

Table on Criterion 6 Refinements

This table shows recommendations for refinements to the Montreal Process indicators, the rationales for the indicators, and in selected cases, approaches to measurement. These recommendations were reached through discussion and general agreement at three technical workshops coordinated by the USDA Forest Service and the Roundtable on Sustainable Forests in April 2005 to obtain high-quality input from a diverse set of forest stakeholders. Column 1 shows the location of the text in the *Draft Document: Excerpts from the Montreal Process Technical Notes Modified for the Series of C&I Refinement Technical Workshops*. Column 2 presents the original language with any deleted text underlined and struck out; column 3 presents the refined text with any additional text underlined. Column 4 includes any comments made on the refinement.

Summary of Refinements

All of the Indicators in Production and Consumption; Recreation and Tourism; Investment in the Forest Sector; Cultural and Spiritual Needs and Values; and Employment and Community Needs are modified in some way. The titles for Indicators 29–35, 38–40, and 42 are modified; rationales for Indicators 29 – 31, and 33 – 42 are modified; and Indicator 43 is deleted. Indicators 36 and 37 are combined into one indicator, and Indicators 44 – 47 are combined into two new indicators. Two new indicators, 29-a and 38-a, are added.

Other Cross-cutting Recommendations

1. Recommended additions for Criteria 1, Indicator 2, 3 and 4: talk about extent of area include the text “to protect the range of cultural, social and spiritual needs and values.”
2. Consider including “Urban Forests” in the discussions on the indicators in Criterion 1, 2 and 3.
3. Cultural, social, and spiritual values and needs should be taken into account throughout this set of indicators within this Criterion.

Breakout Group 6A: Criterion 6 - Indicators 29 – 34 and 38 – 41:

Participants: Kevin Birch, Department of Forestry State of Oregon; Michael Kasterin, Alaska State Office Bureau of Land Management; Richard Pierson, Econo Forest International LLC; Warren Suchovsky, Great Lakes Forest Alliance

Criterion Lead: Peter Ince, U.S. Department of Agriculture Forest Service

Facilitator: Stephen Bratkovich, U.S. Department of Agriculture Forest Service

Breakout Group 6B: Criterion 6 - Indicators 35 – 37, 42 & 43, and 44 – 47:

Participants: Albert Abee, U.S. Department of Agriculture Forest Service; Kristen Magis, Mt. Hood Lucid Project, Portland State University; Maureen McDonough, Department of Forestry, Michigan State University; Bill McKillop, Department of Forestry, University of California Berkley; Susan Odell, Rural Community Assistance, U.S. Department of Agriculture Forest Service; Wendy Sanders, Great Lakes Forest Alliance; Ramiro Villalvazo, U.S. Department of Agriculture Forest Service

Criterion Lead:

Facilitator: Lisa Burban, U.S. Department of Agriculture Forest Service

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Introduction	<p>Forest ecosystems are renewable and, with management regimes that retain their ecological integrity, biological components, and adaptive capacity, can be sustained in perpetuity. Historically, population growth and development pressures have resulted in the conversion and loss of forest land to other uses and the degradation of forest ecosystems. There has been a tendency to focus on the extraction of timber and the management of the forest land base to maximize timber production. The adoption of sustainable forest management has significant implications for the use and management of boreal and temperate forests to provide a wide variety of social and economic benefits.</p>	<p>Forest ecosystems are renewable and, with management regimes that retain their ecological integrity, biological components, and adaptive capacity, can be sustained in perpetuity. Historically, population growth and development pressures have resulted in the conversion and loss of forest land to other uses and the degradation of forest ecosystems. There has been a tendency to focus on the extraction of timber and the management of the forest land base to maximize timber production. The adoption of sustainable forest management has significant implications for the use and management of boreal and temperate forests to provide a wide variety of social and economic benefits. <u>Cultural, social, and spiritual values and needs should be taken into account throughout this set of indicators within this criterion.</u></p>	

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<p>Indicator 29 (6.1.a.) Title</p>	<p>Value and volume of <u>wood</u> and <u>wood</u> products production, including value added through downstream <u>processing</u></p>	<p>Value and volume of <u>timber harvests</u> and <u>forest</u> products production, including value added through downstream <u>manufacturing</u></p>	<p>“Wood” is replaced with “timber harvests” because the term “timber” is consistent with existing definitions (i.e., we have a “nontimber” definition, and the term “nontimber” is used in Indicator 14). The term “harvests” is the primary output that we are trying to measure and “harvests” clarifies the original intent of the indicator. “Timber harvests” is less confusing than “wood.”</p> <p>“Wood products” is replaced with “forest products” because that is a more internationally consistent term. Also, “forest products” better describes products that may be important in the future, such as forest-based bio-oils.</p> <p>“Processing” is replaced with “manufacturing” because that is a more precise term. “Manufacturing” includes both primary (e.g., lumber, pulp, etc.) and secondary (e.g., furniture, mobile homes, etc.) products. The term “processing” could erroneously include construction, warehousing, and publishing industries, for example.</p>

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Indicator 29 (6.1.a) Rationale	<p>This indicator measures the size and economic health of the <u>wood</u> products sector by identifying trends in the value and volume of wood and wood products production and allowing comparison of those trends <u>against</u> management objectives.</p>	<p>This indicator measures the size and economic health of the <u>forest</u> products sector by identifying trends in the value and volume of <u>timber harvests</u> and <u>forest</u> products production and allowing comparison of those trends <u>with forest</u> management objectives.</p>	<p>“Wood products” is replaced with “forest products” because that is a more internationally consistent term. Also, “forest products” better describes products that may be important in the future, such as forest-based bio-oils.</p> <p>“Wood” is replaced with “timber harvests” because the term “timber” is consistent with existing definitions (i.e., we have a “non-timber” definition, and the term “non-timber” is used in Indicator 14). The term “harvests” is the primary output that we are trying to measure and “harvests” clarifies the original intent of the indicator. “Timber harvests” is less confusing than “wood.”</p>
Indicator 29 (6.1.a) Approaches to Measurement			<p>This section was not reviewed but needs to be revised.</p>
Indicator 29a Title		<p>Value of forest ecosystem services by principal category</p>	<p>Forest managers anticipate and have experienced increased demand for forest ecosystem services that are providing new sources of revenue or having other impacts on land values.</p>

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Indicator 29a Rationale		Ecosystem services are an emerging market for forest lands and values, including, for example, conservation easements, forest carbon credits, watershed services, and traditional services such as recreational, hunting, and gathering leases. These services and their values need to be tracked by category of service to understand their relationship to forest management.	
Indicator 30 (6.1.b) Title	Value and <u>quantities</u> of production of non-wood forest products	Value and <u>volume</u> of <u>non-timber</u> forest products production	“Quantities” is replaced with “volume” to make it consistent with Indicator 29. Changing “non-wood” to “non-timber” is consistent with the wording used in Indicator 14 and the Montreal Process glossary of terms.
Indicator 30 (6.1.b) Rationale	This indicator measures trends in the value and quantities of non-wood products derived from the forest that may be economically important to indigenous people and local communities. Cultural, social or spiritual values are monitored under other indicators.	This indicator measures trends in the value and quantities of <u>non-timber</u> products derived from the forest that may be economically important to indigenous people and local communities. Cultural, social or spiritual values are monitored under other indicators.	The language in the rationale and the indicator should be consistent. The term “non-timber forest products” should include only products of the forest and not agricultural products (i.e., not ginseng, Christmas trees, and agricultural hybrid poplar).
Indicator 30 (6.1.b) Approaches to Measurement			This section was not reviewed but may need updating.

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Indicator 31 (6.1.c) Title	Supply and consumption of wood and wood products, including consumption per capita	<u>Value and volume of both timber and forest</u> products consumption including consumption per capita	This change allows calculation of net import volume and value when compared with Indicator 29, satisfying numerous review comments received related to this indicator. (Review comments emphasized the need to observe import trends in relation to production and consumption; see, e.g., pages 39–40 of “Refining and Improving the Montreal Process C&I,” February 2005). The word “supply” was removed because it is already covered in Indicator 29.
Indicator 31 (6.1.c) Rationale	This indicator measures the demand and extent to which the supply of wood and wood products meets the needs for domestic consumption. A measure of consumption per capita might reflect a cultural affinity to wood products, the level of disposable income, the price or availability of wood products and their substitutes, or the efficacy of conservation, recycling and reuse measures. High per capita consumption levels may also reflect pressures on forest resources.	This indicator measures the <u>domestic</u> demand and extent to which the supply of <u>timber and forest</u> products meets the needs for domestic consumption <u>when compared to Indicator 29</u> . A measure of consumption per capita might reflect a cultural affinity to wood products, the level of disposable income, the price or availability of wood products and their substitutes, or the efficacy of conservation, recycling and reuse measures. High per capita consumption levels may also reflect pressures on forest resources.	“Wood” is replaced with “timber” because the term “timber” is consistent with existing definitions (i.e., we have a “nontimber” definition, and the term “nontimber” is used in Indicator 14). “Wood products” is replaced with “forest products” because that is a more internationally consistent term. Also, “forest products” better describes products that may be important in the future, such as forest-based bio-oils.
Indicator 31 (6.1.c) Approaches to Measurement			This section was not reviewed but may need updating.

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Indicator 32 (6.1.d) Title	Value of <u>wood</u> and non- <u>wood</u> products production as a percentage of GDP	Value of <u>forest products</u> and non- <u>timber forest products</u> production as a percentage of GDP	
Indicator 32 (6.1.d) Rationale	This indicator is one measure of the contribution and importance of the forest sector to the national economy.		No modifications suggested.
Indicator 33 (6.1.e) Title	Degree of recycling of forest products	Degree of recycling of forest products <u>and the degree of substitution of forest products by non-renewable materials</u>	Recycling and substitution both offset demands for raw forest products
Indicator 33 (6.1.e) Rationale	As global demands for forest products increase, there is a growing awareness of the opportunity and need to extend, and improve the efficiency of, the use of forest products through recycling. This indicator identifies the extent to which recycling/reuse of forest products occurs, and can be linked to conservation of forest resources, as well as reduction in solid waste.	As global demands for forest products increase, there is a growing awareness of the opportunity and need to extend, and improve the efficiency of, the use of forest products through recycling. This indicator identifies the extent to which recycling/reuse of forest products occurs, and can be linked to conservation of forest resources, as well as reduction in solid waste. <u>The substitution of forest products by non-renewable materials has impacts on sustainable forests and broader environmental consequences such as energy consumption.</u>	
Indicator 34 (6.1.f) Title	<u>Supply and consumption/use of non-wood</u> products	<u>Value and volume of non-timber forest</u> products consumption.	Wording has been changed to be consistent with Indicators 31 and 32. The word “supply” was removed because it is redundant per Indicator 30.

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Indicator 34 (6.1.f) Rationale	This indicator measures the extent to which the supply of non- wood products meets the needs of consumption. A measure of consumption per capita may reflect the cultural affinity to these products, the level of disposable income, or the price or availability of these products. High per capita consumption levels might also reflect pressures on forest resources.	This indicator measures <u>the domestic demand, and helps determine</u> the extent to which the supply of non- <u>timber forest</u> products meets the needs for <u>domestic</u> consumption <u>when compared to Indicator 30.</u>	
Recreation and Tourism Rationale	As population and income levels increase, and as populations become more urbanized, societies tend to utilize forests increasingly for the purpose of outdoor recreation and tourism. At the same time, economic development may impact on the availability of natural, aesthetically pleasing, or reasonably undisturbed forest lands. For these activities to be sustainable, supply and demand of recreation and tourism opportunities should be considered. This element considers recreation and tourism values from both supply and demand perspectives. It considers trends in visitor use days, as well as availability of recreation, and tourism opportunities.	As population and income levels increase, and as populations become more urbanized, societies tend to utilize forests increasingly for the purpose of outdoor recreation and tourism. At the same time, economic development may impact on the availability of natural, aesthetically pleasing, or reasonably undisturbed forest lands. For these activities to be sustainable, supply and demand of recreation and tourism opportunities should be considered. This element considers recreation and tourism values from both supply and demand perspectives <u>and in consideration of the sustainability of the resource base.</u> It considers trends in visitor use days, as well as availability of recreation, and tourism opportunities.	General Comment for writing and editing Indicators 35 – 37: consider engaging recreation and tourism experts (outside the USFS) for appropriate wording.
Indicator 35 (6.2.a) Title	Area and percent of forest land managed for general recreation and tourism, in relation to the total area of forest land	Area and percent of forest land managed for general recreation and tourism <u>at or below Levels of Acceptable Change (LAC), as a percent of</u> the total area of forest land	Add the definition of “LAC” (Limits of Acceptable Change) in glossary

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<p>Indicator 35 (6.2.a) Rationale</p>	<p>This indicator provides a measure of the extent to which forest management programs recognize the recreational needs of the community.</p>	<p>This indicator provides a measure of the extent to which forest management programs recognize the recreational needs of the community. <u>The indicator reflects (in a trend line over time) the impact of recreation/tourism on the sustainability/integrity of the resource base used for recreation and tourism. The indicator is an integrator of supply and demand impacts on the resource base. LAC is a commonly accepted process or approach for establishing a use threshold for recreation and tourism (see glossary). Identifying the LAC assures the protection of cultural, social, and spiritual needs and values associated with recreation and tourism.</u></p>	
<p>Indicator 35 (6.2.a) Approaches to Measurement</p>	<p>Useful data for this indicator might include the following:</p> <ul style="list-style-type: none"> • Area and per cent of forest land available for recreation and tourism by ownership • Total area of forest land • Types of forest recreation and tourism available <p>Data for measuring this indicator may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Government, non-government, and industry sources • National/regional recreation and tourism management organizations <p>The indicator should report the area and</p>	<p>Useful data for this indicator might include the following:</p> <ul style="list-style-type: none"> • Area for recreation and tourism by ownership • Total area of forest land • <u>Total land area managed for recreation and tourism, by ownership and broad ecotype</u> • <u>Total land area managed for recreation and tourism at or below the level of acceptable change</u> • <u>Established sustainable thresholds identified in operational and management plans dedicated to recreation and tourism</u> <p>Data for measuring this indicator may be</p>	

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	<p>proportion of forest that is managed for recreation and tourism purposes. Such land would include any that is explicitly allowed by management objectives, but might exclude land that is privately owned, unless the owners give specific permission.</p>	<p>obtained from the following sources:</p> <ul style="list-style-type: none"> • Government, non-government, and industry sources • National/regional recreation and tourism management organizations <p>The indicator should report the area and proportion of forest that is managed for recreation and tourism purposes. Such land would include any that is explicitly allowed by management objectives, but might exclude land that is privately owned, unless the owners give specific permission.</p>	
<p>Indicators 36 and 37 (6.2.b and 6.2.c) Title</p>	<p>Indicator 36: Number and type of facilities available for general recreation and tourism, in relation to population and forest area</p> <p>Indicator 37: Number of visitor days attributed to recreation and tourism, in relation to population and forest area</p>	<p><u>Effectiveness in matching forest recreation and tourism opportunities with demand</u></p>	<p>The original indicators as written were seen as measures. Further, they did not accomplish the spirit and intent of what the indicators were intended to achieve. The revised indicator is intended to address the impact of tourism and recreation on resource sustainability and capture recreation and tourism supply and demand.</p>

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<p>Indicators 36 and 37 (6.2.b and 6.2.c) Rationale</p>	<p>Indicator 36: This indicator assesses the availability of specific facilities for forest-based recreation. It can imply changes in public recreational preferences, the cost-benefit relationship of various recreational developments or the priority placed on providing recreational facilities in a country.</p> <p>Indicator 37: This indicator provides a useful measure of national recreation and tourism use, and apparent demand. Number of visits per annum is a key variable in determining the potential pressure of visitors and, within management constraints, the sustainability of forest recreation and tourism.</p>	<p>This indicator assesses the availability of specific facilities for forest-based recreation. It can imply changes in public recreational preferences, the cost-benefit relationship of various recreational developments or the priority placed on providing recreational facilities in a country. <u>This indicator assures that a forest's available natural and physical resources match demands for recreation and tourism opportunities in a sustainable manner.</u></p>	
<p>Indicators 36 and 37 (6.2.b and 6.2.c) Approaches to Measurement</p>	<p>Indicator 36: Relevant data might include the following:</p> <ul style="list-style-type: none"> • Type and number of recreation and tourism facilities available in forests (e.g., picnic sites, campsites, toilets, visitor centres, walking trails, or major tourism developments) • Location of forest recreation and tourism facilities • Population size and density <p>This indicator may be assessed through analysis of data and maps obtained from government, associations, and industry sources. Other sources might include the following:</p> <ul style="list-style-type: none"> • General tourist information • Surveys of forest owners and tourism 	<p>Relevant data might include the following:</p> <ul style="list-style-type: none"> • Type and number of recreation and tourism facilities available in forests (e.g., picnic sites, camp sites, toilets, visitor centers, walking trails, or major tourism developments) • <u>Public satisfaction with forest land managed for general recreation and tourism</u> • Location of forest recreation and tourism facilities • Population size and density <p>This indicator may be assessed through analysis of data and maps obtained from government, associations, and industry sources. Other sources might include the</p>	

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	<p>enterprises</p> <p>Indicator 37: Data for this indicator might include the following:</p> <ul style="list-style-type: none"> • Number of visitor use days for tourism and recreation purposes related to specific forests per annum • Population of the country (local/regional data are useful to the explanation and elaboration of this indicator) • Forest area • Measurement of this indicator might involve the following activities: • Collation of data from government and industry sources • Analysis of data from vehicle counters, track counters, registration books, booking systems, and licenses issued • Monitoring visits in representative forest recreation sites • Use of historical data to estimate use of forest areas not currently monitored 	<p>following:</p> <ul style="list-style-type: none"> • General tourist information • Surveys of forest owners and tourism enterprises • Number of <u>forest visits</u> for tourism and recreation purposes related to specific forests per annum <u>(This is a useful measure of national recreation and tourism use, and apparent demand)</u> • Population of the country (local/regional data are useful to the explanation and elaboration of this indicator) • Collation of data from government and industry sources • Analysis of data from vehicle counters, track counters, registration books, booking systems, and licenses issued • Monitoring visits in representative forest recreation sites • Use of historical data to estimate use of forest areas not currently monitored • <u>Income, race, and ethnicity</u> 	

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Investment in the Forest Sector Rationale	Investment reflects the interest of society in producing goods and services from the forest. Investment is closely linked to the production of goods and services and continued investment depends largely on the expected rate of return on that investment. The investment source may be from either the public or private sectors. Investment is commonly made in plantation establishment, forest growing, harvesting, protection and processing and in the social and educational sectors, to support the forest sector. Therefore, the level of investment in the forest sector can reflect the direction of the sector's economic activities.		No modifications suggested.
Indicator 38 (6.3.a) Title	Value of investment, including investment in forest growing, forest health and management, planted forests, wood processing, recreation and tourism	Value of investment, including investment in forest growing, forest health, <u>protection</u> , management, planted forests, wood processing, <u>forest-based outdoor</u> recreation and tourism, <u>and environmental enhancement</u>	There is a need to reflect the costs of environmental investments including forest protection, wildlife, fisheries, and other forms of environmental enhancements as recommended by the Committee of Scientists Input, Portland workshop, page 36. The words “forest-based outdoor” as qualifiers for recreation and tourism are needed to avoid including non-forest recreation and tourism.
Indicator 38 (6.3.a) Rationale	This indicator measures the short and long-term commitment of societies to forest management, processing of forest products and the use of forests for environmental, economic and social purposes.		No modifications suggested.

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Indicator 38a Title		Numbers of forest product mills and capacities by sector	This is an important measure of infrastructure needed to manage the forest that is not captured in other indicators. Also, this indicator quantifies the infrastructure similar to the recreation and tourism indicator (Indicator 36).
Indicator 38a Rationale		This is an important piece of information related to the ability to manage forests for forest products and forest health, and to maintain and enhance the long-term multiple socio-economic benefits to meet the needs of societies.	
Indicator 39 (6.3.b) Title	Level of expenditure on research and development, and education	Level of expenditure on <u>forest and product</u> research and development, and education	The words “forest and product” are appropriately more inclusive (i.e., include research on forests), and are recommended in the review documents Criteria Form, page 1.
Indicator 39 (6.3.b) Rationale	New knowledge through research and development, and its communication, extension, and education to practitioners and the public will improve the practice of forest management in economic, social, and environmental terms.	New knowledge through research and development, and its communication, extension, and education to practitioners and the public will improve the practice of forest management in economic, social, and environmental terms. <u>A good understanding of forest ecosystems is essential to the conservation and sustainable management of those ecosystems.</u>	Language added from deleted Indicator 63.

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Indicator 40 (6.3.c) Title	Extension and use of new and improved technologies	<u>Advances in productivity</u> linked to new and improved technologies	The current indicator is already measured by Indicator 38. “Productivity” measures the effectiveness of advances in technology, and industrial wood productivity was used by the USDA Forest Service as the measure of this indicator.
Indicator 40 (6.3.c) Rationale	This indicator measures continuous improvement in forest management and forest products industries. This indicator is based on the assumption that improvements in forest management are related to the level of effort in seeking out and implementing better technologies in production, processing, and use.	This indicator (<u>productivity</u>) measures continuous improvement in forest management and forest products industries. <u>Productivity measures could include industrial wood productivity, timber yield per acre, or other measures of output over input ratios.</u> This indicator is based on the assumption that improvements in forest management are related to the level of effort in seeking out and implementing better technologies in production, processing, and use.	
Indicator 41 (6.3.d) Title	Rates of return on investment		No modifications suggested
Indicator 41 (6.3.d) Rationale	The internal rate of return on investment is an indicator of the financial attractiveness of the forest sector to capital.	The internal rates of return on investment is an indicator of the financial attractiveness of the forest sector to capital. <u>Application should be made to each of the investment categories in Indicator 38.</u>	

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Cultural and Spiritual Needs and Values Rationale	Society’s values and needs may include cultural and spiritual connections of society to the forest. These cultural and spiritual connections and needs will vary substantially among and within countries and local communities. For example, the spiritual and cultural needs and values of indigenous peoples may be unique and distinct from the spiritual and cultural value of forests of people who live in urban environments.	Society’s values and needs include cultural and spiritual connections of society to the forest. These cultural and spiritual connections and needs will vary substantially among and within countries and local communities. For example, the spiritual and cultural needs and values of indigenous peoples may be unique and distinct from the spiritual and cultural value of forests of people who live in urban environments.	
Indicator 42 (6.4.a) Title	Area and percent of forest land managed in relation to the total area of forest land to protect the range of cultural, social and spiritual needs and values	Degree to which people are “satisfied” that the range of cultural, social, and spiritual needs and values <u>are met</u>	May need to consider another word or phrase for the term “satisfied.” Original indicator text related to “area and percent of land managed that is set aside” should be moved to Criterion 1, Indicators 2, 3, and 4.
Indicator 42 (6.4.a) Rationale	This indicator measures the amount of forest land placed under the range of tenure classifications and/or management regimes that are specifically designed to protect cultural, social and spiritual values. This includes land that is formally recognised as being under indigenous or other citizen’s tenure.	This includes land that is formally recognized as being under indigenous or other citizen’s tenure. <u>The cultural, spiritual, and social values of people embody the full range of uses of forest land. We are focusing on the degree of satisfaction, which will better reflect intra- and inter-generational equity.</u> <u>Recognize that lands have been set aside for various reasons (e.g., aesthetics, cultural heritage, etc.)</u>	This change removes the “amount of forest land,” but that measure is retained in the “Approaches to Measurement” section.

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Indicator 42 (6.4.a) Approaches to measurement	<p>Data for this indicator might include the following:</p> <ul style="list-style-type: none"> • Area and per cent of forest land by tenure, management regime and zoning that is formally managed to protect indigenous and non-indigenous peoples' cultural, social, and spiritual values • Tenure, including indigenous tenure • Inventory of cultural, social, and spiritual values/resources in the forest • Reports of impacts, by site, and area, that diminish cultural, social, religious, and spiritual values • Level of compliance with relevant national or sub-national conservation legislation or ordinances 		<p>Comment on the first bullet: The point on the area and per cent of forest land by tenure, etc... which was removed from the Indicator description, is more appropriately placed in this section.</p> <p>Comment on the third bullet: The point on the inventory of cultural, social, and spiritual values/resources in the forest could lead to a measure of "satisfaction."</p>
Indicator 43 (6.4.b) Title	Non-consumptive use of forest values		This information is addressed in Indicators 30, 35, and 42. Deleting the indicator strengthens integration by threading together concepts from Criteria 1 and 6. Because recommended changes to Indicator 42 capture nonconsumptive values, this indicator becomes redundant.
Indicator 43 (6.4.b) Rationale	The non-consumptive use of the forest is a common and traditional activity in many societies.		
Employment and Community Needs Rationale	Forest-related jobs and community stability, or livelihood, are very important social values of forests. Forest management is primarily a rural activity that often occurs in areas where there are few alternative economic development opportunities. In	<u>This deals with the contribution of the changing role of the forest to community change (community well-being, community sustainability, sense of place, etc.) Within this set of indicators, community change should be expanded</u>	

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	<p>some cases, rural communities, by becoming heavily reliant on the harvesting or processing of forest products, also become vulnerable to business cycles and structural changes in markets. Such communities may lack the capacity to adapt or respond to changes in external circumstances. In other cases, the expansion of plantations, or use of alternative forest products, can make a positive contribution to rural development. In some cases, the need of some parts of the forest sector to remain competitive in global markets has resulted in the adoption of new technologies that, while maintaining production levels, have reduced local levels of employment.</p> <p>The needs of forest sector employees, residents of rural communities, subsistence users and forest dwelling communities that rely heavily on the forest are important aspects of public decision making and policy.</p> <p>There is also significant employment in urban areas in the processing of forest products, e.g., furniture making. Additional employment is associated with the recycling of wood products, park management, arboriculture, recreational enterprises, etc.</p>	<p>beyond economic changes to include, <u>social, cultural, political, technological, and environmental (e.g., fire, water use, etc.) changes.</u> Forest and community needs should be considered from a <u>“systems/inter-related” perspective.</u> <u>These indicators help to illustrate the inter-relationships from a human ecology perspective.</u></p> <p><u>These indicators could help forest managers and policy makers to understand the relationship of the forest to the communities. A holistic understanding of the community is needed including social, political, economic, and environmental dimensions. We need to discern the relationship between the forest and the community on this understanding.</u></p> <p>Forest-related jobs and community stability, or livelihood, are very important social values of forests. The needs of forest sector employees, residents of rural communities, subsistence users, and forest-dwelling communities that rely heavily on the forest are important aspects of public decision making and policy.</p> <p>There is also significant employment in urban areas in the processing of forest products, e.g., furniture making. Additional employment is associated with</p>	<p>Note: it would be appropriate to add citations for the term “human ecology” and add a definition for the term in the glossary.</p>

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		<p>the recycling of wood products, park management, arboriculture, recreational enterprises, etc.</p> <p><u>These indicators look at the extent to which forest land is used to provide basic products for survival outside the economic or market-based system. Such uses of the forest can be valid and their extent should be known and forest management regimes developed to provide for them.</u></p>	
<p>Indicators 44, 45, 46, and 47 Titles</p>	<p>Indicator 44: Direct and indirect employment in the forest sector and forest sector employment as a proportion of total employment</p> <p>Indicator 45: Average wage rates and injury rates in major employment categories within the forest sector</p> <p>Indicator 46: Viability and adaptability to changing economic conditions, of forest dependent communities, including indigenous communities</p> <p>Indicator 47: Area and percent of forest land used for subsistence purposes</p>	<p>Indicator 46: <u>The Contribution of the forest to community livability and welfare</u></p> <p>Indicator 47: <u>The Contribution of the forest to community resiliency</u></p>	<p>Indicators 44, 45, 46, and 47 are subsumed and combined under two revised indicators (46–Community Livability and 47–Community Resiliency). The original indicators did not accomplish what was intended: looking at the relationship between forests and communities. In addition, they were “measures” rather than indicators.</p>

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<p>Indicators 44, 45, 46, and 47 Rationales</p>	<p>Indicator 44: This indicator measures the contribution of the forest sector in providing employment, at national and regional levels.</p> <p>Indicator 45: This indicator measures forest sector wage rates and injury rates as a measure of workforce health and welfare.</p> <p>Indicator 46: This indicator measures the extent to which communities may be able to successfully respond and adapt to economic change. Communities with high economic and cultural dependence on the forest sector but which are adaptable to changing economic conditions, should be sustainable into the future.</p> <p>Indicator 47: This indicator measures the extent to which forest land is used to provide basic products for survival outside the economic or market based system. Such uses of the forest can be valid and their extent should be known and forest management regimes developed to provide for them.</p>	<p>Indicator 46: This indicator builds a clear understanding of the general welfare needs of the community and then identifies the contributions of forests towards these basic needs. Basic needs refer to a minimally acceptable level of welfare. These include employment, health, education, etc. To the extent that these needs are met, a community is considered livable.</p> <p><u><i>McKillop Addition:</i></u> Sectors such as the timber industry, which pay higher salaries and bring in income from outside a region by exporting goods from it or reducing its level of imports, are especially important as sources of employment and income because they stimulate economic activity in other sectors of the economy.</p>	<p>Indicator 47: Note: This indicator should logically follow Indicator 42 that relates to the range of values across the U.S.</p>
<p>Indicators 44, 45, 46, and 47 Rationales (cont)</p>		<p>Indicator 47: Community resiliency reflects the ability of communities to respond to internal and external change. Community resiliency is predicated on</p>	

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		<p><u>four community dynamics. First, social infrastructure such as associations, clubs and churches must be in place to provide community space in which to gather, learn, and collaborate. Second, the community must collectively possess the relevant knowledge, skills, and abilities to anticipate and respond to change. Third, local political leadership is required to facilitate the accomplishment of community objectives. Finally, community members need be actively engaged in problem resolution and the accomplishment of community objectives.</u></p>	
<p>Indicators 44, 45, 46, and 47 Approaches to Measurement</p>	<p>Indicator 44: Consistent employment data are required. Data that may be useful for this indicator include the following:</p> <ul style="list-style-type: none"> • Total employment in all sectors • Direct employment in the various forest sectors • Indirect employment in appropriately identified downstream activities <p>Relevant information could be obtained from national institutions or agencies with responsibility for the collection of employment statistics. Direct employment figures may be available from forest industry associations. Indirect employment is usually estimated by a sampling procedure to develop multipliers that are applied to direct employment data. In some circumstances, direct employment figures</p>	<p>Indicator 46:</p> <ul style="list-style-type: none"> • Total employment in all sectors • Direct employment in the various forest sectors • Indirect employment in appropriately identified downstream activities • Data to measure this indicator include wage and injury rates by different components of the forest sector, including non-wood industries and services. Government, union, industry, or research health and safety sources may be useful. • Number of permits requested and issued for access to harvesting rights for particular products or land • Information on policies relating to access to these areas • Reports from custodians of land on 	<p>Indicator 47: Note: Communities of place, tribes, and local government have concerns about how this indicator is being measured.</p>

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	<p>may also need to be estimated.</p> <p>Indicator 45: Data to measure this indicator include wage and injury rates by different components of the forest sector, including non-wood industries and services. Government, union, industry, or research health and safety sources may be useful.</p> <p>Indicator 46:</p> <ul style="list-style-type: none"> • Data to measure this indicator in terms of indigenous people may include the following: • Traditional and social uses such as shelter, instruments, art, healing, food, fuel, transport, weapons, trade, water finding, ceremonies, and gatherings • Economic uses including cultural tours or camps, artifacts, medicines, bush food, seed • Folklore and oral history from elders • Traditional boundaries, ownership, "focal points" (e.g., trees, stone markers) • How local communities are involved in forest management practices, possibly including the number of indigenous people employed in the forest sector, and the number of forest-based enterprises owned by indigenous people • For other local and forest dependent communities, useful data might incorporate the following: 	<p>any difficulties related to access</p> <ul style="list-style-type: none"> • Uses related to a particular forest type, species, product or service • Employment and labor force (rate of unemployment, years worked in the forest sector, experience in other industries, age structure of the workforce, education or skill level attained, level of non-indigenous employment) • Level of community dependence on individual forest commodities or industries, or services • Socio-demographic structure of communities (level of household income, population distribution, age structure, ethnicity, presence of dependent children, years of residence in area) • Community vitality (quantitative and qualitative assessment of proportion of family in community, degree of pride in community, length of residence, desire to relocate, political efficacy, crime rates, housing ownership, income distribution, dependence on social security, unemployment rate) • Community infrastructure (number of schools, enrolments, childcare facilities, retail and trade services, community groups and use of local services) • <u>Town size</u> 	

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	<ul style="list-style-type: none"> Local economic viability (industry by employment, size of businesses, income or profit derived from the forest sector, dependence of businesses on forest sector) Employment and labour force (rate of unemployment, years worked in the forest sector, experience in other industries, age structure of the workforce, education or skill level attained, level of non-indigenous employment) Level of community dependence on individual forest commodities or industries, or services Socio-demographic structure of communities (level of household income, population distribution, age structure, ethnicity, presence of dependent children, years of residence in area) Historical response to change (qualitative assessment of historical responses of communities, to other significant economic changes, in recent years) Community vitality (quantitative and qualitative assessment of proportion of family in community, degree of pride in community, length of residence, desire to relocate, political efficacy, crime rates, participation in community groups, housing ownership, income distribution, dependence on social 	<ul style="list-style-type: none"> Traditional and social uses such as shelter, instruments, art, healing, food, fuel, transport, weapons, trade, water finding, ceremonies, and gatherings Economic uses including cultural tours or camps, artifacts, medicines, bush food, seed How local communities are involved in forest management practices, possibly including the number of indigenous people employed in the forest sector, and the number of forest-based enterprises owned by indigenous people Local economic viability (industry by employment, size of businesses, income or profit derived from the forest sector, dependence of businesses on forest sector) <p>Indicator 47:</p> <ul style="list-style-type: none"> Historical response to change (qualitative assessment of historical responses of communities, to other significant economic changes, in recent years) Community vitality; participation in community groups. Folklore and oral history from elders Social well-being (qualitative assessment of attachment to place, sense of community, quality of life) Community vision (qualitative 	

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	<p>security, unemployment rate)</p> <ul style="list-style-type: none"> • Social well-being (qualitative assessment of attachment to place, sense of community, quality of life) • Community infrastructure (number of schools, enrolments, childcare facilities, retail and trade services, community groups and use of local services) • Qualitative stressors (assessment of additional economic stressors within the region, e.g., service closures) • Community vision (qualitative assessment of the potential for alternative development of options or scenarios) • Sources of data might include the following: • Analysis of data from government agencies, professional groups and organisations, community and industry groups • Research or survey of forest based communities <p>Indicator 47: <u>Useful data for measuring this indicator might be based on the following:</u></p> <ul style="list-style-type: none"> • Number of permits requested and issued for access to harvesting rights for particular products or land • Information on policies relating to access to these areas • Reports from custodians of land on any 	<p>assessment of the potential for alternative development of options or scenarios)</p> <p><u>Subsistence could refer to many things—the forest is necessary but not sufficient for viable communities.</u></p>	

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	<p>difficulties related to access</p> <ul style="list-style-type: none"> • Uses related to a particular forest type, species, product or service • Information may be obtained through discussions with appropriate custodians, indigenous land managers, other subsistence forest users, and government agencies. 		