

Lake Superior State
Forest Sustainable
Forest Management
Pilot Project

REPORT

9



Workshop II Summary: Establishing Targets, Practices and Responsibilities for the Indicators of the Lake Superior State Forest

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Executive summary

Two workshops have been held in Newberry, Michigan with the stakeholders of the Lake Superior State Forest (LSSF). The purpose of the first workshop, held June 25 and 26, 1998, was to develop a list of values with corresponding indicators for the LSSF. A key objective of the second workshop, held October 21 and 22, 1998, was to review and, where necessary, revise the list of values and indicators developed at Workshop I. Also at Workshop II, the processes of setting targets, defining practices and assigning roles and responsibilities for each indicator were begun.

Participants in Workshop II made several modifications to the list of values and indicators that was presented in the summary report for Workshop I. Changes to the list included giving new titles to some values, adding new indicators, moving some indicators between values and completely removing others. The possibility of adding a separate value that addresses the consumption of forest products was discussed and will require further consideration by stakeholders. The following table lists each indicator and shows the values with which each is associated as determined at Workshop II. A similar table was produced in the summary report for Workshop I. A comparison of the two tables reveals that, after Workshop II, there is less overlap among the values, and each value is now more distinct.

The next steps:

A set of values and indicators with clearly defined targets and practices to achieve those targets is important for effective forest management planning as well as for certification purposes. In order to ensure that the values and indicators that have been developed for the LSSF are as useful as possible and can be modified in the future if necessary, the LSSF SFM Project Team will complete the following tasks by the time this pilot project terminates at the end of February.

- The final list of indicators from Workshop II will be reviewed and, if necessary, modified so that they are as useful as possible. A useful indicator is one that is relevant, understandable and measurable.
- The final list of indicators will be challenged against the Canadian Standards Association (CSA) criteria and indicators for inclusion in the final project report.

- The process that has been used to develop the values and indicators for the LSSF will be evaluated and included as part of the LSSF forest planning manual currently being developed and as part of the final project report.
- The target-setting process that was proposed at Workshop II was generally regarded as unsatisfactory. This process will be reviewed and modified for inclusion in the final project report.

Values and indicators as determined at Workshop II.

Indicator	Ownership Patterns	Institutional Processes	Recreation	Multiple Use	Spiritual	Social/Cultural	Economic Health	Biodiversity	Healthy Forests	Biological Cycles	Water and Soil Resources Quality	Unique Features
Road density	✓				✓							
Ownership type and land use	✓											
Stewardship	✓											
Changes in ownership	✓											
Existence of audit or assessment program		✓										
Integrated planning system		✓	✓									
Response to public requests		✓										
Existence of public participation in review of initial plan and audit or assessment program		✓										
User days/activity			✓		✓							
Miles of trail systems by land-use designation			✓			✓						
Size and distribution of natural and 'special' areas and allowed use for those areas			✓		✓							✓
Area of forest by type, age class and quality			✓					✓	✓			
Number, type and quality of educational and recreational resources			✓									✓
Diversity of recreational opportunities			✓			✓						
Quality of recreational experience			✓									
Sufficient number of other values being provided for				✓								
Number of educational and recreational resources and presence of information resources					✓							
Change in status of land ownership, use and distribution					✓							
Amount of trash in forest					✓							
Number of historic sites						✓						✓
Presence and implementation of a historic/archeological resource plan						✓						
Cultural forest products						✓						

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Indicator	Ownership Patterns	Institutional Processes	Recreation	Multiple Use	Spiritual	Social/Cultural	Economic Health	Biodiversity	Healthy Forests	Biological Cycles	Water and Soil Resources Quality	Unique Features
Wood product summary							✓					
Ratio of harvest to growth by volume, species and products							✓					
Net quantity difference between growth and harvest							✓					
Correlation of LSSF to local economic development plans							✓					
Job/income/employment/retirement data							✓					
Area, percentage and representativeness of forest types in protected areas								✓	✓			
Forest regeneration by forest type and silvicultural prescription								✓				
Population levels, habitat and changes over time of selected species guilds								✓	✓			✓
Water quality									✓			
Pest assessment									✓			
Forest growth									✓			
Exotic species									✓			
Cycles relative to historic patterns									✓			
Landscape health and integrity of natural cycles										✓		✓
Land ownership, use, quality and fragmentation											✓	
Landscape health and integrity of water and soil resources											✓	
Land cover assessment/inventory											✓	
Quality of fisheries												✓
Miles of undeveloped shoreline												✓
Wetlands												✓

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1. Introduction

In June, 1998, a workshop (Workshop I) was held in Newberry, Michigan with the internal and external stakeholders of the Lake Superior State Forest (LSSF). A second workshop (Workshop II) was held in Newberry on October 21 and 22, 1998. Thirty-five of the 43 stakeholders who participated in Workshop I were able to attend Workshop II, as well as 10 people who were not able to attend Workshop I. A list of the participants of Workshop II is provided in Appendix 6. One of the objectives of Workshop I was to develop a list of values and indicators for the LSSF. The objectives of Workshop II were to review and, if necessary, modify the list of values and indicators from Workshop I, as well as begin defining practices and tools and assigning responsibility for each indicator. This report summarizes the results of Workshop II.

2. Fine-tuning the values

The participants of Workshop II were divided into five small groups. The first task assigned to the groups was to review the list of values developed at Workshop I and decide if any modifications were necessary. Listed in Table 1 are the values from Workshop I and the changes that were suggested during Workshop II. Below the table is the revised list of values that resulted from discussions during Workshop II. Participants changed the titles of three of the values. 'Diversity of Jobs' became 'Economic Health', 'Global Cycles' became 'Biological Cycles', and 'Water Resources' became 'Water and Soil Resources Quality'. The titles for the other values remained unchanged.

Table 1. Suggested changes to values developed at Workshop I.

Value	Comments and suggested changes
Ownership Patterns	<ul style="list-style-type: none"> • Change to 'Landscape Composition/ Structure' • Merge 'Ownership Patterns' and 'Institutional Processes' • Change to '<i>Current Ownership Patterns</i>'
Institutional Processes	
Recreation	
Multiple Use	
Spiritual	<ul style="list-style-type: none"> • Change to 'Psychological Satisfaction' • This value should be absorbed into existing values
Social/Cultural	

[cont'd]

Table 1. Suggested changes to values developed at Workshop I.

Value	Comments and suggested changes
Diversity of Jobs	<ul style="list-style-type: none"> • Change to 'Economic Health' • Change to 'Quantity and Quality of Jobs'
Biodiversity	<ul style="list-style-type: none"> • Too much concentration on forest in this value
Healthy Forests	
Global Cycles	<ul style="list-style-type: none"> • Change to 'Biological Cycles' but be sure that the role LSSF plays at a state, national and global level is not lost
Water Resources	<ul style="list-style-type: none"> • Change to 'Water and Soil Resources Quality'
Unique Features	
<i>Other changes</i>	<ul style="list-style-type: none"> • Add 'Fiber Production' as a value • Add 'Consumptive Forest Products' as a value (Volume, value, diversity of forest products - e.g., acres of blueberry picking area, number of critters, money spent, timber) • Combine values into the following four values: <ol style="list-style-type: none"> 1. Sustain Biological Resources (Include Biodiversity, Healthy Forests, Unique Values, and Ownership Patterns) 2. Sustain Local, Regional, and State Communities (Include Ownership Patterns, Recreation, Multiple Use, Spiritual, Social/Cultural, and Diversity of Jobs) 3. Sustain Soil, Water and Air Resources (Include Global Cycles and Water Resources) 4. Sustain Institutional Processes (Include Institutional Process)

Revised list of values

1. Ownership Patterns
2. Institutional Processes
3. Recreation
4. Multiple Use
5. Spiritual
6. Social/Cultural
7. Economic Health
8. Biodiversity
9. Healthy Forests
10. Biological Cycles
11. Water and Soil Resources Quality
12. Unique Features

3. Fine-tuning the indicators

Each small group was given two or three values and asked to review the indicators associated with those values. For each value, the groups

decided which indicators should be kept, discarded, or modified and if any new indicators should be added. Appendix 1 outlines the decisions that were made by the groups and includes suggestions about which indicators to add, as well as comments made by individuals or groups assigned different values.

Comments received concerning the summary document for Workshop I, as well as comments made during Workshop II, showed that people felt the indicators developed during Workshop I were edited too extensively following the workshop. For example, participants felt that threatened and endangered species were not adequately addressed nor was soil protection quality. The concern that some indicators were lost is reflected in the large number of suggestions for additional indicators for some of the values, particularly 'Biodiversity'. The small group assigned 'Biodiversity' kept all the indicators from the June workshop, and there were 12 suggestions of indicators that could be added to the value.

The lists of indicators for some of the values changed substantially. The group assigned 'Economic Health' discarded four of the five indicators and replaced them with four new ones. As well, there were 17 suggestions of additional indicators for this value. The group assigned 'Healthy Forests' kept four of the five indicators and added another four.

The group assigned 'Multiple Use' at Workshop II discussed whether or not 'Multiple Use' should remain a separate value, since it actually incorporates all of the other values. The small group decided that the fact that the forest has multiple uses is valuable in and of itself, and therefore 'Multiple Use' should be kept as a value. However, the small group drastically changed the list of indicators associated with 'Multiple Use'. Following Workshop I, 'Multiple Use' had eight indicators associated with it. The small group at Workshop II dropped one indicator and suggested that five be moved to 'Recreation', one be moved to 'Economic Health' and one be moved to 'Biodiversity'. All of the original eight indicators were replaced by the following indicator: 'Provision for sufficient number of other values'.

Table 2 outlines the revised list of indicators following Workshop II. The list has been edited as little as possible. Some titles have been changed to distinguish among indicators that are similar but have slightly different descriptions. Also, descriptions have been provided for the indicators that did not have descriptions at the end of the workshop. These descriptions appear in italics in Table 2.

Table 2. Revised list of indicators with descriptions as determined at Workshop II. For indicators that did not have descriptions following the workshop, descriptions were developed and these appear in italics.

Value	Indicator	Description	Additional indicators suggested by individuals or groups assigned different values
Ownership Patterns	Road density	Type (primary, secondary, tertiary) and length (miles) of road and characteristics of the area within 1 mile of the roads.	<ul style="list-style-type: none"> • Area/perimeter ratio • Area of land used for particular purposes
	Ownership type and land use	Measures land ownership type (federal, state, corporate, individual, etc.), land use (productive, unproductive, recreational, etc.), land distribution and zoning practices.	
	Stewardship	The level, quality, and quantity of stewardship on private land.	
	Changes in ownership	Measures parcel size/parcel fragmentation.	
Institutional Processes	Existence of audit or assessment program	Determines whether or not an audit or assessment procedure is in place.	<ul style="list-style-type: none"> • Involvement of all stakeholders • Landowner assistance • Interim review (all parties?) for major new developments/projects, plan compliance and suggested changes • Budget for research, development and dissemination of information • Opportunity for public input into key policy development • Area harvested • Assessment of damaging agents
	Integrated planning system	Determines whether or not a planning system is in place that takes into account values from the various parties interested in the forest.	
	Response to public requests	Measures adherence to a policy for responding to public requests in a timely fashion.	
	Existence of public participation in review of initial plan and audit or assessment program	<i>Determines whether or not the public has been given adequate opportunity to review the forest management planning process and the audit or assessment program.</i>	
Recreation	User days/activity	The number of days people spend on various activities in the forest (e.g., hunting, fishing, camping, learning, enjoying nature, etc.).	<ul style="list-style-type: none"> • Road density • Level of impact • Miles of water use (e.g., paddleable streams) • Area (acres) harvested
	Miles of trail systems by land-use designation	Measures the miles of trail systems and what the trails are used for (e.g., snowmobiling, cross-country skiing, hiking, etc.).	

[cont'd]

Table 2. Revised list of indicators with descriptions as determined at Workshop II. For indicators that did not have descriptions following the workshop, descriptions were developed and these appear in italics.

Value	Indicator	Description	Additional indicators suggested by individuals or groups assigned different values
	Size and distribution of natural and 'special' areas and allowed use for those areas	Measures size (acres), number, distribution and interconnectedness of natural areas, corridors, etc., and how those areas are used.	
	Integrated planning system	Determines whether or not a planning system is in place that takes into account values from the various parties interested in the forest.	
	Area of forest by type, age class and quality	Information from the Operations Inventory (OI) manual and basic Forest Inventory and Analysis (FIA). Small, uncommon forest types should be included.	
	Number, type and quality of educational and recreational resources	The number of viewing areas, interpretive centers, areas and trails for both education and recreation.	
	Diversity of recreational opportunities	The availability of different ways for people to use the forest provides a measure of the various ways people can access the forest.	
	Quality of recreational experience	<i>Surveys users of the forest to determine the level of quality of recreational experiences.</i>	
Multiple Use	Provision for sufficient number of other values	Measures whether a sufficient number of indicators is satisfied for each value.	
Spiritual	Size and distribution of natural and 'special' areas and allowed use for those areas	Measures size (acres), number, distribution and interconnectedness of natural areas, corridors, etc., and how those areas are used.	<ul style="list-style-type: none"> • Small spiritual area identification • Total forest quality • Undeveloped Great Lakes shoreline
	User days/activity	The number of days people spend on various activities in the forest (e.g., hunting, fishing, camping, learning, enjoying nature, etc.).	
	Number of educational and recreational resources and presence of information resources	The number of viewing areas, interpretive centers, areas and trails for both education and recreation. Monitors the presence of signage, greetings, pamphlets, etc. that help to enhance the public's enjoyment of the forest.	

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Table 2. Revised list of indicators with descriptions as determined at Workshop II. For indicators that did not have descriptions following the workshop, descriptions were developed and these appear in italics.

Value	Indicator	Description	Additional indicators suggested by individuals or groups assigned different values
	Change in status of land ownership, use and distribution	Tracks change in ownership type (federal, state, corporate, individual, etc.), land use (productive, unproductive, recreational, etc.) and land distribution.	
	Road density	Type (primary, secondary, tertiary) and length (miles) of road and characteristics of the area within 1 mile of the roads.	
	Amount of trash in forest	<i>A measure of how much trash is in the forest.</i>	
Social/ Cultural	Diversity of recreational opportunities	The availability of different ways for people to use the forest provides a measure of the various ways people can access the forest.	<ul style="list-style-type: none"> • Trash in the forest • Road density • Size and distribution of intensive fiber management units • Specific efforts to enhance fiber production, and acreage available • Specific efforts and area impacts of MDNR cost containment and revenue generation
	Miles of trail systems by land-use designation	Measures the miles of trail systems and what the trails are used for (e.g., snowmobiling, cross-country skiing, hiking, etc.).	
	Number of historic sites	Measures the number of historic sites that have been identified and conserved.	
	Presence and implementation of a historic/archeological resource plan	The degree to which historic and archeological sites are addressed in the planning system.	
	Cultural forest products	Identifies and lists products (e.g., blueberries, mushrooms, black ash bark, cattails, etc.).	
Economic Health	Wood product summary	Annual statement of wood products.	<ul style="list-style-type: none"> • Snow statistics • Miles of trail by type • Number of educational and recreational resources • Quantity and quality of jobs • Indirect jobs related to the State Forest • User days/activity
	Ratio of harvest to growth by volume, species and products	<i>Compares data on volume of trees harvested by species and products with data on tree growth.</i>	
	Net quantity difference between growth and harvest	<i>Compares trees grown to trees harvested.</i>	

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Table 2. Revised list of indicators with descriptions as determined at Workshop II. For indicators that did not have descriptions following the workshop, descriptions were developed and these appear in italics.

Value	Indicator	Description	Additional indicators suggested by individuals or groups assigned different values
	Correlation of LSSF with local economic development plans	<i>Monitors how the current economic state of the LSSF compares with local economic development plans.</i>	<ul style="list-style-type: none"> • Recreational and tourism jobs • Riverine systems • Volume offered (by species/product class) • Volume sold (by species/product class) • Volume harvested (by species/product class) • Import/export of raw materials (FIA) • Mill receipts (FIA) • Product shipments (MDNR) • Standing volume (FIA, OI) • Indirect jobs related to the state forest
	Job/income/employment/retirement data	<i>Examines readily available data on jobs, incomes, employment and retirement.</i>	
Biodiversity	Area of forest by type, age class and quality	Information from the OI manual and basic FIA. Small, uncommon forest types should be included.	<ul style="list-style-type: none"> • Presence and number of threatened, endangered, or vulnerable species or communities • Amount of restored coastal systems • Road location on the landscape • Condition, quality and occurrence of rare/declining species and natural communities • Size of unfragmented forest areas • Presence of exotic species • Interconnectedness • Opening size (moved from 'Ownership Patterns') • Area harvested (moved from 'Multiple Use') • Size and distribution of natural areas (moved from 'Biological Cycles')
	Area, percentage and representativeness of forest types in protected areas	Protected forest areas (including uncommon types) can be used as ecological benchmarks to compare undisturbed areas with areas managed for other purposes (including open areas).	
	Forest regeneration by forest type and silvicultural prescription	Measures forest regeneration on the basis of silvicultural guidelines and forest type.	
	Population levels, habitat and changes over time of selected species guilds	A group of species identified for each forest age class can be used to monitor species diversity and health of an ecosystem. Species can be chosen on the basis of various factors (e.g., breeding and feeding requirements, habitat requirements, etc.).	

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Table 2. Revised list of indicators with descriptions as determined at Workshop II. For indicators that did not have descriptions following the workshop, descriptions were developed and these appear in italics.

Value	Indicator	Description	Additional indicators suggested by individuals or groups assigned different values
Healthy Forests	Population levels, habitat and changes over time of selected species guilds	A group of species identified for each forest age class can be used to monitor species diversity and health of an ecosystem. Species can be chosen on the basis of various factors (e.g., breeding and feeding requirements, habitat requirements, etc.).	<ul style="list-style-type: none"> • Basic forest growth parameters and stand structure information (Information from basic FIA database) • Forest regeneration by forest type and silvicultural prescription • Treatment by type • Wetlands • Opening size (moved from Ownership Patterns)
	Water quality	Measures oxygen content, sedimentation, coliform count, etc., of water bodies and compares them with standard levels.	
	Area of forest by type, age class and quality	Information from the Operations Inventory manual and basic FIA. Small, uncommon forest types should be included.	
	Area, percentage and representativeness of forest types in protected areas	Protected forest areas (including uncommon types) can be used as ecological benchmarks to compare undisturbed areas with areas managed for other purposes (including open areas).	
	Pest assessment	<i>Measures the impact of pests (e.g. insects, diseases, etc.) on the forest.</i>	
	Forest growth	<i>Measures the amount of tree growth in a given time.</i>	
	Exotic species	<i>Inventories the number and type of exotic species in the forest.</i>	
	Cycles relative to historic patterns	<i>Evaluates the current status of natural cycles on the basis of the historic patterns of those cycles.</i>	
Biological Cycles	Landscape health and integrity of natural cycles	Measures the health of the cover (e.g., amount of water and air pollution) and the integrity of natural cycles.	<ul style="list-style-type: none"> • Forest growth measures • Distribution of forest types • Migratory bird stopover sites

[cont'd]

Table 2. Revised list of indicators with descriptions as determined at Workshop II. For indicators that did not have descriptions following the workshop, descriptions were developed and these appear in italics.

Value	Indicator	Description	Additional indicators suggested by individuals or groups assigned different values
Water and Soil Resources Quality	Land ownership, use, quality and fragmentation	Measures land ownership type (federal, state, corporate, individual, etc.), land use (productive, unproductive, recreational, etc.), land quality and land fragmentation.	<ul style="list-style-type: none"> Local ecosystem management agencies Soil protection quality
	Landscape health and integrity of water and soil resources	Measures the health of the cover (e.g., amount of water and air pollution) and the integrity of water and soil resources.	
	Land cover assessment/inventory	<i>Assesses and inventories geological features of the land.</i>	
Unique Features	Size and distribution of natural and 'special' areas and allowed use for those areas.	Measures size (acres), number, distribution and interconnectedness of natural areas, corridors, etc., and how those areas are used.	<ul style="list-style-type: none"> Stream classifications
	Number, type and quality of educational and recreational resources	The number of viewing areas, interpretive centers, areas and trails for both education and recreation.	
	Number of historic sites	Measures the number of historic sites that have been identified and conserved.	
	Population levels, habitat and changes over time of selected species guilds	A group of species identified for each forest age class can be used to monitor species diversity and health of an ecosystem. Species can be chosen on the basis of various factors (e.g., breeding and feeding requirements, habitat requirements, etc.).	
	Landscape health and integrity of natural cycles	Measures the health of the cover (e.g., amount of water and air pollution) and the integrity of natural cycles.	
	Quality of fisheries	<i>Determines quality of fisheries as measured by stream classifications.</i>	
	Miles of undeveloped shoreline	<i>Determines the miles of undeveloped shoreline and monitors changes.</i>	
	Wetlands	<i>Inventories the number and type of wetlands and monitors changes.</i>	

4. Target-setting process

At Workshop II, the process of setting targets for indicators was begun. A target is the desired level to be achieved for an indicator. Figure 1 illustrates a process for setting targets that was suggested to the participants at Workshop II. Some groups tested this process during the target-setting exercise. Other groups modified the suggested process slightly. Outlined in Appendix 2a are the target-setting processes that were developed for the indicators of each value. Target-setting processes were not developed for all of the indicators. The small group assigned 'Multiple Use' and 'Recreation' used a slightly different format for the target-setting process. The target-setting processes for the indicators of 'Multiple Use' and 'Recreation' are described in Appendix 2b.

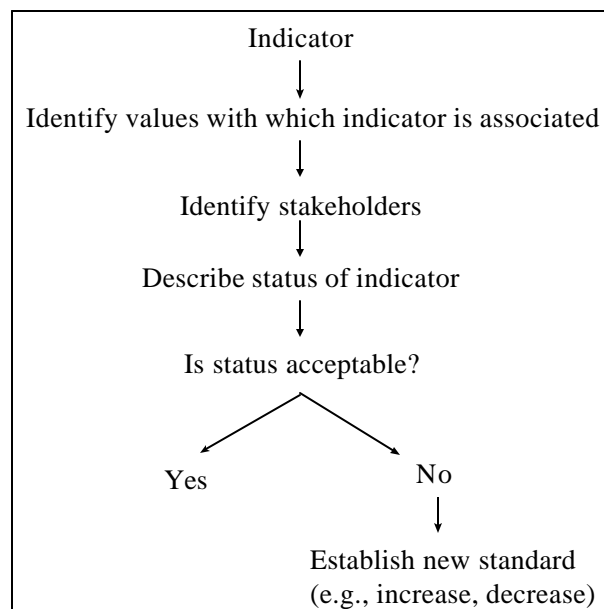


Figure 1. Suggested process for developing targets for indicators

The proposed target-setting process was generally regarded by the small groups as being unsatisfactory. For the final project report, an improved target-setting process will be recommended.

5. Practices, tools and responsibilities for indicators

Practices are on-the-ground forest management activities designed to achieve the targets set for indicators. Participants in Workshop II began the process of identifying practices for the indicators of the values assigned to their small groups. The groups also began describing the tools that would be needed to carry out those practices. Appendix 3 outlines the practices and tools identified by the small groups.

For a sustainable forest management system to be effective, each indicator must be assigned to people or agencies that will assume responsibility for ensuring that that indicator is being maintained and managed in an appropriate manner. In a few cases, the small groups were able to identify who should be responsible for the indicators of the values assigned to their group. Assigned responsibilities are also captured in Appendix 3.

6. Phone survey prior to Workshop II

To get a sense for how comfortable the LSSF stakeholders were going to be with the tasks scheduled for Workshop II, eight stakeholders were asked to participate in a phone survey prior to the workshop. Each person was asked to review two or three of the indicators developed at Workshop I and answer the following four questions:

1. Is the description of this indicator understandable and useful?
2. Do you feel you could set a target (e.g., increase, decrease, stay the same) for this indicator?
3. Can you think of two or three ways (i.e., practices) of achieving the set target?
4. Who do you think should carry out the practice?

Survey participants made several suggestions about possible modifications to the values and indicators from Workshop I. They seemed comfortable with the tasks scheduled for Workshop II. Survey participants began identifying targets and practices for the indicators and suggesting who should be responsible for individual indicators. Appendix 4 outlines the suggestions received during the phone survey concerning targets, practices and roles and responsibilities. Where applicable, comments from

the phone survey have been incorporated into the appropriate sections of this workshop summary.

7. Timber: Should it be its own value?

In the phone survey conducted prior to Workshop II, as well as during the workshop, the suggestion was made that, even though timber as a value is covered in some of the other values (e.g., 'Economic Health'), a separate value should be created for timber. Outlined below are the comments concerning this issue that were made by participants at Workshop II:

- Timber is conspicuously missing from the list of values.
- Some workshop participants feel that timber is the engine that drives the forest. Other participants do not feel that it is or should be. Some participants feel that the forest can have value without producing timber.
- Vegetation is managed because of the other values, not necessarily because it is a value in and of itself. Because of this, 'Fiber Production' would be a more appropriate value than 'Timber'.
- Participants do not want the addition of 'Timber' as a value to result in quotas being set for cords because then environmental managers become farmers.
- The comment was made that management of fiber is rarely for anything but money. However, many participants disagreed with this, noting that management of fiber is often for aesthetics, pride, etc.
- The suggestion was made that rather than 'Timber', the value could be 'Forest Management' with silviculture as a component.
- Timber is actually present in all of the other values; it is more critical to look at indicators. How the indicators are lumped together is secondary. All the values could be split in different ways.

In order to begin reaching a decision on this issue, one of the small groups was given the assignment of deciding whether or not a new value that

addresses timber should be added. Below is a summary of the results from the small group's discussions:

- Timber should be addressed in a separate value. The value should be 'Consumptive Forest Products' (e.g., deer, mushrooms, berries, timber, etc.) rather than 'Timber'.
- It was suggested by the small group that the values be modified to 'Consumptive Forest Products *Appropriately Extracted*'. Although there is a concern that products be consumed appropriately, the small group could not reach a consensus on this change.
- A possible indicator for the value would be 'Volume and value of forest products consumed'.

The following are comments from the large group in reaction to the conclusions reached by the small group:

- Habitat could be used to link consumption of forest products to biodiversity (e.g., certain habitats will produce x quantities of berries, cords of wood, etc.).
- Need to know how products are being extracted and if they are being regenerated.

Although the group seems to be leaning towards adding a separate value that addresses the consumption of forest products, the conclusion at the workshop was that this issue will require further analysis from participants.

8. Fine-tuning 'Unique Features'

The large group discussed whether or not it was necessary to keep 'Unique Features' as a separate value since all of its indicators appear in other values. The small group that was assigned 'Unique Features' discussed this issue and decided that it was important to keep it as a separate value in order to ensure that unique features were carefully tracked. They felt this value would serve as a fine filter for the other values that address unique features.

It was suggested that it is important for this value to capture features that are unique to the Eastern Upper Peninsula in comparison with the rest of Michigan, the nation, or the world. For example, a species that is common to the Eastern Upper Peninsula but rare in other areas is unique and very important. It was also suggested that the aquatic wetlands in the area should be captured in this value because the fact that so many streams in the area do not have any exotic species in them is unique. The comment was made that it is important that staff be made aware of the issues that surround the unique features of the Eastern Upper Peninsula.

To address the suggestions made by the large group, the small group that was assigned 'Unique Features' was asked to fine-tune the important components of the value. Listed below are sub-values and practices that the small group developed to enhance this value.

Sub-values:

1. Wetlands
2. Miles of undeveloped shoreline
3. Externally rare but locally common features
4. Locally rare features
5. Geological features

Practices:

1. Determine the number of features and monitor change. Some inventories of features already exist. Stakeholders will determine if the change is positive or negative.
2. Develop an avenue for continually updating the "features" list.

9. Human influences and human resources

It was suggested that an element missing from the evolving list of values and indicators was how an increase in the human population would affect the forest. The small group that examined this issue developed a list (Table 3) of possible effects and assigned each one a corresponding indicator from the list of indicators already identified.

Table 3. Effects that a population increase might have on the forest and associated indicators that would address those effects.

Effect population increase has on forest	Indicator
Trash in the woods	Amount of trash in forest
Trash over all	
Shopping malls	Integrated planning system
Subdividing of parcels	Ownership type and land use
Conflicts with logging	Response to public requests
O.R.V. misuse	Water quality
Recreational-use conflicts	Response to public requests
Surface-water degradation (riparian and soil erosion)	Water quality
Fiber demand (global and national)	Growth/harvest ratios
Second homes	Ownership type and land use
Increase demand for information and education	Presence of information

In addition to considering the effects that human populations have on the forest, this small group began looking at the skill sets that would be needed to monitor individual indicators. The indicators that they were able to cover are listed in Table 4.

Table 4. Skill sets needed for 15 of the 42 indicators identified at Workshop II.

Indicator	Skill set
Road density	Remote sensing and forest technology
Ownership type and land use	Planning
Existence of audit or assessment program	Training in forestry and interdisciplinary planning
Integrated planning system	Training in forestry and interdisciplinary planning
Response to public requests	Everyone will have to be able to do this
User days/activity	Survey and research
Miles of trail systems by land-use designation	Remote sensing, survey, and GIS
Size and distribution of natural and 'special' areas and allowed use for those areas	Landscape ecologist
Area of forest by type, age class and quality	Forester
Number, type and quality of educational and recreational resources	Extension-type survey [Non-government organization (NGO)]
Miles of undeveloped shoreline	Remote sensing and Geographic Information System (GIS)
Number of historic sites	Historian and archeologist
Presence and implementation of a historic/ archeological resource plan	Historian and archeologist
Diversity of recreational opportunities	Planner and sociologist

10. Should discarded indicators be researched or just discarded?

One small group was assigned the task of deciding what to do with indicators that had been removed from the list of indicators that was presented to the group at the start of Workshop II. For each indicator removed from the list, the small group had to decide if it should just be discarded or if it required more research to make it into a useful indicator. The small group's results are summarized in Table 5. Some of the indicators that were discarded for the value listed may still be indicators for other values. As well, some of the indicators listed in the table were reclaimed for one or more of the values, but were identified as needing more research.

Table 5. Outline of whether discarded indicators require more research or should just be discarded from particular values.

Value	Indicator	Research	Discard	Comments
Ownership Patterns	Opening size		✓	Move to 'Biodiversity'
Recreation	Number of historic sites		✓	Keep in 'Social/Cultural'
	Presence of a historic/ archeological resource plan		✓	Part of 'Integrated planning system'
	Miles of undeveloped shoreline		✓	'Unique Features' took this one
	Opening size		✓	Move to 'Biodiversity'
Spiritual	Integrated planning system		✓	Keep under 'Institutional Processes' and as an 'enabling condition' under all values
Healthy Forests	Integrity of natural cycles	✓		Needs to be better defined
Biological Cycles	Miles of trail systems by land-use designation		✓	Keep in 'Recreation'
	Size and distribution of natural and 'special' areas and allowed use for those areas		✓	Move to 'Biodiversity'
Water and Soil Resources Quality	Landscape health and integrity of water and soil resources	✓		
	Size and distribution of natural and 'special' areas and allowed use for those areas		✓	Move to 'Biodiversity'

11. Public Consultation

During the workshop, a brief overview was provided of the process for public participation that is being suggested for forest management planning for the LSSF. A document on public participation entitled *Public Participation in Forest Management Planning in LSSF: Finding the Right Pathway* has been prepared for a more thorough review by the stakeholders of the LSSF. At the workshop, one section of the document, a draft text for the public participation section of the proposed LSSF planning guide, was reviewed and briefly discussed. The following is an outline of the text that was discussed:

Planning Manual Section x. Guidelines for the participation of the general public and stakeholders in the preparation of LSSF forest management planning

1 Goal

The goal of the public participation process in LSSF is to ensure that everyone living in the area, and as many non-residents as feasible:

- are made aware that planning is occurring,
- have reasonable opportunity to make their views known, and
- can see that their views were fairly considered in the process.

2 Consultation (3 levels)

- Broad scale – media based information intended for the general public.
- Medium scale – focus-group workshops.
- Fine scale – a standing citizens advisory committee to review and comment on outcome from broad- and medium-scale input, as well as issues involving the state interests.

3 Citizens Advisory Committee (CAC) Terms of Reference

4 Dispute Resolution

5 Schedule

6 Documentation of Public Consultation

Suggestions made by participants at the workshop concerning the above text included the following:

- Add a fourth bullet point under **Goal** that says, ‘can see that plan is being implemented’

- Consider giving the Citizens Advisory Committee a different name.

A question was raised about whether or not compartment reviews would still exist under the proposed planning process. Compartment reviews relay operations information to people and will continue to be annual activities within the proposed 10-year planning process.

12. Conclusion

Like the previous sessions we have had with the internal and external LSSF stakeholders, Workshop II proved to be a very useful effort, thanks to the hard work and perseverance of the stakeholders who participated. A great deal of information was gathered and discussed, and progress was made on the challenging task of developing values and indicators for the LSSF.

Workshop II gave stakeholders the opportunity to fine-tune the values and indicators for the LSSF, and begin identifying the practices and tools necessary for each indicator. A process for setting targets for the indicators was tested and will now be modified into a more useful process. More time will have to be devoted to the setting of targets. More time will also have to be spent addressing who is responsible for each indicator, and responses gathered during the phone survey prior to Workshop II will be helpful during this process.

As the role that BioForest Technologies Inc. has been playing in establishing a sustainable forest management planning process for the LSSF winds down, stakeholders will be invited to participate in a workshop in Newberry on February 8 and 9, 1999. The purpose of this workshop is to let stakeholders review and provide feedback on the forest management planning manual we are preparing and the reports that have been produced over the course of this project. We hope to see you there!

Appendix 1. Status of indicators developed at Workshop I

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
Ownership Patterns	Road density	X			<ul style="list-style-type: none"> Not a good indicator of this Should not go with this value but is suited to several other values Must be subdivided according to management objective for the tracts
	Ownership type and land use	X			<ul style="list-style-type: none"> Not relevant to state land management at this planning scale
	Opening size		Move to 'Biodiversity' / 'Healthy Forests'		<ul style="list-style-type: none"> Not a good indicator Not a good measure - better under 'Biodiversity' State can generate these data easily with Geographic Information Systems (GIS) but are they relevant to sustainability?
	Stewardship indicator			Description: The level of stewardship in private land. Quality - Quantity - Levels	
	Changes in ownership			Description: Parcel size/parcel fragmentation. Land tenure - maintenance of stewardship values	
	Additional indicators?				<ul style="list-style-type: none"> 'Area/perimeter ratio'

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
Institutional Processes	Existence of audit or assessment program	X			
	Integrated planning system	X			
	Response to public requests	X			
	Existence of public participation in review of audit or assessment program			X	
	Additional indicators?				<ul style="list-style-type: none"> • 'Involvement of all stakeholders' • 'Presence of public participation in both planning and review processes' • 'Landowner assistance' • 'Interim review (all parties?) for new major developments/projects, plan compliance and suggested changes' • 'Budget for research, development and dissemination of information' • 'Assessment of damaging agents'
Recreation	User days/ activity	X			
	Miles of trail systems by land-use designation	X			
	Size and distribution of natural areas	Change to 'Size and distribution of natural areas <i>and allowed use</i> '			<ul style="list-style-type: none"> • What is the definition of a 'natural area'? • May affect type of recreational use but this is probably a biological measure • Could be combined with 'Area, percentage and representativeness of forest types in protected areas'

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
	Integrated planning system	X			
	Area of forest type by age class	Change to 'Area of forest by type, age class and quality'			
	Number of educational and recreational resources	X			<ul style="list-style-type: none"> • Change to 'Number, type and quality of educational and recreational resources'
	Number of miles of restored coastal systems		Can't describe - not relevant		<ul style="list-style-type: none"> • Remove "of restored" and just have 'Number of miles of coastal systems' • Should be a high priority but probably for Department of Environmental Quality (DEQ)
	Number of historic sites		Move to 'Social/Cultural'		
	Presence of a historic/ archeological resource plan		Incorporated in other indicator		
	Diversity of recreational opportunities	X			<ul style="list-style-type: none"> • Change to 'Diversity, quality, and compatibility of recreational opportunities'
	Opening size		Adequately described elsewhere		
	Quality of recreational experience			X	
	Additional indicators?				<ul style="list-style-type: none"> • 'Area harvested' • 'Road density' • 'Level of impact' • 'Miles of water use (e.g. paddleable streams)'

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
Multiple Use	Miles of trail systems by land-use designation		Move to 'Recreation'		
	User days/activity		Move to 'Recreation'		
	Number of educational and recreational resources		Move to 'Recreation'		
	Area of forest type by age class		Move to 'Recreation'		
	Volume/acre by species, type and age class		Move to 'Economic Health'		
	Area harvested		Move to 'Biodiversity'		
	Volume/acre/forest type		X		
	Integrated planning system		Move to 'Recreation'		
	Provision for sufficient number of other values				Description: Measured by sufficient number of indicators being satisfied for each value.
Spiritual	Size and distribution of natural areas	X			<ul style="list-style-type: none"> What is the definition of 'natural areas'? Could be combined with 'Area, percentage and representativeness of forest types in protected areas'
	User days/activity	X			
	Number of educational and recreational resources	Combine with 'Presence of information resources'			

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
	Integrated planning system		Not a good indicator, broad and redundant		
	Change in ownership	X			<ul style="list-style-type: none"> • Change to 'Change in average private land size (fragmentation)' • State land would not readily change ownership and U.S. Forest Service (USFS) Forest Inventory and Analysis (FIA) already tracks general trends in ownership. Why does the state need to know?
	Presence of information resources	Combine with 'Number of educational and recreational resources'			
	Road density			X	
	Amount of trash in forest			X	
	Additional indicators?				<ul style="list-style-type: none"> • 'Undeveloped Great Lakes shoreline' • 'Small spiritual area identification' • 'Total forest quality' (because natural area "set asides" are not the only place one appreciates the spiritual value of the forest)
Social/ Cultural	Presence of information resources		Combine with 'Number of educational and recreational opportunities' and move to 'Spiritual'		

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Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
	Diversity of recreational opportunities	X			
	Miles of trail systems by land-use designation	X			
	Number of educational and recreational resources		Combine with 'Presence of information resources' and move to 'Spiritual'		
	Number of historic sites	X			
	Presence of a historic/archeological resource plan	Change to 'Presence of and implementation of a historic/archeological resource plan'			
	Cultural forest products			Description: Identify and list (e.g., blueberries, mushrooms, black ash bark, cattails, etc.)	
	Additional indicators?				<ul style="list-style-type: none"> • 'Trash in the forest' • 'Road density' • 'Size and distribution of intensive fiber management units' • 'Specific efforts to enhance fiber production and acreage available' • 'Specific efforts and area impacts of MDNR cost containment and revenue generation'

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Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
Economic Health	Volume/acre by species, type and age class		X		
	Volume/acre/forest type		X		
	Jobs/economic activity		X		<ul style="list-style-type: none"> Not sure this is the appropriate measure - other measures exist that are more suitable
	Volume of wood/product		X		
	Wood product summary	X			
	Ratio of harvest to growth by volume, species and products			X	
	Net quantity difference between growth and harvest			X	
	Correlation of LSSF with local economic development plans			X	
	Job/income/employment/retirement data			X	
	Additional indicators?				<ul style="list-style-type: none"> 'Snow statistics' 'Number of educational and recreational resources' 'Miles of trail by type' 'User days/activity' 'Other types of employment (e.g., tourism)' 'Diversity (as well as the number) of job opportunities'

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Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
					<ul style="list-style-type: none"> • 'Recreational and tourism jobs' • 'Riverine systems' • 'Volume offered (by species/product class)' • 'Volume sold (by species/product class)' • 'Volume harvested (by species/product class)' • 'Import/export of raw materials' (FIA) • 'Mill receipts' (FIA) • 'Product shipments' (MDNR) • 'Standing volume' [FIA, Operations Inventory (OI)] • 'Indirect jobs related to the state forest' • 'Quantity and quality of jobs'
Biodiversity	Area of forest type by age class	X			
	Area, percentage and representativeness of forest types in protected areas	X			<ul style="list-style-type: none"> • This can be measured but does it really relate to biodiversity? • Could be combined with 'Size and distribution of natural areas'
	Forest regeneration by forest type and silvicultural prescription	X			<ul style="list-style-type: none"> • May just be an early stage of 'Area of forest type by age class'
	Population levels, habitat and changes over time of selected species guilds	X			<ul style="list-style-type: none"> • Want to be sure that species are not defined solely on the basis of commercially defined age classes • 'Overmature' age class must be included

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
					<ul style="list-style-type: none"> • Age class needs to be supplemented with cover type and consideration of non-forested habitats • Should not be limited to wildlife - should consider plant guilds
	Additional indicators?				<ul style="list-style-type: none"> • 'Presence and number of threatened, endangered, or vulnerable species or communities' • 'Presence of adequate habitat for threatened, endangered, or vulnerable species' • 'Condition, quality and occurrence of rare/declining species and natural communities' • 'Presence of exotic species' • 'Interconnectedness' • 'Area and health of wetlands' • 'Amount of restored coastal systems' • 'Size of unfragmented forest areas' • 'Where are roads located on the landscape?' - Some ecologists feel that woods roads can be barriers to movement of species, particularly when located in transition zone. • 'Area harvested' (moved from 'Multiple Use') • 'Size and distribution of natural areas' (moved from 'Biological Cycles') • 'Opening size' (moved from 'Ownership Patterns')

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
Healthy Forests	Population levels, habitat and changes over time of selected species guilds	X			<ul style="list-style-type: none"> • Want to be sure that species are not defined solely on the basis of commercially defined age classes • 'Overmature' age class must be included • Should not be limited to wildlife - should consider plant guilds • Age class needs to be supplemented with cover type and consideration of non-forested habitats
	Water quality	X			<ul style="list-style-type: none"> • Not sure if this really measures forest health - seems to measure effect of human activity • Not a collectively exhaustive measure - changes in water 'pollution' do not completely explain changes in the forest's natural cycles
	Forest health and integrity of natural cycles		X		<ul style="list-style-type: none"> • This is not specific enough - can't be measured • The term 'forest health' is devoid of practical application, although it provides for a class of variables that could be measured.
	Area of forest type by age class	X			
	Area, percentage and representativeness of forest types in protected areas	X			<ul style="list-style-type: none"> • Must define 'protected areas' • Could be combined with 'Size and distribution of natural areas'
	Pest assessment				X
	Forest growth				X

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
	Exotic species			X	
	Cycles relative to historic patterns			X	
	Additional indicators?				<ul style="list-style-type: none"> • 'Treatment by type' • 'Basic forest growth parameters and stand structure information' (Information from basic FIA database) • 'Forest regeneration by forest type and silvicultural prescription' • 'Wetlands' • 'Opening size' (moved from 'Ownership Patterns')
Biological Cycles	Forest health and integrity of natural cycles	Change to ' <i>Landscape</i> health and integrity of natural cycles' - Description: Measures the health of the <i>cover</i> (e.g., amount of water and air pollution) and the integrity of natural cycles			<ul style="list-style-type: none"> • Not measurable • The term 'forest health' is devoid of practical application, although it provides for a class of variables that could be measured.
	Size and distribution of natural areas		Move to 'Biodiversity'		<ul style="list-style-type: none"> • Must define 'natural areas' • Must evaluate what relevance this has • Could be combined with 'Area, percentage and representativeness of forest types in protected areas'
	Miles of trail systems by land-use designation Additional indicators?		X		<ul style="list-style-type: none"> • How does this relate? • 'Forest growth measures' • 'Distribution of forest types' • 'Migratory bird stopover sites'

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Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
Water and Soil Resources Quality	Ownership type and land use	Change to 'Ownership type and land use, <i>quality and fragmentation</i> '			<ul style="list-style-type: none"> Not easily evaluated
	Size and distribution of natural areas		X		<ul style="list-style-type: none"> Must define 'natural' - protected or operating under Best Management Practices (BMPs) Could be combined with 'Area, percentage and representativeness of forest types in protected areas'
	Forest health and integrity of natural cycles	Change to ' <i>Landscape health and integrity of water and soil resources</i> '			<ul style="list-style-type: none"> The term 'forest health' is devoid of practical application, although it provides for a class of variables that could be measured.
	Land-cover assessment/inventory			X	
	Additional indicators?				<ul style="list-style-type: none"> No mention of water quality BMP 'Local ecosystem management agencies' 'Soil protection quality'
Unique Features	Size and distribution of natural areas	Change to 'Size and distribution of natural areas and " <i>special</i> " areas'			<ul style="list-style-type: none"> Must define 'natural areas' Could be combined with 'Area, percentage, and representativeness of forest types in protected areas'
	Number of educational and recreational resources	X			
	Number of historic sites	X			

[cont'd]

Appendix 1. Summary of indicators that were kept, dropped from or added to the list of indicators developed at Workshop I. Comments on the indicators provided by participants at Workshop II are also included.

Value	Indicator	Status of indicator as decided by group to which value was assigned			Comments from other individuals or groups assigned different values
		Keep	Drop	Add	
	Population levels, habitat and changes over time of selected species guilds	X			<ul style="list-style-type: none"> • Includes threatened and endangered? • Want to be sure that species are not defined solely on the basis of commercially defined age classes • 'Overmature' age class must be included • Age class needs to be supplemented with cover type and consideration of non-forested habitats • Should not be limited to wildlife - should consider plant guilds
	Forest health and integrity of natural cycles	Change to ' <i>Landscape</i> health and integrity of natural cycles'			<ul style="list-style-type: none"> • The term 'forest health' is devoid of practical application, although it provides for a class of variables that could be measured.
	Area of forest type by age class		Drop as an indicator because not adequate by itself. It is more of a tool to define certain features.		
	Quality of fisheries			X	
	Miles of undeveloped shoreline			X	
	Wetlands			X	
	Additional indicators?				<ul style="list-style-type: none"> • 'Stream classifications'

Appendix 2. Target-setting processes for the indicators

Appendix 2a. Target-setting process for the indicators of 7 of the 12 values for the LSSF.

Value	Indicator	Associated values	Stakeholders	Status	Needs
Institutional Processes	Existence of audit or assessment program	All 12	MDNR, timber interests, recreationalists, landowners, economic planners, state and local government elected officials, natural resource organizations, hunters/anglers	<ul style="list-style-type: none"> Partial audits exist (e.g., timber, economic, Michigan Natural Features Inventory (MNFI), fish and wildlife) 	<ul style="list-style-type: none"> Improved collection, storage and interpretation of data Legal compliance should be addressed Possible reliance on outside contractor
	Integrated planning system	All 12	MDNR, timber interests, recreationalists, landowners, economic planners, state and local government elected officials, natural resource organizations, hunters/anglers	<ul style="list-style-type: none"> To be developed after Workshop II 	<ul style="list-style-type: none"> Include in plan some interim mechanism to respond to unplanned events (e.g., 'the great fire') Include a public review mechanism for the plan as well as for the assessment process Relate to broader plans (e.g., Lake States, regional forest plans)
	Response to public requests	Recreation, Spiritual, Economic Health	MDNR, political units, politicians	<ul style="list-style-type: none"> At present, MDNR letter files 	<ul style="list-style-type: none"> Better capturing and monitoring of queries and information from the public (e.g., better documentation of inquiries by phone or visits)

[cont'd]

Appendix 2a. Target-setting process for the indicators of 7 of the 12 values for the LSSF.

Value	Indicator	Associated values	Stakeholders	Status	Needs
Spiritual	Size and distribution of natural and 'special' areas and allowed use for those areas	Recreation, Spiritual, Biodiversity, Biological Cycles, Water and Soil Resources Quality, Unique Features	The Nature Conservancy (TNC), Sierra Club, MDNR, Forest Industry, Naturalists, Non-motorized and motorized vehicle groups	<ul style="list-style-type: none"> 90,000 acres potential old growth (7-8% of LSSF) 	<ul style="list-style-type: none"> Inventory
	User days/activity	Spiritual, Recreation, Multiple Use, Economic Health, Water and Soil Resources Quality	Michigan United Conservation Clubs (MUCC), politicians, local service industries, researchers who use the area	<ul style="list-style-type: none"> O.K. 	
	Number of educational and recreational resources and presence of information resources	Recreation, Multiple Use, Spiritual, Social/Cultural, Unique Features	Schools, 4H, youth groups, local service industry, recreation groups, tourist groups	<ul style="list-style-type: none"> Slightly less than adequate 	
	Change in status of land ownership, use and distribution	Spiritual, Ownership Patterns, Institutional Processes, Unique Features, Multiple Use	Local units of government, TNC, forest industry, user groups, mineral users	<ul style="list-style-type: none"> Good internal process for reviewing state land only 	<ul style="list-style-type: none"> Room for improvement in public involvement Need to add more comprehensive tracking process
	Road density	Ownership Patterns, Multiple Use, Spiritual, Recreation, Biodiversity, Social/Cultural	Forest industry, recreationalists, road contractors	<ul style="list-style-type: none"> Current inventory is 'shaky at best' 	
	Amount of trash in forest	Spiritual	User groups	<ul style="list-style-type: none"> Case-by-case basis Adopt-a-forest is marginally successful 	<ul style="list-style-type: none"> Comprehensive plan

[cont'd]

Appendix 2a. Target-setting process for the indicators of 7 of the 12 values for the LSSF.

Value	Indicator	Associated values	Stakeholders	Status	Needs
Social/Cultural	Diversity of recreational opportunities	Social/Cultural	Recreational user groups, American Disabilities Association (ADA), Handicapped Association		<ul style="list-style-type: none"> Incomplete information on this indicator
	Miles of trail systems by land-use designation	Social/Cultural	Recreational user groups	<ul style="list-style-type: none"> Miles of trail in current Operations Inventory (OI) 	<ul style="list-style-type: none"> Not currently in Geographic Information System (GIS) Miles of trail not summarized by land-use class
	Number of historic sites	Social/Cultural	Michigan historic/ archeological societies, Secretary of State	<ul style="list-style-type: none"> Some information in compartment reviews Some other groups have information 	
	Presence and implementation of a historic/ archeological resource plan	Social/Cultural	Historical societies, archeological societies, colleges and universities, Civilian Conservation Corps (CCC) alumni group	<ul style="list-style-type: none"> No plan exists 	
	Cultural forest products	Social/Cultural	Native Americans, blueberry pickers, medicinal plant users, greens buyers, etc.	<ul style="list-style-type: none"> There is a trial greens permit 	<ul style="list-style-type: none"> Need list of these products/users and cohesive policy/procedures
Economic Health	Wood product summary	Economic Health	MDNR, timber industry	<ul style="list-style-type: none"> Already being calculated on a yearly basis (for a portion of the area) 	
	Net quantity difference between growth and harvest	Economic Health	MDNR, timber industry	<ul style="list-style-type: none"> Already being calculated on a yearly basis (for a portion of the area) 	

[cont'd]

Appendix 2a. Target-setting process for the indicators of 7 of the 12 values for the LSSF.

Value	Indicator	Associated values	Stakeholders	Status	Needs
	Ratio of harvest to growth by volume, species, and products	Economic Health	MDNR, timber industry	<ul style="list-style-type: none"> Already being calculated on a yearly basis (for a portion of the area) 	
	Correlation of LSSF with local economic plans	Economic Health	MDNR, tourist industry, wood industry, businesses	<ul style="list-style-type: none"> Not currently being done 	
	Job/income/employment/retirement data	Economic Health	Business community, MDNR, Internal Revenue Service (IRS), politicians	<ul style="list-style-type: none"> Easily available 	<ul style="list-style-type: none"> Data need to be collected
Biological Cycles	Landscape health and integrity of natural cycles			<ul style="list-style-type: none"> O.K. 	<ul style="list-style-type: none"> Need historical data Need to have chemical analysis of water quality (currently not available)
Water and Soil Resources Quality	Land ownership, use, quality and fragmentation	Water and Soil Resources Quality, Forest Health	Agencies (multi-government), landowners (riparian), sportsmen's clubs, interested public (recreationalists, fishermen, environmentalists, researchers)	<ul style="list-style-type: none"> O.K. 	
Unique Features	Size and distribution of natural and "special" areas and allowed use for those areas	Unique Features	Agencies (multi-government), interested public	<ul style="list-style-type: none"> Acceptable 	

Appendix 2b. Target-setting process for the indicators of Recreation and Multiple Use.

Value	Indicator	Stakeholders	Process
Recreation	User days/activity	MDNR, external stakeholders	<ul style="list-style-type: none"> • Survey demand/activity (research) • Count user days/activity (user counts) • Assess impact on resources (opinions of manager) • Set targets (upper level, range)
	Miles of trail systems by land use	MDNR, external stakeholders, local organizations	<ul style="list-style-type: none"> • Count trail miles by land use [Global Positioning System (GPS)] • Survey desire/demand (research) • Assess impact on resource/experience (manager opinions, research) • Set targets (range)
	Size and distribution of natural and 'special' areas and allowed use for those areas	MDNR, MNFI, TNC, external stakeholders	<ul style="list-style-type: none"> • Inventory natural areas (current data) • Survey desire for numbers of acres, type of use, distribution (research) • Assess impact on resource/experience • Set target number and appropriate management
	Integrated planning system	MDNR manager, external stakeholders	<ul style="list-style-type: none"> • Convene stakeholders to survey whether needs being addressed (stakeholder opinion) • Adjust system
	Area of forest by type, age class, and quality	MDNR, user groups, external stakeholders, Michigan Department of Transportation (MDOT)	<ul style="list-style-type: none"> • Determine current amounts (Operations Inventory (OI) data) • Consider landholders (landholder meeting/opinion, manager opinion) • Survey desires (research, stakeholder opinion) • Set targets
	Number, type and quality of educational and recreational resources	MDNR, user groups, educators, professional societies, external stakeholders	<ul style="list-style-type: none"> • Count them (stakeholder and other knowledge) • Check needs level and assess quality (stakeholder opinion) • Set targets and include all lands
	Diversity of recreational opportunities	MDNR, user groups, researchers	<ul style="list-style-type: none"> • Determine current availability (manager and user opinion) • Assess trends and compatibility and include dual- season use (research) • Determine gaps (manager and user opinion) • Set targets

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Appendix 2b. Target-setting process for the indicators of Recreation and Multiple Use.

Value	Indicator	Stakeholders	Process
	Quality of recreational experience	MDNR, user groups, researchers	<ul style="list-style-type: none"> • Convene users and researchers to design survey • Administer survey (research) • Assess results (manager, user groups) • Determine and implement necessary program changes (MDNR managers) • Set target level
Multiple Use	Provision for sufficient number of other values	MDNR managers, external stakeholders	<ul style="list-style-type: none"> • Convene managers and stakeholders to set minimum number of values and specific values to be satisfied (as measured by whether a sufficient number of indicators is being met per value) • Monitor plan and adjust as needed

Appendix 3. Practices, tools and responsibilities for the indicators

Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
Ownership Patterns	Road density	<ul style="list-style-type: none"> • Use assessment (how?) • Road closures 	<ul style="list-style-type: none"> • Maps - Geographic Information System (GIS) • Target by land use 	
	Ownership type and land use		<ul style="list-style-type: none"> • Maps - GIS • Public land acquisition • Zoning regulations 	
	Stewardship	<ul style="list-style-type: none"> • Quality assessment (how?) 	<ul style="list-style-type: none"> • Program inventory (number and types) 	
	Change in ownership	<ul style="list-style-type: none"> • Measure parcel size and distribution over time • Measure stewardship use/patterns/attitudes (how?) • Monitor Non-Industrial Private Forest (NIPF) logging (how?) 	<ul style="list-style-type: none"> • Tax-Plat-Maps, GIS 	
Institutional Processes	Existence of audit or assessment program	<ul style="list-style-type: none"> • Review existing data sources • Assess need for additional data (set priorities) • Identify all processes • Expand Forest Inventory and Analysis (FIA) • Integration of data sources 		
	Integrated planning system			
	Response to public requests	<ul style="list-style-type: none"> • Tracking - capturing individual contacts 	<ul style="list-style-type: none"> • Public meetings • Policy adjustment mechanisms 	
	Existence of public participation in review of initial plan and audit or assessment program	<ul style="list-style-type: none"> • Solicit input • Analyze responses • Periodic evaluation of public/stakeholder opinion 		

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Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
Recreation	User days/activity	<ul style="list-style-type: none"> • Survey demand/activity • Count user days/activity • Assess impact on resources 		
	Miles of trail systems by land-use designation	<ul style="list-style-type: none"> • Count trail miles by land use • Survey desire/demand • Assess impact on resource/experience 	<ul style="list-style-type: none"> • Global Positioning Systems (GPS) • Manager opinions, research 	
	Size and distribution of natural and 'special' areas and allowed use for those areas.	<ul style="list-style-type: none"> • Inventory natural areas • Survey desire for numbers of acres, type of use, distribution • Assess impact on resource/experience 	<ul style="list-style-type: none"> • Current data • Research 	
	Integrated planning system	<ul style="list-style-type: none"> • Convene stakeholders to survey whether needs are being addressed • Adjust system 	<ul style="list-style-type: none"> • Stakeholder opinion 	
	Area of forest by type, age class and quality	<ul style="list-style-type: none"> • Determine current amounts • Consider landholders • Survey desires 	<ul style="list-style-type: none"> • Operations Inventory (OI) data • Landowner, manager and stakeholder opinion • Research 	
	Number, type and quality of educational and recreational resources	<ul style="list-style-type: none"> • Count them • Check needs level and assess quality 	<ul style="list-style-type: none"> • Stakeholder opinion • Other knowledge 	
	Diversity of recreational opportunities	<ul style="list-style-type: none"> • Determine current availability • Assess trends and compatibility and include dual-season use • Determine gaps 	<ul style="list-style-type: none"> • Manager and user opinion • Research • Manager and user opinion 	
	Quality of recreational experience	<ul style="list-style-type: none"> • Convene users and researchers to design survey • Administer survey • Assess results • Determine and implement program changes 	<ul style="list-style-type: none"> • MDNR managers 	

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Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
Multiple Use	Provision for sufficient number of other values	<ul style="list-style-type: none"> • Convene managers and stakeholders to set minimum number of values and specific values to be satisfied (as measured by whether a sufficient number of indicators is being met per value) • Monitor plan and adjust as needed 		
Spiritual	Size and distribution of natural and 'special' areas and allowed use for those areas	<ul style="list-style-type: none"> • Inventory - List of areas 	<ul style="list-style-type: none"> • GIS - Mapping center • Operations Inventory • Maps - old growth and natural areas 	
	User days/activity	<ul style="list-style-type: none"> • Surveys • Fee collection • Tracking information 	<ul style="list-style-type: none"> • Chuck Nelson's survey • Fee revenues • Registrations • Censuses 	
	Number of educational and recreational resources and presence of information resources	<ul style="list-style-type: none"> • Inventory of resources • Mapping and locations • Prepare materials 	<ul style="list-style-type: none"> • Maps • Completed inventory • GPS and GIS 	
	Change in status of land ownership, use and distribution	<ul style="list-style-type: none"> • Review plat books/court house records and deeds • Compartment review - identify for acquisition/trade • Contact with real estate agents 	<ul style="list-style-type: none"> • Other-owner GIS systems • Economic development/county offices • Information/planning committees 	
	Road density	<ul style="list-style-type: none"> • Inventory (compartment, fire roads) • Hire GIS/GPS technician for the state • Locate existing maps 	<ul style="list-style-type: none"> • GIS • Air photos • Topographic maps • GPS state forest roads 	
	Amount of trash in forest	<ul style="list-style-type: none"> • Survey of dumping sites (informal dumping sites/roads) • Assessment of type of trash (toxic, white goods, etc.) 	<ul style="list-style-type: none"> • Form for dumping sites • Adopt-a-forest 	

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Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
Social/ Cultural	Diversity of recreational opportunities	<ul style="list-style-type: none"> Identify sites - American Disabilities Act (ADA) sites Identify recreational demands and users of the forest Identify spatial relationships among user types 	<ul style="list-style-type: none"> Chuck Nelson surveys Maps, etc. 	
	Miles of trail systems by land-use designation	<ul style="list-style-type: none"> Inventory trail system/road system Correlation of land use with trails 	<ul style="list-style-type: none"> Maps GIS OI Photos 	
	Number of historic sites	<ul style="list-style-type: none"> Identify in compartment review Notify Secretary of State Teach employees to recognize and locate Hire archeologist/historian on contract 	<ul style="list-style-type: none"> Secretary of State historic office information Compartment review comments and influence zone box 	
	Presence and implementation of a historic/archeological resource plan	<ul style="list-style-type: none"> Develop a plan to integrate into process Develop procedure 	<ul style="list-style-type: none"> Independent audit Quality action team 	
	Cultural forest products	<ul style="list-style-type: none"> Identify what people are using - list products How much is being done, by type Assess need for permit process 	<ul style="list-style-type: none"> Chuck Nelson survey Permit records Other agencies' experiences 	
Economic Health	Wood product summary	<ul style="list-style-type: none"> Forest inventory FIA 	<ul style="list-style-type: none"> Statistician OI Timber sale data Wood products survey 	
	Ratio of harvest to growth by volume, species and products	<ul style="list-style-type: none"> Forest inventory FIA 	<ul style="list-style-type: none"> Statistician OI Timber sale data Wood products survey 	

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Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
	Net quantity difference between growth and harvest	<ul style="list-style-type: none"> • Forest inventory • FIA 	<ul style="list-style-type: none"> • Statistician • OI • Timber sale data • Wood products survey 	
	Correlation of LSSF with local economic development plans	<ul style="list-style-type: none"> • What plans are out there? • During development, ensure consideration of other plans 	<ul style="list-style-type: none"> • Survey Economic Development Corporation (EDC) and Eastern Upper Peninsula Consortium 	
	Job/income/employment/retirement data	<ul style="list-style-type: none"> • Review statistics 	<ul style="list-style-type: none"> • Michigan Employment Security Commission (MESC) data • Department of Labor data 	
Biodiversity	<ul style="list-style-type: none"> • Area of forest type by age class and quality • Area, percentage and representativeness of forest types in protected areas • Forest regeneration by forest type and silvicultural prescription • Population levels, habitat and changes over time of selected species guilds 		<ul style="list-style-type: none"> • FIA/FHM/Animal and Plant Health Inspection Service (APHIS) • OI • Remote sensing • Wildlife surveys • Michigan Natural Features Inventory (MNFI)/The Nature Conservancy (TNC) • Breeding birds • GIS • Road inventory/plan (available?) • Modeling • Gap analysis • TNC: statewide/eco-region planning • Treatment by type • Wildlife/habitat models • Wildlife population models • Government Land Office (GLO) • Forest regeneration survey • Wetland inventories 	

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Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
Healthy Forests	<ul style="list-style-type: none"> Population levels, habitat and changes over time of selected species guilds Area of forest type by age class and quality Area, percentage and representativeness of forest types in protected areas Pest assessment Forest growth Exotic species Cycles relative to historic patterns 		<ul style="list-style-type: none"> FIA/FHM/APHIS OI Remote sensing Wildlife surveys MNFI/TNC Breeding birds GIS Road inventory/plan (available?) Modeling Gap analysis TNC: statewide/eco-region planning Treatment by type Wildlife/habitat models Wildlife population models GLO Forest regeneration survey Wetland inventories 	
	<ul style="list-style-type: none"> Water quality 		<ul style="list-style-type: none"> Best Management Practices (BMP) monitoring Department of Environmental Quality (DEQ)? Fish division? Aquatic biota? 	
Biological Cycles	Landscape health and integrity of natural cycles	<ul style="list-style-type: none"> Chemical analysis of water quality 	<ul style="list-style-type: none"> OI data Carbon data DEQ Environmental Protection Agency (EPA) 	
Water and Soil Resources Quality	Land ownership, use, quality and fragmentation		<ul style="list-style-type: none"> Ownership records Zoning records 	

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Appendix 3. Practices, tools and responsibilities for the indicators of each value as developed by Workshop II participants.

Value	Indicator	Practices	Tools	Responsibility
	Landscape health and integrity of water and soil resources	<ul style="list-style-type: none"> BMP audits Local ecosystem management projects 		
	Land cover assessment/inventory			
Unique Features	Size and distribution of natural and "special" areas and allowed use for those areas	<ul style="list-style-type: none"> In-house inventories Network with other agencies for their inventories 		
	Number, type and quality of educational and recreational resources	<ul style="list-style-type: none"> Survey "senior" agency employees 	<ul style="list-style-type: none"> Local tourist bureaus MDNR Parks and Recreation inventory U.S. Forest Service inventory 	
	Number of historic sites		<ul style="list-style-type: none"> Bureau of History Local governments Historical societies 	
	Population levels, habitat and changes over time of selected species guilds		<ul style="list-style-type: none"> MNFI 	<ul style="list-style-type: none"> MDNR Wildlife Division U.S. Fish and Wildlife
	Landscape health and integrity of natural cycles	<ul style="list-style-type: none"> Assess geological features Assess unique plants 	<ul style="list-style-type: none"> BMPs TNC Watershed councils denote unique features (i.e., alvars, other unique plant communities) Local ecosystem management groups/agencies 	
	Quality of fisheries	<ul style="list-style-type: none"> Measure by stream classifications 		MDNR Fisheries Division
	Miles of undeveloped shoreline			
	Wetlands	<ul style="list-style-type: none"> Measure \pm 		

Appendix 4. Phone survey results

Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
Ownership Patterns	Road density		<ul style="list-style-type: none"> Add roads Block roads Increase or decrease quality of roads 	<ul style="list-style-type: none"> Depends on where the road is
	Ownership type and land use		<ul style="list-style-type: none"> Use the following tools: records from the court house, purchaser sell or trade between ownerships 	<ul style="list-style-type: none"> Involved parties Third party could be brought in to coordinate
Institutional Processes	Existence of audit or assessment program		<ul style="list-style-type: none"> Identify what will be audited Ensure that audit is conducted sufficiently often 	<ul style="list-style-type: none"> Someone who has no vested interest should conduct the audit Auditors should be knowledgeable enough to do an appropriate assessment
	Integrated planning system			<ul style="list-style-type: none"> LSSF with MDNR May also benefit from bringing in someone independent of MDNR
	Response to public requests		<ul style="list-style-type: none"> Divisions have to make this a priority - there has to be direction from above 	<ul style="list-style-type: none"> Area foresters, area biologists, and supervisors
Recreation	User days/activity		<ul style="list-style-type: none"> Provide appropriate habitat for wildlife, advertise opportunities and employ user days/activity to monitor 	<ul style="list-style-type: none"> Wildlife (hunting), fisheries (fishing), forestry (learning, camping, etc.)
	Miles of trail systems by land-use designation		<ul style="list-style-type: none"> Access is a big issue because a lot of public land is surrounded by private land 	<ul style="list-style-type: none"> Joint between forestry and wildlife

[cont'd]

Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
	Size and distribution of natural and 'special' areas and allowed use for those areas	<ul style="list-style-type: none"> Increase from what it used to be 	<ul style="list-style-type: none"> Design and scope area Compartment review on annual basis - review and monitor natural areas at that time or more frequently throughout the year 	<ul style="list-style-type: none"> Habitat biologist Unit manager and staff Forest planner
	Integrated planning system			<ul style="list-style-type: none"> LSSF with MDNR May also benefit from bringing in someone independent of MDNR
	Number, type and quality of educational and recreational resources	<ul style="list-style-type: none"> Probably want to set targets at a compartment level and then compare what is appropriate for that compartment with what is attained 	<ul style="list-style-type: none"> 3 suggestions: <ul style="list-style-type: none"> One could develop a list of potential educational and recreational resources that might be present on the forest. Then for each stand, just note whether it is present or absent. Select a single univariate measure, or perhaps a class of presence/absence-type measures. This reflects neither the intensity of desire for various ed/rec opportunities nor the number and variety of opportunities offered. Count: Miles of trails of various types; miles of interconnected two tracks for all-terrain vehicle (ATV) and other recreational motoring; number of campgrounds (and number of sites per campground); miles of stream available for various types of fishing; etc. Count visitor days involved in various activities (an outcome-based concept). 	<ul style="list-style-type: none"> MDNR [Forest Management Division (FMD) and Wildlife Division (WD)], but could also include contractors on a project-by-project basis
	Diversity of recreational opportunities		<ul style="list-style-type: none"> Access is a big issue because a lot of public land is surrounded by private land - have to avoid over-developing areas that are accessible 	<ul style="list-style-type: none"> Joint between forest division, wildlife, and fisheries

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Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
Spiritual	Size and distribution of natural and 'special' areas and allowed use for those areas	<ul style="list-style-type: none"> Increase from what it used to be 	<ul style="list-style-type: none"> Design and scope area Compartment review on annual basis - review and monitor natural areas at that time or more frequently throughout the year 	<ul style="list-style-type: none"> Habitat biologist Unit manager and staff Forest planner
	User days/activity		<ul style="list-style-type: none"> Provide appropriate habitat for wildlife, advertise opportunities and employ user days/activity to monitor 	<ul style="list-style-type: none"> Wildlife (hunting), fisheries (fishing), forestry (learning, camping, etc.)
	Number of educational and recreational resources and presence of information resources	<ul style="list-style-type: none"> Probably want to set targets at a compartment level and then compare what it is appropriate for that compartment with what is attained 	<ul style="list-style-type: none"> 3 suggestions: <ul style="list-style-type: none"> One could develop a list of potential educational and recreational resources that might be present on the forest. Then for each stand, just note whether it is present or absent. Select a single univariate measure, or perhaps a class of presence/absence-type measures. This reflects neither the intensity of desire for various ed/rec opportunities, nor the number and variety of opportunities offered. Count: Miles of trails of various types; miles of interconnected two tracks for ATV and other recreational motoring; number of campgrounds (and number of sites per campground); miles of stream available for various types of fishing; etc. Count visitor days involved in various activities (an outcome-based concept). 	<ul style="list-style-type: none"> MDNR (FMD and WD), but could also include contractors on a project-by-project basis.
	Change in status of land ownership, use and distribution			<ul style="list-style-type: none"> These data (trends) are available from U.S. Forest Service (USFS) Forest Inventory and Analysis (FIA), census and county plot update

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Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
	Road density		<ul style="list-style-type: none"> Add roads Block roads Increase or decrease quality of roads 	
Social/ Cultural	Diversity of recreational opportunities		<ul style="list-style-type: none"> Access is a big issue because a lot of public land is surrounded by private land - have to avoid over-developing areas that are accessible 	<ul style="list-style-type: none"> Joint between forest division, wildlife, and fisheries
	Miles of trail systems by land-use designation		<ul style="list-style-type: none"> Access is a big issue because a lot of public land is surrounded by private land 	<ul style="list-style-type: none"> Joint between forestry, wildlife, etc.
	Number of historic sites		<ul style="list-style-type: none"> Practices already in place 	<ul style="list-style-type: none"> Responsibility depends on age and significance of site (more significant handled by state, less significant handled locally)
	Presence and implementation of a historic/archeological resource plan	Don't set a number target (e.g., 50 sites). Set an area to be surveyed (e.g., forest management unit), record how many sites are found and use those sites.		
Biodiversity	Area, percentage and representativeness of forest types in protected areas		<ul style="list-style-type: none"> Planning at landscape level 	<ul style="list-style-type: none"> Forest and wildlife division

[cont'd]

Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
	Forest regeneration by forest type and silvicultural prescription			<ul style="list-style-type: none"> Forestry staff or summer part-time staff could do this work Sampling intensity should vary by forest type
	Population levels, habitat and changes over time of selected species guilds	<ul style="list-style-type: none"> To set targets, first have to estimate population of forest occupied Want to define communities, and that is difficult to do. (One way to do this is to examine pre-settlement data and look at the change in communities over time and identify trends.) Have to take into account historical levels of various species as well as continuing interests of stakeholders (e.g., hunters) and decide, for example, if non-game and game species will get equal consideration 	<ul style="list-style-type: none"> Identify communities Adjust management practices accordingly Need to monitor (on-the-ground monitoring and imagery mapping) 3 options: <ul style="list-style-type: none"> – Presettlement species, their numbers and distribution throughout the landscape. The age-class considerations here would be radically different from those of the present forest, as would the forest cover types and composition. – Species distribution since the time we had good data on the LSSF (1930s?) – The present species distribution. 	<ul style="list-style-type: none"> MDNR (FMD and WD) with partners: LSSF, contractors, volunteers (e.g., bird surveys)

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Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
Healthy Forests	Population levels, habitat and changes over time of selected species guilds	<ul style="list-style-type: none"> To set targets, first have to estimate population of forest occupied Want to define communities, and that is difficult to do. (One way to do this is to examine pre-settlement data and look at the change in communities over time and identify trends.) 	<ul style="list-style-type: none"> Identify communities Adjust management practices accordingly Need to monitor (on-the-ground monitoring and imagery mapping) 3 options: <ul style="list-style-type: none"> – Presettlement species, their numbers and distribution throughout the landscape. The age-class considerations here would be radically different from those of the present forest, as would the forest cover types and composition. – Species distribution since the time we had good data on the LSSF (1930s?) – The present species distribution. 	<ul style="list-style-type: none"> MDNR (FMD and WD) with partners: LSSF, contractors, volunteers (e.g., bird surveys)
	Water quality	<ul style="list-style-type: none"> There must be multiple targets (a target set?) Target set will be different for different streams and lakes - will need baseline measurements and standards for what is normal for a given area 	<ul style="list-style-type: none"> Sedimentation in stream appropriate for that stream? If not, more rigid adherence to BMPs might be the appropriate management response. Is coliform above normal for a particular lake? If so, determine source and reduce. Other measures with similar response patterns. 	<ul style="list-style-type: none"> MDNR (FMD), although actual testing could be carried out by Department of Environmental Quality (DEQ) or contracted out
	Area, percentage and representativeness of forest types in protected areas			<ul style="list-style-type: none"> Planning at landscape level

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Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
Biological Cycles	Landscape health and integrity of natural cycles	<ul style="list-style-type: none"> Individual variables have to be defined first and then targets for various locales can be set 	<ul style="list-style-type: none"> Sub-level variables must be set first Prevalence of various types of diseases and insects in a stand, taken individually and jointly Is the soil too compacted and are the appropriate microorganisms present? 	<ul style="list-style-type: none"> MDNR (FMD and WD)
Water and Soil Resources Quality	Land ownership, use, quality and fragmentation		<ul style="list-style-type: none"> Use the following tools: records from the court house, purchaser sell or trade between ownerships 	<ul style="list-style-type: none"> Any parties involved Third party may be brought in to coordinate
	Landscape health and integrity of water and soil resources	<ul style="list-style-type: none"> Individual variables have to be defined first and then targets for various locales can be set 	<ul style="list-style-type: none"> Sub-level variables must be set first Prevalence of various types of diseases and insects in a stand, taken individually and jointly Is the soil too compacted and are the appropriate microorganisms present? 	<ul style="list-style-type: none"> MDNR (FMD and WD)
Unique Features	Size and distribution of natural and 'special' areas and allowed use for those areas.	<ul style="list-style-type: none"> Increase from what it used to be 	<ul style="list-style-type: none"> Design and scope area Compartment review on annual basis - review and monitor natural areas at that time or more frequently throughout the year 	<ul style="list-style-type: none"> Habitat biologist Unit manager and staff Forest planner
	Number, type and quality of educational and recreational resources	<ul style="list-style-type: none"> Probably want to set targets at a compartment level and then compare what it is appropriate for that compartment with what is attained 	<ul style="list-style-type: none"> 3 suggestions: <ul style="list-style-type: none"> One could develop a list of potential educational and recreational resources that might be present on the forest. Then for each stand, just note whether it is present or absent. Select a single univariate measure, or perhaps a class of presence/absence-type measures. This reflects neither the intensity of desire for various ed/rec opportunities, nor the number and variety of opportunities offered. 	<ul style="list-style-type: none"> MDNR (FMD and WD), but could also include contractors on a project-by-project basis.

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Appendix 4. Additional suggestions about targets, practices and roles and responsibilities made during a phone survey conducted just prior to Workshop II

Value	Indicator	Targets	Practices	Roles and responsibilities
			<ul style="list-style-type: none"> – Count: Miles of trails of various types; miles of interconnected two tracks for ATV and other recreational motoring; number of campgrounds (and number of sites per campground); miles of stream available for various types of fishing; etc. – Count visitor days involved in various activities (an outcome-based concept). 	
	Number of historic sites		<ul style="list-style-type: none"> • Practices already in place 	<ul style="list-style-type: none"> • Responsibility depends on age and significance of site (more significant handled by state, less significant handled locally)
	Population levels, habitat and changes over time of selected species guilds	<ul style="list-style-type: none"> • To set targets, first have to estimate population of forest occupied • Want to define communities, and that is difficult to do. (One way to do this is to examine pre-settlement data and look at the change in communities over time and identify trends.) 	<ul style="list-style-type: none"> • Identify communities • Adjust management practices accordingly • Need to monitor (on-the-ground monitoring and imagery mapping) • 3 options: <ul style="list-style-type: none"> – Presettlement species, their numbers and distribution throughout the landscape. The age-class considerations here would be radically different from those of the present forest, as would the forest cover types and composition. – Species distribution since the time we had good data on the LSSF (1930s?) – The present species distribution. 	<ul style="list-style-type: none"> • MDNR (FMD and WD) with partners: LSSF, contractors, volunteers (e.g., bird surveys)
	Landscape health and integrity of natural cycles	<ul style="list-style-type: none"> • Individual variables have to be defined first and then targets for various locales can be set 	<ul style="list-style-type: none"> • Sub-level variables must be set first • Prevalence of various types of diseases and insects in a stand, taken individually and jointly • Is the soil too compacted and are the appropriate microorganisms present? 	<ul style="list-style-type: none"> • MDNR (FMD and WD)

Appendix 5. Additional comments from Workshop II participants

- Establish a first-cut process that gathers like-minded/interested individuals around a specific value. They would develop specific indicators that measure factors they consider significant, as opposed to first-cut homogeneous groups that come up with “fuzzier” indicators.
- The following are the Great Lakes Forest Alliance Criteria:
 - 1) Maintenance of biological resources
 - 2) Maintenance of soil, water, air quality
 - 3) Multiple economic benefits
 - 4) Maintenance of community and cultural values
 - 5) Society’s framework (processes) for sustainable forest management

All 12 of our values can be fitted into one or another of the above (5).

- We really need more private time to give serious thought expressed through written comments in the workbook. This private time should be part of the workshop, since many of us have competing priorities and probably couldn’t get around to it at home or work.
- Over the eons our biologic resources have shown a tremendous amount of resiliency to natural catastrophes as well as to human activity. Some would suggest that diversity is the reason for resiliency - maybe, maybe not. Some are now suggesting that all elements in an ecosystem are not truly dependent on each other but merely co-exist in the same place. We need to get a better feel for what affects resiliency and concentrate our sustainability efforts on these factors.
- We need to be careful that we don’t get hung up on trying to make sure that some interest group’s special “key” or “catch” words get into print. Many of the values are so all-encompassing that if we really let our minds be open to the task and don’t define things too narrowly the indicators will adequately measure important elements of the values.
- Part of this process should address a) the role the LSSF needs to play in providing for some of society’s needs and wants relative to other ownerships in the region, and b) the LSSF’s niche relative to other state ownerships. The economic concept of comparative advantage will probably have some bearing on final implementation of a statewide plan at some point in the future.

Appendix 6. List of Workshop II participants

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Project Partners:

Michigan Department of Natural Resources

Mater Engineering, Ltd.

Smartwood

BioForest Technologies Inc.

Craig Howard

Anne Hayes

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Tom Clark (CMC Consulting)

Reports generated by this project include:

Project Summary: The Lake Superior State Forest Sustainable Forest Management Pilot Project

An Assessment of the Michigan Department of Natural Resources' Commitment to Sustainable Forest Management

The Lake Superior State Forest: A Description

Michigan Department of Natural Resources Operations Inventory: Survey Results

Roles and Responsibilities for Forest Management Planning in the Lake Superior State Forest

Public Participation in Forest Management Planning in the Lake Superior State Forest: Finding the Right Pathway

Establishing Criteria and Indicators for the Lake Superior State Forest

Workshop I Summary: Values and Indicators of the Lake Superior State Forest

Workshop II Summary: Establishing Targets, Practices and Responsibilities for the Indicators of the Lake Superior State Forest

Modeling Forest Management on the Lake Superior State Forest

Wildlife Habitat Projections for 15 Species in the Lake Superior State Forest

Risk Assessment of Forest Management for the Lake Superior State Forest

A Forest Management Planning Guide for the Lake Superior State Forest

Further information on this report or any of the reports listed may be obtained from:



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