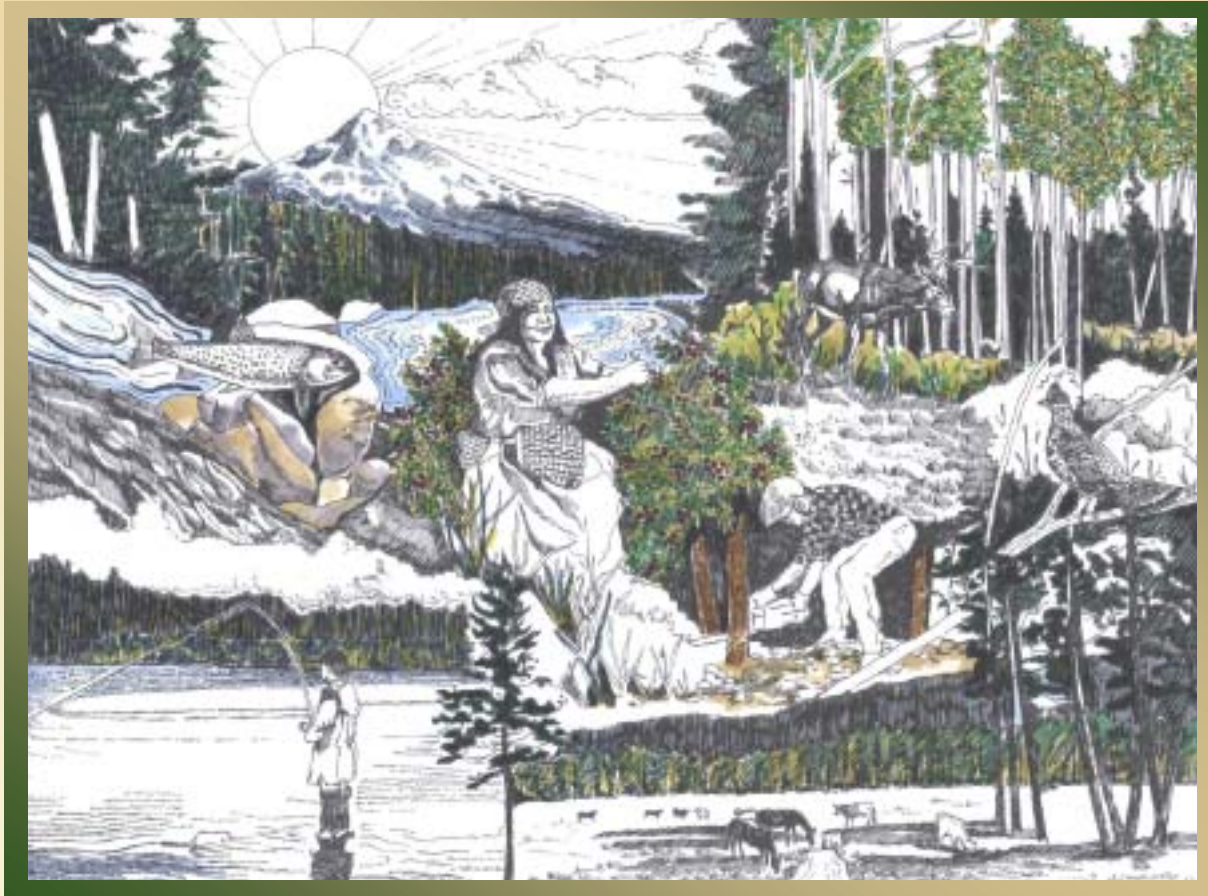


# Monitoring for Sustainability at Multiple Scales









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**Director**

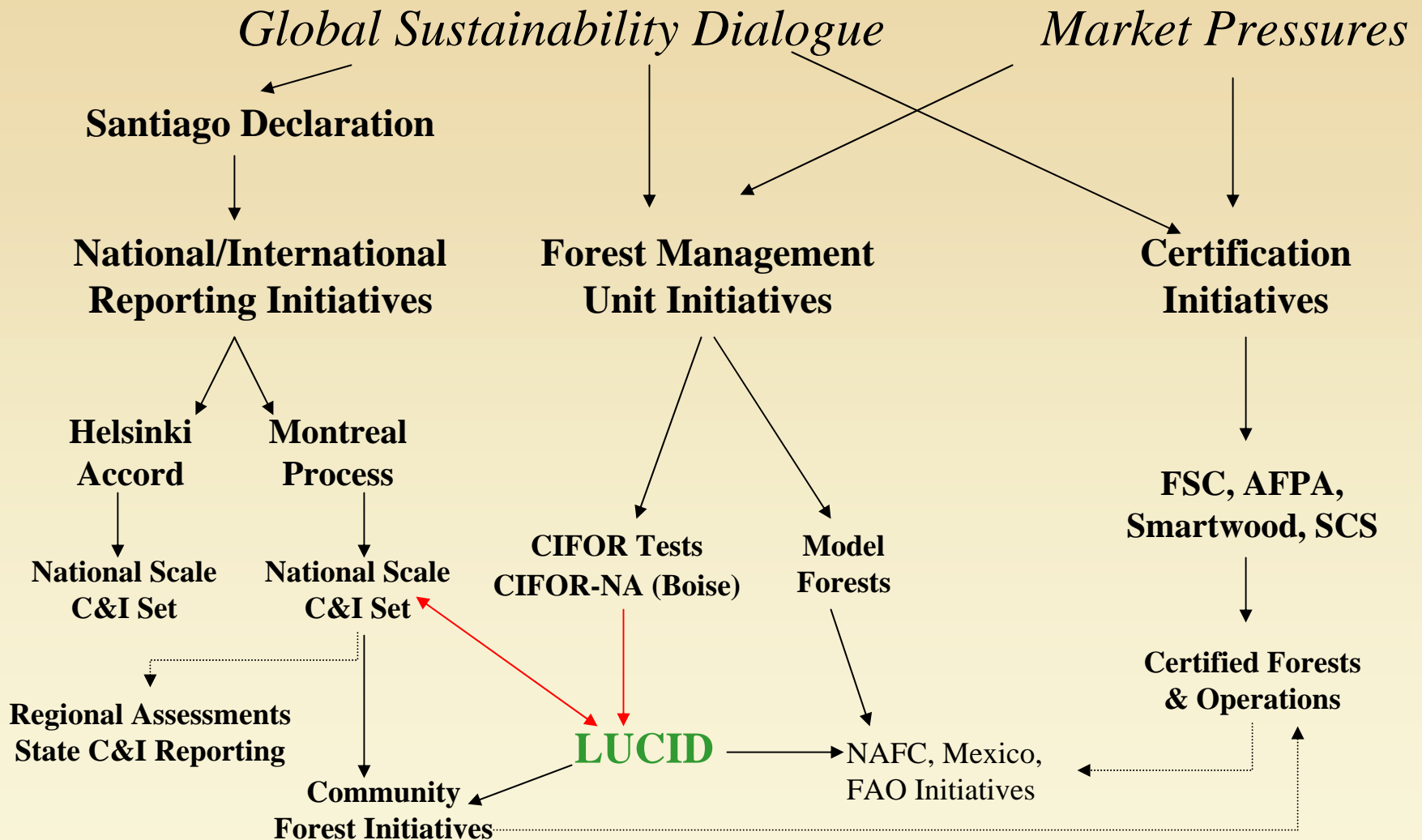
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# The Sustainability Quest

-  Sustainability requires deciding what to sustain, for whom, where, for how long, and at what cost
-  Serve as a basis for public value discussion
-  Criteria and indicators serve as measures for assessing sustainability
-  C&I vary depending on what, where, and when of the sustainability assessment
-  Historical reference values and future system desired conditions bookmark the time interval
-  Sustainability assessments are relative rather than absolute measures

# Multi-Scaled Sustainability Initiatives



# Scale of Sustainability



Sustainability is multi-scaled



Sustainability goals exist at different scales



Assessment of sustainability varies with scale



Sustainability issues/questions vary with scale

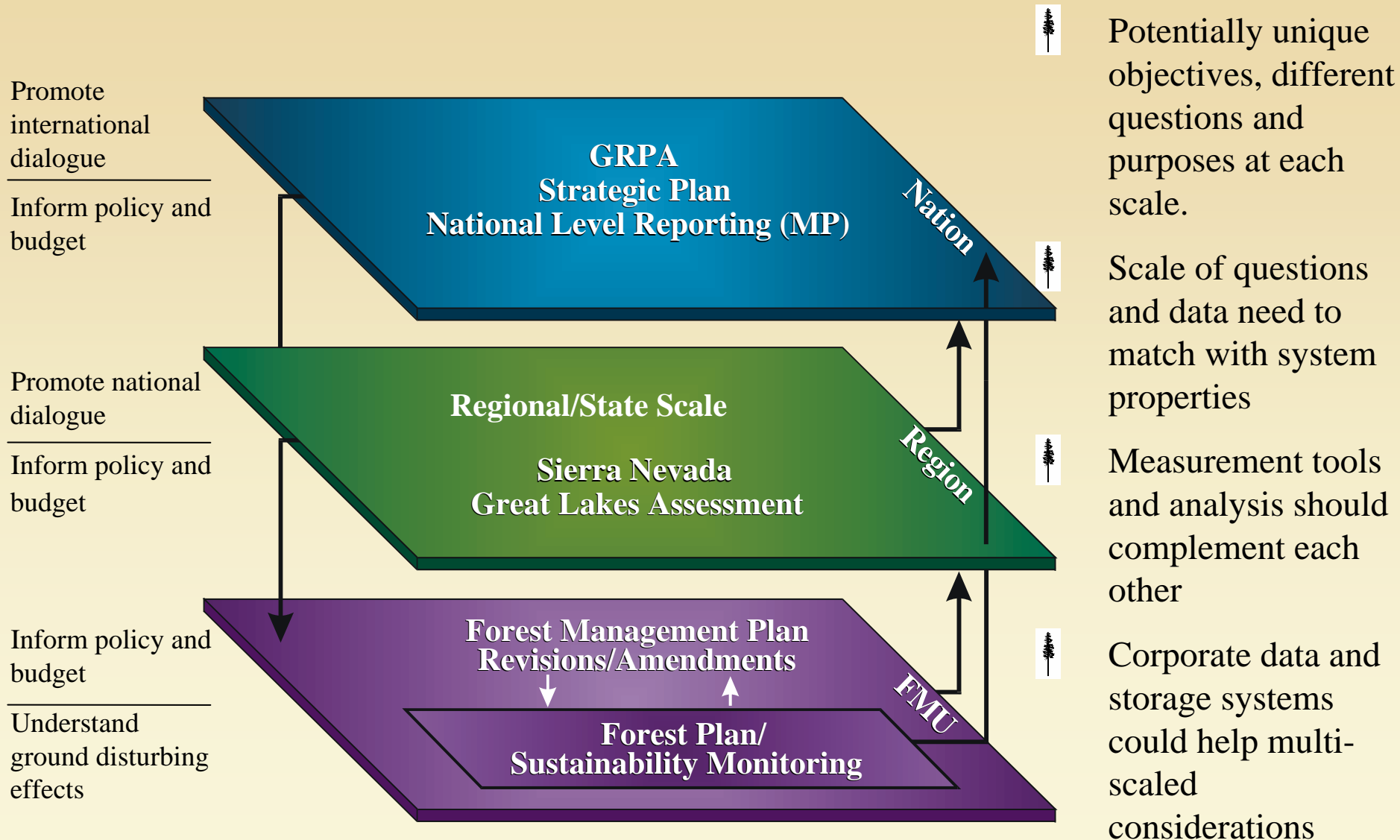


C&I are multi-scale tools used to help describe, and assess progress towards sustainability – within and between scale




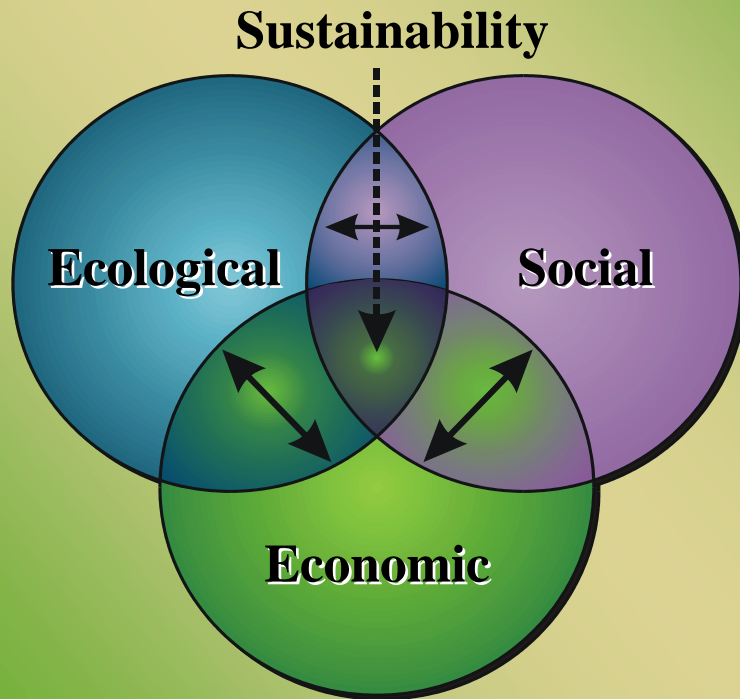
Sustainability monitoring and analysis vary with scale




# Scale of Sustainability Assessments



# Sustainable Systems

 Sustainability is defined by the interaction of social, economic and ecological systems



-  No single scale is adequate
-  No single system is adequate
-  System properties change with scale

# Fire and Fuels

## Value Statement:

Forests have become overgrown and unhealthy

## Reference Condition:

- Historic forest structure
  - Historic forest fire processes
- **National Scale Issue Assessment:**
    - Area and percent of forest biomes affected by structure and process outside the range of historic variation.
    - Area and percent of forest type by age class or successional stage.
  - **Regional Scale Issue Assessment:**
    - List of forest vegetation types in a region/state that have unhealthy structural condition.
  - **National Forest Scale Issue Assessment:**
    - Acres of forest vegetation community types in an administrative forest eco-group where stand density exceeds expected norm

# Invasive Species

## Value Statement:

Invasive species affect half of all imperiled species in the United States.






## Reference Condition:

- Area impacted by invasive species
- Number of invasive species
- **National Scale Issue Assessment:**
  - Area and percent of forest biomes affected by invasive species competition beyond the range of historic conditions
  - Area and percent of forest land with diminished biological composition resulting in changes in fundamental ecological processes
- **Regional Scale Issue Assessment:**
  - List of invasive species by forest type in a region/state.
- **National Forest Scale Issue Assessment:**
  - Acres and change in area of invasive species by forest type.

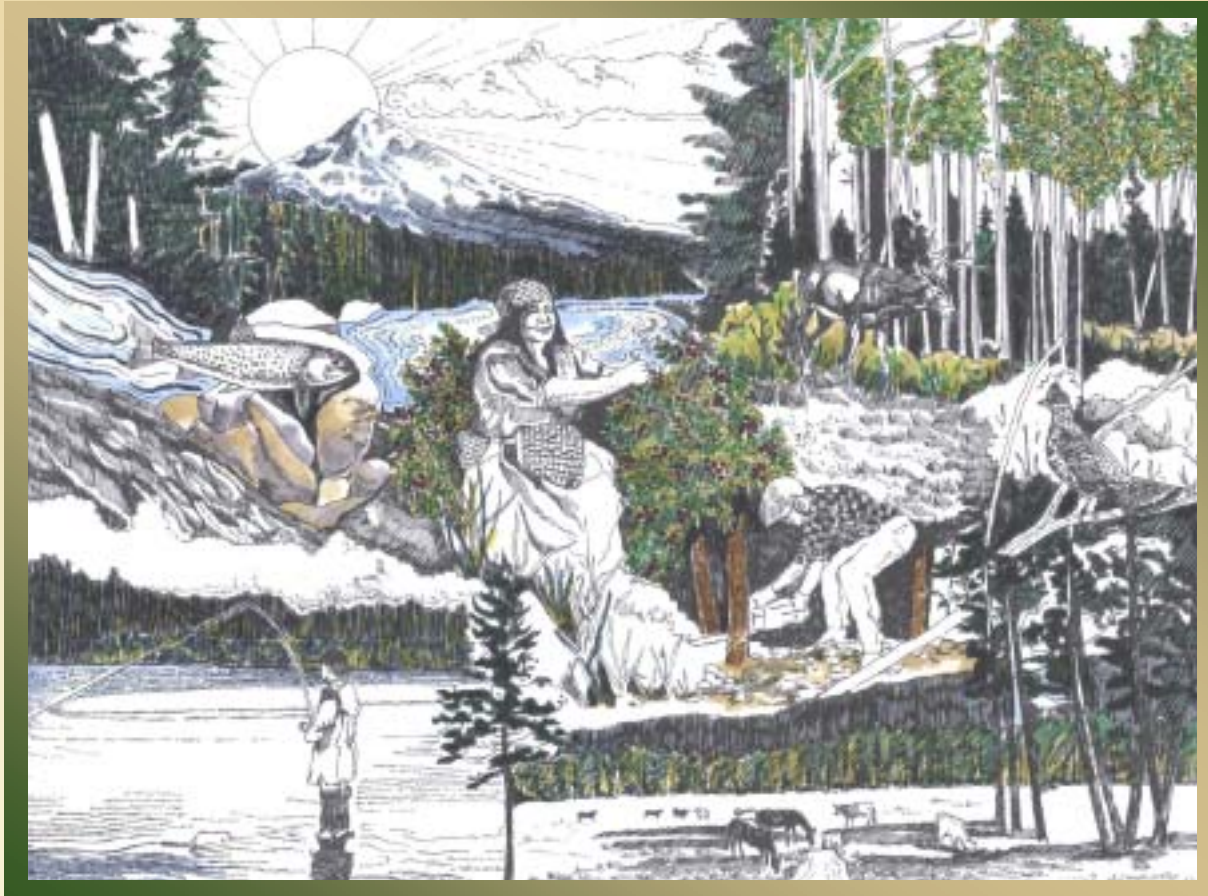
# Local Management Unit Scale Monitoring

*Establish a dialogue on place-based sustainability and improve management on the ground*

*“Where the rubber hits the road”*

-  Forest monitoring designed to help measure progress towards land management plan objectives and decisions for sustainability
-  Provide information to assist and inform forest managers
-  Increase focus on the goal of sustainability within an adaptive social and ecological systems approach to management
-  Monitor progress towards desired sustainable conditions
-  Use social and ecological systems to monitor the complexity of social and ecological consequences of forestland management.

# Monitoring for Sustainability at Multiple Scales



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**Director**

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# Loss of Open Space

## Value Statement:

America is losing wildlife corridors and interior contiguous forest habitat as working forests are sold and developed.

## Reference Conditions:

- Wildlife corridor landscape structure
- Interior contiguous forest habitat landscape structure
- **National Scale Issue Assessment:**
  - Fragmentation of forest types within biomes
- **Regional Scale Issue Assessment:**
  - Landscape patterns for Ecoregion provinces in state/region
- **National Forest Scale Issue Assessment:**
  - Landscape patterns (e.g., mean patch size, edge to interior ratios) for Ecoregion land type associations on ownership ecogroups.
  - Change in parcel size by land use and ownership type

# Unmanaged Recreation

## Value Statement:

Outdoor recreation use is not adequately controlled on forests and grasslands.

## Reference Conditions:

- Area of unplanned roads and trails
- Number and influence of OHV organizations
- **National Scale Issue Assessment:**
  - Area and percent of forest land used for general recreation and tourism, in relation to the total area of forest land.
  - Fragmentation of forest types by biome.
- **Regional Scale Issue Assessment:**
  - Density of unplanned roads and trails within Ecoregional Provinces in a state/region
- **National Forest Scale Issue Assessment:**
  - Density of unauthorized roads and trails on forest ecogroups by land type association.