



U.S. Department of the Interior  
Bureau of Land Management

# Establishment of National Land Health Standards and Watershed Condition Assessments

Fall 2024



Sacramento River Bend, BLM photo





# Informed Decision-Making—What the Rule Does

**Establishes a process to:**

**Gather** high-quality data and information, including Indigenous Knowledge.



**Assess and evaluate** information to understand landscape health, connectivity and intactness.



**Document** the results in public databases.



**Use** results to identify high priority areas for protection, restoration, and development, and to inform decision-making across programs.






# Inventory and Monitoring of Ecological Resources Manual (MS 1735)

Establishes policy for **gathering high quality information** related to ecological resources on public lands managed by the BLM, **assessing** and **evaluating** information to understand the landscape, **documenting results**, and **using results** to inform decision-making across program areas.



Form 1221-682 (May 2023)	UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT	Release 1-1831
	MANUAL	TRANSMITTAL SHEET
Subject: INVENTORY AND MONITORING OF ECOLOGICAL RESOURCES	Date 08/07/2024	
	Office Code HQ-210	
	FOIA Designation: P Letter:	
1. <u>Updates, supersedes, or rescinds:</u>		
New Manual.		
2. <u>Explanation of Materials Transmitted:</u>		
MS-1735, Inventory and Monitoring of Ecological Resources, provides policy guidance for collecting, managing, and applying high-quality, science-based inventory, assessment, and monitoring information related to ecological resources on public lands managed by the BLM. This new policy ensures that BLM ecological resource monitoring activities are well-coordinated, efficient, and provide maximal information for decision-makers. This policy builds on existing MS-1734 Inventory and Monitoring Coordination and the 2011 Assessment, Inventory, and Monitoring (AIM).		
3. <u>Reports Required:</u>		
None		
4. <u>Delegations of Authority Updated:</u>		
None		
5. <u>Filing Instructions: File as directed below.</u>		
REMOVE	INSERT	
None	All of 1735 (Ref. 1-27) (Total: 29 Pages)	
S./ Sharif Branham Assistant Director		





U.S. Department of the Interior  
Bureau of Land Management

# BLM Monitoring Principles



**Structured implementation**



**Standardized field measurements**



**Appropriate sample designs**



**Data management and stewardship**



**Integration with remote sensing**



**Data use**

<https://www.blm.gov/aim>







# MS 1735 Objective 1: Implement Monitoring Using Best Practices

## AIM Monitoring Design Worksheet

(Updated June 2024)  
Project Name:  
Date:

### Author Log

Name	Contact Information	Description of Edits	Date Edited

This worksheet provides a step-by-step template for designing BLM Assessment, Inventory, and Monitoring (AIM) efforts. This template should be used to document the development of monitoring program objectives, benchmarks, sample design, and steps to ensure data quality. For detailed information on concepts described below and instructions on how to complete each step, please reference the [AIM Desk Guide](#). We encourage you to work through the implementation steps as an interdisciplinary team, but completion of the worksheet should be done in coordination with the AIM state monitoring coordinator and the National AIM team.

Designing an AIM project is an iterative process. After completing each step, be sure to review the results of previous steps, as the outcome of later steps may cause a need to modify earlier decisions. For example, design decisions made when stratifying the study area (Step 3) often reveal issues that lead to new management goals or monitoring objectives (Steps 1 and 2).

**Step 1: Develop management goals: select additional ecosystem attributes and indicators to monitor.**

**Step 1a: Develop management goals related to resource condition and (if necessary) resource trend.** Management goals should provide the context for why monitoring information is needed and how it will

## Monitoring Plans

**Terrestrial Indicators Table** Identify which indicators will be monitored as part of this effort and where the associated data will be collected. For monitoring efforts that seek to evaluate RMP/LUP effectiveness all BLM AIM core terrestrial indicator data should be collected in all locations, but contingent and supplemental indicators may be collected at a sub-set of monitoring locations. Specify which contingent and supplemental indicators you will monitor and describe the types of monitoring locations at which you will collect these data. Record the monitoring locations where contingent indicators should be denoted in the Core and Contingent column. Supplemental indicators should be written into their own row and the locations where these data will be collected should be recorded in the Supplemental column.

Land Health Fundamental or Management Goal	Indicators	Core + Contingent	Supplemental
Watershed Function	Bare ground		



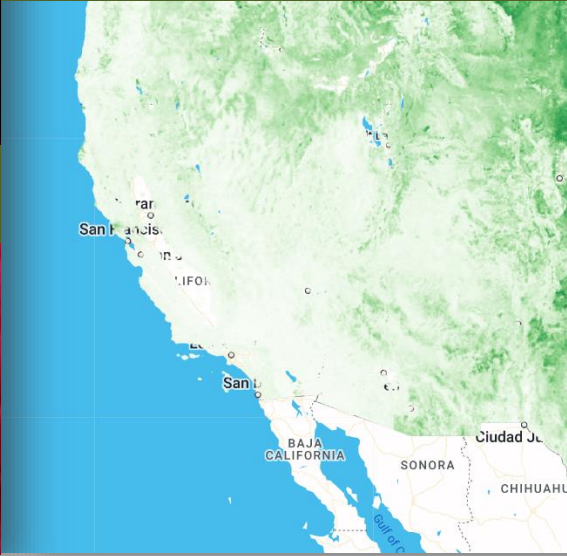
## Standardized Protocols w/ Training



## Mobile Data Capture



## Satellite-Derived Maps



*“...monitor ecological resources using BLM’s best practices.”*



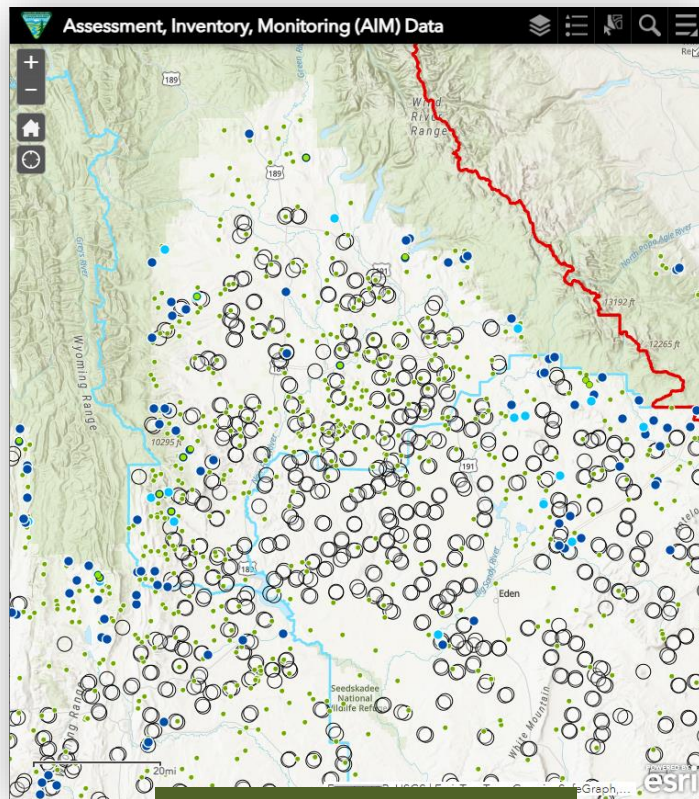
# MS 1735 Objective 1: Implement Monitoring Using Best Practices

- The BLM monitoring principles are smart business practices for streamlining monitoring and ensuring that the data we collect can be used to support decision-making across many applications, in addition to informing watershed conditions and helping us understand land health.
- MS 1735 directs BLM to apply these principles to ecological resources monitoring broadly – not just to the upland and aquatic resources currently covered by the AIM program, but to other ecological resources, such as populations or fuels.
- BLM is already in some situations applying these principles to ecological resources monitoring, providing tools to build on.
  - For example, the AIM program provides monitoring plans, standardized protocols and trainings, and mobile data capture tools that are used by many programs. AIM have also partnered with wildlife, aquatic resources, and range programs to provide info and training on available map products. The wildlife and wild horse and burro programs similarly have standardized methods and datasets for population monitoring.

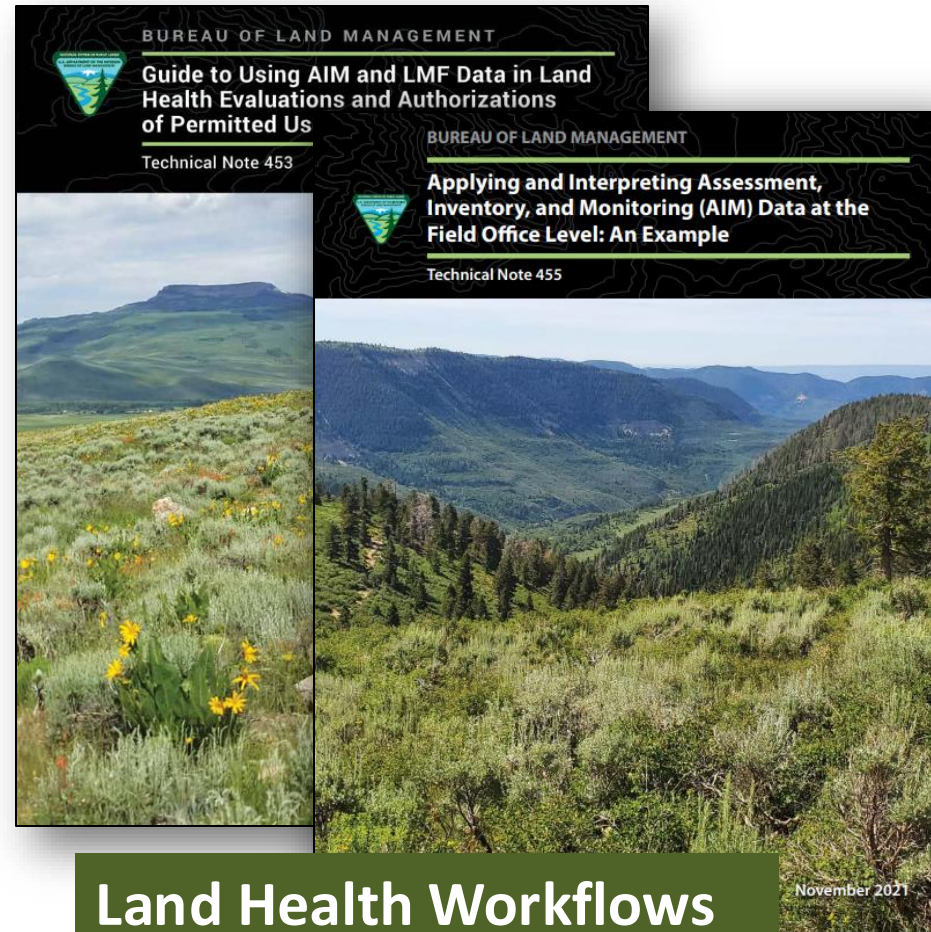




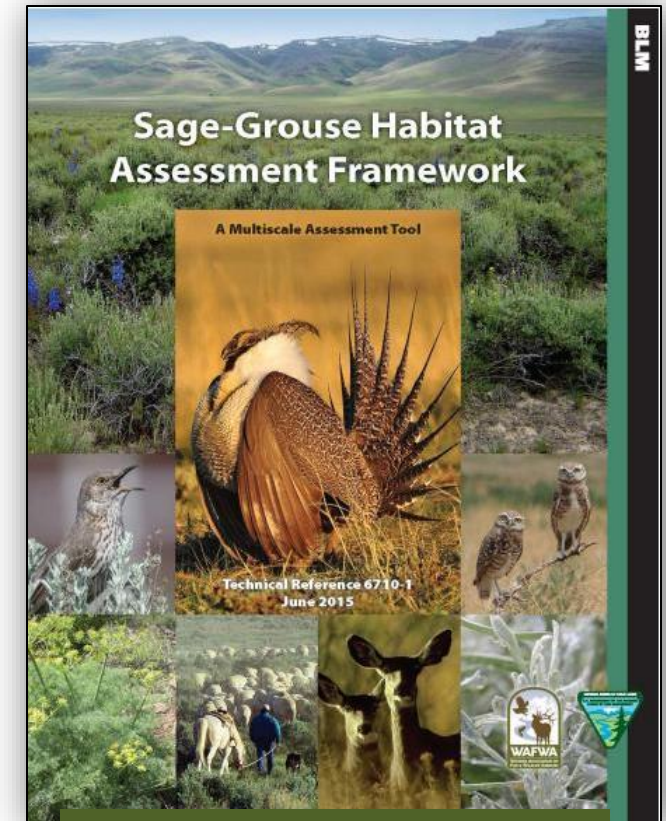
# MS 1735 Objective 2: Apply Ecological Resource Monitoring Information to Decision-Making



Data Portals



Land Health Workflows



Habitat Workflows



# MS 1735 Objective 2: Apply Ecological Resource Monitoring Information to Decision-Making

Consistent use of standardized data will help us be more efficient and provide a shared understanding of resource conditions and management effects across BLM lands. The Public Lands Rule emphasizes this in Section 6103.2(c), which directs Authorized officers to use high-quality monitoring information to inform decision-making across program areas.

MS 1735 builds on many existing policies, workflows and examples, such as:

- Land Health Evaluations
- Planning and NEPA (BLM IM 2023-043)
- Restoration Planning and Effectiveness

....and more, beyond the Public Lands Rule

Learn more about available datasets and analysis workflows on the BLM AIM website – [blm.gov/aim](https://blm.gov/aim)





# Informed decision-making – *Managing for Landscape Health*

**§ 6103.1:** Adopts the *Land Health Fundamentals* and directs development of national land health standards and indicators that serve as measures for the fundamentals for all ecosystems managed by the BLM.

**§ 6103.1.1:** Consider land health in decision-making across all programs.

**§ 6103.1.2:** Evaluate land health on all BLM-managed land every 10 years using the results of Watershed Condition Assessments.







# Land Health in the BLM

Fundamentals for Rangeland Health added to grazing regulations

1995

1995–1997

BLM develops state and regional sets of Rangeland Health Standards and Guidelines

Standards and Guidelines used to evaluate health of allotments and guide livestock grazing management.

1997–Present

2024

Public Lands Rule expands fundamentals and standards across BLM lands and programs.

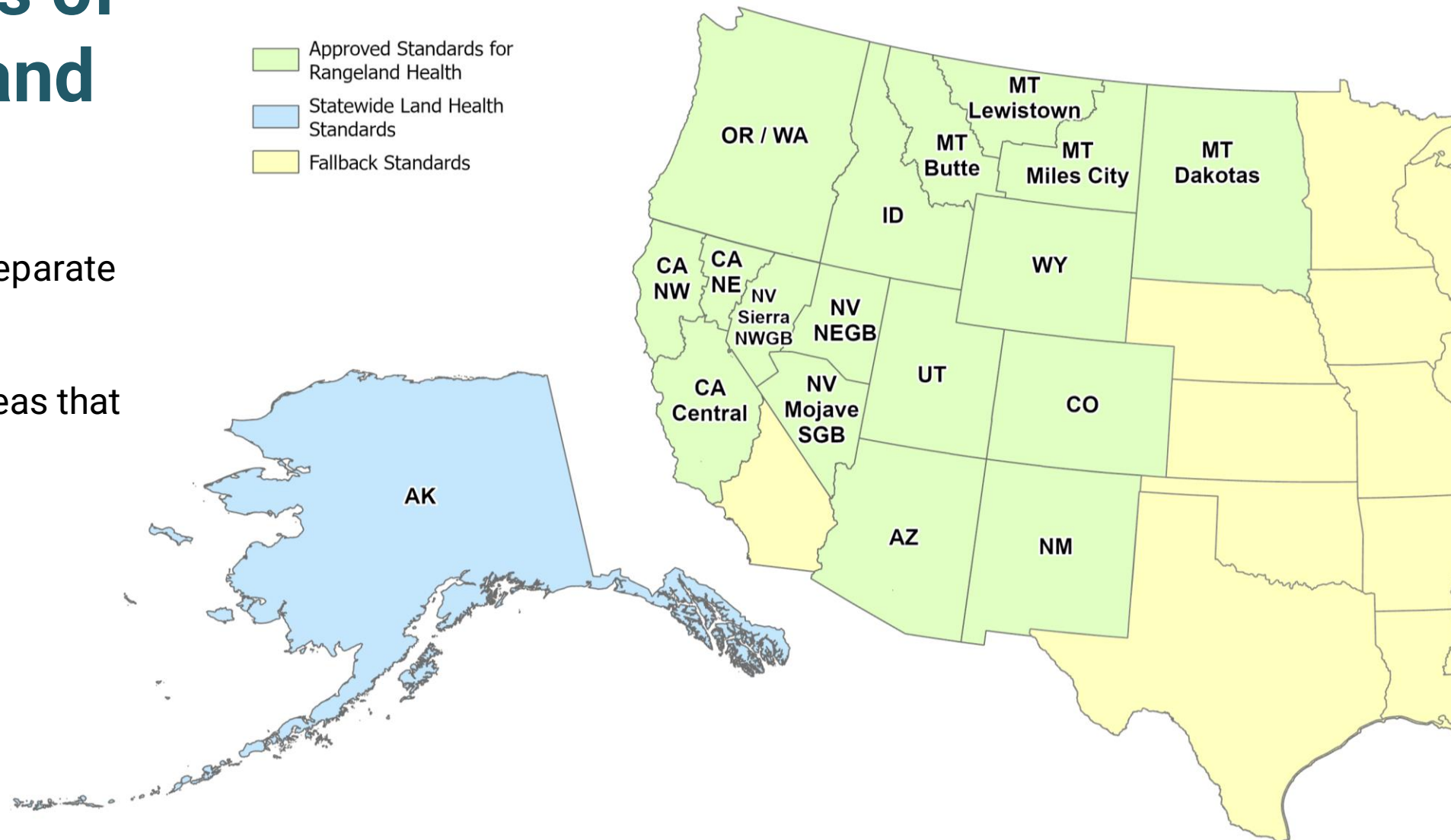






# Current Sets of Standards and Guidelines

BLM currently has 19 separate sets of Standards and Guidelines that apply to different geographic areas that BLM manages.



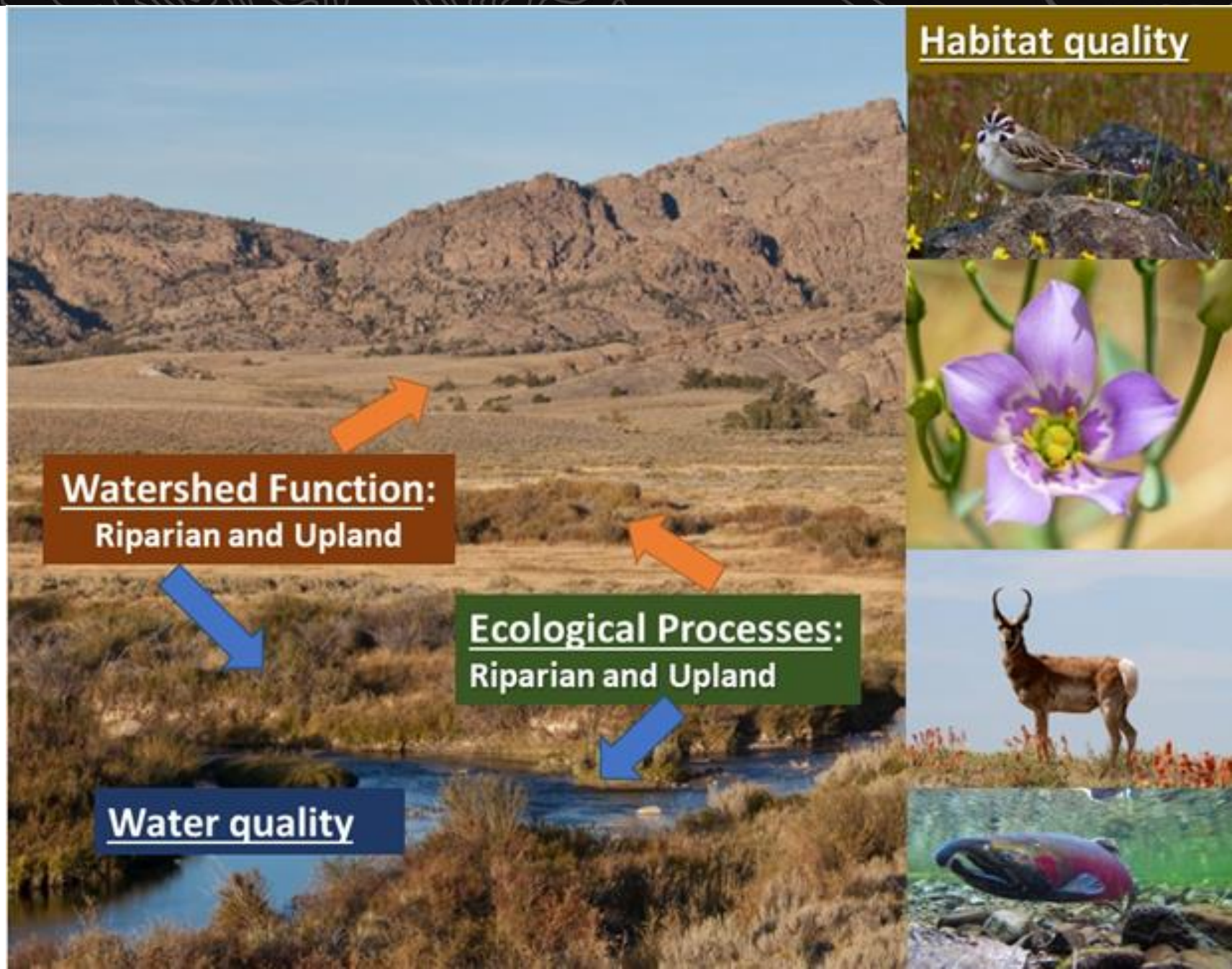




## Land Health Fundamentals:

Overarching principles of land health, or the degree to which the integrity of the soil and the ecological processes of ecosystems are sustained.

***See: 6103.1 (a)***







# Land Health Standards

- The levels of physical and biological condition or degree of function required for healthy lands and sustainable uses and the minimum resource conditions that must be achieved or maintained.
- Land health standards are written as resource objectives that help us consistently evaluate conditions and manage towards the achievement of the land health fundamentals and other ecological functionality objectives.







## Indicators:

Components of system whose characteristics can be measured or observed and used to evaluate a land health standard. Indicators are used as multiple lines of evidence when evaluating whether an area is achieving each applicable land health standard.

## Examples:

- Bare ground cover
- Invasive species distribution
- Water temperature
- Vegetation structure







# Land Health Workflow Overview



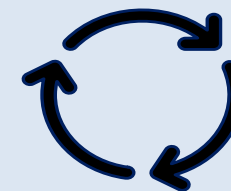
Gather and analyze data and information (indicators) for each standard.



Evaluate whether each land health standard is achieved.



Determine causal factors for areas not achieving standards.



Take appropriate actions, monitor and re-evaluate.







# IM 2024-037 – Development and Revision of Land Health Standards

- Implements 43 CFR Subpart 6103.1 (*Land Health Standards*).
- Steering committee and interdisciplinary team(s) will be established.
- BLM will develop six national land health standards + supporting indicators.
  - Submitted for director approval by February, 2026.
- In *rare* instances, States may supplement national standards if necessary.
- National standards will be adopted by June 10, 2027.



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
National Headquarters  
Washington, DC 20240  
<https://www.blm.gov>



August 6, 2024

In Reply Refer To:  
6103 (HQ-200) P

EMS TRANSMISSION 08/08/2024  
Instruction Memorandum No. 2024-037  
Expires: 09/30/2027

**To:** State and Center Directors  
**From:** Assistant Director, Resources and Planning  
**Subject:** Development and Revision of Land Health Standards

**Program Areas:** Resources and Planning

**Purpose:** The Conservation and Landscape Health Rule (commonly known as the “Public Lands Rule”), effective as of June 10, 2024, advances the Bureau of Land Management’s (BLM) multiple use and sustained yield mission by prioritizing the health and resilience of public lands. Conservation<sup>1</sup> is a use of public lands on equal footing with other uses and is necessary for the protection and restoration of important resources. The Public Lands Rule will help safeguard the health of our public lands for current and future generations by ensuring we:

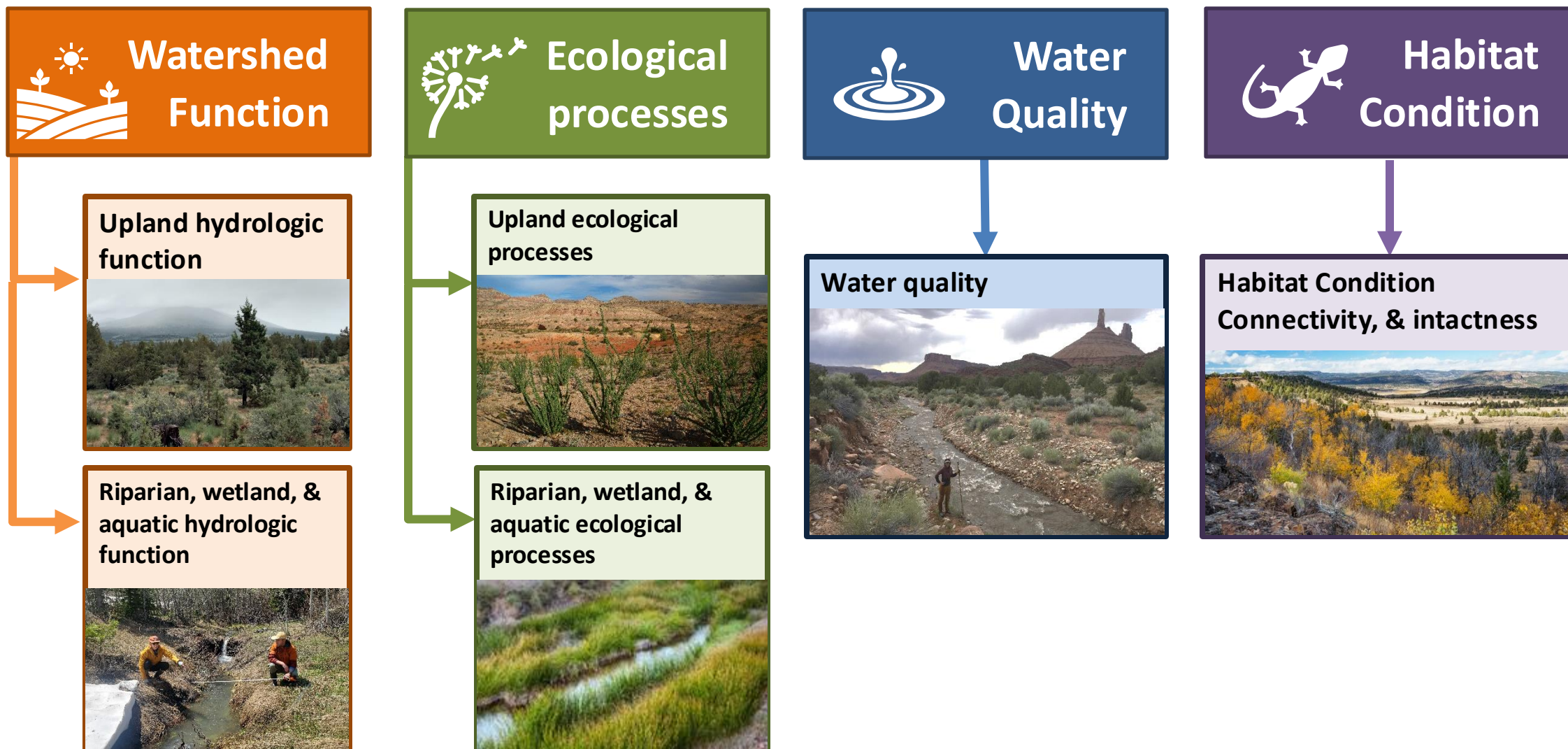
- Protect the most intact, functioning landscapes;
- Restore degraded habitats and ecosystems; and
- Use science and data, including Indigenous Knowledge, as the foundation for management decisions across all plans and programs.

This Instruction Memorandum (IM) provides guidance to implement 43 CFR Subpart 6103.1 (*Land Health Standards*) and develop national land health standards and indicators that consistently address land health fundamentals, habitat condition, connectivity, intactness, and changing environmental conditions. Emphasis shall be placed on landscape scale assessment of these standards, relying upon existing data whenever possible. In accordance with the Public Lands Rule, the BLM will develop national land health standards and supporting indicators.



# Fundamentals of Land Health

## National Land Health Standards







# Standards Development Components

- For each standard, BLM will develop a title and narrative description of the conditions that should exist in areas where the standard is achieved.
- Each standard will have a list of supporting indicators that are recommended for evaluating attainment of the standard, including indicators that can be used in watershed condition assessments.
- In some cases, ecosystem indicators may be included to address ecoregional resource issues that might not be applicable to the standard across all BLM-managed lands.
  - Some examples of these might be indicators for evaluating forested lands, or areas that are susceptible to wind erosion.
- BLM will ensure that the components of connectivity and intactness are incorporated as required in the rule.







# Standards Development - Organization

## **Steering Committee –**

- Headquarters program leads & national subject matter experts
- Oversees standards development process
- Coordinates with BLM leadership & external engagement

## **Interdisciplinary Teams -**

- Membership from national, state & field offices
- Subject matter experts focused on each standard
- Geographically diverse

## **External engagement -**

- Science partners
- Tribal organizations
- Resource advisory councils
- Others, TBD







# Standards Development - Next Steps

- Convene steering committee and interdisciplinary teams.
- Review existing standards and indicators.
- Coordinate with the BLM team working on Watershed Condition Assessments so that pilot assessments can move forward, and we are using common indicators for both efforts as much as possible.
- Develop national standards and indicators.
- Submit national standards to BLM director for approval.







# Standards Development - Next Steps

- Once the national standards are approved, they will be transmitted to states with additional implementation guidance.
  - Will include further guidance on state/regional standards.
- Transition to using national standards to evaluate land health. Implementing consistent standards will enable us to develop training, tools, standard analyses, and guidance that will help us evaluate land health more efficiently.
- Watershed condition assessments will incorporate national standards.







# Informed Decision-Making

## § 6103.2: Watershed Condition Assessment (WCA)

**Assess:** condition of soil, water, habitats, and ecological processes; disturbances; and landscape intactness

**Frequency:** Conducted every 10 years by the National Operations Center (NOC)

**Local Data:** State and field offices leverage locally available data with WCAs in decision-making







# **The Public Lands Rule identifies 5 primary uses of the Watershed Condition Assessments:**

- Inform land use planning and other NEPA actions
- Identify Intact Landscapes
- Provide a foundation for land health assessments
- Prioritize areas for conservation or restoration
- Inform the development of restoration plans

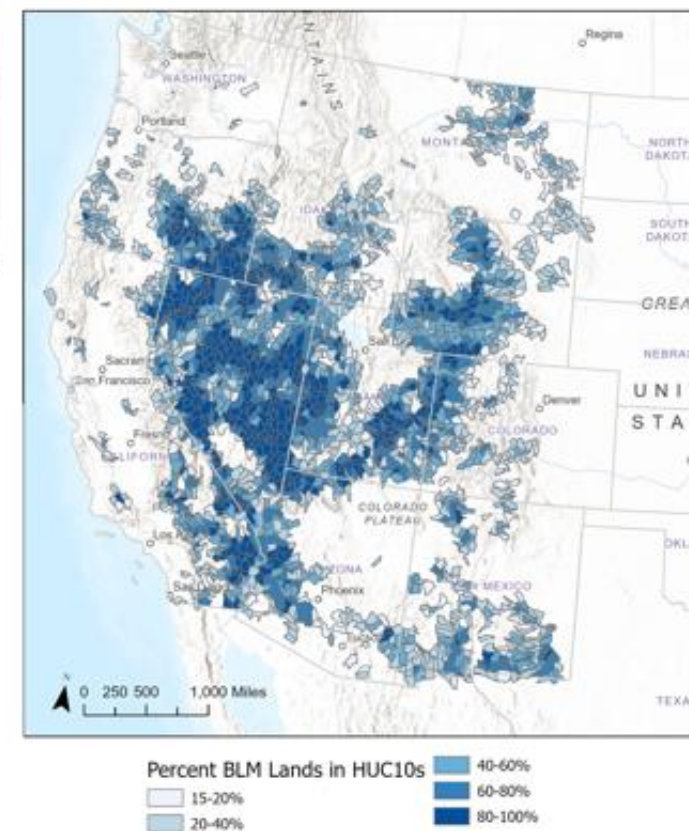
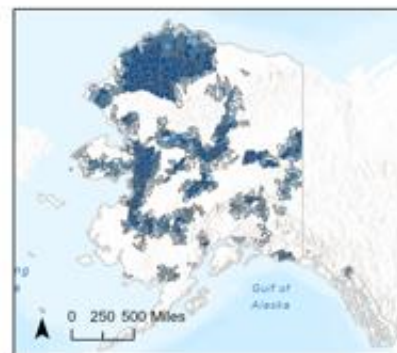
## **WCA requirements:**

- Execute at the 5th level, 10-digit hydrological unit (HUC) with >15% BLM surface management
- Use publicly available and standardized data



# WCA: Why Standardize Data & Analysis Approaches?

- The WCAs will help BLM meet the FLPMA requirement to prepare and maintain an inventory of all public lands and their resources and values in a consistent fashion.
- There are 2,154 10-digit HUCs with >15% BLM surface management in the lower 48, and 636 in Alaska. This necessitates an approach that is easily repeated and reasonably executed.



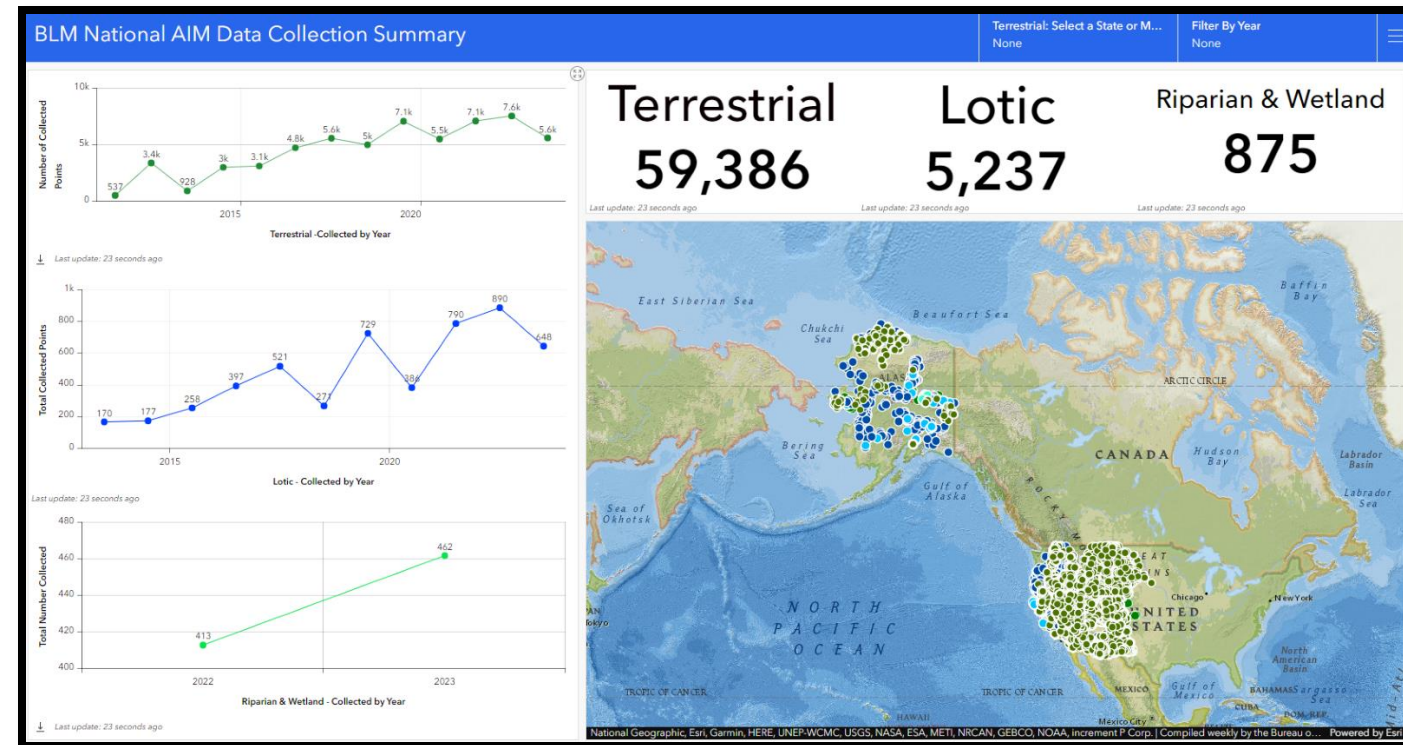
Data Sources 07/2024 : Esri, TomTom, FAO, NOAA, USGS, County of Utah, Esri, TomTom, Garmin, FAO, NOAA,





# WCA: What Standardized Data & Analysis Approaches?

- Field collected data to be leveraged will be from the National AIM and Forestry program data repositories. These data represent on the ground measurements of core and supplemental indicators across BLM managed terrestrial, lotic, and riparian & wetland systems.
- Analysis approach will vary based on data availability in each 10-digit HUC.
- Will inform conditions and trends (depending on data availability) on BLM managed lands.



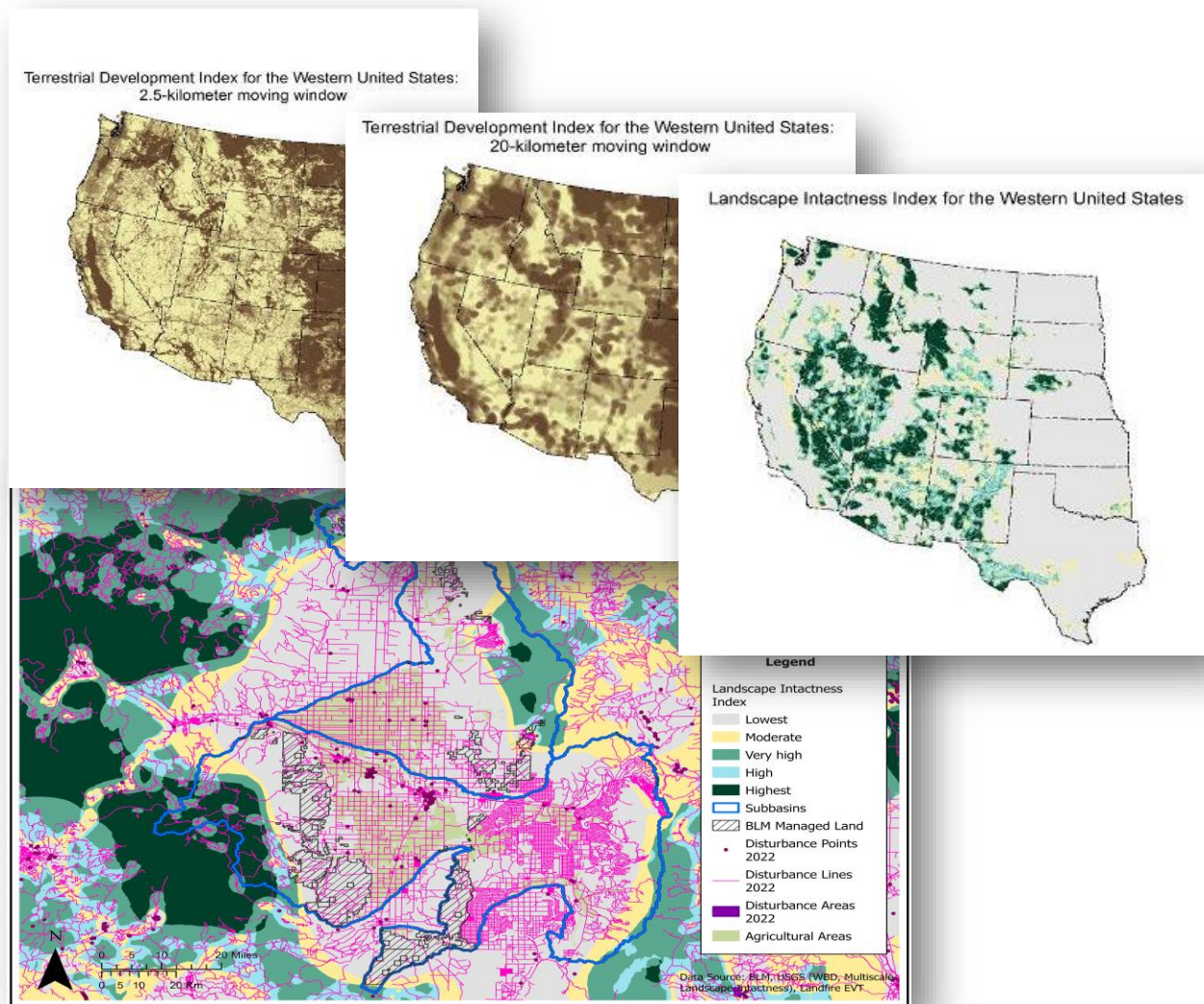
# WCA: What Standardized Data & Analysis Approaches?

- We now have several modeled datasets derived from satellite imagery and field data.
- These suites of information will allow BLM to estimate resource conditions and trends across all lands and across historical timeframes within a 10-digit HUC to better evaluate the drivers of ecological processes.
- Analysis approaches are numerous and require standardization for WCAs.





# WCA: What Standardized Data & Analysis Approaches?



- In addition, estimates of landscape intactness have been published and can be updated as the WCA analyses processes are documented.
- Approaches to estimating anthropogenic disturbance and associated impacts are documented in the literature and will be drawn upon to inform intactness and other WCA analyses.

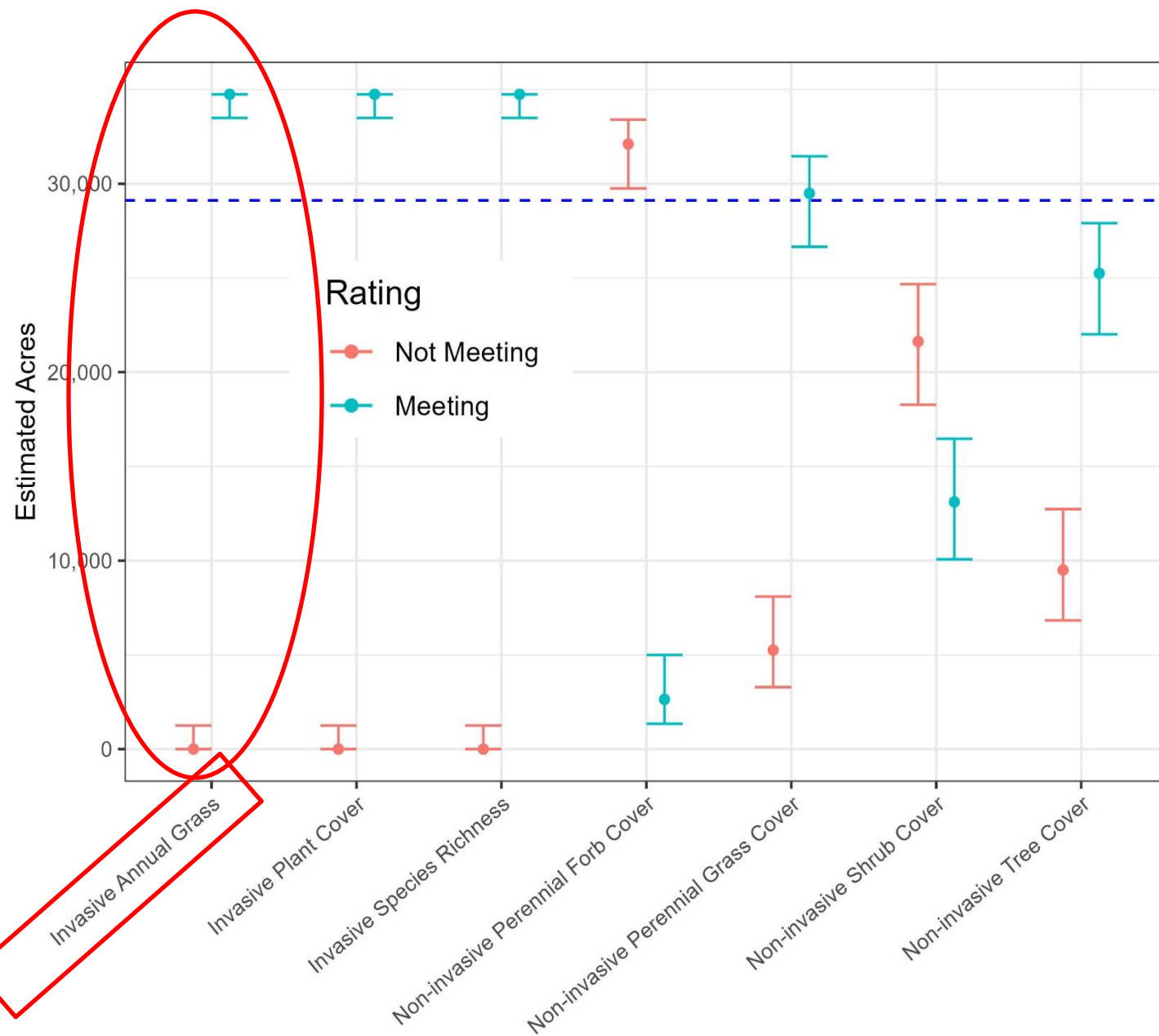


## Example: AIM & Remotely Sensed Models

The figure represents a statistical estimate of how much of a watershed is meeting or not meeting desired conditions for a suite of indicators of interest.

Focusing on the 1<sup>st</sup> indicator, invasive annual grass cover, the AIM data analysis summary shows the vast majority of BLM managed lands within this watershed are meeting the management objective for invasive annual grasses.

This is very valuable information across a very large area of interest – in this case > 30k BLM managed acres.



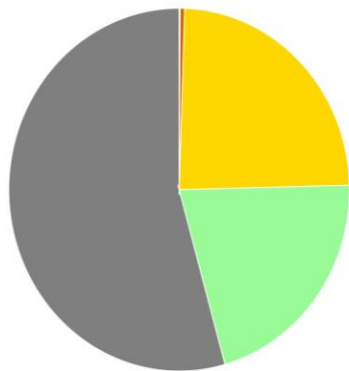




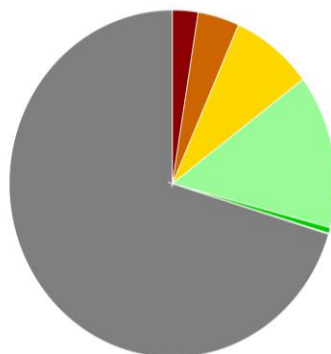
# Example: AIM & Remotely Sensed Models

We can then leverage the modeled data now available to look at an indicator that is highly associated with the AIM annual grass indicator. Using these data, we can not only map the current estimates of annual forb and grass cover across the watershed, we can look at trends over time. Analyzing the time series models, we can highlight where changes are occurring (both positive and negative) and estimate the magnitude of these changes – on BLM managed lands and across all lands in the watershed.

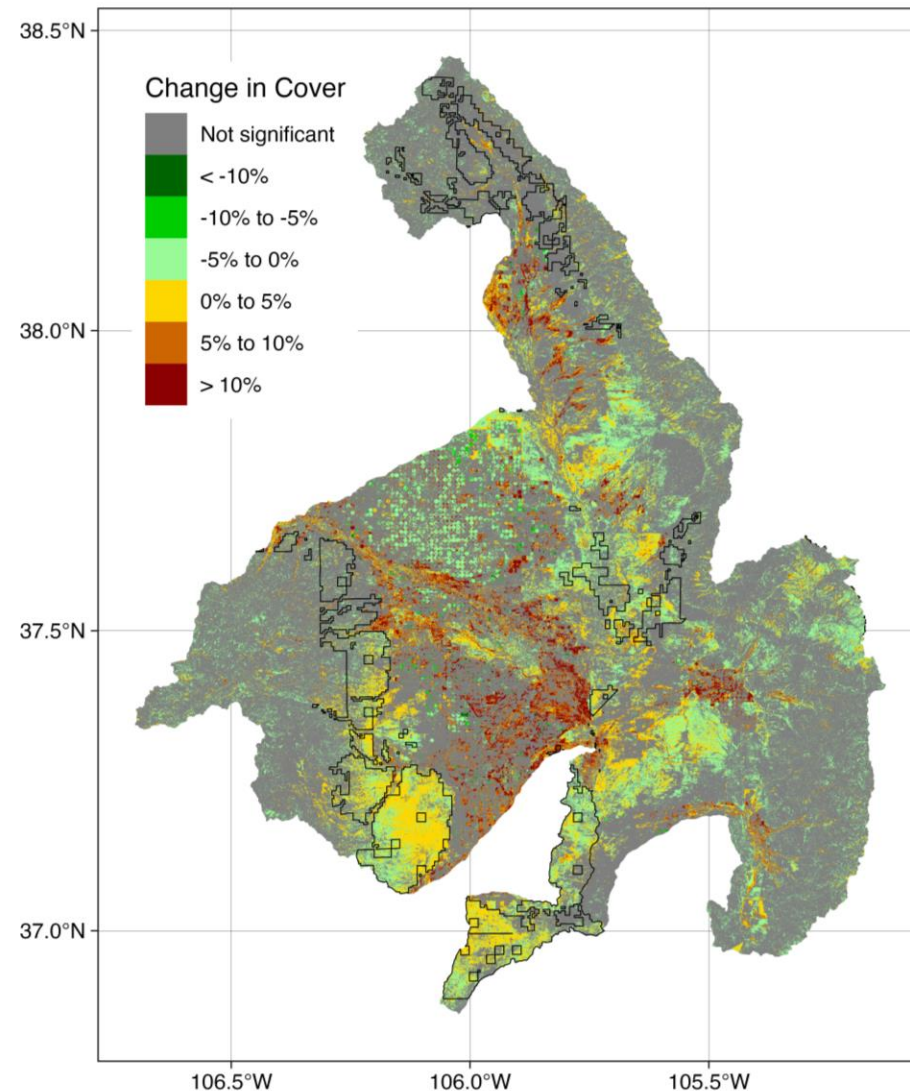
**BLM Land:** 45.7% has a significant trend (either direction)



**Non-BLM Land:** 29.7% has a significant trend (either direction)

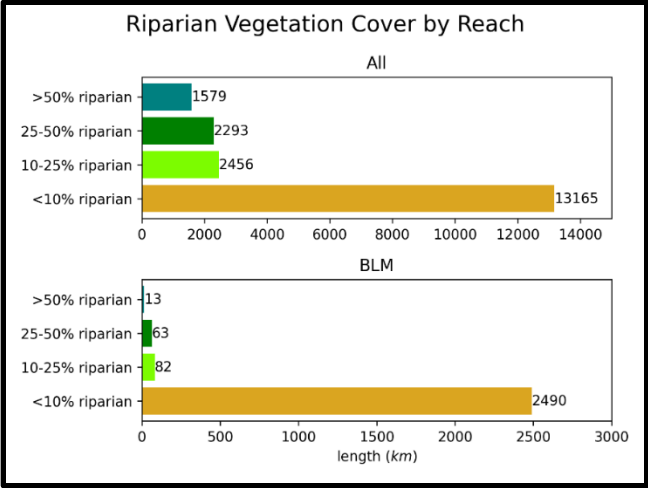
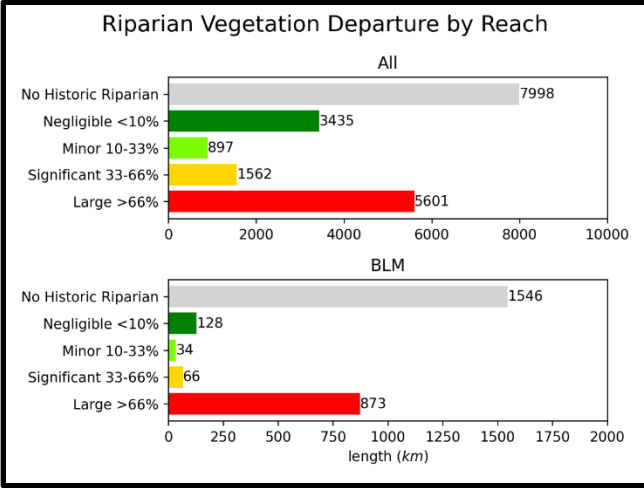
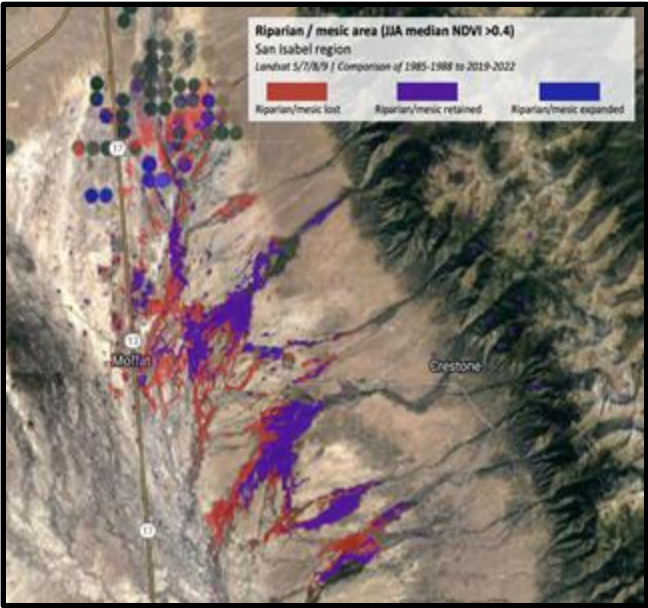
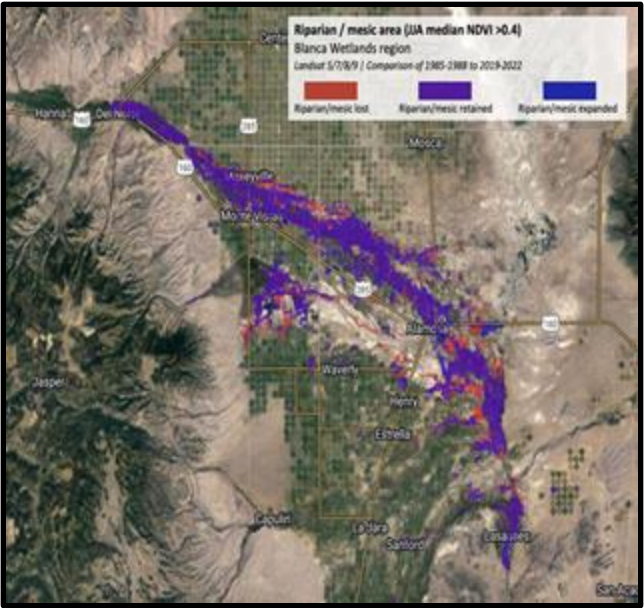


Change in Annual Forb & Grass Cover (1986-2021)





# Riparian Area Trends



# Example 2: AIM & Remotely Sensed Models

Using a suite of metrics derived from several remotely sensed data products and models, we can estimate extent of resources (in this case riparian areas) and estimate the gain or loss of the resource over time and across a watershed.

Further, leveraging standard rulesets applied to modeled data we can estimate specific indicators as well as the level of departure from reference or desired conditions. The broad scale data, once again, allow us to look at BLM managed resources specifically as well as all lands with our analysis area.

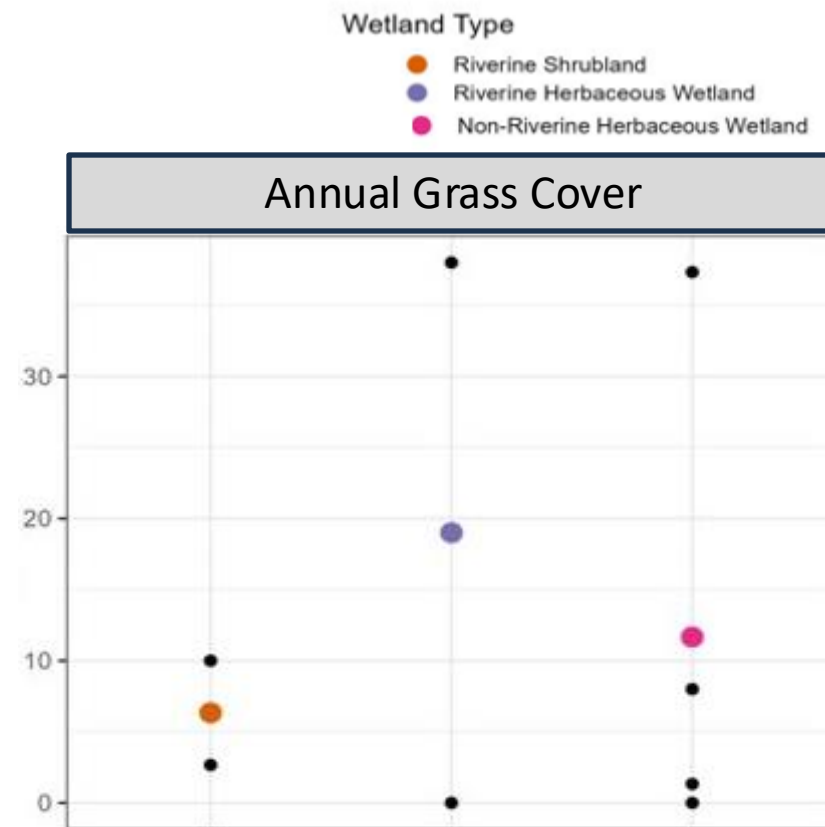
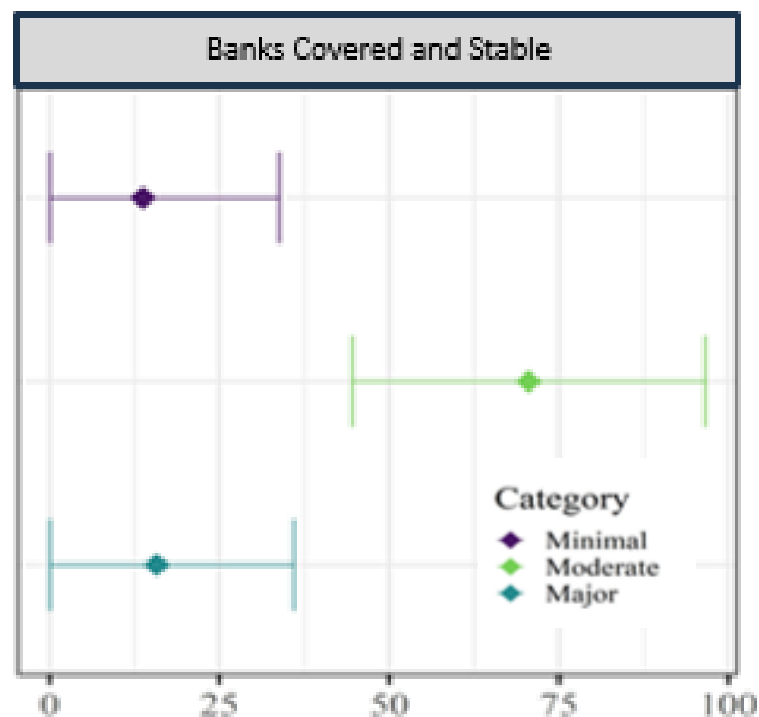
CONDITION			
	ALL	BLM	BLM perennial
Average percent riparian cover	12.70%	2.03%	30.98%
Average riparian vegetation departure	25.60%	27.98%	47.96%
Average RCAT condition score (0-1)	0.811	0.813	0.73





## Example 2: AIM & Remotely Sensed Models

We can then summarize the available AIM data collected on BLM managed portions of the riparian and river systems to gain further insights on conditions that drive ecosystem processes.

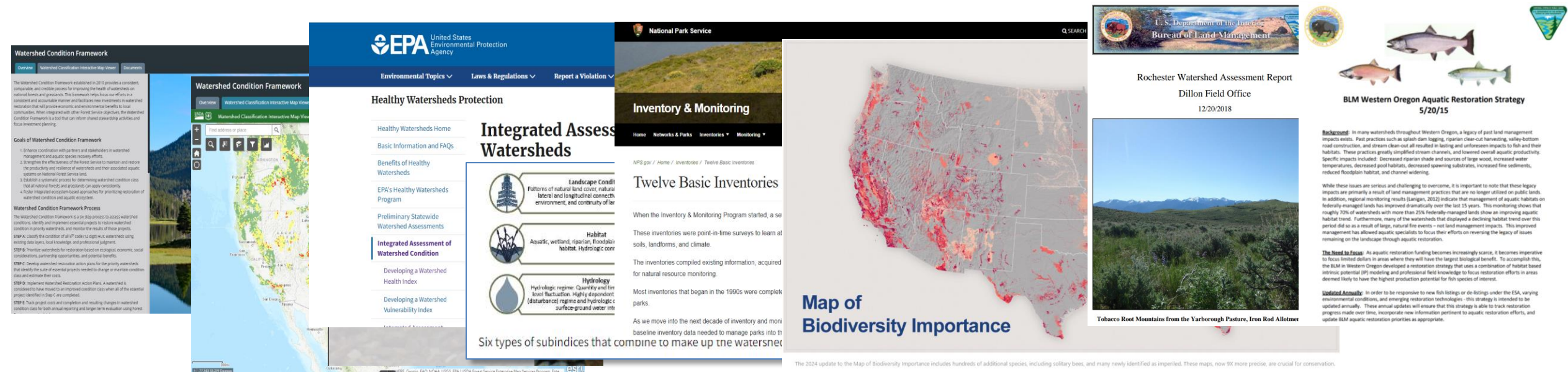




# Watershed Condition Assessments – Current Status

The NOC has assembled a working group initially focused on a literature review of existing watershed condition efforts, to include but not limited to:

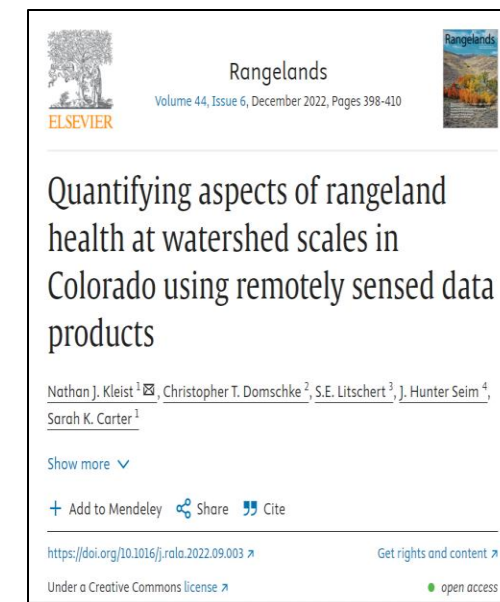
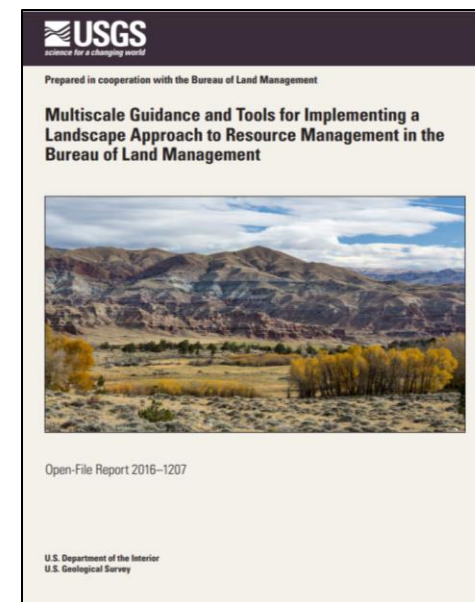
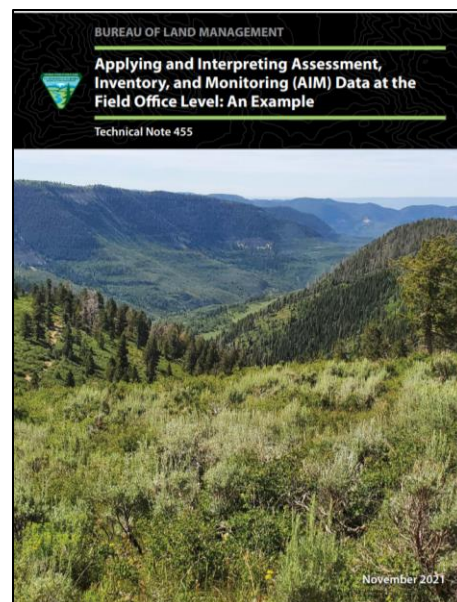
- The USFS Watershed Condition Framework
- EPA's watershed assessment process
- The NPS inventory and monitoring framework
- Assessments conducted by science partners and NGOs
- Work BLM has already done on this front across multiple BLM states





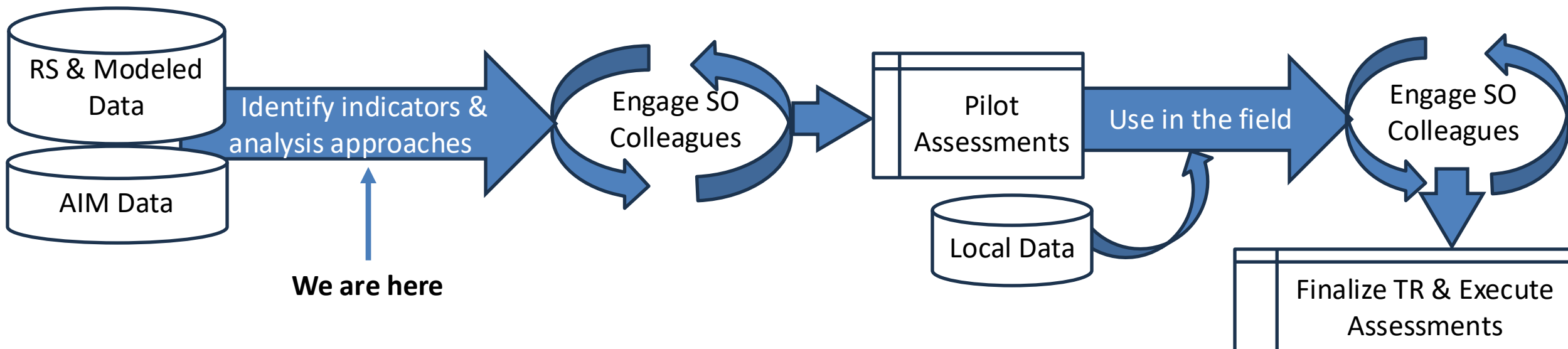
# Watershed Condition Assessments – Current Status

BLM has data, established ties between these data and land health, restoration, and other BLM activities, numerous analysis workflows, and co-produced science that can be leveraged to meet the stated needs of WCAs in the Public Lands Rule.



# Developing and Implementing Watershed Condition Assessments

- We will be leveraging and combining multiple suites of data into a repeatable, easy to understand workflow in these assessments.
- BLM leadership and the NOC will soon begin to evaluate criteria and establish a process to identify areas for pilot assessments. This approach to iterating a series of pilots will test selected approaches across the diverse landscapes we are tasked with managing, from forests and rangelands to arctic tundra and riverine systems. It will also provide a mechanism to bring the experience and expertise of our colleagues in State and Field offices to bear on the process.
- Based on these experiences, we will finalize and publish a Tech Reference outlining the execution of WCAs and their use.







U.S. Department of the Interior  
Bureau of Land Management

# Thank You

