



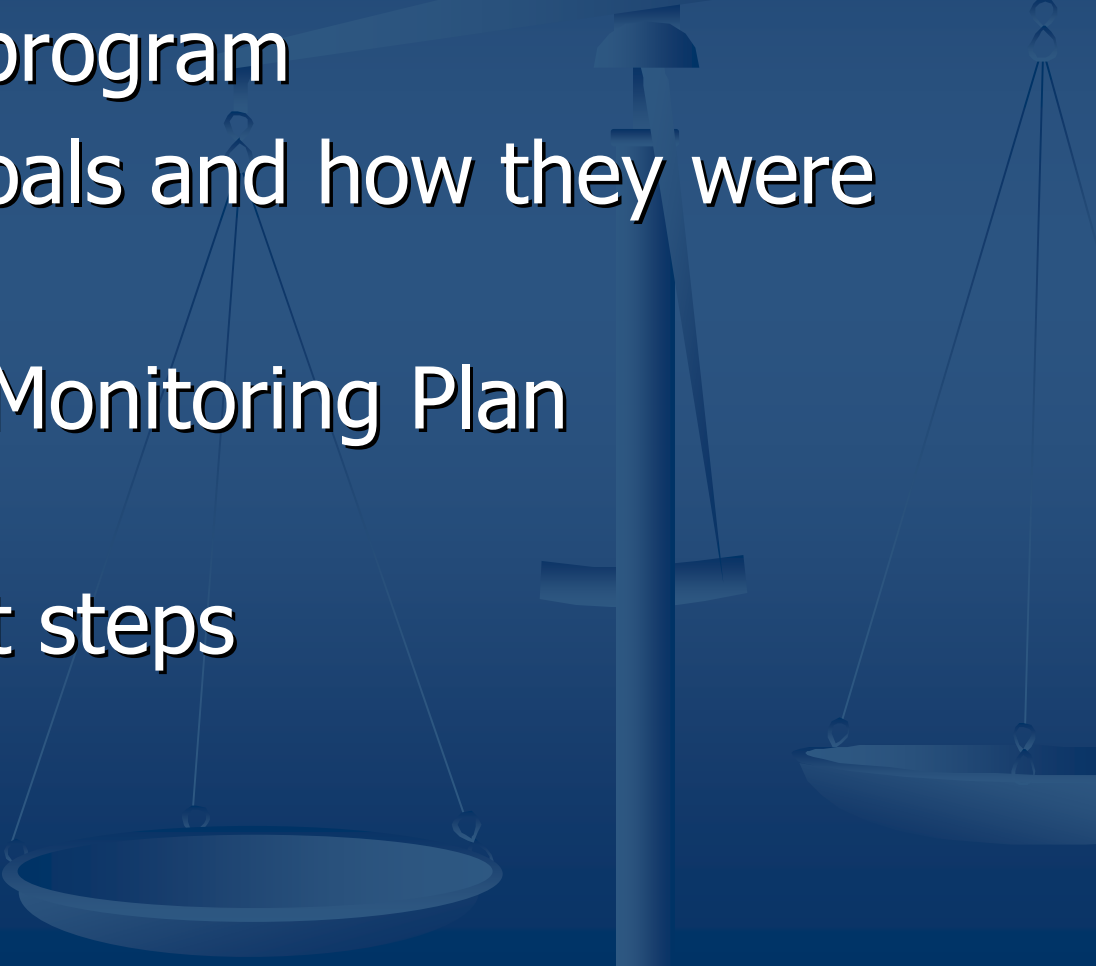
NPR-A Monitoring Plan

Bruce Hollen

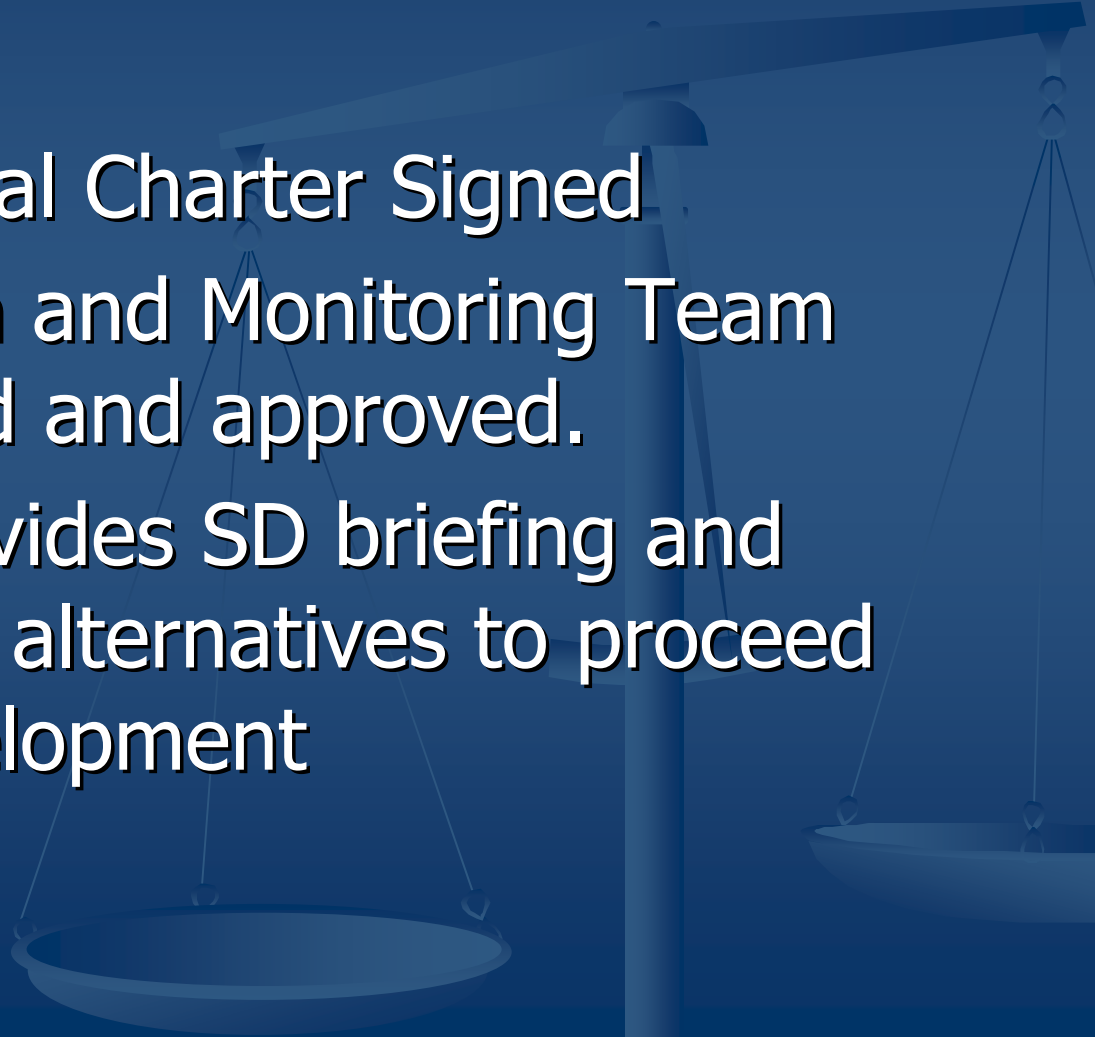
Special Status Species Biologist

BLM Alaska State Office

Purpose of Presentation

- Provide brief history of the development of the monitoring program
 - Describe Plan goals and how they were derived
 - Summarize the Monitoring Plan components
 - Present the next steps
- 
- A faint, semi-transparent image of a balance scale is visible in the background of the slide. The scale is positioned on the right side, with its vertical column and horizontal beam extending across the middle. The two pans are visible, hanging from the beam. The entire image is rendered in a light blue color that blends with the dark blue background.

History

- 1998 NE NPR-A ROD calls for monitoring
 - 2000 Secretarial Charter Signed
 - 2002 Research and Monitoring Team (RMT) selected and approved.
 - 2005 RMT provides SD briefing and recommended alternatives to proceed with plan development
- 

RMT Priority Resources

■ Category A

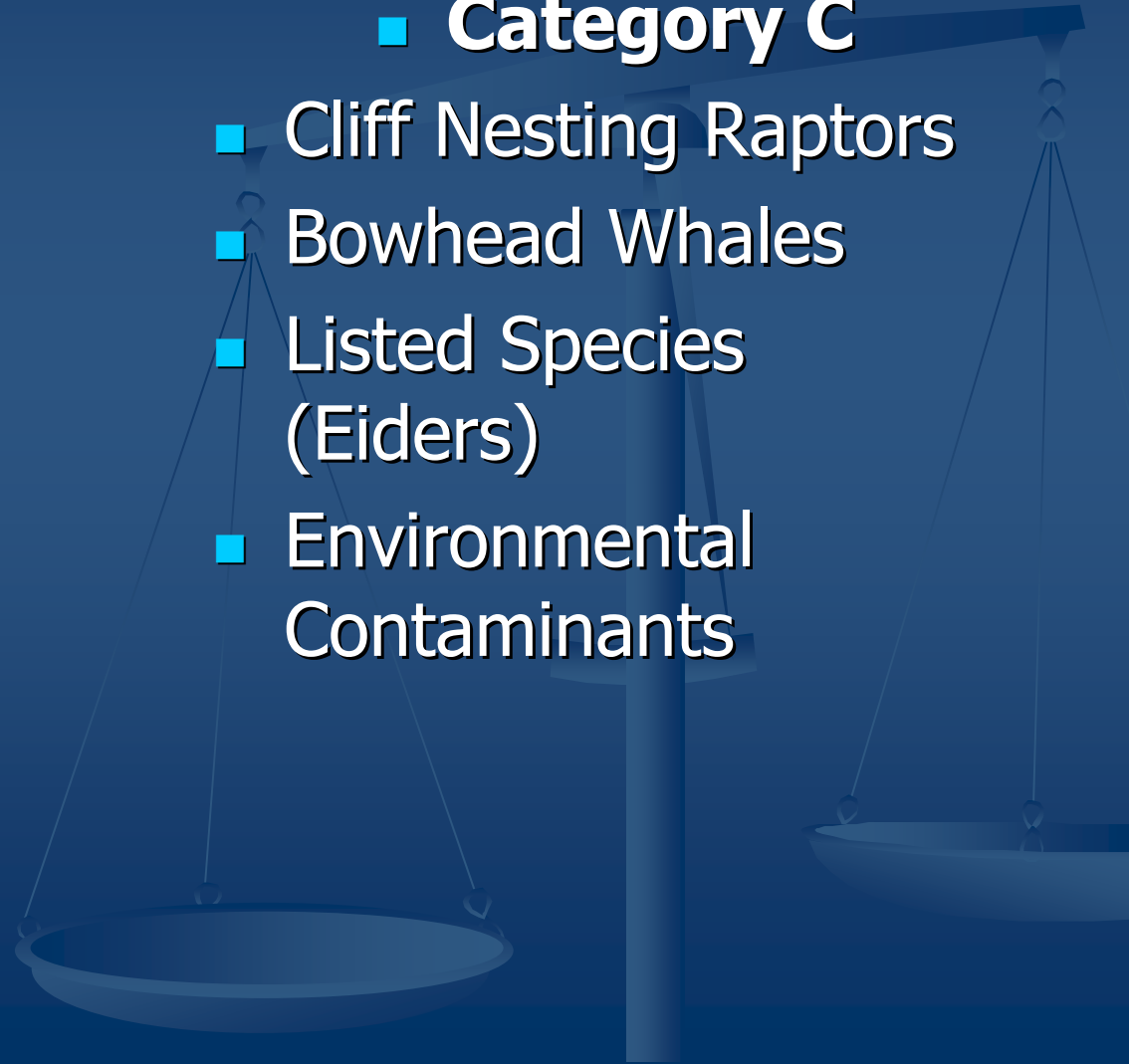
- Caribou
- Molting Geese
- Fisheries
- Subsistence
- Predators

■ Category B

- Sociocultural

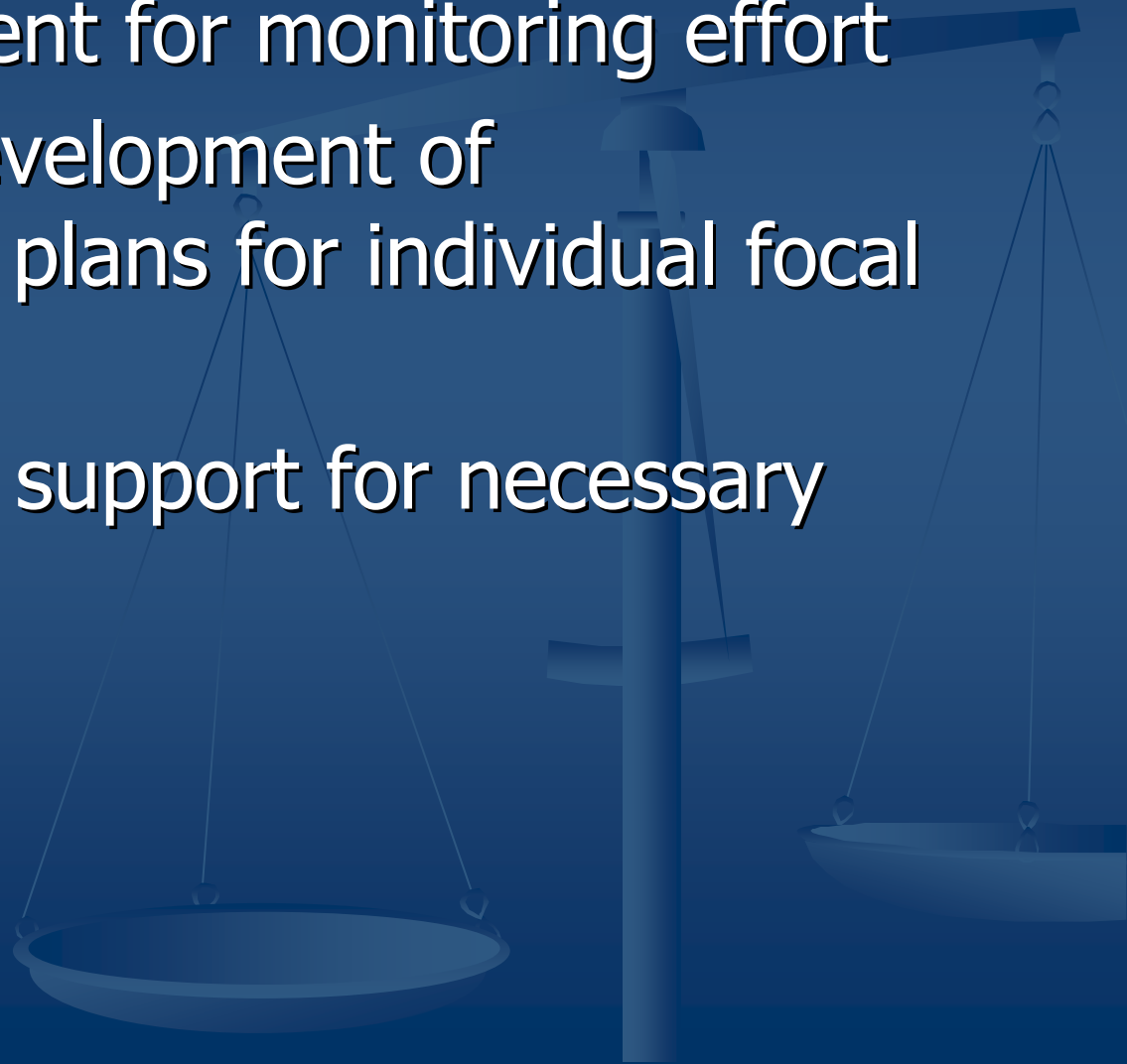
■ Category C

- Cliff Nesting Raptors
- Bowhead Whales
- Listed Species (Eiders)
- Environmental Contaminants

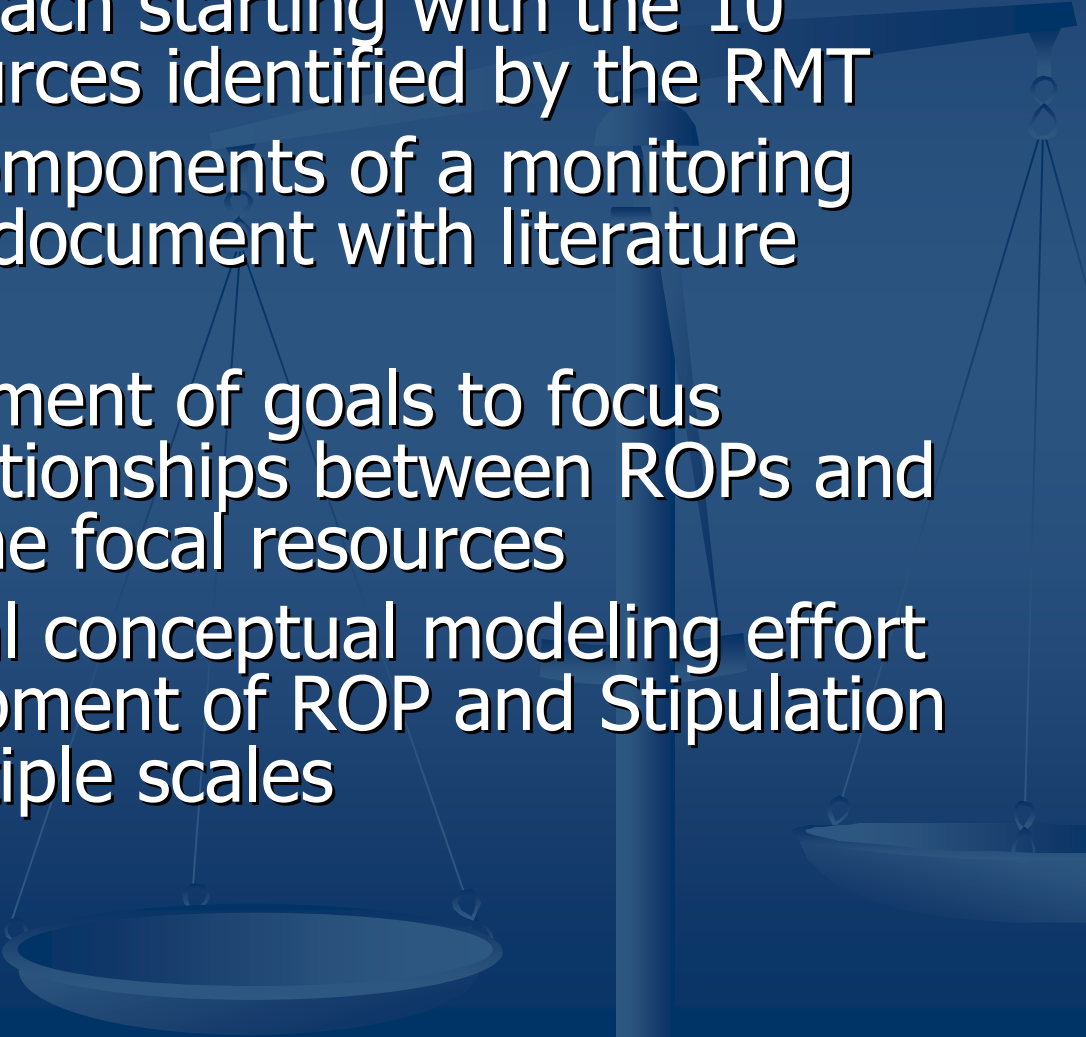


The Framework, what is it?

- Support document for monitoring effort
- Guidance for development of implementation plans for individual focal resources
- Description and support for necessary components



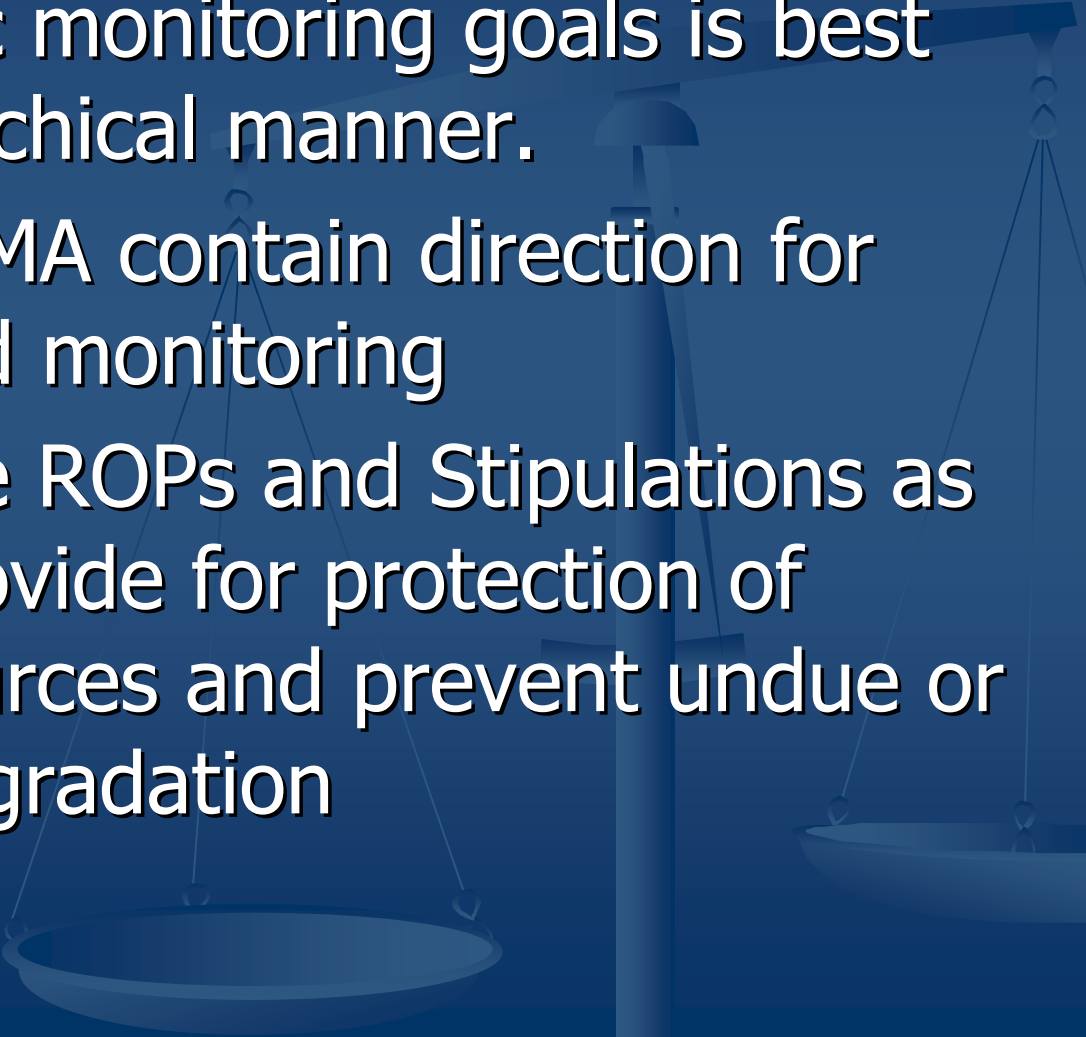
Framework

- Incremental approach starting with the 10 priority focal resources identified by the RMT
 - Consolidates all components of a monitoring program into one document with literature support
 - Uses explicit statement of goals to focus monitoring on relationships between ROPs and Stipulations and the focal resources
 - Requires additional conceptual modeling effort to support development of ROP and Stipulation Monitoring at multiple scales
- 

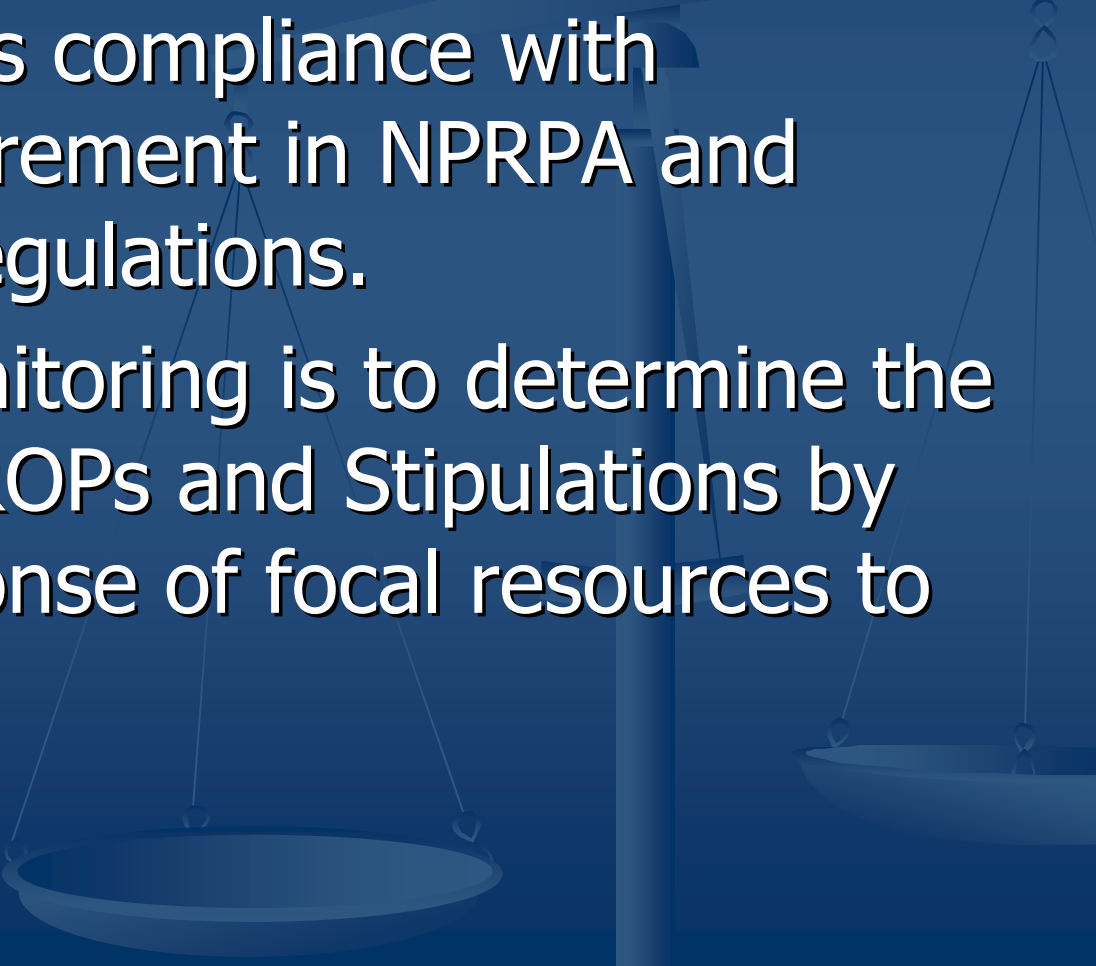
Framework Objectives

- Explain and define plan purpose and goals,
- Describe critical components of a monitoring plan,
- **Accommodate management evaluation and participation by providing a thorough description of theoretical foundations, goals, outputs, and implications of implementing a program of this scale,**
- Provide standards and guidelines for the preparation of plans specific to focal issues (implementation plans),
- Provide the history and rationale for plan development so plan implementation over the long term remains meaningful and relevant,
- Develop realistic cost estimate for a plan of this scale

Arriving at Monitoring Goals

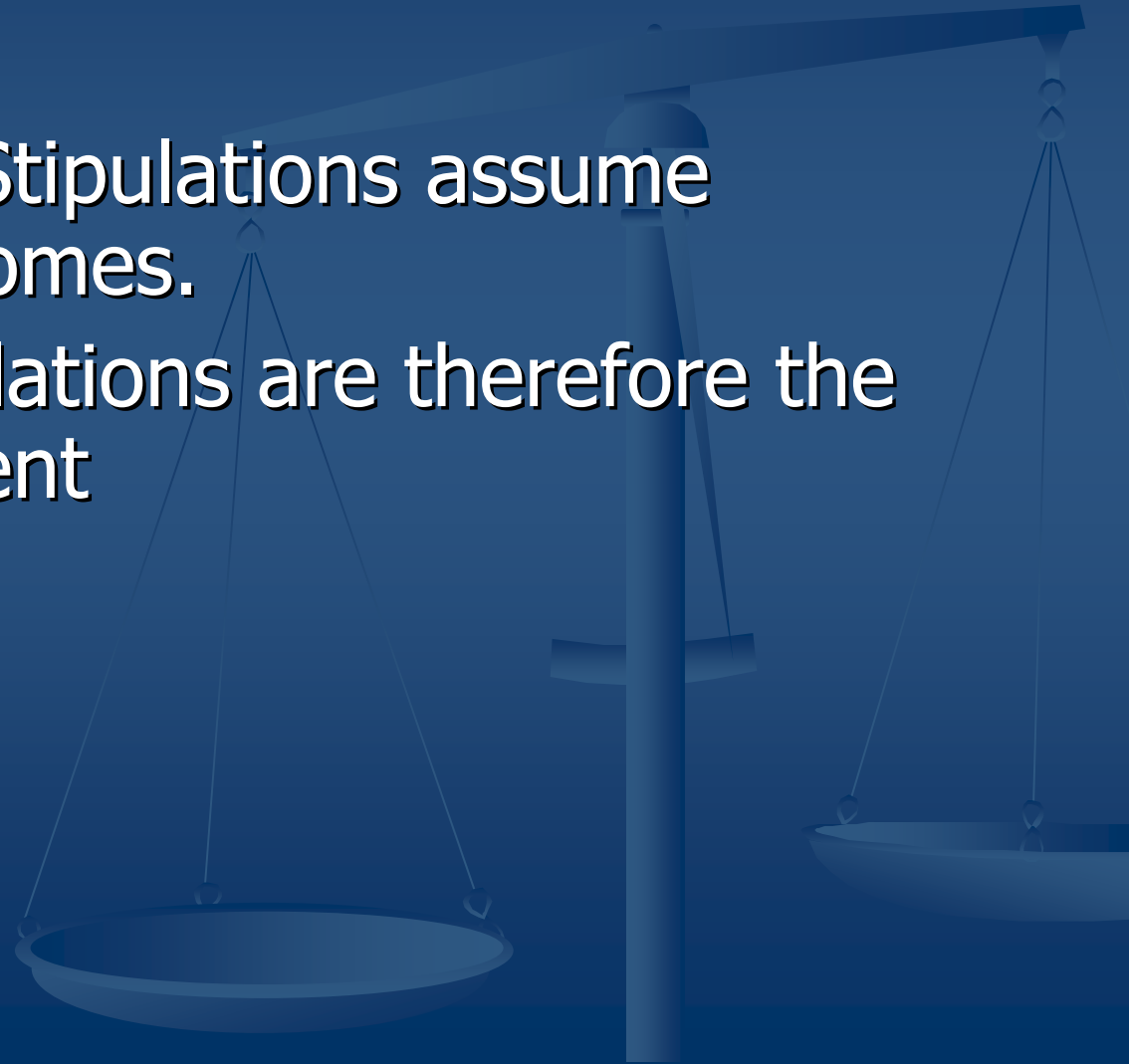
- Deriving specific monitoring goals is best done in a hierarchical manner.
 - NPRPA and FLPMA contain direction for multiple use and monitoring
 - EISs incorporate ROPs and Stipulations as strategies to provide for protection of significant resources and prevent undue or unnecessary degradation
- 

Monitoring Goals

- ROPs and Stipulations are the mechanism BLM proposes as compliance with protection requirement in NPRPA and implementing regulations.
 - The goal of monitoring is to determine the efficacy of the ROPs and Stipulations by describing response of focal resources to development
- 

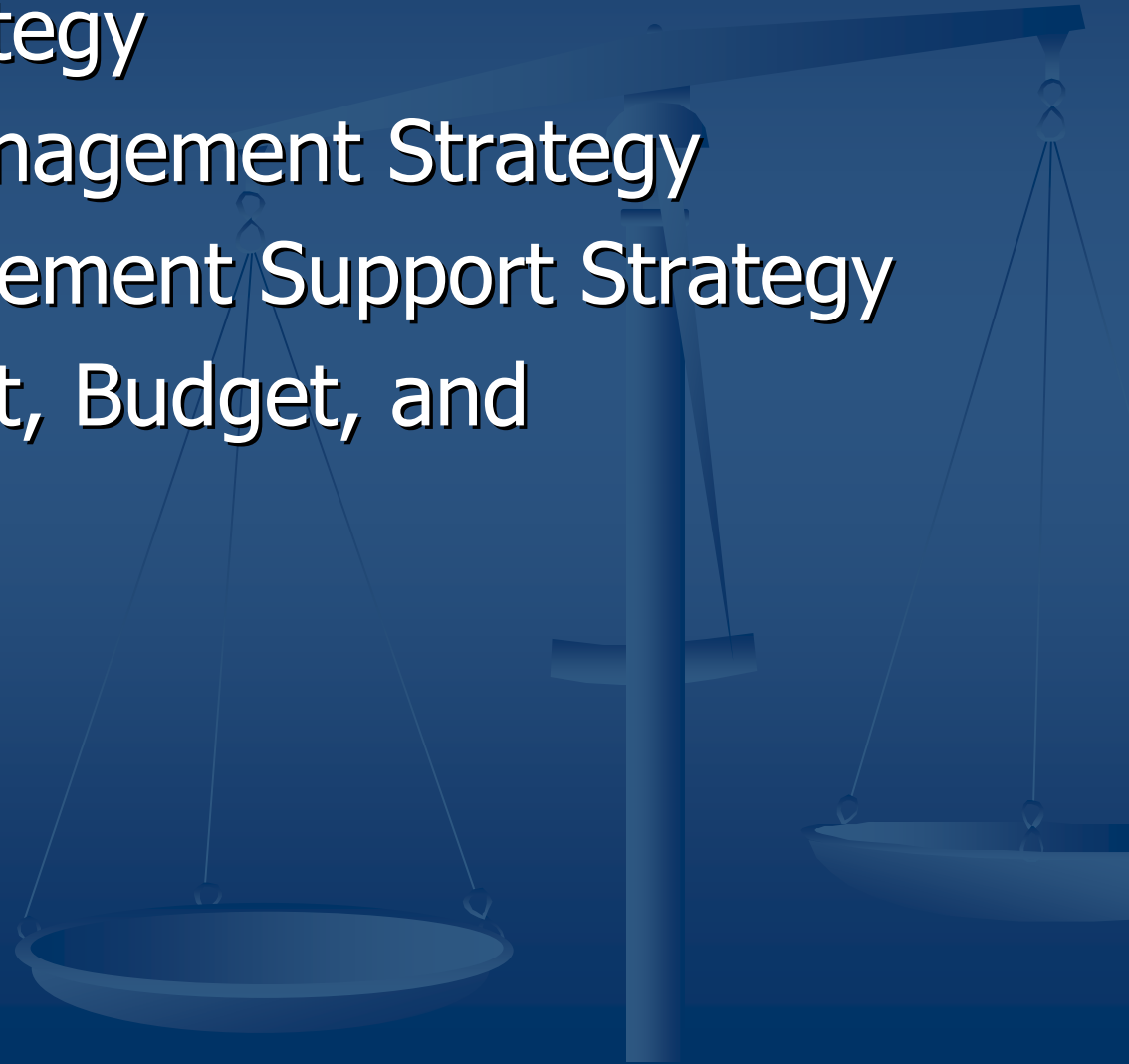
Goals Cont'd

- The ROPs and Stipulations assume successful outcomes.
- ROPs and Stipulations are therefore the primary treatment



Framework Components

- Monitoring Strategy
- Information Management Strategy
- Decision Management Support Strategy
- Estimate of Cost, Budget, and Infrastructure



Monitoring Strategy

- Develop additional Conceptual Models at multiple levels of spatial and temporal resolution to identify putative stressors at appropriate scale and support the models with comprehensive literature search and synthesis.
- Use intensive project specific monitoring
- Use extensive landscape and population monitoring.
- Review and incorporate existing extensive and long-term data collection efforts with BLM NPR-A specific data collection to monitor variation and long-term status and trend.
- Work with agencies, industry, and the scientific community to develop a complimentary research program to evaluate and develop monitoring methods and analytical approaches, as well as facilitate a mechanistic understanding of resource ecology.

Validation Monitoring

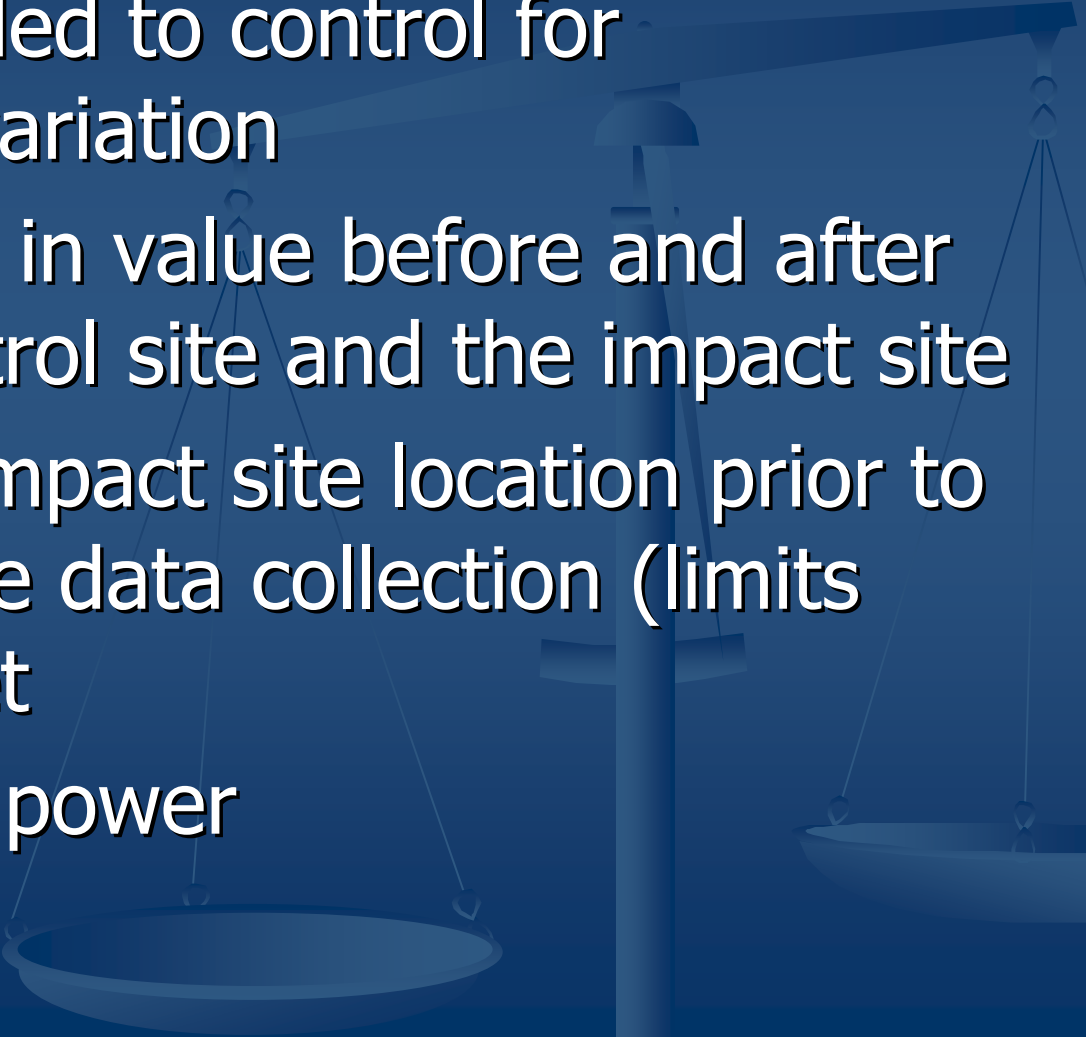
A faint, semi-transparent image of a balance scale is visible in the background, positioned on the right side of the slide. The scale is tilted, with the right pan being lower than the left pan. The background is a solid dark blue color.

- Site/Action specific monitoring
- Measure response of individuals to components of development
- Direct Assessment of efficacy of ROPs and Stipulations (“Validation”)


Validation Example

- Several ROPs require set backs from water bodies and other measures to reduce the potential for contaminants to reach water. A monitoring program to “validate” those ROPs might measure pre- and post development water quality parameters.

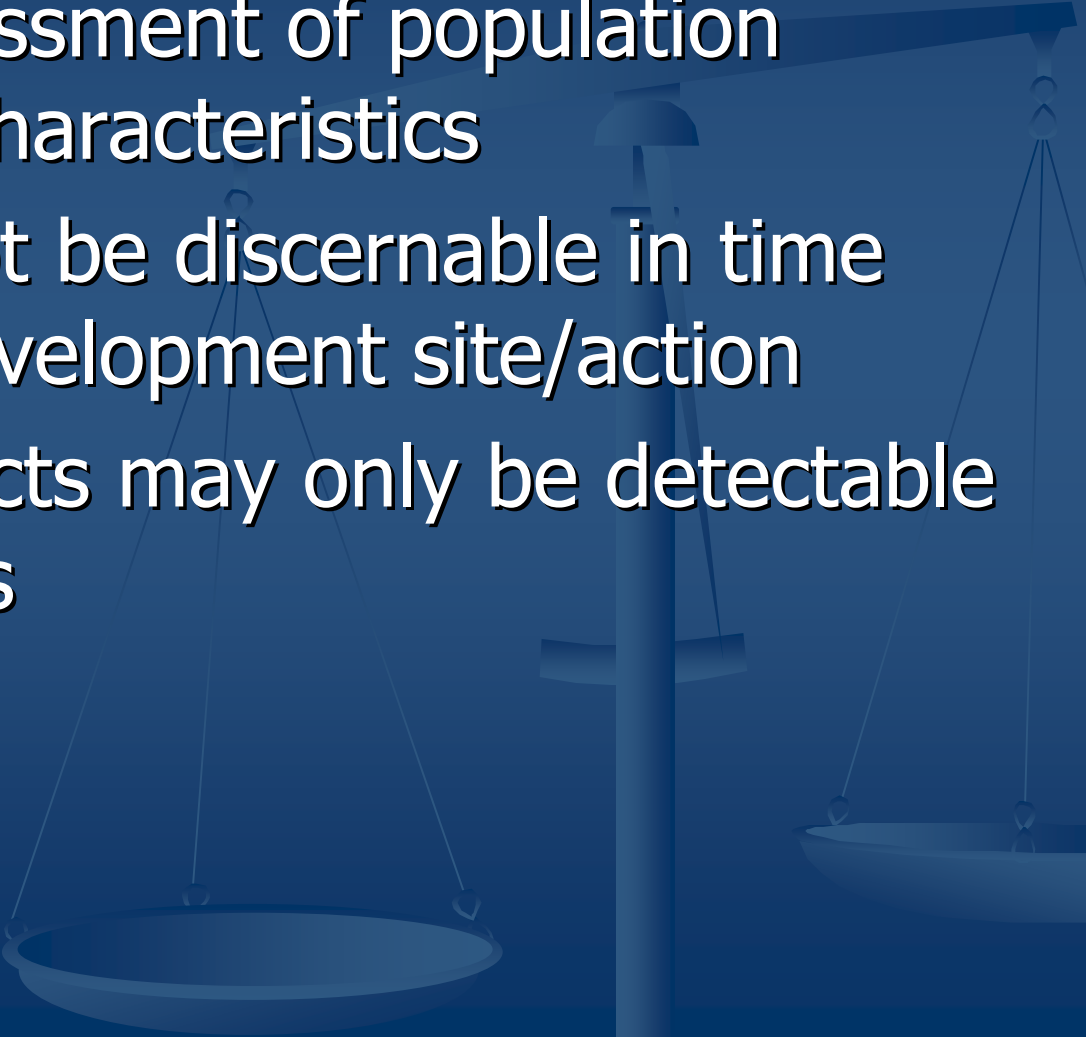
Before After Control Impact (BACI)

- Approach intended to control for environmental variation
 - Tests difference in value before and after impact at a control site and the impact site
 - Need to know Impact site location prior to beginning Before data collection (limits baseline data set)
 - Weak statistical power
- 

Intensive Node Monitoring

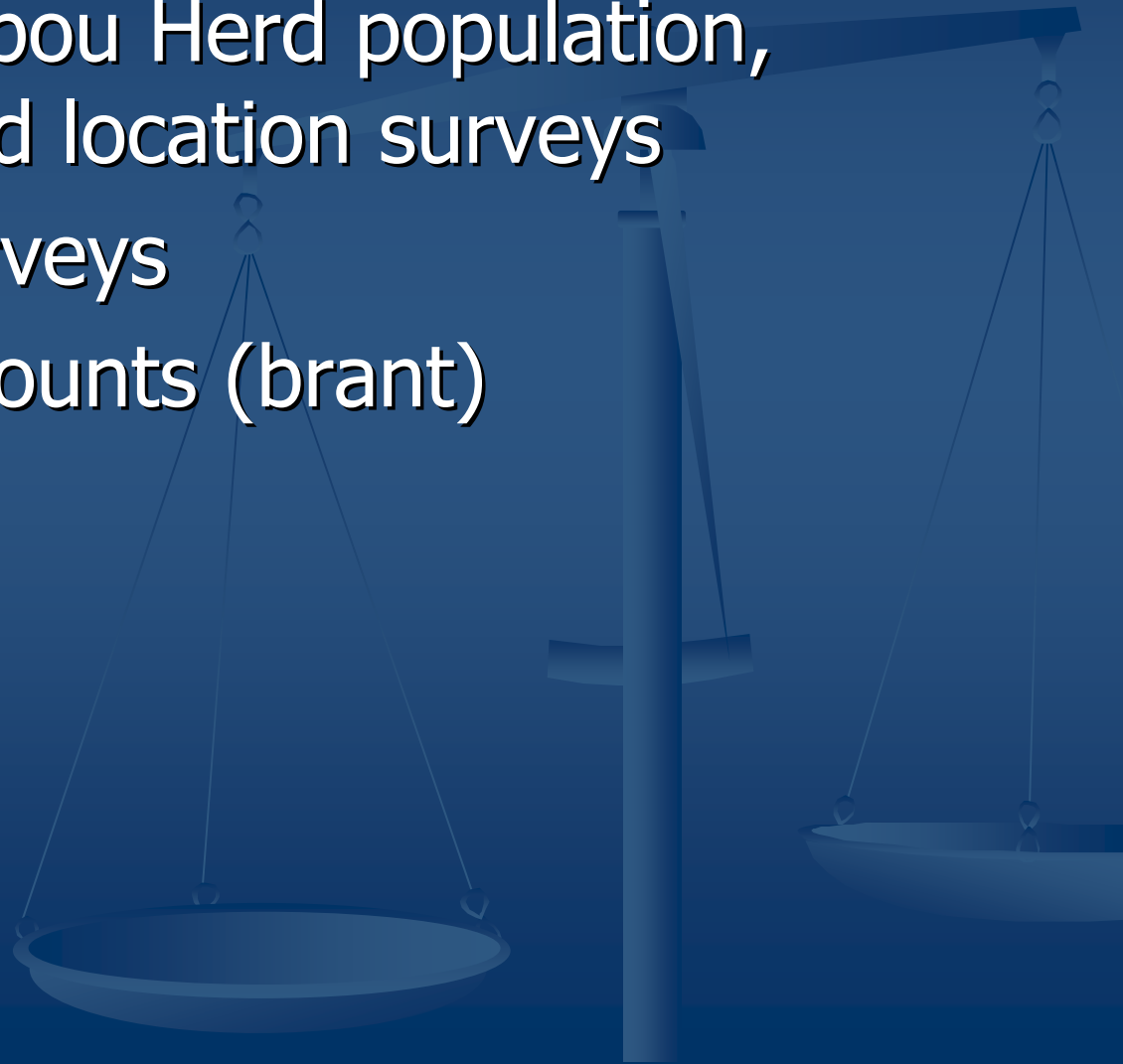
- “Nodes” probabilistically distributed across NPR-A
 - Nodes sized to encompass expected development
 - Baseline Monitoring conducted at same scale and intensity as future monitoring at development site – could start as soon as funded
- 

Effectiveness Monitoring

- Broadscale assessment of population health/habitat characteristics
 - Impacts may not be discernable in time and space of development site/action
 - Cumulative Effects may only be detectable at greater scales
- 

Effectiveness Examples

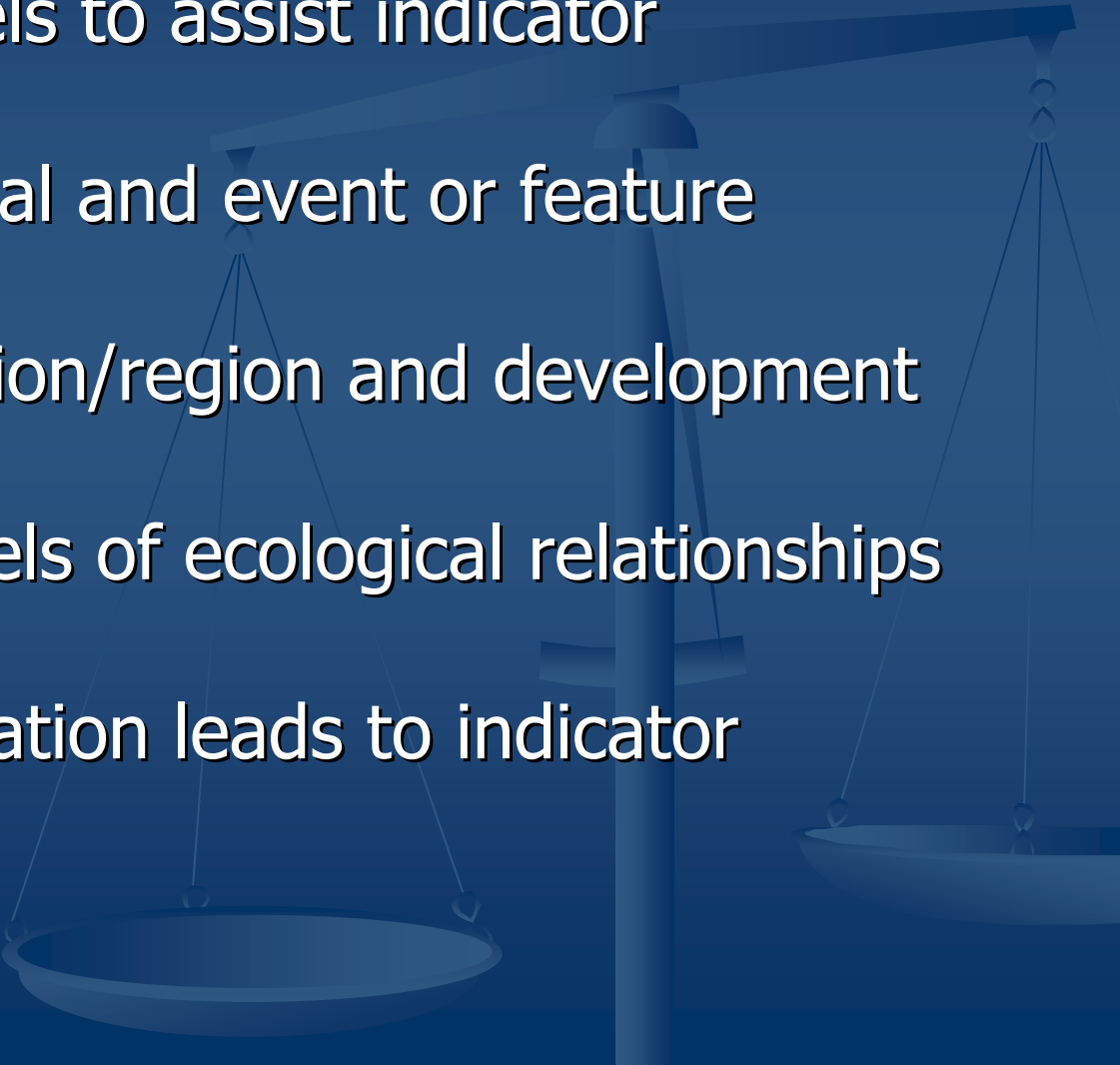
- Teshekpuk Caribou Herd population, productivity, and location surveys
- Spring eider surveys
- Molting geese counts (brant)




Validation compared to Effectiveness

- Do measurable effects from extrinsic stressors occur to individual members of a focal resource? (Validation)
- Are the effects adverse to the individual members of the focal resource? (Validation)
- Are the effects sufficient to result in changes at the population level? (Validation and Effectiveness)
- Do the population level impacts, when combined with intrinsic stressors exceed the resilience of the system, is the system being pushed to a new and undesirable state? (Effectiveness)

What to Monitor?

- Conceptual Models to assist indicator selection
 - Focus @ individual and event or feature (Validation)
 - Focus @ population/region and development (Effectiveness)
 - Mechanistic Models of ecological relationships (research)
 - Stressor identification leads to indicator selection
- 

Role of Research

- Monitoring should drive and be driven by research.
 - Research will be necessary to assess and develop monitoring and analysis techniques
 - Research will support interpretation of information developed by monitoring
- 

Information Management Strategy

- Information management is the set of processes intended to assist in the collection, organization, validation, storage and retrieval of data, with the ultimate purpose of converting data into information (reporting) useful to management (Palmer 1999)

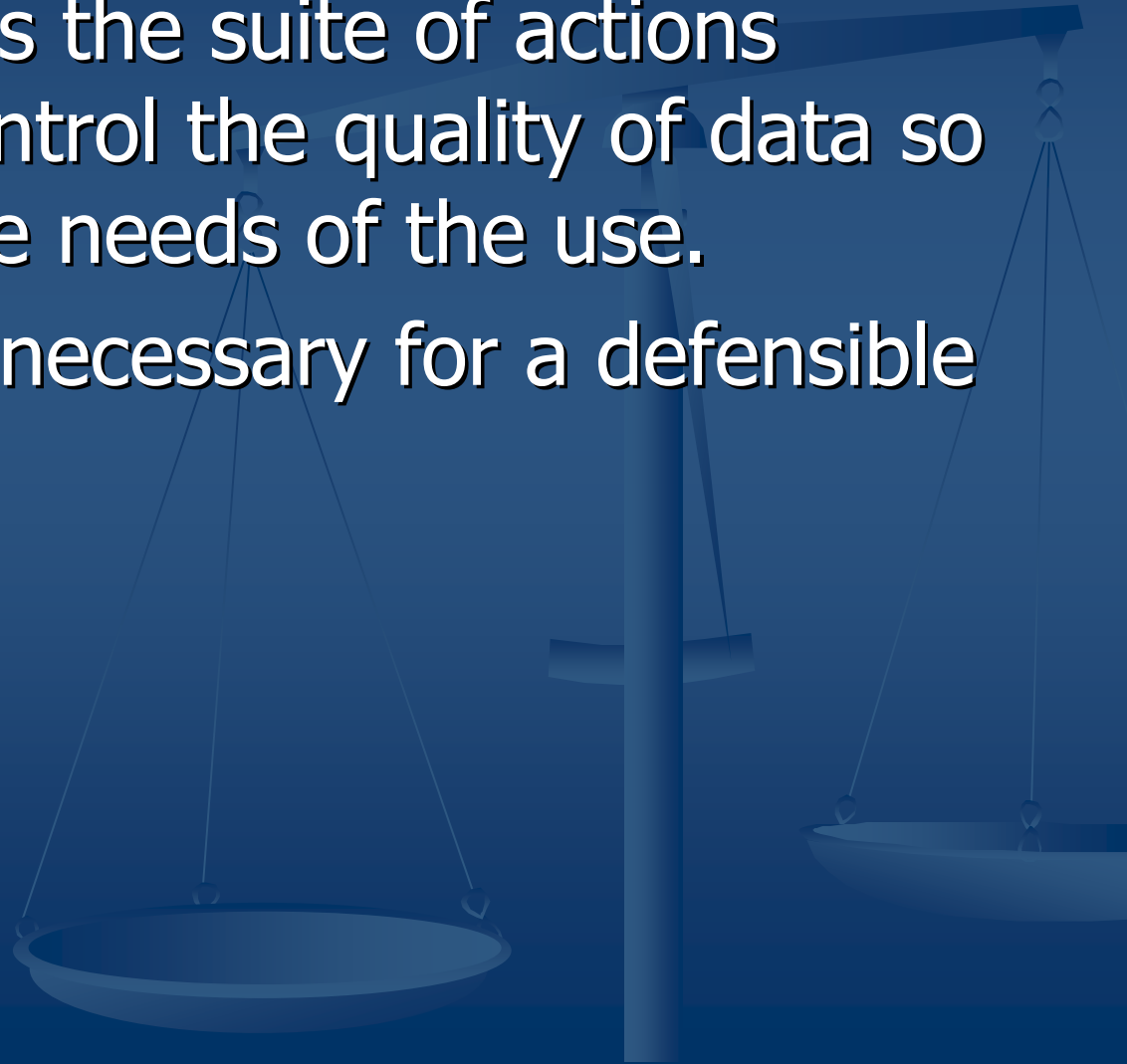
Information Management Strategy

- Quality Assurance/Quality Control
- Data Storage and Retrieval
- Metadata Standards
- Reporting Requirements



Quality Assurance/Quality Control

- Quality control is the suite of actions necessary to control the quality of data so that it meets the needs of the use.
- Formal process necessary for a defensible product



Data Storage/Retrieval

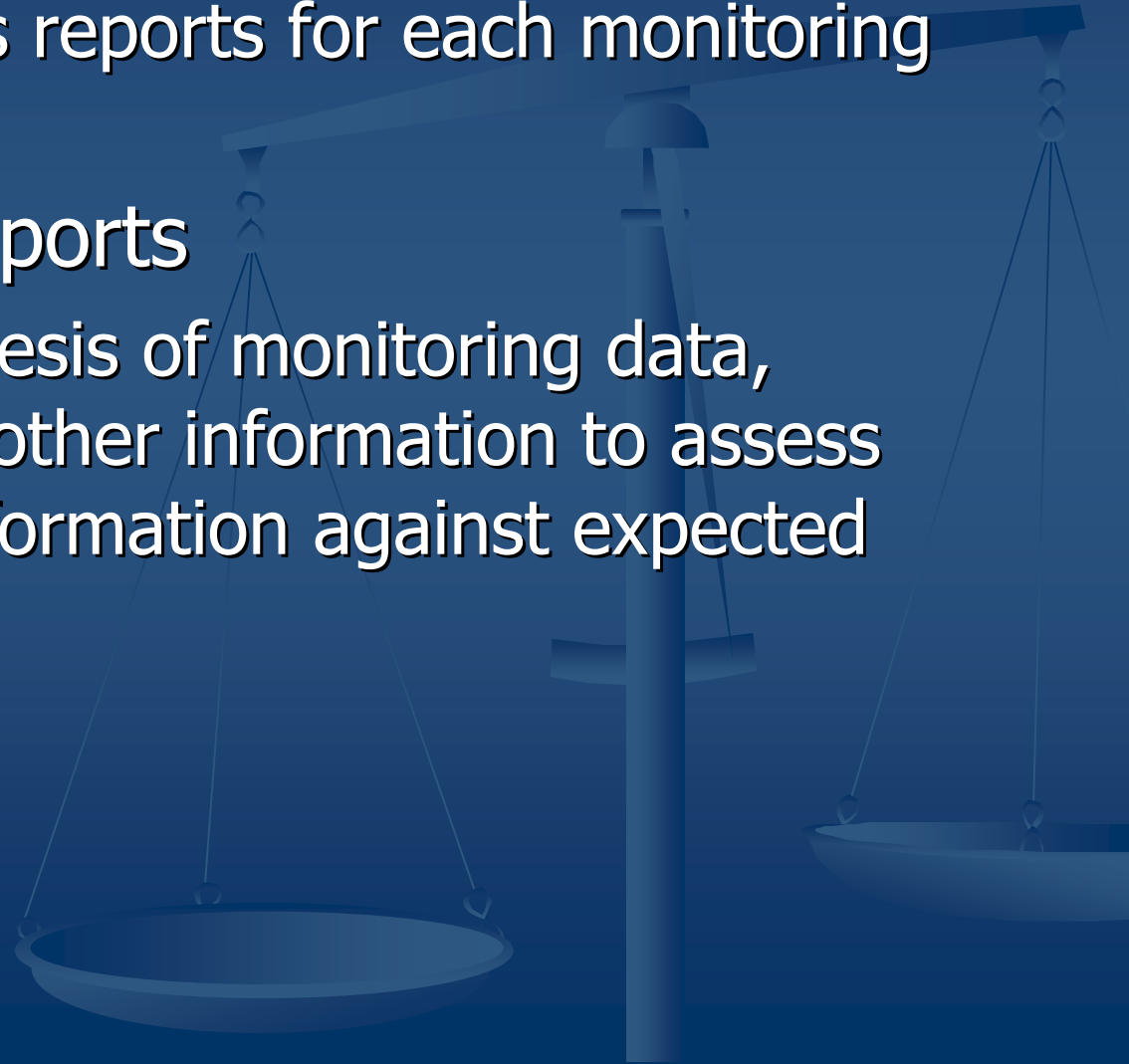
- "... attempts to broaden research efforts often fail because the data pertaining to environmental resources are incompatible, stored in isolated locations, inadequately protected, and poorly documented."
(Michener 1999)

Metadata

- "Metadata is the set of instructions or documentation that describe the content, context, quality, structure, and accessibility of a data set."
- The purpose metadata is to describe who, what, when, where, and how about every aspect of the monitoring data

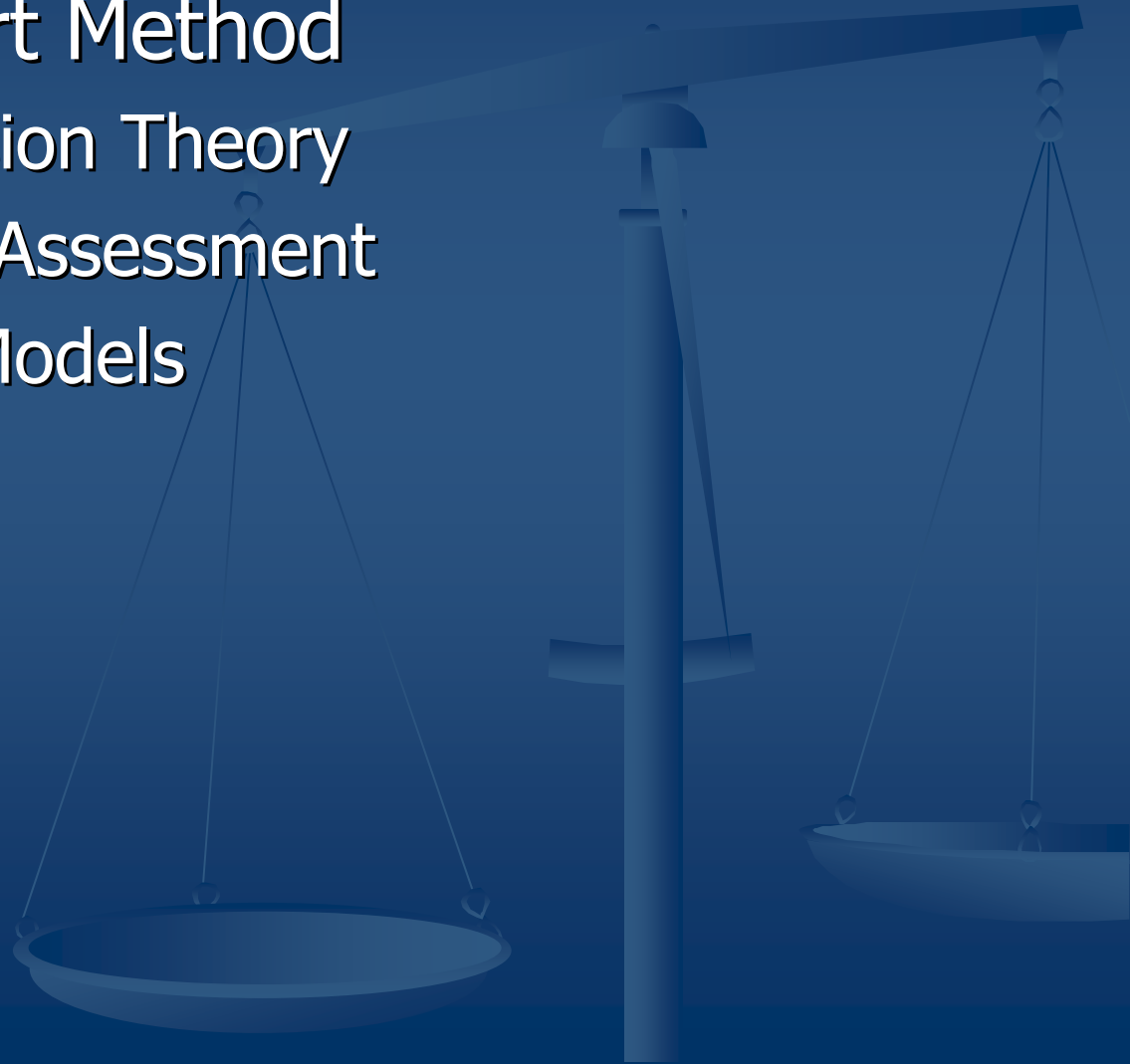
Reporting Requirements

- Data summaries
 - Concise status reports for each monitoring period
- Interpretive reports
 - Periodic synthesis of monitoring data, research and other information to assess monitoring information against expected outcomes.



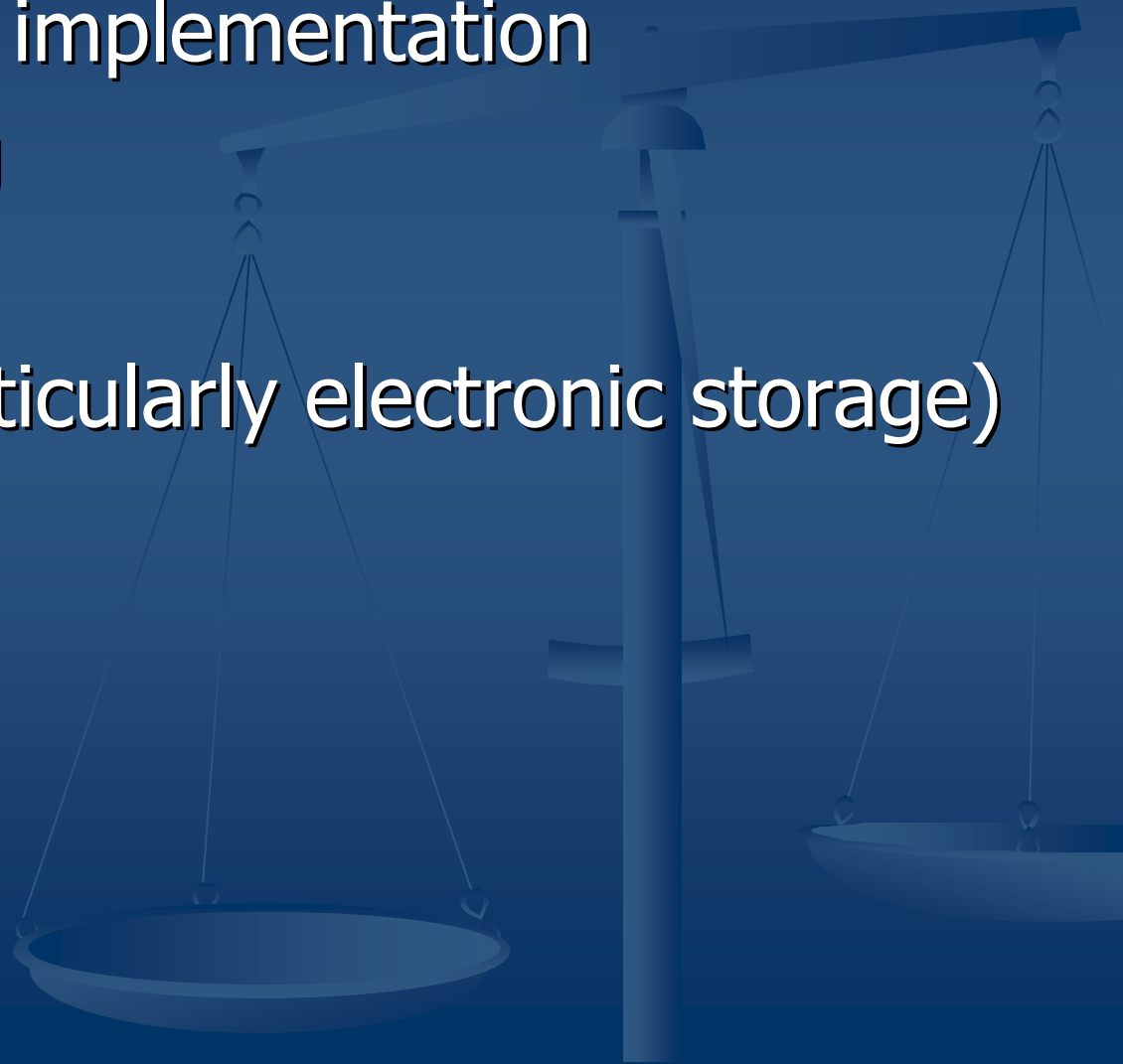
Decision Support Strategy

- Decision Support Method
 - Statistical Decision Theory
 - Ecological Risk Assessment
 - Decision Tree Models

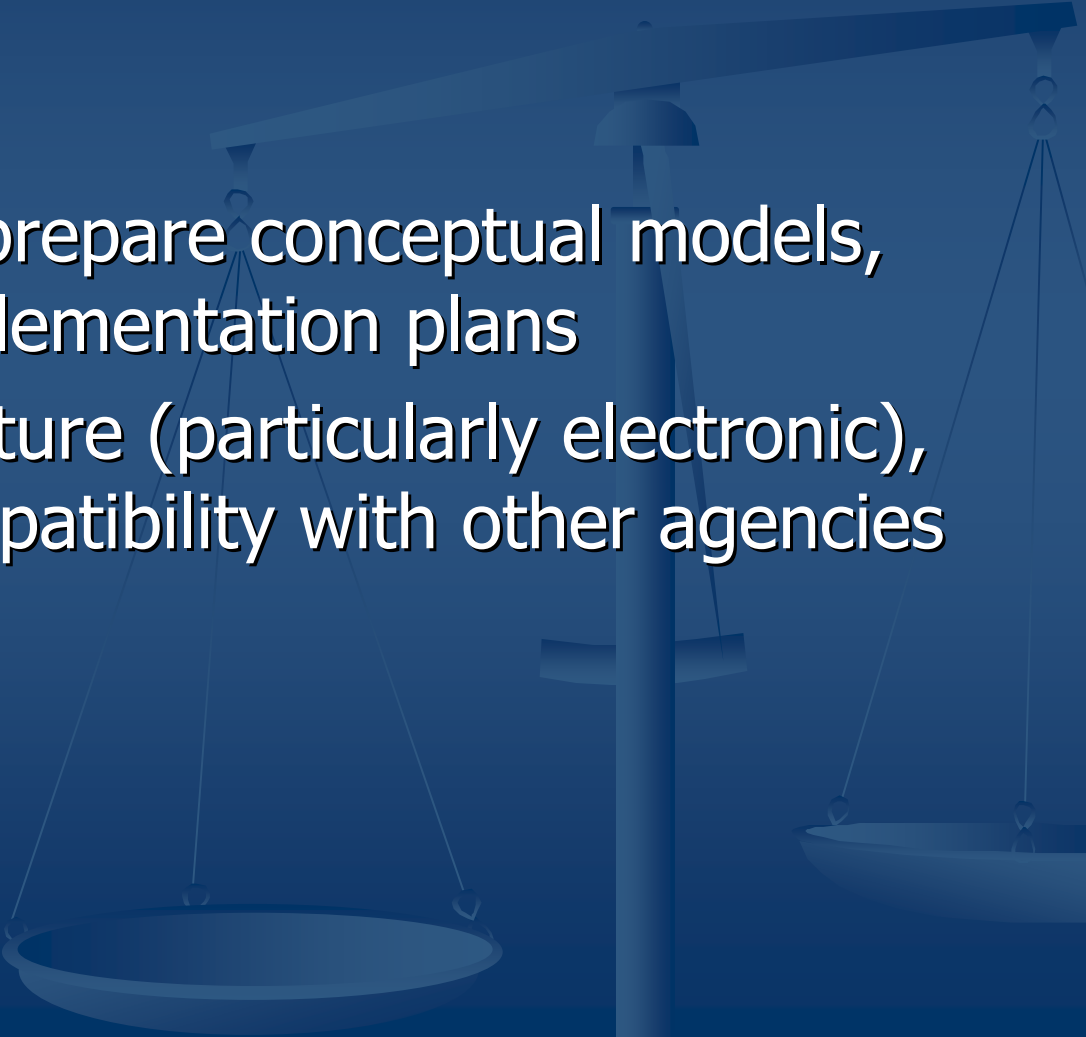


Infrastructure Requirements

- Costs, Start up, implementation
- Budget/Funding
- Personnel
- Equipment (particularly electronic storage)



Next Steps

- Pursue funding
 - Assemble teams, prepare conceptual models, and individual implementation plans
 - Develop infrastructure (particularly electronic), work towards compatibility with other agencies through NSSI.
- 

Questions?

