

Criteria and Indicators for Sustainable Forestry

In an attempt to better quantify what sustainable forestry means and assess our progress in achieving sustainability, in 1993 twelve countries — including the United States — joined together in Montreal, Canada to discuss how sustainable forestry might be defined and potentially measured in terms of outcomes. The product of that meeting is referred to as the “Montreal Process.” The Montreal Process identifies a framework of criteria and indicators for tracking progress in forest sustainability. This framework of criteria and indicators can be used to foster discussions on the progress of achieving forest sustainability. The elements of Wisconsin’s statewide forest plan can be linked to these criteria and indicators to allow us to participate in a more global assessment of progress in sustainable forestry.

Montreal Process Criteria and Indicators

CRITERION 1: CONSERVATION OF BIOLOGICAL DIVERSITY

Indicator 1

Extent of area by forest type relative to total forest area.
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Indicator 2

Extent of area by forest type and by age class or successional stage.
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Indicator 3

Extent of area by forest type in protected area categories as defined by IUCN or other classification systems.
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Indicator 4

Extent of area by forest type in protected areas defined by age class or successional stage.
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Indicator 5

Fragmentation of forest types.
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Indicator 6

Number of forest dependent species.
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Indicator 7

Status (threatened, rare, vulnerable, endangered, or extinct) of forest dependent species at risk of not maintaining viable breeding populations, as determined by legislation or scientific assessment.
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Indicator 8

Number of forest dependent species that occupy a small portion of their former range.
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Indicator 9

Population levels of representative species from diverse habitats monitored across their range.

CRITERION 2: MAINTENANCE OF PRODUCTIVE CAPACITY OF FOREST ECOSYSTEMS

Indicator 10

Area of forest land and net area of forest land available for timber production/
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Indicator 11

Total growing stock of both merchantable and non-merchantable tree species on forest land available for timber production.
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Indicator 12

The area and growing stock of plantations of native and exotic species.
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Indicator 13

Annual removal of wood products compared to the volume determined to be sustainable.
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Indicator 14

Annual removal of non-timber forest products (e.g. fur bearers, berries, mushrooms, game), compared to the level determined to be sustainable.

CRITERION 3: MAINTENANCE OF FOREST ECOSYSTEM HEALTH AND VITALITY

Indicator 15

Area and percent of forest affected by processes or agents beyond the range of historic variation.
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Indicator 16

Area and percent of forestland subjected to levels of specific air pollutants or ultraviolet B that may cause negative impacts on the forest ecosystem.
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Indicator 17

Area and percent of forestland with diminished biological components indicative of changes in fundamental ecological processes and/or ecological continuity.

CRITERION 4: CONSERVATION OF SOIL AND WATER RESOURCES

Indicator 18

Area and percent of forestland with significant soil erosion.
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Indicator 19

Area and percent of forestland managed primarily for protective functions such as watersheds or flood protection.
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Indicator 20

Percent of stream kilometers in forested catchments in which stream flow and timing has significantly deviated from the historic range of variation.
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Indicator 21

Area and percent of forestland with significantly diminished soil organic matter and/or changes in other soil chemical properties.

Indicator 22

Area and percent of forestland with significant compaction or change in soil physical properties resulting from human activities.

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Indicator 23

Percent of water bodies in forest areas with significant variance of biological diversity from the historic range of variability.

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Indicator 24

Percent of water bodies in forest areas with significant variation from the historic range of variability in pH, dissolved oxygen, levels of chemicals, sedimentation, or temperature change.

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Indicator 25

Area and percent of forestland experiencing an accumulation of persistent toxic substances.

CRITERION 5: MAINTENANCE OF FOREST CONTRIBUTION TO GLOBAL CARBON CYCLES

Indicator 26

Total forest ecosystem biomass and carbon pool and, if appropriate, by forest type, age class, and successional stages.

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Indicator 27

Contribution of forest ecosystems to the total global carbon budget, including absorption and release of carbon.

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Indicator 28

Contribution of forest products to the global carbon budget.

CRITERION 6: MAINTENANCE AND ENHANCEMENT OF LONG TERM MULTIPLE SOCIOECONOMIC BENEFITS TO MEET THE NEEDS OF SOCIETY

Indicator 29

Value and Volume of Wood and Wood Products, Including Value Added Through Downstream Processing

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Indicator 30

Value and Quantities of Production of Non-Wood Forest Products

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Indicator 31

Supply and Consumption of Wood and Wood Products

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Indicator 32

Value of Wood and Non-Wood Products as a Percentage of GSP

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Indicator 33

Degree of Recycling of Forest Products

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Indicator 34

Supply and Consumption/Use of Non-Wood Forest Products

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Indicator 35

Forest Land Managed for General Recreation and Tourism, in Relation to the Total Area of Forest Land

Indicator 36

Number and Type of Facilities Available for General Recreation and Tourism

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Indicator 37

Visitor Days Attributed to Recreation and Tourism

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Indicator 38

Value of Investment in Forest Health and Management, Reforestation, Wood Processing, Recreation, and Tourism

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Indicator 39

Level of Expenditure on Forest Related Research and Development, and Education

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Indicator 40

Extension and Use of New and Improved Technology in the Forest Industry

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Indicator 41

Rates of Return on Investment in Forests

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Indicator 42

Forest Land Managed to Protect Cultural, Social, and Spiritual Needs, in Relation to the Total Area of Forest Land

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Indicator 43

Non-Consumptive Use Forest Values, Including Social/Cultural, Recreational, and Biological Values

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Indicator 44

Direct and Indirect Employment in the Forest Sector, and Forest Sector Employment as a Proportion of Total Employment

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Indicator 45

Average Wage Rates and Injury Rates in Major Employment Categories Within the Forest Sector

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Indicator 46

The Viability and Adaptability of Forest Dependent Communities, as They Respond to Changing Economic Conditions

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Indicator 47

Area and Percent of Forest Land Used for Subsistence Purposes

**CRITERION 7: LEGAL, INSTITUTIONAL AND ECONOMIC
FRAMEWORK FOR FOREST CONSERVATION AND
SUSTAINABLE MANAGEMENT**

Indicator 48

The Extent to Which the Legal Framework Clarifies Property Rights, Provides for Appropriate Land Tenure Arrangements, Recognizes Customary and Traditional Rights of Indigenous Peoples, and Provides Means of Resolving Property Disputes by Due Process

Indicator 49

The Extent to Which the Legal Framework Provides for Periodic Forest-Related Planning, Assessment, and Policy Review That Recognize the Range of Forest Values, Including Coordination With Relevant Sectors

Indicator 50

The Extent to Which the Legal Framework Provides Opportunities for Public Participation in Policies and Decisions Related to Forests, and Supports Public Access to Information

Indicator 51

The Extent to Which the Legal Framework Encourages

Indicator 52

The Extent to Which the Legal Framework Provides for the Management of Forests to Conserve Special Environmental, Cultural, Cultural, Social and/or Scientific Values

Indicator 53

The Extent to Which the Institutional Framework Supports the Capacity to Provide for Public Involvement Activities and Public Education, Awareness, and Extension Programs, and Make Available Forest Related Information

Indicator 54

The Extent to Which the Institutional Framework Supports the Capacity to Undertake and Implement Periodic Forest-Related Planning, Assessment, and Policy Review Process, Including Cross-Sectional Planning and Coordination

Indicator 55

The Extent to Which the Institutional Framework Includes the Capacity to Develop and Maintain Human Resource Skills Across Relevant Disciplines

Indicator 56

The Extent to Which the Institutional Framework Has the Capacity to Develop and Maintain an Efficient Physical Infrastructure, in Order to Facilitate the Supply of Forest Products and Services and Support Forest Management

Indicator 57

The Extent to Which the Institutional Framework has the Capacity to Enforce Laws, Regulations, and Guidelines

Indicator 58

The Extent to Which Investment and Taxation Policies and the Regulatory Environment Recognize the Long-Term Nature of Investments in Forests, and the Extent to Which These Policies and Regulations Permit Capital to Flow in and Out of the Forest Sector in Response to Market Signals, Non-Market Economic Valuations, and Public Policy Decisions, in Order to Meet Long-Term Demands for Forest Products and Services

Indicator 59

The Extent to Which the Economic Framework Supports Non-Discriminatory Trade Policies for Forest Products

Indicator 60

The Availability and Extent of Up-To-Date Data, Statistics, and Other Information Important to Measuring or Describing Indicators Associated With Criteria 1-7

Indicator 61

Scope, Frequency, and Statistical Reliability of Forest Inventories, Assessments, Monitoring, and Other Relevant Information

Indicator 62

Compatibility With Other Countries in Measuring, Monitoring, and Reporting on Indicators

Indicator 63

Development of the Scientific Understanding of Forest Ecosystem Characteristics and Functions

Indicator 64

Capacity to Develop Methodologies to Measure and Integrate the Environmental and Social Costs and Benefits of Forest Management Into Markets and Public Policies; and Also The Capacity to Reflect Forest-Related Resource Depletion or Replenishment in National Accounting Systems

Indicator 65

Capacity to Develop New Technologies and to Assess the Socioeconomic Consequences Associated With the Introduction of New Technologies

Indicator 66

Capacity to Enhance the Ability to Predict the Impacts of Human Intervention on Forests

Indicator 67

Capacity to Predict the Impacts of Possible Climate Change on Forests