Ecoregions of Wyoming

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable response to disturbance (Bryce and others, 1999). These general purpose regions are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources within the same geographical areas (Omernik and others, 2000).

The approach used to compile this map is based on the premise that ecological regions can be identified through the analysis of the spatial patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity (Wiken, 1986; Omernik, 1987, 1995). These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology.

The relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level. A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I is the coarsest level, dividing North America into 15 ecological regions. Level II divides the continent into 52 regions (Commission for Environmental Cooperation Working Group, 1997). At level III, the continental United States contains 104 ecoregions and the conterminous United States has 84 ecoregions (United States Environmental Protection Agency [USEPA], 2003). Level IV is a further subdivision of level III ecoregions. Explanations of the methods used to define the USEPA's ecoregions are given in Omernik (1995), Omernik and others (2000), Griffith and others (1994), and Gallant and others (1989).

Wyoming is made up of semiarid shrub- and grass-covered plains, alluvial valleys, volcanic plateaus, forested mountains, woodland- and shrubland-covered hills, glaciated peaks, lava fields, and wetlands. Ecological diversity is enormous. There are 7 level III ecoregions and 39 level IV ecoregions in Wyoming and many continue into ecologically similar parts of adjacent states.

The level III and IV ecoregion map on this poster was compiled at a scale of 1:250,000 and depicts revisions and subdivisions of earlier level III ecoregions that were originally compiled at a smaller scale (USEPA, 2003; Omernik, 1987). This poster is part of a collaborative project primarily between USEPA Region X, USEPA National Health and Environmental Effects Research Laboratory (Corvallis, Oregon), Wyoming Department of Environmental Quality (WDEQ), United States Department of Agriculture–Forest Service (USFS), United States Department of Agriculture–Natural Resources Conservation Service (NRCS), United States Department of the Interior–Bureau of Land Management (BLM), and United States Department of the Interior–Geological Survey (USGS)–Earth Resources Observation Systems (EROS) Data Center.

The project is associated with an interagency effort to develop a common framework of ecological regions. Reaching that objective requires recognition of the differences in the conceptual approaches and mapping methodologies applied to develop the most common ecoregion-type frameworks, including those developed by the USFS (Bailey and others, 1994), the USEPA (Omernik, 1987, 1995), and the NRCS (U.S. Department of Agriculture–Soil Conservation Service, 1981). As each of these frameworks is further refined, their differences are becoming less discernible. Regional collaborative projects such as this one in Wyoming, where agreement has been reached among multiple resource management agencies, are a step toward attaining consensus and consistency in ecoregion frameworks for the entire nation.

Literature Cited:

Bailey, R.G., Avers, P.E., King, T., and McNab, W.H., eds., 1994, Ecoregions and subregions of the United States (map) (supplementary table of map unit descriptions compiled and edited by McNab, W.H. and Bailey, R.G.): Washington, D.C., USFS, scale 1:7,500,000.

Bryce, S.A., Omernik, J.M., and Larsen, D.P., 1999, Ecoregions – a geographic framework to guide risk characterization and ecosystem management: Environmental Practice, v. 1, no. 3, p. 141-155.

Commission for Environmental Cooperation Working Group, 1997, Ecological regions of North America – toward a common perspective: Montreal, Commission for Environmental Cooperation, 71 p.

Gallant, A.L., Whittier, T.R., Larsen, D.P., Omernik, J.M., and Hughes, R.M., 1989, Regionalization as a tool for managing environmental resources: Corvallis, Oregon, U.S. Environmental Protection Agency, EPA/600/3-89/060, 152 p.

Griffith, G.E., Omernik, J.M., Wilton, T.F., and Pierson, S.M., 1994, Ecoregions and subregions of Iowa – a framework for water quality assessment and management: Journal of the Iowa Academy of Science, v. 101, no. 1, p. 5-13.

Omernik, J.M., 1987, Ecoregions of the conterminous United States (map supplement): Annals of the Association of American Geographers, v. 77, no. 1, p. 118-125, scale 1:7,500,000.

Omernik, J.M., 1995, Ecoregions – a framework for environmental management, *in* Davis, W.S. and Simon, T.P., eds., Biological assessment and criteria-tools for water resource planning and decision making: Boca Raton, Florida, Lewis Publishers, p. 49-62.

Omernik, J.M., Chapman, S.S., Lillie, R.A., and Dumke, R.T., 2000, Ecoregions of Wisconsin: Transactions of the Wisconsin Academy of Sciences, Arts, and Letters, v. 88, p. 77-103.

U.S. Department of Agriculture–Soil Conservation Service, 1981, Land resource regions and major land resource areas of the United States: Agriculture Handbook 296, 156 p.

U.S. Environmental Protection Agency, 2003, Level III ecoregions of the continental United States (revision of Omernik, 1987): Corvallis, Oregon, USEPA – National Health and Environmental Effects Research Laboratory, Map M-1, various scales.

Wiken, E., 1986, Terrestrial ecozones of Canada: Ottawa, Environment Canada, Ecological Land Classification Series no. 19, 26 p.

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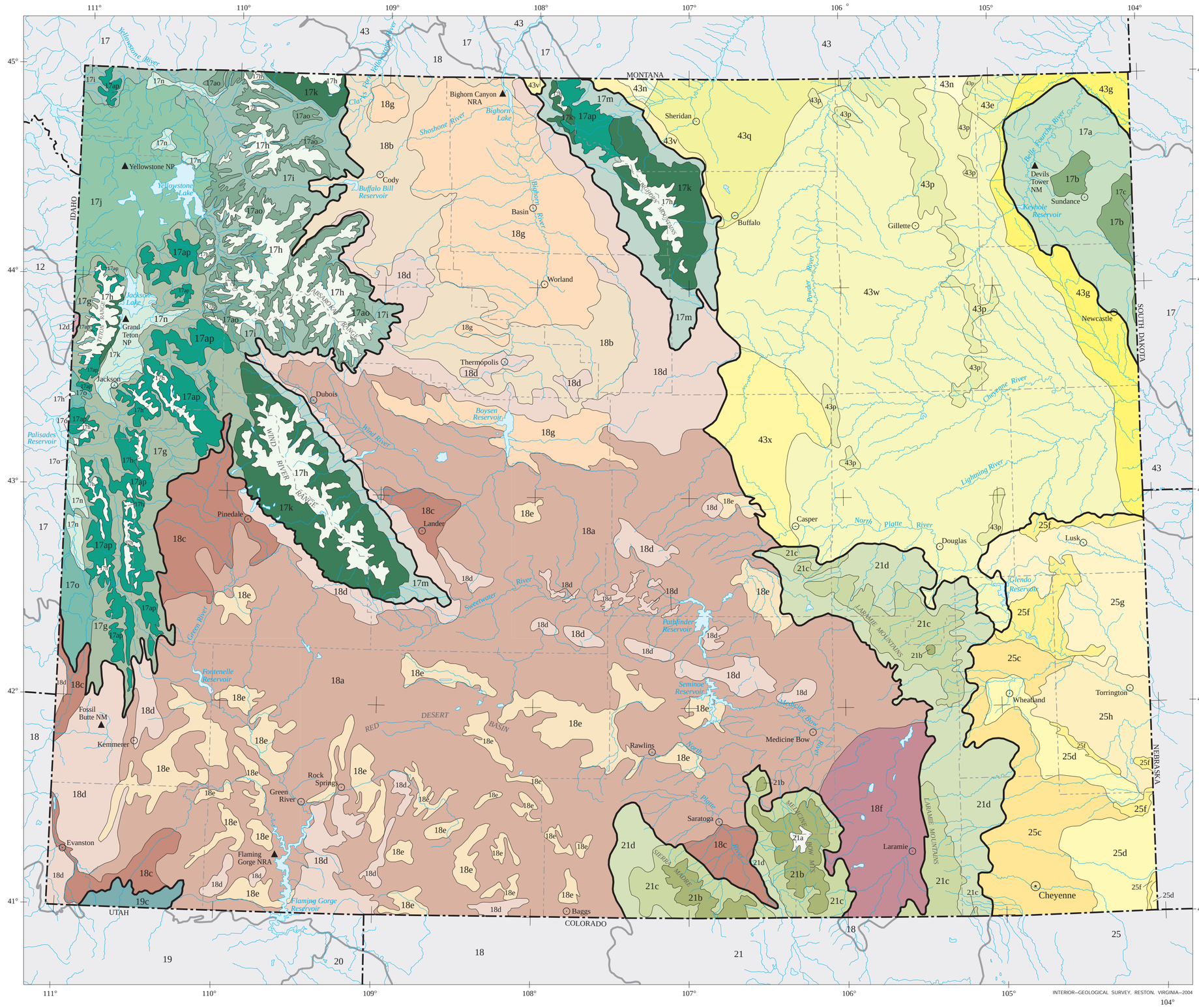

12 Snake River Plain
- 12d Dissected Plateaus Teton Basin

17 Middle Rockies
- 17a Black Hills Foothills
- 17b Black Hills Plateau
- 17c Black Hills Core Highlands
- 17g Mid-Elevation Sedimentary Mountains
- 17h Alpine Zone
- 17i Absaroka-Gallatin Volcanic Mountains
- 17j Yellowstone Plateau
- 17k Granitic Subalpine Zone
- 17m Dry Mid-Elevation Sedimentary Mountains
- 17n High Elevation Valleys
- 17o Partly Forested Mountains
- 17ao Absaroka Volcanic Subalpine Zone
- 17ap Sedimentary Subalpine Zone

18 Wyoming Basin
- 18a Rolling Sagebrush Steppe
- 18b Bighorn Basin
- 18c Sub-Irrigated High Valleys
- 18d Foothill Shrublands and Low Mountains
- 18e Salt Desert Shrub Basins
- 18f Laramie Basin
- 18g Bighorn Salt Desert Shrub Basins

19 Wasatch and Uinta Mountains
- 19c Mid-Elevation Uinta Mountains

21 Southern Rockies
- 21a Alpine Zone
- 21b Subalpine Forests
- 21c Mid-Elevation Forests and Shrublands
- 21d Foothill Shrublands

25 High Plains
- 25c Moderate Relief Rangeland
- 25d Flat to Rolling Cropland
- 25f Pine Bluffs and Hills
- 25g Sandy and Silty Tablelands
- 25h Platte River Valley and Terraces

43 Northwestern Great Plains
- 43e Sagebrush Steppe
- 43g Semiarid Pierre Shale Plains
- 43n Montana Central Grasslands
- 43p Pine Scoria Hills
- 43q Mesic Dissected Plains
- 43v Pryor-Bighorn Foothills
- 43w Powder River Basin
- 43x Casper Arch