



Republic of the Philippines  
Department of Environment and Natural Resources  
**BIODIVERSITY MANAGEMENT BUREAU**  
Quezon Avenue, Diliman, Quezon City  
Tel. Nos.: (632) 924-6031 to 35 Fax: (632) 924-0109, (632) 920-4486  
Website: <http://www.bmb.gov.ph> E-mail: [bmb@bmb.gov.ph](mailto:bmb@bmb.gov.ph)

DEC 22 2016

**TECHNICAL BULLETIN**  
NO. 2016 - 05

**SUBJECT: GUIDELINES ON BIODIVERSITY ASSESSMENT AND MONITORING SYSTEM FOR TERRESTRIAL ECOSYSTEMS**

Pursuant to Republic Act No. 7586 otherwise known as the National Integrated Protected Areas System (NIPAS) Act of 1992, the DENR Administrative Order No. 2008-26 or the Revised Implementing Rules and Regulations of the NIPAS Act, Republic Act No. 9147 or the Wildlife Resources Conservation and Protection Act of 2001, and in order to provide science-based and updated information on terrestrial ecosystems and resources as basis for the effective management of habitats and species, the following Guidelines on Biodiversity Assessment and Monitoring System (BAMS) for Terrestrial Ecosystems is hereby issued.

**Section 1. Objectives.** The BAMS aims to provide the Protected Area Superintendents and field implementers a standardized method of assessing and monitoring terrestrial ecosystems. The results will be used in implementing science-based management interventions and in the formulation or updating of the respective Protected Area Management Plans and other Conservation Plans. These will also be used in updating bio-physical profiles and development of relevant reports on the state of biodiversity and protected areas.

**Section 2. Scope.** The BAMS shall apply to terrestrial ecosystems such as protected areas under the NIPAS, critical habitats, and other terrestrial conservation areas.

For the assessment and monitoring of inland wetland ecosystems, a separate Manual shall be issued.

**Section 3. The Biodiversity Assessment and Monitoring System (BAMS).** The BAMS is a tool for scientific assessment of the current status of terrestrial biodiversity, habitat quality and certain ecosystem services. It is used to establish a baseline for long-term monitoring and management, and determine trends in ecosystem and species abundance and diversity.

In the conduct of BAMS, partnerships with the academic institutions, local governments, and civil society organizations involved in biodiversity conservation shall be forged to enhance expertise on assessment and monitoring.

*de*

**Section 4. Complementarity of BAMS with other Assessment and Monitoring Tools/Systems.** Other assessment and monitoring tools/systems that have been developed and tested in protected areas are defined and distinguished as follows:

- a) **Protected Area Suitability Assessment (PASA)** – A tool for rapid assessment of biodiversity to determine the suitability of an area for establishment as protected area under specific categories of the National Integrated Protected Areas System.
- b) **Biodiversity Monitoring System (BMS)** – A tool designed to improve information available for decision-makers in protected areas through the regular collection of data on natural resources and their utilization. The BMS aims to identify trends in biodiversity and resource uses to guide the actions of the Protected Area Management Board, the Local Government Units, and the local communities in natural resource management in protected areas.
- c) **Lawin Forest and Biodiversity Protection System (Lawin)** – A forest and biodiversity protection system that integrates forest, biodiversity and threats monitoring, implementation of interventions to address threats and monitoring of the response of the forest ecosystem to these management interventions. Lawin systematizes patrolling and also enhances the Field Diary method of the BMS.

The BAMS, as an improved modification of the Resources Basic Inventory (RBI) that provides guidance in the establishment of permanent monitoring transect(s)/plot(s), shall be adopted in all protected areas. It is intended to complement and not substitute the above-mentioned assessment and monitoring tools/systems.

The table below illustrates the complementarity among the above Assessment and Monitoring Tools/Systems:

Frequency	Methods	Sampling/ Monitoring Area(s)	Use/Output
<b>PASA</b>			
One-time screening of areas to determine its suitability as a protected area under the NIPAS.	<ul style="list-style-type: none"> <li>• Secondary Data Collection</li> <li>• On-site Observation including Spot Mapping</li> <li>• Key Informant Interview</li> <li>• Analysis</li> </ul>	Adequate number of study sites representative of the proposed protected area	For determining the suitability of an area under the NIPAS, and appropriate category of the NIPAS
<b>BMS</b>			
Focus Group Discussion (FGD): quarterly  Field Diary: during field monitoring/visit	<ul style="list-style-type: none"> <li>• FGD</li> <li>• Field Diary</li> <li>• Photo Documentation</li> <li>• Transect Walk</li> </ul>	Depends on the size of the PA, types of threats, critical conservation and resource-use areas,	For decision-making and/or undertaking management interventions by the DENR and PAMB.

WJ



Frequency	Methods	Sampling/ Monitoring Area(s)	Use/Output
Photo Documentation: quarterly  Transect Walk: quarterly		number of people using the resources, management zones, threatened species and populations.	
<b>Lawin</b>			
Part of regular PA patrolling	<ul style="list-style-type: none"> <li>• Observation recording</li> <li>• Data management using CyberTracker and SMART (Spatial Monitoring and Reporting Tool)</li> </ul>	Depends on need based on existing information for improved protection	<ul style="list-style-type: none"> <li>• Spatial-based information for management intervention</li> <li>• Identification of hotspots for timely response</li> <li>• Electronic record of patrol effort</li> </ul>
<b>BAMS (improved modification of the RBI)</b>			
Biodiversity assessment for baselining: one-time  Monitoring: every five years; except in cases when catastrophic events occurred, monitoring is done immediately after	Physical Assessment  Flora Assessment  Fauna Assessment	<u>Assessment:</u> at least one two-kilometer transect, representative of the forest formations present in the protected area  <u>Monitoring:</u> permanent monitoring transect(s)/plot(s) per forest formation type	Biophysical Assessment and Monitoring Report, in conjunction with the Socio-Economic Assessment and Monitoring Report, as input to the following: <ul style="list-style-type: none"> <li>• PA Management Plan formulation or updating</li> <li>• science-based management interventions</li> <li>• Database management</li> <li>• State of the PA Report</li> </ul>

**Section 5. Team Formation and Composition.** The BAMS Team shall be created by the Regional Director, with a minimum team composition as follows:

- 5.1. PASu or conservation area manager as the BAMS Coordinator;
- 5.2. PASu staff members assigned either at the PENR or CENR Offices with knowledge on the following: watershed monitoring; biodiversity database and mapping; flora assessment and monitoring; fauna assessment and monitoring;
- 5.3. Technical LGU staff members who are involved in environment and natural resources management projects;
- 5.4. Representative of indigenous peoples within the protected area;

to

- 5.5. Faculty and researchers from higher education institutions with research interests in the protected area and have academic agreements with the DENR; and,
- 5.6. Other members of the BAMS team may include: civil society organizations involved in conservation, volunteers from mountaineering or outdoor clubs, environmental action movers or supporters, media or radio communication clubs, concerned civil society organizations, private and industry sectors; other concerned government agencies or entities like water districts, area development projects, interagency task forces in the locality

**Section 6. Biodiversity Assessment of Terrestrial Ecosystems.** The assessment of terrestrial ecosystems has four major components. Attached diagram illustrates the whole process flow.

- a) **Physical Assessment.** Various relevant maps (i.e. land use, land cover, vegetation, soil, climate, rainfall and topography) shall be overlaid with the map of the area. Map outputs shall be analyzed to be used as guides in identifying location of transect(s) where flora and fauna assessments will be performed. Information on climate, water and soil shall also be gathered for the purpose of understanding how biodiversity influences the quality of physical environment and vice-versa.
- b) **Flora Assessment.** The flora assessment covers ecosystem and species levels. The flora assessment may or may not be simultaneously conducted with the fauna assessment, provided that both are conducted subsequently and adopts the same two-kilometer transect lines.
- c) **Fauna Assessment.** The fauna assessment covers arthropods, herpetofauna, birds, and mammals. The fauna assessment shall run in parallel with the flora assessment.
- d) **Analysis and Database Management.** Data gathered from physical, flora and fauna assessments shall be encoded into a database and analyzed in an integrated manner.

The above-mentioned assessment methods shall be supplemented by a BAMS User Manual to be issued by the DENR through the Biodiversity Management Bureau.

**Section 7. Biodiversity Monitoring of Terrestrial Ecosystems.** The two-kilometer transect that is representative of each forest formation type, and used in the baseline assessment, shall serve as the permanent monitoring transect and shall be monitored regularly every five years after the baseline survey. Monitoring shall be conducted at the start of each protected area management plan period. In cases of catastrophic events, such as but not limited to, strong typhoons and volcanic eruptions, monitoring should be done immediately thereafter. Fauna

species shall be monitored in the same permanent monitoring transect following the prescribed assessment methods.

When manpower and financial resources allow, a two-hectare permanent monitoring plot shall also be established, in the highest plant diversity portion of the two-kilometer transect lines. The permanent monitoring plot(s) shall be monitored every five years.

**Section 8. Reporting.** In conjunction with the results of the Socio-Economic Assessment and Monitoring System, results of assessment and monitoring and the analysis generated shall be reported by the PASu or BAMS Coordinator to the respective Management Board(s), equivalent management body, and/or the DENR Regional/Field Offices for appropriate management interventions. Both the results and recommendations for management interventions shall be submitted, for information and confirmation, by the PASu or BAMS Coordinator to the Office of the Secretary through the Office of the Regional Director and the Biodiversity Management Bureau. Raw data shall be organized into a database and shall be retained with the Office of the PASu.

Existing RBI reports shall be reviewed and updated based on this Technical Bulletin.

**Section 9. Fund Allocation.** The Regional and Field Offices shall allocate necessary funding for the Biodiversity Assessment and Monitoring of Terrestrial Ecosystems.

**Section 10. Effectivity.** This Technical Bulletin shall take effect immediately and shall be circulated for the information and guidance of all concerned.



**THERESA MUNDITA S. LIM**  
Director



# Biodiversity Assessment and Monitoring Process Flow

