minimum, at least some logging contracts should be awarded competitively as a control. Workshops for staff and information sharing between tribes could improve the logging contract process. Evaluate guidelines for timber-sale size, average log pricing, and lump-sum sales.

(F) Develop auditing procedures to document the competitiveness of forest-products enterprises. Use cost, value, and physical measures of logs into the mill and wood products out of the mill to help tribal governments and managers understand and evaluate enterprise performance. Logs should be transferred to forest products enterprises at market value to provide essential market signals to managers and policy decision-makers, and encourage full utilization. Train forest managers on modern process quality control procedures. The ability of tribes to reach income and employment goals from Indian forestlands relies upon efficient utilization of raw material.

(G) Fund and conduct an accurate inventory of allotment lands to define their acreage and condition. The division of Indian forests into allotted lands and tribal lands makes forest management more complex and frequently results in disagreement between allottees, tribes and the BIA and other federal agencies. Currently, we were unable to find out much about the number, extent, and condition of allotted lands relative to tribal lands. Any changes in allotted land status should be made on the basis of the improved understanding this study would provide. For example, it may be important to fund and implement a program to compensate tribes and allottees for costs imposed by federal habitat set-aside constraints on timber harvest.

(H) Broaden and deepen assessment of the ability of management plans to sustain tribal forests and their benefits. The federal government (BIA) has relied on the traditional definition of sustainability—a sustained yield of commercial forest products—to serve as a goal for forest management and a check on the sustainability of proposed plans. IFMAT-I recommended that this definition be broadened to consider the maintenance of ecological processes. So far, this has not been done on a broad scale. Further, there is confusion about how the federal government can sign off on the adequacy of forest plans that no longer use the sustained yield of commercial products as their definition. To address this issue we suggest making *achieving the tribal vision on a continuing basis* the definition of sustainability. Sustainability must be connected to the tribal vision to have meaning and importance in management of tribal forests. To the degree that this vision

D. Stepanaukas

Red Lake Reservation

Flathead Reservation J. Franklin

involves maintaining the tribal forest and its benefits through time, a checklist and process needs to be developed that considers criteria such as these to define an adequate Forest Management Plan:

- a set of goals that reflect tribal aspirations for management of its forests;
- a description of the benefits that will flow and the future forest that will be achieved in pursuing these goals;
- an assessment of whether these benefits, and the forest that provides them, can be maintained in the long-run.

This assessment is at the heart of the "sustainability check" that is needed. It would have two major parts:

(1) Evidence that the forest structures being prescribed can be maintained through time. To the degree that the tribe envisions a "tree farm" as its desired future forest condition, what criteria exist to check that the farming techniques being advocated have a track record of success in producing crop after crop. To the degree that the tribe envisions a forest that reflects "natural" processes and structures, what evidence exists (natural history, historical information, research) that the proposed future forest does, in fact, reflect forest processes and conditions that can occur on a continuing basis?

(2) Evidence that the forest structures being prescribed, if they can be maintained through time, will produce the benefits claimed. To the degree that a tribe wishes a sustained flow of commercial timber, will the forest growth likely provide the harvest levels described in the FMP? In that case, part of this answer could be provided by a harvest schedule (and comes closest to the traditional sustainability check). Checks for other benefits claimed would also be needed.

(I) BIA and/or ITC should convene a task force to further define sustainability on Indian forests in operational terms that can be readily translated to management realities. One option for this would be to investigate adapting the Montreal Process (see glossary) criteria and indicators to tribal forests and forestry. This would have the advantage of using a system already recognized by the federal government and some states. The process is also internationally recognized and intended to be flexible in its local adaptation. These criteria and indicators could also form the basis for the independent review of the federal trust responsibility, and for the recurring assessment called for in NIFRMA.

(J) Each tribe could continue to explore the benefits of using certification programs. Certification is one, but not the only, means of helping tribal members and leaders to understand and evaluate their forest management programs and practices. A tribal certification under one of the pre-existing standards should be considered if there is enough interest.

(K) Revise federal regulations and enact legislation to eliminate requirements for adherence to unfunded mandates. Federal legislation commonly treats public lands differently than private lands and many of these unfunded mandates were expected to apply to public lands. The Secretary acts as trustee for the Indian estate, but Indian lands are distinctly different than the public lands administered by the federal government. There are higher priorities for the use of limited funds available for Indian forestry and, as a BIA study on the subject found, unfunded mandates are a significant burden.

M. Sterner

Round Valley Reservation

Mescalero Apache Reservation

J. Franklin

Concluding Comments

Substantial progress has been made toward self-determination on tribal forests during the last decade and integrated resource management has been endorsed in regulation and pursued in the field. Tribal forestry has made progress in silviculture, forest health management, planning, certification, and carbon credit trading. However, obstacles still prevent tribal forests from reaching their potential.

Funding for Indian forests, even with tribal contributions, continues to lag behind both federal investments on the National Forests that are managed for ecological services, and on comparable state and private lands managed for timber production. Despite increased funding for the fire program to protect forests from catastrophic fire and to increase forest health, rigid regulations prevent efficient use of funds to achieve integrated forest management. Smaller reservations and allotments pose special management problems due to larger per acre management costs. Partitioning of BIA budgets to individual tribes under self-determination and constant or declining budgets for technical services have strained the capacity of the BIA to provide a critical mass of technical service capacity.

The backlog of outdated forest management plans are outside of regulation and threaten continued forest operations. Reductions in federal timber supply have, in some areas, adversely affected processing outlets for Indian timber, and lumber imports continue to drive down markets, jeopardizing tribal income and reducing opportunities to market smaller diameter trees to promote forest health. Nonetheless, Indian forests have the potential to be models of integrated resource management and forest sustainability. At the end of the day, Indians live closer to the consequences of their forest management decisions than other members of American society and depend heavily on their forests to sustain tribal values, employment, and income.

I. INTRODUCTION

The final report of the first Congressionally mandated assessment of Indian forests and forest management (IFMAT-I) began with this statement:

> *Over the past two decades, Congress and Indian tribes have dedicated substantial resources to improving the management of Indian forests and to strengthening and clarifying trust and sovereignty issues. Although significant investments have been made, concern about current management and the future of Indian forests continues to be expressed by many tribes and BIA officials. In response to this concern, the U.S. Congress mandated, through the National Indian Forest Resources Management Act, Title III, P.L. 101-630 (Appendix I), that the Secretary of the Interior, in consultation with affected Indian tribes, enter into a contract with a non-federal entity knowledgeable in forest management practices on federal and private lands to conduct an independent assessment of Indian forestlands.*

Now, ten years after this first assessment, much progress in Indian forests and forestry has been informally noted, but concerns about the future and management of Indian forests remain. It is now mandated that such an assessment be conducted every 10 years (25CFR163.80-83 see below), pursuant to the National Indian Forest Management Act (NIFRMA). The Intertribal Timber Council (ITC) contracted with Interforest, an independent forestry consulting firm, to collect, analyze, and synthesize the data, and to prepare this second report. Most of the members of the Interforest team also participated in IFMAT-I, allowing individuals to make direct comparisons over time in their field of expertise.

Leech Lake D. Stepanauskas

The ITC has worked closely with Interforest during all phases of the assessment, which has been labeled the Indian Forest Management Assessment Team II (IFMAT-II). Don Motanic (ITC Technical Specialist) and Joann Reynolds (ITC) facilitated tribal visits, the distribution of survey instruments and communication with the ITC Executive Board. The ITC Executive Board selected a liaison committee to insure fiscal and contractual accountability and to provide review and feedback to IFMAT-II. The liaison committee members were: John Vitello, Paul DeClay, Jim Erickson, Meredith Parker (chairwoman), Edwin Lewis, and Gary Morishima.

IFMAT-II has worked closely with the tribes and the Bureau of Indian Affairs (BIA) in carrying out the assessment. BIA provided data from their periodic surveys of tribal forestry activities and staffing, met with IFMAT-II representatives at reservations, and performed a host of other helpful actions.

The overall goal of IFMAT-II was to provide a clear understanding, within the limits of available resources, of the status of Indian forests and forestry a decade after the first assessment. The authority (25CFR163.80-83) clearly states the expected outcome:

"Sec. 163.80 Periodic assessment report.

The Secretary shall commission every ten years an independent assessment of Indian forest land and Indian forest land management practices under the guidelines established in Sec. 163.81 of this part.

(a) Assessments shall be conducted in the first year of each decade (e.g., 2000, 2010, etc.) and shall be completed within 24 months of their initiation date. Each assessment shall be initiated no later than November 28 of the designated year.

(b) Except as provided in Sec. 163.83 of this part, each assessment shall be conducted by a non-Federal entity knowledgeable of forest management practices on Federal and private land. Assessments will evaluate and compare investment in and management of Indian forest land with similar Federal and private land.

(c) Completed assessment reports shall be submitted to the Committee on Interior and Insular Affairs of the United States House of Representatives and the Select Committee on Indian Affairs of the United States Senate and shall be made available to Indian tribes.

Sec. 163.81 Assessment guidelines.

Assessments shall be national in scope and shall include:

(a) An in-depth analysis of management practices on, and the level of funding by management activity for, specific Indian forest land compared with similar Federal and private forest land;

(b) A survey of the condition of Indian forest land, including health and productivity levels;

(c) An evaluation of the staffing patterns, by management activity, of forestry organizations of the Bureau of Indian Affairs and of Indian tribes;

(d) An evaluation of procedures employed in forest product sales administration, including preparation, field supervision, and accountability for proceeds;

(e) An analysis of the potential for streamlining administrative procedures, rules and policies of the Bureau of Indian Affairs without diminishing the Federal trust responsibility;

(f) A comprehensive review of the intensity and utility of forest inventories and the adequacy of Indian forest land management plans, including their compatibility with other resource inventories and applicable integrated resource management plans and their ability to meet tribal needs and priorities;

(g) An evaluation of the feasibility and desirability of establishing or revising minimum standards against which the adequacy of the forestry program of the Bureau of Indian Affairs in fulfilling its trust responsibility to Indian forest land can be measured;

(h) An evaluation of the effectiveness of implementing the Indian Self-Determination and Education Assistance Act (Pub. L. 93-638, as amended) in regard to the Bureau of Indian Affairs forestry program;

(i) A recommendation of any reforms and increased funding and other resources necessary to bring Indian forest land management programs to a state-of-the-art condition; and

(j) Specific examples and comparisons from across the United States where Indian forest land is located.

Quinault Reservation

M. Sterner

The assessment focus for IFMAT-II was similar to that of IFMAT I. Our policy in IFMAT-I of not presenting reservation-specific statistics and examples was continued in IFMAT-II. Thus, (J) is treated through regional statistics presented in other sections of the report. The other nine of the ten questions from NIFRMA, above, are answered based on the best information available, our collective professional judgment and, wherever possible, by describing changes since the first assessment. IFMAT-II also comments on some aspects of Indian forestry not in the first assessment and not covered directly in the questions. These included forest certification and the carbon credit trading potential of Indian forests, which we cover in separate sections.

We were particularly interested in examining the state of the four "gaps" in Indian forestry identified by IFMAT-I. These were:

(1) The gap in funding of forest management activities between Indian and other federal, state and private lands similar in character;
(2) The gap between expressed tribal goals for Indian forests and the dominant management paradigm applied to Indian forests;
(3) The relative lack of coordinated resource planning and management on Indian lands; and
(4) The need for a better method of setting and overseeing trust standards for Indian forestry.

IFMAT-II determined that there was progress in all but the final one, and that is now under intense discussion. Thus, the primary finding of IFMAT-II is a very positive one: Indian forestry has improved in many respects over the last ten years due to positive actions by the tribes and BIA. However, many areas of concern persist and some new ones have surfaced. The description of these areas of concern, our findings, and our recommendations regarding them form the bulk of this report.

II. PROCESS

Most data for IFMAT-II were gathered through the Sustainable Forestry Initiative (SFI) and Forest Stewardship Council (FSC) certification assessment processes (see Certification chapter for more detailed description). The ITC organized an assessment of 30 tribal management programs for readiness to undergo the SFI certification process in conjunction with the assessment of 29 of the same 30 tribes under the FSC program. The participating tribes were chosen based on participation in IFMAT-I and tribes' interest in learning about forest certification systems. Auditors from the two certification programs visited these tribes between July and October 2001, interviewed tribal and BIA managers and specialists, reviewed documents, and visited selected field sites. The performance measures and core indicators of the SFI standard were used to assess tribal readiness to become certified. A modified version of the Interforest "gap analysis" protocol was used to determine areas where tribes appear to meet the requirements and areas where additional work is needed. Each tribe visited received a report on its readiness to undergo SFI and FSC certification.

The SFI audit team concluded that the majority of tribes visited could successfully complete third-party certification, provided they join the SFI program and fill identified gaps beforehand. This review was accomplished in conjunction with the FSC assessment and a data-gathering exercise (NIFRMA Agreed-Upon Procedures) to obtain additional information on tribal management that would support later analysis of NIFRMA questions about the status of tribal forestry. All three projects (SFI, FSC, and NIFRMA) supported an assessment of the condition of tribal forestlands by IFMAT-II. The relationship between the various projects is shown in figure 2 .

In addition, IFMAT-II carried out tribal visits, focus groups, and solicited answers through three questionnaires sent to tribes (see Appendix III).

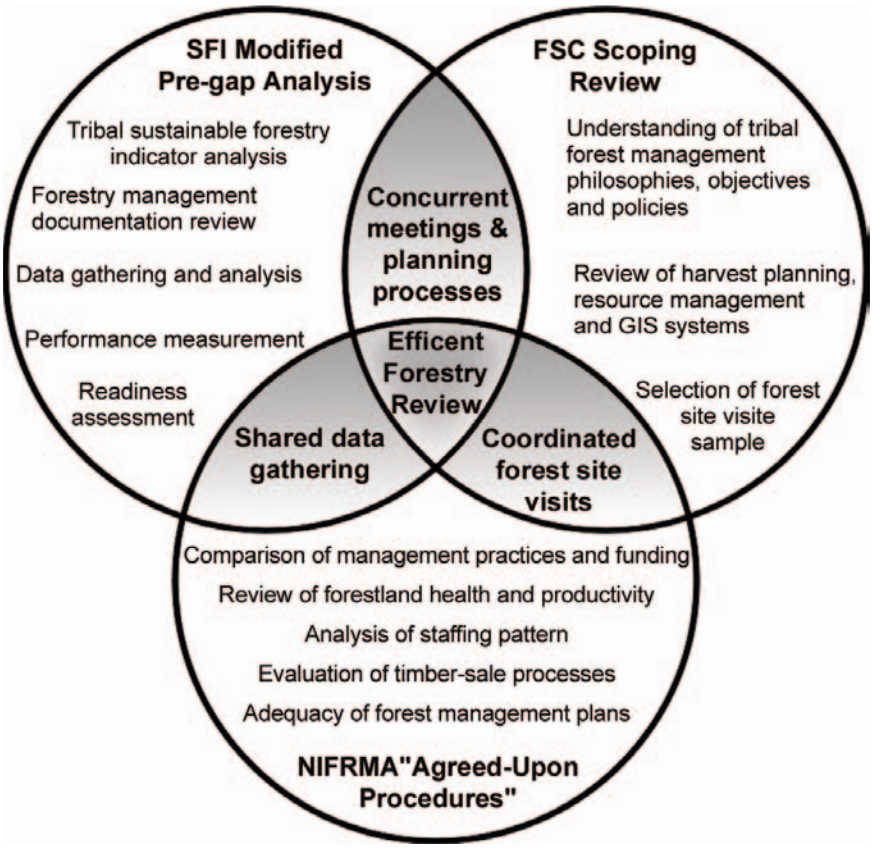


Figure 2. Pre-certification assessment components.

Members of the IFMAT-II visited Blackfeet, Colville, Flathead, Makah, Mescalero Apache, Penobscot, Quinault, and White Mountain Apache Tribal Forests. In addition, IFMAT-II and the certification team attempted to schedule visits to Yakama and Navajo reservations, but circumstances unrelated to the IFMAT-II process precluded these visits. IFMAT-II members did meet with tribal representatives at Yakama. Focus groups were held at Colville, Makah, Quinault, and White Mountain Apache.

Round Valley Reservation M. Sterner

These visits by IFMAT-II (see biographies) to individual tribes served several purposes. They allowed focus groups to be carried out in the same locations in which they occurred in IFMAT-I, they gave first hand observational experience to core team members, and they served as a non-statistical double sample for the locations visited by the certification teams.

A schedule of visits is included in Appendix II under "IFMAT-II Activity Log," and focus group and other results are incorporated into the Findings and Recommendations section under the appropriate NIFRMA questions.

Using these data sources, IFMAT-II appraised data quality and completeness and formed initial ideas about major issues emerging from IFMAT-II. These were presented to ITC in December 2001. IFMAT-II then tested preliminary ideas through further analysis and discussion, and applied the data and issues to answer the NIFRMA questions and to suggest actions in the areas of forest certification and forest carbon trading.

Results and recommendations for each NIFRMA question were agreed upon by all members of IFMAT-II and a draft document was submitted to the ITC liaison committee for review. Several subsequent review meetings and conference calls were held during summer and fall of 2002 and through October 2003. IFMAT-II held its final face-to-face meeting in Portland, OR on January 21, 2003. The Executive Summary was accepted by the ITC Board and presented by members of IFMAT-II at the annual ITC Symposium on June 17, 2003.

The process of data collection in IFMAT-II differed from that of IFMAT-I primarily in that forest certification readiness assessments provided a means of funding for site visits. There were advantages and disadvantages to this process. We present this information to aid future assessments and give insight into how the first two IFMAT reports can be compared.

The pre-certification audit teams overlapped with IFMAT-II, but most members of the audit team were not involved with final analysis and reporting. The primary responsibilities of the two groups were as follows:
(1) Certification audit team: reported to the funder (the Pinchot Institute), ITC, individual tribes and IFMAT-II about SFI and FSC certification readiness.

(2) IFMAT-II: reported to ITC about the condition of Indian forests, based on the NIFRMA questions.

Advantages of the IFMAT-II approach:

- Additional funding was obtained by incorporating forest certification into the assessment.
- A detailed and specific report related to SFI and FSC was given to each participating tribe, thereby providing direct feedback.
- Certification guidelines provided a process and a set of independent standards against which to compare Indian forests, as recommended in IFMAT-I.
- Two large tasks could be completed within a short period of time.
- It was possible to gather information on the appropriateness of certification for tribal forestry.

Disadvantages of the IFMAT-II process:

- Overall funding for the assessment was not adequate to allow IFMAT-II to visit as many sites as the IFMAT-I process.
- IFMAT-II data needs were not completely addressed during certification audit team visits because their main focus (to collect information for the pre-certification process) filled available time.
- Time constraints made it difficult for the certification audit teams to report in full detail (beyond the pre-certification reports) about forest conditions and management to IFMAT-II.
- Tribal forestry representatives often did not have a clear understanding of the purpose of visits and questionnaires: certification or IFMAT. (This contributed to a poor questionnaire response.)
- Some tribes perceived certification as invasive, and therefore did not participate or did not share information as openly as they might have with IFMAT.
- Some tribes had already started to pursue certification and had undergone a pre-certification assessment, making the visit redundant for their purposes.
- Analysis was limited by the criteria of the two certification schemes which provide a useful, but narrow, window through which to observe forestry programs and forests.
- The process for both IFMAT-I and IFMAT-II allowed for many lessons to be learned about how future IFMATs should be conducted.

Two lessons stand out:

Data, in standard formats, should be frequently collected for each of the NIFRMA questions during the interim between assessments. This data collection effort should be coordinated with other tribal and BIA data gathering efforts to minimize the burden on staff, and to produce a continuously improving data base for Indian forests and forestry. This continuous function could be web-based and overseen by ITC, and should be funded by a recurring appropriation dedicated to the purpose.

Field time (time actually spent by the assessment team members in tribal forests) should not be compromised by other considerations. The IFMAT-I process of having a site visit by a preparation team precede a visit by the core members of the IFMAT worked efficiently and should be used in the future. Adequate funding is needed for the process of regular, independent assessments of Indian forestry.

III.INDIAN PEOPLES' VISION FOR THEIR FORESTS

IFMAT-I attempted to learn what Indian people want from their forests and what they want their forests to be. *A Vision for Indian Forests* was compiled using questionnaire results, focus groups, resource management plans, and certification scoping reports. As stated in IFMAT-I,

> *The 'vision' that people have for forests of the future is key to planning what needs to be done to move toward it. Visions of the future are not forecasts, nor are they usually achievable in any perfect sense. Rather they serve as indicators of direction and, as such, provide important means of communication between natural resource managers and their clients, (p. III-1).*

IFMAT-II used the same process to assess: (1) to what degree the gap between management and Indian values found in IFMAT-I still exists, and (2) whether the vision for forests has changed since 1993. To gather information the survey instrument used in IFMAT-I was sent by ITC to the 30 participating tribes with instructions to distribute surveys to members of the tribal public and resource managers. Forty surveys were returned with respondents divided into tribal members (n=16), tribal forestry (n=6), tribal natural resources (n=8), BIA-Indian (n=3) and BIA-non-Indian (n=3). Although the overall response rate and samples from each category are significantly smaller than IFMAT-I, trends in responses appear to be consistent and relevant for comparison.

In addition, findings relating to Indian people's vision for their forest are based on information gathered from pre-certification reviews and the final report for the NIFRMA-related agreed-upon procedures process for the 30 participating tribes. The pre-certification reviews provided a great deal of information to support and supplement the findings from the questionnaire. The FSC scoping reports were especially informative because of the extensive social component of that standard. Site visits and focus groups also supplemented the questionnaire responses. Data contained in other sections of this report (staffing, funding, and forest condition, for example) were also analyzed in relation to the context of tribal vision.

Survey questions asked focus group respondents in IFMAT-I "what do you most value/want from your forests and why?" and "what do you think about current forest management practices on your tribal forest?" were asked again at the IFMAT-II focus groups. IFMAT-II participants also were asked, "Have you seen changes in management since the last IFMAT and if so, what has changed?" Focus groups were held at the Makah, Colville, White Mountain Apache, and Quinault reservations.

Tule River Reservation

M. Sterner

Red Lake Reservation

D. Stepanauskas

Findings

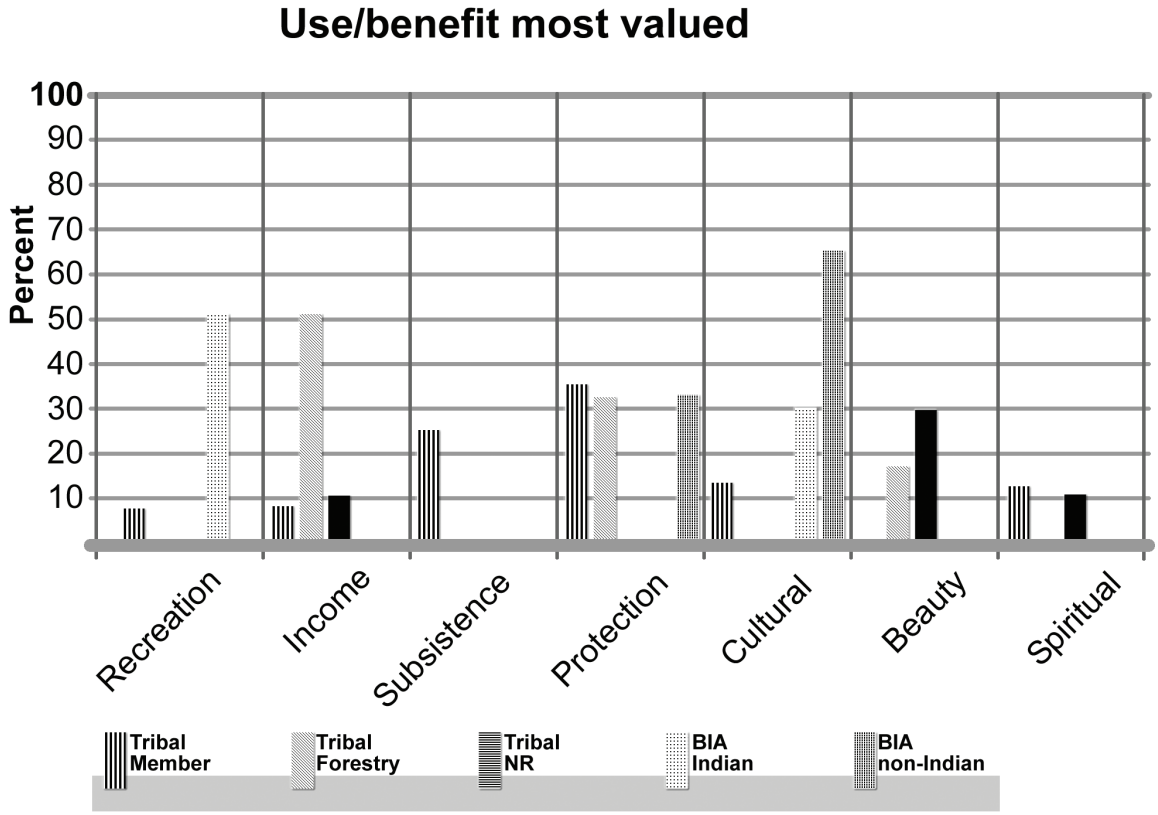
(1) The questionnaire responses, focus groups, and discussions during site visits indicate that the gap in values and goals between Indians and forest managers has closed significantly. Reasons appear to be related to the shift to tribal self-governance, the greater number of forest managers who are tribal members and the enhanced staffing and influence of Natural Resource departments. Also, forest managers are more aware of the need to communicate with and involve tribal members in goal setting and management decisions than a decade ago (see appendix).

When tribal members were asked what they want from their forests and BIA employees were asked what their clients want from their forests, tribal members, tribal forestry personnel, and BIA Indian respondents rated protection of forests as their highest value. Many foresters think of protection as referring to insects and disease, while to many tribal members protection means the whole forest, including environmental resources. Tribal Natural Resource staff rated beauty most highly and protection second. The most striking change was that all BIA non-Indians rated cultural values as very high and half rated protection, spiritual, and beauty as very high. In contrast, no BIA non-Indian rated income very high. Overall, protection and beauty remain the highest rated values when all survey respondents are considered.

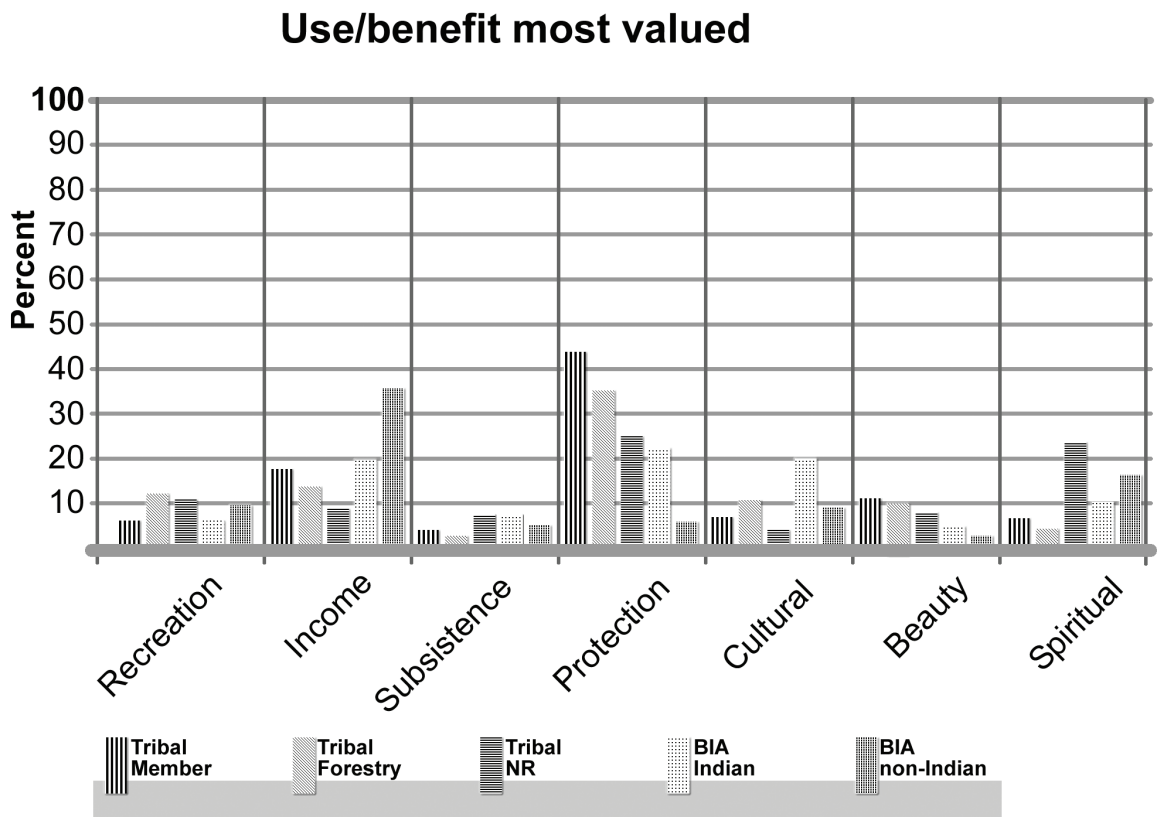
In IFMAT-I, less than 25 percent of tribal members rated management of grazing, recreation, water quality and quantity, non-timber forest products, employment of tribal members, creation of new enterprise, food gathering, spiritual values, visual quality, overall management and protection from pollution, waste, poaching and trespassing as good or excellent. In IFMAT-II, most of these management activities again were

Figures 3a and b. Survey summary graphs. (Source of 1991data, IFMAT-I 1993.)

2001



1991



Blackfeet Reservation J. Franklin

only rated good or excellent by one quarter or fewer of tribal members. However, improvement is indicated in water quality and quantity, food gathering, protection from pollution/waste and, significantly, overall management.

Overall, tribal Natural Resources staff rated management consistently lower and BIA staff rated management consistently higher than tribal members and tribal forestry staff. Tribal members, tribal foresters and BIA Indians and non-Indians all gave high marks to the management of timber/firewood for tribal use and a large portion of each of the five groups agreed that timber sales/enterprises are being managed well. Management for employment is ranked highly by tribal foresters and Natural Resources and BIA employees and all five groups give relatively high rankings to obtaining a fair price for timber. Livestock and non-timber resources appear to be common areas of concern for all respondents.

A majority of survey respondents (53 percent) say that overall forest protection is the most important management activity or resource, followed by water quality and quantity (40 percent) and employment (33 percent).

Although improvement in forest management is apparent, significant differences often exist between forest managers' views of how much management has improved and focus group participants' assessments of improvements (e.g., roads, timber harvesting).

(2) In general, tribes are moving closer to the Vision for Indian forests presented in IFMAT-I. IFMAT-I recognized that "Indian people, like the rest of society, represent a wide range of viewpoints and value systems. Tribal societies vary greatly because of history, politics and culture." The team, recognizing that individual visions developed by individual tribes will be based on their own unique values and goals, developed the Vision as a reflection of the common themes and perspectives we heard across all tribes. Results from the questionnaire, focus groups, pre-certification, and NIFRMA reports all support the validity of the Vision and its continued importance as a guide to forest management.

The Indian Vision speaks to a number of major themes expressed by Indian people: (1) natural, healthy, beautiful places; (2) integrated management; (3) self-governance and trust responsibility; (4) communication, tribal public involvement and education. These themes were expressed by focus group participants, as the following examples show:

Natural, beautiful places for traditional uses

"The Forest is a place to go for spirituality – a place that is natural and untouched."

"Beauty and scenery need to be preserved and protected so children and great grandchildren will have something. [The] Forest was left to us by our ancestors. We need to leave [it] for our children."

"Everything goes back to spiritual and cultural values. When our ancestors went camping, the day they left it looked natural."

"In our culture and language we are connected to the land. This is what makes us unique."

"If we protect resources, all else will follow."

Integrated management

"The Forest is the home of wildlife and all resources."

"Need to stop talking about timber management and talk about natural resources management."

"When I look at the survey items 1-7 I think of ecosystem management."

"Have to balance between traditional, recreation and forestry resources. No one should take over."

"I value ability to get what I need from the woods (hunting, cedar, firewood, income, other needs)."

Self-governance and trust responsibility

"BIA has the responsibility to preserve and protect."

"Self-governance allows [the] tribe to manage its own resources."

"It's important to remember we're self-sufficient. Need [to] rely less on state and federal government. Tribe needs to have the leverage."

Communication, tribal public involvement, education

"There has to be more input from the public about what they want to see in the forest"

"*We need to teach younger people natural resource management so everyone understands needs of tribal people."*

"Forestry staff is getting more educated and knowledgeable and this comes from learning how tribal members use the land."

"Should have workshops, field tours for tribal members."
"This has been a learning process for all of us. Public knows they need to get involved early. We have had to educate staff about [the] need to share information with the public and the expectation that there will be more public input."

"*Need to teach young ones about the land. If you do certain things, this will affect other things. All are connected."*

White Earth Reservation D. Stepanauskas

The pre-certification and NIFRMA reports prepared for ITC and individual tribes based on site visits also provided input to assess whether or not tribes are moving toward the Indian Vision. The FSC process, designed to give an indication of the readiness of a tribal forestry program to achieve third-party certification as well-managed under the principles of the Forest Stewardship Council, provided several criteria and indicators closely related to this issue. Specifically, items under Program Element B: Forest Ecosystem Maintenance and B:1 Forest Community Structure were used as indicators of the Vision emphasis on protection and integration of resources, and of forests as healthy, natural places with large, beautiful trees. Analysis revealed high ratings for overall Forest Ecosystem Maintenance. FSC ratings of Forest Community Structure showed over half the tribal forests (16) are likely to be above the threshold of "exemplary performance" and only 8 out of 29 are likely to fall below the threshold. The remainder of tribal forests (5) are rated at the margin, where the rating could go either way.

The Vision also places significant emphasis on tribal public involvement and communication. The FSC assessment of Community and Public Involvement rated this criterion exceptionally high. Twenty-four tribes received an above the threshold rating, four were on the margin and only one was below. More detailed review comments regarding tribal public involvement suggest good progress. However, it is not totally clear how much and how often broad-based tribal public involvement programs proactively solicited tribal public input rather than following a process where managers presented already developed plans to tribal members for review. Their comments do suggest that interdisciplinary management teams (composed of specialists from several fields including forestry, wildlife biology, and sociology, for example) appear to be significant catalysts for incorporating diverse values into forest management. Comments also note the focus of many tribes on enhancing professional development and opportunities for tribal members.

The final criterion used as an indicator of movement toward the Vision is the response to FSC Criteria on Public Use Management. This criterion is "concerned with the human dimensions to sustainable forestry. Sound forest management includes facilitating human use but manages that use so as to assure an appropriate balance with other uses which may be in conflict (e.g., timber harvesting and resource protection)." Tribes received exceptionally high ratings with 23 tribes judged above the threshold, five on the margin and only one that is likely to be below the threshold on Public Use Management. Specific comments indicate that cultural protection is good. However, there appears to be mixed attention among tribes to visual quality of the forest.

NIFRMA Questions 3 and 5 also provide perspective on the elements of the Vision. Specific items from these two questions relevant to integrated management that is focused on the protection and balance of resources are: (1) increase in tribal staffing 1991-2001, (2) forest plan in IRMP, and (3) plan covers other resources. Results indicate that 26 out of the 30 tribes surveyed have increased tribal staffing and all plans cover multiple forest resources. However, only nine tribes currently incorporate their forest plan in an IRMP (table 6, below).

Related to tribal public involvement, one NIFRMA question asked whether the current plan fits tribal needs; only ten tribes specifically responded 'yes'. Three tribes said no and the question was not answered (or information not available) for the other 17 tribes. When this question is answered positively, assurance can be given that current forest management is reflecting the Vision and meeting tribal goals.

Region	Number of Tribes Sampled	Increase in Tribal Staffing 1991-2001	Forest Plan in IRMP	Current Plan Fits Tribal Needs	Plan Covers other Resources
Northwest	16	16	6	6	16
Lake States	5	5	3	3	5
Southwest	3	2	1	2	3
Eastern	3	2	0	0	3
Alaska	3	1	0	0	3

Table 6. Relevant indictors from NIFRMA Questions Numbers 3 and 5 IFMAT-II Question: "Have tribes moved closer to their Vision?"

Recommendation

(1) Create inclusive and continuing tribal public involvement programs as a basis for developing tribal Vision to guide forest management objectives and practices. It is clear that although there has been progress, tribal members outside the natural resource management organizations still have major questions about forest management activities and feel the need for greater communication from and with resource managers. As part of its management planning process, each tribe should establish a continuing public involvement program meeting its own needs. These programs should receive technical support from tribal, BIA, or ITC public involvement specialists funded through increased appropriations for management planning.

IV. THE INDIAN FOREST RESOURCE AND THE BENEFITS IT PROVIDES

Indian forestlands are extremely diverse. They include, for example, Northwest coastal Douglas-fir and hemlock, Sequoias in California, Ponderosa pine forest and pinyon-juniper woodlands in the Southwest, aspen and white pine forests in the Lake States, eastern red spruce in the Smokey Mountains, and northern hardwoods and conifers in the Northeast. The socio-economic situation of the forests is equally diverse. Indians' needs from their forestland are multifaceted: forests provide everything from stumpage revenue to employment to game to religious sanctuaries. Managing for such a broad array of ecosystems and human needs is challenging—indeed the complexity continues to grow.

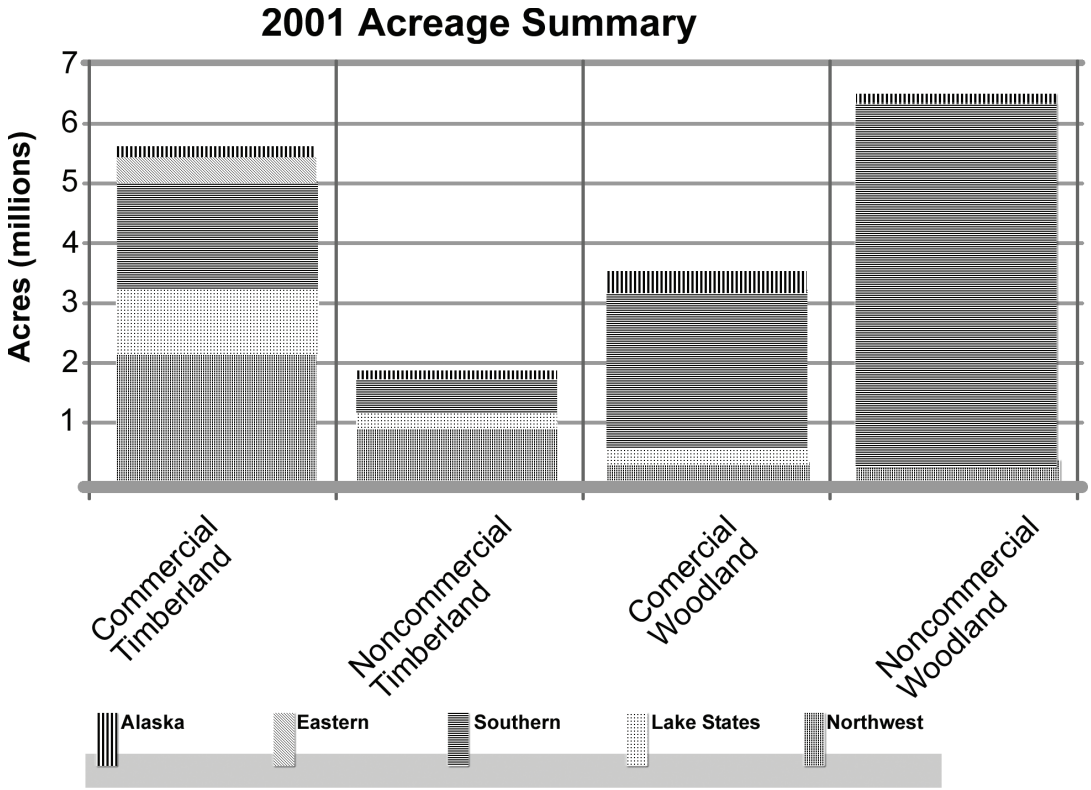
There are almost 18 million acres of forestland on Indian reservations in the United States. Approximately 7.7 million forested acres are classified as timberland, with the remaining 10.2 million acres classified as woodland (that is, forest with less than five percent canopy cover of commercial timber species but at least ten percent total canopy cover). Of these totals, 5.7 million acres are classified as commercial timberland and 3.5 million acres as commercial woodland. Noncommercial acres include those that are unproductive, inaccessible, or reserved.

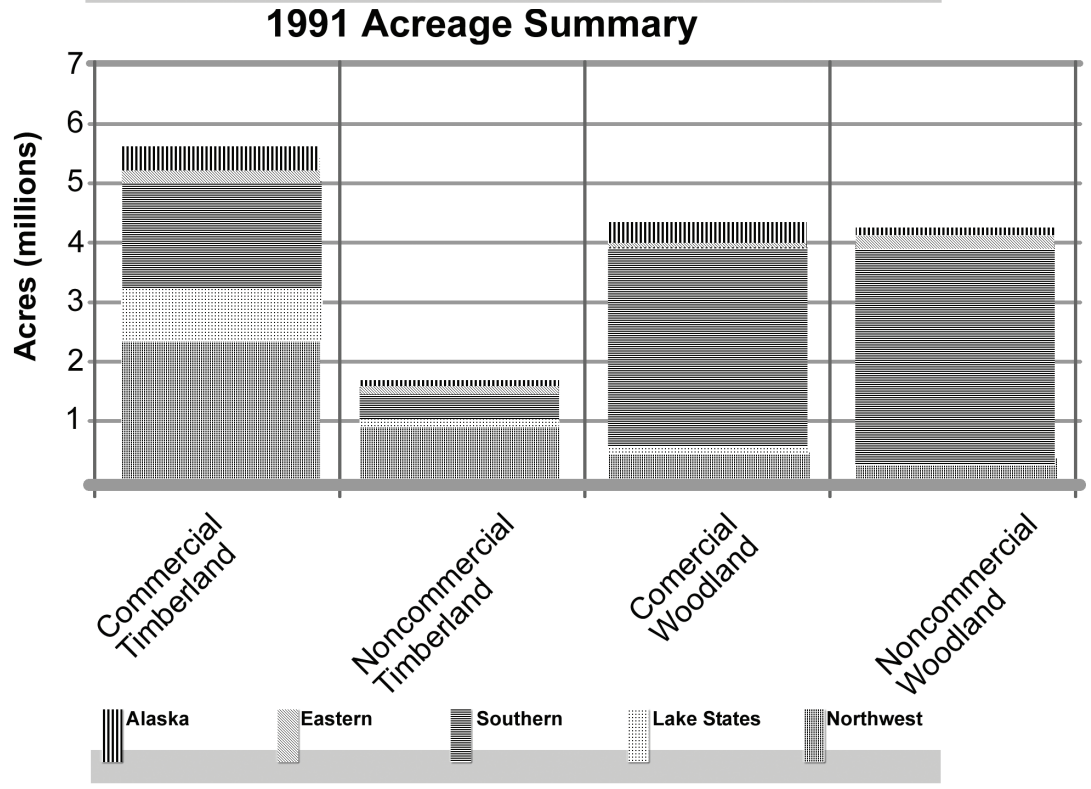
Figures 4a and 4b provide information about changes in the overall acreage of tribal forestland over the last decade. The increase in total forestland area is in part attributable to purchases of new fee lands, including buyout of in-holdings on reservations. The change in woodland acres is largely attributable to adjustments to forestland classification and large fee acquisitions in the Southwest.

D. Stepanauskas

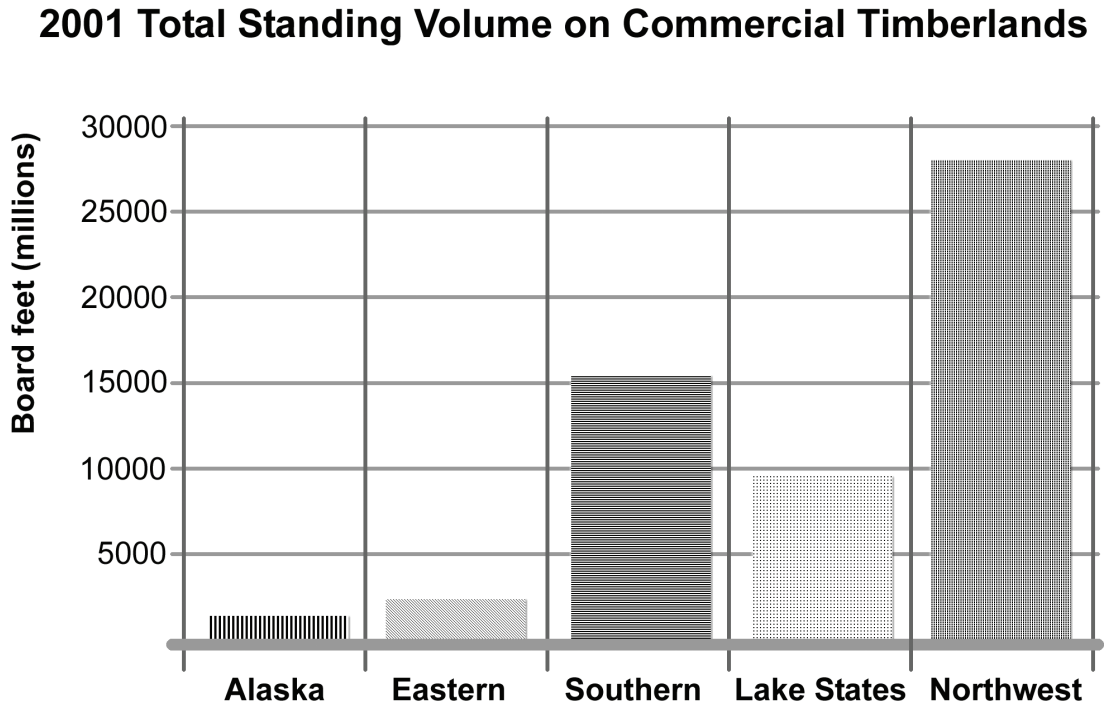
A Minnesota lake

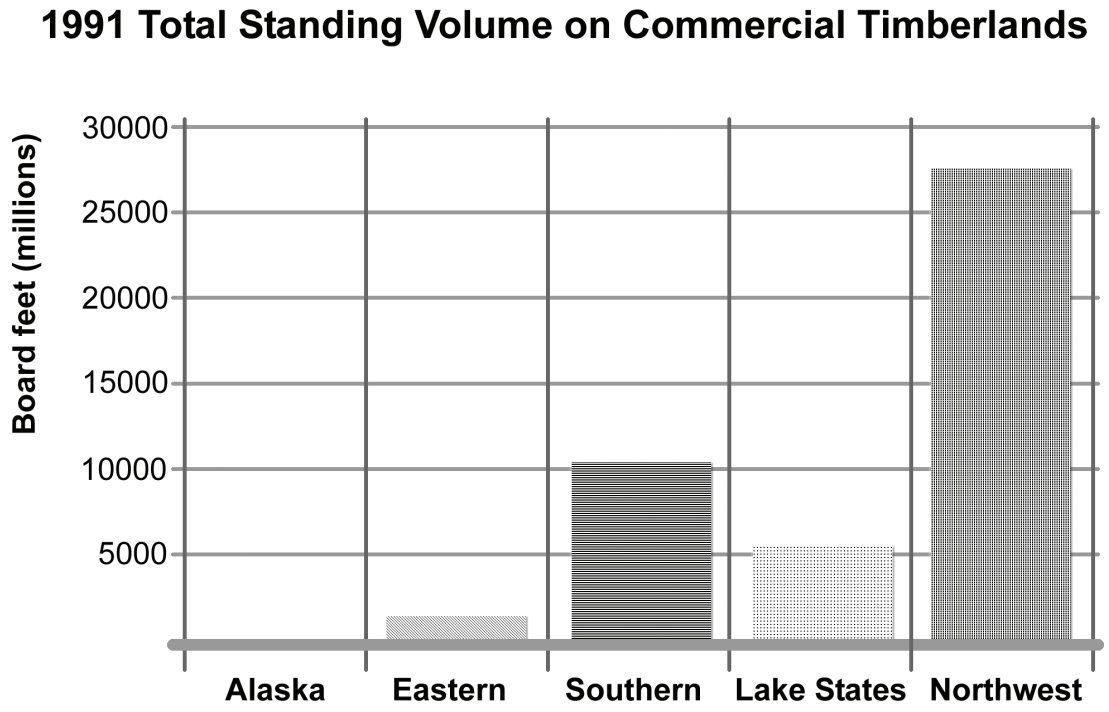
Figures 4a, b. Acreage of trust and fee land on Indian forests by region. The non-commercial category includes unproductive, reserved and inaccessible land (a. BIA 2001. Status of forest management inventories and planning. b. IFMAT-I 1991).





Figures 5a, b. Standing volume on trust and fee commercial timberlands on all reservations. (Source a. BIA 2002. Forestry Program 2001 Funding and Position Analysis. b. IFMAT-I 1991. Note, 1991 Alaska data not available).





Most of the timber harvested on tribal forests comes from the 5.7 million acres of commercial timberland. These 5.7 million acres contain 43 billion board feet, most of which is Douglas-fir, Ponderosa pine, and white pine. The Northwest region has 55 percent of the standing volume (Figure 5a), and contains the most commercial timber acreage (35 percent of the total) of any region.

The average industrial wood harvest on all Indian commercial timberland and woodland in the 1990s was over 700 million board feet per year; it was just over 600 million board feet in 2000 and 2001 (Figure 6a). The Northwest produced almost twice the volume of the other regions combined during the period from 1991 to 2001.

Woodlands comprise 57 percent of total Indian forestland area. The commercial woodland has a standing volume of almost ten billion board feet. Woodlands provide numerous products such as firewood, pinyon nuts, acorns, medicinal plants, and range forage. Most woodland area, over nine million acres, is in the Southwest region. The pinyon-juniper type of the Southwest is the most prevalent ecosystem type within the woodland classification. The other woodland types are juniper (eastern Oregon, Washington, and northeastern California); oak (California, the Southwest, and Oklahoma); the aspen types (the Rockies); mesquite (Southwest); and Sabal palm (Florida). In total, 187 tribes have woodlands; 104 tribes have only woodlands.

Indian forests contribute a relatively small proportion of the nation's total wood supply, about one percent, but their timber today is especially important locally and regionally. In the mid-1990s, timber from Indian forests accounted for almost four percent of the harvested volume in the Rocky Mountains and Southwest based on 1996 U.S. Forest Service Resource Planning Act data. In the Northwest Indian timber accounted for about two percent of the harvested volume during the same period. Due to changes in Forest Service policy, which have reduced harvests on federal land, some of the tribes in the Southwest and California are now the only consistent supply of timber. Mill closures caused by the loss of timber from federal lands have created a problem for some tribes by limiting their market and increasing transport costs.

The market for small diameter trees is particularly important for maintaining forest health. However, there is a limited market for small diameter and low quality timber, with potential supply far exceeding demand. In some regions, tribes have found a market for small diameter trees, including dead and dying, as biomass fuel for cogeneration plants.

Further mill closures may be necessitated by the forest fires of 2002 which burned a record acreage throughout the Western U.S.. These losses threaten the long-term economic well-being of several tribes. A series of drought years appears to have exacerbated the intensity and extent of these fires. Persistent forest health problems, including insects and overstocking, certainly led to some fires, but other lands which were in good condition were heavily burned as well. The impact of initiatives proposed in 2003 for fuels reduction is not yet certain. Another change in the area of tribal forestland is due to federally imposed constraints which have in some cases reduced the area of commercial timberland by imposing restrictions for habitat and water quality. Although seen as necessary to protect wildlife and water resources, these restrictions reduce available timber volume, a financial liability for tribes.

The 12 BIA Regional Offices have been classified into five regions for the purpose of forest analysis, as was done in IFMAT-I (see table 7).

Region	Acreage (millions)	Timber Volume (MMBF)
Northwest (Rocky Mountain, Northwest, Pacific)	3.8	28,386
Lake States (Great Plains, Southern, Plains, Midwest, Eastern Oklahoma)	1.5	9,559
Southwest (Southwest, West)	11.7	15,044
East (Eastern)	0.4	1,617
Alaska	0.5	1,198
TOTAL	17.9	55,803

Table 7. Regional acreage and volume summary. (Funding & Position Analysis for 2001, Dec. 2002.)

Quinault Reservation M. Sterner

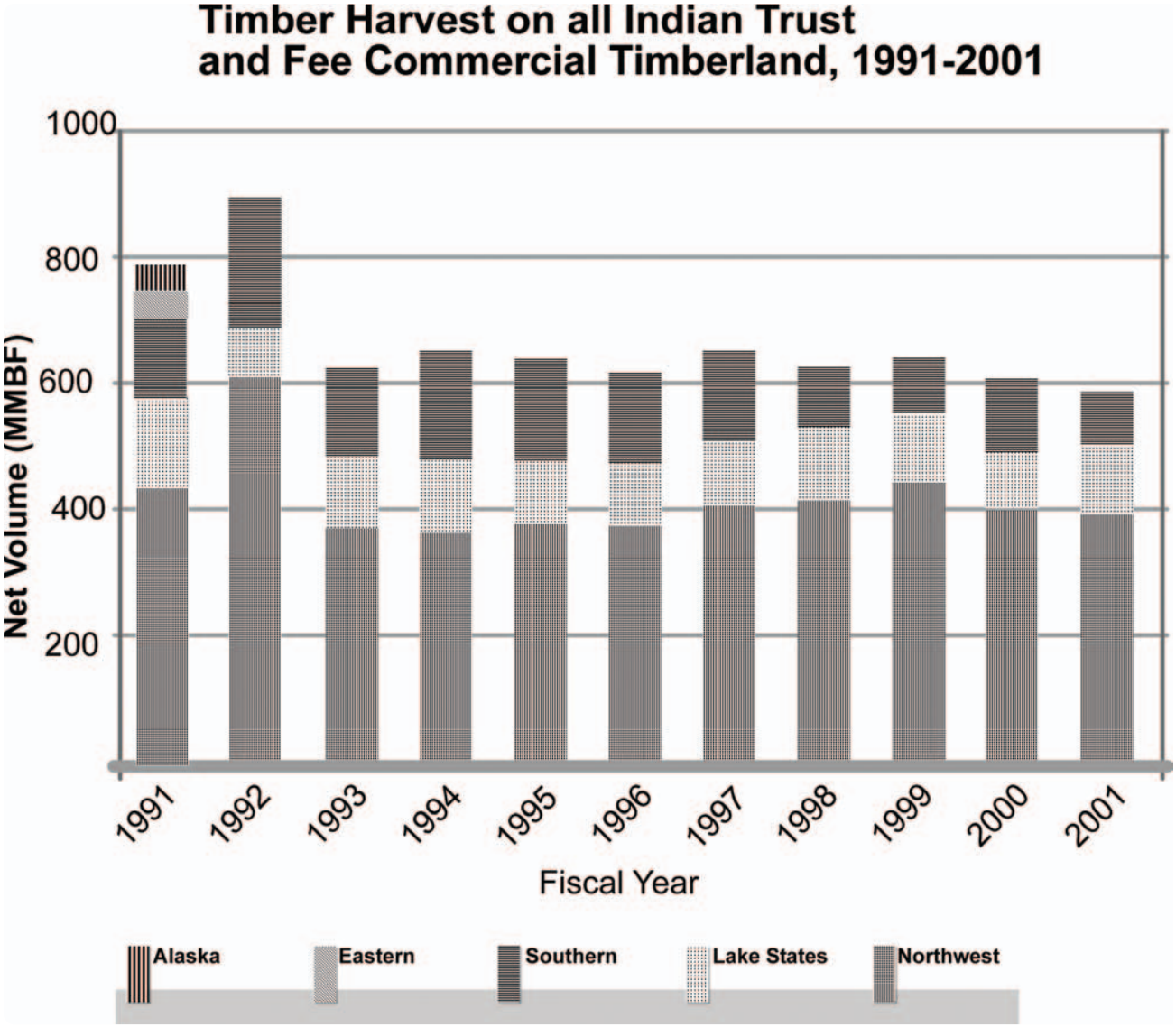
Economic Importance

In the 2001 fiscal year, forests and forestry on Indian lands supported over 2,400 positions directly with the BIA and tribes for Indians and non-Indians. The Indian forest resource provides 30,800 full-time equivalent jobs with personal revenues of approximately $477 million.

Fire funding through BIA and tribes provides $30 million a year in wages. The 2002 fire season provided twice that amount. Staff often leave their home reservations for fire work in other regions. This has positive and negative consequences. On the positive side, worker remittances indicate that remote fire earnings are sent home. However, tribes who provide fire employees to remote locations are strained by the loss of staff during the fire season. Tribal agency total staffing has increased since 1991, and approximately 50 percent of that staffing is for fire programs. Fire programs thus provide a significant source of employment for tribal members.

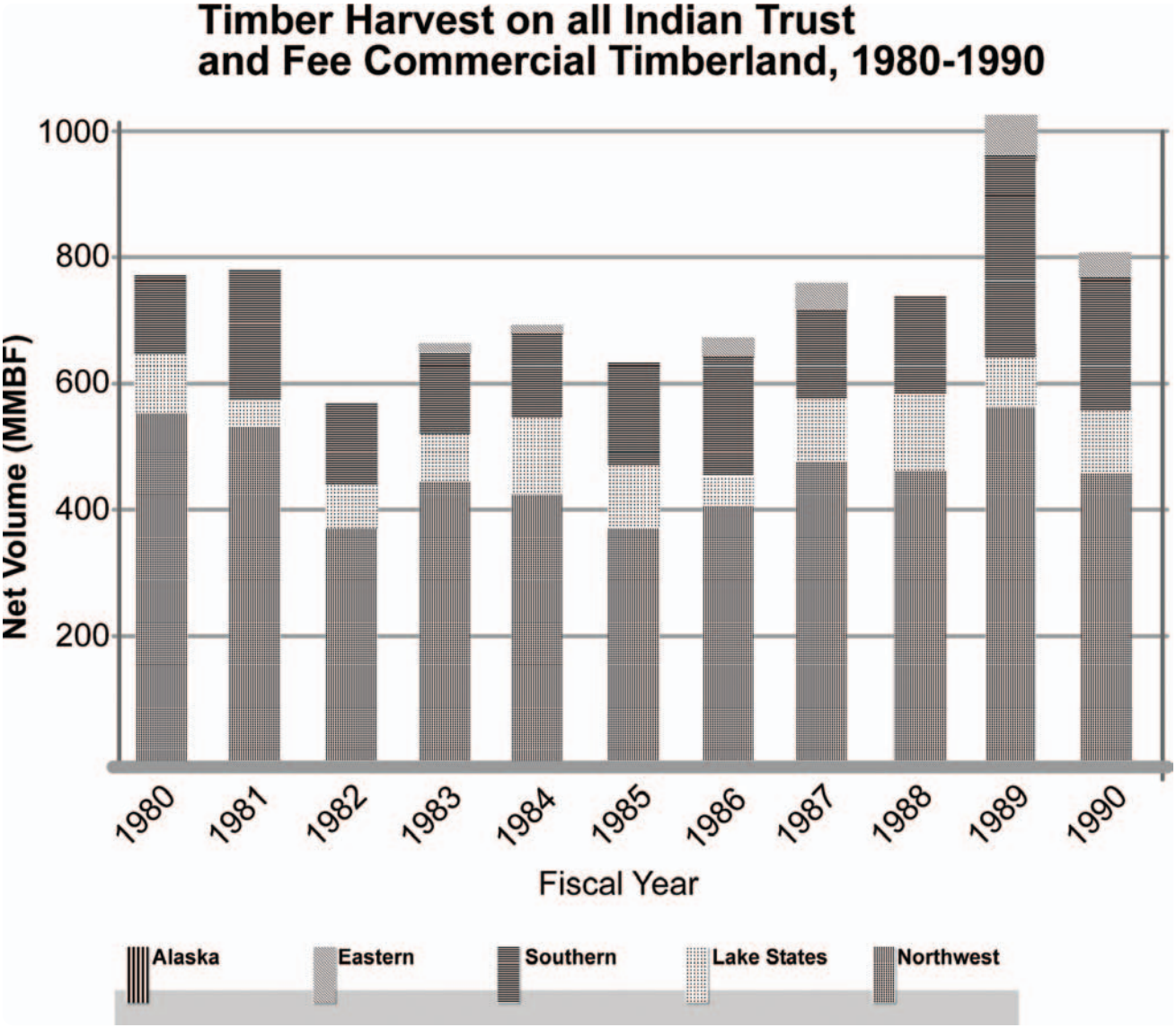
Figures on economic benefits to Indians have not been updated by a central source due to cuts to the BIA economic analysis staff. Thus, the most up to date data (BIA 1988) come from the same source used by IFMAT-I. Indians are able to realize personal use benefits from their forests, although again the current economic value of these has not been estimated (personal use benefits are an estimate of the non-market values realized by Indians as a result of their efforts to obtain and prepare non-marketed traditional forest products).

Figures 6 a. Timber harvest on all Indian trust and fee commercial timberland. Millions of board feet (values are rounded). (a. BIA 2002. Tribal harvest by year. b. IFMAT-I 1991).



MMBF	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Northwest	448	614	389	392	388	396	429	439	470	423	435
Lake States	110	116	123	134	144	123	129	139	120	97	95
Southwest	142	155	105	133	110	114	113	80	78	86	63
Eastern	22	19	17	16	16	17	15	14	13	11	13
Alaska	7	8	0	1	0	0	0	0	0	2	0
Total	730	912	634	676	658	650	686	672	681	619	606

Figures 6 b. Timber harvest on all Indian trust and fee commercial timberland. Millions of board feet (values are rounded). (a. BIA 2002. Tribal harvest by year. b. IFMAT-I 1991).



MMBF	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Northwest	567	538	364	477	458	417	430	501	499	572	471
Lake States	86	81	71	48	106	104	41	85	105	89	107
Southwest	109	144	138	125	134	126	191	131	126	341	207
Eastern	2	6	7	11	9	0	20	21	0	30	23
Alaska	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total	764	768	580	660	707	647	682	738	730	1032	808

Harvest volume and stumpage values have decreased over the last ten years, but most of the economic return from Indian forests ($85.9 million in stumpage revenue for timber in 2001) is derived from the industrial harvest from commercial timberland. In 2001, the Northwest region accounted for over 70 percent of the harvested timber volume and more than 85 percent of the revenue, followed by the Lake States at 13.5 percent of the harvested timber volume and over seven percent of the revenue. Woodlands are a significant source of other goods, some of which are unpriced. Firewood is the most valuable woodland product overall, followed by pinyon nuts and range forage. The most recent analysis by the BIA dates from 1988; it estimated that the annual value of woodland products was approximately $38 million.

Tule River Reservation M. Sterner

Other Forest Resources, including Non-Timber Forest Products

Fish, wildlife, range, and water continue to be highly valued because of their economic, recreational, cultural, and aesthetic values. In some areas non-timber forest products are key components of tribal subsistence, lifestyle, and economy.

Fishing and hunting are important recreational and cultural activities, and generate income for tribes whose members are commercial fishermen or professional hunting and fishing guides, and through the sale of big game permits. Wildlife contributes to religious, cultural, and medicinal needs. Items such as elk and deer antlers are sold locally for carving or as medicines. The ability to hunt and fish is integral to the survival of the culture of many tribes. The forest is a sanctuary for worship and religious ceremonies and offers a refuge for solitude. Wilderness areas are often included in tribal Forest Management Plans for these reasons. Within the forest lie burial sites and other culturally significant areas. The forest is the source of traditional foods such as huckleberries, pine nuts, acorns, and medicinal plants. Non-timber plant resources contribute substantially to tribal economies by providing specialty foods and herbal medicines.

Forested watersheds are essential for protecting water resources. Water supports recreation, fish, wildlife, and livestock, provides aesthetic enjoyment, and is used domestically and industrially. The fair allocation of this scarce resource is a cause of conflict within tribes, and between tribes and non-tribal landowners. The value of water to tribal communities is not limited to withdrawal. For many tribal communities, the value of water is in situ—in streams and lakes for wildlife, fish, and spiritual purposes.

Findings

(1) The funding and management programs available for inventory and monitoring of forest resources other than timber have improved, but are still deficient. Tracking of forest attributes important to the broad suite of forest values sought by tribes are still not adequately funded and included in forest measurement protocols. Today, as in 1991, little information is available at the regional and national levels, although the few tribes with completed IRMPs do have updated timber and non-timber inventory information. A centralized database of species and plant and wildlife habitat condition on each reservation would be exceedingly valuable in the future for evaluating the condition of Indian forests. Such a database should be funded and created.

(2) Federally imposed constraints to protect fish and wildlife habitat have effectively reduced the size and value of timber resources on tribal lands. Set asides from timber harvest for habitat purposes have had a measurable impact on the timber production from Indian forests, although harvests have been maintained close to historic levels on many reservations. These under-funded or unfunded mandates may distort forest management, deprive Indian landowners of revenue, and reduce funds available for stewardship.

(3) New services have evolved such as the potential market for carbon credit trading and biomass energy. Some tribes have already made progress on exploring emerging markets for carbon credit trading. All tribes were informed of the opportunity of carbon credit trading during the 26th ITC Symposium in April, 2002. Tribal corporations in Alaska have been especially active in pursuing carbon trading issues. At this time, however, these opportunities do not appear to be developing rapidly in the absence of firm national and international markets for carbon credits.

Biomass energy utilization offers a potential market for small diameter, and dead and dying trees. Use of biomass energy offers the possibility of economically reducing wildfire risk.

(4) The current state of international timber economics affects Indian forests. Like all timber production forests in America, Indian forests are impacted by international timber market conditions. A decline in the export log market has reduced prices for Indian timber in the West. At the same time, increased availability of timber and wood products from Canada and offshore sources, such as South America and New Zealand, has adversely affected timber prices. Canada remains the largest wood exporter to the U.S. market in spite of the on-going U.S.-Canada softwood lumber dispute.

(5) The reduction in harvest from the National Forest system has caused some U.S. mills to buy more imported logs, and other mills have closed. Several tribes stated that the number of mills to which they have access has decreased since 1991. Stumpage prices have remained low and transport prices have increased as distance to mills has grown.

(6) Indian forestlands have special ecological value as a component of the mosaic of forested landscapes which includes Federal, private, and industrial forestland in the U.S. The importance of Indian forestland at this scale has only become understood in recent years. It can provide connectivity between wildlife habitat area and provides habitat diversity. Tribal forests also serve as an example to other landowners of sustainable forest management that provides numerous economic and cultural benefits to tribal communities while protecting ecosystem structure and function.

V. THE LEGISLATIVELY MANDATED TASKS

A. Comparative Analysis of Management Practices and Funding

An in-depth analysis of management practices on, and the level of funding for, specific Indian forestland compared with similar federal and private forestlands (25 CFR 163.81 Assessment guidelines).

Findings

Funding for Indian forestland management is divided between forestry (growing, tending, and harvesting of trees) and the fire program (fuels management, fire preparedness, and emergency stabilization activities). Exact division of costs is not always possible and there are shared costs in terms of staff, facilities, vegetation treatments, and transportation systems.

(1) There has been a significant increase in funding for fuels management, fire preparedness, and emergency stabilization activities to handle the heavy fuel loadings that have accumulated due to past management practices, particularly in the West. However, in large part, restrictions on the use of these funds provide only limited support to the forestry program and peripherally support timber production. Federal funding for the forestry program on Indian forestlands has eroded in real terms. The inflation adjusted 1991 budget for the forestry component of the forest management program was $52.6 million (2001 dollars) (table 8a). The 2001 forestry budget is $50.7 million. During that period tribal forestlands increased from 16 million acres to 17.9 million acres.

Funding Source	2001 million $	1991 million $
BIA Forestry Program	50.7	52.6
BIA Special non-recurring	8.1	0.4
BIA Fire	109.1	28.5
Tribal Contributions	23.5	24.0
All Sources	191.4	105.5

Table 8a. A comparison of federal and tribal contributions between 2001 and 1991 for funding for the forest management program on Indian Forests. (Data for 1991 adjusted to 2001 dollars using CPI adjustment factor from 2001.) Tribal contributions differ from IFMAT-I report due to change in BIA accounting convention. Forestry Program includes Special Recurring funding such as funding for implementing the Endangered Species Act. (BIA Funding and Position Analysis, December, 2002)

Federal special "non-recurring" funding did markedly increase in 2001 (see table 8a), but this was primarily directed toward mitigation of fire damage on tribal lands from fires originating on adjacent federal lands that spread to tribal lands.

Tribal contributions to forestry programs slightly declined from $24.0 million in 1991 to $23.5 million in 2001. Tribal contributions depend in large part on management deductions from timber revenue. A combination of lower harvest volumes and lower stumpage prices may make it difficult for tribes to continue this level of contribution.

The most significant funding change since 1991 has been the increase of the fire program on Indian lands, in real terms, a gain of almost $81 million, almost four times the 1991 level. This increase in funding recognizes the large buildup of fuels on many tribal forests in the west that have resulted from previous forest management. The funds are specifically targeted toward fuels management, fire preparedness, and emergency stabilization activities. Current fire fund allocation procedures sometimes incur inefficiencies in overall management by separating projects of fuel reduction from harvesting activities when their joint operation would reduce overall management costs.

(2) The funding gap identified between Indian forestlands and the National Forests in 1991 has been reduced. This has been due to reductions in National Forest funding, a change in National Forest mission, increased funding for the Indian fire program, and increased funding for special projects rather than increased funding for the integrated management of Indian forests. In IFMAT-I, the USDA Forest Service was used as the primary comparator to gauge funding and investment levels on Indian forests. The Forest Service, through management of National Forests, is the federal agency with responsibility for managing the bulk of the nation's federal forests. The National Forests have been created out of the public domain and can be considered to be held "in trust" for the citizens of the United States. The level of federal investment in National Forests was considered an indicator of the efforts of the federal government (through the Forest Service) to carry out its "trust" responsibilities on the National Forests. We compare federal funding for Indian forests to the National Forests below, and then, in findings (3) and (4), discuss why the National Forests may no longer be the best comparator and consider other owners for more appropriate comparison.

J. Franklin

White Mountain Apache Reservation

In 1991, the average per acre funding for the overall fire and forestry program for tribal forestlands was 38 percent (29 percent excluding tribal contributions) of the funding available for management of lands in the National Forest system (Table 8b). This gap has been reduced. In 2001 the average per acre funding for the overall Indian program was 78 percent (69 percent excluding tribal contributions) of the funding of the National Forest System. The major reasons for the gap reduction have been the large increase in funding of the Indian fire program and the redirection of activities away from commodity production on the National Forests.

The 2001 fire program allocation is now 57 percent (65 percent excluding tribal contributions) of the overall Indian fire and forestry budget allocation. This compares to a National Forest fire program allocation of about 30 percent of the 2001 USDA Forest Service National Forest system budget. Since fire funds can be used only for fuels management, fire preparedness, and emergency stabilization, they only contribute peripherally to general forest management.

Funding for the Indian forestry program continues to trail far behind federal funding for forestry activities on the National Forests. In 1991, per acre federal funding for forestry on Indian forests was 22 percent of the federal funding for forestry on the National Forests. In 2001 it had grown slightly to 30 percent of the per acre funding for forestry activities on the National Forests. But real federal funding per acre for forestry on Indian forests had actually declined from $3.29 per acre to $2.83 per acre.

Recent litigation, judicial decisions, and wrangling with federal regulatory agencies have largely suspended active timber management on the National Forests, including timber salvage following fire and insect attack. Direct and indirect economic contributions from federal timber production to local communities in the West have largely disappeared.

Table 8b. Comparison of funding and revenues between 2001 and 1991 for Indian Forests and National Forests (1991 data adjusted to 2001 dollars using CPI adjustment factor from 2001). Indian forest land bases referenced are commercial timberland and total timberland plus woodland acres. National forest total land base includes about 3.0% national grasslands and other miscellaneous categories. Dollar values in parentheses do not include tribal contributions. (BIA Funding and Position Analysis, December, 2002)

	2001		1991	
Owner	**Indian**	**NF System**	**Indian**	**NF System**
Total Intergrated Mgmt Funding				
w/o fire (million $)	82.3 (50.7)	1,815.6	81.5 (52.6)	2,900.3
w/ fire (million$)	191.4 (167.9)	2,616.4	105.5 (81.5)	3,312.1
Land Base				
Commercial (million ac)	5.7	77.8	5.6	77.8
Total Acres (million ac)	17.9	191.0	16.0	191.0
Average Funding				
w/ fire ($/ac)	4.60 (2.83)	9.51	5.09 (3.29)	15.18
w/o fire ($/ac)	10.69 (9.38)	13.70	6.59 (5.09)	17.34
Harvest				
Total (million bf)	605.5	1,939	729	10,036
Bf/ac/year	106	25	130	129
Timber Revenue				
Total (million $)	85.9	177.7	117.3	1,505.4
Avg ($/ comm. ac)	15.07	2.28	20.94	19.35
Avg ($Mbf)	142	92	161	150

Blackfeet Reservation J.Franklin

(3) The mission of the USDA Forest Service has changed to the extent that it may no longer be a useful comparator to gauge appropriate investment levels in Indian country, particularly for the Western tribes. In USDA Forest Service Region 6, formerly the largest contributor to National Forest timber harvest, harvest levels in 2000 were less than ten percent of the 1990 level and staff was only 60 percent of the 1990 level. As Mt. Hood (Oregon) Forest Supervisor Gary Larsen (2002) said, "The amount of timber we are generating per planning dollar is just a lot smaller than it once was."

In rural counties nationwide, direct Congressional financial support to the counties now substitutes for timber receipts. In the current context, one must ask whether the National Forests remain a useful comparator in the West for tribal forests whose owners live close to the forest and with the consequences of their actions. Arguably, the U.S. Department of the Interior Bureau of Land Management (BLM) has maintained a more active forestry program and their forest health improvement programs have been more aggressive. For the West, an additional comparison might be with the state forests that are held "in trust" for the citizens of the states. In the Interior West and Eastern regions, where forests are of relatively lower economic importance, a comparison with the National Forests may still be meaningful.

Furthermore, there is a growing awareness that investments in forest health on the national forests are not adequate and political leaders are now debating how much additional investment will be allocated. Thus, current levels of federal investment on the National Forests should be regarded as a lower limit, particularly in the fire-prone Western forests where many Indian forests share either common boundaries or common vegetation conditions with the adjacent National Forests.

(4) In the Pacific Northwest, where the majority of the highly productive Indian forestlands are located, funding is substantially less than that of adjacent state and private owners. More than 50 percent of the BIA and tribal funding for forestry is invested in the Northwest. Although per acre funding for tribal forests in the Northwest Region now exceeds current federal funding for National Forests in the Northwest under their current management direction, the funding levels lag behind other owners in the region (table 9) for whom timber production is an important goal.

(5) Smaller forest units are more expensive to manage on a per acre basis than larger forest units. Regardless of the size of the forest, a minimum staff and infrastructure need to be maintained. Past management studies have shown that the per acre cost for delivery of management services decreases with increasing forest size. The cost structure of the National Forests results from districts of 100,000 acres or more. Few tribes have more than 100,000 acres while many have less than 20,000 acres. Thus, costs for administration of federal, state, and larger private forests must be considered a lower limit for comparison of management costs. Although the BIA has tried to gain efficiencies for delivery of technical services to smaller reservations though regional centers, cost differences will persist and should be recognized.

Owner	$/acre/year	BF harvest/total forest acres	$/MBF
Private	40	350+	114
State	33	330	100
BLM	27	85	318
Tribes NW	18	200	92
National Forest	18	14	1,286

Table 9. A comparison of the state and private forestland budgets in the Pacific Northwest. State funding is a weighted average of 1.4 million acres of Washington DNR and Oregon Department of Forestry lands. Private is a weighted average of 2 million acres of forest industry lands. USDI Bureau of Land Management (BLM) is a weighted average of 0.6 million acres. Costs do not include fire control.

Recommendation

(1) Invest in tribal forestry through the federal appropriations process, and insure and coordinate existing funding to bring per acre investment to the current level of investment in similar federal, state, and private forests. Insure that "fire money" forms a permanent part of the base of Indian forest funding in order to efficiently address forest health as part of overall forest management. Implement coordinating procedures that increase the effectiveness of fire funds in contributing to fire management, timber production, and ecological service objectives. Within the next ten years, bring investment in Indian forestry to parity with investment in other forests as a clear indication that federal trust responsibility is being effectively discharged. Further increase the level of effort in forest health and silviculture by providing more funds and better integrated funding mechanisms. Reduce regulatory restrictions and use emergency declarations if needed to more rapidly improve forest condition.

Quinault Reservation M. Sterner

B. Survey of Forestland Conditions

A survey of the condition of Indian forestlands, including health and productivity levels.

Forest Health and Related Issues

Forest health, which includes issues related to wildfire, insects, and disease, has been and remains a major concern on Indian forestlands throughout North America. We consider forest health and productivity in this section along with the related topics of silvicultural practices and urbanization of reservation landscapes. Forest productivity is also addressed in Section IV and Section V A (above) of this report.

Round Valley Reservation M. Sterner

Findings

(1) There has been overall improvement in the silvicultural practices in Indian forests in the decade since IFMAT-I. In addition to the observed improvement in silvicultural practices, the focus of silviculture has shifted significantly toward integrated management goals aligned with the overall vision for Indian forest lands identified in IFMAT-I. However, substantial variability does remain among the reservations in the level and quality of silvicultural practices. While silvicultural activities have advanced on most reservations, some have fallen behind or slipped from earlier levels of performance.

A greater variety of silvicultural prescriptions, including many variations on partial cutting, are more evident now on Indian forestlands than ten years ago. These incorporate innovations designed to better integrate commodity and environmental objectives, such as maintaining or enhancing structural complexity in the residual stands and structural diversity across landscapes. The increased complexity of silvicultural prescriptions reflects well on the competence of tribal and BIA foresters.

Integration of silviculture with other resource values, such as wildlife and water resources, has also improved, although this varies substantially by reservation. There are still some locations where day-to-day communication and collaboration between foresters and other resource professionals appears limited. This is particularly the case when forestry staff and other resource professionals are funded or housed separately or administered through separate lines of authority, or both.

Unfortunately, despite the substantially greater level of and qualitative improvement in silvicultural activities, conditions continue to deteriorate on many Indian forestlands as a consequence of numerous new challenges and the large historic backlog of forest health issues. New challenges include the larger scale of pest outbreaks and fires, and invasive exotic plants, insects and disease, as discussed below. This has added to management costs and necessitated the use of tribal timber management money for fuels reduction and pest treatments.

(2) Forest health issues related to insects, disease, and wildfire risk represent one of the largest continuing challenges on Indian forests. Issues related to both native and introduced (exotic) insects and disease are huge and inadequately addressed at current funding levels. While substantially greater efforts have been made during the last decade, we judge that overall conditions related to insects and disease have not significantly improved and may have deteriorated.

The Intermountain and Southwestern regions are often viewed as currently facing the most serious current problems, which include bark beetle epidemics, outbreaks of spruce budworm and other defoliating insects, and stands heavily infected with dwarf mistletoe. However, Indian forests in eastern North America also face significant problems including sugar maple decline, oak wilt, beech bark disease, hemlock woolly adelgid, impacts of air pollutants, and the consequences of such historical introductions as chestnut blight, white pine blister rust, Dutch elm disease, and gypsy moth. A virulent new fungus identified in California (an aerially-dispersed *Phytophthora*), known commonly as sudden oak death, is decimating oak woodlands and threatens catastrophic damage to hardwoods in California and southwestern Oregon.

As noted, significant increases in efforts to deal with insects and disease have occurred in the last decade. For example, the majority of the current timber harvest in Indian country comes from just a few reservations and is driven by efforts to prevent pest outbreaks. Foresters have typically been very aggressive in their efforts to deal with dwarf mistletoe, a serious problem in ponderosa pine and associated conifers throughout the Intermountain west.

Fort Bidwell Reservation M.Sterner

However, the challenges of forest insects and disease are likely to increase—rather than decrease—under current conditions. There are many reasons for this. One is the scale of current problems in the face of limited and un-integrated funding for control programs and the low economic value of many stands. Another factor is the continuing introduction of new insects and disease from abroad as well as the spread and intensification of infestations by exotics introduced earlier. A third important

factor is availability of adequate and accurate scientific knowledge and technical support for Indian forest managers with regard to insects and disease—a problem that is not unique to Indian forestlands. Some tribal and BIA forest managers were satisfied with their access to research and information while others were not.

A limited market for small and low quality logs is also an issue throughout the United States and is related to forest health. This lack of small-log markets creates challenges in treating stands for insects and disease as well as in implementing treatments to reduce wildfire risk; the need for small log markets is particularly acute in the Southwest.

Absence of markets for small, low quality logs is becoming a serious problem throughout most of North America, creating a problem for all forest landowners, not just Indian forest managers. This problem, rapidly building to crisis proportions, transcends Indian forestry, and there is probably little the tribes or BIA can do unilaterally to remedy this. Processing capacity in the West was lost as a result of the huge reduction in the availability of National Forest timber in the 1990s, and because of the increasing globalization of the markets and sources of wood products. Any remedies relevant to Indian and other forestlands will involve the development of better technology and markets for small and/or low quality logs. Until a wide array of forestland owners (public and private) collaborate to pursue these ends it is unlikely that government assistance or private innovation will be forthcoming. Hence, this may well be an issue on which Indian and other forestland owners could collaborate.

Flathead Reservation J. Franklin

(3) Indian forest managers have made significant strides in reducing the potential for wildfire during the last decade. Programs to reduce fuel loadings in Indian forests using both silvicultural treatments and prescribed burning have undergone significant expansion. The level of technical expertise associated with fire management, including implementation of prescribed fire programs, appears to have improved. There also appears to be broader acceptance of prescribed burning as an appropriate management treatment among tribal members.

Some tribes have made excellent use of special funding made available under recently enacted fire management programs. For example, tribes in the Southwest have been using such funds to creatively treat stands at the wildland-urban interface, including areas around both recreational facilities and homes. Prescriptions and implementation of actual fuel reduction programs were typically observed to be good to excellent. Risk to Indian forests also results from the condition of forests on adjacent ownerships, requiring landscape-level fuels treatments.

However, the challenges related to fire and fuel reduction remain great. Furthermore, the issue is not just the potential for catastrophic fire. Development of overstocked stands as a result of fire suppression and previous timber management efforts also contributes significantly to insect epidemics present on several reservations, and can slow the increase in value due to diameter growth of individual trees.

(4) Increased year-round human occupation of Indian forestland was noted on almost all of the reservations visited during the IFMAT-II assessment. As human populations have increased on the reservations, driven in part by the return of many Native Americans to reservation homelands from urban areas, pressure to establish new residences throughout the reservations, including forests, increases. Furthermore, there seems to be relatively little planning, coordination, and control associated with the expansion in dispersed year-round settlement of reservation lands. Efforts to reduce fire risk and mount effective suppression programs are increasingly complicated by the great expansion in settlement and urbanization of Indian forestlands.

The increasing residential development of reservation lands is creating several significant issues that need to be addressed. First, there is the loss of productive forestlands and fragmentation of wildlife habitat associated with the creation of home sites. Naturally, some of the most productive portions of the forest landscape are among the most attractive for settlement. A second, related element is the potential impact of year-round settlement on aquatic resources, including water quality. Again, sites with surface water are particularly attractive for settlement. Third, the presence of home sites within forest landscapes significantly impacts the types and intensities of forest management practices that are acceptable and influences the strategy and tactics of wildfire control programs. For example, more intensive management practices such as clearcutting are less likely to be acceptable when there are adjacent home owners. As another example, fire suppression activities will focus on protection of homes and other developments rather than minimizing fire impacts on forest resources.

Residential development of Indian lands requires further study both generically and at the tribal level to learn how to minimize long-term impacts on forestlands and resource values.

(5) The current level of effort in forest health and silviculture is inadequate in the face of the accelerating challenges to forest health in the 21st century, despite the very significant improvement in their level and quality over the past ten years. Clearly, assumption of more management responsibility by the tribes has contributed to the observed improvement and the tribes are to be commended for this. But greater effort is needed. Factors that are contributing to the overall forest health problem include:

- Inadequate funding, including funding for stand improvement work;
- Inadequate technical support and training. As noted elsewhere, the continuing downsizing of the Bureau of Indian Affairs, the major source for such technical support, is one aspect of this problem;
- Inadequate scientific information regarding insects and disease, control measures and future threats;
- Absence of markets for small, low quality logs, which make it very difficult to adequately treat immense acreages of forests; and
- Expanding insect and disease challenges, including both diversity of species and intensification of infestations.

Forest Wildlife and Wildlife Management Issues

Information collated from the SFI and FSC reviews provides some general indication of the quality of wildlife management on Indian forests as part of a tribe's total operational and management system performance measures. The combined information from SFI, FSC, and IFMAT-II provides sufficient data for making qualitative assessments of the degree of wildlife management in place on Indian reservations. Although the qualitative assessments are subjective, they are based on the best management practices, principles, and policy and can be used as indicators of overall quality expressed here as low, moderate, and high (table 10).

Region	High	Moderate	Low
Northwest	4	6	6
Lake States	1	2	2
Southwest	1	2	0
East	0	2	1
Alaska	0	1	2

Table 10. Number of tribes by Region by Degree of Wildlife Management (Source: FSC reports to tribes).

(6) For the six FSC categories applicable to wildlife the percent of tribes that met the measurement standards is as follows:

A. Habitat diversity at stand and landscape levels	47%
B. Improve science and understanding of wildlife	67%
C. Apply knowledge to manage wildlife	53%
D. Methods to promote diversity across the forest	60%
E. Management actions and strategies	57%
F. Focus on issues (listed species, biodiversity, etc.)	40%

Using an analysis of the SFI and FSC pre-certification reports and a separate IFMAT-II wildlife survey (see appendix), six tribes were rated as having a high degree of wildlife management. All of these tribes have a wildlife biologist and two met conditions for pre-certification. These tribes either have an IRMP in place or a process that integrated wildlife into timber management plans so that forestry and wildlife personnel work together to resolve resource issues. In this rating of management, there will be some areas that do not conform to the ranking assigned, but the overall rating is high.

In the same analysis, 13 tribes had a moderate degree of wildlife management. Only one tribe did not have a wildlife biologist and nine were prepared for certification. These 13 tribes have policy and practices relating to threatened and endangered species, provide habitat components for non-game species in timber sales, and have a way to integrate wildlife into their resource management plans. Management that is rated as moderate can include one or two factors that are either in the low or high rating.

Of the 30 tribes reviewed, 11 were rated as having a low degree of wildlife management. Tribes in this management level lack information for two or more of the SFI and FSC indicators for certification and nine of the 11 tribes in this category do not have a wildlife biologist. Of the two that have a biologist, their focus is not well integrated with other resources, but threatened and endangered species receive some management attention. Most of these tribes rank in the lower third in terms of reservation size. In evaluating a low assessment, one must remember that there will be some criteria ranked as moderate or high, but the overall rating will remain low.

Mescalero Apache. J.Franklin

(7) A comparison of wildlife management assessments made among seven tribes reviewed in 1991 and again in 2001 revealed little change over ten years. One tribe went from a high to a moderate rating and one went from a moderate to a high rating. The six tribes that were doing well are still managing at the same level and the one tribe that was rated as low is still in this category.

Although there is a wide range in how tribes manage their wildlife resource, there is some commonality of factors that contribute to management activities. With a few exceptions, there are at least three general tendencies observed regarding the quality of wildlife management on Indian reservations:

- Tribes with large forested reservations are better able to provide funding and personnel for wildlife management activities than smaller tribes;
- Tribes that meet the criteria for certification by SFI and FSC are more likely to have a moderate to high degree of wildlife management than those that have gaps in their certification requirements; and
- Tribes that have a wildlife biologist are more likely to have a moderate to high degree of wildlife management than those without biologists.

(8) Many problems and issues (listed below) relating to wildlife management on Indian reservations are the same as those on state and federal lands and could provide increased opportunities for cooperation with adjacent landowners.

- Designating areas that can support specific wildlife populations of interest to tribes and neighbors;
- Working to protect threatened and endangered species without decreasing other tribal values;
- Enhancing fisheries to meet subsistence needs;
- Improving retention of habitat snags and dead and down material in harvested areas;
- Retaining appropriately sized areas of old growth for wildlife habitat;
- Conducting better wildlife surveys to improve population estimates;
- Funding research on key wildlife species;
- Coordinating wildlife with other resources in the planning process, especially timber harvests;
- Reducing the loss of habitat due to residential and other construction;
- Providing appropriate predator control to increase desired wildlife populations; and
- Reducing erosion to protect aquatic habitat.

Two overarching issues are conflicts between wildlife and forestry staff in deciding wildlife needs when planning and executing timber harvests, and tribal sovereignty. The latter issue, sovereignty, is critical to effective cooperative landscape management. Cooperative relationships between landowners must maintain fairness and the independence to make decisions. Tribal managers have experienced restrictions on tribal management prerogatives to compensate for environmental deterioration on other ownerships, and therefore approach these relationships cautiously.

Range Resources

(9) Grazing has a significant impact on sensitive areas such as riparian zones and at high elevation when there is open grazing access. Information for assessing range condition was difficult to obtain and came mostly from the IFMAT-II wildlife and range questionnaire returned by 18 tribes of the 30 participating in IFMAT-II. Of these tribes, half had livestock grazing on the reservation, but only one had a range management system in place. Several tribes indicated that because of grazing problems in the past, livestock were removed from the reservation. While open access is beneficial for some individuals, damages are incurred as a cost to tribes. Costs include the degradation of other resources and increased need for restoration.

Woodland Management and Firewood Harvest

(10) Firewood harvest from tribal forests and woodlands represents a small percentage of the biomass and value removed through management, but it accounts for a significant impact on sensitive sites and favored species. Firewood is important to Indian communities who rely on it for home heating and cooking as well as for traditional cultural practices. Nevertheless, firewood is a low value product that does not often attract the attention of land managers or researchers, and thus has not been effectively addressed on most reservations. Firewood harvesting has an impact on commercial forestland in all regions of the country, but may be most dramatic in woodland ecosystems.

Table 11a. Change in total woodland volume (MMBF) (BIA Funding and Position Analysis, Dec. 2002). Difference is largely due to change in acreage.

Region	2001	1991	% Change
Northwest	1.627.1	1.607.1	1.2
Lake States	1,228.9	1,018.4	20.7
Southwest	16,283.9	10,999.9	48.0
East	0	0	0
Alaska	638.9	712.6	-4.0
Total	19,823.8	14,338.0	38.3

Table 11b. Standing volume (MMBF) of commercial timberlands and woodlands (BIA 1992, 2002).

	2001	1991
Timberland	43,468	41,746
Woodland	9,912	14,338

In 2001, commercial woodlands accounted for 38 percent of commercial forestland acreage and contained 19 percent of the commercial volume, representing 11 percent of the allowable annual cut (table 11b). In 1991, commercial woodland area was larger and accounted for 26 percent of the commercial volume. Some tribes have policies to issue permits for firewood cutting. These permits are intended to allow for personal use harvesting, although commercial firewood cutting may occur. Other tribes have official permit policies, but do not actually issue permits. Even when permits are issued, few forestry programs are able to do adequate follow-up and monitoring. The lack of monitoring results in poor understanding of forest and woodland health, tree regeneration, stocking, and species composition (see table 12).

Woodland and firewood management monitoring is not consistent with commercial timber harvest monitoring. Most firewood harvesting is solely for personal use, however, some individuals do cut firewood in large quantities to be sold off of the reservation. Regulations on firewood harvests, where they exist, tend not to affect allotment land where a large quantity of firewood is cut. This differs from the situation of commercial timber harvests, which are closely monitored by forestry departments on both tribal trust and allotment land.

The impact of firewood harvesting is also apparent in the eastern U.S., although there are few uniquely defined woodlands. Here the species favored for firewood are white ash, red oaks, and hickory. In all regions of the country there is a clear pattern of concentrated harvesting along infrequently traveled secondary roads. Also, firewood extraction is concentrated at more accessible, lower elevation sites. However, the spatial distribution of this activity even in commercial forestland makes it unlikely to be detected by forest inventories.

(11) Few Indian forestry departments devote staff to firewood management. Commercial timberland receives first priority, often leaving too little time for woodland management. This makes it difficult to educate the tribal public, to conduct field checks of firewood harvesters, and to identify restricted harvest areas. Monitoring of the resource is challenging because continuous forest inventory (CFI) plots often are not located in woodlands.

Report (Source)	Cited as Silvicultural Tool (remove small diameter trees)		Pre-Land Use Conversion Activity		Cited illegal Cutting as a problem		Permits Required	
NIFRMA	Lake States	3	Northwest	1	Northwest	3	Northwest	2
			Eastern	1	Southwest	2	Eastern	1
					Eastern	1		
SFI	Northwest	2						
	Southwest	1						
	Eastern	2						
FSC	Northwest	3			Northwest	6	Eastern	1
	Lake States	1			Lake States	1		
	Southwest	2			Southwest	1		
	Alaska	1			Eastern	1		

Table 12. Review of NIFRMA, SFI, and FSC reports (2001) for information on firewood cutting. (Region, number of tribes).

White Mountain Apache Reservation J. Franklin

Many western tribes have woodlands that are ecologically separate from commercial forestland. The responsibility for woodland management is sometimes ambiguous, caught between rangeland and forest. Foresters and range managers are often ambivalent about woodland ecosystems, or at least their responsibilities are unclear. These woodlands are found at lower, more accessible elevations than the commercial forest. They do not often contain large volumes of commercially valuable timber, thus are not subject to large-scale harvesting. They also do not receive significant management attention, with infrequent inventories, little investment in roads, and insufficient personnel.

Western woodlands are typically composed of species appropriate for firewood, such as blue oak, black oak, Gambel oak, pinyon pine, and juniper. These woodland tree species occur only in narrow altitudinal zones, near ephemeral watercourses, or on particular soil types. As such, the potential range of these species is limited. Resource managers have stated that some woodland species do not regenerate well because either they do not coppice sprout, the seedbed or canopy opening is not appropriate for the species requirements, or because of secondary disturbances caused by livestock or wildlife browse. Field observation indicates that firewood harvest on some sites can negatively impact the condition of forest and woodland resources. The impact of firewood harvest, however cannot be quantitatively determined due to the absence of adequate inventory and monitoring data.

Access to firewood by tribal members must be maintained. Improved attention to extension programs and inventory could result in better management of the resource, including monitoring, permitting, and research.

Management of woodlands is not simply a forestry issue, because it goes beyond silviculture and wood utilization. Range and housing development pressure impact the firewood resource, while forest roads, in providing access, directly relate to excessive firewood pressure. These pressures are often too great for natural resources departments to alleviate. It is important for the tribal public to recognize that firewood collection can have a significant impact on forest resources. There needs to be wider recognition of the value of woodland ecosystems. Firewood cutting practices would improve if forestry departments had the means to direct cutting, as suggested above. Firewood is very much the forgotten resource of the American forest, and tribal lands could provide a model for national improvement.

Recommendations

(1) Increase the level of effort in forest health and siliviculture by increasing federal appropriations and coordinating current fund sources. Enhance the integrated approach to solving forest health problems while maintaining the current funding level for fire and forestry. Added funding is needed to avert or reduce the impact of future catastrophic fires and insect and disease outbreaks. The rate and risk of introduction of exotic insects and diseases in increasing, and these can only be countered by increasing technical knowledge and integrating forest management expenditures.

(2) Fund an independent study through ITC to further define the nature and impacts of urbanization on reservations including accurate assessment of acreage changes and reservation population change. Anecdotal evidence indicates that increased housing construction in and near commercial forestland may be increasing fire risk, affecting both wildlife populations and water resources, and complicating forest management. However, before prescribing remedies it is necessary to better define the problem, including its magnitude and specific nature. Although similar well-documented problems exist for non-Indian forests, the topic has received little study on tribal forests.

(3) Encourage and fund interdisciplinary and cross-boundary collaboration to enable cooperative landscape-level wildlife management activities. Wildlife and biological diversity issues are major problems and opportunities for tribes, and many tribes are understaffed with respect to these issues. Controversy abounds in the management of game and non-game species and the protection of threatened and endangered species. Habitat areas rarely coincide exactly with ownership boundaries so more effective management often requires cross boundary actions. Improved communication and collaboration across ownerships and disciplines is the only route to facilitate landscape-level management.

(4) Bring woodlands into the mainstream of forest management planning by enhancing research, inventory, and monitoring of their basic condition and of practices, such as grazing and firewood harvest, that impact them heavily. Because of their extent and ecological function as wildlife habitat, watershed protection forests, and their production of range, firewood, and non-timber forest product values, woodlands should receive more professional management attention. A better understanding of their contributions to tribal and national welfare should be sought through studies of their economic and social value. Some important and well-conceived research is currently being done on woodlands, but it is not sufficient in scope or continuity to provide the needed basic understanding of woodlands throughout tribal holdings.

(5) Firewood and other non-timber forest product harvesting should be better integrated into commercial forestry operations. Firewood production offers a means of utilizing small diameter trees from overstocked forest stands in need of thinning. Specific harvest locations should be defined by forestry staff so that rotations can be followed avoiding undue strain on a single area. Field checks of firewood cutters and enforcement of permit regulations will improve performance. Above all, firewood harvest should be used to attain silvicultural objectives while meeting tribal firewood needs.

Leech Lake Reservation D. Stepanauskas

C. Comparative Analysis of Staffing

An in-depth analysis of management practices on, and the level of staffing for, specific Indian forestland compared with similar federal and private forestlands.

Findings

(1) Overall staffing for Indian forestlands increased slightly from 1991 levels, but after adjusting for the increase in the fire program, net staffing on the forest management program has declined 26 percent (table 14). The combined federal BIA plus tribal staffing on Indian forestlands slightly increased from 2,267 full time equivalent positions (FTE) to 2,483 FTE in 2001 (table 13a). There have been two reallocations of Indian forest staffing: (a) a major increase in the percentage of tribal staff, and (b) a major shift in staff from the forestry to the fire program.

In 1991 tribal agency staff accounted for approximately 34 percent of the combined federal BIA plus tribal agency staff. In 2001, tribal staff had increased to 51 percent of total staff. The combined BIA and tribal staff increased ten percent from 1991 to 2001 (table 13a). Tribal natural resources and forestry professional staff doubled from 23 percent of total professionals in 1991 to 46 percent of total professionals in 2001. The combined BIA and tribal professional staff increased 22 percent from 1991 to 2001 (table 13b). The number of Indians employed in 1991 and 2001 is not available. Based on the sample of the 30 tribes visited, perhaps one third of tribal and BIA foresters are Indians.

	2001	1991	% Change
BIA staff	1,206	1,492	-19%
Tribal staff	1,278	775	65%
Total	2,483	2,267	10%

Table 13a. Forest staff on tribal lands (BIA 2002).

	2001	1991	% Change
BIA professional	291	342	-15%
Tribal professional	249	100	149%
Total	540	442	22%

Table 13b. Professionals on tribal lands (BIA 2002).

In 1991, approximately 73 percent of the work force was engaged in the forestry program and 27 percent were in the fire program (fire preparedness, fuels reduction, and emergency stabilization). In 2001, the forestry workforce was 49 percent of the total workforce and 51 percent were in the fire program. In absolute terms, the forestry work force is 26 percent lower in 2001 than in 1991 (Table 14) despite the fact that tribal forestlands have increased over the decade.

(2) Although the percentage of professionals in the workforce has increased, it remains well below that of federal and state agencies and private industry. Also, many BIA staff are near retirement. In 1991 about 20 percent of the workforce was in professional positions. In 2001 about 22 percent of the workforce was in professional positions, well below the National Forests that had approximately 48 percent of the workforce in professional positions. In the Pacific Northwest the percentage of

professionals in state and industry forests is even higher (Table 15). The average acres per professional staff person on tribal forestlands is greater than on the National Forests and much higher than on state and forest industry lands in the Northwest considering the total land base. If all tribal and BIA professionals were assumed to work only on commercial forest land, then the acres per professional would be similar to that found on Northwest private forests.

It is not clear that the current level of competence and commitment will be maintained. A concern raised during site visits was that a significant number of natural resource professionals are nearing retirement. However, tribal and BIA sources offer conflicting information about retirement of natural resource professionals. Based on knowledge of other federal agencies and tribal sources, it is likely that a large percentage of staff is nearing retirement age.

(3) The rapid growth of fire funding may have outpaced staff infrastructure. The rapid increase in fire funding has raised two concerns. First, funding has increased more rapidly than the staff infrastructure (space, communications, equipment) and second, there has been a drain of staff from forestry to fire in order to provide staff for the fire program. An analysis of the average funding per staff person appears to support these concerns (table 16). Funding per staff person for forestry and fire were roughly equal in 1991. In 2001, real funding per forestry staff had increased 33 percent and real funding for fire staff had increased 89 percent. Part, but not all, of the increase may be due to the increase in the percentage of professional staff (table 16). Depending upon the time needed to reduce the heavy fuel loadings to maintenance levels, a further increase in fire staff may (and probably will) be needed.

Engineering professionals are notably absent on Indian forestlands. Engineers would be able to make recommendations to improve forest roads, thus improving water quality, and to analyze management activities to increase efficiency and integration. The IFMAT-II survey of 30 tribes covering over four million acres of land identified only three engineering professionals, or less than one per one million acres. For comparison, state forestry departments and the Forest Service have on average one engineer per 125,000 acres of forestland.

	2001	1991	% Change
Forest Management Staff			
BIA	409	1,002	-59%
Tribal	815	642	27%
Total	1,224	1,645	-26%
Fire Staff			
BIA	796	490	62%
Tribal	462	133	247%
Total	1,258	622	102%
Combined Staff			
BIA	1,206	1,492	-19%
Tribal	1,277	775	65%
Total	2,483	2,267	10%

Table 14. Forestry and fire staff (BIA 1992, 2002). The 1996 data are used as an estimate of the pre-fire buildup staff level because the 1991 data for fire staff are not available.

Owner	% Professional	Forest land per Professional staff Person
BIA/Tribes, all	22%	33,000 (10,000)
National Forests, all	48%	16,000
State of Oregon	80%	6,000
NW Forest Industry	40-80%	10-15,000

Table 15. Percent of forest staff that are professionals and the acres of forest land per professional staff person (BIA 2002, USFS 2001, Oregon Department of Forestry 2001). Forest land is commercial forest plus woodlands for tribes and National Forests. Forest land for State of Oregon and NW Forest Industry is primarily commercial forest land. (Value in parentheses is commercial acres per professional staff person).

(4) BIA staffing to provide technical support at central and regional levels has been gutted over the last decade. With the growth of tribal compacting affecting resource allocation to the BIA, the overall level of BIA technical support has shrunk over the last decade. Although the central office staff has grown slightly from 1991 to 2001 (11.5 to 14.5 professional FTE), the overall level of BIA technical support in inventory and planning has declined. Staff levels should be increased at least to 1991 levels. The BIA has fewer people in inventory and planning than in the past, particularly in the Northwest Regional office and the Branch of Forest Resource Planning (BOFRP). This reduction in staffing jeopardizes support for the IRMP effort. In 1991 there were 53 current Forest Management Plans for the 198 forested reservations (27 percent). This peaked at 92 current Forest Management Plans (45 percent) in 2000 and has declined to 83 (42 percent) current Forest Management Plans in 2002. At this time there are no management planning specialists, harvest scheduling specialists, watershed specialists, hydrologists, or engineers at BOFRP to backstop the tribal IRMP process. The personnel cuts resulting from the 1995 reorganization of the BIA have essentially gutted the technical capacity of BOFRP. Considering that the BIA should not be approving operations on any reservation that does not have a current management plan, this is a serious and urgent situation.

Recommendations

(1) Perform a study to determine the condition and effectiveness of education-funding programs for tribal forest and natural resource managers. As tribes assume greater responsibility for more broadly conceived management of their forests, their success will be determined by the quality of the professional resource managers they attract and retain. There need to be adequate opportunities to educate a new generation of tribal forest resource managers. In addition, the current rate of increase in the training and continuing education of existing tribal resource managers must be maintained and increased. A study to determine the adequacy of current professional and continuing education programs should be done, and, on the basis of its results, adequate professional development and continuing education programs for all tribal resource staff should be implemented. Investments will need to be made in leadership education to improve the ability of tribal staff members to develop and apply trust standards for natural resource management of the sort this report recommends.

Mescalero Apache forestry staff in an early snowfall

J. Franklin

	2001	1991
Forest Management		
Staff	1,224	1,645
Funding	$81.5 million	$82.3 million
Funding/person	$66,584	$50,030
Fire		
Staff	1,258	622
Funding	$109.1 million	$28.5 million
Funding/person	$86,725	$45,820

Table 16. Funding per staff person (2001 dollars) (BIA 1992, 2002). Forestry funding includes special project funding and tribal contributions.

(2) Increase the effectiveness of BIA service to tribes. Greater technical expertise needs to be available to all tribes, particularly to small reservations with limited forestry and natural resources staff. A Small Tribe Technical Center which could serve many tribes efficiently is needed. The technical assistance capacity of the BIA should be rebuilt by adding regional specialists in economics, marketing, public involvement, inventory and planning, scaling, road design, fish and wildlife, and forest health. BIA attrition through retirement should be offset by recruiting, retaining, and replacing staff with adequate orientation training before institutional knowledge is irretrievably lost. BIA technical advice on Geographic Information Systems (GIS), forest inventory, and forest planning needs to be better integrated at the national level (see part V, chapter E, below).

J. Franklin

Mescalero Apache Reservation

D. Evaluation of Timber Sale Administration

An evaluation of procedures employed in timber sale administration, including preparation, field supervision, and accountability for proceeds.

Findings

The following findings draw on the six elements identified by IFMAT-I that are required in order for tribes to obtain the full benefit from timber harvested from their forests. These six elements pertain to timber sale preparation, marking, bidding, size of sale, utilization, and scaling. Business management is also pertinent.

Flathead Reservation J. Franklin

(1) Our overall assessment is that timber sale administration procedures are somewhat improved in comparison to IFMAT-I, but problems still exist. There appears to have been a general improvement in the clear identification of timber for sale since IFMAT-I, as indicated by the data gathered during the field visits to 30 tribal locations. Significant remaining problems revolve around the timely preparation of timber sales in ways that meet tribal needs. These in turn usually relate to the adequacy of personnel (see part V, chapter C, above).

(2) Lack of funding for road maintenance, particularly forest roads, and lack of coordination with BIA road departments are commonly viewed as significant barriers to improved operational performance in timber sales. A second significant problem remains in the lack of resources for planning and maintenance of roads. Road assessments and improvements are included in timber sale planning and in timber contracts, but these activities are generally restricted to the portion of the road system utilized for a particular sale. Most road planning and maintenance activities are not integrated into overall tribal forestry and land management programs. Improvements are still needed in preparing pre-sale transportation plans, sale layout, implementation of true competition for sales and logging contracts, and utilization monitoring.

(3) Timber sales accounting procedures are in place, at great cost to tribes, and appear to be utilized to focus appropriate levels of attention on the accurate measurement (scaling) of and record-keeping for harvested timber. The linkage of timber sales to tribal enterprises sometimes causes distortions in the woods, as documented in IFMAT-I, although there has been improvement in enterprise management. Marketing is still a problem and BIA technical assistance in this area has been lost since IFMAT-I. Larger tribal enterprises have upgraded timber-scaling programs to meet marketing needs at a cost of thousands of dollars. The situation has been influenced in positive ways while

Quinault Reservation M. Sterner

also made somewhat more difficult by transitional issues related to the pronounced shift towards the use of tribal forest managers and natural resources departments.

The ten year period between the initial and current IFMAT reviews was marked by substantial transition from BIA to tribal control and responsibility. Thus, there are many diverse organizational structures for the administration of timber sales. These structures can best be viewed as a continuum based on the balance between BIA organizations and tribal organizations. At opposite ends of the continuum are tribes that administer their entire resource management programs under tribal resource and forestry departments (compacting tribes) and tribes that rely on the BIA for nearly all of their forest management functions.

A blend of tribal and BIA responsibility is most common. Within these blended organizations timber sale administration is the function that most commonly remains with the BIA, or is the final function to be transferred to complete tribal control. Another feature common to blended responsibilities is the presence of a tribal natural resource department, which generally is the first department transferred to the tribal side. At this time, several tribes visited by the audit team and IFMAT-II have tribal natural resource departments and separate BIA timber sale departments. One variation involves having partial tribal staffing within BIA timber sale administration organizations.

The administrative split between natural resource departments and timber sale departments has resulted in delays in the preparation and sale of timber in some cases. This can lower the price received for timber, perhaps to zero, in areas where the timber is deteriorating due to the effects of major insect infestations or disease. The split has also exacerbated traditional differences between forestry and wildlife professionals in analytical approaches and values.

(4) Competitive bidding is not universal, with about half of tribes selling timber using open bidding. Several tribes used a mixture of open and restricted (to tribal members) bidding, with sales of allottee timber being more open. Numerous tribes allocate timber sales by agreement to tribal enterprises, most of which include sawmills.

(5) Timber sales prepared for bidding appear to be of a size that allows for competition. In most cases managers must insure that sales are not too large for potential bidders to complete in the time allowed and that the financial terms do not preclude bidding. For tribes in the most remote locations, or where mills are distant, sales must be large enough to justify the cost of mobilizing harvesting operations and to cover the costs of road improvements.

(6) Timber sale policies generally do encourage efficient use of raw material and are effectively enforced during timber harvests. Problems with utilization are largely due to poor markets for small diameter or low-quality wood, although some tribal policies designed to favor tribal loggers occasionally reduce opportunities to market such material. Enforcement of contract provisions is sometimes uneven when the logger is also a tribal member. This can be positive for individual tribal members, although it can reduce revenue for the tribe as a whole.

Tribes use a variety of appraisal methods to set stumpage rates for tribal enterprises. However, competitive bidding is uncommon when it is the intent of the tribes to transfer logs to their enterprise. Knowledge of local stumpage prices is difficult without competitive bidding. Without appropriate appraisal and knowledge of logging costs, tribes will not be able to price stumpage to maximize revenue in instances where that is their intended goal.

(7) Stumpage receipts for the tribes appear low compared to some of their neighbors, particularly in the Northwest (Table 17). This may be due to a number of factors including sales procedures, differences in timber quality, and differences in management objectives. Lower stumpage receipts are perhaps also the result of unfunded mandates, mostly in the form of habitat protection set asides that have affected season of harvest, accessible timber, and harvesting methods.

Recommendations

Although good progress has been made, the recommendations from the initial IFMAT report are still largely valid. Most recommendations are based on site visits and interviews with managers. The current recommendations parallel those of ten years ago.

(1) Fund a series of regional workshops through the ITC to determine the reason for the difference in stumpage revenues between tribes and neighboring public and private lands. Tribal stumpage revenues average 20 percent lower than comparable non-Indian ownerships in the Pacific Northwest. There could be a variety of reasons for this, but the causes are not currently apparent and should be understood in the context of federal trust responsibility.

Stumpage	($/MBF)
All Tribes	142
Tribes (PNW)	158
National Forest 2001	92
Washington DNR (west side)	330
Oregon Dept. of Forestry	300
Washington DNR (eastside)	265

Table 17. Stumpage comparison between tribes and selected neighbors (BIA 2002, USFS 2001, ODF 2001, WA DNR 2001).

(2) Periodically review timber sale policies to verify that sale procedures lead to maximum benefits for the tribe. Consider competitive bidding for all logging contracts. At a minimum, a portion of all tribal contracts should be awarded competitively as a control. Workshops for staff and information sharing between tribes could improve the logging contract process. Tribes should evaluate guidelines for timber sale size, average log pricing, and lump-sum sales to insure that they fit local conditions, and provide for revenues goals and forest improvement.

(3) Develop auditing procedures to document the competitiveness of forest-products enterprises. Use cost, value, and physical measures of logs into the mill and wood products out of the mill to help tribal governments and managers understand and evaluate enterprise performance. Transfer logs to forest-products enterprises at market value. Transferring logs at market value provides essential economic signals to enterprise managers, and encourages full utilization. Train forest managers on modern process quality control procedures. The ability of tribes to reach income and employment goals is dependent upon efficient utilization of raw material.

Warm Springs Reservation C. Mukumoto

E. Analysis of BIA Administrative Procedures

An analysis of the potential for reducing or eliminating relevant administrative procedures, rules and policies of the BIA consistent with federal trust responsibility.

Findings

(1) There has been little improvement in trust oversight of Indian forests, with BIA still "pitching and umpiring," an untenable position for the agency and the tribes. The IFMAT-I finding that "the administrative relationships among the U.S. government, tribal governments, and resource management agencies are the most important factors affecting the ability of tribes to achieve their visions for their forests," is still valid. Until trust responsibility is better defined and discharged, tribes will still be hampered in achieving their goals and the federal government still will not be effectively meeting its trust responsibility regarding Indian forests. It is still imperative that "delivery of technical services…be separated from evaluation of trust services to clarify lines of responsibility and accountability."

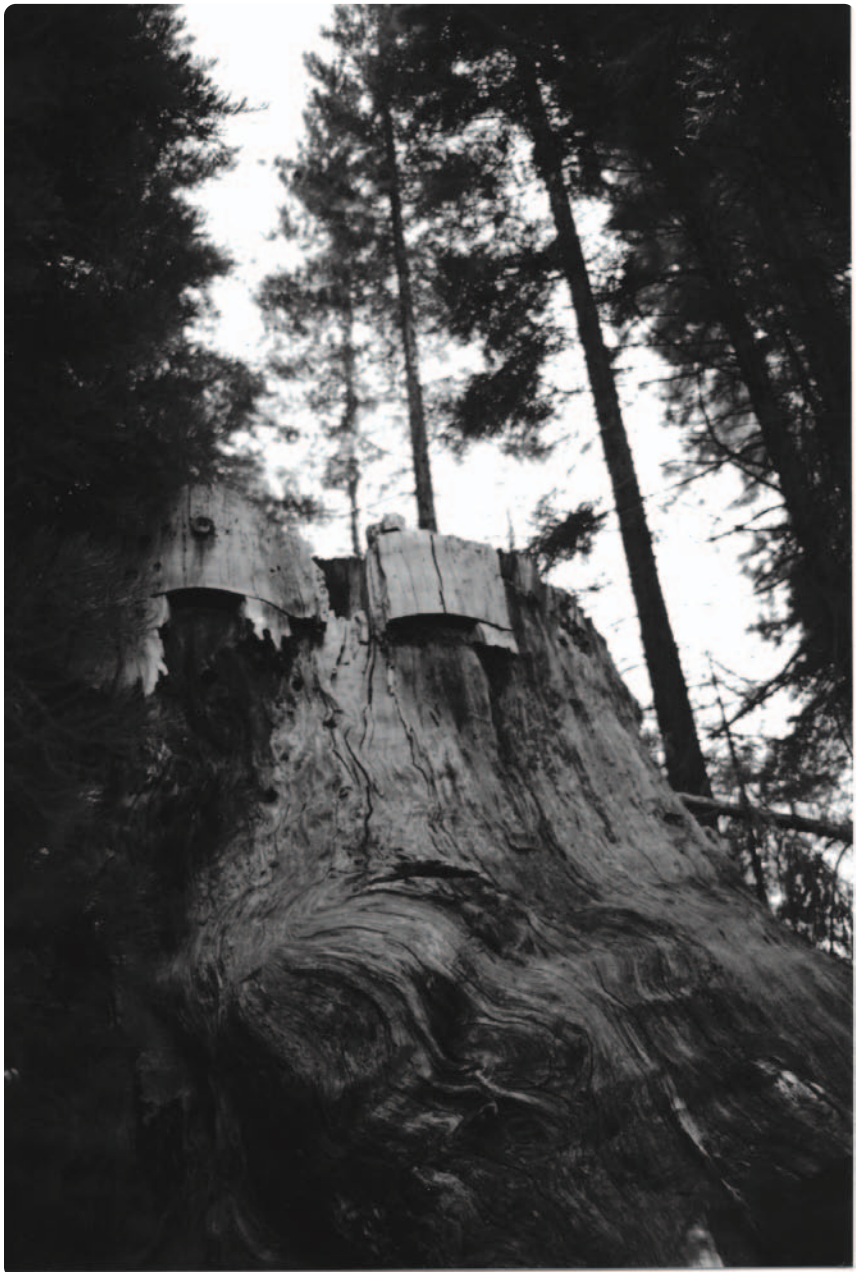
(2) BIA forestry regulations, as described in the current 25CFR163, are much improved over those in force at the time of IFMAT-I. New regulations focus on Indian forestland as compared to commercial forests. Regulations in effect in 1991 refer to the "reforestation, growth and harvest of timber and other forest products," whereas current regulations emphasize the management of Indian forestlands in accordance with "standards and objectives set forth in Forest Management Plans." Thus, there is a broader view of Indian forests with increased emphasis on resources other than timber. Current regulations also now incorporate "the full and active consultation and participation of appropriate Indian tribe," and plans that are "supported by written tribal objectives." This language does well to emphasize tribal participation in forest management, but still does not provide clear direction to insure that plans are based on, not merely supported by, tribal vision and goals. The CFR may need to be revised to reflect further the primacy of tribes in goal setting, the description and implementation of integrated management, and the importance of non-timber values to many tribes.

(3) The administration of allotments is still complex and an impediment to modern integrated management of Indian lands. Neither the allottees nor the tribes are to blame for this; rather, the situation is the outcome of a largely failed past federal policy. Until the effects of the failed policy are nullified, integrated resource management will continue to suffer. No accurate estimate of the total acreage of allotted forestlands was available to IFMAT-II, but a senior BIA official estimated it to be as much as one million acres. Until these lands within reservation boundaries can be managed in a more integrated way with other tribal lands, true integrated resource management on reservations will remain elusive. Tribal and allottee objectives sometimes differ, resulting in conflict over resources and possible takings by the tribe. Takings also occur when compliance with federal regulations limit resource use on allotments.

(4) BIA regulations now embody a number of "unfunded or under-funded mandates." "Unfunded mandates" include:

- the preparation of IRMPs ($600,000 budget nationally, which at most would allow the preparation of one or two IRMPs annually);
- technical assistance to tribes for which fewer specialists are available in most areas (e.g. marketing, silviculture, economics) than at the time of IFMAT-I;
- compacting, which is increasingly the way tribes do business, and financial assistance to tribes generally (funding for Forest Management Inventory and Planning suffers an 89 percent shortfall);
- compliance with various Federal laws, including the Endangered Species Act (ESA) and National Environmental Protection Act (NEPA); and
- education, in which tasks are described, but funding is inadequate to accomplish them.

In particular, there is a need for more and better economic analysis to support BIA procedures and to provide a technical basis for tribal decisions. Unfunded mandates due to environmental and regulatory laws also put a burden on the Indian forestry program. A paper prepared in 1994 by the Bureau of Indian Affairs, Office of Trust Responsibilities (OTR), documents several unfunded environmental and other regulatory mandates. The OTR estimated an average unfunded amount of $46 million per year between 1994 and 1998. This is close to half of the total Federal budget (before tribal contributions) for Indian forests—clearly relief is needed. Compliance with the National Environmental Policy Act (NEPA) accounts for $10 million of this shortfall. A lead BIA manager estimates the unfunded need is of the same magnitude in the year 2002 as in 1994, adjusted for rising costs. Most respondents in the 1994 paper (both BIA and tribal) were found "…having to address environmental compliance as ancillary function beyond their normal duties." The lead BIA manager summarizes the situation as "a heavy burden to put on an already underfunded forestry program."



Tule River Reservation M. Sterner

(5) There has been improvement in tribal public involvement through the IRMP process, but there needs to be better financial and technical support for tribal public involvement efforts. As tribal goals increasingly drive tribal resource management, public involvement processes that effectively engage tribal members in setting goals will be ever more critical to effective management. Although improved over the past decade, communication between forest and resource managers and tribal members remains inadequate.

(6) Tribes continue to move toward self-determination and continue to assume forestry and resource management functions previously performed by the BIA (Tables 18a and 18b). Tribes reporting BIA program administration (BIA direct services tribes) have decreased 11 percent, and those with self-governing compacts or partial compacts have increased about nine percent. This trend needs to be reinforced by better trust oversight and by more and better technical assistance from the BIA.

2001	Program	Category					
Program Adminstration Type	**1**	**2**	**3**	**4**	**5**	**Not Classified**	**Total**
BIA	11	30	13	125	1	0	180
PL 93-638	13	5	1	8	1	0	28
Partial 638	13	4	1	10	1	0	29
Compact	11	9	2	8	0	0	30
Partial Comp.	1	4	0	2	0	0	7
Other	0	0	0	6	21	0	27
Total	49	52	17	159	24	0	301

Table 18a. 2001 Tribal Program Classification and Breakdown (numbers of tribes reporting, whether they have timberland, woodland or both). Category based on reservation size, 1 is largest. (Source, B. Yemma and D. Wilson, Branch of Forest Resources Planning, BIA, Lakewood CO)

1991	Program	Category					
Program Adminstration Type	**1**	**2**	**3**	**4**	**5**	**Not Classified**	**Total**
BIA	14	26	35	83	0	2	160
PL 93-638	11	7	1	4	0	0	23
Partial 638	14	12	1	2	0	0	29
Compact	1	3	2	0	0	0	6
Partial Comp.	1	0	0	0	0	0	1
Other	0	0	0	0	5	0	5
Total	41	48	39	89	5	2	224

Table 18b. 1991 Tribal Program Classification and Breakdown (numbers of tribes reporting, whether they have timberland, woodland or both). Category based on reservation size, 1 is largest.

Recommendations

(1) Implement the trust oversight recommendations of IFMAT-I (see recommendation 1, part V, chapter G, below).

(2) Fund and conduct an accurate inventory of allotment lands to define their acreage and condition. The division of Indian forests into allotted lands and tribal lands makes forest management more complex and frequently results in differences of opinion between allottees, tribes, and the BIA and other federal agencies. For this assessment, we were unable to evaluate the number, extent, and condition of allotted lands relative to tribal lands. Any changes in allotted land status should be made on the basis of the better understanding such a study would provide. For example, it might be desirable to fund and implement a "willing buyer-willing seller" program to consolidate lands under tribal control. It may also be important to fund and implement a program to compensate tribes and allottees for costs imposed by federal habitat set-aside constraints on timber harvest.

(3) Federal regulations should be revised to eliminate unfunded mandates if methods of compensating tribes and allottees for them are not developed.

Quinault Reservation

M.Sterner

F. Review of Forestland Management Plans

A comprehensive review of the adequacy of Indian forestland management plans, including their compatibility with applicable tribal Integrated Resource Management Plans (IRMPs) and their ability to meet tribal goals. Assess the state of forest planning and inventory on Indian forestlands and the amount and quality of BIA support for planning.

Criteria developed for IFMAT-I were used to review a sample of 12 current Indian Forest Management Plans. IFMAT-I focused on planning, analysis, and integrated management, while IFMAT-II has added criteria on planning and analysis for sustainability. The criteria are:

- A set of goals that reflect tribal aspirations for forest management (linked to the tribal vision for the forests);
- A discussion of the natural history of the forest, including historical disturbance processes;
- A discussion of human use of the forest (the history of human use) and its roles in the culture and economy of the tribe:
- Trends of vegetation and current conditions;
- A description of future forest reflecting tribal goals that becomes the long-term objective for the plan (and whether the plan gives a visual or other portrayal of this future forest such that laymen can understand it);
- A description of the kinds of actions that the tribe will take to achieve its desired future forest conditions, uses, and values;
- A projection of future stand conditions, growth, and yield;
- A definition of sustainability related to achieving the tribal vision on a continuing basis, including protection of underlying ecological processes and forest productivity, and a demonstration that the plan will contribute to sustainability.
- A portrayal of the benefits that will result from the management plan in the short-term and their economic and social effects, including the economic outputs produced in the near term in a form usable by tribal enterprises;
- An assessment of whether these benefits can be maintained in the long-run (up to 100 years into the future);
- Compatibility of the forest plan with tribal Integrated Resource Management Plans;
- Integration of the forest plan with plans for the management of other resources such as fire plans;
- Linkage to operations plans that will guide implementation, including a description of the type and location of activities;
- Standards and guidelines forest-wide and for different zones within the forest to guide implementation;
- A set of measures to gauge achievement of plan goals and a mechanism for monitoring their achievement and revising the plan as necessary (adaptive management plan).

Findings

Application of these criteria revealed that management plans now are generally better than at the time of IFMAT-I, and some progress has been made toward IRMPs (but less than was expected at the time of IFMAT-I). Funding for plan development has not been available at a level that would spur rapid progress. There is currently enough funding for one IRMP per year to be prepared. A ten year interval for IRMPs is very expensive and difficult. Either more money or fewer requirements are needed. Technical support for tribal management planning has decreased. Management plans probably better serve tribal goals than at the time of IFMAT-I, but much progress is yet possible.

(1) Forest Management Plans appear in many forms, reflect many different approaches and vary tremendously in their content, depth, and coverage. As might be expected with the move toward self-governance, planning is more decentralized and individualized than before. Forest Management Plans vary tremendously in their focus, approach, content, and completeness. A single mold for planning on Indian forestlands no longer exists across the nation or within regions. While such freedom helps encourage creativity, it also insures variability in the plans. As an example, the coverage on many of the criteria listed above, such as discussion of natural history, the future forest, and a monitoring system for adaptive management varies from no mention to very impressive, detailed treatment. Some tribes have stand-alone Forest Management Plans (FMPs), some have them linked to IRMPs. Many different approaches have surfaced in the last few years.

Leech Lake Reservation

D. Stepanauskas

(2) Development of IRMPs proceeds too slowly, but the spirit of the IRMP process can be found in much of forest management planning. Both NIFRMA and IFMAT-I put great stock in completing a coordinated resource plan (such as an IRMP) for each tribal forest. It has proven difficult for tribes to develop both IRMPs and FMPs. According to U.S. government policy, tribes must have a forest management plan if they want to sell timber. Thus, more energy often goes into FMPs than IRMPs. However, recent FMPs often contain many of the elements of IRMPs, including a tribal vision, an attempt to look at forest ecosystems in an integrated way to achieve this vision, and a comprehensive discussion of the implications of the forest plan. In addition, the Environmental Assessments or Environmental Impact Statements associated with the plans look at alternatives to the plan and their implications.

Some regions and tribes are encouraging an IRMP as a replacement for a FMP. It appears that Forest Management Plans may increasingly take on many attributes and much of the spirit of IRMPs.

In some places tribes have put their energy into IRMPs while BIA regional offices have completed harvest scheduling analyses and related work often associated with forest plans. In such cases, it is often difficult for the tribal vision to transfer from the IRMP to the FMP.

The energy in the IRMP process seems to be broadening beyond management of natural resources to other issues such as land development and housing because these issues increasingly affect the forest resource. Unlike natural resources staff, people in these sectors may not be familiar with the IRMP approach. Thus, overall planning, including land development issues, may fall to natural resource managers.

(3) Forest Management Plans are more focused on defining and achieving the tribal vision than in the past, although there is still room for improvement. IFMAT-I made the tribal vision for forests the centerpiece of forest management planning. There has been significant progress towards making this approach a reality. Most Forest Management Plans provide evidence that a tribal vision guided the goals for the plan. Some plans that still seem to be following the BIA formula do not, but they are in the minority.

In some places, though, the development of the tribal vision in the IRMP does not translate into the harvest scheduling portion of the FMP. This difficulty seems especially apparent where the BIA continues to use the traditional formulas to calculate desired actions on tribal forests. Tribal goals and timber production are not always well integrated or complimentary.

(4) Considerations of fundamental ecological processes, delineation of the future forest, linkage to operation plans, and development of an adaptive management approach have improved, although some problems persist. IFMAT-I recommended that sustainability be broadened to consider ecological processes such as disturbance regimes, nutrient and water cycles, and habitat succession. IFMAT-I also recommended that the desired future forest be clearly described, that implementation plans be linked to forest plans, and that monitoring become an important part of planning. Adaptive management should be based on scientific method and long-term data collection and analysis. It must not be an avenue for political manipulation of resource management. Our review found shortcomings in all these areas in many plans.

Some, but not all, of the FMPs are anchored to the natural history of the forest including historical disturbance processes. Without recognition of the history, ecological processes and unique character of the forest it will be difficult to evaluate whether the proposed plans are sustainable. A few of the plans describe the future forest that the plan will achieve, using terms that the layman can understand. Most do not, but those that do will be more accessible to the tribal public.

Some forest plans outline the amount and probable location of forest management activities, including timber harvest. A number do not give this information. Finally, the plans vary most in their recognition of the need for an adaptive management strategy. Some have very sophisticated monitoring plans; others include little monitoring.

(5) The idea of sustainability remains elusive and is given its clearest definition through traditional sustained yield calculations. In keeping with the regulations under which the BIA operates, a sustained yield calculation for commercial timber products is made somewhere in the forest planning documents, usually in the Forest Plan or the inventory analysis. It is increasingly unclear, however, how the sustained yield calculation relates to providing for sustainability of the forest resource and its benefits. In IFMAT-I, we recommended that this definition be broadened to consider the maintenance of ecological processes. So far this has not been done and there is confusion about how the BIA can "sign off" on the adequacy of forest plans that no longer use the sustained yield of commercial products as their endpoint.

The definition of sustainability should encompass the ability to achieve the tribal vision on a continuing basis. The BIA is seeking an operational framework to understand what sustainability might mean under this new definition. Such a framework would measure the level at which a tribe can manage its natural resources to maintain a quality of life for all its members as defined in the their tribal vision. Levels can then be determined by each tribe—such as outputs of goods and services.

(6) Tribes remain opportunistic in obtaining planning resources and in their focus; currently fire planning has the most resources. As discussed above, expansion in the federal support for planning and management of tribal forests has come recently from the National Fire Plan. We would expect that this issue-driven source of planning funds will continue, and that it will inevitably create plans oriented toward the problem, issue, or resource driving the funding.

(7) The BIA's Continuous Forest Inventory (CFI) system for planning and policy analysis continues to compare favorably with that of other agencies. The BIA's careful husbandry of forest resource information over the last 30-40 years continues to be the most outstanding aspect of its technical support. BIA and tribal professionals are able to do trend analysis over three to four inventory cycles (30-40 years) based on repeated measurement of CFI information. These measures provide a wealth of information on forest change over time as well as the inventory input into planning. In addition, they provide some of the best data we have on what is happening to the forest. The ability of the BIA to maintain and construct compatible data sets outpaces anything the Forest Service has been able to do. They should be commended for their effort and it is essential that this work continues (see recommendation below).

(8) Two overlapping efforts exist to do the CFI analysis. One of these efforts is in Portland (Northwest Regional Office) for the Northwest and other effort is conducted by the the Branch of Forest Resources Planning (BOFRP) in Colorado for the rest of the country. IFMAT-I recommended that these two efforts be combined. Right now, there are two different offices continuing to develop two different versions of computer programs to do essentially the same thing. The work of the Northwest Regional Office (NRO) is impressive and useful, but that office continues to invest in FORTRAN programs, rather than move to more modern programming languages. BOFRP, on the other hand, is shifting their programs to more modern languages (Visual Basic, C++). Tentative efforts to consolidate the two efforts have not made much progress, but need to continue.

(9) With shrinking resources the BIA has focused their attention on inventory analysis and greatly reduced assistance to tribes in forest planning and inventory support. The overall level of BIA technical support in inventory and planning has shrunk over the last ten years. The BIA has fewer people in inventory and planning than in the past, especially in Northwest Regional Office and BOFRP. As a result NRO and BOFRP have greatly reduced their national assistance in forest planning and harvest scheduling except for the (very important) inventory trend analysis, some simple harvest scheduling, and a one man effort in IRMP. Currently, their specialists are taxed even to keep up with the inventory trend analysis. At a minimum, standard inventory and planning methods and software need to be supplied to tribes.

(10) The larger tribes support their own forest planning/ harvest scheduling work which helps them better connect this analysis to the tribal vision. When the BIA does the analysis, on the other hand, it seems more focused on the traditional sustained yield calculations. Sustainability should be defined here as the ability to continuously meet the tribal vision (see finding 5, above).

Some tribes have turned to consultants to develop forest plans for them. The resulting plans are variable in quality, but do show promise as a way to provide technical resources that tribes and the BIA do not have. Standard software for projections and analysis is needed for smaller tribes to better meet their needs themselves.

Blackfeet Reservation J. Franklin

Some tribes, especially the smaller tribes, rely on BIA advice at the Regional level for their harvest scheduling. Also the Northwest Regional Office does simple area/volume check calculations as part of inventory analysis. It appears that the use of these traditional harvest scheduling methods make it difficult for the planning to connect to the tribal vision because of the traditional focus on sustained yield of wood relative to other values and resources.

It is increasingly difficult for compacting tribes to utilize the analysis resources of the Regional Offices, thus some tribes have turned to the resources of the national office. Compacting tribes can take their share of the inventory/planning money from the area office, although to do so they must pay the area office at the going rate for use of inventory and planning people. Since the Northwest Regional Office does the inventory work for the tribes in that area, compacting tribes cannot ask for their assistance without paying them—and often having to pay them more than they took when they compacted. On the other hand, compacting tribes (outside the Northwest Regional Office) can still get free inventory support from the national office even if they take their inventory/planning shares from the regional office.

(11) The BIA's national Geographic Data Service Center has reduced its support for GIS systems on Indian reservations; the Inventory and Service Center groups are largely unconnected. As we noted in IFMAT-I, the Service Center provided important GIS support to the tribes. This has changed substantially. Now, the GIS group works on a contract basis when provided funds by the tribes. Apparently there is little integration of technical support for CFI and GIS information even though the support groups are located one mile apart in Denver. Currently, GIS, inventory, and planning advice to tribes comes from three sources that operate largely on their own: 1) the Northwest Regional Office for forest inventory analysis and harvest scheduling for Northwest tribes; 2) the BOFRP office in Denver for forest inventory analysis and harvest scheduling for all tribes outside the Northwest; and 3) the BIA office in Denver that provides GIS support.

(12) It is not clear that the tribes will continue the CFI which is essential to monitor forest change. The CFI on the different reservations is a resource to be treasured and nurtured. The degree to which tribes will need to continue this work as self-governance increasingly takes hold is unclear. Questions surface about both the commitment to this work and the quality control on the work. Some tribes also see a need for stand-based inventory in lieu of CFI. The great value of CFI lies in its relevance to ecosystem processes and long-term trends that cannot be derived from stand inventories. The forest products industry, for example, puts an emphasis on long-term data collection. Long-term data are all the more important on Indian lands which remain in one ownership in perpetuity.

Recommendations

(1) Broaden and deepen assessment of the ability of management plans to sustain tribal forests and their benefits. To address this issue we recommend making *achieving the tribal vision on a continuing basis* the definition of sustainability. Sustainability must be connected to the tribal vision to have meaning and importance in management of tribal forests. To the degree that this vision involves maintaining the tribal forest and its benefits through time, a checklist and process needs to be developed that considers many of the following criteria for a forest management plan:

- A set of goals that reflect tribal aspirations for management of its forests;
- A description of the benefits that will flow and the future forest that will be achieved in pursuing these goals;
- An assessment of whether these benefits, and the forest that provides them, can be ecologically, economically and socially maintained in the long-term. This assessment is at the heart of the "sustainability check" that is needed. It would have two major parts:
    - Evidence that the forest structures being prescribed can be maintained through time. To the degree that the tribe envisions a "tree farm" as its desired future forest condition, what evidence exists that the farming techniques being advocated have a track record of success in producing crop after crop during the entire planning time horizon? To the degree that the tribe envisions a forest that reflects "natural" processes and structures, what evidence exists (natural history, historical information, research) that the proposed future forest does, in fact, reflect forest processes and conditions that can occur on a continuing basis without the danger of collapse?
    - Evidence that the forest structures being prescribed, if they can be maintained through time, will produce the benefits claimed. To the degree that a tribe wishes a sustained flow of commercial timber, will the forest growth likely provide the harvest levels described in the plan? Checks for other benefits claimed would also be needed.
    - A set of measures to gauge achievement of plan goals and a mechanism for monitoring their achievement and revising the plan as necessary (adaptive management plan).

(2) Maintain the IRMP process, and increase its funding to the level that would allow the preparation of ten percent of the tribal IRMPs annually, so that re-planning is completed through a ten year cycle. The IRMP process has received careful thought and is now in need of funding for vigorous implementation.

(3) Convene a task force to further define sustainability on Indian forests in operational terms that can be readily translated to management realities. One option for this would be to investigate adapting the Montreal Process criteria and indicators to tribal forests and forestry. This would have the advantage of using a system already recognized by the federal government. The process is internationally recognized and intended to be flexible in its local adaptation. These criteria and indicators could also form the basis for the independent review of the federal trust responsibility, and for the recurring assessment called for in NIFRMA.

(4) Consolidate the CFI analysis and integrate it with the GIS support. With the decreasing support for national technical advice and the increasing complexity of forest planning, it is essential that the BIA consolidate its CFI support and integrate it with the GIS support. IFMAT-I recommended consolidation of inventory support staffs. That recommendation is even more important now and should be broadened to include planning and GIS support while maintaining the CFI. This integration would result in better service to tribes by allowing "one stop shopping" for CFI and GIS information and services. With the rise of the Internet and related technology, it may not be necessary to have the two inventory/planning groups in one physical location, but it would be beneficial to consolidate the two CFI analysis systems into a single system that both groups could use.

Round Valley Reservation

M. Sterner

G. Evaluation of Establishing Standards

An evaluation of the feasibility and desirability of establishing minimum standards against which to measure the adequacy of the forestry programs of the BIA in fulfilling its trust responsibility to Indian tribes.

Finding

(1) The concept of trust responsibility in relation to Indian forestry has not been clearly defined in law or regulation, although draft trust standards exist for several forest resources and activities. The lack of clear definition of trust responsibility has not changed since IFMAT-I, although there has been and continues to be serious discussion of the changes various parties see as needed. Lack of definition of the trust responsibility still contributes to poor communication between the trustee (the federal government, usually represented by the BIA) and the beneficiaries (the tribes) and can lead to inadequate forest management. This is especially evident now as tribes increasingly move toward self-determination. Decision making and accountability could be better with less uncertainty on the part of both the trustee and beneficiaries. In addition, it is increasingly clear, as some tribes acquire additional forestland through fee purchase, that the mechanisms for taking land into trust do not work quickly or well. This is a major constraint to attempts to create tribal forest holdings that are manageable at the landscape-level in ecologically and fiscally sound ways. This, coupled with the forest fragmentation resulting from the allotment system and increasing housing construction, makes integrated management of forest resources difficult, and, in some places, nearly impossible.

Lastly, better investment in resource management education is needed. Funding opportunities are available to all land grant universities and Indian colleges through the Renewable Resources Extension Act (RREA), which is currently funded at only $4.5 million of an authorized $30 million. Moving to the authorized amount would allow much greater participation by tribes and is therefore favored by IFMAT-II.

Both the tribes and BIA understand that trust responsibility is held by the U.S. government. Among other things, tribes cannot sell tribal trust lands, cannot usually put tribal lands at risk for collateral to obtain loans, and must manage tribal forestlands on a sustainable basis (25CFR163.3). Under 25CFR, tribes must approve harvest levels and specific harvest decisions, but the Secretary of the Interior currently retains final responsibility to sign off on them.

Tribal enterprises could perform better if there were an acknowledged trust responsibility for ensuring their efficient operation. Forest products enterprises are often the actual determinants of forest management decisions. Although forestland is held in trust, enterprises currently operate outside the trust. Ineffective communication between forest managers and forest enterprise managers hinders planning in both areas. Also, the BIA does not currently acknowledge that trust responsibility includes providing information on enterprise performance to tribes.

Forest management and enterprises are often not linked effectively. In general, forest-products enterprises need to be modernized and better connected to tribal goals for economic development if tribal forest resources are to be managed in a truly coordinated way. Trust standards for utilization of raw material (logs) should be linked to forest-products enterprises. It makes little ecological or economic sense to improve forest productivity, only to have the increased yield poorly utilized at the mills. Communication between forest managers and forest-products enterprises needs to be strengthened. For example, forest-management representatives should be included on an enterprise's board of directors; also, forest-enterprise personnel should be included on a coordinated resource planning team.

A narrow view of "trust responsibility" defines the legal duties of the United States in managing property and resources of Indian tribes and, at times, of individual Indians.

Warm Springs Reservation

C. Mukumoto

These duties have been characterized as that of a fiduciary to be judged by the highest standards. The activities of tribal forest products enterprises often determine the economic return that tribes receive from their forests. Provisions in timber sales contracts often treat tribal enterprises the same as an outside non-tribal company. This treatment has reduced the total economic return the tribe receives from its forest resource. For example, alternative minimum stumpage prices embedded in standard BIA timber sale contracts can cause the BIA to enforce harvesting material that has a negative economic value to the tribe as a whole. Effective planning in market logistics is often hindered when forest managers view the forest enterprise as an outside party.

Further, without the marketplace, tribes rely on the ability of the BIA to provide a fair market price for its timber. This is often done without sufficient experience in log or lumber markets or through the use of questionable databases. In one case the price is set as an arbitrary percentage of lumber sales. When a tribe establishes an enterprise, the system by which the tribe captures economic benefits from its trust resources is enlarged. To ignore the expanded portion of the system is to ignore a significant portion of the U.S. government's trust responsibility for tribal forest resources. In a free market, businesses are motivated by self-interest and are regulated by competition. With a tribal enterprise, the self-interest must be that of the tribe and the regulation of that enterprise originates in part through the administration of the U.S. government's trust responsibility.

Trust standards should be derived from the objectives embodied in each tribe's management plan. Obviously, not all tribal governments will be able to adopt integrated resource management plans in the short term. Therefore, interim procedures for agreeing upon trust standards will need to be established.

Recommendation

(1) Implement the forest trust oversight recommendations from IFMAT-I, and adopt a management structure that can efficiently plan and implement a timber program as part of an integrated resource plan based on a tribal vision for their forests. IFMAT-I suggested a triangulated procedure for insuring effective trust oversight and Indian forest sustainability. Under this system, tribes would create management plans based on tribal goals with the support of BIA technical specialists. These plans would be negotiated with the Secretary of the Interior, and when in place, form the basis for evaluation of trust performance. BIA and, where applicable, tribal performance under the plan would be monitored by a commission independent of the Secretary and BIA, in a manner consistent with tribal sovereignty and federal law and responsibility. Responsibility for delivering the natural resource program would be placed under a single manager for each tribal forest. This was a recommendation of IFMAT-I, and is of even greater importance now as managers face increased forest health and other challenges. In the complex forest management setting, where actions taken today can have long-term effects on many resources, we believe the trustee (U.S. government) must (1) require that specific information from each tribe (e. g., integrated resource plans, cumulative effects analysis) be developed, and (2) assure that the beneficiary (tribe) clearly understands the possible consequences of forest management activities. Further, we believe that certain principles can assist the Secretary and tribe in developing standards:

- A tribal vision for forests and their management should be articulated where one does not now exist;
- Trust standards should be linked and relative to this tribal vision;
- Each tribal government should, in cooperation with the Secretary, develop the standards;
- The agreed-upon standards should have measurable yardsticks for achieving trust responsibility, with measurement techniques determined before standards are approved;
- To the degree possible, standards should measure achievement of desired conditions and outcomes (performance) rather than inputs, techniques, or technologies; and
- Standards should encourage and reward compliance and promote efficient use of resources.

These principles need to be applied flexibly in a tribal setting. They would, however, provide relatively easy guidelines to monitor and would considerably improve trust oversight. A truly participatory trust would allow the beneficiary to determine the objectives and requirements for management. Such a trust would consist of these parts:

1) a beneficiary – care must be taken to clearly distinguish the exercise of governmental authority in developing management plans from the tribe and individuals as beneficiaries of trust management;

2) a trust corpus – Indian forestlands;

3) a trustee – the BIA or tribes performing work under contract or compact; and

4) an agreement between the trustee and beneficiary that sets forth the duties and obligations of the trustee – the management plan.

Finally, a leadership education initiative is needed. It should (1) create more incentives for tribal members to enter natural resource, forest enterprise, and business professions, and (2) incorporate greater use of forest resource and management concepts in kindergarten-grade 12 education. There are pre-existing funding programs which can be effectively used to improve opportunities for Indian students at land grant educational institutions and to build teaching capacity. Money needs to be in place, and programs need to advertise better. Cooperative State Research, Education and Extension Service (CSREES) also solicits applications for numerous grants. In 2001, the federal cooperative education forestry program was barely able to recruit enough participants for the 20 posts available.

CSREES	Amount available annually, est.$ millions	Intended use
Higher Education Multicultural Scholars	0.9	Scholarships
Higher Education Challenge Grants	5.3	Curriculum development, experiential learning
Tribal Colleges Research Grant	1.0	Research
Tribal Colleges Education Equity Grants	1.7	Teaching capacity
Equity in Educational Land-Grant Status Act of 1994	3.1	Extension capacity

Table 19. CSREES grant programs (USDA 2003a).

It is unfortunate that the recommendations of IFMAT-I remain valid in the area of trust standards and their oversight. Indeed, in one important respect the situation now is worse than ten years ago. Tribal and BIA resource managers are working more closely together in a more complex world (see Staffing, Forest Health, and Management Planning above). But they still have no clear set of directions as to the discharge and effect of the federal government's trust oversight responsibilities. The BIA remains the locus of both federal trust oversight and management support and action. IFMAT-II could find little agreement on what would constitute a violation of the trust responsibility in the future, although many allegations and arguments about past situations are in evidence. We see progress on many fronts, yet little has improved in this most fundamental area. If Indian forests are to reach their potential ecologically and economically, this situation must change, and rapidly.

H. Evaluation of the Effectiveness of Implementing the Indian Self-Determination and Education Assistance Act (Pub. L. 93-638, as amended) in regard to the Bureau of Indian Affairs Forestry Program

Finding

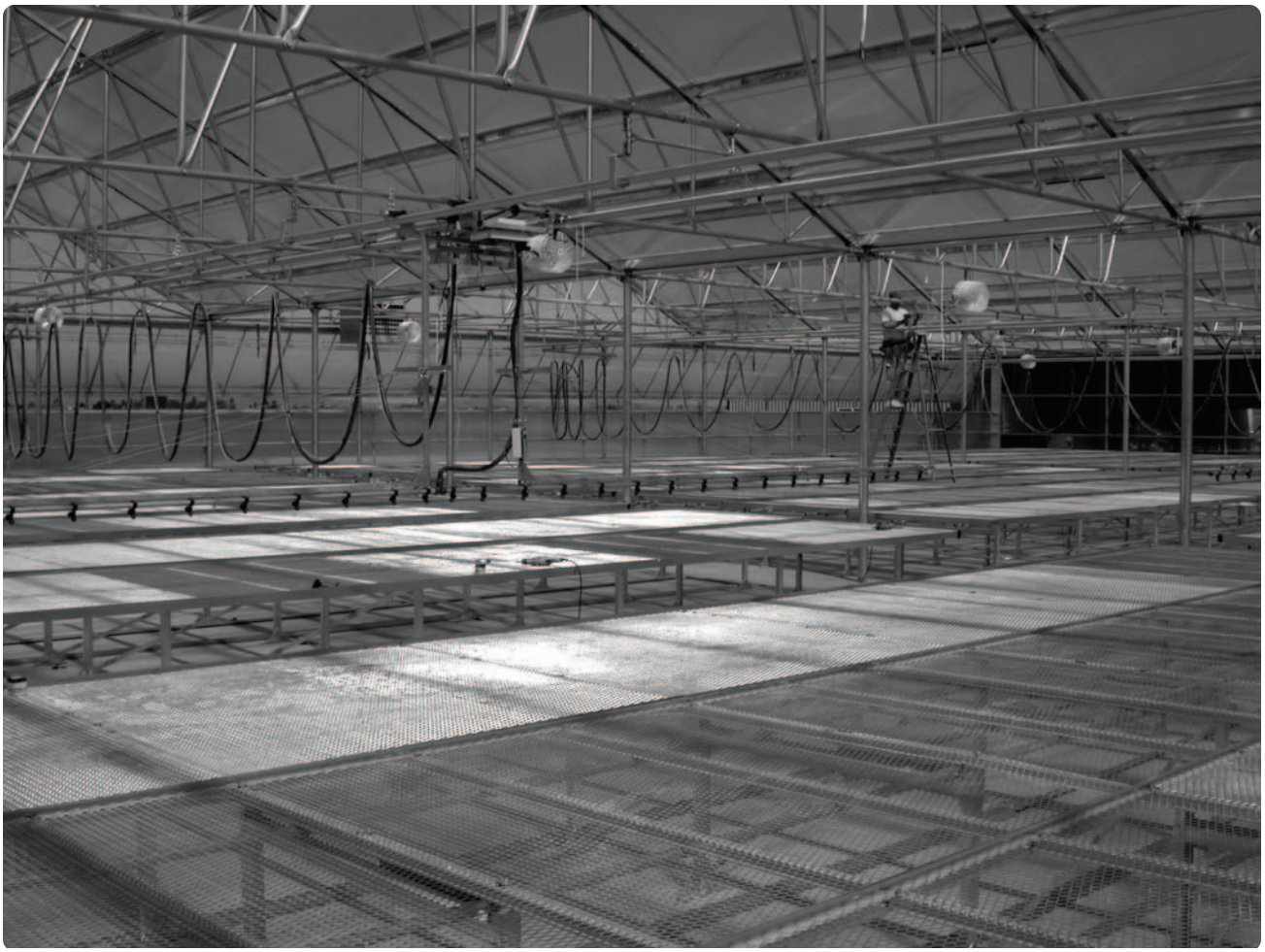
(1) There has been major progress toward self-determination, as indicated by the increase in the number of Category 1 Compacting Tribes as reported by the BIA. This is significant. There is a growing body of evidence, including the IFMAT-I report and our findings in IFMAT-II, that tribes with a greater degree of control over their resources have forests and forestry that align better with tribal goals and vision than those that have less autonomy. Kalt (1996) makes the general case that tribal enterprises with independent management (as opposed to council-controlled enterprises) are more likely to be profitable. He states,

> *The implications for federal policy are clear…The first step on the road to sustained economic development in today's world economy is fundamental governmental-consitutional reform. Federal policy should make it a priority to support such reform in Indian Country. Such support should take the same government-to-government form being followed internationally, consisting of technical and educational assistance and facilitation of the process of reform, but not consisting of the imposition of a one-size-fits-all model that overrides tribes' sovereignty.*

This direction meshes well with our recommendation that trust oversight for forestry be, in the first instance, responsive to the tribal vision for their forests, and that integrated forest planning and management be done by the tribes, with BIA and other technical assistance.

Krepps (1991) in a multiple regression study of forest productivity and prices received for forest products on 75 Indian forests found that as tribal labor and management replaced BIA labor and management, both the quantity of timber harvested and the price received for it increased. In so far as tribes that carry out more of their own forestry activities can be regarded as more autonomous, this directly supports the conclusion that tribal management is more effective as judged by these measures. Krepps did not include other forest benefits (water, wildlife, and cultural values, for example) in his analysis. However, our observations during the IFMAT-II process would support the notion that these values, too, are as well or better served in contracting and compacting tribes.

Leech Lake Reservation D. Stepanauskas



J. Franklin

Flathead Reservation

Recommendation

(1) Federal support for activities that enhance true tribal autonomy, as defined by Kalt, should be maintained and intensified.

These activities include the strengthening of institutions of self-governance so that each can:

1) efficiently make and carry out strategic choices and policies;
2) provide a political environment in which investors—large or small, tribal members or non-tribal members—feel secure; and
3) mobilize and sustain the tribal community's support for its institutions and for particular development strategies (Kalt 1996).

The last of these is particularly important in forestry activities. Unless tribal members are knowledgeable of and in tune with forest management activities, through effective tribal public involvement programs, management is less effective and more controversial.

Also, funding and technical assistance through federal sources such as the BIA, USDA Forest Service, and federal and corporate sources that fund the American Indian Science and Engineering Society should strengthen tribal autonomy and decision making capacity, rather than restrict it. Thus, for example, as we point out in the funding section of this report, the restrictions placed on "fire" funds and the lack of coordination with "forestry" funds in effect decreases tribal efficiency and decision making flexibility.

I. Recommendations for Reform and Increased Funding

If several key funding and organizational problems can be solved, Indian forestry has a bright future and an important role in informing American and world forest management policies and practices. The main funding problem could be remedied by allocating Congressionally appropriated funds to support Indian forestry at the same per acre level as the federal forests held in trust for all Americans. Currently, federal support for forestry on Indian lands is $2.83 per acre annually, and federal support for National Forests is $9.51 per acre annually. This equates to 30 cents on the dollar for Indian lands. An additional allocation of $6.68 per acre per year or $119.6 million per year overall would bring forestry on Indian lands to parity with Federal forestland, although it is becoming increasingly recognized that the National Forests, themselves, cannot provide for forest health at their current funding levels. We also recommend realigning funding of the fire program to promote more efficient integrated forest management. Protecting forest health will be an ongoing effort that is most efficiently addressed through integrated management. Specifically, (1) we recommend making fire funding a permanent part of the base and (2) removing barriers that reduce the ability to integrate fire funding into the total forest management program.

Fire and forest management funds need to be integrated to efficiently provide for ecological services and forest protection. Given the importance of Indian lands in timber supply, environmental protection, and as models for integrated forest management, we recommend additional appropriations above $119.6 million that would bring investment in Indian forests to parity with similar state and private forestland on a regional basis. These investments would yield immense future dividends in healthy forests, environmental protection, flourishing tribal enterprises and governments, and available timber that would benefit all Americans.

The main organizational problem to be solved, which would require minimal expenditures, is the establisment of effective trust oversight, as described above and again briefly below. The following recommendations emphasize, and partially consolidate, the recommendations from the preceding sections of this report. Numerous recommendations require increased funding as available funding will not meet all current needs. Therefore, we have prioritized categories of recommendations in the order in which they should be funded:

Indian	National Forest	Difference ($/ac)	Added Funding (millions$)
$2.83	$9.51	$6.68	$119.6

Table 20. Comparison between federal funding for Indian Forestry and National Forests in 2001 and required additional funding to reach parity on 17.9 million tribal acres.

(1) The most important federal investment opportunity is to fund Indian forestry, as a whole, in order to adequately discharge the federal trust responsibility and as a national and international example of integrated, locally based forest management. Adequate investment in Indian forests is critical for meeting the trust obligation (see note on Studies). Tribal goals have become more complex and new influences are appearing (e.g. urbanization). Because of policy changes, the National Forest System is no longer a useful comparator for costs and benefits of management on Indian lands. Three times as much timber is harvested per acre on Indian lands as compared to National Forest lands. We recommend federal funding for Indian forestry be increased by $119.6 million to reach parity with the federal investments in the National Forests. Even the current level of National Forest funding is becoming regarded as inadequate in the face of forest health challenges in the Western forests. Where timber production is an important tribal goal, additional funding should also be considered to more closely align with the investment levels adjacent state and private neighbors are making. Rigid distinctions between fire funds and general forest management funds should be eliminated to provide for efficient forest management including forest health. Indian forests, as pointed out in IFMAT-I and above in this report, still have great potential to serve as demonstrations of integrated forest management that serves broader societal goals as well as the needs and objectives of the people who live in and around them. Only by strengthening the autonomy of tribes and tribal management through adequate funding and technical assistance will this demonstration potential be fully realized.

Studies

In several places in this report we suggest that further studies be done on selected topics. As a result of consultation with a variety of reviewers of the drafts of this report, we believe that the points listed below should characterize each of them:

1) Regional workshops on the topic should be initially held to determine what is currently known, what specific gaps in knowledge exist, and to allow tribes to share information on the topic with each other.

2) Based on the material from the workshops, a careful problem analysis should be prepared for each that lists the costs and benefits of further research on the topic.

3) In so far as possible, the workshops and any further studies should be led by tribal personnel.

(2) Implement the trust oversight recommendations made in IFMAT-I. Consistent with other recommendations in this assessment, tribes will continue to move toward a greater degree of self-determination. In this context, we believe that establishing trust standards will clarify what is expected of both trustee and beneficiary. As a tribe becomes better able to develop information, assess consequences, and take action, the Secretary's need to oversee will diminish, and the tribe will assume greater responsibility for its actions. The beneficiaries cannot, however, replace the U.S. government as trustee or trust overseer. Above all, discussion of trust oversight reform should not be used as a pretext to delay urgently needed investments.

The interests of Indian owners differ from tribe to tribe, thus we believe that the most appropriate setting for establishing trust standards is the individual tribe, with participation of the Secretary and trust oversight mechanism (e. g., independent commission) as each tribe chooses its level of self-determination.

(3) The most urgent use for the increased funding should be to rebuild the BIA technical services capacity, at least to the 1991 level, but hopefully far beyond, which will be necessary for trust reform, to support a forest health initiative, and bring forest plans into regulation. Tribal management for tribal goals should be assisted by robust technical assistance and backup from BIA. It is urgent to put in place specialists in the categories described earlier in this report, and to streamline the delivery of BIA technical services, particularly to support the smaller tribes. Integration of forestry into the Extension Indian Reservation Program could help to address deficiencies in delivery of some technical services. Many forest plans are not current, and could be interpreted to be operating "outside the trust" due to lack of BIA technical capacity.

(4) The next highest use for the increased funding is for investment in the IRMP process. If the requirements now in place for Integrated Resource Management Planning are to be observed and effective, it must be fiscally and technically possible for more than one tribe per year to do an IRMP, as is now the case. Above, we suggest funding be directed at a rate that would allow a ten year planning cycle for all tribes.

(5) Additional funding above the $119.6 million should be considered to remedy the federal policies that created forest allotments that fragment management of many Indian forests. If integrated management of natural resources is to become more prevalent on tribal forests, consolidation of tribal and allotment lands is a high priority since fragmentation now hampers or prevents integrated management. Funding a "willing buyer-willing seller" program of land consolidation for tribes eventually to buy back allotments is the most feasible way to realize consolidation.

(6) Lastly, if progress is to be made and monitored, continue the ten year cycle of Indian Forest Management Assessments with improved, continuous, and coordinated interim data collection techniques and provide adequate funding for a consistent monitoring process. Two overriding conditions could vastly improve this important periodic analysis. First, the primary responsibility for doing the assessment should rest with a permanently existing organization. Second, data collection should be continuous and done in a similar way and to a similar set of standards over time. This would allow the construction of a living database in a continuing organization dedicated to Indian forestry. Independence could be provided by review of the periodic report by an independent commission comprised of outside experts similar in composition to IFMAT-I and -II. The level and sophistication of resource information management appears to be trailing substantially behind that of other governmental organizations. Databases, including GIS layers, that would typically be available to stakeholders on-line, are generally not available for Indian forestlands, as IFMAT-II discovered. Although this protects critical information, it also limits access by tribal members and agencies with trust oversight responsibilities. Our recommendation is to fund ITC to carry out the creation of the database and the continuous assessment using their own staff, with five and ten year periodic review by an independent body.

As discussed in the introduction, the IFMAT-II process included a forest certification pre-audit assessment of the participating tribes. This process involved the two primary certification programs in the U.S., the Sustainable Forestry Initiative (SFI) and the Forest Stewardship Council (FSC).

Flathead Reservation

J. Franklin

VI. CURRENT TRENDS IN FOREST MANAGEMENT

A. Certification and Indian Forests

Findings

(1) Neither SFI or FSC certification programs, as presently conducted, match well with most tribal needs or programs because of issues of cost and transparency. One possible approach to the issue of standards on tribal forestlands is the use of existing certification programs to assess the management of tribal forests. Although many possible approaches to assessing forest sustainability currently are available, the two most common approaches in the U.S. are the Forest Stewardship Council Principles and the Sustainable Forestry Initiative ® Standard. While these programs have begun to achieve market penetration in general forest ownerships in the U.S., they have yet to catch on with a significant number of Indian forestry programs. Further, markets for certified wood do not always provide premiums that offset certification costs.

In 2001, the Intertribal Timber Council (ITC) set up a process for tribes to gain more information about the two leading certification programs, FSC and SFI. Thirty tribes from across the United States agreed to participate in pre-certification reviews. The process was designed to provide, for each participating tribe, a preliminary indication of the relevance of the criteria and indicators for assessing sustainability (SFI analysis), an indication of the likelihood to be able to gain immediate certification (FSC analysis), and an understanding of the broad areas of strength and areas needing improvement (both analyses).

Auditors from the two certification programs visited these tribes between July and October 2001, interviewed tribal and BIA managers and specialists, reviewed documents, and visited selected field sites. The findings were reported to the participating tribes, to the ITC, and were provided to the IFMAT-II team as a major portion of the data for this report.

The preliminary reviews found that several tribal programs appear to meet the requirements for one or the other of the certification systems. The vast majority of tribes, however, do not have a good fit with existing certification systems. In most cases this lack of fit is due to a difference between tribal goals and the values or purposes underlying certification.

(2) There is already a set of trust obligation standards existing between tribes and the federal government. There are numerous sovereignty questions surrounding certification. An example concerns the many SFI requirements to participate in programs designed to promote forest management to other landowners. This outreach or extension requirement does not fit well with Indian forest management programs that are struggling to obtain necessary resources to establish comprehensive management systems and programs for their own lands. Another example of the lack of fit involves the SFI requirement for a procedure for responding to complaints about "inconsistent practices." This requirement (and many other SFI Core Indicators) is generally met by other SFI participants through membership in State Implementation Committees (SIC). Procedures established by SICs and the associated SFI requirements are viewed by some tribal members as potentially serious encroachments on tribal governance and sovereignty.

Broadly construed, FSC requirements to manage for a broad array of environmental benefits seem to match well with tribal desires for their forests. However, a specific FSC criterion requires implementing a program that provides a far different balance between economic returns and ecological benefits than that which tribes determine for themselves. FSC requirements for reserves and for the protection of old-growth forests can also conflict with tribal priorities.

Summary of SFI Readiness from GAP Analysis with respect to possibly pursuing SFI certification a number of common strengths and gaps emerged across most Indian forestry programs.	**Summary of FSC Pre-Certification Review** with respect to possibly pursuing FSC certification a number of common strengths and gaps emerged across most Indian forestry programs.
Strengths	**Strengths**
Providing recreation and education oppertunities Reforestation Protecting soil and riparian resources Managing healthy forests Promoting biodiversity	Ecosystem maintenance Community and public involvement Inter disciplinary management teams Professional development
Areas needing improvement	**Areas needing improvement**
Written policies, training, outreach, and communications Activities that are specific to the SFI program (and thus could not be met until after tribes formally adopt the program)	Concern for visual impacts
Source: SFI GAP Analysis Reports for Individual Tribes and Overal Summary	Source: IFMAT-II Analysis of FSC pre-certification reports

Table 21. Certification readiness assessment summary.

With respect to trust oversight, a third party assessment is appropriate in the format discussed in Primary Recommendation 2 above, in which an independent oversight body critically examines the fit between tribal vision and goals and tribal management activities, with technical support to tribes provided by BIA where needed. Certification as currently constituted, however, is founded on standards which may not be a good fit for all tribes. It is therefore not an appropriate mechanism for evaluating whether the trust responsibility of the federal government for tribal lands is being effectively discharged.

The source of the poor fit of existing certification standards to tribal forestry is that externally derived standards do not necessarily incorporate a clearly expressed set of tribal goals and a tribal vision. These standards do incorporate elements useful to tribes such as adherence to the management plan, interdisciplinary analysis, and staff professional development.

We recommend independent, third-party oversight of Forest Management Plans in the same way that we recommend trust obligation should be independently assessed. This assessment would have to keep issues related to the tribal public paramount in regard to harvest levels, forest health, and wildlife. Tribes wishing to pursue certification through one of the existing systems (e.g., FSC or SFI) would integrate their own standards (e.g., tribal vision and self-determination) into those of one of the existing systems.

FSC Certification will benefit some tribes, SFI Certification will benefit other tribes, but most tribes are likely to refrain from participating in certification until economic benefits emerge that compensate for the costs and the lack of comfort with the program's requirements.

Consideration should be given to the development of a tribal certification option linked to one or both of the pre-existing standards that would be:

- Led and staffed by tribal foresters and other foresters with tribal forest management experience;
- Used to modify existing standards to better match the purposes of Indian forest management as determined by individual tribes; and
- Available as a model for native peoples throughout the world.

Such a program, if developed, could provide independent assurance to tribal members that forests are well managed. Further, this approach can be used to meet customer or market demands for certified wood. Although it is not apparent that a premium will be paid for certified wood, it is possible that some form of certification will be required to maintain market access in an environment that may eventually be dominated by certified wood.

A tribal certification program linked to one or both of the leading existing standards could include support for tribal efforts to become certified by coordinating outreach and research activities, by promoting the use of certified wood, and by serving as a clearinghouse of certification-related information. Finally, such a program could serve as a platform for advocating changes in existing certification programs that could be favorable to Indian forest participation.

A modified certification process that would better meet tribal forestry needs would be based on the two-stage approach of existing programs, including a Pre-certification Review and a Certification Audit. The approach might proceed along the following lines.

The *Pre-certification Review* would be an office review focused on:

- Tribal goals and vision, and the process used to derive these;
- The management plan and the process for developing it; and
- The presence of an integrated resource program that included self-correcting mechanisms (ISO model of "plan - implement - check - corrective action," see appendix)

This pre-certification phase would be directed towards answering the question, Is a system in place to determine tribal goals and vision, develop a plan that reflects that vision, and then implement the plan on the ground? If the answer is no, then the tribe would be advised to focus additional resources on the system before attempting to be certified.

The *Certification Audit* would assess a sample of field activities. The range of issues covered would be based on the management plan, but would likely include a range of criteria which constitute a robust set of sustainability indicators. Scoring and reporting would have to be designed to meet the objectives of the overall program to move everyone along in a process of continuous improvement.

The creation of a new, completely independent tribal certification system would be problematic because:

- Establishing marketplace acceptance and broad recognition for a new program would require significant expenditure of resources;
- A program restricted to tribal lands would have a narrow financial base to support costs of program development and administration;
- Existing certification schemes have already developed substantial programs, certified land bases, and market acceptance; and
- A credible program would require transparency, including some degree of public access to records.

Recommendation

(1) Each tribe should continue to explore the benefits of using certification programs to help tribal members and leaders to understand and evaluate their forest management programs and practices. Consideration should be given to further development of tribal certification under one of the pre-existing standards. SFI and FSC are well known in the market and several tribes have already obtained certification.

Quinault Reservation

M. Sterner

B. Opportunities for Carbon Sequestration in Tribal Forestry

Finding

(1) The financial and environmental value of using forests to offset carbon dioxide emissions has been gaining some traction in tribal forestry and has significant potential for the future. To date, there have been few successful contracts concluded in North America, but there are several additional projects ready for financing and others in development. As an example of the interest in carbon-financed forestry projects, the 2002 ITC annual symposium included a full day session on carbon sequestration.

The carbon market

Carbon dioxide (CO_2) is one of a number of greenhouse gases (GHG) that is increasingly being monitored and regulated both nationally and internationally. There are two ways to decrease the amount of carbon dioxide (and other GHG) in the atmosphere: reduce emissions or increase sequestration. Companies and governments with high CO_2 emission exposure are increasingly seeking experience in the emerging GHG markets as a means to prepare for future stringent regulations. Trees absorb carbon from CO_2 during the photosynthesis process. Since tree growth can lead to the sequestration of atmospheric carbon, projects such as reforestation can generate carbon sequestration credits. Forestry-based and other sequestration carbon credits are considered to be less costly to produce than many emission reduction credits. North American forestry operations are in a strong position to offer carbon sequestration services to potential buyers and can soon use carbon markets as an additional source of value from their forestland resources. The market for carbon sequestration and emission reduction credits remains in its infancy. This is a result of several factors. First, governments are very cautious about implementing national laws that could restrict energy production (a major source of GHG) since cheap energy maintains low costs of transport and production. Subsequently, the international negotiations and processes aimed to establish compatible "credit" standards among countries progresses very slowly. For example, the U.S. rejected the Kyoto Protocol, claiming the emission reduction targets would have too great an impact on the U.S. economy relative to other countries (primarily emerging markets). The absence of the U.S. jeopardizes the success of the Protocol, an agreement that has been under negotiation for many years. Thus, although most policy makers working in this area agree that standardization, concrete reduction targets, and international trading of commoditized credits would be the best way to address the problems of human induced climate change, the implementation of such a program is complex and slow.

The uncertainties in the marketplace currently keep the value of carbon trades very low. In spite of this uncertainty, some projects and trades have been occurring both nationally and internationally. Most trades have been unique direct contractual agreements between buyer and seller. There are, however, emerging – pilot – marketplaces for carbon trades including CO2e.com, NatSource (www.natsource.com), and the Chicago Climate Exchange (CCX). Among other elements, these marketplaces are seeking standardization of credit criteria. Below is a description of one such new exchange.

The Chicago Climate Exchange (CCX) is a voluntary pilot greenhouse gas trading program for emission sources and offset projects in North America, with limited offset projects in Brazil. The exchange began operations in 2002.

The CCX objectives are:

- Proof of concept: capped GHG trading system, with project offsets;
- Develop market infrastructure and skills;
- Price discovery;
- Predictable GHG reduction schedule;
- Start small and grow over time, provide a model.

In addition to the CCX, there are state programs and registries and the federal government is currently working on a program for voluntary emission reductions and carbon sequestration. As these programs and standards emerge, the market will begin to mature. However, only national legislation including either an emission cap-and-trade program or a significant tax or subsidy program will create strong market incentives for carbon sequestration.

Although it is clear that various market opportunities will soon emerge, the financial value of a carbon commodity (a metric ton of either avoided emissions or sequestered CO_2 equivalents) is far from evident. The absence of clear regulatory guidelines forces early market players to err on the side of caution with estimates, documentation, and certification procedures. This introduces a significant amount of waste into a market at its infancy, thus further reducing the current market opportunity for carbon trades. Although this is the current state of affairs, within several years' time, the market is likely to explode and the players who have gained experience with pilot projects at this early stage stand to benefit greatly from their early investment and risk-taking.

Figure 7. CCX participating organizations (www.chicagoclimatex.com April 2002).

Opportunities for forestry-based carbon offset projects

There are various activities that can increase the carbon sequestration value of forestland. The main options include increasing productivity on existing forestland; increasing rotation ages; afforestation and increasing the area of forestland being managed; protection of sensitive areas; increasing the efficiency of wood (and other resource) use; increasing the use of biomass fuels; and avoiding the loss of forestland.

The main opportunities for tribal forestland projects are increasing the area of forestland through reforestation and afforestation, and increasing the use of biomass fuels. The other options, such as increasing productivity and increased efficiency, are not as relevant to the tribal forestlands since most forestry practices are currently at a high level of quality and are aimed at sustainability.

It is notable that the few trades and currently developed projects that are described below are all reforestation or afforestation projects. Afforestation refers to the planting of forests on land where the preceeding vegetation or land use was not forest.

General issues concerning sequestration projects

Forestry projects fall under the paradigm of "Land use, Land use Change and Forestry" (LULUCF or simply LUCF.) Land use change and forestry projects have certain characteristics that separate them from other types of greenhouse gas projects. Most of these differences boil down to the question of what is known as permanence. The risk is that growing trees could always be cut at some future date and release the sequestered CO_2 and other greenhouse gases into the atmosphere eliminating all the gains achieved by growing the trees in the first place. These and other issues concerning the credibility of carbon forestry projects are discussed below.

White Mountain Apache Reservation

J.Franklin

Additionality and baselines

To qualify, a carbon sequestration project must be an increment above baselines or "business as usual." There are two main types of additionality: financial and ecological. Financial additionality requires that the project implementer show that additional funding was needed to implement the project – that is the carbon funding itself was critical to the successful implementation of the project. Some current market players require this (e.g. Climate Trust) while others do not (Prototype Carbon Fund).

All potential market participants require ecological additionality. The project implementer must show that the project resulted in greater carbon sequestration (or emission reduction) than what would have occurred without the project. This is supported by verification (often third party) at the project onset time (baseline establishment) and at identified intervals over the course of the project. There are date issues associated with baseline establishment as well. Often the date for the baseline is pushed back to

either 1990 or 2000. Establishing a baseline starting point in the past prevents the misuse of carbon financing. It avoids, for example, a landowner clearcutting a stand then seeking carbon financing to replace the stand. This is less of an issue with afforestation (generally considered to be on land that was non-forest prior to 1990). The site should have either lost its forests prior to 1990 or lost its forest cover due to a major catastrophe such as a stand replacing fire.

Permanence

This is the largest issue that separates Land Use Change and Forestry (LUCF) projects from direct energy-based emission reductions project. Unlike avoided emissions that are permanent, carbon sinks can be lost to fire, cutting, and various other changes. Acceptable projects must make the case that the sequestration of carbon will last for a certain amount of time. Currently 100 years is the target, but shorter periods may be acceptable. This challenge of permanence has been one element limiting the use of sinks in developing countries (non-Annex I) under the Kyoto Protocol's Clean Development Mechanism. The permanence requirement makes the association of carbon projects with certified sustainability programs very attractive and increases the relative value of forestry-based carbon projects in developed countries in comparison to developing countries. Clear property ownership is essential and many sequestration projects will require the establishment of long-term contracts and legal instruments such as conservation or development easements.

Leakage

In many cases, decreased emissions (or increased sequestration) from one area may lead to the opposite impact in another area. When this type of impact from a project is not accounted for, it is considered leakage. Leakage can be defined as the inadvertent emission of CO_2 (or other GHG) as an externality to the project that is not accounted for by the project. One example is in energy production: if one power plant shuts down, one or more may increase production to meet the demand – depending on the relative levels of emissions, this leakage would reduce the emissions impact of the first plant shutting down. In the case of afforestation, leakage may be less likely since there is simply an overall increase in planted acres – this should have little if any impact on demand and will only increase supply. However, over time an increase in planted acres may reduce the commodity price of timber (as supply increases relative to demand).

A common approach to examining leakage is to include the entire company in the analysis even if the project will only appear to influence one part of the landowner's forestry operations. The project implementers should attempt to predict the projects' impact on the next one or two interlocutors in the market. For example, a forestry company could consider the project's impact on the mills and the mills' clients. If a mill will be forced to purchase wood from another source as a substitute for decreased wood coming from the project implementer, then carbon leakage is involved. Leakage may either decrease the amount of carbon credits or invalidate the entire project. Accounting for leakage from the beginning (internalizing) strengthens the project by reducing risks; however there will always be market factors over which the landowner has no control.

All projects will have to determine an appropriate area of impact and be able to define and monitor potential leakage issues.

Documentation, verification, registration, and certification

Documentation, verification, registration, and, ultimately, certification play a major role in the commercialization and the commoditization of carbon sequestration. Most buyers of carbon credits will require registration or third party certification for carbon sequestration projects. To facilitate certification, adequate documentation must be maintained. The carbon credits (regardless of their nature) will be issued and tradable only upon certification or registration. Although the certification process is not presently standardized it is possible to find both third-party certifiers and registries. The criteria for sequestration projects are not well defined for the existing registries and most are currently working on appropriate language to cover sequestration projects.

There are a few organizations that could play a role of registrar or standard setting body for carbon offsets. Ultimately the U.S. government will set up a clearing body for carbon credits, but this will only follow the establishment of overall GHG legislation. The U.S. government currently has a registry for carbon projects (1605B at the DOE that

currently contains carbon projects for some 200 companies including some forestry), but it is perceived as requiring only minimal criteria. Some states have made steps towards registering projects including California, Wisconsin, and NESCOM (which is moving New England together as a group.) The California registry requires third party certification and they have opened up their registry to corporations operating nationally. Emerging markets for GHG will establish their own minimum criteria and registration protocols.

Due to the complex nature of the emerging markets and the varied criteria for different registries, there are no universally accepted criteria or standards against which all carbon sequestration projects can be assessed. As a result, most third party certifiers are taking a conservative approach to verification and will seek comprehensive documentation and field verification of actual levels of carbon sequestration. Because of the thorough nature of certification approaches, third party verification can be an expensive element to a carbon sequestration project and implies the potential for economies of scale. With the competitive advantage of forestry-based carbon offset projects being low cost, it is essential to minimize expenditure on verification and certification services. Where possible, certification costs can be transferred to the buyer since it guarantees (or at minimum, decreases risks to) the value of the credits being purchased. On the other hand, if registration or certification is conducted prior to the sale, it will increase the value of the carbon credits and could easily pay for itself as long as the seller is careful to negotiate a higher price. The approach will depend on the willingness of the forestland owner to spend the money up front.

To minimize costs of certification, the forestland owner can maintain clear documentation of historic treatments and other reflections of past management procedures as well as management plans prior to the decision to implement the carbon sequestration project. This documentation will help to establish and support the baseline scenario.

The ITC session on carbon financing

At the Intertribal Timber Council meeting and conference in April 2002, carbon projects received a full day's discussion and presentation. Some market and science-based issues discussed included the emergence of new markets, regulations, carbon accounting, and project development. Speakers at the conference included: Neil Sampson, who has been involved in international negotiations on climate change issues and helped establish the Colville and Nez Perce reforestation project; Michael Walsh, of Environmental Financial Products, who has been involved in the development of environmental markets and is working to develop a greenhouse gas market in Chicago; and Brian Kummet, of the Nez Perce Tribal Forestry Department, who has established a carbon project and explained the details of carbon accounting. In addition, John Vitello of the BIA,

Tribes that have had funded projects	Tribes with developed projects	Tribes developing or concidering the development of projects
Northwest (2)	Northwest (2) Alaska (1)	Northwest (3)

Table 22. Tribes pursuing carbon sequestration projects, by region (SFI Pre-certification Reports 2001).

Division of Forestry, presented a draft BIA policy document addressing many of the trust land policy issues; Jim Erickson, Colville Forestry, (now ITC fire specialist) discussed his experience developing projects; and Scott Rodgers, BIA Colville, discussed history and procedures issues.

Several policy issues were discussed in the recent ITC conference including monitoring, tribal sovereignty, and the treatment of allotment lands.

Some tribes were concerned that the third party monitoring requirements would compromise the tribes' ability to limit outside observation of tribal activities. It was suggested that perhaps the ITC, or related body, could establish a tribal committee to verify and monitor carbon projects.

The long-term contracts of carbon projects were a concern not only for tribal sovereignty issues but also for the federal trust responsibilities. The BIA draft policy paper outlines specific issues of trust responsibilities and seeks to protect the tribes from compromising their sovereignty. While true that carbon projects require long-term contracts, tribal forestry may be at an advantage over other forestry enterprises in this regard since the carbon purchaser can be assured by the fact that the "…land will remain under the tribes' ownership, as insured by the fact that the land is held in trust status by the United States Government." With private landowners and forestry companies, a type of conservation easement must be put on the land to assure long-term management agreements.

The treatment of allotment lands can be a complex issue for general forestry issues (see elsewhere in document.) With regard to carbon sequestration projects, they may require multiple contracts or other forms of legal solutions. The costs of negotiating contracts with a large number of buyers can be harmful to the value of a carbon project since cost is an extremely important factor now and will continue to be into the future. Currently, the BIA is examining existing legislation to identify how carbon from allotments can be managed contractually together with tribal trust land. Allotment land is currently not covered under the contracts and agreements with Indian tribes' authority since it was amended in 2000.

Recommendation

(1) Cautiously continue to pursue carbon credit trading while monitoring emerging opportunities. Continuing to build tribal expertise in carbon marketing and science will facilitate this process. Although no clear consensus has emerged on the multi-lateral accords on carbon credit trading, there is continued activity surrounding this issue at the regional level in the U.S. and abroad. Both industry (buyers and sellers) and governments are closely monitoring emerging carbon markets. Based on the effort going into market analysis and press reporting, it is likely that carbon credit will become a reality in the near future.

VII. CONCLUDING COMMENTS

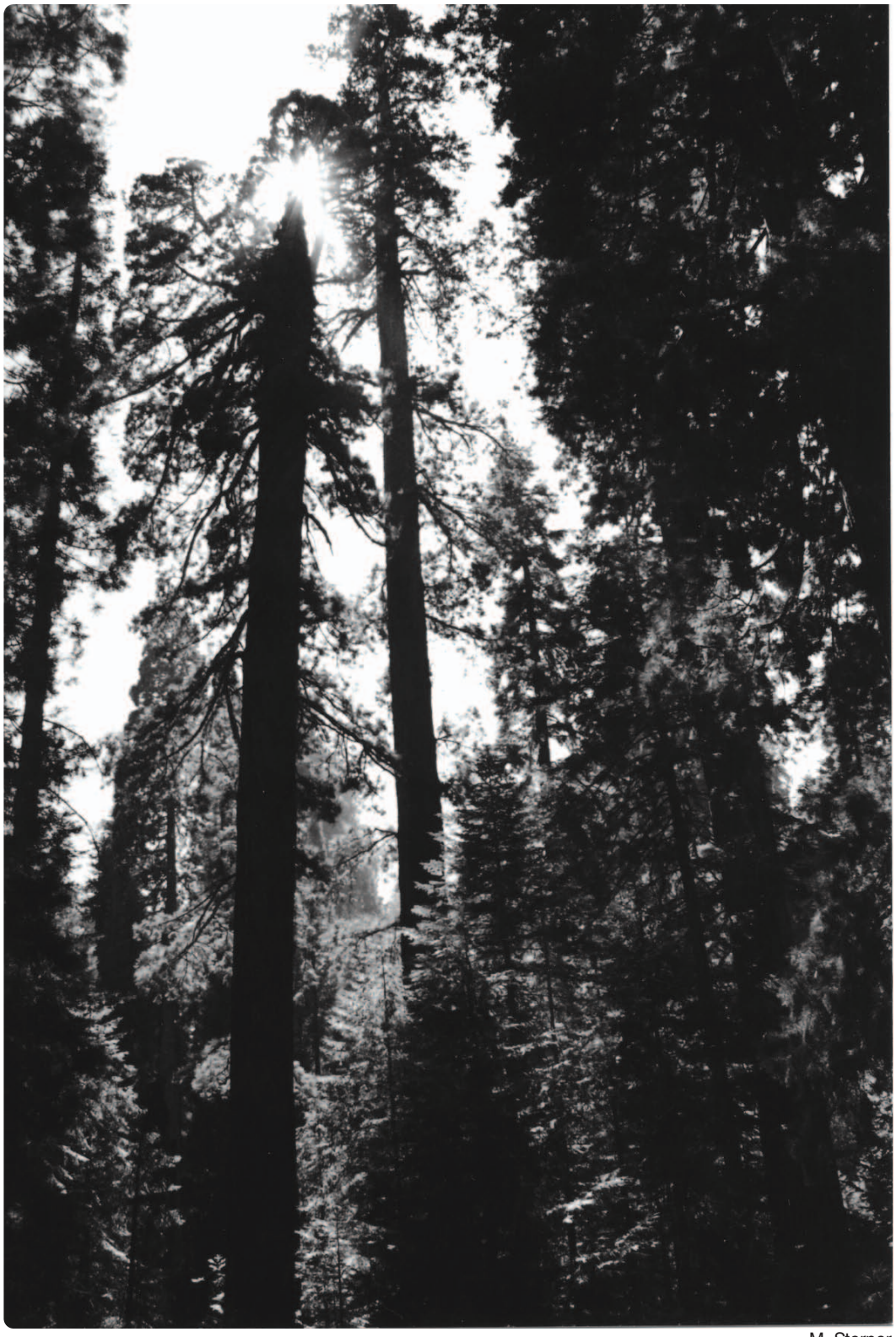
This report represents the second decadal independent assessment of the status of Indian forests and forestry pursuant to NIFRMA requirements. The assessment was completed by a group of nationally recognized experts, including many of the same individuals involved in the first IFMAT assessment reported in 1993. The strength of this periodic evaluation lies in the continuity of membership and the comparative potential of regular, independent assessments in which the same eight aspects of forest management are addressed. This structure provides an invaluable means to evaluate progress and monitor change in the management of Indian forests.

Everyday, forests continue to affect the economies and cultures of Indian people on hundreds of Indian reservations nationwide. Indian forests remain a vital part of tribal life in every part of the nation. The variety of forests, their uses, and significance varies from tribe to tribe, but one inescapable fact remains - at the end of the day, Indians live closer to the consequences of their forest management decisions than other elements of American society. In this regard, although the management of Indian forests is vital to the welfare of tribal societies, the condition of Indian forests can also yield valuable lessons for society in general; indeed, Indian forests have the potential to be models of integrated resource management and forest sustainability from which we can all learn.

In the decade since the first IFMAT assessment, substantial progress has been made. Self-determination has taken hold and is rapidly advancing with tribal governments gaining greater prominence in establishing the direction for management of their forests and in performing a wide variety of field and planning activities. Tribal forestry has made progress in silviculture, forest health management, planning, certification and carbon credit trading. The timber-production focus of the past has begun to give way to integrated resource management to better fit the visions of tribal communities.

Despite this progress, however, significant problems still remain and pose continuing obstacles that prevent tribal forests from reaching their potential. Indian forests are facing increasing risks from urbanization, wildfire, insects, and disease. Funding for Indian forests, even with tribal contributions, continues to lag behind both federal investments on the National Forests that are managed for ecological services, and on comparable state and private lands managed for timber production. Despite increased funding for the fire program to protect forests from catastrophic fire and to increase forest health, rigid regulations prevent efficient use of funds to achieve integrated forest management. Partitioning of BIA budgets to individual tribes under self-determination, and constant or declining budgets for technical services have strained the capacity of the BIA to provide a critical mass of technical service capacity. Smaller reservations and fragmentation of ownership patterns pose special management problems due to larger per acre management costs and increased costs of administration. The backlog of outdated forest management plans are outside of regulation and threaten continued forest operations. Staffing levels for forest management are still far short of needs, and there are concerns that imminent retirements could result in loss of expertise and institutional knowledge. Reductions in federal timber supply have, in some areas, adversely affected processing outlets for Indian timber, and lumber imports continue to drive down markets, jeopardizing tribal income and reducing opportunities to market smaller diameter trees to promote forest health. Lastly, effective trust oversight is lacking, with the BIA still serving as both “pitcher” and “umpire” in the management of Indian forests.

In our report, we present recommendations for addressing several key funding and organizational problems. Increases in investment, reduced burden from unfunded mandates, and improved trust oversight are needed. It is imperative that these remedial actions be taken quickly; there is considerable risk that efforts to combat forest health problems and institute sustainable management for all forest resources will be overwhelmed by a combination of funding shortfalls, personnel shortages, and ecosystem-based problems (insects, disease, and fire). If our recommendations are implemented, we are confident that the future for Indian forestry will be bright and that Indian forests will have the opportunity to play an important role in informing American and world forest management policies and practices. Investments in Indian forestry would yield immense future dividends in healthy forests, environmental protection, and available timber that would benefit all Americans.



Tule River Reservation

M. Sterner

APPENDIX I.
National Indian Forest Resources Management Act

US CODE TITLE 25, CHAPTER 33

Sec. 3101. - Findings

The Congress finds and declares that -

(1)the forest lands of Indians are among their most valuable resources and Indian forest lands -
(A) encompass more than 15,990,000 acres, including more than 5,700,000 acres of commercial forest land and 8,700,000acres of woodland,
(B)are a perpetually renewable and manageable resource,
(C)provide economic benefits, including income, employment, and subsistence, and
(D) provide natural benefits, including ecological, cultural, and esthetic values;
(2)the United States has a trust responsibility toward Indian forest lands;
(3) existing Federal laws do not sufficiently assure the adequate and necessary trust management of Indian forest lands;
(4) the Federal investment in, and the management of, Indian forest land is significantly below the level of investment in, and management of, National Forest Service forest land, Bureau of Land Management forest land, or private forest land;
(5) tribal governments make substantial contributions to the overall management of Indian forest land; and
(6)there is a serious threat to Indian forest lands arising from trespass and unauthorized harvesting of Indian forest land resources.

Sec. 3102. - Purposes
The purposes of this chapter are to -

(1)allow the Secretary of the Interior to take part in the management of Indian forest lands, with the participation of the lands' beneficial owners, in a manner consistent with the Secretary's trust responsibility and with the objectives of the beneficial owners;
(2) clarify the authority of the Secretary to make deductions from the proceeds of sale of Indian forest products, assure the use of such deductions on the reservation from which they are derived solely for use in forest land management activities, andassure that no other deductions shall be collected;
(3)increase the number of professional Indian foresters and related staff in forestry programs on Indian forest land; and
(4) provide for the authorization of necessary appropriations to carry out this chapter for the protection, conservation, utilization, management, and enhancement of Indian forest lands

Sec. 3103. - Definitions
For the purposes of this chapter, the term -

(1)''Alaska Native'' means Native as defined in section 1602(b) of title 43;
(2) ''forest'' means an ecosystem of at least one acre in size, including timberland and woodland, which -
(A) is characterized by a more or less dense and extensive tree cover,
(B)contains, or once contained, at least ten percent tree crown cover, and
(C) is not developed or planned for exclusive nonforest use;
(3)''Indian forest land'' means Indian lands, including commercial and non-commercial timberland and woodland, that are considered chiefly valuable for the production of forest products or to maintain watershed or other land values enhanced by a forest cover, regardless whether a formal inspection and land classification action has been taken;
(4) ''forest land management activities'' means all activities performed in the management of Indian forest lands, including -
(A) all aspects of program administration and executive direction such as -
(i)development and maintenance of policy and operational procedures, program oversight, and evaluation,
(ii) securing of legal assistance and handling of legal matters,
(iii) budget, finance, and personnel management, and
(iv)development and maintenance of necessary data bases and program reports;
(B) all aspects of the development, preparation and revision of forest inventory and management plans, including aerial photography, mapping, field management inventories and re-inventories, inventory analysis, growth studies,allowable annual cut calculations, environmental assessment, and forest history, consistent with and reflective of tribal integrated resource management plans;
(C)forest land development, including forestation, thinning, tree improvement activities, and the use of silvicultural treatments to restore or increase growth and yield to the full productive capacity of the forest environment;
(D)protection against losses from wildfire, including acquisition and maintenance of fire fighting equipment and fire detection systems, construction of firebreaks, hazard reduction, prescribed burning, and the development of cooperative wildfire management agreements;
(E)protection against insects and disease, including -
(i)all aspects of detection and evaluation,
(ii)preparation of project proposals containing project description, environmental assessments and statements, and cost-benefit analyses necessary to secure funding,
(iii) field suppression operations, and
(iv) reporting;
(F) assessment of damage caused by forest trespass, infestation or fire, including field examination and survey,
damage appraisal, investigation assistance, and report, demand letter, and testimony preparation;

(G)all aspects of the preparation, administration, and supervision of timber sale contracts, paid and free use permits, and other Indian forest product harvest sale documents including -

(i) cruising, product marking, silvicultural prescription, appraisal and harvest supervision,
(ii) forest product marketing assistance, including evaluation of marketing and development opportunities related to Indian forest products and consultation and advice to tribes, tribal and Indian enterprises on maximization ofreturn on forest products,
(iii)archeological, historical, environmental and other land management reviews, clearances, and analyses,
(iv) advertising, executing, and supervising contracts,
(v) marking and scaling of timber, and
(vi) collecting, recording and distributing receipts from sales;

(H) provision of financial assistance for the education of Indians enrolled in accredited programs of postsecondary and postgraduate forestry and forestry-related fields of study, including the provision of scholarships, internships, relocation assistance, and other forms of assistance to cover educational expenses;
(I) participation in the development and implementation of tribal integrated resource management plans, including activities to coordinate current and future multiple uses of Indian forest lands;
(J)improvement and maintenance of extended season primary and secondary Indian forest land road systems; and
(K)research activities to improve the basis for determining appropriate management measures to apply to Indian forest lands;
(5)''forest management plan'' means the principal document, approved by the Secretary, reflecting and consistent with a tribal integrated resource management plan, which provides for the regulation of the detailed, multiple-use operation of Indian forest land by methods assuring that such lands remain in a continuously productive state while meeting the objectives of thetribe and which shall include -
(A) standards setting forth the funding and staffing requirements necessary to carry out each management plan, with a
report of current forestry funding and staffing levels; and
(B standards providing quantitative criteria to evaluate performance against the objectives set forth in the plan;
(6) ''forest product'' means -
(A)timber,
(B) a timber product, including lumber, lath, crating, ties, bolts, logs, pulpwood, fuelwood, posts, poles and split products,
(C)bark,
(D) Christmas trees, stays, branches, firewood, berries, mosses, pinyon nuts, roots, acorns, syrups, wild rice, and herbs,
(E) other marketable material, and
(F)gravel which is extracted from, and utilized on, Indian forest lands;
(7) ''forest resources'' means all the benefits derived from Indian forest lands, including forest products, soil productivity, water, fisheries, wildlife, recreation, and aesthetic or other traditional values of Indian forest lands;
(8)''forest trespass'' means the act of illegally removing forest products from, or illegally damaging forest products on, forestlands;

(9)''Indian'' means a member of an Indian tribe;
(10)''Indian land'' means land title to which is held by -
(A)the United States in trust for an Indian, an individual of Indian or Alaska Native ancestry who is not a member of a federally-recognized Indian tribe, or an Indian tribe, or
(B) an Indian, an individual of Indian or Alaska Native ancestry who is not a member of a federally recognized tribe, or
an Indian tribe subject to a restriction by the United States against alienation;
(11) ''Indian tribe'' or ''tribe'' means any Indian tribe, band, nation, Pueblo or other organized group or community which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians and shall mean, where appropriate, the recognized tribal government of such tribe's reservation;
(12) ''reservation'' includes Indian reservations established pursuant to treaties, Acts of Congress or Executive orders, public
domain Indian allotments, and former Indian reservations in Oklahoma;
(13) ''Secretary'' means the Secretary of the Interior;
(14) ''sustained yield'' means the yield of forest products that a forest can produce continuously at a given intensity of management; and
(15)''tribal integrated resource management plan'' means a document, approved by an Indian tribe and the Secretary, which provides coordination for the comprehensive management of such tribe's natural resources

Sec. 3104. - Management of Indian forest land

(a) **Management activities**
The Secretary shall undertake forest land management activities on Indian forest land, either directly or through contracts, cooperative agreements, or grants under the Indian Self-Determination Act (25 U.S.C. 450f et seq.).
(b) Management objectives
Indian forest land management activities undertaken by the Secretary shall be designed to achieve the following objectives -
(1) the development, maintenance, and enhancement of Indian forest land in a perpetually productive state in accordance

with the principles of sustained yield and with the standards and objectives set forth in forest management plans by providing
effective management and protection through the application of sound silvicultural and economic principles to -
(A) the harvesting of forest products,
(B) forestation,
(C) timber stand improvement, and
(D) other forestry practices;
(2) the regulation of Indian forest lands through the development and implementation, with the full and active consultation and participation of the appropriate Indian tribe, of forest management plans which are supported by written tribal objectives
and forest marketing programs;
(3) the regulation of Indian forest lands in a manner that will ensure the use of good method and order in harvesting so as to make possible, on a sustained yield basis, continuous productivity and a perpetual forest business;
(4) the development of Indian forest lands and associated value-added industries by Indians and Indian tribes to promote self-sustaining communities, so that Indians may receive from their Indian forest land not only stumpage value, but also the benefit of all the labor and profit that such Indian forest land is capable of yielding;
(5) the retention of Indian forest land in its natural state when an Indian tribe determines that the recreational, cultural, aesthetic, or traditional values of the Indian forest land represents the highest and best use of the land;
(6) the management and protection of forest resources to retain the beneficial effects to Indian forest lands of regulating water run-off and minimizing soil erosion; and
(7) the maintenance and improvement of timber productivity, grazing, wildlife, fisheries, recreation, aesthetic, cultural and other traditional values Sec. 3105. - Forest management deduction
(a) Withholding of deduction
Pursuant to the authority of section 413 of this title, the Secretary shall withhold a reasonable deduction from the gross proceeds of sales of forest products harvested from Indian forest land under a timber sale contract, permit, or other harvest sale
document, which has been approved by the Secretary, to cover in whole or part the cost of managing and protecting such Indian
forest land.
(b) Amount of deduction
Deductions made pursuant to subsection (a) of this section shall not exceed the lesser amount of -
(1) 10 percent of gross proceeds, or
(2) the percentage of gross proceeds collected on November 28, 1990, as forest management deductions by the Secretary on such sales of Indian forest products,
unless the appropriate Indian tribe consents to an increase in the deductions.
(c) Use of deduction
The full amount of any deduction collected by the Secretary shall be expended according to an approved expenditure plan, approved by the Secretary and the appropriate Indian tribe, for the performance of forest land management activities on the reservation from which such deductions are collected and shall be made available to the tribe, upon its request, by contract or agreement for the performance of such activities.
(d) Limitations
(1) Forest management deductions withheld pursuant to this section shall not be available to -
(A) cover the costs that are paid from funds appropriated specifically for fire suppression or pest control, or
(B) otherwise offset Federal appropriations for meeting the Federal trust responsibility for management of Indian forest lands.
(2) No other forest management deductions derived from Indian forest lands shall be collected to be covered into the general
funds of the United States Treasury

Sec. 3106. - Forest trespass

(a) Civil penalties; regulations
Not later than 18 months from November 28, 1990, the Secretary shall issue regulations that -
(1) establish civil penalties for the commission of forest trespass which provide for -
(A) collection of the value of the products illegally removed plus a penalty of double their value,
(B) collection of the costs associated with damage to the Indian forest land caused by the act of trespass, and
(C) collection of the costs associated with enforcement of the regulations, including field examination and survey,
damage appraisal, investigation assistance and reports, witness expenses, demand letters, court costs, and attorney
fees;
(2) designate responsibility with the Department of the Interior for the detection and investigation of forest trespass; and
(3) set forth responsibilities and procedures for the assessment and collection of civil penalties.
(b) Treatment of proceeds
The proceeds of civil penalties collected under this section shall be treated as proceeds from the sale of forest products from the Indian forest lands upon which such trespass occurred.
(c) Concurrent jurisdiction
Indian tribes which adopt the regulations promulgated by the Secretary pursuant to subsection (a) of this section shall have concurrent civil jurisdiction to enforce the provisions of this section and the regulation promulgated thereunder. The Bureau of

Indian Affairs and other agencies of the Federal Government shall, at the request of the tribe, defer to tribal prosecutions of forest
trespass cases. Tribal court judgments regarding forest trespass shall be entitled to full faith and credit in Federal and State courts to
the same extent as a Federal court judgment obtained under this section

Sec. 3107. - Direct payment of forest products receipts

(a) Regulations
Notwithstanding any other law, the Secretary shall, within 1 year from November 28, 1990, promulgate regulations providing for
the payment of the receipts from the sale of Indian forest products as provided in this section.
(b) Payment into a bank depository
Upon the request of an Indian tribe, the Secretary shall provide that the purchaser of the forest products of such tribe, which are harvested under a timber sale contract, permit or other harvest sale document which has been approved by the Secretary, shall
make prompt direct payments of the gross proceeds of sales of such forest products, less any amounts segregated as forest management deductions pursuant to section 3105 of this title, into a bank depository account designated by such Indian tribe

Sec. 3108. - Secretarial recognition of tribal laws

Subject to the Secretary's responsibilities as reflected in sections 3101(2) and 3102(1) of this title and unless otherwise prohibited by Federal statutory law, the Secretary shall comply with tribal laws pertaining to Indian forest lands, including laws regulating the environment or historic or cultural preservation, and shall cooperate with the enforcement of such laws on Indian
forest lands. Such cooperation shall include -
(1) assistance in the enforcement of such laws;
(2) provision of notice of such laws to persons or entities undertaking activities on Indian forest lands; and

(3) upon the request of an Indian tribe, the appearance in tribal forums

Sec. 3109. - Indian forest land assistance account

(a) Establishment
At the request of an Indian tribe, the Secretary may establish a special Indian forest land assistance account within the tribe's trust fund account to fund the Indian forest land management activities of such tribe.
(b) Deposits and expenditures
(1) The Secretary may deposit into the Indian forest land assistance account established pursuant to subsection (a) of this
section any funds received by the Secretary or in the Secretary's possession from -
(A) non-Federal sources, if such funds are related to activities on or for the Indian forest lands of such tribe's
reservation,
(B) donations and contributions,
(C) unobligated forestry appropriations for the benefit of such Indian tribe, and
(D) user fees or other funds transferred under Federal interagency agreements if otherwise authorized by Federal law and, if such funds are related to activities on or for the Indian forest lands of such tribe's reservation.
Funds deposited in such account shall be for the purpose of conducting forest land management activities on the Indian forest
lands of such tribe.
(2) Funds in the Indian forest land assistance account and any interest or other income earned thereon shall remain available
until expended and shall not be available to otherwise offset Federal appropriations for meeting the Federal responsibility for
management of Indian forest lands.
(c) Audits
At the request of an Indian tribe or upon the Secretary's own volition, the Secretary may conduct audits of the Indian forest land assistance account and shall publish the results of such audit

Sec. 3110. - Tribal forestry programs

(a) Establishment
The Secretary shall establish within the Bureau of Indian Affairs a program to provide financial support to forestry programs
established by an Indian tribe.
(b) Support allocation formula; criteria
(1) The Secretary, with the participation of Indian tribes with Indian forest lands, shall establish, and promulgate by
regulations, a formula -
(A) for the determination of Indian tribes eligible for such support,
(B) for the provision of levels of assistance for the forestry programs of such tribes, and
(C) the allocation of base support funds to such tribes under the program established pursuant to subsection (a) of
this section.
(2) The formula established pursuant to this subsection shall provide funding necessary to support -
(A) one professional forester, including fringe benefits and support costs, for each eligible tribe, and

(B) one additional professional forester or forest technician, including fringe benefits and support costs, for each level of assistance for which an eligible Indian tribe qualifies.
(3) In any fiscal year that appropriations are not sufficient to fully fund tribal forestry programs at each level of assistance under the formula required to be established in this section, available funds for each level of assistance shall be evenly divided
among the tribes qualifying for that level of assistance

Sec. 3111. - Assessment of Indian forest land and management programs

(a) Initial assessment
(1) Within 1 year after November 28, 1990, the Secretary, in consultation with affected Indian tribes, shall enter into a contract with a non-Federal entity knowledgeable in forest management practices on Federal and private lands to conduct an independent assessment of Indian forest lands and Indian forest land management practices.
(2) Such assessment shall be national in scope and shall include -

(A) an in-depth analysis of management practices on, and the level of funding for, specific Indian forest land compared
with similar Federal and private forest lands,
(B) a survey of the condition of Indian forest lands, including health and productivity levels,
(C)an evaluation of the staffing patterns of forestry organizations of the Bureau of Indian Affairs and of Indian tribes,
(D) an evaluation of procedures employed in timber sales administration, including preparation, field supervision, and
accountability for proceeds,
(E) an analysis of the potential for reducing or eliminating relevant administrative procedures, rules and policies of the
Bureau of Indian Affairs consistent with the Federal trust responsibility,
(F) a comprehensive review of the adequacy of Indian forest land management plans, including their compatibility
with applicable tribal integrated resource management plans and their ability to meet tribal needs and priorities,
(G) an evaluation of the feasibility and desirability of establishing minimum standards against which the adequacy of the forestry programs of the Bureau of Indian Affairs in fulfilling its trust responsibility to Indian tribes can be measured, and
(H) a recommendation of any reforms and increased funding levels necessary to bring Indian forest land management
programs to a state-of-the-art condition.

(3) Such assessment shall include specific examples and comparisons from each of the regions of the United States where
Indian forest lands are located.
(4) The initial assessment required by this subsection shall be completed no later than 36 months following November 28, 1990. Upon completion, the assessment shall be submitted to the Committee on Natural Resources of the United States House of Representatives and the Committee on Indian Affairs of the United States Senate and shall be made available to Indian tribes.
(b) Periodic assessments
On each 10-year anniversary of November 28, 1990, the Secretary shall provide for an independent assessment of Indian forest
lands and Indian forest land management practices under the criteria established in subsection (a) of this section which shall include
analyses measured against findings in previous assessments.
(c) Status report to Congress
The Secretary shall submit, within 1 year of the first full fiscal year after November 28, 1990, and within 6 months of the end of
each succeeding fiscal year, a report to the Committee on Natural Resources of the United States House of Representatives, the Committee on Indian Affairs of the United States Senate, and to the affected Indian tribes a report on the status of Indian forest lands
with respect to standards, goals and objectives set forth in approved forest management plans for each Indian tribe with Indian forest lands. The report shall identify the amount of Indian forest land in need of forestation or other silviculture treatment and the quantity
of timber available for sale, offered for sale, and sold for each Indian tribe.
(d) Assistance from Secretary of Agriculture
The Secretary of Agriculture, through the Forest Service, is authorized to provide, upon the request of the Secretary of the Interior, on a nonreimbursable basis, technical assistance in the conduct of such research and evaluation activities as may be necessary for the completion of any reports or assessments required by this chapter

Sec. 3112. - Alaska Native technical assistance program

(a) Establishment
The Secretary, in consultation with the village and regional corporations established pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.), shall establish a program of technical assistance for such corporations to promote the
sustained yield management of their forest resources. Such technical assistance shall also be available to promote local processing
and other value-added activities with such forest resources.
(b) Indian Self-Determination Act
The technical assistance to be provided by the Secretary pursuant to subsection (a) of this section shall be made available
through contracts, grants or agreements entered into in accordance with, and made available to entities eligible for, such contracts,
grants, or agreements under the Indian Self-Determination Act (25 U.S.C. 450f et seq.)

Sec. 3113. - Establishment of Indian and Alaska Native forestry education assistance

(a) Forester intern program
(1) Notwithstanding the provisions of title 5 governing appointments in the competitive service, the Secretary shall establish
and maintain in the Bureau of Indian Affairs at least 20 forester intern positions for Indian and Alaska Native students.
(2) For purposes of this subsection, the term ''forester intern'' means an Indian or Alaska Native who -
(A) is acquiring necessary academic qualifications to become a forester or a professional trained in forestry-related fields, and
(B) is appointed to one of the positions established under paragraph (1).

(3) The Secretary shall pay all costs for tuition, books, fees and living expenses incurred by a forester intern while attending an approved post-secondary or graduate school in a full-time forestry-related curriculum.

(4) A forester intern shall be required to enter into an obligated service agreement to serve as a professional forester or other forestry-related professional with the Bureau of Indian Affairs, an Indian tribe, or a tribal forest-related enterprise for 2 years foreach year of education for which the Secretary pays the intern's educational costs under paragraph (3) of this subsection.
(5) A forester intern shall be required to report for service with the Bureau of Indian Affairs during any break in attendance at school of more than 3 weeks duration. Time spent in such service shall be counted toward satisfaction of the intern's obligated service agreement.
(b) Cooperative education program
(1) The Secretary shall maintain, through the Bureau of Indian Affairs, a cooperative education program for the purpose of recruiting promising Indian and Alaska Native students who are enrolled in secondary schools, tribally-controlled community colleges, and other post-secondary or graduate schools for employment as a professional forester or other forestry-related professional with the Bureau of Indian Affairs, an Indian tribe, or a tribal forest-related enterprise.
(2) The cooperative educational program that is to be maintained under paragraph (1) shall be modeled on and shall have essentially the same features of the program operated on November 28, 1990, pursuant to chapter 308 of the Federal Personnel Manual of the Office of Personnel Management.
(3) Under the cooperative agreement program that is to be maintained under paragraph (1), the Secretary shall pay all costs for tuition, books, and fees of an Indian or Alaska Native student who -
(A) is enrolled in a course of study at an education institution with which the Secretary has entered into a cooperative agreement, and
(B) is interested in a career with the Bureau of Indian Affairs, an Indian tribe or a tribal enterprise in the management of Indian forest land.
(4) Financial need shall not be a requirement to receive assistance under the cooperative agreement program that is to be maintained under this subsection.
(5) A recipient of assistance under the cooperative education program that is to be maintained under this subsection shall be required to enter into an obligated service agreement to serve as a professional forester or other forestry-related professional with the Bureau of Indian Affairs, an Indian tribe, or a tribal forest-related enterprise for one year for each year for which the Secretary pays the recipient's educational costs pursuant to paragraph (3).
(c) Scholarship program
(1) The Secretary is authorized to grant forestry scholarships to Indians and Alaska Natives enrolled in accredited programs for post-secondary and graduate forestry and forestry-related programs of study as full-time students.
(2) A recipient of a scholarship under paragraph (1) shall be required to enter into an obligated service agreement with the Secretary in which the recipient agrees to accept employment for one year for each year the recipient received a scholarship, following completion of the recipient's forestry or forestry-related course of study, with
(A) the Bureau of Indian Affairs;
(B) a forestry program conducted under a contract, grant, or cooperative agreement entered into under the Indian Self-Determination Act (25 U.S.C. 450f et seq.);

(C) an Indian enterprise engaged in a forestry or forestry-related business; or
(D) an Indian tribe's forestry-related program.
(3) The Secretary shall not deny scholarship assistance under this subsection solely on the basis of an applicant's scholastic achievement if the applicant has been admitted to and remains in good standing in an accredited postsecondary or graduate institution.
(d) Forestry education outreach
The Secretary shall conduct, through the Bureau of Indian Affairs, and in consultation with other appropriate local, State and Federal agencies, and in consultation and coordination with Indian tribes, a forestry education outreach program for Indian and Alaska Native youth to explain and stimulate interest in all aspects of Indian forest land management and careers in forestry.
(e) Adequacy of programs
The Secretary shall administer the programs described in this section until a sufficient number of Indians and Alaska Natives are trained to ensure that there is an adequate number of qualified, professional Indian foresters to manage the Bureau of Indian
Affairs forestry programs and forestry programs maintained by or for Indian tribes

Sec. 3114. - Postgraduation recruitment, education and training programs

(a) Postgraduation recruitment
The Secretary shall establish and maintain a program to attract Indian and Alaska Native professional foresters and forester technicians who have already graduated from their course of postsecondary or graduate education for employment in either the
Bureau of Indian Affairs forestry programs or, subject to the approval of the tribe, in tribal forestry programs. According to such regulations as the Secretary may prescribe, such program shall provide for the employment of Indian and Alaska Native professional foresters or forestry technicians in exchange for the Secretary's assumption of the employee's outstanding student loans. The period of employment shall be determined by the amount of the loan that is assumed.
(b) Postgraduate intergovernmental internships
For the purposes of training, skill development and orientation of Indian, Alaska native, [1] and Federal forestry personnel, and the enhancement of tribal and Bureau of Indian Affairs forestry programs, the Secretary shall establish and actively conduct a program for the cooperative internship of Federal, Indian, and Alaska Native forestry personnel. Such program shall -
(1) for agencies within the Department of the Interior -
(A) provide for the internship of Bureau of Indian Affairs, Alaska Native, and Indian forestry employees in the forestry-related programs of other agencies of the Department of the Interior, and
(B) provide for the internship of forestry personnel from other Department of the Interior agencies within the Bureau of Indian Affairs and, with the consent of the tribe, within tribal forestry programs;
(2) for agencies not within the Department of the Interior, provide, pursuant to an interagency agreement, internships within the Bureau of Indian Affairs and, with the consent of the tribe, within a tribal forestry program of other forestry personnel of such agencies who are above their sixth year of Federal service;
(3) provide for the continuation of salary and benefits for participating Federal employees by their originating agency;
(4) provide for salaries and benefits of participating Indian and Alaska Native forestry employees by the host agency; and
(5) provide for a bonus pay incentive at the conclusion of the internship for any participant.
(c) Continuing education and training
The Secretary shall maintain a program within the Division of Forestry of the Bureau of Indian Affairs for the ongoing education and training of Bureau of Indian Affairs, Alaska Native, and Indian forestry personnel. Such program shall provide for
(1) orientation training for Bureau of Indian Affairs forestry personnel in tribal-Federal relations and responsibilities;
(2) continuing technical forestry education for Bureau of Indian Affairs, Alaska Native, and tribal forestry personnel; and
(3) developmental training of Indian and Alaska Native personnel in forest land based enterprises and marketing

Sec. 3115. - Cooperative agreement between Department of the Interior and Indian tribes

(a) Cooperative agreements
(1) To facilitate the administration of the programs and activities of the Department of the Interior, the Secretary is authorized to negotiate and enter into cooperative agreements with Indian tribes to -
(A) engage in cooperative manpower and job training and development programs,
(B) to develop and publish cooperative environmental education and natural resource planning materials, and
(C) to perform land and facility improvements, including forestry and other natural resources protection, fire protection, reforestation, timber stand improvement, debris removal, and other activities related to land and natural resource management.
The Secretary may enter into such agreements when the Secretary determines the public interest will be benefited.
(2) In such cooperative agreements, the Secretary is authorized to advance or reimburse funds to contractors from any appropriated funds available for similar kinds of work or by furnishing or sharing materials, supplies, facilities or equipment

without regard to the provisions of section 3324, title 31, relating to the advance of public moneys.
(b) Supervision
In any agreement authorized by this section, Indian tribes and their employees may perform cooperative work under the supervision of the Department of the Interior in emergencies or otherwise as mutually agreed to, but shall not be deemed to beFederal employees other than for purposes of section [1] 2671 through 2680 of title 28 and section [1] 8101 through 8193 of title 5.
(c) Savings provision
Nothing in this chapter shall be construed to limit the authority of the Secretary to enter into cooperative agreements otherwise authorized by law.

Sec. 3116. - Obligated service; breach of contract

(a) Obligated service
Where an individual enters into an agreement for obligated service in return for financial assistance under any provision of this chapter, the Secretary shall adopt such regulations as are necessary to provide for the offer of employment to the recipient of such
assistance as required by such provision. Where an offer of employment is not reasonably made, the regulations shall provide that such service shall no longer be required.
(b) Breach of contract; repayment
Where an individual fails to accept a reasonable offer of employment in fulfillment of such obligated service or unreasonably terminates or fails to perform the duties of such employment, the Secretary shall require a repayment of the financial assistance provided, prorated for the amount of time of obligated service performed, together with interest on such amount which would be payable if at the time the amounts were paid they were loans bearing interest at the maximum legal prevailing rate, as determined by the Treasurer of the United States

Sec. 3117. - Authorization of appropriations
There are authorized to be appropriated such sums as may be necessary to carry out the purposes of this chapter

Sec. 3118. - Regulations
Except as otherwise provided by this chapter, the Secretary is directed to promulgate final regulations for the implementation of
the [1] chapter within eighteen months from November 28, 1990. All regulations promulgated pursuant to this chapter shall be
developed by the Secretary with the participation of the affected Indian tribes.

ec. 3119. - Severability

If any provision of this chapter, or the application of any provision of this chapter to any person or circumstance, is held invalid, the application of such provision or circumstance and the remainder of this chapter shall not be affected thereby

Sec. 3120. - Trust responsibility

Nothing in this chapter shall be construed to diminish or expand the trust responsibility of the United States toward Indian forest lands, or any legal obligation or remedy resulting therefrom.

APPENDIX II.
IFMAT-II Activity Log

June 2001
ITC and Interforest planned the logistics of the tribal visits by IFMAT-II and certification scoping teams.

July 2001
ITC and Interforest held a training session for all certification scoping personnel.

Dr. John Sessions, Dr. Joyce Berry and Calvin Mukumoto visited the Makah reservation. A focus group meeting was held on July 25th.

One of the certification scoping teams visited Grande Ronde (17th and 18th), Confederated Tribes of Siletz (19th and 20th), Warm Springs (23rd and 24th), and Spokane (25th to 27th) reservations. A second certification scoping team visited the Lummi (23rd and 24th), Makah (25th to 27th) and Quinault (30th to August 2nd) reservations.

August 2001
Dr. John Gordon, Dr. Joyce Berry and Dr. Jerry Franklin visited the Colville reservation on August 2nd and 3rd. A focus group meeting was held August 3rd. On August 7th Dr. John Gordon, Dr. Joyce Berry, Dr. Jerry Franklin, Dr. John Sessions and Dr. David Patton met briefly with forestry staff and tribal leaders at Yakama.

A certification scoping team visited the Colville reservation August 1st to 3rd.

A certification scoping team visited Leech Lake (10th and 11th), Fond du Lac (13th and 14th), White Earth Band of Ojibwe (15th to 17th), Red Lake (20th to 22nd). A second certification scoping team visited the Tanana Chiefs Conference (13th to 15th), Chugachmiut, Inc. (16th and 17th), and Metlakatla (20th to 22nd) in Alaska.

Surveys related to NIFRMA were sent to forest managers at all participating tribes to distribute to tribal and agency stakeholders. These surveys addressed social issues about the forest resource; wildlife and range management; and tribal business enterprises.

September 2001
On September 10th through 12th Dr. John Gordon, Dr. Jerry Franklin, Dr. John Sessions, Mike Ferrucci and Michael Sterner visited the Penobscot Indian Reservation. Certification scoping was also carried out during this visit.

Events of September 11 led to cancellation of IFMAT-II visits to the Eastern Band of Cherokee, Lac du Flambeau, and Menominee.

A certification scoping team visited the Alabama-Coushatta Tribe (10th and 11th), Mississippi Band of Choctaw (13th and 14th), and Eastern Band of Cherokee (17th to 19th). A second certification team visited Cheyenne (10th to 13th), Confederated Tribes of the Blackfeet (13th to 15th), Flathead (17th to 19th), Nez Perce Tribe (20th to 22nd), and Coeur d'Alene (24th and 25th).

A certification scoping team visited Tule River Indian Reservation (24th and 25th), Round Valley Indian Reservation (26th and 27th), and Fort Bidwell Paiute Tribe (Oct 1st and 2nd) in California.

October 2001
The certification scoping team visited the Southern Ute Reservation on October 4th to 6th.

On October 9th and 10th Dr. John Gordon, Dr. Joyce Berry, Dr. John Sessions, Dr. Jerry Franklin, Dr. David Patton, Calvin Mukumoto and Mike Ferrucci visited White Mountain Apache. Certification scoping was carried out during this visit and continued on October 12th.

A certification scoping team visited the Mescalero Apache Reservation from October 24th to 26th.

November 2001
Certification scoping reports were completed and sent to all tribes and ITC.

Survey responses were collected and analyzed. Social surveys were sent by mail, fax and email to participating tribes a second time.

Further research related to NIFRMA was carried out. This focused on timber value, management funding, and positions. Reports with regional comparison data were sent to tribes.

December 2001
Dr. John Gordon, Dr. John Sessions, Dr. Joyce Berry, Dr. Jerry Franklin, Mike Ferrucci, Dr. David Meyers and Michael Sterner visited the Quinault Nation on December 4th. Dr. Joyce Berry and Dr. John Gordon conducted a focus group.

On December 5th and 6th IFMAT-II held a team meeting at the Quinault Beach Resort.

Dr. John Gordon and Dr. John Sessions attended the ITC Board meeting on December 12th.

March 2002
A second team meeting was held in Tucson, AZ on March 19th and 20th. Dr. John Gordon, Dr. John Sessions, Dr. Joyce Berry, Dr. Jerry Franklin, Dr. David Patton, Calvin Mukumoto, Mike Ferrucci, and Michael Sterner attended. During this meeting, IFMAT-II heard a presentation on forest conditions at Yakama.

June 2002
IFMAT-II submitted its first draft report to the ITC Board on June 12th.
On June 18 IFMAT-II, represented by Dr. John Gordon, Dr. John Sessions, Calvin Mukumoto and Michael Sterner, presented the first draft to the ITC IFMAT Oversight Committee and received comments.

On June 23rd and 24th Dr. Jerry Franklin and Dr. David Patton visited the Flathead Reservation and on June 25th and 26th Blackfeet Reservation.

August 2002
On August 8 Dr. John Gordon, Dr. John Sessions, Dr. Joyce Berry, Dr. Jerry Franklin, Dr. David Patton, Calvin Mukumoto, Mike Ferrucci, and Michael Sterner participated in a conference call on the appropriateness of certification for tribal forests.

October 2002
On September 10 Dr. John Gordon and Michael Sterner met with ITC technical specialist Don Motanic and submitted a revised draft report.

On October 29 IFMAT-II, represented by Dr. John Sessions, Calvin Mukumoto, Michael Sterner, and by phone, Dr. John Gordon, met with the ITC IFMAT Oversight Committee.

January 2003
IFMAT-II held its final team meeting to evaluate the report. The team agreed to a final list of findings and recommendations. Peer review and final report production were scheduled.

March 2003
Dr. Hal Salwasser of Oregon State University reviewed the final draft of the report and returned comments to IFMAT-II in April.

June 2003
The ITC IFMAT Oversight Committee recommended that the ITC Board accept an executive summary of the IFMAT-II report.
Dr. John Gordon, Dr. John Sessions and Michael Sterner attended the ITC Symposium in Cherokee, NC to present findings and recommendations from the report on June 17.
Dr. John Gordon and Michael Sterner participated in a conference call with Dr. Mit Parsons of the USFS and CSREES staff experts to discuss the Forest Service technical resources available to tribes as well as education funding issues.

October 2003
Dr. John Sessions, Dr. John Gordon (by phone) and Michael Sterner met with the ITC Oversight Committee in Portland, OR to go over comments on the final draft of the report.

December 2003
The ITC IFMAT oversight committee accepted the final draft of the report for publication and public presentation.

APPENDIX III, A.

Questionnaire for Assessment of Indian Forest Land Management

Contact: Prof. Joyce Berry, Colorado State University, Fort Collins, CO
[Note: text in parentheses indicate BIA staff questionnaire version]

Please provide the following information to help with interpretation and follow-up.
Name (Optional):
Occupation or title:
Reservation of Alaskan Native Association/Tribe:
Address (Optional):

Are you a tribal member of the above named reservation or Alaskan Native Association/ Tribe?
Yes No
Are you willing to discuss your responses with IFMAT?
Yes No
Please indicate your gender, age and years of schooling.
Sex:
male female
Age:
18-25 26-35 36-45 46-55 56-65 66+
Schooling:
K-6 7-9 10-12 High School degree College, # years_____

I. *Tribal members only.* In general, how concerned are you about what happens on your tribal forests? Please circle 5 (very concerned) to 1 (not concerned).

Very concerned				Not concerned
5	4	3	2	1

II. What do you (your clients) want from your (their) tribal / association forests? Rate these from 5 (high value) to 1 (low value). Circle appropriate number.

	High Value			Low Value	Don't Know
1. Recreation	5	4	3	2	1	0
2. Income	5	4	3	2	1	0
3. Subsistence (living off the land)	5	4	3	2	1	0
4. Protection of forest resources	5	4	3	2	1	0
5. Spiritual values	5	4	3	2	1	0
6. Cultural values	5	4	3	2	1	0
7. Beauty/Scenery	5	4	3	2	1	0
8. Other_____	5	4	3	2	1	0

III. How well do you think your (clients') forests are being managed right now? Rate the management of the forest resources or activities below from 5 (excellent) to 1 (poor).

	High Value			Low Value	Don't Know
1. Wildlife	5	4	3	2	1	0
2. Fisheries	5	4	3	2	1	0
3. Grazing for livestock	5	4	3	2	1	0

4. Timber or firewood for tribal use	5	4	3	2	1	0
5. Timber for sale or enterprise	5	4	3	2	1	0
6. Recreation	5	4	3	2	1	0
7. Water quantity and quality	5	4	3	2	1	0
8. Cultural site protection	5	4	3	2	1	0
9. Forest resource protection	5	4	3	2	1	0
10. Non-timber forest products (ie, mushrooms)	5	4	3	2	1	0
11. Obtaining a fair price for timber	5	4	3	2	1	0
12. Employment of tribal members	5	4	3	2	1	0
13. Creation of new enterprises	5	4	3	2	1	0
14. Food gathering	5	4	3	2	1	0
15. Spiritual values	5	4	3	2	1	0
16. Visual quality	5	4	3	2	1	0
17. Protection from pollution/ waste	5	4	3	2	1	0
18. Poaching	5	4	3	2	1	0
19. Trespassing	5	4	3	2	1	0
20. Overall management	5	4	3	2	1	0

V. Of the forest resources or activities listed in question IV above, which three are the most important to you (your clients)?
1. (most important)_____
2. _____
3. _____

VI. What organization has primary management responsibility for your (clients') forests? Check one below.
1. BIA
2. Tribe
3. Equally shared tribe and BIA
4. Other (list)_____
5. Don't know

VII. What organization in your opinion should have primary management responsibility for your (clients') forests?
1. BIA
2. Tribe
3. Equally shared tribe and BIA
4. Other (list)_____
5. Don't know

VIII. What resources/activities do you think are being managed best on your (clients') forest (list up to three)?
1. 2. 3.

IX. List the three aspects of forest management most in need of improvement on your forests, and suggest what should be done about them.
1. 2. 3.

X. Do you have any additional comments or suggestions about your (clients') forests? [Space provided on back]

Thank you for your comments, if you have additional comments please attach additional pages to this questionnaire.

APPENDIX III, B.
Business Assessment Questions

Objective: To discover how well do Indian forests based enterprise meet tribal goals.

1. What goals does the Tribe have for their business?
    a. What is its mission?
    b. Is there a business plan for this business?
    c. Is the plan adequate to meet the goals?

2. How does the business work?
    a. How does it make money?
    b. What other values does it create?
    c. Is it reliant upon outside relationships such as joint ventures or marketing agreements?

3. How, if at all, is the performance of the business measured?
    a. By whom?
    b. How does its performance compare to average industrial performance?
    c. How well has it met Tribal goals?
        i. By whose opinion?

4. How is the business organized?
    a. What is its legal form?
    b. By what authority does it exist?
    c. Is there a charter, resolution or other legal document authorizing this business? What authority and power does it have?

5. Does the business convert or distribute raw forest resources?
    a. If so, how is it transferred to the business?
    b. How are transfer prices set?
        i. Do the Tribe, the business, and/or the BIA perceive the transfer pricing as fair?
        ii. Are there other stakeholders such as allotees involved with transactions with this business?
    c. Is the business appropriate for the type, quality, species and volume available from Tribal resources?
    d. Does the business rely solely on reservation resources or does it also obtained them from other sources?

6. What is the market outlook for this business?
    a. Has the business done regular market assessments?
    b. Is its industry growing, maintaining or dying?
    c. Are there any events that might significantly change the way this business operates?
    d. What competitive strengths does this business have?
    e. What are its major weaknesses?
    f. What do they perceive as their greatest opportunities?

7. Does the business maintain adequate financial records? Need at least three years if available.
    a. Are they current and meet GAAP?
    b. Are they audited by certified public accountants?
    c. Do they reflect activity down to operating levels?
    d. Are inventory levels and other measures of efficiency within standard?
    e. Is cash flow adequate for the size of the investment?

8. What are the skill, knowledge and abilities of management?
    a. Do they have adequate background necessary for the activities of the business?
    b. Is the business heavily reliant upon outside consultants or other expertise?
    c. Are there mechanisms ready to train and develop managers?
    d. Are Tribal members employed by the enterprise? If so at what numbers and in what positions?
    e. What, if any, is the make up of its Board of Directors?

9. How well does the business meet other Tribal goals?
    a. Does it work with other tribal businesses?
    b. Does it employ tribal members?
        i. Is it subject to regulations similar to TERO?
        ii. Does it enforce TERO on its vendors or contractors?
    c. Does it act as a steward for Tribal resources?
        i. Is it considered a tool to implement ecological and other goals as set forth in the IRMP or other Tribal resource plans?

10. How important is this business to the overall tribal economic health?
    a. Is it changing in importance?
    b. Are there other economic ventures, such as casinos, which affect its importance?

11. What, if it existed, could improve the performance of this business to meet Tribal goals?

APPENDIX III, C.

Questions to Support Wildlife Assessment, 2001.

WILDLIFE

1. What are the Tribe's featured species?

2. Does the Tribe have a wildlife biologist on its staff?

3. Does the Tribe manage habitat and have programs for all wildlife species?

4. Does the tribe have a policy to leave snags, stumps, down material including rotting logs, old forest conditions, travel corridors, and critical habitat areas?

5. Does a qualified wildlife biologist review resource plans, such as timber, range, watershed, recreation, etc, to determine their effects on different animal species?

6. Does the Tribe have an approved and documented process requiring the integrating of all natural resources in a systematic way?

7. Does the Tribe manage for threatened, endangered and sensitive species?

8. Does the Fish and Wildlife Service provide technical support to the tribe?

9. Does the tribe conform to state hunting and fishing regulations?

10. Does the tribe allow non-Indians to hunt or fish on the reservation?

11. Who enforces hunting and fishing regulations on the reservation?

12. Are there conflicts between biologists and tribal members concerning Native American wildlife management philosophy and the management philosophy taught by colleges and universities?

13. Are there conflicts between wildlife management and timber management on the reservation?

14. How are daily and seasonal limits set for hunted species?

15. Are there species that have a special meaning to the tribe?

16. Are vegetation condition and trend studies made on the reservation for either wildlife or livestock?

17. Does the tribe provide continuing education for biologists or other management personnel?

18. What type of training does a biologist need to adequately carry out the tribes management direction for wildlife?

19. Is the wildlife program adequately funded to meet the management objectives of the tribe?

20. What type of management organization does the tribe have and where is the wildlife program located in the line of authority?

21. Who approves management recommendations, either for hunting or habitat improvement?

22. Does the tribe conform to federal regulations protecting threatened and endangered species?

23. Does the tribe participate in a migratory waterfowl inventory?

24. What wildlife research is in progress on the reservation?

25. What outside federal or state agencies are doing wildlife research on the reservation?

26. Is the tribe now using or in the past used radio telemetry or geographic information systems in any wildlife management or research programs?

27. Does the tribe have a federal or state fish hatchery on reservation land?

28. What is the most difficult wildlife management problem on the reservation that needs attention over the next 3(c)5 years?

29. Does the tribe have plans to introduce or reintroduce exotics or native species on the reservation in the next 5 years?

30. Has the tribe developed mitigating procedures for any species of wildlife whose habitat is affected by managing other resources?

31. Is there any damage from high populations of wildlife to other resources such as loss of tree seedlings, stream bank erosion, or tree girdling by porcupines?

32. Does the tribe have a predator control program and what is the program designed to do?

33. Does the tribe have any animal rights or welfare groups active on the reservation that interfere with hunting or management practices?

34. Has there been any wildlife disease problem on the reservation that has been linked to livestock-wildlife interactions?

35. Is there information to indicate the percent of members on the reservation that actively hunt or fish?

36. Does the tribe have and use any type of wildlife data storage and retrieval system?

37. Does the State Game and Fish Department provide technical assistance to the tribe?

RANGE

38. Does the Tribe have an approved livestock management plan for the reservation?

39. Does the Tribe have a professional, full time range conservationist?

40. Does the Tribe have an approved grazing system for the reservation?

41. Who determines the stocking rate and grazing system for livestock?

42. Are there production and utilization studies done to determine carrying capacity for livestock, deer, and elk?

43. Is “overgrazing” by livestock a serious concern by tribal leadership?

44. Is the number of livestock that are permitted to graze on the reservation based on carrying capacity?

APPENDIX IV.

Certification Objectives and Principles.

2001 Edition Sustainable Forestry Initiative[SM] (SFI) Standard

4.1 Objectives for Sustainable Forestry on Program Participants' Forests

Objective 1. Broaden the practice of sustainable forestry by employing an array of scientifically, environmentally, and economically sound practices in the growth, harvest, and use of forests.

Objective 2. Ensure long-term forest productivity and conservation of forest resources through prompt reforestation, soil conservation, afforestation, and other measures.

Objective 3. Protect the water quality in streams, lakes, and other waterbodies by implementing riparian protection measures based on soil type, terrain, vegetation, and other applicable factors.

Objective 4. Manage the quality and distribution of wildlife habitats and contribute to the conservation of biological diversity by developing and implementing stand- and landscape-level measures that promote habitat diversity and the conservation of forest plants and animals.

Objective 5. Manage the visual impact of harvesting and other forest operations.

Objective 6. Manage Program Participant lands of ecologic, geologic, or historic significance in a manner that recognizes their special qualities.

Objective 7. Promote the efficient use of forest resources.

Objective 8. Broaden the practice of sustainable forestry by cooperating with forest landowners, wood producers, consulting foresters and Program Participants' employees who have responsibility in wood procurement and landowner assistance programs.

Objective 9. Publicly report Program Participants' progress in fulfilling their commitment to sustainable forestry.

Objective 10. Provide opportunities for the public and the forestry community to participate in the commitment to sustainable forestry.

Objective 11. Promote continual improvement in the practice of sustainable forestry and monitor, measure and report performance in achieving the commitment to sustainable forestry.

2001 FSC Principles

Principle #1: Compliance with Laws and FSC Principals
Focuses on issues such as conformance to all applicable national and local laws and regulations, payment of legally prescribed fees, taxes and royalties, protections against illegal harvesting and other unauthorized activities, and demonstrating a long-term commitment to adhere to the FSC Principles and Criteria.

Principle #2: Tenure and Use Rights and Responsibilities
Focuses on the long-term tenure and use rights to the land that is undergoing certification evaluation. Forest managers seeking FSC-endorsed certification must establish clear and legal ownership or right to manage the defined forest area that is being evaluated. Customary use rights, if clearly demonstrated, must be appropriately honored.

Principle 3: Indigenous Peoples' Rights
This FSC principle is concerned about the rights of indigenous peoples to own, use and manage their lands and territories. The relevance of this principle is pertinent with respect to protection of sites of special cultural or ecological importance.

Principle #4: Community Relations and Workers Rights
Addresses the effects of forest management on the well being of forest workers and local communities. The criteria focus on issues such as: preferences for local employment, compliance with employee health and safety regulations, rights of workers to organize, completion of social impact assessments, and employee grievance resolution mechanisms.

Principle #5: Benefits from the Forest
Addresses several loosely related issues such as efficiency in the use of forest products, financial viability of the forest management operation, and diversity of environmental and social benefits from forest management. The main criteria focus is on the sustainability of the harvest. The five other criteria within this principle address matters such as balancing financial objectives with full cost accounting (including environmental costs), optimal use of harvested products and local processing, minimization of waste and residual stand damage, diversification of products from the forest, and protection of forest services such as watershed functions and fisheries values.

Principle #6: Environmental Impact
Elaborated by a set of 10 criteria that focus on issues such as impact assessments, protection of listed species, biodiversity, reserve areas, stream-side and wetlands buffers, erosion control, exotic species, chemical use, high conservation value forests, and forest conversions. Of all the FSC principles, this one is the most expansive in scope, with an associated high level of emphasis on data and information collection and analysis.

Principle #7: Management Plan
Elaborated through 4 criteria, which collectively call for a very high level of commitment to management planning.

Principle #8: Monitoring and Assessment
Requires certified operations to engage in an aggressive and formal program of periodic monitoring of the impacts of management operations, focusing upon both bio-physical and socio-economic impacts as well as the extent of plan compliance.

Principle 9: Maintenance of High Conservation Value Forests
Focuses on the identification and appropriate management of areas within the defined forest area(s) that possess notable attributes meriting conservation. Such attributes may be ecological or social, in nature. Areas of high conservation value are to be managed so that the defining attributes are maintained or enhanced; focused monitoring must be undertaken with respect to efficacy of HCVF management strategies.

ISO 14001 Environmental Management Systems

Background

The International Organization for Standardization (ISO) is an NGO founded in 1947 to develop voluntary, international technical standards. These standards are developed by experts from industrial, technical, or business sectors in a consensus-based process driven by market demands. Currently there are over 9,600 ISO standards. The ISO 14000 series of environmental standards, first adopted in 1996, include a range of measures for environmental management and performance.

ISO 14001 was designed to "provide organizations with the elements of an effective environmental management system, which can be integrated with other management requirements, to assist organizations to achieve environmental and economic goals."

Requirements

ISO 14001 requires the development and implementation of an effective environmental management system. Top management must develop an environmental policy for the organization which includes commitments to prevention of pollution, pursuit of legal and regulatory compliance, and continual improvement. The policy must be documented, implemented, maintained, communicated to all employees, and available to the public.

The 14001 standard "contains only those requirements that may be objectively audited for registration purposes and/or self-declaration purposes". There are extensive requirements for an integrated EMS that must include provisions for planning, implementation and operation, regular checking and corrective action, and periodic management review. This approach follows the widely adopted Deming management model of "plan-do-check-act". http://www.dmu.ac.uk/dept/schools/business/corporate/tqmex/deming.htm

ISO 14001 was designed to be very flexible to accommodate a wide range of types and sizes of organizations and geographical, cultural, and social conditions, so it does not contain detailed performance requirements. Instead, each organization can include performance requirements based on externally established or internally established quality standards for forest management. In practice ISO has been combined with performance standards developed through FSC, SFI, or internationally developed criteria and indicators of sustainable forest management.

Scope

ISO 14001 is designed to include all environmental aspects and impacts of an organization's activities. As such, it is not generally limited to forestry activities, but includes manufacturing and distribution as well. An organization can choose to implement and audit an ISO 14001 for all of its operations or only for a portion of them. If the entity to be reviewed is not the entire organization it must have separate management functions. National standards bodies exist in the majority of the nations and all of the developed nations.

Assessment Methods

Compliance with ISO 14001 can be self-declared or can be assessed by an outside, third-party audit (Registration Audit) if the subject firm so chooses. Organizations approved to conduct an external assessment are termed Registrars. A thoroughly documented methodology exists for Registration Audits, with a growing number of Registrars available to conduct audits.

The audit process begins with the preparation of an audit plan defining the scope of the audit, its timing, methodology, and the members of the audit team. Most teams are comprised of a Lead Auditor and one or more Technical Experts. Registration audits are designed to ensure that all aspects of the EMS are being effectively implemented. Performance measures are also included in the audit to the extent that they are included in the policy statement.

Additional Information

International Organization for Standardization
1, rue de Varembe, Case postale 56, CH-1211 Geneva, Switzerland
Email: central@iso.ch

American National Standards Institute http://web.ansi.org/public/iso14000/default.htm
11 West 42nd St, 13th Floor, New York, NY 10036

Intergovernmental Processes for Criteria and Indicators Montreal Process/ Santiago Declaration

Background
A working group, established in 1994, eventually developed criteria and indicators for the conservation and sustainable management of temperate and boreal forests. The Montreal Process approach involves managing the forests as ecosystems. The Santiago Declaration was the endorsement of the criteria and indicators for use at the national level in developing forest policies.
Requirements
The 7 criteria are:

1. Conservation of biological diversity;
2. Maintenance of productive capacity of forest ecosystems;
3. Maintenance of forest ecosystem health and vitality;
4. Conservation and maintenance of soil and water resources;
5. Maintenance of forest contribution to global carbon cycles;
6. Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies; and
7. Legal, institutional and economic framework for forest conservation and sustainable management.

There are also 67 indicators that provide measurable or describable variables relating to the criteria and which can, if observed periodically, demonstrate trends. Taken together, the criteria and indicators are to be used by each nation in the development and improvement of their forestry policies, laws, regulations, and practices.

Scope
The following countries have agreed to participate, although this agreement conveys no legal or political obligations: Argentina, Australia, Canada, Chile, China, Japan, The Republic of Korea, Mexico, New Zealand, Russia, United States, Uruguay.

Assessment Methods
There are no provisions for assessing individual forests or operations.

Additional Information
"Santiago Declaration". 1995 Statement on Criteria & Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests. Santiago, Chile, February 1995.

Progress Report. The Montreal Process. 1997. Liaison Office of the Montreal Process. Canadian Forest Service. Natural Resources Canada, Ottawa, Canada.

GLOSSARY

A

Adaptive Management – The process of implementing policy decisions as scientifically driven management experiments that test predictions and assumptions in management plans and, using the resulting information, to improve the plans.
Aesthetics – A characteristic of a forested landscape pertaining to beauty.
Alaska Native Claims Resettlement Act (ANCSA) – Legislation enacted Dec. 18, 1971 which seeks to compensate Alaska Natives for the extinguishment of the title to their lands.
Alien Invasive Species – Plant, animal, fungal or viral species not endemic to an ecosystem which aggressively invade or infect native species or habitat. Also referred to as exotic invasive species, or introduced pests and pathogens.
Allotments – Parcels of land held in trust for specific Indian individuals. Originating out of the General Allotment Act of 1887, communally held tribal lands were divided into separate parcels and a parcel was given to each tribal member.
Allottees – the owners of the allotments.
Annual Allowable Cut (AAC) – The timber volume which can be harvested in one year without exceeding annual timber volume growth. AAC can also be reduced by taking into account other harvest constraints based on management goals.
Appraisal – An estimate of the economic value of a stand of timber or piece of land at a particular point in time.
Archaeological Site – A geographic locale that contains the material remains of prehistoric and/or historic human activity.
Austrian Formula – A means of calculating annual allowable cut based on a formula that considers the current growing stock level, the desired future growing stock level, the number of years over which the forest will be converted from the current level to the future level, and forest growth.

B

Bark Beetle – Insects of the family *Scolytidae*, some of which attack live trees and live and mine between the bark and wood of the main stem of the tree. Their infestation may lead to the death of the tree.
Basal Area – The area of the cross section of a tree stem including the bark, near is base, generally at breast height, or 4.5 feet above the ground.
Big Game – Large mammals that are hunted by humans, including black bear, black-tailed deer, and elk.
Biological Diversity (biodiversity) – The variety of life forms and processes, including a complexity of species, communities, gene pools, and ecological functions.
Biological Legacies – Large trees, down logs, snags, and other components of the forest stand left after harvesting for the purpose of maintaining site productivity and providing structure and ecological function in subsequent stands.
Board Foot (BF) – Lumber or timber measurement unit. The amount of wood contained in an unfinished board 1 inch thick by 12 inches long by 12 inches wide.
Bureau of Indian Affairs (BIA) – A division of the U.S. Department of the Interior charged with providing federal services to Indians.
Bureau of Land Management (BLM)– A division of the U.S. Department of the Interior.

C

Canopy – A layer of foliage in a forest stand. This most often refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied stand.
Carbon Sequestration – The capacity of vegetation, soils, and oceans to take in and retain atmospheric carbon. This is important in relation to global climate change because carbon dioxide is a greenhouse gas.
Categories of Reservation – see Reservations.
Cavity Nester – Wildlife species, most frequently birds, that require cavities (holes) in trees for nesting and reproduction.
Certification – A system by which a third-party auditor assesses how well a forest owner/ manager conforms with a standard set of principles or objectives, such as FSC or SFI.
Clearcut Harvest – A timber harvest method in which all trees are removed in a single entry from a designated area, with the exception of wildlife trees or snags.
Commercial Timberland – Land classified as forest that contains at least 5% crown cover of commercial timber species which is currently or prospectively capable of bearing merchantable forest products at a high enough value to provide a net benefit to the user.
Commercial Thinning – The removal of generally merchantable trees from an stand, usually to encourage growth of the remaining trees.
Commercial Woodland – Land classified as forest that contains less than 5% crown cover of commercial timber species which is currently or prospectively capable of bearing merchantable forest products at a high enough value to provide a net benefit to the user.
Compacting – A mechanism (authorized under P.L. 100-472) by which a tribe can take over management of any or all federal Indian programs with their associated budgets and exercise discretionary power over how the budgets are distributed among the "compacted" programs.

Competitive Bidding – A process of conducting a timber sale offering which requires prospective buyers to make bids and allows the seller to select from the offers.
Conifer – A softwood tree of the order *Gymnospermae*, which are mostly evergreen, and are cone bearing with needle or scale-like leaves.
Contracting (authorized by 93-638) – Under P.L.93- 638, tribes may contract the operations of all or part of federal Indian programs.
Continuous Forest inventory (CFI) – A system of permanent plots that provide a sampling of both area and tree attributes (growth, mortality, regeneration). The system's purpose is to render a planning inventory for large ownership tracts over long periods of time.
Cooperative Agreements – A legal mechanism, (authorized by P.L. 95-313, "Cooperative Forestry Asssistance Act"), by which tribes may enter into service contacts with federal agencies for various forestry activities.
Cooperative Management – The collaboration of a number of landowners in the management of a natural resource that is common to all, e.g., private owners of adjacent lands may coordinate fuels reduction treatments to reduce mutual fire risks.
Cord – A unit of measure of cut and stacked wood, generally for pulp. (128 cubic feet; 4' by 4' by 8').
Cover – Vegetation used by wildlife for protection from predators, or weather conditions. May also refer to the protection of soil and the shading provided to herbs and forbs by trees.
Criteria and Indicators – Tools used for conceptualizing, evaluating, and implementing sustainable forestry (Pokorny, et al 2004). Similar to a set of guidelines.
Crown Cover – The degree to which the crowns of trees are nearing general contact with one another. Generally measured as the percentage of the ground surface that would be covered by a downward vertical projection of foliage of tree crowns.
Cultural Resources – Those tangible items which relate to the traditional way that Indian peoples interact with their landscape, including medicine, craft and food plants, sacred or special areas, and burial/ archaeological sites.
Cumulative Effects – The compounded impact on the environment of actions taken over time. Incrementally these effects appear minor, but collectively result in significant, unintentional environmental change.

D

Defoliators – Insects that feed on foliage and act to remove some or all of the foliage from a tree, shrub or herb.
Down Log – Portion of a tree that has fallen or been cut and left in the woods.
Dwarf Mistletoe – A parasitic flowering plant, capable of survival only on living conifers. Heavy infections cause reduction in height and diameter growth, and can result in tree mortality.

E

Ecological Classification – A system which categorizes ecosystems, usually by plant community.
Ecological Health – The state of an ecosystem as measured by the adequacy of processes and functions to maintain the diversity of biotic communities commensurate with those initially found there.
Ecologically Significant – Species, stands, and forests considered important to maintaining the structure, function, and processes of particular ecosystems.
Ecosystem – A system of interacting organisms with distinct structural and functional characteristics, considered together with its physical environment.
Ecosystem Diversity – The variety of species and ecological processes that occur in different physical settings.
Ecosystem Management – A strategy or plan to manage ecosystems to provide for all associated organisms and processes.
Endangered Species – Any species of plant or animal defined through the process of the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range.
Endangered Species Act – Legislation passed in 1973 that seeks to protect any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range.
Engineered Wood Products – Specialized lumber or other manufactured wood products which have been designed for maximum strength or efficiency of utilization.
Even-Aged Forest – A forest stand comprised of trees with less than a 20 year difference in age.
Even-Aged Management (Even-Aged Silviculture) – Manipulation of a forest stand to achieve a condition in which trees have less than a 20 year age difference.

F

Fauna – The animal life of a region.
Featured Species – A species that is important to a tribe, either for subsistence or sport hunting, cultural and religious values.
Fire Program – The unit of a federal or tribal agency charged with fire prevention and suppression. Its budget is generally separate from the forestry or forest management program.
Flora – The plant life of a region.
Focus Group – A group of people assembled to provide advice and opinions about, in this case, tribal forestry.
Forage – Vegetative material that is eaten by animals, either wildlife or livestock.
Forest – An ecosystem with dense and extensive tree cover which contains at least 10% tree crown cover of any size, or formerly having had such tree cover, and currently not developed nor planned for exclusive non-forest use. Roadside, streamside, and shelterbelt strips must have tree crown width of at least 120 feet. Timberland and woodland are forests.

Forest Development – Those activities to do with the regeneration of forest vegetation and control of stand composition and growth, e.g., planting or seeding, thinning, brush control, fertilization, pruning.
Forest Development Backlog – The number of acres of forested land that requires additional stocking or thinning to meet management standards.
Forest Enterprise – Wood processing facilities.
Forest Inventory – A detailed list of various characteristics of all the forested stands of a particular ownership. Characteristics frequently include the number, species, and growth rates of commercial trees.
Forest Management – The unit of a federal or tribal agency charged with forest management not directly related to fire prevention and suppression. Its budget is generally separate from the Fire program.
Forest Service – A division of the U.S. Department of Agriculture charged with management of the National Forests and other duties.
Forest Stewardship Council (FSC) – An international association consisting of environmental and social groups, the timber trade and the forestry profession, indigenous people's organizations, community forestry groups and forest product certification organizations. See Certification.
Forestland – Land that is now, or is capable of becoming, at least ten percent stocked with forest trees and that has not been developed for non-forest use.
Forestry – The science and the practice of managing forest resources for environmental and human benefits.
Fragmented Land Ownership – A discontinuity of ownership over a discrete unit of land, e.g., within the boundary of an Indian reservation.

G

Geographic Information System (GIS) – A computer system capable of storing and manipulating spatial (mapped) data.
Genetic Diversity – The genetic variety within populations of a species.
Grazing Capacity – The number of livestock or wildlife that a given area can support without causing site degradation.
Group Selection – Harvest of groups of trees ranging in size from a fraction of an acre up to about two acres.
Growth and Yield – Related to the estimate of current, or prediction of future tree sizes, densities, and volumes.
Growth Model – A quantitative simulation based on empirical research, often computer driven, for predicting future growth and yield of trees and stands.

H

Habitat – The environment of a specific place in which an animal can survive and reproduce.
Habitat Diversity – The number of different types of habitat within a given area.
Habitat Feature – A characteristic of a habitat.
Habitat Type – Units of a landscape which share similar vegetative characteristics.
Harvest Level – The amount of timber volume that is removed from a forest over a discrete time period, generally a year.
Harvest Scheduling - The act of determining the harvesting level under assumptions about the land available for timber production, land productivity, management intensity, and fluctuation in harvest level permitted from period to period.
Hatcheries - A place for hatching fish eggs, usually with the intention of stocking some water body with young fish.

I

Infrastructure - The transportation system including roads, trails, and bridges.
Integrated Resource Management Plans (IRMPs) - A plan that integrates the goals, objectives and operations of all the natural resource management programs (e.g., forestry, fish, wildlife, range, water and cultural resources). Related to coordinated management plans.
Interdisciplinary Teams - A group of individuals with different areas of expertise assembled to solve a problem or task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately analyze the problem and proposed action.
International Organization for Standardization (ISO) - An international body based in Switzerland which is concerned with the standardization of industrial processes including environmental systems.

K

Kyoto Protocol - A global climate change agreement made in 1991 which seeks to reduce green house gas emissions.

L

Landscape - A heterogeneous land area with interacting ecosystems that are repeated in similar form throughout.
Large Woody Debris (also, coarse woody debris) - Pieces of wood larger than 10 feet long and 6 inches in diameter.
Lump-Sum Sales - A timber sale in which the purchaser buys rights to all the timber in a given stand at a single flat rate regardless of volume and species.

M

Managed Forest - Any forest that is treated with silvicultural practices and/or harvested. Often applied to land that is harvested on a scheduled basis and contributes to an allowable sale quantity.
Market Value - The economic value of an item on an open market.
Marking (Timber Sales) - The process of marking the trees within a timber sale area which are either to leave or take in a partial harvest.
Matrix - The lands outside of ecological reserves which can be actively managed for timber and other objectives.

Merchantable Trees, Stands or Timber - Trees or stands that can be sold for the wood they contain.
Mitigate - Modification of actions to (1) avoid impacts by not taking a certain action or parts of an action; (2) minimize impacts by limiting the degree or magnitude of the action and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resources or environment.
Monitoring - The process of collecting information to evaluate if objective and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.
Montreal Process - A working group, established in 1994, eventually developed criteria and indicators for the conservation and sustainable management of temperate and boreal forests.
Multi-Aged Management - A forest stand that has more than one distinct age class arising from specific disturbance and regeneration events at various times. These stands normally will have multilayered structure.

N

Native Fish - A fish that is indigenous to a specific place.
National Environmental Protection Act (NEPA) - An act passed in 1969 to declare a national policy that encourages productive and enjoyable harmony between humankind and the environment, promotes efforts which will prevent or eliminate damage to the environment and biosphere, stimulate the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the nation, and establishes a Council on Environmental Quality. It also made federal law the process by which federal development activities must be analyzed to assess their potential effects on the environment.
National Historic Preservation Act (NHPA) - An act passed in 1966 that seeks to protect historic properties; Sec. 106 of that act requires every federal agency "take into account" how each of its undertakings could affect historic properties.
Non-Commercial Timberland - Land classified as forest that contains at least 5% crown cover of commercial timber species which is not currently or prospectively capable of bearing economically viable quantity of merchantable forest products.
Non-Commercial Woodland - Land classified as forest that contains less than 5% crown cover of commercial timber species which is not currently or prospectively capable of bearing economically viable quantity of merchantable forest products.
Non-Timber Values - Values on the forest environment, other than timber for income, such as aesthetic or cultural values.
Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.
Nutrient Cycling - Circulation or exchange of elements such as nitrogen and carbon between nonliving and living portions of the environment. Includes mineral and nutrient cycles involving mammals and vegetation.

O

Optimal Stocking - A stocking level within a plantation or stand of trees that best achieves the objectives for the area.

P

Partial Cutting - Removal of selected trees from a forest stand.
Performance Measures – Means of measuring compliance with SFI forest certification standard objectives.
Pole - Commercial timber species 5.0 inches DBH to 8.9 inches DBH.
Population - A group of individual organisms of the same species that is capable of interbreeding, and shares a common gene pool. Population density refers to the number of individuals of a species per unit area, population persistence to the capacity of the population to maintain sufficient density to persist, well distributed, over time.
Pre-Commercial Thinning - The removal of a portion of the trees in a stand which are less that merchantable size in order to stimulate growth in the remaining trees.
Prescribed Fire/Burning - A fire burning under specified conditions that will accomplish certain planned objectives. The fire may result from planned or unplanned ignitions.
Pulpwood - Logs of a size or species that make them more suitable for pulping for paper manufacturing than for use in solid wood products.

R

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.
Regeneration - The actual seedlings and saplings growing in a stand; or the act of establishing young trees naturally or artificially.
Reservation,

Category 1 - Major forested reservation: comprised of more than 10,000 acres of commercial timberland in trust, or determined to have more than 1.0 MMBF (million board feet) harvest of timber products annually.

Category 2 - Minor forested reservation: comprised of less than 10,000 acres of commercial timberland in trust, and less than 1.0 MMBF harvest of timber products annually, and whose forest resource is determined to be of significant timber value.

Category 3 - Significant woodland reservation: comprised of an identifiable forest area of any size which is lacking a timberland component, and whose forest resource is determined to be of significant commercial woodland value.

Category 4 - Minimally forested reservation: comprised of an identifiable forest area of any size determined to be of minor commercial value at current time.

Category 5 - Reservation or Indian property with forestland that the Bureau is charged with some degree of legal responsibility, but the land is not [federal] trust status.

Residual Stand - The trees that remain standing after some event such as selection cutting or thinning.

Restoration - Improving the current conditions of an ecosystem to restore its original functioning and provide for its long-term productivity.
Riparian Area - A geographic area containing an aquatic ecosystem and adjacent upland areas that directly affect it.
Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows.
Root Rot - A tree disease that attacks the roots of trees frequently causing individual tree death. Infected trees and stumps may infect others nearby and can create pockets within a stand with no live trees.
Rotation - The planned number of years between regeneration of a forest stand and its final harvest (regeneration cut or harvest). A forest's age at final harvest is referred to as rotation age.

S

Salvage - The removal of dead or diseased trees from forest stands.
Sawlogs - Logs that are suitable for construction grade or better grades of lumber.
Sawtimber - A stand of timber that exhibits size, form and species characteristics that make it suitable for lumber manufacture.
Scaling - The measurement of a log to estimate the sawtimber volume within it.
Second-Growth - Relatively young forest that has developed following a disturbance (e.g., cutting, serious fire, or insect attack) of the previous old-growth forest.
Selection Harvest - A method of uneven-aged management involving the harvest of single trees from stands (single tree selection) or in groups (group selection) without harvesting the entire stand at any one time.
Self Determination - The ability of a people to pursue their own goals.
Self-Governance Demonstration Project - A provision under Title III, P.L. 100-472, an amendment to the Indian Self-Determination Act, which allows Indian tribes to enter into an annual funding agreement with the Secretary of the Interior. These agreements allow the Indian tribes to plan, consolidate, and administer programs, services, and functions administered federally and redesign programs, functions and services. It allows tribes the flexibility to develop programs and establish funding priorities to meet their specific needs.
Silviculture - The science and the practice of controlling the establishment, composition, and growth of the vegetation of forest stands. It includes the control or production of stand structure such as snags and down logs, and live vegetation.
Silvicultural Prescription - A professional plan for controlling the establishment, composition, constitution, and growth of a forest stand.
Site Class - The measure of an area's relative capacity for producing timber or other vegetation.
Site Index - The measure of forest productivity expressed as the height of the tallest tree in a stand at an index age.
Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment favorable to tree survival during the first growing season. It includes altering ground cover, soil or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods.
Site Productivity - The ability of a geographic area to produce biomass, as determined by conditions such as soil type, rainfall, and temperature in that area.
Skid Trail - A path created by dragging logs to a landing (gathering point).
Snags - Any standing dead, partially dead, or defective (cull) tree at least 10 inches DBH and at least 6 feet tall. A hard snag is composed primarily of sound wood. A soft snag is composed primarily of wood in advanced stages of decay and deterioration.
Snag Characteristics - Attributes of a snag that define its ecological function— degree and type of rottenness, likely longevity, and number of branches.
Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.
Species - (1) A group of individuals that have their major characteristics in common and are potentially interfertile. (2) The Endangered Species Act defines species as including any species or subspecies of plant or animal. Distinct populations of vertebrates also are considered to be species under the act.
Spruce Budworm - A defoliator that feeds principally on current year buds and foliage. Sustained heavy infestation causes complete defoliation in 4-5 years. Epidemics cause decreased growth, tree deformity, top killing, and ultimate death of the trees over extensive areas of forest. It occurs primarily on Douglas-fir and true firs.
Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition that it is distinguishable from the forest in adjoining areas.
Stand Condition - A description of the physical properties of a stand such as crown closure or diameters.
Stand-Level Inventory - An inventory that collects data on the characteristics of trees within discrete stands. It provides a finer scale than CFI, although it is not a substitute for the permanent plots used to monitor long-term forest change.
Stand Structure - The various horizontal and vertical physical elements of a stand of trees.
Stocking - A measure of the proportion of the area actually occupied by trees.
Structural Complexity - The degree of variation of horizontal and vertical elements within a forest.
Structural Retention - Harvest practices that leave physical elements of old-growth forests such as green trees, snags, logs, on site after harvest.
Stumpage - The value of standing timber after deduction of logging and processing costs.

Subsistence - Means of supporting life.
Suitable Forest Acres - Acres available for regularly scheduled timber harvest.
Suppression - The action of extinguishing or confining a fire.
Sustainable Forestry Initiative (SFI) - A third-party certification system devised by the American Forest & Paper Association and administered by an independent board.
Sustainable Harvest - A harvest volume that can be maintained through time without decline (harvest is less than or equal to growth).
Sustainability - In the context of Indian forestry, it is herein defined as the ability to attain the tribal Vision on a continuing basis.
Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

T

Thinning - The removal of some trees from a stand to increase growth and vigor in remaining trees.
Third Party Auditor - A qualified individual who has not been involved in management or planning on the forest to be audited, who is charged with verifying conformity with a forest certification standard.
Timber Harvest Schedule - The quantity of timber planned for sale and harvest, by time period, on an area of forest.
Timberland - Land qualifying as forest and containing at least 5% crown cover of commercial timber species.
Timber Management Plan - An activity plan that specifically addresses procedures related to the offering and sale of timber in volumes consistent with the approved, allowable cut.
Timber Production - The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use, but not fuelwood.
Timber Sale Administration - The administration of the timber sale contract including review of contractor operation plans, on-site inspection of harvest operations for conformance with contractual requirements, and post-operation audit for contract compliance.
Timber Sale Preparation - Those activities relating to preparing a stand of timber for logging, including cruising and appraising the timber; designating sale area boundaries; marking trees; defining skid trail locations; preparing the sales contract and putting the sale out to bid.
Timber Stand Improvement - Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.
Transportation System - Network of roads used to manage a land area.
Trust - Pertains to the relationship of the U.S. federal government to Indian tribes and denotes a degree of responsibility on the part of the U.S. government.
Trust Oversight Committee - Proposed by IFMAT-I and -II, the oversight committee is a group that would review tribal resource management plans and offer periodic assessment on whether tribes are meeting the standards set down in the plans. Part of the redesigned federal government- tribal relationship. (Recall Analysis of BIA Administrative Procedures).

U

Understocked - The condition when a plantation of trees fails to meet the minimum requirements for number of well-spaced trees per acre of the desired species.
Understory - The trees and other woody plant species growing under the dominant tree canopy.
Uneven-Aged Management - A combination of actions that simultaneously maintains continuous forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.
Unfunded Mandate – A federally imposed, legally enforceable duty for which compliance has an economic cost to other levels of government. The Congressional Budget Office monitors such impacts.
Utilization - In reference to timber harvest, the removal of wood biomass (logs) from the forest to the mill. Specifically, it refers to that portion of the tree that is removed as a log.
Utilization Standards - Rules defined by forestry departments, enterprises or mills that indicate the portion of tree that must be removed during harvest (e.g., "to a 6 inch top" indicates that the portion of a tree stem below which the trunk tapers to 6 in will be bucked off and removed; the remainder left in the woods. A similar standard would be applied to stump height).

V

Variable Density Thinning - Forest stand thinning which creates gaps and leaves clumps of trees, thus better emulating natural mortality patterns and improving habitat.
Vision - The desired future condition of a forest and forest resources.
Vertical Diversity - The diversity in a stand that results from the complexity of the above-ground structure of the vegetation. The more tiers of vegetation and/or more diverse the species composition, the higher the degree of vertical diversity.

W

Watershed - The drainage area of a lake or stream.
Watershed Restoration - Improving current conditions of watersheds to restore degraded fish habitat and provide long-term protection to aquatic and riparian resources.
Wildlife Tree - A live or dead tree retained for food or cover for one or several animal species.
Windthrow - A tree or trees uprooted or felled by the wind.
Woodland - Land qualifying as forest and containing less than 5% crown cover of commercial timber species.

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