FOREST AND RANGELAND ASSESSMENT: CRITERIA AND INDICATORS

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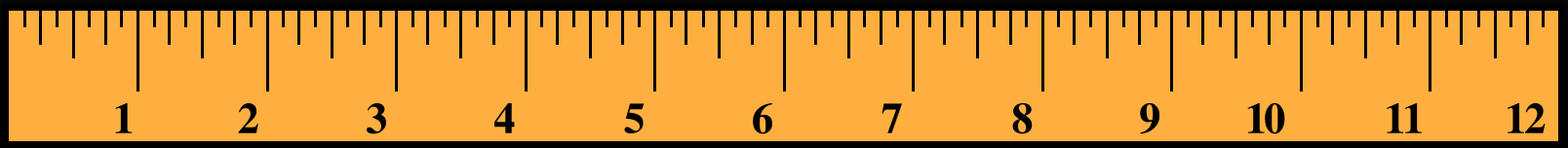
PROJECT GOALS

Indicators to Measure Progress



Collaborative Process

Broad Range of Issues

TASKS

- Synthesis of existing indicator reporting systems in forestry and rangeland managemen
- Stakeholders, Outreach and Indicator Development
- Indicator Reporting Template
- Case Study: Water
- Report and Indicator Workshop

FOREST INDICATOR SYSTEMS

- Previous Assessments
- Montreal Process
- State of Oregon
- US Forest Service

- Millennium Ecosystem Assessment
- EPA Report on the Environment
- Other global and US systems

MONTREAL PROCESS CRITERIA

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
7. Legal, institutional and economic framework for forest conservation and sustainable management

MONTREAL PROCESS, CRITERION EXAMPLE

Criterion 4:Conservation and maintenance of soil and water resources

4.1 Protective Function

4.1.a Area and percent of forest whose designation or land management focus is the protection of soil or water resources

4.2 Soil

4.2.a Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources

4.2.b Area and percent of forest land with significant soil degradation

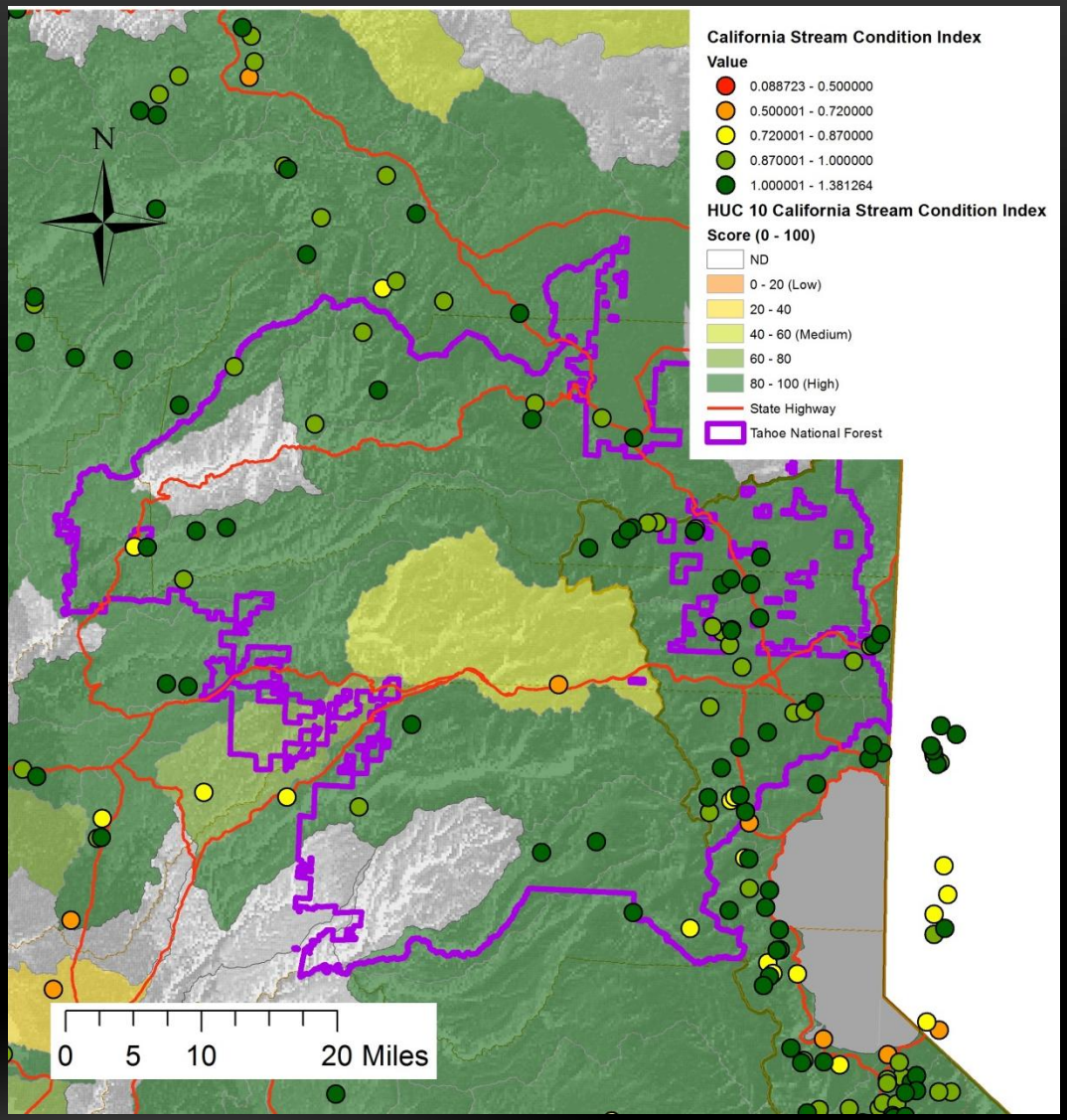
4.3 Water

4.3.a Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water related resources

4.3.b Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical or biological properties from reference conditions

EXAMPLE: 4.3.b Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical or biological properties from reference conditions

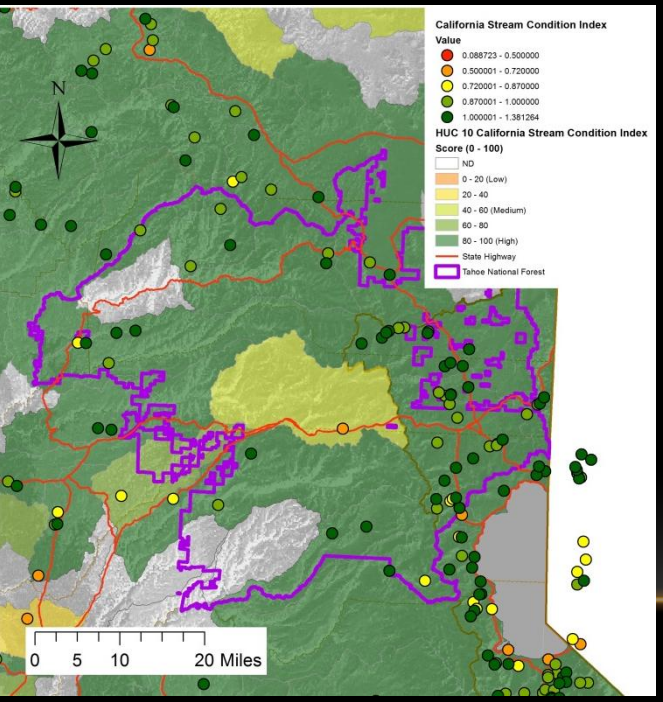
California Stream Condition Index and Tahoe National Forest

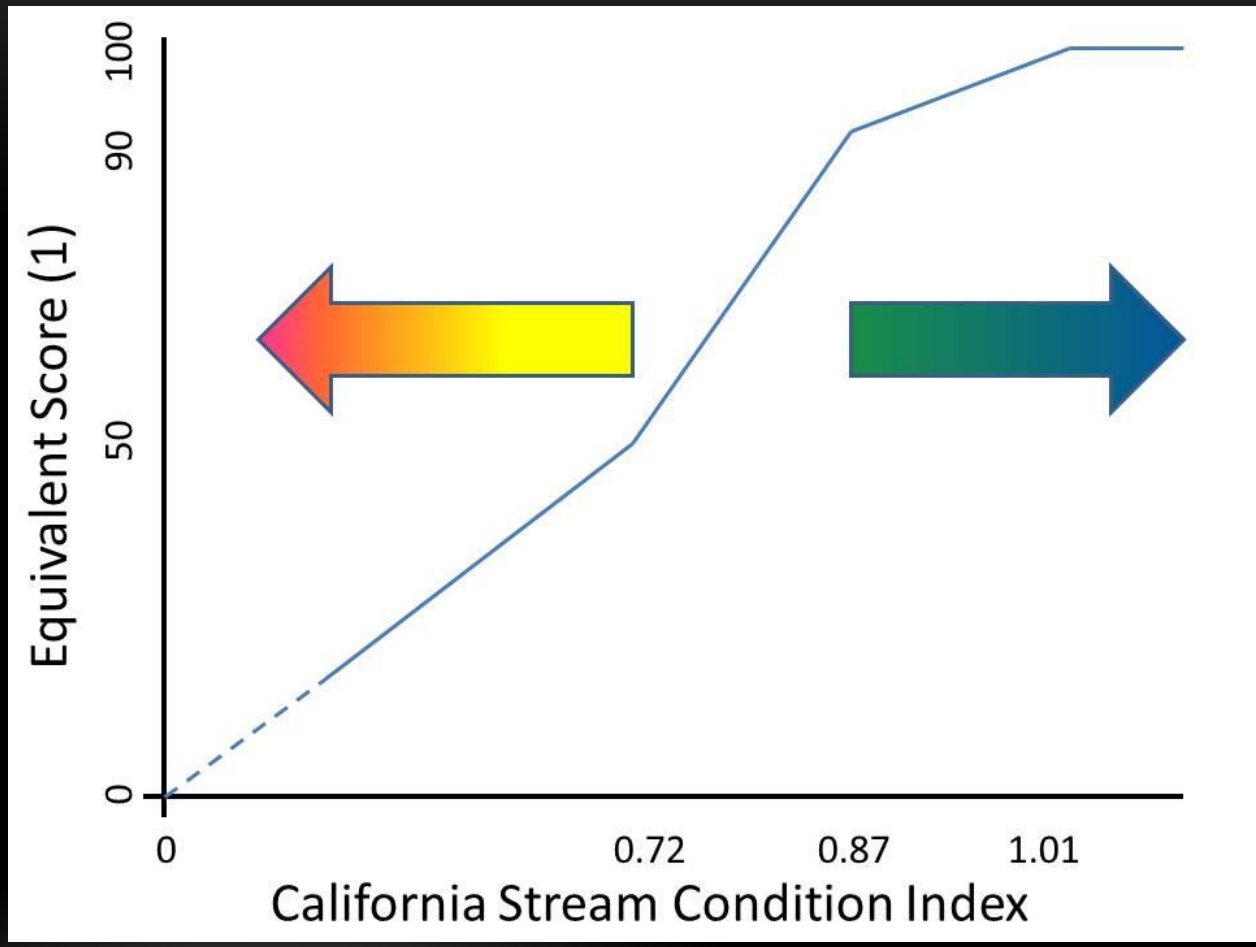


CRITERIA AND INDICATORS

- Select indicators based on objective and transparent criteria that effectively measure progress toward goals
- The evaluation principle is one of measuring progress toward targets for specific metrics and indicators
- Two numeric targets must be set for quantitative evaluation of indicators: a low or undesired condition and a high or desired condition
- There may be linear, non-linear, and binary relationships between an indicator parameter state and an indicator distance from a desired (or undesired) condition

EXAMPLE: CALIFORNIA STREAM CONDITION INDEX





WATER

- Input on Indicators that fulfill specific forest/forestry and rangeland assessment needs
- Feedback on proposed system of indicators
- Suggestions for data sources for assessment and case study
- Review of final indicators system for the 2015 Assessment

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Montreal Process Criteria and Indicators (third edition - 2009)

Criterion 1: Conservation of biological diversity

1.1. Ecosystem Diversity

1.1.a Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure

1.1.b Area and percent of forest in protected areas by forest ecosystem type, and by age class or successional stage

1.1.c Fragmentation of forests

1.2. Species Diversity

1.2.a Number of native forest-associated species

1.2.b Number and status of native forest-associated species at risk, as determined by legislation or scientific assessment

1.2.c Status of on site and off site efforts focused on conservation of species diversity

1.3. Genetic Diversity

1.3.a Number and geographic distribution of forest-associated species at risk of losing genetic variation and locally adapted genotypes

1.3.b Population levels of selected representative forest-associated species to describe genetic diversity

1.3.c Status of on site and off site efforts focused on conservation of genetic diversity

Criterion 2: Maintenance of productive capacity of forest ecosystems

2.a Area and percent of forest land and net area of forest land available for wood production

2.b Total growing stock and annual increment of both merchantable and non-merchantable tree species in forests available for wood production

2.c Area, percent, and growing stock of plantations of native and exotic species

2.d Annual harvest of wood products by volume and as a percentage of net growth or sustained yield

2.e Annual harvest of non-wood forest products

Criterion 3:Maintenance of forest ecosystem health and vitality

3.a Area and percent of forest affected by biotic processes and agents (e.g. disease, insects, invasive alien species) beyond reference conditions

3.b Area and percent of forest affected by abiotic agents (e.g. fire, storm, land clearance) beyond reference conditions

Criterion 4:Conservation and maintenance of soil and water resources

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Criterion 5: Maintenance of forest contribution to global carbon cycles

5.a Total forest ecosystem carbon pools and fluxes

5.b Total forest product carbon pools and fluxes

5.c Avoided fossil fuel carbon emissions by using forest biomass for energy

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits

6.1 Production and Consumption

6.1.a Value and volume of wood and wood products production, including primary and secondary processing

6.1.b Value of non-wood forest products produced or collected

6.1.c Revenue from forest based environmental services

6.1.d Total and *per capita* consumption of wood and wood products in round wood equivalents

6.1.e Total and *per capita* consumption of non-wood forest products

6.1.f Value and volume in round wood equivalents of exports and imports of wood products

6.1.g Value of exports and imports of non-wood forest products

6.1.h Exports as a share of wood and wood products production, and imports as a share of wood and wood products consumption

6.1.i Recovery or recycling of forest products as a percent of total forest products consumption

6.2 Investment in the Forest Sector

6.2.a Value of capital investment and annual expenditure in forest management, wood and non-wood forest product industries, forest-based environmental services, recreation and tourism

6.2.b Annual investment and expenditure in forest-related research, extension and development, and education

6.3 Employment and Community needs

6.3.a Employment in the forest sector

6.3.b Average wage rates, annual average income and annual injury rates in major forest employment categories

6.3.c Resilience of forest-dependent communities

6.3.d Area and percent of forests used for subsistence purposes

6.3.e Distribution of revenues derived from forest management

6.4 Recreation and Tourism

6.4.a Area and percent of forests available and/or managed for public recreation and tourism

6.4.b Number, type, and geographic distribution of visits attributed to recreation and tourism and related to facilities available

6.5 Cultural, Social and Spiritual needs and Values

6.5.a Area and percent of forests managed primarily to protect the range of cultural, social and spiritual needs and values

6.5.bThe importance of forests to people

Criterion 7: Legal, institutional and economic framework for forest conservation and sustainable management

7.1.a Legislation and policies supporting the sustainable management of forests

7.1.b Cross sectoral policy and programme coordination

7.2.a Taxation and other economic strategies that affect sustainable management of forests

7.3.a Clarity and security of land and resource tenure and property rights

7.3.b Enforcement of laws related to forests

7.4.a Programmes, services and other resources supporting the sustainable management of forests

7.4.b Development and application of research and technologies for the sustainable management of forests

7.5.a Partnerships to promote the sustainable management of forests

7.5.b Public participation and conflict resolution in forest-related decision making

7.5.c Monitoring, assessment and reporting on progress towards sustainable management of forests

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