

Measuring What We Need to Know

What are the critical information needs of the U.S. Fish and Wildlife Service and the Refuge System in the face of climate change? How can resource monitoring respond to those needs? An eight-member team of refuge biologists and data managers – known as the core Refuge System Inventory and Monitoring (I&M) Team – is working to answer those questions and identify specific goals.

With the demands of accelerating climate change and the Service's implementation of Strategic Habitat Conservation, the importance of a consistent, sophisticated and efficient system of inventory and monitoring has risen exponentially. The I&M team will develop priorities for gathering baseline information, make recommendations on how to administer a national data program and identify what technology is needed to make it all happen. "Much of the groundwork identifying the information refuges need has been done by the teams that worked on implementing *Fulfilling the Promise*. We now need to consider the implications of climate change and other environmental stressors, and broaden our thinking to include how monitoring on refuges can inform landscape level conservation," explains Andy Loranger, chief of the Division of Natural Resources and Conservation Planning.

"Data management is key. The information we collect must be easily available to refuge managers, decision-makers and the public," Loranger continues. "We must also ensure the long term integrity of that data."

How will this change what happens on an individual refuge? "A lot of work on refuges won't change," says Loranger. "How we manage data and its transparency - that will change." An I&M program that generates key layers of baseline data, coordinates monitoring efforts System-wide and ensures that information is easily available and informs management decisions at all levels – that is the goal.

"The more information we can tie together about what's happening to the resources. the more compelling a case we can make for what we need to conserve those resources. This presents an unprecedented opportunity to build our capacity for science-based decision-making. It is a critically important challenge for the Refuge System, and I am confident we can do it, he says."

Alaska in the Forefront

Alaska has taken the lead in reevaluating how data are analyzed and reported. . In April, the Alaska Division of Realty and Natural Resources joined USGS Alaska in sponsoring a three-day forum attended by government land managers, biologists and other scientists, and leaders of key nonprofit organizations. The discussions focused on ecoregional monitoring. Until now, says Danielle Jerry, chief of the Alaska Division of Realty and Natural Resources, inventory and monitoring had been done on a refuge-by-refuge basis. Several years ago, refuge biologists recognized the need for a region-wide plan, culminating in this spring's forum.

Forum participants agreed to divide Alaska into four ecoregions – polar, maritime, boreal and coastal boreal. Each is a large area of land and water containing geographically distinct species and environmental conditions. “We have eight refuges in the boreal northern forest,” explains Jerry. “They have little in common with Alaska Maritime National Wildlife Refuge, but a lot in common with Denali or Yukon-Charley National Parks.”

As climate change accelerates, “we know we will have more shrubs and trees on the North Slope. What does that mean for animals?” asks Jerry. “If we look only at one refuge, we can’t understand the regional, much less global, context.”

Prior to the forum, refuge biologists created conceptual models of the energy flow on a refuge: for example, salmon swim upstream, salmon die and the carcasses provide nutrients for bears, plants, eagles and more. The USGS collaborators then generated ecoregional models to help biologists conceptualize the links that matter to fish and wildlife as permafrost melts, wetlands dry and land erodes.

“The conceptual models allow biologists to clarify our thinking and even conduct mind experiments,” Jerry explains, “We can also overlay existing monitoring efforts on the models and identify data gaps or possibilities for partnerships. Our goal is to expand a refuge-based monitoring framework into an integrated regional effort.”

The Alaska experience and other federal monitoring systems will help inform the development of an I&M program within the Refuge System. “It has to be relevant at the refuge level and within an ecoregion, or landscape conservation region,” insists Loranger. “At the same time, we need to look at inventorying and monitoring in the context of climate change and identify the most important information that could help reduce uncertainty. This requires a lot of thought.”

By Karen Leggett. Reprinted with permission from Refuge Update.