Advisory Team Briefing

The PRIDE Project:
Strategic Information Planning for
Natural Resources
Presented by Gary Williams

Wednesday, April 27, 2005
12:00 – 1:30 (MDT)
Teleconference
The Current PRIDE Project Team

Executive Committee
- Office of Inventory, Monitoring, and Evaluation
- Office of Natural Resource Information Systems
- Regional and Park Staff

Advisory Committee

Subject Matter Experts
Consultant, Quality Technology, Incorporated
What PRIDE Stands For

Protecting
Resources through
Informed
Decision-making and
Education
PRIDE in a Nutshell

A project designed to conduct a \textit{structured, comprehensive} assessment of the Service’s natural resource business requirements, critical information needs, and information technology applications.
What Are **Business Requirements**?

Business requirements include any function an organization needs to perform in order to accomplish its mission. e.g.:

- Make Decisions (reintroduce endangered species)
- Plan Programs (develop RSP’s)
- Synthesize Information (assess impairment)
- Collect Data (monitor air quality parameters)
Some Important Milestones

NRC Element – “Make Data Useable for Mgmt Decisions and Public Needs” (August, 1999)

Park Natural Resource Information Needs Workshop (Silver Creek, September, 2000)

Natural Resource Data Integration Team (NRSS, FY 2001)

Natural Resource Advisory Group Decision (May, 2002)

Project Definition Workshop (September, 2002)

PRIDE Phase I Implementation Workshop (September, 2004)
Why PRIDE and the I&M Program?

Long Term Programmatic Goals (NPS-75: 1992)

1. Establish natural resource inventory and monitoring.

2. Inventory the natural resources and park ecosystems.

3. Monitor park ecosystems.

4. Integrate natural resource inventory and monitoring information into NPS planning, management, and decision making.

5. Share NPS accomplishments and information.
PRIDE is Needed Because

Never a comprehensive effort designed to:
- Relate NRSS business functions to information requirements, and data collection efforts
- Document how information needs vary at park, regional, and national levels

OMB Mandate:
- Conduct an independent review/evaluation of NRSS management programs
The Goals of PRIDE

Two main goals for PRIDE:

1. To determine if NRSS data collection efforts are aligned with its business functions
2. To develop a strategy to improve the use of NRSS information technologies to support its business functions

PRIDE is ultimately a review of a major NPS investment, to make sure that the money is being spent wisely.
The "Real" Natural Resource Challenge!

The National Park Service **MUST** make sure that:

- The "right" information is being collected and,
- Made available through accessible sources to,
- Support mission-critical functions for,
- Achieving long-term management goals that,
- Allow the NPS to accomplish its legislatively-mandated mission.
Conceptual Framework of the NPS Resource Planning and Management System

Legislation, Executive Proclamations

Mission

Strategic Mission Goals

Mission-Critical Functions/Decisions

Information Requirements

Information Systems

Data Collection
Where PRIDE Fits in the Framework

Legislation, Executive Proclamations

Mission

Strategic Mission Goals

Mission-Critical Functions/Decisions

Information Requirements

Information Systems

Data Collection
The Scope of PRIDE

PRIDE is not limited to I&M information collection only - it extends to all natural resource information collected by NRSS.

To assess information utility and accessibility, PRIDE will examine two types of integration:

1. Integration across resource categories
2. Integration across information systems
**Definition**

Natural Resource Stewardship and Science (NRSS) Stakeholders

Includes all National Park Service employees, partners, contractors, and cooperators at the park, regional, and national levels who are directly involved with activities related to natural resource stewardship and protection.
Methodology of PRIDE

The methodology of PRIDE includes a 5-step process:

1. Identify major NRSS business requirements (i.e. functions)
2. Determine information needs
3. Assess existing information systems
4. Identify information gaps and holes
5. Develop Modernization Blueprint
Step 1: Identify Critical Business Functions

Two Major Sources:

1. Published NPS Policy Documents
   - Reference Manuals
   - Technical Guidelines
   - Director’s Orders

2. Professional Judgment
   - Silver Creek Workshop
   - September 2004 PRIDE Workshop
Published Policy Documents

Reference Manual — 77 Documents: 24 Functions Described. Some Examples Include:

- Wetland Protection
- Air Resources Management
- Geologic Resources Management
- Sound Preservation and Noise Management
- Cave and Karst Management
Step 2: Identify What Information is Needed

Develop a “Conceptual Model” of the Business Function by Describing:
- Steps in the Function
- Information Needed at Each Step
- Potential Sources of Information

Conceptual Models represented as “Data Flow Diagrams”

Have the Models (DFD’s) Peer Reviewed by Subject Matter Experts to Make Sure They are Accurate and Complete.
- Central Office SME’s (e.g. authors)
- Park/Network SME’s (e.g. implementers)

Review Results with Stakeholders
1) to provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands;
2) to preserve and enhance the natural and beneficial values of wetlands;
3) to avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands.

- adopt a goal of “no net loss of wetlands”
- strive to achieve a longer-term goal of net gain of wetland habitat
- conduct park-wide wetland inventories to help assure proper planning with respect to management and protection of wetland resources.
- use “Classification of Wetlands and Deepwater Habitats of the United States”
- for proposed new development or other new activities will:
  - avoid adverse wetland impacts to the extent practicable,
  - minimize impacts that could not be avoided, and
  - compensate for remaining unavoidable adverse wetland impacts
- address wetlands impacts with an Environmental Assessment (EA)
- use a Statements of Findings (reviewed by a certified scientist) to proceed
- restore wetlands to pre-disturbance conditions where appropriate & practical
- enhance natural wetland values by using them for educational, recreational, scientific, and similar purposes that do not disrupt natural wetland functions.

**Preserve, Enhance & Restore Park Wetland Values DFD - Level 1**

Sample DFD
Core Natural Resources Model & Its Component Views

Each Discipline Needs a Particular “View” of Information
All Views Can Be Provided by a Core Data Model
### Business Function Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>GPRA and/or Accountability</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>Major NRSS Programs</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>Resource Specific</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Supported by NRSS</td>
</tr>
</tbody>
</table>
Step 3: Assess Information Systems – The “As Is” Architecture

PRIDE Workshop Participants Identified 80 Existing Natural Resource Information Systems and Sources, Including:

- Databases (e.g. STORET)
- Information Systems (e.g. ARIS)
- Web-sites (e.g. Nature and Science)
- Technical Publications (e.g. Ecology)

Collectively, These Sources Define the “As-Is” (Current) Information System Architecture
Step 4: Is the Required Information Currently Available?

Work With DFD’s and “As Is” Architecture to Identify Any Information Gaps and/or redundancies by:

- Compiling Information Needed to Implement all Business Functions (i.e. “Super Data Set”)
- Comparing Elements in the Super Data Set with Data Provided through “As Is” Architecture
Mapping of Wetlands Data to the Current NRSS IT Systems

The complete data model is then mapped to current systems.
Step 5: Provide Recommendations for Improvement

Recommendations Related to Business Functions:
- Describe ways to make functions more efficient
- Identify information required but not available or easily accessible

Recommendations Related to Information Technology:
Describe a “Target System Architecture”
- Additions
- Deletions
- Modifications
An Example Roadmap for NRSS Ecosystem Monitoring Architecture Evolution

Current Environment
(As-is architecture)

Interim Environment (1-2 years)
(Interim To-be architecture)

Interim Environment (3-5 years)
(Interim To-be architecture)

Future Environment (5-10 years)
(Future To-be architecture)

NRSS I&M Systems

Systems that store data will evolve over time towards the common data model
Two Major PRIDE Products

**Gap Analysis Report** – Identifies any gaps in the availability or accessibility of information needed to perform decision-making and planning.

**Modernization Blueprint** - Describes “as is” business functions and related data, “target” business functions and related data, and recommended transition plan.
PRIDE Project Timeline

1. Implementation Workshop  Sept.  2004
2. Business Function Modeling  May  2005
5. Gap Analysis  Sep.  2005
6. Information Requirements  Nov.  2005
7. Functional Requirements  Dec.  2005
8. Project Completion  Feb.  2006
In Summary: Important Benefits of the PRIDE Project

1. Match Critical Resource Information Needs with Existing Sources. — Maximize Benefits
2. Explore Ways to Optimize Information Technology Applications and Deployment — Provide Road Map
3. Assist in the Identification of “Core” Natural Resource Information Requirements
4. Position the National Park Service to Undertake Development of an Enterprise Architecture as Mandated by Congress and the Department
Enterprise Architecture = Missions + People + Information + Technology

Legislation, Executive Proclamations

Mission

Strategic Mission Goals

Mission-Critical Functions/Decisions

Information Requirements

Information Systems

Data Collection