



**EWNHS**

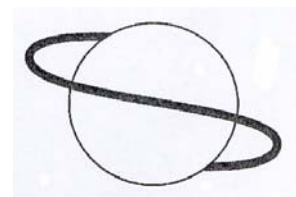


**ETHIOPIAN WILDLIFE AND NATURAL HISTORY SOCIETY  
(EWNHS)**

**African NGO-Government Partnerships for Sustainable Biodiversity  
Action**

**Guidelines for Monitoring Ethiopian's  
Important Bird Areas (IBAs)**

**By Yilma Dellelegn and Mengistu Wondafrash**



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**October 2001**

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# Guidelines for Monitoring Ethiopia's Important Bird Areas

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## 1 Introduction

Monitoring has become a buzz word that can be heard in environmental conservation communication much like "biodiversity", "sustainability", or "communities". Institutions or projects of this or that kind cannot do without some form of monitoring in their work plans. The Cambridge International Dictionary of English defines "monitoring" as the process of observing or watching something over a period of time. The word "monitor" is derived from the Latin, *moneo*, to warn; it therefore implies a warning system to give notice of changes (Grimsdell, 1978). Monitoring generally involves the follow-up and regular checking of certain variables in order to discern changes or trends. The changes we are trying to follow-up (monitor) can be effects brought about by natural conditions in the environment or conditions where human manipulation is involved. The word is also defined as the task of supervising, regulating or controlling. This definition can be related to forms of human or personnel management. An example can be a time punching machine that monitors (controls) the check-in/check-out times of staff in an office. Monitoring is also understood from a project cycle context where logical approaches are used to plan activities on determined indicators. Mentioning indicators, it will be useful to know that with the signing of the Biodiversity Convention several countries in the world are formulating indicators for biodiversity monitoring (Sutherland, W.J., 2000).

The presence of properly executed policies can assist monitoring work on the environment. In Ethiopia, for example an environmental policy has been approved and laws on Environmental Impact Assessment have been drafted. Laws on genetic engineering are also ready for implementation. The presences of these legal instruments, when properly executed are believed to be a basis for monitoring and regulating Ethiopia's environment (Tewoldebirhan, 2001).

This paper discusses monitoring from an ecological standpoint and more precisely on carrying out ecological monitoring in Ethiopia's Important Bird Areas (IBAs). As a result, monitoring here is seen as long-term observation, recording, collation, analysis and reporting of information. This paper starts out by giving examples of current definitions of the word and sets out to explain various aspects of monitoring in connection to why, what, and who in monitoring. This is followed by a description of the stages and requirements of monitoring. A brief overview is given on other institutions that have or are still carrying out ecological monitoring in the country and the relevance of these studies is seen vis-à-vis IBA monitoring. In the final chapters, guidelines are presented to assist the design of a monitoring strategy for IBAs in Ethiopia and a list of variables for monitoring work in Ethiopia's IBAs are summarised.

Ecological monitoring has several definitions but all definitions lead to an overall connotation that it has to be carried out with objectivity and purpose. Here are some definitions of monitoring:

*"Monitoring is a tool which assists to recognise changes (in direction, size, rate) when they occur, to assess the reasons for the changes and to predict their consequences."*

"Biodiversity Support Programme (1993)"

*"Monitoring is intermittent (regular or irregular) surveillance carried out in order to ascertain the extent of compliance with a predetermined standard or the degree of deviation from an expected norm."*

Hellawell, J.M (1991)

*"Monitoring involves repeated collection of information over time, in order to detect changes in one or more particular variables."*

Bennun L.A. (2000<sub>2</sub>)

*"Monitoring is the process of measuring change in ecological character in any wetland over a period of time."*

Ramsar Convention Bureau, Annex to Resolution 5.6

*"Monitoring is the continuous or periodic surveillance of the physical implementation of a project to ensure that inputs, activities, outputs and external factors are proceeding according to plan".*

Norwegian Agency for Development Co-operation

To be effective monitoring requires careful planning and a clear set of objectives. A monitoring strategy is flexible so that the final reporting is able to provide solutions to issues rose at the inception and determined objectives at the start of the monitoring task. The monitoring strategy may not be able to find all the answers to our problems. This is the strength of a properly planned strategy

because a planner will be able to detect changes and revise the strategy as required. One will appreciate the fact that monitoring, as an activity is a process that involves some amount of dynamism and is one of those tasks that requires various levels of participatory input. This emphasises the fact that monitoring should be more than an academic exercise. The data gathered from such activities should be analysed, interpreted and fed back in to the management of the site.

## **2 Purpose of Monitoring in IBAs**

It is recognised that much of the planning in environmental conservation within Africa (especially sub-Saharan Africa) is not based on a firm ground of baseline data (BSP, 1993). As a result, decisions on the use of resources are haphazard and often lead to costly manoeuvres with irreparable consequences. IBAs in this context are conservation sites with special biological significance (and at times with other cultural and historical importance) that require a regular audit of their status. Monitoring is an extremely valuable exercise that can provide information on location, timing and numbers of declines and credible evidence for legal action (Sutherland, W. J, 2000).

Much of what has been identified in connection with IBAs (their selection process and prioritisation for conservation action) goes hand in hand with other conservation activities including monitoring programmes within their premises. Inputs concerning the conservation of IBAs and consequently all conservation decisions on priority sites requires up to date information on the status of species and habitats, socio-economics/perceptions of human communities and use of resources. A monitoring programme that is conducted on a regular basis will

provide valuable lessons that can be incorporated to existing policies and legislation.

The purpose of setting up a monitoring programme within IBAs can also be associated to the specific objectives of why we want to monitor what is being monitored. While the purpose for monitoring is a general statement (i.e. to observe if conservation interventions are having a positive effect) an objective based on the above purpose would see if particular interventions or management decisions (i.e. setting up of a protected area, eco-tourism, etc) are having an effect on a particular species or habitat. Besides those given above, the following points that were the results of a brainstorming session on the reasons for IBA monitoring (Paulinus N.C., 2001) are briefly elaborated.

## **2.1 Information Communication and Networking**

A monitoring activity can produce immense amount of data that can be communicated in various forms to other partners in the region and outside. The African region already has an active cohort of members in the African NGO-Government BirdLife Partnership. The region has several things in common and the production of information can be the basis for co-managing resources. This can be done if the network can communicate relevant information generated on the status of IBAs to other members.

## **2.2 Early warning sign detection**

One of the key reasons for carrying out monitoring on a long-term basis is to enable the detection of changes in the environment. Sutherland (2000) states that

major changes in the world's ecosystems have taken place without being quantified. The solution to this oversight is the establishment of institutions of monitoring systems that can detect modifications based on the measurement of variables in the environment.

### **2.3 Production of information for the revision of management plans/Updates on IBAs**

Monitoring is an activity that should be tailored to the needs of management. In many cases human intervention (mostly planned decisions on the better management of the environment) requires careful planning. A decision to alter or add something on to the environment calls for a regular check to see if it is positively affecting the environment. This can only be seen if the monitoring programme has been instituted to produce relevant data to make necessary changes to management plans. Several countries in Africa have produced Important Bird Area Directories that need updating. This update can be readily produced if a monitoring database has the information required.

### **2.4 Provision of credible and defensible data on species and site conservation**

Conservation issues increasingly involve legal action (Sutherland, 2000) and as a result the information we collect from the field must be substantial. Institutions like the Ethiopian Wildlife and Natural History Society produced a number of educational publications and are looking forward to play a great role in advocacy and lobbying with regards to on-the-ground conservation of IBAS (Kinf Abebe, pers. comm.). Public support for the conservation of species and sites can only come

from properly collected, analysed and reported information from monitoring schemes.

## **2.5 Identification of data gaps**

A monitoring activity is analogous to the effort that one goes through to find the right piece in a jigsaw puzzle. It is usually the case that a young monitoring programme cannot collect information on every species or environmental condition in the beginning (Corfield, 1993). A programme usually begins its work by concentrating limited resources on the main aspects of an ecosystem. Data can be usefully interpreted if it is collected over a long period of time on a regular basis. After a bigger picture is formed (further to our analysis of data), the programme can safely interpret from the results on where and what to do about data gaps. In this case the gaps in data have been detected as a result of a continuing monitoring activity.

## **2.6 Impact assessment of management actions**

Monitoring allows us to follow-up our own actions on the environment. Human action on the environment can be either deliberate or unintentional. A management action in most cases is a deliberate or planned action on the environment. Monitoring in this case will assist by giving us information on whether the management action has been for better or worse.

## **2.7 Contribution to the conservation of biodiversity**

The Convention on Biological Diversity in Article 7 in subparagraphs (b) and (c) states that contracting parties are responsible for carrying out monitoring programmes pursuant to the identification of components of biological diversity. The CBD particularly emphasises the need to carry out monitoring work on those organisms requiring urgent conservation measures and processes that have a likelihood of being threatened. Monitoring in this sense plays an important role by generating data over a period of time and providing baseline information for subsequent decisions.

## **3 What do we monitor in IBAs?**

What we can or cannot monitor in IBAs is to a large extent decided by the level of information that we wish to extract using available resources and input (BSP, 1993). Available resources here refer to trained staff, funds, equipment and time. It should also be noted that even if we have fulfilled the above requirements we might not still be ready to carry out monitoring in the field. External factors including faulty partnerships with local communities and our credibility with other institutions can be deciding factors even when assumed we are prepared.

IBA monitoring should take into account the fact that we need to collect information on atmospheric/geo-physical, biological and human factors of the environment. The various parameters will require distinct approaches and preparation for the collection of data.

### **3.1 Atmospheric/Geo-physical information**

These data concentrate on the environmental support systems without which other biological and human factors cannot function. These include information on the weather (especially rainfall records), micro-climatic conditions (including air pressure and humidity), soil moisture, water levels, general hydrology, water quality etc. These factors are conveniently recorded if the monitoring programme has some form of permanent station from where records can be collected at regular intervals. Better still, other institutions could be carrying out most of the work that is required under this topic. Records could be made available to the programme with necessary arrangements.

### **3.2 Biological Information**

Since birds form the core element of the IBA programme, there would always be a tendency to put all efforts on collecting information on either general bird information for the area or concentrate on selected species that could be threatened. Decisions often have to be made about which species of birds are most in need of conservation action. The basis for these decisions and the effectiveness of resulting conservation measures can only be judged by monitoring the number and distribution of the species in question (Gillian et al, 1998). A full complement of the monitoring activity should try to avoid the bird slant to collect useful data on plants, other wildlife, and even possible fish and insects. A strong IBA monitoring programme will eventually come up with a list of biological indicators (variables) that can be rapidly assessed to give an implied explanation about changes and trends in the environment. For example, such indicators will give us

information on the status of biodiversity, trends in specified ecosystems or the population of wildlife in an area.

Sample censuses are perhaps one of the most reliable methods of collecting various kinds of monitoring information both for birds and other wildlife in an area (Sutherland, 1997). Sutherland (1997) discusses in an excellent compendium of census techniques that would apply for various groups of wildlife. Bird census (monitoring) techniques are thoroughly discussed in Bibby et al. (1992) and other useful references include Pomeroy (1992) and Bibby et al (1998). Regular counts of birds and other major wildlife can be instituted in IBAs by staff or trained counters within Site Support Groups. One useful method of estimating the numbers of biological populations particularly for density parameters is the "distance" method (Buckland et.al, 1993). This method employs either line transects or point counts and uses a software "DISTANCE" to calculate density figures. A straightforward but crucial part of the method is that perpendicular distance measurements are taken from the point where the bird was first observed to the line which a transect walk is following.

### **3.3 Human Related Information**

Grimsdell (1978) explains that the study of human population trends and influences around sites of special concern (IBAs, other protected areas) is fundamental to any monitoring programme. Human population increase and the needs of communities from the natural environment is the major factor that will affect the survival of ecosystems and species. Information concentration should be around the effects of growing settlements, cultivation, vegetation removal, hunting,

grazing, and fishing. Other related information on disease transmission from domestic livestock to wildlife or vice versa is also considered important. Views and attitudes of local people on the conservation of natural resources or perception on particular species are information that is necessary for future management decisions. Much of this information can be collected from national census data or aerial photographs. With the advent of GIS technology most of this task has been simplified but again requires substantial resources especially funds to secure information on relatively small IBAs. In general an approach that would require some baseline study (if this is not available) is a necessary before a monitoring programme is run. In this case, a preliminary socio-economic survey that would be able to collect basic data on demography is useful. One time information can be collected during this survey including location, distance from nearest city, protection status, community composition, sex and age data etc. On the other hand other information including soil erosion and degradation are factors that require a study on time series and thus would need a system for regular checks.

#### **4 Who should monitor IBAs?**

Monitoring is generally an activity that requires some level of expertise. Again this depends on the level of information we would wish to extract. The more information we need, it may mean using various types of scientific equipment that again require skilled manpower for operation. To be effective, monitoring in IBAs should attempt to consolidate all kinds of backgrounds and skills. This has the advantage of allowing us to use both highly skilled persons and valuable participation at the community level. Not being able to use all kinds of expertise would tend to polarise our efforts and the whole programme can be handicapped as

a result of emphasis on either making use of highly skilled people (costly, un-integrated but more quantitative data) or using local communities alone (less costly, integrated with more qualitative data). Striking a balance on the use of either group should be the main concern of the programme from the start. Local participation is extremely valuable if and even if the IBA monitoring programme cannot readily involve highly skilled people, it should settle for strengthening close links with the local communities. The IBA programme in Ethiopia has just begun forming Site Support Groups in IBAs that need critical attention. Three of the five Site Support Groups (established at Menagesha-Suba National Priority Forest and Berga and Weserbi Flood plains) are proving useful in providing valuable information that would help consolidate the database of these IBA sites. A good balance of local community involvement to skilled persons should be a ratio of something between 60:40 or 70:30. Bennun (2000<sub>2</sub>), explains that involving local communities in IBA monitoring has the advantage of sharing responsibility, build a sense of ownership, establishing trust, a means for feedback and encouragement and to create new skills.

At another scale, the IBA monitoring programme should be able to assess what is going on in terms of other similar work carried out by other institutions at IBAs. Knowing who is doing what and where is perhaps one of the preliminary tasks of such a programme. The monitoring work will thus define itself to certain aspects of monitoring work if other institutions are covering other areas. Of course this calls for better and stronger networking with institutions to get access to their data that may be useful in the management of the site.

Besides the above, the monitoring programme must be ready to train others (especially at the local community level) and be ready to justify the need to establish a monitoring programme at the sites for subsequent assistance both from inside and outside the country.

## **5 Stages of Monitoring**

A monitoring programme cannot be realised over a short period of time. For monitoring to be effective, a programme needs to pass through a series of stages where one successively builds into another before a fully-fledged monitoring programme actualises itself (Hellawel, 1991). Hellawel (1991) describes these successive stages as survey, surveillance and monitoring.

### **5.1 Survey**

This is an exercise where observations are made using standardised procedures within a restricted period of time. This exercise does not presuppose what the outcomes of the survey ought to be.

### **5.2 Surveillance**

This exercise is a sequence of surveys carried out to find out a time series. It can be used to investigate variability that can be encountered over time and again does not presuppose the outcome of the task.

### **5.3 Monitoring**

Monitoring is a regular or irregular surveillance carried out to ascertain the extent of compliance with a predetermined standard or the degree of deviation from an expected norm. Monitoring refers to the measurement of variables over time in a

systematic way with specific objectives in mind. It assumes a specific reason for the collection of data, such as ensuring targets are being met.

Hellawel (1991) explains while both surveys and surveillances are open-ended, monitoring sets standards that can be checked regularly to see if conditions are being met. Standards can vary according to needs and in IBA monitoring it could mean different things including trends in the density or abundance of a key species, change of perception of human communities living around a site or even increase or decrease of use of natural resources even after awareness-raising campaigns and Environmental Education workshops are conducted. Surveillances gain from a number of surveys carried out in an area and monitoring will build on the knowledge gained from surveillances. This usually means that even though surveys are carried out to increase knowledge or satisfy curiosity, surveillances (being a step ahead) require some planning to see if there is a change of ecological character over time. Monitoring (regular or irregular surveillance) on the other hand defines a standard after the results of a time series that can be checked to see if there is a deviation from the norm.

## **6 Requirements of Monitoring in IBAs**

Bennun (2000<sub>2</sub>) explains that the two fundamental questions one should ask before the start of a monitoring programme are 1). How useful the data are likely to be and how they can link to the aspects they are supposed to indicate and 2). How feasible is it to collect the data over a long period of time. The second question especially poses questions related to practicality, cost-effectiveness, and available skills to do the job.

The following are general requirements in IBA monitoring:

### **6.1 Needs Assessment**

It is practically unjustifiable to carry out a monitoring programme without a reason nowadays. The main issue here is that resources to execute a monitoring exercise are limited and hard to come by. A major requirement here is the definition of the problem. For example, is it the declining numbers of a globally threatened species at a site, unprecedented habitat changes due to intensification of farming practices, or the need to assess changes after a better conservation practice is instituted in an IBA? It is usually a working principle to have some kind of vision or hypothesis before starting the programme. Needs assessment can be an exercise that can be carried out using a brainstorming session of IBA staff and concerned stakeholders of the site.

### **6.2 Defining and refining objectives**

A monitoring programme as any planned activity requires objectives that give outline clearly and practically what we want to achieve. There could be a number of objectives but it can be helpful to define main objectives and immediate objectives. The immediate objectives differ from main objectives because they are an elucidation of the kind of activities that will be carried out in the ensuing work. Another way of refining the objectives is to have long-term and short-term objectives.

### **6.3 Defining the work site**

Though it is outwardly apparent in our case, it is an extremely important question that needs consideration and reconsideration. An IBA will be delimited and should

have its own area. As a result, a monitoring team will not have much trouble of where to work and concentrate efforts. The crucial question here is that the working definition of an Important Bird Area in effect deals with a site or network of sites whose areas can alter with the input of information on the needs of a species over time. While an IBA should be amenable to conservation efforts it should also be supportive of a sites-based approach. An IBA as a requirement should be large enough to support self-sustaining populations for those species they are selected for. But perhaps more important is that the site should form part of a wider integrated conservation activity to embrace sites, species and habitats (EWNHS, 1996). Our monitoring work should enable us to collect information about the site but also about the circumstances affecting the site from outside. Grimsdell (1978) notes that an ecosystem defined in spatial terms only can alter with time and this requires as redefinition at a later time. An update of the site delineation is a possibility in many of our IBAs because boundaries may have not considered the migration and extent of distribution of key species we are trying to conserve.

Bennun (2000<sub>2</sub>) in his guidelines for monitoring Kenya's IBAs summarises the following as requirements for monitoring.

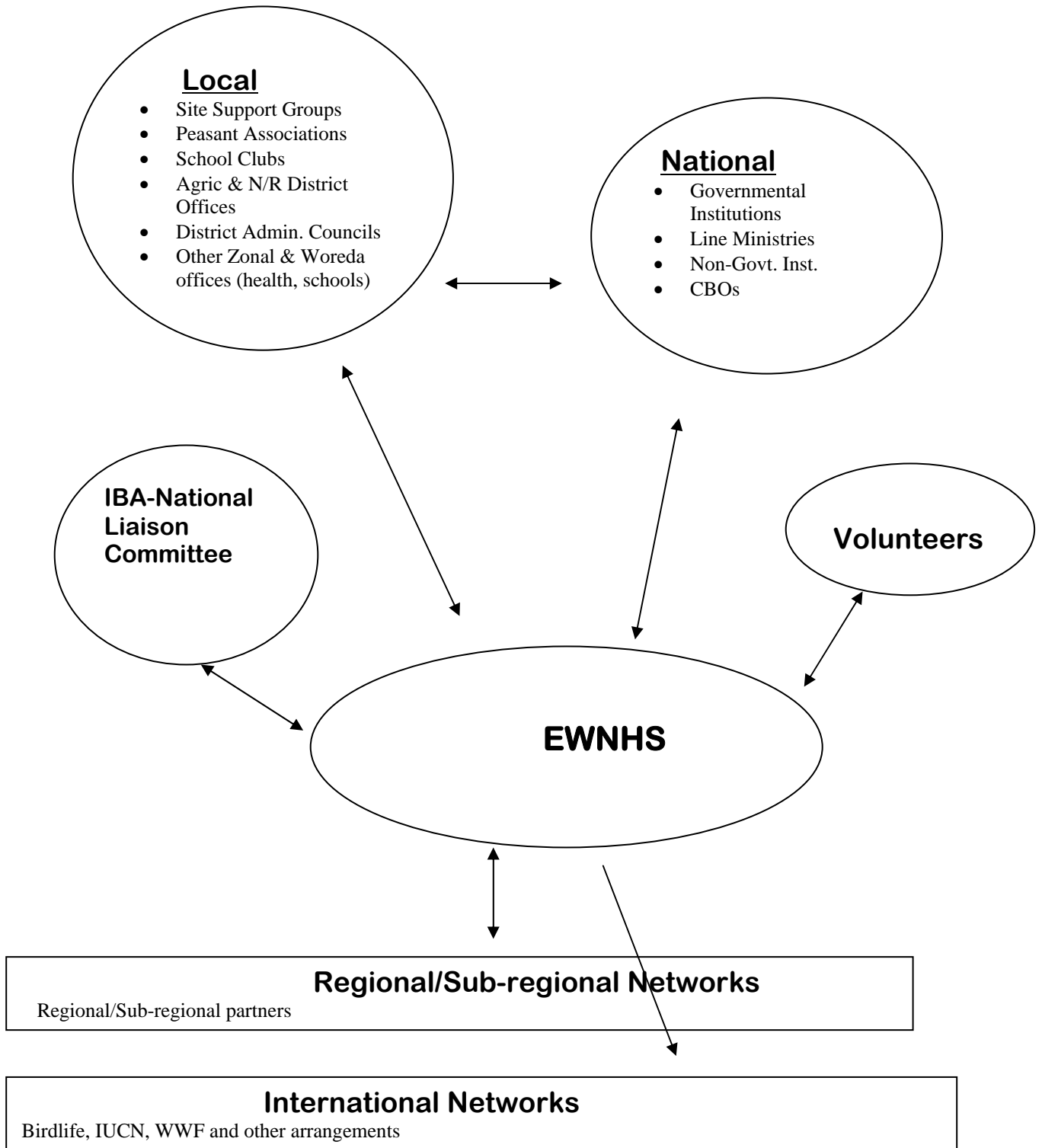
- **Design and testing:** A sample design appropriate for data analysis and carried out by the persons who will later do the work in the field.
- **Co-ordination:** A central institution with relevant expertise should be responsible for co-ordination. The Ethiopian Wildlife and Natural History Society could take the lead but needs to work closely with other institutions locally.

- **Data collection:** The question of who should collect data is made practical by the fact that technical staff cannot be everywhere to do the work. This entails involving local communities and institutions in monitoring. There may be a need to cover basic expenses of volunteer workers including transportation and subsistence.
- **Training and Evaluation:** Proper training and timely evaluation to update any gaps that will be revealed during field work.
- **Equipment:** Basic equipment like binoculars and notebooks are needed. Expensive equipment and complicated methodology are best avoided.
- **Sample analysis:** Analysis that requires work outside field should be avoided for IBA monitoring.
- **Data analysis:** A centralised database should be kept with the lead institution at least. Data system should allow storage and assessment of trends.
- **Reporting:** Periodic monitoring reports should be sent around to stakeholders including members of the IBA-NLC. These reports could be annual or bi-annual as the circumstance dictates.
- **Application:** Reports form a basis for future action. Reports should outline what needs to be done (recommendations) with a defined responsibility to an institution or body.
- **Review and feedback:** The process of monitoring requires constant review to be effective. The procedures outlined above allow the evaluation of the methods and approach used. This is a means to re-design the strategy afresh with the incoming of new information.

The following considerations are useful to note in the design of a monitoring programme for IBAs:

- Monitoring can be a useful tool to obtain useful data but it should also be noted that it could cause disruption to the species under study (Sutherland, 2000). Disruption can be caused as a result of disturbance from trapping or possible manipulation.
- Bias and error is a major factor that needs to be addressed in the course of design of the monitoring strategy and collection of information.
- Monitoring data is useful if the strategy can combine the recording of broad overall changes with localised studies.
- Locate and liaise with stations in or around IBAs that periodically collect data on environmental variables (temperature, rainfall etc). Look into possibilities of setting up such stations for priority sites (as a starter) where there are none.
- Use a combination of direct and indirect monitoring methodology for effective data sets.
- Involve as many relevant stakeholders as possible in the programme. This is actually not only the right thing to do to gain acceptability but ensures that the approach is sensible and sustainable. It will be useful to carry this task through by inviting experienced individuals who have worked on this kind of scheme before.
- As monitoring is an activity that builds on previous work, ensure that preliminary objectives are slowly refined to include major issues including human-environment attributes.

**Figure 1. Schematic drawing showing EWNHS's likely relationship to other institutions and groups in IBA monitoring work.**



## **7 Roles of Institutions in IBA monitoring**

### **7.1 Ethiopian Wildlife and Natural History Society**

The Ethiopian Wildlife and Natural History Society as an initiator of the whole programme should have a central role of co-ordinating the work especially in the field. This may not be practical all the time but the initiation would be expected from a central institution. Monitoring requires a trained effort and EWNHS would need to carry the capacity of training field personnel. Data organisation, collation and analysis would preferably be carried out at the Society's office where there would be a central database for collected data. This presumably also means that the Society has to build its own capacity in the handling of large masses of data. Another important area where the Society would need to concentrate its efforts and time is to the task of fund raising. Several of the monitoring schemes would be just starting and such fledgling groups will always seek help. The Society would also be responsible to report to the NLC.

### **7.2 IBA National Liaison Committee**

The National Liaison Committee, as per its terms of reference should give an overall institutional co-ordination and advice to the monitoring programme.

### **7.3 Governmental Organizations**

It is assumed that several governmental organisations and institutions would already have some kind of monitoring schemes in place. They can feed into this programme by sharing their experience. The design of the programme shown here can act as a starting point but it can be further enriched by the valuable

experiences that can be gleaned from other institutions. Technical co-ordination can also be shared amongst various institutional stakeholders. There might even be a possibility of creating a kind of working group or committee selected amongst active institutional participants.

#### **7.4 Non-governmental Organizations**

Their main role is data collection. Again we are not yet aware of all the important work other NGOs are carrying out in various areas where IBAs are located. They may not be collecting ecological data because several work closely with local communities. This kind of social and economic data is invaluable for decision-making if accessed. Many NGOs have systems where they share their data in various forms including journals, annual reports, or libraries.

#### **7.5 Various Zonal and District Offices**

Main task is data collection but this only should include Agricultural and Natural Resource Departments and Offices. Zonal and District Administrative Councils are useful to liaison with for smooth running of work at the site. The Society or other persons carrying out monitoring work should always contact administrative institutions not only for facilitation of work but also for future feedback ensuing from monitoring work.

In all circumstances it would be advisable to obtain permission before gaining access to or new areas. To that end, please remember the following:

- It is good practice to cultivate and maintain good relations with landowners/tenants and their staff.

- Do not carry out any survey work without prior access permission, preferably in writing.
- Respect the wishes of the landowner, e.g., give advance warning of the dates of your visits.
- Be aware of special circumstances for some sensitive species or habitats, e.g., night surveys and access to occupations land or shooting estates.

### **7.6 Site Support Groups/Peasant Associations/School Nature/Wildlife Clubs**

Their main task should be data collection but the programme should fully involve these groups in the envisaged growth and process of monitoring. This is particularly important because the programme should not be seen as a potestate where local people are working for it. The programme should expect and work towards a scenario where local people are not only a means to achieving a goal (in this case data on a site).

### **7.7 Volunteers**

There will always be volunteers to work on the programme. Their provenance can be local or international.

### **7.8 Regional and International Networks**

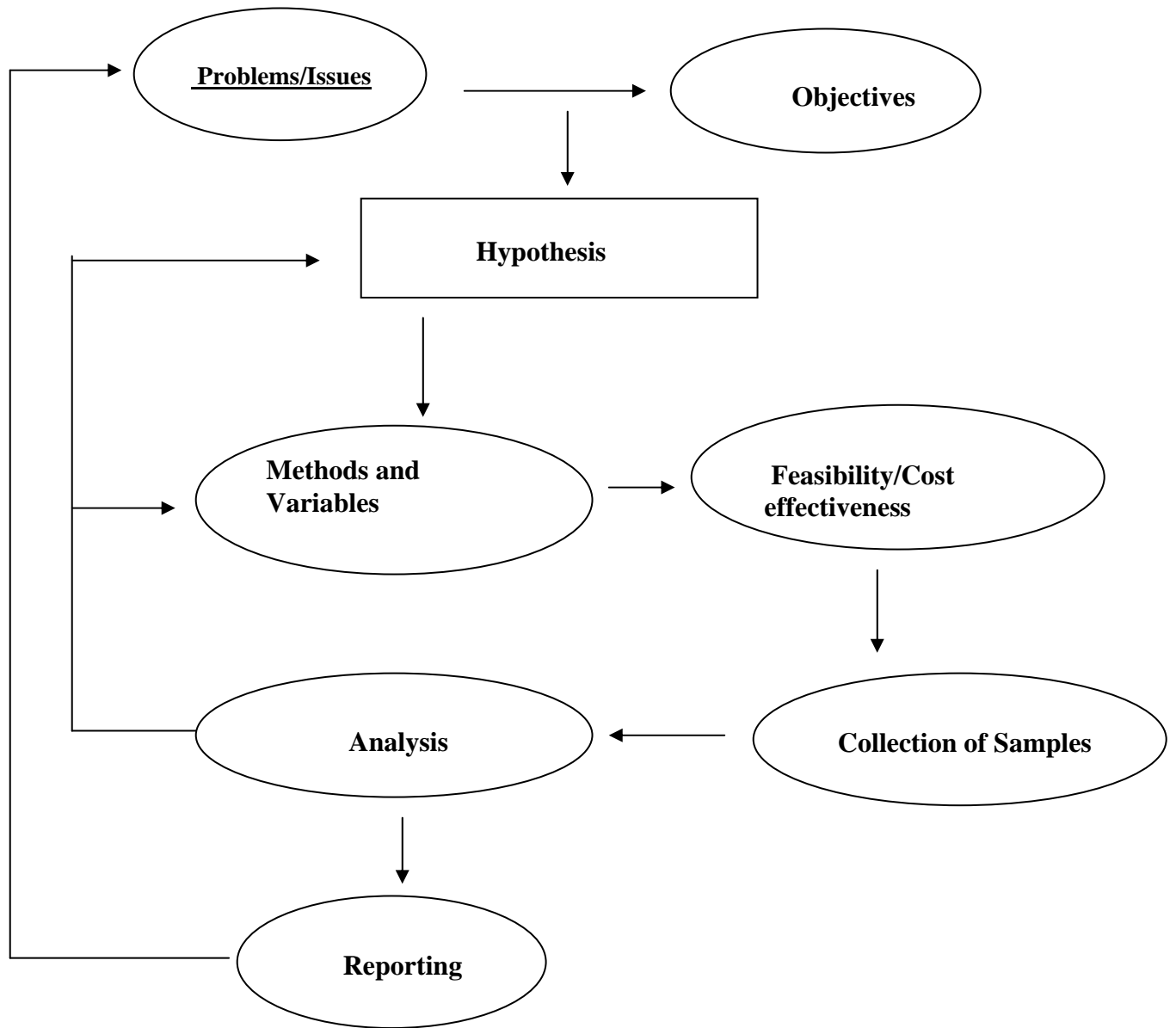
This is seen to be a significant issue in the Council of African Partnership (CAP) when it comes to carrying out monitoring at a regional scale. EWNHS can carry out monitoring in conjunction with other institutions in the country but this is not enough when considering regional actions. There is a need to harmonise conceptual issues and the collection of basic monitoring data across the network. Though

sites and indicators selected can vary from country to country, harmonisation can assist to rate sites regularly for pressure, state and response (Bennun, 2001).

## **8 Designing a Monitoring Strategy for IBAs in Ethiopia**

The following schematic diagram, which has been adapted from the framework for designing a wetlands monitoring programme (Ramsar Convention Bureau, 2000) has the major principles for a monitoring framework that can be used in IBAs. It should be noted that monitoring is a dynamic activity and a framework must allow for flexibility and adaptability to local situations.

Figure 2. A framework for monitoring IBAs in Ethiopia.



## **8.1 A Description of the Framework Components**

### ***8.1.1 Problems/Issues***

This is clear statement of what we would like to look at. It is also useful to describe the extent and probable cause of the problem. This stage will also call for further investigation into baseline studies carried out before. In general it is a stage of observation, retrospection, knowing where we stand in knowledge gap and collecting as much information on the issue as possible.

### ***8.1.2 Objective***

The objective is the basis for the collection of information. It is a statement of an achievable goal within a set period of time. In other words, an objective must be attainable and tangible.

### ***8.1.3 Hypothesis***

A hypothesis is generally a proposition given as an explanation for a phenomenon and can act as a guide to an investigation (Kothari, 1985). This may be an optional requirement when monitoring IBAs but is useful in the sense that the programme can make assumptions before the collection and analysis of data on the issue. A hypothesis assumes and the objectives are tested to see if the assumption is true or not. A hypothesis is also an acceptable approach because it is an extension of defining the problem and thus assists in clarifying the issue.

#### ***8.1.4 Methods and Variables***

There are several methods to choose from (Sutherland, 1997), and there must be caution to work with a specific option for the problem. Methods selected must also provide information to test the hypothesis. Variables on the other hand enable us to detect changes and also assess the significance of any modification.

#### ***8.1.5 Feasibility/Cost effectiveness***

During this phase, the programme should be able to know whether the activity can sustainably be carried out or not. A number of factors should be taken into consideration including the availability of trained personnel, access to sampling sites, availability and reliability of specialised equipment, data analysis methods, use of data, and reporting methods. Cost of running the programme is an important issue considering due to the fact that resources are limited. Is the programme reliant on existing budget or is looking into the possibilities of getting full funding or co-funding?

#### ***8.1.6 Collection of Samples***

This stage is where the real fieldwork begins. The programme must ensure that people who are doing the actual collecting are conversant with methods and variables. Data should be collected using standard procedures. Analysis will be affected unless a uniform approach is used. Documentation of data is crucial as well as timely processing of data.

### **8.1.7 Analysis**

The analysis should be rigorous and effective. This doesn't necessarily mean that we would need to use complex methods. Ensuring that the results of the analysis are documented properly assists timely reporting.

### **8.1.8 Reporting**

The report should be timely and carried out in a cost-effective manner. A concise report that indicates whether or not the hypothesis has been supported will assist the development of the programme because it allows the exposition of gaps. Reports lastly should have management recommendations and actions for future monitoring work.

## **9 Monitoring variables in Ethiopia's IBAs**

| <b>No.</b> | <b>Site Name</b>        | <b>Variables for Monitoring</b>                        | <b>Monitoring approach</b>  |
|------------|-------------------------|--|-----------------------------|
| 1          | Lake Abbe               | Awash River level, vegetation cover and wetland census | Level checks, samples       |
| 2          | Abijata-Shalla Lakes NP | Waterfowl census                                       | Samples                     |
| 3          | Akaki Wetlands          | Waterfowl and wetland census                           | Samples                     |
| 4          | Alemaya/Adele Lakes     | Waterfowl Census                                       | Samples                     |
| 5          | Aliyu Amba-Dulecha      | Yellow-throated Serin                                  | Transects                   |
| 6          | Anferera Forest         | Forest extent and structure, Prince Ruspoli's Turaco   | PCQs, transects             |
| 7          | Ankober/Debre Sina      | Ankober Serin, habitat structure                       | Transects, vegetation plots |
| 8          | Arero Forest            | Forest extent and structure, Prince Ruspoli's Turaco   | PCQs, transects             |
| 9          | Ashenge Lake            | Waterfowl Census                                       | Samples                     |

|    |                            |  |                               |
|----|----------------------------|--|-------------------------------|
| 10 | Awassa Lake                | Water levels, waterfowl census                     | Level checks, samples         |
| 11 | Awash National Park        | Yellow-throated Serin, Sombre Chat, habitat        | Transects, annual review      |
| 12 | Awash Valley               | General condition of habitats                      | Annual Status Review          |
| 13 | Awi Zone                   | Forest extent and structure, wetland bird census   | PCQs, samples                 |
| 14 | Babille Elephant Sanctuary | General condition of habitats                      | Annual Status Review          |
| 15 | Bahir Dar-Lake Tana        | Waterfowl and wetland Census                       | Samples                       |
| 16 | Bale Mts. NP               | Wattled Crane, Spot-breasted Plover, Forest extent | Samples, PCQs                 |
| 17 | Baro River                 | Waterfowl & wetland Census                         | Samples                       |
| 18 | Berga Floodplains          | White-winged Flufftail, habitat condition          | Samples, vegetation surveys   |
| 19 | Bishoftu Lake              | Waterfowl & wetland Census                         | Samples                       |
| 20 | Bisidimo                   | Salvadori's Serin                                  | Transects                     |
| 21 | Bogol Manyo                | Degodi's Lark, White-winged Dove                   | Transects                     |
| 22 | Bonga Forest               | Forest cover, structure                            | PCQs                          |
| 23 | Boyo Wetlands              | Waterfowl census and Wattled Cranes                | Samples                       |
| 24 | Chelekleka Wetland         | Waterfowl & wetland census                         | Samples                       |
| 25 | Chew Bahir Lake            | Waterfowl (lesser flamingos)                       | Samples                       |
| 26 | Chilimo                    | Forest cover, endemic birds                        |                               |
| 27 | Choke Mts.                 | General condition of habitat                       | Annual Status Review          |
| 28 | Dawa-Wachille              | White-winged Dove, Jubaland Weaver                 | Transects                     |
| 29 | Desa'a Forest              | Forest cover and structure                         | Vegetation surveys            |
| 30 | Dilu/Tefki Flood plains    | Wattled Cranes, General condition of habitats      | Transects, annual review      |
| 31 | Dindin-Arba Gugu Forest    | Forest cover and structure                         | PCQs, other vegetation survey |
| 32 | Denkoro Forest             | Forest cover                                       | PCQs other vegetation survey  |
| 33 | Entoto Natural Park        | General condition of habitats                      | Vegetation surveys            |

|    |                              |  |                               |
|----|------------------------------|--|-------------------------------|
| 34 | Fincha'a-Chomen Swamps       | Wattled Cranes and other wetland species   | Samples, vegetation surveys   |
| 35 | Fogera Plains                | Waterfowl and wetland census               | Samples                       |
| 36 | Gambella Nat. Park           | Forest cover, waterfowl and wetland census | Vegetation surveys, samples   |
| 37 | Gefersa Reservoir            | Waterfowl census                           | Sample census                 |
| 38 | Genale River                 | General habitat status                     | Annual status review          |
| 39 | Green Lake                   | Waterfowl census                           | Samples                       |
| 40 | Gudo                         | Waterfowl census, Spot-breasted Plover     | Samples, Transect             |
| 41 | Guassa Montane Grassland     | Spot-breasted Plover, Abyssinian Longclaw  | Transects                     |
| 42 | Hugumburda/Grat Kahsu Forest | Forest cover and structure                 | Vegetation surveys            |
| 43 | Jemma-Jara Valleys           | Harwood's Francolin                        | Transects                     |
| 44 | Jibat Forest                 | Forest cover, endemic birds                | Vegetation surveys, transects |
| 45 | Koffe Swamp                  | Wattled cranes, wetland birds              | Transects, samples            |
| 46 | Koka Dam                     | Waterfowl counts                           | Samples                       |
| 47 | Konso-Segen                  | Friedmann's Lark                           | Transects                     |
| 48 | Langano Lake                 | Waterfowl counts                           | Samples                       |
| 49 | Liben Plains/Neghelle        | Sidamo Long-clawed Lark                    | Transects                     |
| 50 | Wabe Shebelle River/Warder   | White-winged Dove, general habitat         | Transects, vegetation survey  |
| 51 | Mankubsa-Welenso Forest      | Ruspoli's Turaco, Salvadori's Serin        | Transects                     |
| 52 | Melka Wakena Dam             | Waterfowl counts                           | Samples                       |
| 53 | Menagesha-Suba Forest        | Forest cover, endemic birds                | PCQs, transects               |
| 54 | Metu-Gore-Tepi Forests       | Forest cover, endemic birds                | PCQs, transects               |
| 55 | Mid-Abbay River Basin        | General habitat status                     | Annual status review          |
| 56 | Mugo Highlands               | Ruppell's chat, habitat trends             | Transects, vegetation surveys |

|    |                         |   |                               |
|----|-------------------------|---|-------------------------------|
| 57 | Nechisar NP             | Nechisar Nightjar   | Transects                     |
| 58 | Mago Nat. Park          | General habitat condition, trends                           | Vegetation surveys            |
| 59 | Omo NP                  | General habitat condition, trends                           | Vegetation surveys            |
| 60 | Senkelle Sanctuary      | General habitat status                                      | Vegetation surveys, reviews   |
| 61 | Shire Lowlands          | Status review   | Annual status review          |
| 62 | Simen Mts. NP           | Ruppell's Chat, habitat condition                           | Transects, vegetation surveys |
| 63 | Sof Omar                | Salvadori's Serin   | Transects                     |
| 64 | Shiek Hussien           | Salvadori's Serin   | Transects                     |
| 65 | Sululta Plains          | White-winged Flufftail, habitat status                      | Transects, vegetation surveys |
| 66 | Tiro-Boter-Becho Forest | Forest cover, endemic birds                                 | Transects, vegetation surveys |
| 67 | Turkana Lake/Omo Delta  | Waterfowl & wetland survey                                  | Samples                       |
| 68 | Yabello Sanctuary       | Ruspoli's Turaco, white-tailed Swallow, Abyssinian Bushcrow | Transects                     |
| 69 | Yangudi Rassa NP        | General habitat status                                      | Vegetation surveys, reviews   |
| 70 | Yegof Forest            | Forest cover, endemic birds                                 | Vegetation surveys, transects |
| 71 | Yerer Forest            | Vultures  | Transects                     |
| 72 | Ziway Lake              | Waterfowl & wetland birds                                   | Samples                       |
| 73 | Zuqualla Mountain       | Forest cover, endemic birds                                 | Vegetation surveys, transects |

## 10 Conclusion

Monitoring is a complex activity and is not as straightforward as it sounds. The Ethiopian Wildlife and Natural History Society recognises that it cannot carry out

this enormous task alone but that it needs close links with governmental, non-governmental institutions and local set-ups for the purpose of defining a monitoring programme within IBAs. The importance of monitoring in IBAs can be understood from the fact that they are a unique collection of natural assets within the context of the human environment. The fact that they are within reach of human needs and aspirations makes them dynamic realms where modifications can detract optimum conditions for species and habitats. It is easily recognised as well that such changes are in effect the detriment to human livelihoods and quality of life on earth. As a result, an effective monitoring programme strategizes to fill gaps of knowledge with valuable information that will give us lead to better planning of human lives as well as fulfilling the needs of the environment.

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