



Ecological Subsections Mapping of Alaska National Park Units

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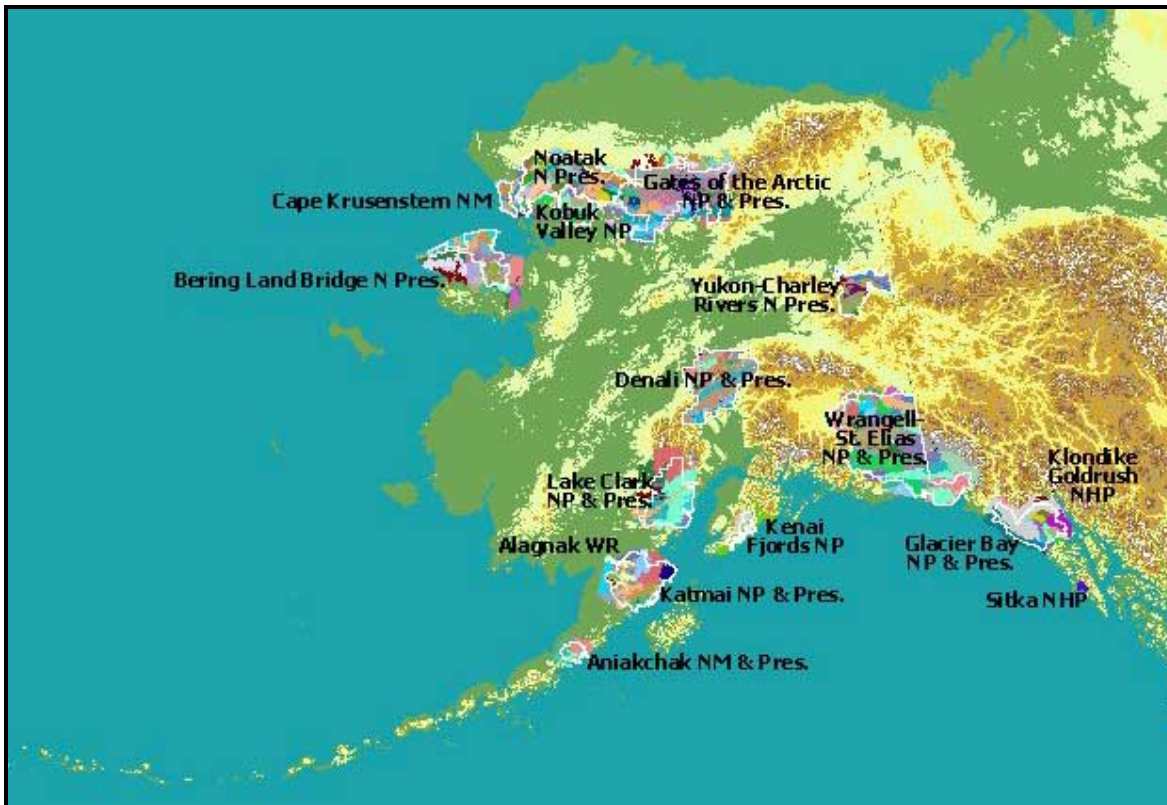
Overview:

The Alaska Region's Inventory Program mapped ecological subsections for all National Park Units in Alaska. The Ecological subsections serve as a stratification tool for sample design of inventories. The subsections are used for Step 2 of the Inventory process: habitat mapping of park units. Subsection units give a more holistic ecological picture of the parks than is possible by mapping habitat types with the available data. Early planning for the Monitoring Program indicates that these data will be useful for the monitoring program design and integration.

Subsections represent a mid-level layer in the hierarchical mapping scheme for ecosystems (Bailey 1980). Previous efforts have mapped Alaska down to the Ecoregion level (Table 1). We selected the subsection/detailed subsection level as the optimum amount of spatial detail for inventory efforts. Section level units were also defined as part of this mapping effort to round out the hierarchy.

Table 1. Hierarchy of Ecological Mapping Units.		Adapted from ECOMAP (1993)
Ecological Units	General size ranges	Defining characteristics
Domain	>70 million acres	Global climatic patterns
Division	10-100 million acres	Continental climatic patterns
Province (Ecoregion)	2-40 million acres	Continental weather and associated broad vegetation patterns
Section	100,000-1 million acres	Physiography, regional climate
Subsection	5,000-100,000 acres	Bedrock and surficial geology patterns and processes, local vegetation patterns
Landtype Association (detailed subsection)	500-7,000 acres	Specific geomorphic processes, topographic features, soils
Landtype	Hundreds of acres	Soils, vegetation succession trajectories
Landtype Phase	Ten-one hundred acres	Small scale features and processes

Figure 1. Alaska's National Parks with Ecological Subsections



Process:

Subsection level mapping delineates landscape level units. Major subsection units were delineated based primarily on bedrock and surficial geologic features and processes, with refinements from vegetation and weather patterns. Subsections may be merged upward in the hierarchy to form sections and to fit into the previously mapped ecoregions. Where a subsection unit extended beyond the park boundaries, the unit was mapped to its fullest extent, or the edge of the TM image.

Ecological subsections were mapped by interpreting and integrating the bedrock and surficial geology and topographic and vegetation patterns across the landscape. Units were delineated by manual lines or heads up digitizing on Landsat TM images. Background data varied among parks, with fairly complete geologic, soils and landcover maps for some parks, while others had unpublished reports and generalized data from statewide datasets. Some of the mappers have extensive field experience in their respective parks; others had experience in similar ecosystems and conducted field reconnaissance to verify their mapping of a specific park unit.

A team of experienced ecologists and ecosystem mappers was assembled to generate the subsection maps of the parks. All of the mappers have extensive experience in Alaskan ecosystems and mapping. Park units were assigned to individual mappers (Table 2). Two workshops and several conference calls were held to standardize mapping procedures and criteria among the mappers. This helped ensure consistent mapping across the state through ecosystems ranging from polar arctic to rugged montane, boreal valleys and coastal rainforests. Additional discussions were held between mappers with adjacent units to match lines and unit names across common park boundaries, or with previously mapped areas of the Chugach and Tongass National Forests.

Table 2. Mapping Cooperators	
Park Unit	Mapper/affiliation
Bering Land Bridge	Torre Jorgenson/ABR
Cape Krusenstern	Dave Swanson/NPS
Noatak	Torre Jorgenson/ABR
Kobuk Valley	Dave Swanson/NPS
Gates of the Arctic	Keith Boggs/Heritage Program
Yukon Charley Rivers	Dave Swanson/while with NRCS
Denali	Mark Clark/NRCS
Lake Clark	Page Spencer/NPS
Wrangell-St Elias	Dave Swanson/NPS
Katmai	Michael Shephard/USFS
Aniakchak	Jerry Tande/Heritage Program
Glacier Bay	Michael Shephard/USFS
Kenai Fjords	Jerry Tande/Heritage Program
Sitka	USFS
Klondike Gold Rush	USFS
Alagnak Wild River	Michael Shephard, USFS

Figure 2. Alaska's National Parks with Ecoregions



Mapping criteria:

The working scale for subsections mapping is 1:250,000. Subsections are landscape level units in the range of 5,000 to 100,000 acres. There may be multiple units of the same subsection type in a park. In addition to subsection level units, two types of detailed subsections (sometimes called landtype associations) were mapped in greater detail: active floodplains and coastal ecosystems. The ecologists decided that the greater diversity of habitats (and resulting biodiversity) warranted more detailed mapping of these units to ensure adequate sampling of unusual ecosystems for more specialized species. Floodplains and coastal units may be as narrow as .5 km and as small as 500 acres.

Products:

Data from all park units are available in digital ArcView format through the NPS-Alaska website and internal GIS database. Every park has a shapefile of geographic units and the associated attribute files. Lines are matched across shared park boundaries and with mapping by USFS. Attribute files are standardized so that parks can be merged into multi-park or statewide datasets, or generalized into higher levels in the hierarchical ecological mapping scheme.

A detailed report was prepared for each park, outlining individual baseline data and resources, mapping procedures and a written description of every ecological unit in the park. Representative photos accompany most of the subsection descriptions. These reports are available as Word files for printing or as html documents for digital browsing.

Results:

Taken en masse, these reports, descriptions and maps form the first comprehensive ecological look at the park units in Alaska. The next step is to standardize and condense these materials into a book describing the Ecosystems of Alaska's National Parks.

References:

Bailey, R.G. 1980. Descriptions of the Ecoregions of the United States. USDA Forest Service Misc. Publ. No. 1391, Washington, DC.

USDA Forest Service. 1993. ECOMAP-- National Hierarchical Framework of Ecological Units. USDA Forest Service. Washington DC.

