Manual for assessment and monitoring fauna in the Lake Bosomtwe catchment area with proposed training needs for schools and communities

MANUAL FOR ASSESSMENT AND MONITORING

Assessment and Monitoring of faunal diversity is essential for population and environment "status" analysis.

In collecting distribution data, there are four leading methods:

- Research by processing existing data
- Research through hearing
- Research by collecting data through observation.
- Research on inhabitant species through capture and trapping methods.

The most certain method would be by the collection of the distribution data by the researchers themselves through observation. Hearing through interviews is also helpful by interviewing hunters, farmers, foresters and people who deal in bush meat. It minimizes errors in mapping the data gathered as well as providing various information available to distribution such as ecology and change in inhabitation environment.

Wildlife Data gathering through observation could be classified into two:

Observation of species by researchers themselves is the most certain method to gathering data on mammals and birds. Observation is classified into two.

1. Direct Observation:
This method is commonly used for monitoring and assessment of birds. It is a little bit difficult for mammals due to inhabitation under forest covers e.g. mice or due to their nocturnal nature.

2. Traces Observation:
Traces observation is common for medium to large sized mammals. Confirmation of the presence of such species is made by looking for field signs as foot prints, dung, tooth marks and identifying the species. Three practical methods available are as follows:

- Thorough walking over a study area. It is appropriate for researching of specific limited area but causes more work load.
- Walking through only prepared paths or mountain paths the data is often biased.
- Searching along a fixed route.

Research on inhabitant species through capture and trapping methods
This method is excellent for the confirmation of the presence of species and the acquisition of information out of the captured individuals. This method is applicable to small – sized mammals.

TYPES OF CAPTURING MEANS
Pit fall cans – for insectivores
Cans of 5 – 25cm diameter and 10 – 30cm depths are buried in the ground for pit falls. It can be made of metal or plastics or may be polypropylene cops. It can be used for field mice. No bait is required

MONITORING AND ASSESSMENT THROUGH CAPTURE AND TRAPPING METHODS
This method is suitable for small-sized mammals to confirm their presence in the study area. Types of capturing means:
* Pit fall cans (for insectivores).
Cans of 5 – 25cm diameter and 10 – 30cm depths preferably are buried in the ground for pit fall. It can be made of metal or plastics or polypropylene cups.
Pit fall cans are used for field mice.

Spring Traps: These are used for field mice and may be used for rats heavier than 100g depending on the size of the traps. This method is ideal when the traps are inspected daily since trapped mice may get rotten or spoiled by ants making identification of the specimen difficult.
Traps (Sherman Traps): They are made of tin late and foldable for portability. It is designed for capturing live species
Cage Traps: These are made of wire net, and usually used for capturing medium sized animals e.g. squirrels.
Mist Nets: these are used for capturing small to medium sized bats and birds. Mist nets with sizes of 6m and 12m are frequently used.

AMPHIBIANS

A. What is an amphibian?

Amphibians are vertebrate animals with metamorphosis

- Larva (tadpole): in the water
- Adult (frog) in the met land

(i) Classification

Class Amphibia
Order Caudata (salamandeis): about 400 species in the world
Order Gymnophiana (Caecilians): about 160 species in the world
Order Anura (frogs and toads): about 4,000 species in the world

(2) Amphibians occupy significant position in the ecosystem

- Mammals, fishes, juvenile crocodiles etc. live on them.
- They also serve as predator of invertebrate animals (insects, worms, etc).

(3) Threatened species

- 199 species are listed on the IUCN Red list of Threatened Animals (1996)

B. MONITORING AND ASSESSMENT

Amphibians: one of the best animals to evaluate wetland – outline of fauna and rough density of each species.

(1) It is important to note that amphibians are secretive.

(i) On the breeding site

- adults: easy count, to observe shape and call
- egg mass: easy count on some species
- larvae (tadpole): easy to observe, hard to identify the species

(2) Their activity affected with weather conditions

- active in the rainy night.

(3) Census methods

Walk along a census route, record and count encountered animals

(4) Research subjects

(i) fauna
substance: record all species

(ii) population density
substance: record the number of animals per unit (time or distance or area)

(3) Habitat

- substance: record the environment around each animal.

Reference

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PROPOSED TRAINING NEEDS FOR COMMUNITY, SCHOOLS and F.O.E –GHANA STAFF

Introduction

The success of management of the Lake's catchment area depends very much on the degree of support and respect awarded to the area by the fringe communities. Indeed when the local communities realize the positive benefits to be derived from the area they would ensure that any activity that would threaten the area is stopped. To ensure that the Lake's catchment area is sustainably managed, it is therefore necessary to upgrade the knowledge and skills of the people living around the area.

It is therefore being proposed that the Community, schools and F.O.E Ghana Staff be trained to enable them to have a fairly good idea of Wildlife roles and regulations to ensure that they become aware of the benefits they can derive from Wildlife, threatened and endangered species as well as species the law that allows to be hunted.

To derive full benefits from the ecotourism potentials of the catchment area, some committed people from the community should be trained in tour guiding and anti-poaching control techniques within the conservation area, as community forest guards.

Knowledge of grasscutter, snail rearing and bee-keeping techniques could also be imported to them to enable them venture into these areas as alternative source of livelihood as well as agro-forestry techniques.

To enable them to monitor and assess the faunal species in the conservation area, it is also being proposed that there should be training for them in skills for the identification of faunal species especially those of conservation concern.

Preparation of checklist for faunal species inhabiting the conservation area

It is envisaged that these proposed training would help the people within the Lake's Catchment area to become allied with the resource managers in protecting the area by halting degradation of the forest and fauna.

Creation of awareness on environmental protection, rational and sustainable use of biological resources including land, forest and wildlife as well as evolving a new thinking amongst them that as the local communities, they are responsible for protecting the lake, are needed for the sustainable management of the lake and its resources. This will include:

- Identification of species in their area especially those of conservation concern
- Training in tour guiding for community members and patrolling the conservation area
- Grasscutter rearing, snails and bee keeping
- Assessment and monitoring of faunal species in the conservation area
- Preparation of checklist on species inhabiting the conservation area
- Additional information could be added.

WATER QUALITY ASSESSMENT PROJECT

Rich biodiversity abounds in the Lake Bosomtwi Basin ranging from macro-micro fauna to flora species in the aquatic and terrestrial components of the Basin. These biodiversity resources are of dual significance as Life Supporting and Economic Resources to the surrounding communities and the nation at large.

Lake Bosomtwi is a national heritage that must be protected and also as an economic resource that must be utilised for the well being of the same society. This dual quality of the Lake Basin (economic utilisation and species conservation qualities) tends to create enormous imbalance in the entire natural resource architecture and eco-system arrangements of the lake Basin.

Importance of the Lake's Biodiversity

The importance of the Lake is derived from its major functions. These are:

- Natural Capital Stock: a biodiversity bank, and its species conservation serves as a source of useful renewable and non-renewable goods and services.
- Natural Sink: the ability to absorb waste products of all activities both natural and man-made through air, water and soil.
- Life-support System: the ability to ensure sustenance to the local environment.

A number of human-simulated practices in and around the Lake contribute to the progressive depletion of biodiversity resources and decline of the quality of aquatic and terrestrial resources found at the Lake. However, these activities form major threats to the survival of existing biodiversity components. Below are some of the practices that adversely affect the quality of the local environment:

- Excessive harvesting of fishes from the Lake leading to depletion and extinction of aquatic flora and fauna species.
- Application of chemicals in harvesting fish resulting in the decline of water quality and its related health and ecological implications
- Washing and bathing along the banks of the Lake Basin leading to a decline of water quality
- Physical developments along the catchments of the Lake that threated local biodiversity
- Farming close to the banks of the Lake Basin causing sedimentation of the lake and depletion of the water level.

Framework of the Biodiversity Remedial Process

The proposed Lake Bosomtwe biodiversity remedial and restoration process falls within the larger scope of the biodiversity assessment and monitoring programme being led by the local school children. The process will make use of the bottom-up-approach systems through community participation and early warning actions.

Schoolchildren are considered as the most suitable target group in the implementation of environmental resource conservation and protection programmes. This is because children at their formative age imbibe effectively better behavioural patterns and information and grow with it. Under this, schoolchildren from the various surrounding communities will be co-opted into a self-water quality monitoring and the ecology-growing programme. This process is expected to foster sustainable and equitable catchment practices through effective and conscious awareness creation and radical altitudinal change toward the environment.

In this way, the key step to ensure broader community participation and to have access to ownership and involvement of the process are essential to the success of the process.

(a) Justification

- The local environment is seriously under constant threat. This is in view of the continuous upsurge of human activities in and around the Lake.
- Against the backdrop of the dual-significance nature of the Lake as a national heritage and the source of economic wealth, it is broadly in place to solicit partnerships and commitments in the conservation and protection of the Lake.
- School children and the teachers are the key potential adopters and disseminators of awareness and good practices in relation to daily behaviour

(b) Thematic Monitoring Area

As a composite approach to environmental conservation and protection, the remedial process envisages using simple environmental remedial and restoration exercises in the areas of water quality and ecological monitoring. The following are the focus thematic areas:

- Self-Water Quality Monitoring by school children (using catchment action starter kits).

- Community Ecological Growing and Monitoring Exercise
- Results Assimilation and Early Warning Actions

(c) Statement of Intent

To:

- Instill conscious environmental conservation and protection awareness in the surrounding communities using Schoolchildren as the starter group(s) and eventually:
    - Reduce levels of pollution in the Lake through the adoption of good environmental practices in the communities.
    - Eliminate/minimize or control human-induced activities that an pose adverse threat to the natural resources at the Lake Basin.

(d) Process Activities

(i) Participation

Participation in the monitoring exercises will take place in Twenty-Two (22) Basic Schools and Junior Secondary Schools and in Twenty-Seven (27) communities surrounding the Lake Basin.

Four (4) self-monitoring groups will be formed on the basis of proximity to each other and for the purpose of capturing wider communities.

Below are the groupings:

Table A:

Zone A	**Zone B**
Abono	Nyameani
Obbu	Asissiriwa
Nkowi	Mim
Pippie	Konkoma
Abaase	Beposo
Adwafo	Brodekwano
Zone C	**Zone D**
Amakom	Detieso
Adjamam	Esaase
Duase	Nyinatiese
Dompa	Banso
Ankaase	Apewu

The self-monitoring exercise will make use of the existing school environmental club members as the starter sub-group in each participating school with the aim of expanding to cover other students as the participation grows.

Through peer group discussions and under the direction of the teachers, each school/community will have to identify, study and adopt sections of the Lake Basin in their communities for the monitoring purpose.

(ii) Self-Monitoring Using School Children

This process principally aims to test the effectiveness of relatively low-cost means of improving environmental awareness while also contributing to science education, and to encourage the schools to use their newly acquired knowledge for the wider benefit of their communities.

Each school will be tasked to monitor the quality of the Lake Water using simple rapid result testing kits (catchment action starter kits). Interested Teachers from the schools will lead the children in testing process and as well help interpret result to the level of understanding of the school children.

Water Testing
Water testing will involve the following process:

- Water sampling and preservation
- Water testing – including:
    - Visual estimation of number of types of pollutants
    - Visual inspection of the water
    - Water Life
    - Water Temperature
    - Water pH
    - Dissolved of Oxygen
    - Turbidity
    - Apparent colour

- Recording of result on the data recording booking sheet (sample attached).
- Interpretation and charting of results.

Task Ahead
- Selection of suitable sampling points within the watershed areas and immediate catchment of the Lake Basin.
- Baseline self-water testing for all the groups
- Demonstration of teachers and instructors of the use catchment action starter kits.
- Capacity building and/or enhancement of Friends Of Earth (F.O.E) staff in the monitoring and supervision of the exercise.
- Developing sampling, monitoring and evaluation protocols.

(iii) Community Ecological Improvement and Monitoring Exercise
This component of the process is fundamentally targeted at restoring the vegetative cover within the basin catchment and the watershed area. Again much responsibility will be placed on the communities in area of ownership and involvement.

The process will make selective use of some of the existing traditional resource conservation practices and improve on the capacities of the communities to apply simple scientific monitoring systems/methods of biodiversity.

Tree growing
Communities and their respective schools will be expected to employ ecological protection and conservation principles in the restoration exercise. On the whole, each group will be allocated with portions of the catchment areas as a "buffer working zone" for the carrying out the various exercises.

Group Task
Each group will be guided to identify the various common flora and fauna indicator-species within their allotted zone. The purpose is to assess the population trends in terms of distribution, endangered and extinction of species. The information determine of the kinds of species to be re grown in the effort to improve on the vegetative cover and enhance the restoration of biodiversity resource.

Apart from this, each group will be supplied with particular species of prime -replenish-need based upon the status of their indicator assessment for growing. Monitoring of the growth rate of these species will be carried out progressively and in a composite manner.

Task Ahead

- Develop simple species indicator assessment form.
- Selection and allocation of "buffer working zone".
- Development of management, monitoring and evaluation protocols/guidelines.
- Develop Ecology Growth rate and restoration indicator form.
- Community involvement in the development of restoration maps.

(e) Implementation Plan

The exercise will make fuller use of the school children in the various communities as the key adopters. The programme will be scheduled to meet the academic calendar of the schools.

Each School will be expected to undertake six (6)-(10) round monitoring trips to the various sites for water sampling and testing. On the tree growing exercise, school children will initially conduct species indicator sampling (renaissance sampling) within a week followed by the mainstream tree growing exercise throughout the term.

A bi-weekly growth rate assessment will be undertaken upon commencement of the exercise. By the end of the first year of commencement, a tentative ecology restoration map will be developed by the school children each term.

(f) Conducting Stakeholder Analysis

Stakeholder analysis will be undertaken to identify persons, groups or communities that have interest in the process and assess how their interest may affect the success rate of the project. The stakeholders will be categorised as:

- Primary Stakeholders – those who are affected positively or negatively by the outcome
- Secondary Stakeholders – those who can affect the outcome the proposed programme.

In identifying stakeholders, the following issues are to be considered:

- **Who** might be affected positively or negatively?
- **Who** are those likely to be affected?
- **Who** can make intended programme more **effective** through participation or **less effective** by non-participation?
- **Whose** behaviour has to change for the programme to succeed?

This exercise/analysis will allow an early identification of possible stakeholders and their level of influence and importance in the success of the programme. The following category will be established:

- Stakeholders having high degree of influence and who are very important to success of the process.
- Stakeholders of high importance and low influence
- Stakeholders with high influence who can affect the outcome but whose interest may not be the target of the process.
- Stakeholders with low influence and importance to the process and considered to be of lower priority.

(a) Identifying stakeholder Task

As part of the stakeholder analysis, various identifiable stakeholders groups will be apportioned specific tasks within the structure of the programme. These projects must be perceived to be high priorities at the local level e.g. environmental improvement programmes.

(b) Stimulating Stakeholder Action

A contributing factor likely to ensure success of the programme has been the implementation of a number of stakeholder tasks. These are likely to generate significant interest among the community, stimulated further actions and enhanced the credibility of the programme as being the plan for action.

Tracking Feedback and Evaluation

Targeted feedbacks from the implementation of the process will be tracked progressively through regular visits and supervision of the process. This will be augmented the assessment of completion task apportion to the various stakeholders.

Evaluation and auditing of the process achievement will be carried out at the end of each term through stakeholder consultations and discussions. Regular community fora will be carried out as means of soliciting broader consensus and improving and sustaining participation in the process.

Anticipated Outcomes

- Increase Environmental conservation and protection awareness in the surrounding communities
- Reduce levels of pollution in the Lake through the adoption of good environmental practices in the communities.
- Eliminate/minimize or control human-induced activities that pose adverse threat to the natural resources at the Lake Basin.
- Solicit support to activate and sustain stakeholder interest in the protection of the Lake.