The *Russian Chronicles of Nature (Letopis prirody)*

Is This a Model for a Chronicle of Wilderness?

BY DAVID OSTERGREN AND STEVE HOLLENHORST

Abstract: The Russian system of *zapovedniki* (strict nature preserves) was established in 1919 primarily to preserve typical and unique ecosystems and conduct baseline field research. We review a management tool on *zapovedniki* called the *Letopis prirody* or *Chronicles of Nature*–an annual document of significant information and research. Research on North American wilderness information is conducted by a wide range of universities, federal agencies, and nonprofit organizations and is disseminated through conferences, refereed journals, and various publications. However, wilderness areas lack a centralized comprehensive archival database. We suggest that one step toward such a database may follow the Russian model and be an annual document called the "Wilderness Chronicles."

The Russian system of *zapovedniki* (strict nature preserves) was established in 1919 primarily to protect areas of scientific interest. By the mid-1930s, *zapovedniki* were defined as areas that exclude virtually all anthropogenic disturbances, including wildlife management, species introduction, extractive resource use (industrial or personal), and recreational activities such as hiking and hunting. Their primary purpose was to preserve typical and unique ecosystems throughout the United Soviet Socialist Republic (USSR) and conduct baseline field research in ecology, geology, botany, and zoology. This definition has persevered through seven decades of Soviet rule and dominates the management goals of Russian *zapovedniki* in the 1990s (Colewell et al. 1997; Weiner 1999). In 1995 additional goals were added to include environmental education (which may include limited ecotourism), assisting in environmental impact assessments and training conservation personnel (Federal law … 1995). With the economic and social turmoil in Russia, *zapovednik* directors have augmented traditional management tools with new strategies and funding mechanisms (Ostergren 1998).

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A traditional management tool retained on all *zapovedniki* is the *Letopis prirody* or *Chronicles of Nature* (Shvarts and Volkov 1996). *The Chronicles of Nature* is an annual document of all activities and significant events on a *zapovednik* throughout the year. In sharp contrast, wilderness information and scientific reporting in the United States is conducted by a wide-ranging cadre of scholars, scientists, and managers working for universities, colleges, the U.S. Forest Service (USFS), the National Park Service(NPS), the Bureau of Land Management (BLM), the Fish and Wildlife

Service (FWS), nonprofit groups, and environmental advocacy organizations. Outlets for these works include conferences, books, refereed journals, internal documents, popular literature, gray literature, memorandum, and publications for public information. However, individual wilderness areas lack a centralized comprehensive archival database. One step toward such a database may be modeled on the *Russian Chronicles of Nature.*

We propose an annual document for each wilderness area called the "Wilderness Chronicles." Many attributes of wilderness areas are already described in agency publications. However, a Wilderness Chronicle would provide an updated record that is searchable and accessible for managers and researchers alike. Standardized titles, chapters, search terms, dates, and formats would enhance and ameliorate decision-making within and across land management agencies. This article discusses a rationale for adoption of such a documentation system for the U.S. National Wilderness Preservation System (NWPS).

History and Background

In 1848 the Russian Geographic Society (Society) began the first systematic long-term methodology to observe nature in Russia (Filonov and Nukhimovskaya 1985). The Society sought to establish connections with a broad range of scientists and solicited observations across disciplines. This collection of natural phenomena was the earliest systematic program to be applied across several regions. Phenology drove much of the early interest in record keeping, with early observations focusing on migration patterns for birds and reindeer, vegetative flowering events, and seasonal precipitation. In 1895 the soil scientist V. V. Dokuchaev suggested a system of research stations in the Black Earth region of southern Russia and Ukraine. The intention was that these stations would conduct research and maintain continuous records of conditions on undisturbed steppe (Filonov and Nukhimovskaya 1985).

The concept of collecting standardized data from preserves was formally developed by naturalists V. N. Sukachev (c. 1914) and G. A. Kozhevnikov (c. 1928) (Shvarts and Volkov 1996). An early influence in Russian nature preservation, G. A. Kozhevnikov, proposed that the planning horizon for *zapovedniki* "should be … over 100–200 years or across centuries … to grasp some knowledge from a great process—evolution" (1928, p. 14). He suggested that such long-term research required a systematic standardized method of record keeping. The information should be collected by an interdisciplinary team mapping and documenting the animate and inanimate characteristics of each protected area. He argued that even small plots of land with detailed information may reveal clues to large-scale changes in vegetation, climate, species composition, or productivity (Kozhevnikov 1928).

The term "Chronicle of Nature" was suggested in 1937 by A. N. Formozov (Filonov and Nukhimovskaya 1985), and by 1940 a standardized format was developed for the entire system (over 120 preserves throughout the Soviet Union in 1985). The format has been modified several times to fit the needs of research and the evolving role of the chronicle in management. The most recent revision was by K. P. Filinov and U. D. Nukhimovskaya in 1985 (Shvarts and Volkov 1996). The format (still in use in 1999) standardizes where a particular subject or field will be placed within the chronicle (see Table 1). For instance, data on elk (*Cervus* spp.) population is in chapter 8, and current research on elk is in chapter 11.

A U.S. Wilderness Chronicle modeled after the Russian *Chronicles of Nature* might be modified to reflect the nuances of American environmental law, policy, and science.

Each *zapovednik* is divided into several departments—administration, enforcement, maintenance, and research. Research proposals are initiated by individual scientists within the *zapovednik* or an affiliated university and then reviewed by a national committee for consistency with system-wide goals. However, the committee does not dictate specific projects to fulfill a nationwide strategy. The scientific method guides research, the *Chronicles of Nature* report the results in a systematic fashion (Stakheev 1995). Fundamental to the success and usefulness of the chronicles is that they include information on activities from both management and research.

A. E. Volkov (1990) recommended that researchers conduct meta-analysis of past chronicles to detect regional or large-scale trends. He provided a brief example by comparing data across 26 *zapovedniki* with respect to ornithology, mammalogy, ichthyology, and herpetology. For the English-speaking community, a collaborative effort from the

Stolby Zapovednik—the unique pillars of stone (granite) that inspired preservation of the area crop up through the *taiga* (boreal forest). Photo courtesy of David Ostergren.

Department of Zapovednik Management and the Biodiversity Conservation Center produced a compilation of 1991–1992 data from 85 *zapovedniki* in Russia (Volkov 1996). Investigators may use this resource to search for specific species or to develop comparative research projects.

Stolby Zapovednik—flowers across a hillside in a meadow. Photo courtesy of David Ostergren.

Each preserve is expected to keep one copy of the chronicle at the *zapovednik*, while another copy is sent to the main office in Moscow. The Department of Zapovednik Management of the State Nature Protection Committee has chronicles from the last five years from many *zapovedniki*. Unfortunately, most *Chronicles of Nature* are buried in the Russian government archives. The archival resources are not easy to access, and information must be painstakingly gathered by inspecting each volume.

Since the fall of the Soviet Union funding shortages have reduced the quantity (not quality) of research projects. Another problem is funding publication of the annual *Chronicle of Nature*. In general, the older established *zapovedniki* have made it a priority to maintain the tradition of publishing the annual chronicle. Newer *zapovedniki* have been constrained to an initial report providing the scientific justification for creating the preserve. These initial chronicles include broad descriptions of the area, species, and geological characteristics as well as general assessments of floral and faunal populations. Unfortunately, the newer *zapovedniki* often lack the resources to continue an adequate amount of research, much less publish the chronicle.

The Russian *Chronicle of Nature* is a potential wealth of information for protected area managers and researchers from many disciplines. With monitoring and ecological reports on several preserves dating back to the 1920s and 1930s, the chronicles offer long-term ecological data (Shvarts and Volkov 1996). In light of current economic conditions in Russia, the international community may consider supporting an inventory of past volumes and publication of current information. A promising project still searching for adequate funding is the World Conservation Union's (IUCN) Protected Area Resource Centre (PARC). Its mission is to strengthen the capacity of protected area networks for information flow and networked communication and to provide a single distributed and coherent source of protected area information resources and services. A small contingent within PARC is searching for support to document and access the archived *Chronicles of Nature.* Despite some problems with access, the *Chronicle of Nature* offers an excellent model to document information from protected areas throughout the world.

The *Chronicles of Nature* Model Applied in the United States

Wilderness in the United States has evolved over eight decades of debate, refinement, and expansion to include 157 of the nation's 261 ecosystems (Davis 1988). In the 1920s wild areas benefited from administrative designation by the USFS and the NPS. The administrative protection was deemed inadequate by a few visionaries who pushed for a congressionally mandated NWPS. Finally passed and signed into law in 1964, this legislative system now encompasses over 104 million acres. In addition to the USFS and NPS, the FWS and BLM also administer wilderness areas. The NWPS is unified by the primary function to

preserve areas that "generally appear to have been affected primarily by the forces of nature … [and have] outstanding opportunities for solitude or a primitive and unconfined type of recreation … or other features of scientific, educational, scenic or historical value" (Public Law 88-577). However, because wilderness is managed by four different agencies with diverse units located from Florida to Alaska, each area is unique and may be characterized by size, topography, habitat, primary recreation activities, traditional use, visitor numbers, and role in a larger ecosystem.

As we enter the 21st century and an era of ecosystem-based management, more organizations and politicians are calling for a scientific basis for decision-making. For instance, the National Forest Management Act of 1976 requires using the latest scientific methodology, and the Vision 2020 National Parks

Table 1—Standardized outline for the Russian *Chronicles of Nature,* and suggested additions appropriate for a U.S. *Wilderness Chronicle.*

Standardized Elements of the Chronicles of Nature
1. Territory of the Zapovednik
2. Sample and inventory areas, key places, permanent and temporary routes.
3. Topography
4. Soil characteristics
5. Weather
5.1 Meteorological data by season
6. Water quality
7. Flora and Vegetation
7.1 Changes in flora
7.2 Changes in vegetation
7.2.1 Seasonal dynamics
7.2.2 Fluctuations in vegetative community
7.2.3 Succession changes
7.2.4 Unusual influences on the vegetation
8. Fauna and Animal Populations
8.1 Species composition
8.1.1 New species (vertebrate and invertebrate)
8.1.2 Rare Species
8.2 Number of individuals by species
8.3 Ecological survey of each species
9. Calendar of Nature
10. Condition of the zapovednik regime. Influence of anthropogenic factors on the natural conditions in the zapovednik and protection zones.
10.1 Partial use of the natural resources for internal zapovednik needs.
10.2 Measures to protect the zapovednik
10.3 Neighboring and indirect influences
11.1 Scientific Research
11.1 Conducting cartography and photo documentation
11.2 Research conducted by zapovednik staff
11.3 Research conducted by cooperating agencies and organizations
12. Buffer zones
13. Compilation of multiple-year data

Suggested Additions for a Wilderness Chronicle
- Legislative History
- Other anthropogenic factors
- Air quality data
- Threatened and endangered species
- Exotic species
- Recreation visitation, use patterns, and activity behavior trends
- Management Plans, decision notices, etc.

Helicopters are the only means of access to the remote northern *zapovednik* located across the tundra. Photo courtesy of David Ostergren.

Restoration Act passed in November 1998 calls for science-based management and authorizes the NPS to conduct more research. In partial response to these demands, federal agencies are developing methods to retrieve and utilize the data and investigations conducted on their areas. For instance, the NPS is currently inventorying its gray literature but has not decided how to use the inventory and simultaneously protect sensitive species or habitat (M. Ostergren 1999). Although larger ecological processes may not be the subject of many research projects in wilderness areas (Murray 1996), biological research is increasing in wilderness areas.

The most northern forest in the world is protected for research by the Taimir Zapovednik. Photo courtesy of David Ostergren.

Currently, the wilderness system lacks a coherent method of collecting, storing, and disseminating annual data. Websites exist within the four federal agencies and other organizations such as The Wilderness Society and the Aldo Leopold Wilderness Research Institute. An excellent source of information on wilderness (supported by the four federal agencies and the University of Montana Wilderness Institute) may be found at www.wilderness.net. A tremendous advantage to collecting and archiving Wilderness Chronicles in the 21st century is making the information available electronically via a database that is fully searchable. The 624 U.S. wilderness areas (or 641 wilderness units, see Landres and Meyer 1998) have the potential to generate a mountain of useful scientific information.

The international wilderness community is increasing its exchange of ideas, information, and philosophies. While converging policies and management techniques may be the result of several factors (Ostergren and Hollenhorst 1999), obvious evidence of increased contact is a proliferation of collaborative research projects and conferences such as the World Wilderness Congress. International comparative and collaborative research projects would benefit from consistent wilderness area reports collected in a centralized clearinghouse. An advantage to adopting the Russian chronicle format is the immediate ability to compare and contrast long-term data between the United States and 14 nations of the former Soviet Union. The momentum may prompt other nations to adopt similar chronicles.

Implementation

We suggest that one organization be dedicated for the long-term archival collection of wilderness data in a consistent, standardized manner. The database would be searchable and, ideally, annual reports from each wilderness area would be supplemented with research from cooperating agencies and universities. A challenge to any systemwide archival and record-keeping effort is allocating the funding for implementation. In a new era of shifting federal emphasis and priorities, agencies may be able to direct resources for a one-time short-term effort to create the first Wilderness Chronicle—most likely mandated at the administrative level. The administrative impetus already exists in the USFS. The USFS has indicated that the Forest Inventory and Analysis be expanded to include such areas as wilderness and urban areas (Powell, McWilliams, and Birdsey 1994). The early efforts to create a Wilderness Chronicle may rely on grants and research projects in combination with internal budgeting by the USFS, NPS, FSW, and BLM. However, to ensure long-term value and permanence, the funds for an annual Wilderness Chronicle would have to be funded by enabling legislation.

A U.S. Wilderness Chronicle modeled after the Russian *Chronicles of*

Nature might be modified to reflect the nuances of American environmental law, policy, and science. For instance, a section should be included early in the chronicle that focuses on the legislative history of the area. In chapter 10, anthropogenic influences may be expanded to include attributes such as air quality data, threatened and endangered species, exotics, recreation visitation, use patterns, and activity behavior trends. A section on management plans and decision notices also seems appropriate.

Establishing an annual Wilderness Chronicle will take time. Current resource allocation within each agency limits the amount of time that wilderness managers may dedicate to such a project. The first Chronicle of Wilderness would demand an inordinate amount of time and effort to document the resources and establish baseline information. As an example from Russia, the 4-million acre Putoranski Zapovednik in northern central Siberia was established in 1988. The first *Chronicle of Nature* was largely the result of a handful of people and was not submitted until 1991 (Lareen 1995; Putoranski Zapovednik 1991). The chronicle relied heavily on published articles and monographs and is 115 pages in length, just documenting the most prominent plant and animal species.

Similar work exists to establish the first Wilderness Chronicle for many U.S. wilderness areas. In fact, much of this information may be gleaned from wilderness plans. The federal employee responsible for each unit may work collaboratively with a university and a pool of graduate students or an internship program for the first issue. The potential exists for a whole host of partnerships between university research and educational programs, local and national nongovernmental organizations (NGOs), and other local, state, and federal agencies.

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In a final note, the home for the archives could be determined by stakeholders and interested parties in wilderness management. The initial group would include the four federal agencies and other academic or nonprofit institutions that are willing to donate the time and resources to house the hard copy and electronic Wilderness Chronicles. Ideally, the electronic documents will be accessible to everybody, which would avoid the necessity of an annual publication. However, enough hard copies may be warranted to supply the federal document repository. For ease of publication, wilderness units may be grouped by state, region, or agency.

Conclusion

Since the 1930s the *Chronicles of Nature* have been used by Russian *zapovednik* managers to document significant research and ecological information. In 1985 a standardized format was adopted to facilitate comparative research and long-term analysis. We suggest that a similar Chronicle of Wilderness be adopted by the U.S. NWPS. A centralized database, with standardized terms and formats, would enhance and ameliorate ecological research, philosophical

Alpine view of the Altai Mountains at 6,000 feet in the Altai Zapovednik. Photo courtesy of David Ostergren.

The Altai Zapovednik base station is located on Lake Teleskoya. The lake borders 70 kilometers of the 880,000 hectare preserve near the Mongolian border. Photo courtesy of David Ostergren.

discussion, and management decisions between individuals, institutions, and nations. By adopting a perspective that spans centuries, the current wilderness community can provide priceless information to future generations who will protect and manage the world's wilderness resources. IJW

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