Communicating Science Information on Everglades Restoration

Moving Beyond Data Rich, But Information Poor in Science Communication

Laura A. Brandt
U.S. Fish and Wildlife Service, Davie, FL, USA
We have made progress in our communication

There is still room for improvement in:
  – Audience identification
  – Understanding what is important
  – Understanding what resonates
  – Explicit efforts to coordinate and integrate
  – Explicit commitment of resources for communication
South Florida Ecosystem Restoration Task Force
System-wide Ecological Indicators

• Background
• Communication framework
• Example:
  – Task Force Biennial Report System-wide Ecological Indicators
South Florida Ecosystem Restoration Task Force

• Established by WRDA 1996
• 14 member organizations
  – 7 federal, 2 tribal, and 5 state and local government representatives
• Secretary of Department of Interior as Chair
The South Florida Ecosystem Restoration Program

• A healthy South Florida Ecosystem that supports diverse and sustainable communities of plants, animals, and people
  
  – Get the water right
  – Restore, preserve, and protect natural habitats and species
  – Foster compatibility of the built and natural systems
Reporting Requirement

• Biennial Report to Congress
  – Summarize activities
  – Report on progress toward restoration
The South Florida Ecosystem Restoration Program

- Comprehensive Everglades Restoration Plan (CERP)
- Non-CERP
  - Kissimmee River Restoration Project
  - Everglades Construction Project
  - C-111 Project
  - Modified Water Deliveries to Everglades National Park Project
  - “Critical Projects” authorized by WRDA 1996
- South Florida Multi-species Recovery Plan
- State water quality plans
- State land acquisitions authorized for Save Our Rivers (SOR) and Conservation and Recreation Lands (CARL) programs
- Federal land acquisitions for national parks, preserves and wildlife refuges
Progress Towards Ecosystem Restoration

Goal 1: Get the Water Right

Subgoal 1-A: Get the Hydrology Right
Objective 1-A.1: Provide 1.8 million acre-feet of surface water storage by 2036.
Objective 1-A.2: Develop alternative water storage systems capable of storing 1.7 billion gallons per day by 2030.

Subgoal 1-B: Get the Water Quality Right
Objective 1-B.1: Construct 96,010 acres of stormwater treatment areas by 2035.
Objective 1-B.2: Prepare locally based plans to reduce pollutants as determined necessary by the total maximum daily loads by 2014.

Goal 2: Restore, Preserve, & Protect Natural Habitats & Species

Subgoal 2-A: Restore, Preserve, & Protect Natural Habitats
Objective 2-A.1: Complete acquisition of 5.7 million acres of land identified for habitat protection by 2020.
Objective 2-A.2: Protect 20 percent of the coral reefs by 2015.
Objective 2-A.3: Improve habitat quality for 2.4 million acres of natural areas in south Florida.

Subgoal 2-B: Control Invasive Exotic Plants & Animals
Objective 2-B.1: Achieve maintenance control of Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern on south Florida’s public conservation lands by 2020.
Objective 2-B.2: Release two biological control insects per year for the control of invasive exotic plants.
2005

• Task Force directed SCG to develop a “suite” of system-wide indicators for restoration
  – Judge the performance of CERP and Non-CERP projects
  – Evaluate ecological change from implementation
  – Coordinated with RECOVER to create a harmonious communication tool
System-wide Ecological Indicators

- Invasive Exotic Plants
- Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation
- Eastern Oysters
- Crocodilians (American Alligators and Crocodiles)
- Fish and Macroinvertebrates
- Periphyton and Epiphyton
- Wading Birds (White Ibis and Wood Stork)
- Southern Estuaries Algal Blooms
- Florida Bay Submersed Aquatic Vegetation
- Juvenile Pink Shrimp
- Wading Birds (Roseate Spoonbill)
Generalizable Strategic Communication Conceptual Framework using a Strategic Communication Matrix

1. Set Project Goals and Objectives
2. Set Communication Goals
3. Identify Audience(s)
4. Develop Messages
5. Select Vehicles
6. Define Metrics for Success
7. Implement Plan
8. Monitor & Evaluate

Steps 2-6 can be done using a Strategic Communication Matrix

Figure by M.C. Harwell
Set Communication Goals

• Biennial report
  – Report to Congress on progress made towards restoration
  – Assess the current status of the ecosystem
  – Track responses to restoration projects and system-wide operational changes
Identify Audiences

• Biennial report
  – United States Congress
  – Florida Legislature
  – Seminole Tribe of Florida
  – Miccosukee Tribe of Indians of Florida
Develop Messages

• Biennial report
  – We are making progress towards restoration
  – Investments are worth it
  – Continued investments will get us to full restoration
Select Vehicles

• Biennial report
  – Stoplight presentation

  **Red** - Substantial deviations from restoration targets creating severe negative condition that merits action

  **Yellow** - Current situation does not meet restoration targets and may require additional restoration action

  **Green** - Situation is within the range expected for a healthy ecosystem within the natural variability of rainfall. Continuation of management and monitoring effort is essential to maintain and be able to assess “green” status
Changes to System-wide Ecological Indicator Reporting in the Biennial Report

• Shorter

• Focus on audience of Congress, Legislature, and Tribes

• Summary of indicators
  – Indicators at a glance
  – One page per indicator

• Case studies/story lines- examples of ecological responses to investments
Indicators at a Glance

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Water Year 2008</th>
<th>Water Year 2009</th>
<th>Water Year 2010</th>
<th>Water Year 2011</th>
<th>Water Year 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Okeechobee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invasive Exotic Plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Estuaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invasive Exotic Plant Species</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Oysters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Everglades</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crocodilians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish and Macroinvertebrates (WCA 3 and ENP only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invasive Exotic Plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periphyton and Epiphyton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wading Birds (White Ibis and Wood Stork)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Coastal System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crocodilians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Estuaries Algal Blooms**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida Bay Submersed Aquatic Vegetation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invasive Exotic Plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile Pink Shrimp*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wading Birds (Roseate Spoonbill)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wading Birds (White Ibis and Wood Stork)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

System-wide Ecological Indicators

Hospital Hints for Reading the Indicators
Within the system-wide indicator tables, the “Current Status” column contains the most recent indicator information, which for most indicators is at the end of FY 2016 (May 1, 2016 to April 30, 2017). The “Previous Status” column contains information for FY 2014 (May 1, 2013 to April 30, 2014). Status is shown using green, yellow, and red stoplight colors as explained below.

Stoplight Color Legend
- Green (G): Substantial deviations from restoration targets creating severe negative condition that merits action. Well below restoration target.
- Orange (O): Current situation does not meet restoration targets and may require additional restoration action. Below restoration target.
- Red (R): Situation is within the range expected for a healthy ecosystem within the natural variability of natural conditions. Continuation of management and monitoring effort is essential to maintain and be able to assess "green" status. Meets restoration target.
- Black (B): No data or inadequate amount of data were collected due to reductions in funding.

<table>
<thead>
<tr>
<th>INDICATORS AT A GLANCE</th>
<th>Previous Status</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water Year 2014</td>
<td>Water Year 2016</td>
</tr>
<tr>
<td>Invasive Exotic Plants</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Lake Okeechobee Nearshore Zone Submersed Aquatic Vegetation</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Eastern Oysters - Modified (Northern Estuaries only)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Crocodilians (American Alligators and Crocodiles) - Modified (Wetlands Only)</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Fish &amp; Macroinvertebrates (WCA3 and ENP only)</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Periphyton - Modified (no species composition)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Wading Birds (White Ibis and Wood Stork)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Southern Coastal System Phytoplankton Blooms - Modified (no southeast shelf)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Florida Bay Submersed Aquatic Vegetation</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Juvenile Pink Shrimp - Modified (no sampling)</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Wading Birds (Roseate Spoonbill)</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

59
Indicator Sections

Crocodilians (American Alligators & Crocodiles) Indicator

<table>
<thead>
<tr>
<th>STATUS</th>
<th>PREVIOUS (WATER YEAR 2012)</th>
<th>CURRENT (WATER YEAR 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSTEM-WIDE (Federal &amp; State)</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

A full system-wide status for crocodilians for WY 2012–WY 2014 cannot be provided because some routes were eliminated when funding was suspended in WY 2012. However, surveys have continued on Department of Interior lands (Arthur R. Marshall Loxahatchee National Wildlife Refuge, Big Cypress National Preserve, Crocodile Lake National Wildlife Refuge, Biscayne National Park, and ENP).

The spotlight color for the crocodile indicator in the areas listed above has changed to red for WY2014, although positive responses of crocodiles to restoration actions by ENP have occurred around Cape Sable (Cape Sable Slough, Cape Sable Case study) and theintroductory efforts in the C-111 basin (C-111 case study). In addition, encounter rates of alligators in areas with longer hydroperiods (periods of seasonal flooding) are generally increasing or remaining constant (2014 Systematic Indicator Report and 2014 Systematic Status Report). The change from yellow to red from WY2012 to WY2014 is a reflection of two factors: lower survival rates of juvenile crocodiles in Biscayne Bay and an overall index that has consistently hovered near the threshold between yellow and red.

Data collected during 2004–2014 were used to refine what is known about the relationship between alligators and hydrology, and this information was used to plan for the CEPP. Alligator relative abundance is stable or increasing in areas with longer hydroperiods such as the southwest portion of Water Conservation Area 3, but declining in areas that dry out more frequently such as Water Conservation Area 3A north and northwestern Shark Slough in Everglades National Park downstream of the Tamiami Trail bridge project. Alligators south of the Tamiami Trail bridge project currently have low body condition (are skinnier than target levels) and low relative abundance, but increasing trends in these measures are expected as hydrologic regimes are restored.

Data relating salinity to growth and survival of juvenile crocodiles were used as an ecological planning tool for CEPP, which helped to evaluate alternatives and understand the benefits of the various plans. Analysis of data collected during 1976–2013 within Everglades National Park supports the hypothesis that juvenile survival and growth rates increase with lower salinity levels.
Challenges to Communication

**Challenge**
- Information reported for different time periods by each indicator scientist
- Presentation of data was by area
- Reporting across indicators not integrated
- The “so what” is not always clear
- Integration with other reports to make sure harmonious communication

**Solution**
- Now reporting on SFWMD water year
- Now a “system-wide” summary for each indicator
- Working on better coordination among scientists
- Identified as a challenge that requires interaction with audience(s)
- Identified as an issue and coordination is improving
Define Metrics for Success

- Biennial report
  - Continued support for restoration
  - Do people find the report useful?
We have made progress in our communication.

There is still room for improvement in:

- Audience identification
- Understanding what is important
- Understanding what resonates
- Explicit efforts to coordinate and integrate
- Explicit commitment of resources for communication