**Greater Mahale Ecosystem**

**Conservation Action Planning Meeting**

**Kigoma December 10<sup>th</sup> – 14<sup>th</sup> 2007**

# Meeting Summary

**January 2008**

# Executive Summary

The first Greater Mahale Ecosystem Conservation Action Planning (CAP) Meeting was held at the Jane Goodall Institute meeting room in Kigoma from December 11th - 13th, 2007.

The meeting was convened by the Mahale Ecosystem Management Project, Frankfurt Zoological Society and was attended by members of the Greater Mahale Ecosystem Core Planning Team and resource people, totalling 22 participants. Participants represented a range of stakeholders, including: Wildlife Division HQ, Forestry and Beekeeping Division HQ, TANAPA HQ, TANAPA Mahale, Kigoma Regional Secretariat, Rukwa Regional Secretariat, Kigoma Rural District Council, Mpanda District Council, Jane Goodall Institute and Frankfurt Zoological Society.

The aim of the meeting was to bring Core Planning Team members together to initiate the Conservation Action Planning process for the Greater Mahale Ecosystem.

The objectives of the first CAP meeting were:
1. To familiarize the Core Planning Team with The Nature Conservancy's Conservation Action Planning (CAP) process.
2. To select focal targets (Key Ecosystem Components) and recognize important nested components; including at least one livelihood or development target.
3. To complete at least one Key Ecological Attribute and Indicator for each target in order to begin to define its 'health' (viability) over time.
4. To complete a threats analysis; including stresses and sources of stress for each target, and a summary of critical threats to the Ecosystem.
5. To draft an initial set of ecosystem objectives.
6. To ensure that at least one team member has received introductory training to the CAP Excel Workbook.

As part of the CAP training given to participants, the facilitator gave short presentations during the course of the 4 day meeting concerning the following topics: Conservation Action Planning, Project Scope, Project Vision, Focal Conservation Targets, Viability Analysis, Key Ecological Attributes, Indicators, Ratings, Threat Analysis, Stresses, Sources of Stress, and Objectives. Following each presentation, the participants worked together to apply that part of the CAP process to the Mahale Ecosystem.

The following vision for the Greater Mahale Ecosystem was proposed: "An exemplary Greater Mahale Ecosystem in which globally important biodiversity and ecosystem functions are conserved, habitat connectivity is maintained, and natural resources are managed in a way that sustains or improves local livelihoods for the benefit of present and future generations."

The following nine focal conservation targets were agreed upon:
1. Sustainable fisheries*
2. Rivers, streams and riparian habitats
3. Chimpanzees
4. Elephants
5. Montane ecosystems of the Greater Mahale region
6. Bamboo forest
7. Evergreen forest
8. Miombo woodland/grassland mosaic*
9. Agricultural productivity*

*(* particularly important for sustainable livelihoods):*

Viability analyses were conducted for 4 of the focal targets (Chimpanzees, Evergreen Forest, Miombo Woodland/Grassland Mosaic and Agricultural Productivity), comprising identification of key ecosystem attributes and assessment of current statuses.

The threats analysis revealed that agricultural expansion is considered to be a 'Very High' threat, potentially affecting 7 of the conservation targets. Uncontrolled burning, rapid human population growth, settlements, deforestation, infrastructure development, refugee camps/settlements, mining and livestock keeping were all considered to be 'High' threats.

The Core Planning Team identified 7 objectives, although it is expected that more will be added.

Information needs were identified and follow-up work was assigned to Core Planning Team members. It was agreed that the next meeting will take place from 4th to 8th February, 2008.

An additional CAP-workbook training session was also provided to all those interested.

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# Acronyms

| | |
|---|---|
| CAP | Conservation Action Planning |
| FZS | Frankfurt Zoological Society |
| GME | Greater Mahale Ecosystem |
| JGI | Jane Goodall Institute |
| MUE | Masito – Ugalla Ecosystem |
| MMNP | Mahale Mountains National Park |
| MEMP | Mahale Ecosystem Management Plan |
| TANAPA | Tanzania National Parks Authority |

# 1  Introduction

The first Greater Mahale Ecosystem Conservation Action Planning (CAP) Meeting was held at the Jane Goodall Institute in Kigoma from December 11th - 13th, 2007.

The meeting was convened by the Mahale Ecosystem Management Project (implemented by Frankfurt Zoological Society) and was attended by members of the Greater Mahale Ecosystem Core Planning Team and resource people, who together totalled 22 participants. A range of stakeholders were represented, including: Wildlife Division HQ, Forestry and Beekeeping Division HQ, TANAPA HQ, TANAPA Mahale, Kigoma Regional Secretariat, Rukwa Regional Secretariat, Kigoma Rural District Council, Mpanda District Council, Jane Goodall Institute and Frankfurt Zoological Society.

A full list of meeting participants is given in Appendix 1.

**Meeting Aim**

The aim of the meeting was to bring Core Planning Team members together to initiate the Conservation Action Planning process for the Greater Mahale Ecosystem.

**Meeting objectives**

The objectives of the first CAP meeting were:

7. To familiarize the Core Planning Team with The Nature Conservancy's Conservation Action Planning (CAP) process.
8. To select focal targets (Key Ecosystem Components) and recognize important nested components; including at least one livelihood or development target.
9. To complete at least one Key Ecological Attribute and Indicator for each target in order to begin to define its 'health' (viability) over time.
10. To complete a threats analysis; including stresses and sources of stress for each target, and a summary of critical threats to the Ecosystem.
11. To draft an initial set of ecosystem objectives.
12. To ensure that at least one team member has received introductory training to the CAP Excel Workbook.

**Agenda**
The agenda of the meeting is presented in Appendix 2.

# 2 Day 1 - Targets

## 2.1 What is Conservation Action Planning?

### What is Conservation Action Planning?

Conservation Action Planning (CAP) is a relatively simple, straightforward and tested approach for planning, implementing and measuring the success of conservation projects. The methodology was developed by conservation practitioners working in real places. It has been tested and deployed successfully by hundreds of teams working to conserve species, sites, ecosystems, landscapes, watersheds and seascapes across the globe.

At its core, CAP is a framework to help practitioners focus their conservation strategies on clearly defined elements of biodiversity or conservation targets and on fully articulated threats to these targets. It also enables them to measure their success in a manner that facilitates adaptation and learning. The CAP process accomplishes this by prompting a conservation team to work through a series of diagnostic steps that culminate in the development of clearly defined objectives and strategic actions. Together these represent a testable hypothesis of conservation success that forms the basis of an "adaptive" approach to conservation management.

*From: Conservation Action Planning Handbook: Developing Strategies, Taking Action, and Measuring Success at any Scale. June 2007. The Nature Conservancy; Arlington, Virginia, USA.*



**Figure 1. Summary of The Nature Conservancy's Conservation Action Planning process.**

## 2.2  Greater Mahale Ecosystem Scope

The **project scope** is determined based on the biodiversity and other (e.g., cultural, archaeological, societal) values of interest, and can be thought of as the geographic or ecological "frame." Ultimately the selection of our focal conservation targets will focus and further refine our understanding of the project scope because the ecological and other fundamental characteristics of the targets are, in fact, critical to the final project boundary.

The geographic scope of the Greater Mahale Ecosystem is depicted in the map below (Figure 2). The ecosystem is roughly defined by the Malagarasi River to the north (encompassing the Masito-Ugalla region and Tongwe East Forest Reserve) and along the north-eastern boundary, continuing south to Katavi National Park, including the northwest-most portions of Mpanda District, important forest and woodland habitat of the Albertine Rift system, and an elephant movement corridor extending from Katavi National Park northwest towards Mahale Mountains National Park. The ecosystem's entire western extent is defined by the near-shore habitats of Lake Tanganyika.

Meeting participants were familiarized with this initial project scope in a presentation by Lilian Pintea of JGI, which included a virtual tour of the ecosystem via Google Earth (satellite imagery). The scope presented by Lilian, and shown below, is based on previous work and discussions (e.g., Mahale Ecosystem Conservation and Sustainable Livelihood Plan: Scope of Work for the Planning Process, September 2005; and The Greater Mahale Ecosystem Planning Meeting Report, October 2007).  The scope will be refined during the course of the CAP, as focal conservation targets are identified, investigated and better understood.
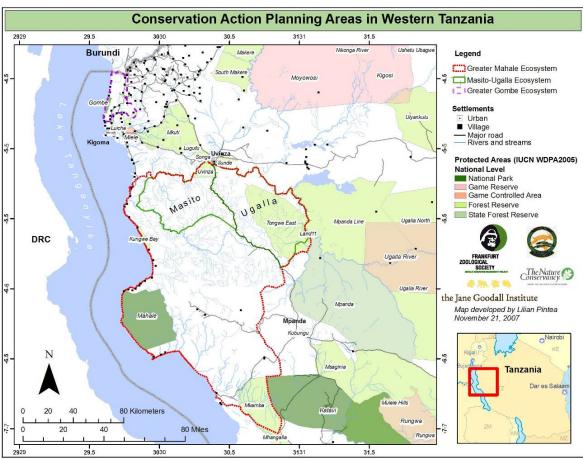


**Figure 2. Map of all areas in western Tanzania where a Conservation Action Plan is underway (as of November 2007).  The geographic scope of the Greater Mahale CAP is outlined in red.**

Several issues relating to the geographic scope of the ecosystem were raised in this first CAP workshop.  First, it was noted that sustainable fisheries (identified as a focal conservation target) obviously depend on the ecological functioning of Lake Tanganyika and are impacted by human utilisation of Lake resources.  Currently, the project boundary does not include Lake Tanganyika.  However, it was recognised that including the entire lake may broaden the scope beyond what is manageable and may thereby reduce the focus of the planning process.  After some discussion it was agreed that the sandy and rocky shallows of the Lake are of particular importance to the majority of fish species (e.g., for breeding and survival of juveniles), and therefore to fisheries in general.  By expanding the project boundary to include just the near-shore habitats of Lake Tanganyika (between the Malagarasi River and Ikola; extending 1.6 km into the lake), we will effectively address many key ecological aspects of fisheries, as well as the critical areas where management interventions (or other strategies) will need to take place.

A second scope-related issue was raised in reference to Katavi National Park.  Some team members questioned why Katavi is currently not included within the project area.  It was explained that the greater Mahale ecosystem is characterised by habitats and species associated with, or endemic to, the Albertine Rift system.  This extremely rich pocket of biodiversity includes nine (possibly ten) primate species and at least 337 avian species, many of which are rare or endemic to the Rift and its evergreen forests.  Katavi National Park falls outside of the Albertine Rift eco-region and does not support most of the conservation targets which define the Mahale ecosystem, notably chimpanzees.

## 2.3  Greater Mahale Ecosystem Vision

A **vision** is a general summary of the desired state or ultimate condition you are hoping to achieve within the project area. The following characteristics describe a typical vision statement:
• Relatively General - broadly defined to encompass all possible project activities
• Visionary - inspirational in outlining the desired change in the state of the targets toward which the project is working
• Brief - simple and succinct so that that all project participants can describe the vision

Approach

Following an introductory presentation, meeting participants worked to develop a common vision for the Greater Mahale Ecosystem by discussing and identifying key elements of their ultimate desired condition and drafting personal vision statements.  Participants then shared their ideas, and elected statements that best captured all common elements.

Results

Vision elements articulated by the Core Planning Team:
- Sustainable livelihoods
- Natural resource management
- Conserve biodiversity
- Present and future generations
- Sustained benefits
- Local/adjacent communities
- Viable populations
- Landscape connectivity
- Demonstration
- Original naturalness
- Habitats

Vision statements receiving the highest number of Core Planning Team member votes:

1. A Greater Mahale Ecosystem in which the conservation of exceptional biodiversity is complimentary to development and improvement of local livelihoods now and for future generations.
2. An ecosystem that ensures connectivity of ecological components and sustains local livelihoods for the benefit of present and future generations.
3. One of the best global demonstrations of a great ecosystem that is conserved and sustains livelihoods.
4. Natural resource management that sustains livelihoods for communities around.

On the last day of the workshop participants were asked to review these statements again and make final recommendations for a single, combined vision that reflects common values and aspirations.

The following vision statement emerged:

> "An exemplary Greater Mahale Ecosystem in which globally important biodiversity and ecosystem functions are conserved, habitat connectivity is maintained, and natural resources are managed in a way that sustains or improves local livelihoods for the benefit of present and future generations."

## 2.4  Focal Conservation Targets

**Focal conservation targets** are a limited suite of species, ecological communities, and ecosystems that are chosen to represent and encompass the full array of biodiversity found in a project area. They are the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness. In theory, conservation of the focal targets will ensure the conservation of all native biodiversity within functional landscapes.

The CAP approach can also be applied to **non-biodiversity targets** such as cultural, archeological, and other societal values; particularly if they provide a strong impetus for protecting a given site and inspire partners to want to undertake a conservation planning process.

Approach

First, the focal conservation targets (or key ecosystem components) that had been identified in 2005 were presented by Lilian Pintea and Zoe Balmforth.  These included: river systems, Lake Tanganyika shallows, evergreen forest, bamboo forest, montane vegetation, chimpanzees, elephants, and dagaa.  The purpose of this presentation and group discussion was to further familiarise participants with the GME, to provide a visual picture of important components of the system, and to inform participants of the progress made by previous work.

A detailed introduction to the process of selecting focal conservation targets was then given.  The process was summarised into four main steps which guided the subsequent discussion:
   1.   Identify major ecological systems and species groupings of the GME

2.  Identify other natural communities or species that require special consideration
3.  Discuss whether any lumping or splitting of the above is appropriate (that is, whether or not these finer-scale components would be 'captured' (i.e., have their specific conservation and/or management needs met) by conservation of the coarse-scale systems or groupings)
4.  Limit the list to approximately eight targets based on: ease of representation, national/global importance, viability and threat status

In addition, the following questions were asked in order to identify at least one appropriate livelihood or natural resource-based target:
*   What natural resources or ecosystem services are people living in the GME most dependent on?
*   Which of these require management interventions?
*   Can we limit the above list based on the following criteria: (1) significance to the local economy and livelihoods, (2) potential for sustainable use, (3) need for management interventions, and (4) link to identified (ecological) focal targets?

Results

Potential ecological targets (major systems and species groupings as main points; finer-scale or nested components as sub-categories) generated by group brainstorming session:
– Chimpanzees
– Lake Tanganyika
    o Beaches
    o Migratory birds (e.g., beaches as stop-over habitats)
    o Fish
    o Aquatic snakes
– Rivers and streams
    o Wetlands
    o Crocodiles
    o Riparian forest
– Mountains
– Forests
    o Resident birds
    o Migratory birds (e.g., stop-over sites/habitats)
    o Butterflies
    o Orchids
    o Primates
    o Large mammals
– Woodlands
    o Resident birds
    o Migratory birds (e.g., stop-over sites/habitats)
    o Butterflies
    o Orchids
    o Large mammals
– Grasslands
    o Resident birds
    o Migratory birds (e.g., stop-over sites/habitats)
    o Butterflies
    o Orchids
    o Large mammals
– Bamboo
    o Large mammals
    o Unknown species associations
– Elephants
    o Other large mammals requiring corridors/landscape connectivity

– Settlements and humans; and Agriculture[*]

Further group discussion and refinement resulted in the following eight ecological targets and comments:

– <u>Chimpanzees</u>
Recognised as a regionally and globally important species that is not only under threat, but which the Tanzanian government is obligated to protect. About 60% of the chimpanzees in the Ecosystem are, however, thought to reside outside of formal protected areas. Because they require large, interconnected areas of relatively undisturbed habitat, with adequate food sources (e.g., fruiting trees), they are considered to be an 'umbrella' species, capturing other biodiversity that relies on the presence of those same conditions.

– <u>Greater Mahale Ecosystem Shoreline and Shallows</u> (Lake Tanganyika)
Includes beaches, fish breeding habitat and river mouths. An important resource in terms of supporting fisheries, and northern portions are under greater threat. A key assumption is that cyclids, as well as other species, lay their eggs in the shallows and, once hatched, juveniles depend on this habitat for early growth stages. Therefore sandy and rocky shallows are thought to be a critical source area for many species (including multiple species which are entirely unique to Lake Tanganyika), as well as for sustainable fisheries in general.

– <u>Elephants</u>
Utilise a variety of different habitats, travel great distances, and require a high degree of connectivity (i.e., habitat corridors) between optimal foraging habitat and reliable water sources. Therefore serve as an 'umbrella' for other large or wide-ranging mammals. They also capture specific population management issues such as poaching.

– <u>Rivers, streams, and riparian habitat</u>
Includes water flow, associated wetlands, wet grasslands, riverine forest, in-stream habitat and associated biodiversity. Most species – including humans – are in some way dependent on this resource. There is already a legal requirement to protect these areas.

– <u>Greater Mahale Montane Ecosystems</u>
Important with regards to headwaters, scenery, biodiversity and cultural values. Intact habitat provides protection from earthquakes/landslides. Include a unique mosaic of montane grasslands and forests, and contain species restricted to high elevation conditions (~ >1500m?). Sensitive to fire. Believed to be relatively intact in Mahale Mountains National Park; but probably represent a relatively small proportion of the whole GME.

– <u>Evergreen forests</u>
Closed-canopy communities that include some semi-deciduous species but are predominantly evergreen. Support chimpanzees, as well as many species that are rare or endemic to the Albertine Rift eco-region.

– <u>Miombo woodland-grassland mosaic</u>
Fire-dependent regeneration. Zambesian Miombo dominated by *Brachystegia* sp..

– <u>Bamboo forest</u>
An extensively represented habitat type in the GME, but not particularly well-researched or understood. Known to be utilised by chimpanzees and provides important natural resources to human populations.

Potential natural resource or livelihood targets brainstormed by the group, followed by the number of votes received (each participant was given five votes and instructed to consider the potential target's significance to the local economy and livelihoods, inherent sustainability, need for management, and link to other focal targets):
– Agricultural productivity (10)
– Fishing (12)
– Firewood (6)

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[*] These were held over for the focussed discussion of "natural resource" and/or "livelihood" targets.

- Bushmeat (4)
- Honey (4)
- Timber (5)
- Farmlands (0)
- Rangelands (0)
- Meat; land-based (0)
- Settlements (0)
- Water; for agriculture (0)
- Materials for handicrafts (0)
- Fertile soil (4)
- Spiritual/cultural sites (2)
- Building materials; wood (2)
- Tongwe culture (0)
- Medicinal plants (0)
- Thatch; building (0)
- Earth; building (0)
- Water; in general (11)
- Wood for charcoal (1)
- Fruit (0)
- Mushrooms (1)
- Bamboo for building (4)
- Clean water for drinking (0)
- Ecotourism potential and values (5)
- Water for transport (1)
- Research potential (1)
- Business opportunities; linked to ecotourism (1)
- Butterflies/silkworms (0)
- Fish for aquariums (0)

The top natural resource or livelihood-based targets were:
- Agricultural productivity
- Fishing
- Water
- Forest and woodland resources

The two sets of targets (ecological and livelihood) were then discussed in combination to arrive at a final set of GME conservation targets:

1. Sustainable fisheries
2. Rivers, streams and riparian habitats
3. Chimpanzees
4. Elephants
5. Montane ecosystems of the Greater Mahale region
6. Bamboo forest
7. Evergreen forest
8. Miombo woodland/grassland mosaic
9. Agricultural productivity

Key discussion points included:

1. Chimps

Considered to be an 'umbrella' species because dependent on large areas of forest habitat, and on connectivity between forest patches.

Globally recognised as a threatened species, and TZ has an obligation under CBD to protect remaining populations.

2. Sustainable fisheries

Target developed from "G.M.E shoreline and shallows", as an umbrella that captures threats to shoreline habitat and to wider fisheries, since protection of breeding habitat alone would not be sufficient to protect fish stocks if unsustainable levels of fishing are occurring. Also this wording was felt to emphasise the livelihood value of fish stocks.

Important that this still captures the habitat that is important for other aquatic species, including endemic snakes and molluscs. The team felt that this is the same as the habitat that is important for fish breeding (i.e., the shallow, rocky habitat in the lake).

Important to remember that we are talking about the G.M.E, which does not include Kigoma where fishing is practiced on a much larger scale.

3. Rivers, streams and associated riparian habitats

Water as a livelihood resource was not listed as a separate target, as the team felt it would be captured under this heading. Therefore, it will be important to ensure the livelihood context is captured when conducting threats' analysis etc..

To include riverine forest, which refers to the narrow belts of evergreen forest that are restricted to river banks, and that criss-cross woodland and bamboo habitats. The team felt that these forest strips belong here (rather than in the evergreen forest target) because protection of water sources requires protection of a buffer of vegetation along the banks, and because the question of fragmentation is different for large expanses of forest, compared to naturally narrow strips.

4. Montane ecosystems

Much discussion occurred over whether "mountains" should be a separate target. This included the argument that deforested slopes are prone to landslides. The resulting consensus was that this would be captured by the "forest" target.

Overall the team agreed that the term "mountains" would imply protection of the mountain itself (which could only be destroyed by blasting or earthquakes). Since the intention was to capture important montane species, and/or ancient or locally endemic ecological systems, the wording "montane ecosystems" was voted as most appropriate.

This target refers to a high altitude ecological zone, which for the G.M.E was estimated to be above 1500m.

5. Evergreen forest

Discussion centred on what we mean by "forest". To many Tanzanians, the term forest means any habitat with large, tall trees, which includes woodland. Hence the term "evergreen" is needed to differentiate true, gallery forest from woodland. Much of the Mahale forest is a mosaic, and includes scattered deciduous trees, but the team felt that any forest in which the majority of trees

are evergreen would be captured by this description, and it would not exclude such semi-deciduous areas.

Some discussion occurred over whether the definition should be "closed canopy forest" rather than evergreen, but the general feeling was that this would be too restrictive.

Important to remember that the forests provide natural resources on which local livelihoods depend. Therefore, one of the indicators of health should be the ability of the forested areas to provide adequate resources to local communities.

6. Woodland/grassland mosaic

Initially just "woodland" but changed to include grassland following a discussion concerning some apparently naturally occurring *lowland* grassland areas that would not be captured by montane ecosystems. These areas may be important for (e.g.) elephants. There are some near Masito-Ugalla and some localised patches to the east of the Mahale Mountains.

Discussion occurred over the importance of keeping woodland and forest separate. Especially since they respond differently to fire – miombo woodland is fire-dependent (although it is currently burnt too often), whereas evergreen forest is severely damaged by fire and does not regenerate (at least not quickly).

As for 5., important to remember that one indicator of health should be ability to provide adequate natural resources to local communities.

7. Bamboo forest

Discussion over whether this should be a target. Are there species that are dependent on bamboo habitat?

Feeling was that too little is known about bamboo in the G.M.E (so we don't know what we would be losing). It is probably the least important habitat in terms of biodiversity, but it is also distinct and may be important for chimpanzees, especially where forest habitat has been reduced or fragmented.

As for 5., important to remember that one indicator of health should be ability to provide adequate natural resources to local communities.

8. Elephants

Considered important as a target in their own right, since they are directly impacted by threats that are separate from threats to their habitat (e.g., poaching).

An assumption was made that other species (e.g., giraffe) use the same corridors as elephants, so that by protecting corridors critical for elephants, we are captured important habitat links for other large mammals.

9. Agricultural productivity

Selected as the most important livelihood target, along with fisheries (which were captured in the lake shallows target). Agricultural productivity was felt to have its own set of threats (including lack of capital investment in farming techniques). Chosen as a target because a recent livelihoods study showed that agriculture is the primary source of income in the Mahale area.

# 3  Day 2 – Target Viability

## 3.1  Viability or Health Analysis: Key Ecological Attributes, Indicators, and Ratings

> This step in the process (**viability analysis**) asks us to look at each of our focal targets carefully to determine how to measure its "health" over time. And then to identify how the target is doing today and what a "healthy state" might look like. This step is the key to knowing which targets are most in need of immediate attention, and also for measuring success over time.

Approach

After an introductory presentation about viability analysis, meeting participants were lead through a thought exercise to begin to define the key components of a "good" evergreen forest. They were asked to imagine a healthy, functioning forest and to describe what it was about the forest that made it a particularly "good" place.  The following descriptions were offered:
- You would feel tired having arrived there
- Tall trees, big trees
- Middle trees
- Little trees growing
- Monkeys, squirrels, butterflies
- Smells (e.g., leaf litter)
- Cool, dark, closed-canopy overhead
- Sounds from above (e.g., birds and insects) and from underfoot
- A forest before human activity impacted it
- Full species composition; rich in species composition; species diversity*
- Not small (e.g., a fragment); extensive
- A water source nearby (e.g., spring); the sound of water
- Lots of layers (e.g., physical structure – canopy, mid-story, understory)*
- Humid (more so than the surrounding area)
- Decomposition happening; leaf litter; soft underfoot*
- No stumps or cut trees
- Simple paths, not roads
- Abundance of insects
- No exotic (non-native) species
- Balanced population structure of trees*
- Natural size/biophysical extent and shape of forest

From this list, those attributes of primary ecological importance were discussed.  Participants felt that the really key ecological attributes of a healthy evergreen forest were its species composition, physical structure, the process of decomposition, and the population structure of dominant tree species.  A variety of potential indicators (measures) were discussed and debated.  The one qualitative indicator everyone agreed upon was "change in species composition", and the entire group also agreed that the current status of this indicator can be described as "a minimal change (in species composition) for the worse".  It was also agreed that this current status is equivalent to a "good" rating or benchmark.

Participants then divided into four groups to work on Key Ecological Attributes, Indicators, and Status benchmarks for other targets.  The point of this group work was not to develop "perfect", nor even necessarily scientifically credible indicators or ratings, but to get started with the best information at hand. Each group's task was to:
- Determine 3 to 5 key ecological attributes for the target
- Identify at least one indicator (for one of the key ecological attributes)

- Develop benchmark criteria for that indicator (based on your collective expert opinion)
  – In terms of benchmarks, at least define the current status and a "good" rating
  – Remember that qualitative ratings are OK at this point (e.g. "Lots of in-stream barriers", "not enough fire" etc.)

The groups decided to focus on chimpanzees, miombo woodland-grassland mosaic, agricultural productivity, and sustainable fisheries. The remaining targets will be worked on as a follow-up assignment, and the entire viability assessment will be revisited regularly and improved as the CAP evolves.

<u>Results</u>

| | Conservation Target | Category | Key Attribute | Indicator | Current Indicator Status | Current Rating | Desired Rating |
|---|---|---|---|---|---|---|---|
| 1 | Chimpanzees | Condition | Habitat integrity | Frequency of human interference | | | |
| 1 | Chimpanzees | Condition | Habitat quality | Presence of key food types / fruiting tree species | | | |
| 1 | Chimpanzees | Condition | Habitat quality | Trends in population size (per community and as a whole) | | | |
| 6 | Evergreen Forest | Condition | Species composition | Change in species composition | minimal change (in spp composition) for the worse | Good | |
| 7 | Miombo Woodland - Grassland Mosaic | Condition | Availability of livelihood resources | Availability of livelihood resources (e.g., timber, firewood, honey, mushrooms, medicines) | | Fair | |
| 7 | Miombo Woodland - Grassland Mosaic | Condition | Species composition / dominance | Presence of *Brachystegia* spp, *Pterocarpus* spp, *Julbernadia glomiflora, Dalbegia melanoxilon*, grassland spp, and shrub spp. | all typical species present | Good | |
| 7 | Miombo Woodland - Grassland Mosaic | Size | Size / extent of characteristic communities / ecosystems | Number of hectares (or %) | very expansive | Good | |
| 8 | Agricultural Productivity | Condition | Seed varieties | TBD | TBD | | |
| 8 | Agricultural Productivity | Condition | Soil fertility | Nutrient levels in the soil (N, P, K) or presence/amount of commercial fertilizers | Minimal fertilizer application | Good | |
| 8 | Agricultural Productivity | Condition | Water availability | TBD | TBD | | |
| 8 | Agricultural Productivity | Size | Food supplied / size of harvest | Some measure of adequacy? | TBD | | |
| 8 | Agricultural Productivity | Land-scape Context | Implementation of agricultural 'best practices' | TBD | TBD | | |
| 9 | Sustainable Fisheries | Condition | Population age structure | % of population in adult life stage versus juvenile life stage | | | |
| 9 | Sustainable Fisheries | Condition | Water quality | Dissolved oxygen, pH, turbidity, and plankton levels | | | |
| 9 | Sustainable Fisheries | Size | Area of rocky and shoreline habitat | Number of fish nests and larvae | | | |
| 9 | Sustainable Fisheries | Size | Population sizes of key or indicator species | Catch rates | stable to decreasing? | | |

# 4   Day 3 – Stresses and Sources

## 4.1  Identifying Critical Threats

In many conservation situations, the biodiversity that we care about has either already been degraded, or is facing a series of threats that need to be countered by conservation actions. Threat ranking is a process wherein sources of stress, or direct threats, to your targets are identified and then prioritized so that conservation actions can be directed where they are most needed. Threat ranking is important because in any given project area, there are always many activities that could be undertaken. The idea is to identify the most critical threats so that energy can be directed at them. Criteria-based ranking of threats provides an objective analysis of which threats are truly the critical threats.

**Stresses** are impaired aspects of conservation targets that result directly or indirectly from human sources (e.g., low population size, reduced extent of forest system). In essence stresses are degraded key ecological attributes. **Sources of stress** (also known as direct threats) are the proximate activities or processes that have caused, are causing or may cause the stresses (e.g., incompatible trawling or logging). For the most part, sources of stress are limited to human activities.

**Critical threats** are the sources of stress that are most problematic, as defined through the threat rating process. Each stress is rated in terms of its likely *scope* and *severity of impact* on the target within the project planning horizon. Each source of stress is then rated in terms of its *contribution* and *irreversibility*, and these ratings are combined to determine threat ratings.

## 4.2  Threat Analysis: Stresses and Sources of Stress

Approach

A presentation about the process of identifying critical threats was given.  The differences between stresses and sources of stress were emphasised, and scoring criteria were reviewed.  Meeting participants then returned to their same break-out groups from the previous day, and were tasked with converting all key ecological attributes (from their viability/health assessment) into stresses, as well as adding important additional stresses.  Each listed stress was then ranked in terms of its scope and severity of impact.  After each group presented their highest ranked stresses to the entire team, they returned to their groups to identify the proximate causes, or sources of all highly-ranked stresses.  Each source of stress was then rated in terms of its contribution and irreversibility.  Brief report-backs were given, and then new groups were formed to conduct full threat analyses for the remaining focal targets.  Stresses, sources of stress, and all ratings were captured on forms submitted to the CAP facilitator for entry into the CAP Workbook Tool.  Once in the workbook, a summary of threats could be produced (see result table below), and the most critical threats clearly identified.

## 4.3  Stresses and sources of stress for Evergreen Forest - discussion points

– "Loss of big trees" was considered to be covered by "loss of species", "loss of canopy cover" and "habitat destruction". Therefore not considered necessary to include it as a separate threat category.

– "Reduction in water in-flow" was considered to affect patches of evergreen forest, rather than forest strips along river banks (which are covered under the Rivers and Streams target). Hence it was included here as a threat category.

– Discussion around the possibility that increased water influx (i.e., flooding, erosion, etc.) could be a threat. General consensus was that this does not affect forest patches, only forest along river banks. Therefore, this threat category will be considered with respect to the Rivers and Streams target.

– "Habitat conversion" was kept as a stress category, despite the fact that it is also a source (for decrease in forest area), because the team felt there needs to be room to include the *sources* of habitat conversion.

– The stress "decrease in forest cover" evolved from "decrease in forest" and "decrease in forest vegetation". This involved a discussion over the problem that "forest" can mean to some people an area gazetted as a forest reserve, and the area is then considered to be stable as long as the theoretical boundary has not changed, even if every single tree has been removed from within it. Therefore "decrease in forest" was not considered to be sufficiently explanatory. "Forest cover" was considered to be less confusing and more specific than the term "forest vegetation".

– Discussion over whether "loss of species" should be split into "loss of valuable tree species" and "loss of bush-meat species". The term "valuable" was taken to imply economic value, but there was a feeling that this could be ambiguous and the terminology should be improved. The central argument for splitting this category was that some species are more threatened than others, which is difficult to capture using a generalised category.

– The eventual consensus was that this stress should remain lumped as "loss of species" because the management actions would be the same for all species (e.g., patrols, by-laws, etc.).

– Discussion occurred over whether to change the terminology to "loss of species due to exploitation" but the consensus was that exploitation is a source, and it is not the only one. Hence the stress was kept as simply "loss of species".

– An important discussion took place concerning the distinction between evergreen forest inside and outside the national park. The overall threat status of evergreen forest came out as high, which made the Chief Park Warden of the national park uncomfortable. The group decided that the threats to evergreen forest are different inside and outside the park. Only uncontrolled burning and invasion of non-native species were considered to occur inside the park, and then at much lower levels than outside. It was agreed that it would be important to somehow redefine the evergreen forest target, since the majority of the forest is inside the park, but it is the forest outside the park that is highly threatened and requires management.

# 5  Day 4 – Objectives

The summary table (see Figure 3) gave the core planning team an opportunity to review and discuss the overall results of our threat rankings and to see if any outcomes failed to match up with our team intuition.  Lilian Pintea also gave a presentation highlighting various threats whose impacts are evident from satellite imagery or via other data sources.  Team members were able to see actual examples and sites of deforestation, village and agricultural expansion, refuge settlements, and fire scars.  This information was particularly helpful in thinking about the scope and contribution of various threats.

In general, everyone was in agreement with the critical threats identified (i.e., those ranked Very High and High overall, plus those ranked Very High or High for one target).  However, two important issues received substantial discussion:

1.  The importance of exploring underlying factors was emphasised and all agreed that conducting a situation analysis was an imperative next step.  Issues like poverty and refugees are indirect and cross-cutting, and add valuable context.  In preparation for the situation analysis some sample scenarios (causal chain descriptions) need to be written, and key players (e.g., refugee camp and settlement decision-makers), as well as their responsibilities, need to be identified.

2.  The different levels of threats inside versus outside of protected areas (primarily Mahale Mountain National Park) was a key point of discussion and significantly influenced the threat rankings. It was recognised that scope rankings generally reflected the extent of the issue *outside* of protected areas. For example, agricultural expansion was identified as a critical threat, but is largely only a problem outside of protected areas.  Similarly, refugee camps, settlements, mining, and commercial logging are also primarily only issues outside of protected areas.  Uncontrolled fire, poaching, and timber extraction, however, are threats both inside and outside of protected areas -- yet to different degrees (i.e., less so in protected areas). It was suggested that the workbook be updated to reflect such geographic differences/qualifications.  This has now been done.

Finally, it was agreed that it was appropriate for a smaller group to review the threat assessment again prior to the next workshop.  This group should be made up of those most familiar with the Greater Mahale Ecosystem, and therefore in a position to base rankings on actual observation, experience, and/or data.  Additional expertise may also be sought.

Results

The highest ranked stresses identified for each conservation target are as follows (see CAP Workbook for complete stress assessment):
– Chimpanzees
    o Habitat loss
    o Population decline
    o Human interference
– Miombo woodland-grassland mosaic
    o Loss of species
    o Reduction of livelihood resources
    o Altered fire regime
    o Change in rainfall patterns
– Agricultural productivity
    o Shortage of water
    o Use of fire to clear land
    o Problem animals (wildlife)
    o Human population growth

- Sustainable fisheries
    - o Loss of species
    - o Loss of breeding habitat
    - o Loss of viable breeding populations / not enough reproducing adults
- Evergreen forest
    - o Loss of species
    - o Habitat conversion (complete loss of entire patches)
    - o Reduced area of forest cover
    - o Fragmentation

**Figure 3: A summary of the highest ranked sources of stress (or direct threats) identified across the entire Ecosystem**

| Threats Across Targets | Chimpanzees | Elephants | Rivers, Streams and Riparian Habitats | Montane Eco-systems of the Greater Mahale Region | Bamboo Forest | Evergreen Forest | Miombo Woodland – Grassland Mosaic | Agricultural Productivity | Sustainable Fisheries | Overall Threat Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| Project-specific threats | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 1  agriculture (expansion; outside of protected areas) | High | High | Very High | | Low | Very High | High | | | Very High |
| 2  uncontrolled burning (both inside & outside of protected areas) | High | Medium | High | | Low | Very High | Medium | | | High |
| 3  rapid human population growth | High | Very High | | Medium | | | | Low | | High |
| 4  settlements (expansion; incl. planned & unplanned; outside of protected areas) | High | High | High | | | High | | | | High |
| 5  deforestation | | | Very High | | | | | | Medium | High |
| 6  infrastructure development (e.g. roads, ecotourism facilities) | High | High | | | | High | | | | High |
| 7  refugee camps / settlements (outside of protected areas) | | | | | | Very High | | | | High |
| 8  mining (outside of protected areas) | High | | | High | | Medium | | | | High |
| 9  livestock keeping (outside of protected areas) | | | High | | | High | | | | High |
| 10  insufficient awareness -- general | | | | High | | | | Medium | Medium | Medium |
| 11  logging (commercial; outside of protected areas) | Medium | | | | | High | Medium | | | Medium |
| 12  diseases | High | | | Medium | | | | | | Medium |
| 13  lack of awareness -- farming practices | | | | High | | | | Medium | | Medium |
| 14  hunting (illegal vs. legal?) | | | | | Low | High | | | | Medium |
| 15  poaching (inside & outside of protected areas, but less so inside) | | High | | Low | | | | | | Medium |
| 16  building along shoreline | | | | | | | | | High | Medium |
| **Threat Status for Targets and Project** | Very High | Very High | Very High | High | Low | Very High | High | Medium | High | Very High |

## 5.1  Draft Objectives

> Objectives are specific and measurable statements of what you hope to achieve. They represent your assumption as to what you need to accomplish and as such, become the measuring stick against which you will gauge the progress of your project. Objectives can be set for and linked to the abatement of threats, restoration of degraded key ecological attributes, and/or the outcomes of specific conservation actions. A good objective meets the criteria of being: specific, measurable, achievable, relevant, and time limited.

Approach

An introductory presentation to developing objectives and strategies was given.  It was emphasised that we will revisit our objectives again, and only begin drafting strategies, in the next workshop following a situation analysis.  However, now that critical threats and key attributes have been identified, we are in a position to begin thinking about and formulating objectives.  The core planning team was divided into three new groups and each group was tasked with developing some draft objectives for the Greater Mahale Ecosystem.  These objectives are to be based on critical threats and/or key attributes, and for each objective the group should ask: What would make this a better (more specific) objective? For example, knowing: What? Where? Or how much? Proposed objectives were recorded on flip chart sheets and presented back to the team for discussion.

Results

- By 2013, Land Use Management Plans (which are in accordance with the/a Greater Mahale Conservation Plan) are developed for all villages (settlements?) in the Ecosystem, and by 2018 are fully implemented.
- From 2013 onward, all infrastructure development is compatible with land use plans and the conservation *of key areas* (as laid out in the Greater Mahale Conservation Plan?).
- By 2018, the regional population growth rate has fallen to the National average (2.6%).
- By 2018, connectivity *of key areas* within the ecosystem is restored and maintained.
- By 2015, more than 75% of agricultural activities take place *in designated areas* (as laid out in the Greater Mahale Conservation Plan?).
- By 2012, the frequency and extent of uncontrolled fire is reduced *by 50%* (or "to acceptable levels" – and we need to define "acceptable" in the viability assessment for each major terrestrial habitat type).
- By 2015, the total deforestation rate (of evergreen forests and woodlands; hectares per year) is reduced *by 60%\** from the 2007 baseline. (*Needs to be linked to a size KEA (key ecological attribute) of the individual systems, or the combined extent of evergreen forests and woodlands).

In discussing these draft objectives, it was recognised that they could be improved by undertaking the following:
- Creating an ecosystem-wide map showing conservation priorities and other preferred land-use zones that reflect a common vision for GME to better inform PLUM activities and other land-use decisions (e.g., infrastructure).
- Determining (to the best of our ability given current information) where key corridors are for the relevant targets.
- Determine a size Key Ecological Attribute for Evergreen Forest – minimum area to accommodate species and ecological process requirements.
- Obtaining soil maps
- Mapping "good" (both suitable and conservation compatible) agricultural areas; good was roughly defined as having the following parameters:
    - o  <40% slope
    - o  Loose soil – not too compacted, nor too shallow

- o Near to settlements
- o Not on river banks or in legislated buffer areas (e.g., must be >500m from the lake; 50-60m from river channels)
- o Adequate and accessible water supply
- o Conditions suitable for desired crops
- o Placed to avoid/minimise wild animal problems/conflicts

## 5.2 Information Needs / Follow-up Assignments

| WHAT | WHO |
|---|---|
| **Elephants** - all information regarding | |
| Elephant Population Size | Rupia – Mpanda<br>Kweka – Kigoma |
| Elephant Migration Routes | Rupia – Mpanda<br>Kweka – Kigoma |
| Incidents of poaching for ivory and bushmeat | Rupia – Mpanda<br>Kweka – Kigoma |
| Tongwe East | Rupia – Mpanda |
| Katavi National Park | Mtui |
| Masito – Ugalla | Sood |
| IUCN for historical data? | Kathryn |
| **Human Population Figures** | |
| Human Population figures for each ward (in the Greater Mahale Ecosystem) 1987 – 2007 (if possible at annual intervals) please collate available information – planning office should have village registers? | Saka - Mpanda<br>Miriam – Kigoma<br>Kathryn |
| Workshop Summary | Genevieve<br>Kathryn |
| **Logging / Hunting License Figures** | |
| Figures (number of licences and quantities permitted for harvest) from Kigoma and Mpanda district about logging or wildlife hunting licenses issued | Kweka – Kigoma<br>Rupia – Mpanda |
| **Salt factory** | |
| Fuel requirements of the salt factory in terms of wood | Sood |
| **TANROADS** | |
| Latest road plans | Kathryn |
| **Statistics** | |
| % and hectares of each major habitat type and/or land use1986/87 – 2007 | Lilian |
| Rate of loss 2001 – 2007 of each habitat type | Lilian |
| **Refugees** | |
| Refugee camps/settlements – future plans and who decides? | MEMP |
| **Mining** | |
| Mining – official plans | MEMP |
| **Fisheries** | |
| General compilation of information | MEMP |
| Catch rates | Sood |
| **Example Situational Analysis** | |
| Example Situational Analysis | Gen / Zoe |
| **Masito – Ugalla** | |
| Biodiversity Data and report | Sood |
| Socio-economic data and report | Sood |
| Review the health assessment | Zoe, Kathryn and Shadrack |
| **MAPS** | |
| Potential agricultural areas | Lilian |
| Soil maps | Maruchu |

## 5.3  Next Workshop

Date: Week of February 4-8, 2008
Venue: Mahale Mountains National Park (depending on weather and logistics)

Participants commented that a formal invitation would be required requesting their attendance.

# 6 Appendices

## 6.1 Appendix 1: Meeting attendees

**Facilitator**
Genevieve Pence

**Wildlife Division HQ**
Abdallah Mwanauta – Planning Office

**Forestry and Beekeeping Division HQ**
Anna Lawuo – Catchment Division

**TANAPA HQ**
Joseph Kessy

**TANAPA Mahale**
Abel Mtui – Park Ecologist
Domician Njau – Chief Park Warden

**Rukwa Regional Secretariat**
Patrick Mwanakusha – Regional Natural Resources Officer
David Kilonzo – Regional Planning Officer

**Mpanda District Council**
Josephina Rupia – District Game Officer
Muok Saka – District Planning Officer

**Kigoma Regional Secretariat**
Cheyo Mayuma – Regional Natural Resources Officer

**Kigoma Rural District Council**
Dominic Kweka – District Natural Resources Officer
Mariam Hassan – District Planning Officer
Dickson Maruchu – District Agricultural Officer

**Jane Goodall Institute***
Lilian Pintea
Sood Ndumuligo – Masito Ugalla Programme
Rob Sassor – CAP Co-ordinator
Dr. Shadrack Kamenya – Gombe

**Frankfurt Zoological Society**
Kathryn Doody – Community Conservation Advisor
Dr. Zoe Balmforth – Ecologist
Magnus Mosha – Jr. Wildlife Officer

* Emil Kayega and Emmanuel Mtiti attended the opening of the meeting.

### 6.2 Appendix 2: Agenda

# Greater Mahale Ecosystem CAP Workshop 1
# 10 – 13th December, Kigoma

# Agenda

## DAY 1 - Monday 10th December - TARGETS

| Timing | Activity | Who |
|---|---|---|
| 8.30 am<br>30 minutes | Welcome<br>Introductions<br>House keeping | JGI<br>Genevieve<br>Kathryn |
| 15 minutes | Brief overview of how the next few days will be spent, as well as what will be covered at future workshops, with particular regard to the team's Terms of Reference. | Genevieve |
| 45 minutes | Brief background to MEMP<br>Geographic Overview of the Ecosystem<br>Background to Masito – Ugalla Ecosystem Project | Kathryn<br>Lilian<br>Kayega |
| 30 minutes | **Tea Break** | |
| 45 minutes | Overview of TNC's Conservation Action Planning process (questions welcome) | Genevieve |
| 15 minutes | Further questions/clarifications.<br>Review workshop objectives and anticipated outcomes, and check that everyone is happy with the agenda now that they know a bit more about the CAP process. | Genevieve |
| 45 minutes | Vision discussion - draft overall vision statement | Genevieve |
| 1 hour | **Lunch** | |
| 30 minutes | Presentation of previously identified Targets / Key Ecosystem Components and their general location within the Greater Mahale Ecosystem | Zoe<br>Lilian |
| 20 minutes | Introduction to Target Selection | Genevieve |
| 45 minutes | Re-Assess/Select Conservation Targets | Whole group |
| 45 minutes | Determine Natural Resource linked Livelihood Target(s) | Whole group |
| 10 minutes | Closing and Announcements | |
| | **Afternoon Tea** | |

# DAY 2 – Tuesday 11<sup>th</sup> December - TARGET VIABILITY

| Timing | Activity | Who |
|---|---|---|
| 30 minutes | Recap and introduction to Target Viability | Genevieve |
| 15 minutes | Brief review of previously identified Key Ecological Attributes | Kathryn |
| 45 minutes | Selection of Key Ecological Attributes, and at least one indicator and benchmarks for a species target | Whole group |
| 30 minutes | **Tea Break** | |
| 45 minutes | Selection of Key Ecological Attributes and at least one indicator and benchmarks for a landscape scale target | Whole group |
| 45 minutes | Selection of Key Ecological Attributes and one indicator and benchmarks for each of the remaining Targets | Group Work |
| 1 hour | **Lunch** | |
| 2 hours | Groups report-back; 10 minutes to present and 20 minutes team discussion | Whole group |
| 2.5 hours | **Kitwe Forest  Walk** | Whole group |
| 1 hour | Optional evening session: Introduction to the CAP Excel Workbook<br>*Venue to be determined | For those who are interested |

# DAY 3 – Wednesday 12<sup>th</sup> December
## STRESSES AND SOURCES

| Timing | Activity | Who |
|---|---|---|
| 40 minutes | Each group review their Key Ecological Attributes and *finalize* at least one indicator and benchmarks. | Group Work |
| 30 minutes | Overall Introduction to Threats Analysis: Stresses and Sources of Stress<br><br>Introduction to Stresses Exercise | Genevieve |
| | Identify and Rank Stresses for each Target | Whole group |
| 30 minutes | **Tea Break** | |
| | Continue Identifying and Ranking Stresses for each Target | Whole group |
| 1 hour | **Lunch** | |
| 15 minutes | Introduction to Sources of Stress Exercise | Genevieve |
| 1 hour | Identify sources for all highly ranked stresses for all targets | Thematic Group Work |
| 1 hour | Groups reporting back | Whole group |
| | **Afternoon Tea** | |

# DAY 4 – Thursday 13<sup>th</sup> December - OBJECTIVES

| Timing | Activity | Who |
|---|---|---|
| 15 minutes | Presentation of threats summary: results of stress and source of stress assessment from day 3 | Genevieve / Kathryn |
| 1 hour | Opportunity to interrogate and revise the threat analysis as needed. | Genevieve |
| 30 minutes | Introduction to Conservation Objectives and Strategies | Genevieve |
| 30 minutes | **Tea Break** | |
| 20 minutes | Discuss critical threats and degraded key ecological attributes around which to base objectives.  What do we need to accomplish to achieve our vision? | |
| 45 minutes | Brainstorm potential objectives (for critical threats and attributes highlighted above), in three break-out groups. | |
| 45 minutes | Group report-backs (5 minute presentation and 10 minute discussion per group) | |
| 1 hour | **Lunch** | |
| 1 hour | Where to from here… <br><br> − What will be covered in next workshop? <br><br> − Dates? <br><br> − What needs to be completed between now and then?  Especially with regard to situation analysis. <br><br> A.O.B | |
| 30 minutes | Workshop evaluation | Genevieve |
| | | |
| | **Workshop Summing Up and Close** | |
| | | |
| | **Afternoon Tea** | |

# Greater Mahale Ecosystem
# CAP Objectives: Workshop 1

1. To familiarize the Core Planning Team with The Nature Conservancy's Conservation Action Planning (CAP) process.

2. To select focal targets (Key Ecosystem Components) and recognize important nested components; including at least one livelihood or development target.

3. To complete at least one Key Ecological Attribute and Indicator for each target in order to begin to define its 'health' (viability) over time.

4. To complete a threats analysis; including stresses and sources of stress for each target, and a summary of critical threats to the Ecosystem.

5. To draft an initial set of ecosystem objectives.

6. To ensure that at least one team member has received introductory training to the CAP Excel Workbook.