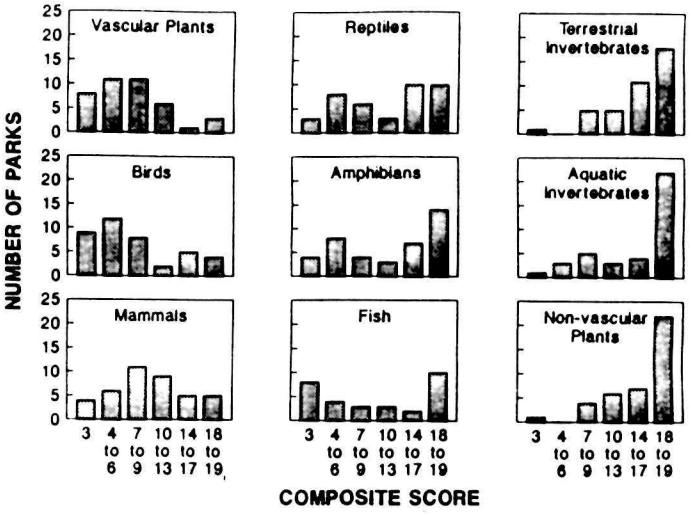
The Problem

The Park Service is faced with an interesting dilemma. Public interest historically has focussed on a few large national parks, but the Park Service's mission is to protect resource integrity and biological diversity in all national park units -- most of which are small. And, most of the biological diversity on NPS lands is in small parks.

Through a series of publications [i.e., technical reports (available), Park Science (in press), Natural Areas Journal (accepted for February 1992), and Issues in Science and Technology (in prep)] large segments of the public and public officials will soon be told that about **80% of our natural area parks have inadequate species inventories:** lists for vascular plants and vertebrates are only 50 to 80% complete (or less)!



Composite Score	Completeness of Species List
3	> 95%
4-6	80 to 95%
7-9	50 to 80%
10-13	< 50%
14-17	Good information on a few taxa
18-19	Inventory poor to nonexistent or unknown

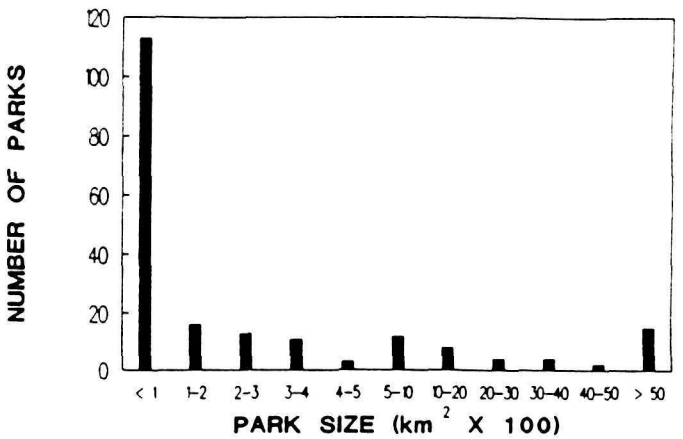
We should be prepared to answer two important questions:

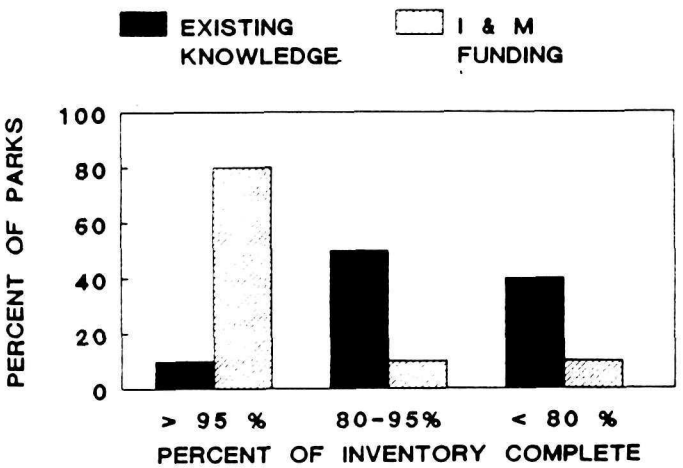
1. What are we doing as an agency (and as the I&M Program Committee) to gather baseline inventory data to improve this situation?, and
2. If little is being done (or is planned) what are the costs to society (and to the Service) by postponing action?

The Facts

1. **Most natural area parks (n = 202) are small: 56% of the parks are < 100 km^2, 77% are < 500 km^2.**

Most of these small parks historically have received little research and resource management attention. There are exceptions (e.g., Channel Islands, Indiana Dunes, Organ Pipe Cactus), but for the most part, small parks know little about their natural resources.





2. **Only a small fraction of the NPS I&M Program is currently committed to improve baseline inventories in the parks that need them most.**

In fact, the criteria used to rank prototype monitoring parks praised parks in which "relatively little money or time would be spent on inventorying." If the vast majority of parks have inadequate resource inventories, how can these atypical prototype monitoring parks have immediate "Service-wide or Multi-Park Applicability" (Criterion 7)?

3. **A small investment in small parks will have greater returns in biological conservation than large investments in large (or previously well-funded) parks.**

Small parks combined can have far greater biological diversity than large parks. Recently, we discovered that six small northern California parks (Lassen Volcanic NP, Muir Woods NM, Point Reyes NS, Redwood NP, Whiskeytown NRA and Lava Beds NM) combined had

	Sequoia and Kings Canyon	Six N. Cal. Parks
Size (km^2)	3431	1485
No. Species		
Vascular Plants	1402	1951
Birds	195	434
Mammals	90	125

50% more species of vascular plants, birds and mammals on 50% less land base. And, because these small parks have been poorly inventoried, they probably contain many more species (and T&E species) than currently known. It also can be argued that, in terms of biological conservation, small parks are more susceptible to external threats (e.g., urbanization, habitat fragmentation, non-native species invasion, air pollution, global change, etc.) and internal threats (e.g., low genetic diversity, fire suppression, etc.) than large parks.

The Solution

We are proposing a Pilot Parks Inventory Program designed to bring all natural area parks to at least a minimum standard of resource awareness. Working closely with Dr. James F. Quinn (UCD), Dr. Michael Ruggiero (WASO) and Dr. Helmut Leith (UNESCO; Biosphere Reserves), we will set minimum standards for plant and vertebrate animal inventories and test field techniques designed to optimize information gain. Products, provided to each pilot park include: standardized field techniques, species lists, species abundance and distribution data, a new vegetation map and GIS hardware and software. At a cost of about $65,000/year for three years, the cost is 5 to 10 times less than a pilot parks monitoring program and has direct and immediate multi-park and Service-wide applicability. The rapid gain in information on the biological diversity of NPS lands, and development of cost-efficient sampling techniques will put the NPS at the forefront of biological conservation organizations. We will be bringing many parks up to a level of resource awareness that the public has already assumed we have achieved.

PILOT PARKS INVENTORY PROGRAM

OBJECTIVES:

1. **Set minimum standards for resource inventories.**
2. **Develop inventory methods for plants and vertebrate animals (Biotic Inventory).**
   - **A. Test "hybrid" (hierarchical) sampling designs.**
   - **B. Develop geo-referenced databases.**
3. **Work with Air Quality, Water Quality, and GIS Divisions for "Abiotic Inventory."**

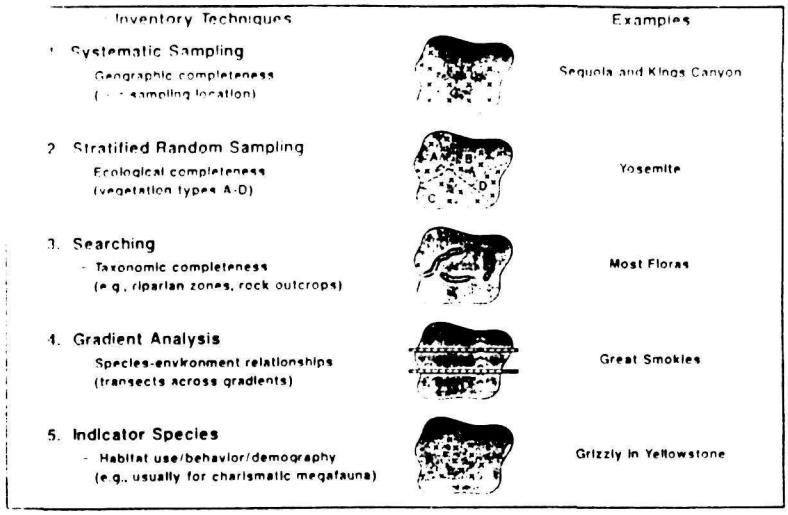
METHODS:

1. **CPSU-University COOP Agreement**
2. **Three Grad Students, 1 professor, 1 NPS GTR**

PRODUCTS:

1. **Species lists, abundance data, distribution data.**
2. **Vegetation Type Map (based on SPOT imagery).**
3. **GIS (hardware and GRASS software).**

COST: **$65,000/yr per park for three years.**



New, hybrid field sampling techniques will be used to produce GIS data bases for each park. Data will be collected and managed in a hierarchical framework from the species to community/biome level using a combination of inventory techniques. Data gathered in this manner is an essential prerequisite to selecting appropriate monitoring organisms, techniques and priorities.