

Uses & benefits of consistent indicators & scalable sample design for BLM local/national data needs

BLM needs information at local to national scales

to address many different management objectives and ecosystem threats. Within BLM, much effort is invested in assessment and monitoring for specific local management needs. However, these data generally cannot be combined or used for other monitoring needs due to differences in how the data were collected. A consistent, but flexible, approach to assessment and monitoring would not only increase the reliability of BLM data locally, but also would provide scalable data that could be combined at different scales for multiple needs including:

- Management planning/actions
- Compliance
- Restoration activities
- Impacts of energy development

BLM's Assessment, Inventory & Monitoring (AIM) Project

is implementing an approach to monitoring built on core indicators and methods for key attributes of ecosystem sustainability and scalable sample design. This flexible approach:

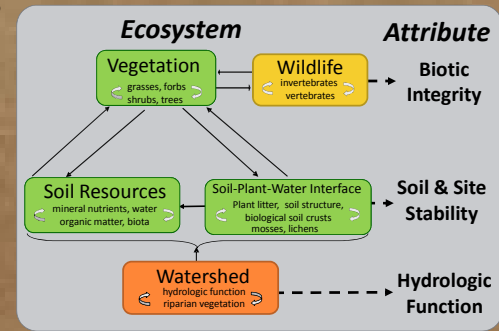
1. Gives local BLM staff tools to design defensible assessment/monitoring programs that meet current and future needs,
2. Allows local datasets to be aggregated at different scales (e.g., state, regional, national), and
3. Permits the use of monitoring data for more than one objective.

Components of AIM Sampling

Combining data requires **both** consistent indicators/ methods and sample design

1 Core Indicators and Methods^{1,2}

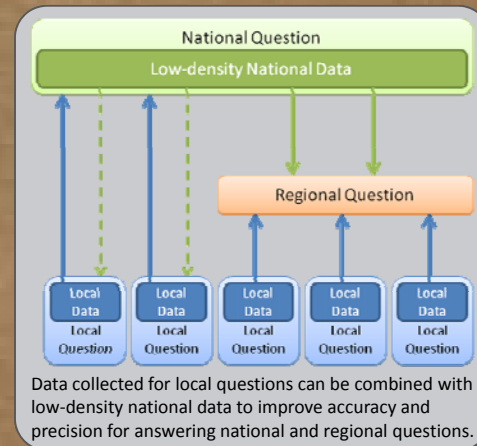
- Suite of indicators for 3 key attributes of ecosystem sustainability (i.e., "What to measure")
- Consistent Methods for measuring them (i.e., "How to measure it")
- High-quality data to address many management needs
- Can be supplemented by additional methods for local needs



Where Applied?	Method	Indicator	Indicator Type
All locations	Line-point Intercept (LPI) with plot-level species inventory	Cover of bare ground, Vegetation composition, Non-native invasive species, Plant species of mgmt. concern	Core
	Height at selected LPI points	Vegetation height, Habitat structure	Core
Locations with canopy gaps > 30cm or where trees exist	Canopy-gap Intercept	Proportion of site in large inter-canopy gaps	Core-Contingent
	Number of trees by species and size class	Stand-diversity index	Core-Contingent
Where necessary	Soil aggregate stability	Erosion potential, Site and soil stability	Contingent – when soils potentially unstable
	Sampling for toxins in soil	Accumulation of toxins	Contingent – when toxins believed present

2 Scalable Sample Design²

- Techniques/tools for local offices to select locations to sample (i.e., "Where to measure")
- Defensible data that meets local needs



Data collected for local questions can be combined with low-density national data to improve accuracy and precision for answering national and regional questions.

- A scalable approach to sampling allows data from different levels to be combined
- Probability-based stratified sampling at local levels
- A low-intensity national sampling grid to answer national- to regional-scale questions
- Local data can be integrated into national grid to improve precision
- Web-based and stand alone tools for sample design

3 Remote Sensing Integration²

- Using field and remote sensing data together to derive reliable information for assessment and monitoring
- In development – implementation in 2011-2012



Value of AIM to BLM Offices

Offices at different levels throughout BLM have diverse assessment and monitoring needs. AIM sampling, supplemented with other methods as necessary, can help efficiently monitor for multiple objectives and, through combining data across units and with surrounding areas, places local BLM management in a larger landscape context.

Core Indicators for BLM Monitoring

Many important indicators for BLM management needs are captured by the AIM Core Indicators. These include bare ground, vegetation cover/height, invasive species, and soil erosion potential. Additionally, a set of common, easy to implement methods reduces error and improves data precision, and provides data that can be combined across BLM offices to answer a variety of questions. The core indicators can be supplemented with additional indicators as needed.

Scalable Sample Design for BLM

AIM sampling provides a statistically-sound sample design to meet local sampling needs within a BLM field office. It gives BLM staff a way to efficiently collect unbiased samples and focus sampling efforts on areas likely to experience change without compromising the unbiased nature of sampling. AIM sampling also ensures that data can be combined between offices for multiple management objectives across a range of scales.



Additional Information

¹BLM. 2010. Terrestrial Indicators and Measurements: Selection Process & Recommendations. Available at: http://usda.ars.nmsu.edu/monit-assess/aim_Terrestrial_Indicators_final.pdf

²Karl, J.W., Herrick, J.E., and M. Eaton. 2010. Uses and benefits of consistent indicators and scalable sample design for NLCS local-to-national data needs. Proceedings of the Decade of Discovery NLCS Science Symposium. US Forest Service Rocky Mountain Research Station. More information on implementation of the AIM project is at <http://usda.ars.nmsu.edu/monit-assess/aim.php>