Yellowstone Science

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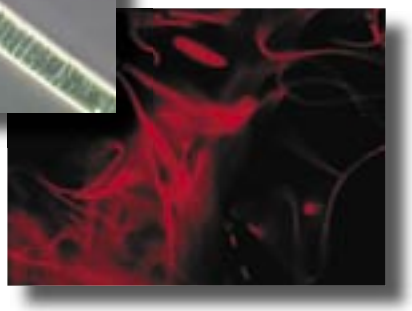

History of Research Permitting

Harry R. Horr Promotes the Park

Birds Added to Park Checklist

A Yellowstone Reader

TERRY MCENEANEY

This rare sighting of a whooper swan (fourth from right) in the park took place in November 2003. It was seen with 503 trumpeter swans. Whoopers can be distinguished from trumpeters by the extensive lemon-yellow triangle on their bills.

The "Search" in Research

"If we are going to succeed in preserving the greatness of the national parks, they must be held inviolate. They represent the last stand of primitive America. If we are going to whittle away at them, we should recognize at the very beginning, that all such whittlings are cumulative and that the end result is mediocrity. Greatness will be lost."

—Newton Drury, NPS Director (1940–51)

SINCE ITS INCEPTION IN 1991, every issue of *Yellowstone Science* has contained an open invitation: "Submissions are welcome from all investigators conducting formal research in the Yellowstone area."

In its first 12 years, this journal has assembled a virtual encyclopedia of information. A quick search of the subject index on Yellowstone's website (www.nps.gov/yell/publications/yellsciweb/index.htm) reveals articles on everything from amphibians to wolverines. As I scan this list, I'm repeatedly impressed by those individuals who devote themselves to increasing their knowledge and understanding (and consequently ours) of the many aspects of the greater Yellowstone area.

The word "research" owes its origins to the Old French "recerche": to seek out, to search again. This issue illustrates the commitment that many people bring to the endeavor of research…to search, to explore, to study, again, again, and again, to re-search. In each article, you'll find examples of how, with diligence, patience, creativity, and an open mind, rare and important discoveries can be found among the common.

First, our own Alice Wondrak Biel chronicles the history of the research permitting process, beginning with the 32-year administration of the U.S. Army (1886–1918), to today's practice of research permitting review. She reports on Dr. Thomas Brock's discovery of the microbe *Thermus aquaticus* in Mushroom Pool in 1966, when the accepted thinking was that life couldn't survive in the extreme environments of Yellowstone's thermal features. Today we know better, and the expanding field of microbial research is on the forefront of scientific investigation in the park.

Working in the Special Collections Library at Montana State University–Bozeman, Brad Coon unearthed a rare letter of Harry R. Horr, an early Yellowstone figure, shedding light on his relationship to the park during its formative years. Yellowstone ornithologist Terry McEneaney's article on new bird sightings is a perfect example of finding something unusual among the more common, as evidenced in his sighting of a whooper swan among a group of trumpeter swans. Richard Saunders, in *A Yellowstone Reader* (reviewed here by Tamsen Hert), offers a collection of often hard-to-find fictional works on Yellowstone. From folklore to literature, to poems and short stories, he exemplifies the work of the investigator, seeking out and recording the rare and wonderful.

This summer, as the park's archives, library, and museum collections are being moved to our new Heritage and Research Center, I'm reminded of the many treasures Yellowstone contains, and I marvel at all those who dedicate themselves daily to the search and re-search of Wonderland's many wonders.

Roger Anderson

YELLOWSTONE SCIENCE

a quarterly devoted to
natural and cultural resources

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For back issues of *Yellowstone Science,* please see www.nps.gov/yell/publications.

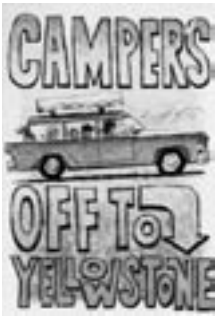
Submissions are welcome from all investigators conducting formal research in the Yellowstone area. To submit proposals for articles, to subscribe, or to send a letter to the editor, please write to the following address:
Editor, *Yellowstone Science,* P.O. Box 168, Yellowstone National Park, WY 82190.
You may also email: Roger_J_Anderson@nps.gov.

Yellowstone Science is printed on recycled paper with a soy-based ink.

on the cover (clockwise from top left):

Dr. C. Max Bauer (middle) in boat on Yellowstone Lake, 1935, NPS Historic Photo Collection; 3 photos from the 2002 thermophile inventory, NPS; grizzly cub with ear tag placed by the Craigheads, YNP Bear Management Office.

COVERS COURTESY UNIV. OF WYO. LIBRARIES/HEBARD COLLECTION



In his book, *A Yellowstone Reader,* Richard Saunders has compiled a rare collection of Yellowstone fiction, including a Cracker Jack prize (left).

FEATURES

DEPARTMENTS

News & Notes

NPS

Yellowstone's Collections Move to the Heritage Center

Museum Curator Colleen Curry and her staff, with the help of moving teams comprised of "keepers of collections" from all over the country, are assisting with the move of Yellowstone's research library, archives, and museum collections from their various repositories in Mammoth to the park's new Heritage and Research Center (HRC) in Gardiner, Montana. They treat each object as if it were the most important historic artifact in existence, cherishing each thing (and there are more than 5,000,000) as part of the great story of our park and our past.

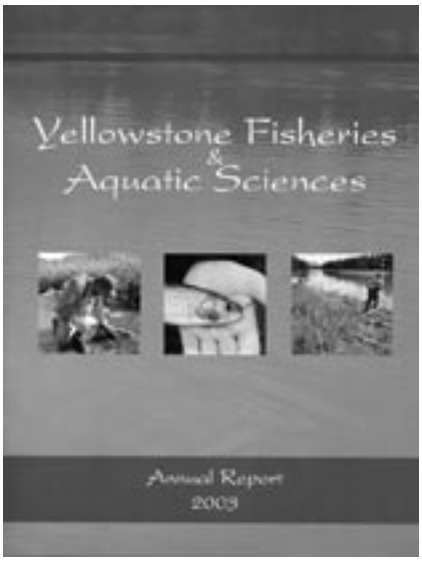
Everything, from archeological artifacts to Thomas Moran paintings, is carried carefully to a table, one at a time, wrapped in special archival tissue paper, bubble-wrapped, taped, and boxed so that nothing can shift or break on its trip down the hill, where the movers at the HRC undo the process just as carefully. Sometimes, box-spacers and archival boards are cut to exact specifications on the spot to protect the objects as they are moved.

There is so much work still to be done, and yet the movers don't allow that knowledge to interfere with how they treat each piece. No one moves quickly. No one is in a hurry. Every item, without question, is treated with the utmost respect.

The move of the collections to the HRC will be completed this summer. The fall issue of *Yellowstone Science* will highlight this incredible addition to Yellowstone National Park. Above is a drawing of the architect's vision for the new facility, which looks very similar in reality.

Study of Groomed Roads and Bison Movements Begins

An independent study to examine how groomed roads influence bison movements during the winter has begun. Dr. Cormack Gates, Program Director in the Faculty of Environmental Design at the University of Calgary, Canada, is the study's principal investigator. The purpose of the project is to produce a thorough assessment of knowledge concerning bison movements and dispersal. This study will link science, within the context of movement ecology, to the management of road grooming. Researchers will analyze existing data from a variety of sources and interview subject-matter experts (as well as other parties and organizations) to seek ecological knowledge of bison movements and dispersal in the Yellowstone ecosystem. A final, comprehensive report will be provided to the National Park Service in January 2005. It will provide recommendations within an adaptive management framework for addressing the issue of bison movements and dispersal, including priority areas requiring further research.



New Publications Available

The *Yellowstone Wolf Project Annual Report 2003,* the *Yellowstone Fisheries & Aquatic Sciences Annual Report 2003,* and the *Yellowstone Center for Resources Annual Report, Fiscal Year 2003* are now available from the YCR. If you would like a copy of any of these reports, please contact Virginia Warner at (307) 344-2230 or virginia_warner@nps.gov. They are also available in pdf format at www.nps.gov/yell/publications.

Old Faithful Inn Lighting Project Restores Night Sky

As the Old Faithful Inn celebrates its hundredth anniversary, the night sky above the inn is being restored to its splendor of a century ago. Overly-bright, upward-facing outdoor light fixtures in the inn's front parking lot have been replaced with new, night sky-friendly lighting that will allow for a glare-free view of the heavens. Like other parks, Yellowstone is looking at ways to reduce light pollution through the use of appropriate lighting and glare-reducing measures. The park worked with local area artisans to design and build original, hand-crafted, wrought iron lanterns that are compatible with the signature rustic architectural style of the Old Faithful Historic District. The lanterns, retrofitted with modern lamp optics donated by GE Lighting Systems, are designed to direct light to the ground, which is more efficient and effective. These improvements were made possible by the donation of GE anti-glare light fixtures, as well as a $97,500 grant from the GE Foundation to the Yellowstone Park Foundation.

Old Faithful Inn Centennial Celebration was a Fine Time

The centennial celebration of the Old Faithful Inn was a great success. The May 6 evening gala included fine dining, music, and dancing in the spirit of days long ago. Everyone dressed for dinner, music drifted down from the eaves, and the aura of the inn was at its best, warm and inviting.

ALL PHOTOS NPS/JIM PEACO

The May 7 celebration was just as fine, and very well attended. Mammoth School children sang "Happy Birthday" to the inn. Service was at its best. Historic displays of inn paraphernalia decorated the bustling lobby. Some were dressed in period costume. History was made, and enjoyed.

YS

The Bearer Has Permission

A Brief History of Research Permitting in Yellowstone National Park

Alice Wondrak Biel

J.R. STACY/COURTESY USGS

Seismic Geyser became active following the 1959 Hebgen Lake earthquake, spurring the interests of researchers.

Introduction

FROM THE PAINTINGS OF THOMAS MORAN to the photographs of Tom Murphy, artists have celebrated Yellowstone's scenic beauty since before its establishment as a national park. Simultaneous with this aesthetic exploration has been scientific exploration, and it is no accident that some of the park's earliest, most notable artists arrived together with some of its earliest, most notable scientists. Today as yesterday, the park is capable of inspiring a multi-faceted human curiosity that seeks its expression through a variety of creative processes. What tends to separate the artist or casual visitor from the scientist, however, is the latter's frequent need to take home more than an image, to do more than just observe and record. And for that, one needs special permission.

At times contentious, the history of research permitting in Yellowstone fits nicely into the larger story of the perpetual negotiation of preservation and use in the National Park Service, and illustrates the evolving debate over appropriate uses of national parks. Figuring out who has been allowed to do what when—as well as which kinds of activities have and have not required permits at different times, reveals both the changing status of science and researchers at the agency level, and the local course of events at the park level. Like other user groups, researchers have encountered unexpected frustrations as well as welcome rewards in their dealings with park administrators, often resulting from shifts in policy and circumstance. Finally, the story parallels the rise and fall of the NPS's own science program, and embedded in this discussion is the question of where science meets management. Determining the role of the scientist in resource management decision making has engendered years of arduous debate. It is a fluid conversation, one that is not likely to find static resolution, and in fact probably should not.

Beginnings

Conducting research within the national parks is complicated by the specific legislative mandates that govern their protection and use. In 1872, in a clause that has been cause for consternation and debate ever since, Congress directed the Secretary of the Interior to make rules to "provide for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities, or wonders within [Yellowstone National Park], and their retention in their natural condition." The 1916 act creating the National Park Service (NPS) specified that "no natural curiosities, wonders, or objects of interest shall be leased, rented, or granted to anyone on such terms as to interfere with free access to them by the public." Both statements left open questions of definition and degree—what constitutes "natural condition?" At what point does an allowed use begin to interfere with free access to a resource? These questions arose almost immediately in Yellowstone, as park managers were asked to balance their preservation mandate against the desires of many visitors engaged in both scientific research and the popular pursuit of natural history, of which specimen collection was a crucial component. By simultaneously allowing and controlling collecting activities, the practice of permitting helped provide a practical response. The 1906 Antiquities Act specifically gave the Secretary of the Interior the power to grant permits to representatives of "properly qualified" institutions for the examination, excavation, and gathering of objects of antiquity on lands under his jurisdiction, and archival evidence indicates that permitting was used in Yellowstone for a variety of purposes at least as early as 1898.

WILLIAM HENRY JACKSON/COURTESY USGS

Ferdinand V. Hayden, who led four park expeditions in the 1870s, was one of Yellowstone's first researchers.

Yellowstone was attracting scientific researchers long before that, however. The U.S. Geological Survey, for instance, sent expeditions to the Yellowstone area in 1871, 1872, 1877, and 1878, under the leadership of Ferdinand V. Hayden.[1] In subsequent years, as the intellectual, the mercenary, and the merely curious descended on the new park, and the U.S. Congress failed to appropriate funds for its administration and operation, it quickly became evident that Yellowstone was in need of a strong regulating body to instill a sense of order upon its human visitors and inhabitants and their activities, scientific or otherwise.[2]

Accordingly, the history of permitting in Yellowstone began with the U.S. Army, which administered the park from 1886–1918. Yellowstone's army superintendents issued permits to people wishing to do all kinds of things in the park—operate concessions, carry firearms, pass through with their hunting parties, hunt predators, bring their dogs inside its borders—even make moving pictures of the park and its wonders. As the army's arrival in Yellowstone had been largely predicated upon the necessity of stopping the rampant vandalism taking place at the hands of souvenir-seekers and entrepreneurs, park administrators recognized early on that conserving the park's resources and regulating their collection went hand-in-hand. Therefore, the park's army administrators required anyone wishing to collect geological, botanical, or other specimens in the park to obtain permission from the superintendent before embarking on the quest.

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This was often done by contacting one's Congressman, who then contacted an official at the Department of the Interior (DOI), who in turn contacted the permit-seeker and sent a letter introducing him or her to the park superintendent. In those days, collectors did not have to possess any special status; private hobbyists, local merchants, and scientific researchers alike were allowed to collect specimens as long as they could produce a collector's permit. People with a scientific interest in collecting comprised a large percentage of those requesting permits, making the collecting permit the effective precursor to today's research permit. Early collecting permits read something like this one, issued in 1908: "The bearer, Professor John W. Wolff, has permission from the DOI to make a collection of such geological specimens as he may desire, for Harvard University; these to be taken in reasonable quantities and in such a manner that the natural beauty of the formations or other objects of interest in the park will not be injured or destroyed."[3]

Lest anyone think these requirements too restrictive, the issuing official at the DOI typically explained, "This limitation is necessary in order that the beauties of the natural formations in the park may not be destroyed or injured, as the granting of a privilege of this character in general terms might soon lead to great abuses."[4] Other restrictions might include that geological specimens not be broken off of features, but rather collected from among those lying on the ground, or that plant collectors not injure or deface larger shrubs or trees, which would obviously impair the park's scenic resources. Letters of permission also instructed collectors to report to the park superintendent upon their arrival in Yellowstone to receive instructions on where to make their collections.

On occasion, reporting to the superintendent prior to beginning one's collection proved a hardship, due to the nature of travel in the park at the time. When Professor Charles Hottes of the University of Illinois wrote to say that his tour itinerary had him entering the park at West Yellowstone, not to reach Mammoth until after he had passed the areas in which he wanted to collect, the superintendent granted him special dispensation that allowed him to make his collection before their meeting in Mammoth.[5]

At the turn of the twentieth century, most permits allowed the bearer to collect igneous rocks and other geological specimens. The superintendent also granted requests to collect butterflies, flowers, algae, petrified wood, and a variety of other plants.

An Influential Permitting Disaster and a Success Story

The practice of issuing collecting permits continued after Horace Albright became Yellowstone's first National Park Service superintendent in 1919. Trouble arose almost immediately. In 1920, NPS Director Stephen Mather issued a collecting permit to the reputable Barton Evermann of the California Academy of Sciences for the collection of four bears—a male, a female, and two cubs—for museum display. The group assembled to do the collecting included Dr. Saxton Pope, a surgeon from San Francisco; his assistant Paul Young; taxidermist Paul Fair; W.J. Compton; Pope's brother; a Michigan judge; a cook; and a local guide, Ned Ward Frost—according to historian James Pritchard, "all a rather dubious selection by the California Academy."[6] Just how dubious became clear after the party collected a total of seven bears by bow-hunting, generating a substantial amount of negative publicity for the park. Afterward, facing the wrath of Mather and Albright, Saxton Pope asked Mather to "give your official pardon to our excess of Zeal, believing that we did it in the interest of science and with no other motive."[7]

YELLOWSTONE ARCHIVES/COURTESY CHUCK YOUNG

Yellowstone's first NPS superintendent, Horace Albright, regretted issuing the permit for this 1920 bear "collection."

Just about a month later, however, an article by Pope titled "Hunting grizzly with the bow: that the age-old implement of the chase still holds its place among modern weapons is conclusively proved by two California sportsmen" appeared in *Forest and Stream/Rod and Gun* magazine. In it, Pope recounted the collecting expedition in the dramatic fashion of a big game hunting narrative, making his pleas of scientific interest to Mather appear less than in earnest. Based on the bad publicity that resulted from the party's exceeding their limit, Albright had already recommended to Mather that "under no circumstances shall the National Park Service grant another permit for killing animals in this park for museum purposes." After the article appeared, according to Pritchard, Albright "regretted issuing the permit in the first place and wished he had detailed park rangers to collect the specimens rather than allowing any outside party to conduct the work."[8]

It seems that Albright was true to his word; the rest of the existing collecting permits and related correspondence in Yellowstone's archives dating from his administration (1919–1929) are absent any permission for people outside the NPS to collect vertebrates in Yellowstone (for scientific purposes—predator control was another matter). In fact, this rule would exist in some form in Yellowstone for some six decades, until the mid-1980s, supported by a 1942 Solicitor's Opinion that prohibited the taking of animal life in national parks by anyone except NPS employees.[9]

> When Albright lent his support, he lent his support.

Albright permitted individuals associated with academic institutions or government agencies to collect geological specimens, however, and in the mid-1920s, lent his support to a project led by Drs. Eugene Thomas Allen and Arthur Lewis Day. Allen and Day were geologists with the Carnegie Institute's Geophysical Laboratory in Washington, D.C. Having recently published two books on the volcanic geology of California's Lassen Peak, Allen and Day proposed to undertake a comprehensive study of the same in Yellowstone. In the

process, they intended to complete the work begun in the late nineteenth century by the U.S. Geological Survey's Dr. Arnold Hague.[10]

When Albright lent his support, he lent his support. He issued Allen and Day a permit "to collect geological specimens of all kinds in Yellowstone Park and also specimens of plant life growing in or near any of the geyser basins or other areas affected by subterranean heat. In fact, they have full authority to take specimens of any kind that have a bearing on their scientific work."[11] In addition to this fairly broad discretion, he granted the duo a number of other provisions enabling them to conveniently conduct their research, including the right to ride in and have their freight hauled by government vehicles, reduced rates for park accommodations, space for a laboratory in the basement of the Mammoth canteen building, and field assistance in the form of a ranger assigned to assist the group full-time. Allen and Day's permit even released them from the common stipulation that all collections be made out of view of the traveling public; instead, it requested that they conform to the requirement when at all possible. In 1927, the park even bought a Dodge sedan from the Blair Motor Company of Livingston, Montana, for use by the researchers; it appears that the Geophysical Laboratory reimbursed the $1,100 purchase price.[12] With the assistance of the amenities provided by the NPS, Allen and Day produced *Hot Springs of the Yellowstone National Park,* published by the Carnegie Institution in 1935—for many decades, the definitive literature on Yellowstone's thermal environment.


HOT SPRINGS

OF THE

YELLOWSTONE NATIONAL PARK

BY

E. T. ALLEN AND ARTHUR L. DAY

CARNEGIE INSTITUTION OF WASHINGTON

Allen and Day wrote their landmark study on Yellowstone's thermal environment while working under a park research permit.

Wartime and Beyond: The Birth of Bureaucracy

Records on Yellowstone's research permitting during the 1930s through World War II are scant, but by 1938, park managers were asking researchers to submit reports on what they had collected, and what had become of the specimens—the precursors to today's Investigators' Annual Reports (IAR).[13] As today, researchers had to conform to regulations governing travel in the park's backcountry areas; in 1941, at the behest of both the NPS's regional director and the park superintendent, a USGS party was prohibited from entering the upper Slough Creek wilderness area with cars and trucks, and instructed to use horses and wagons instead.[14] There is also evidence of Albright's ban on outside collections of vertebrates; in the early 1940s, park rangers filled requests for bear parts, specifically reproductive tracts and brains. They collected the specimens from bears killed in "control actions:" management procedures in which bears that had repeatedly caused injuries to visitors or damage to property were lethally removed from the park's population. They then shipped the parts to researchers, who had to provide the park with suitable shipping materials and preservative solutions.[15] Wartime travel restrictions probably also contributed to this collection-by-proxy.

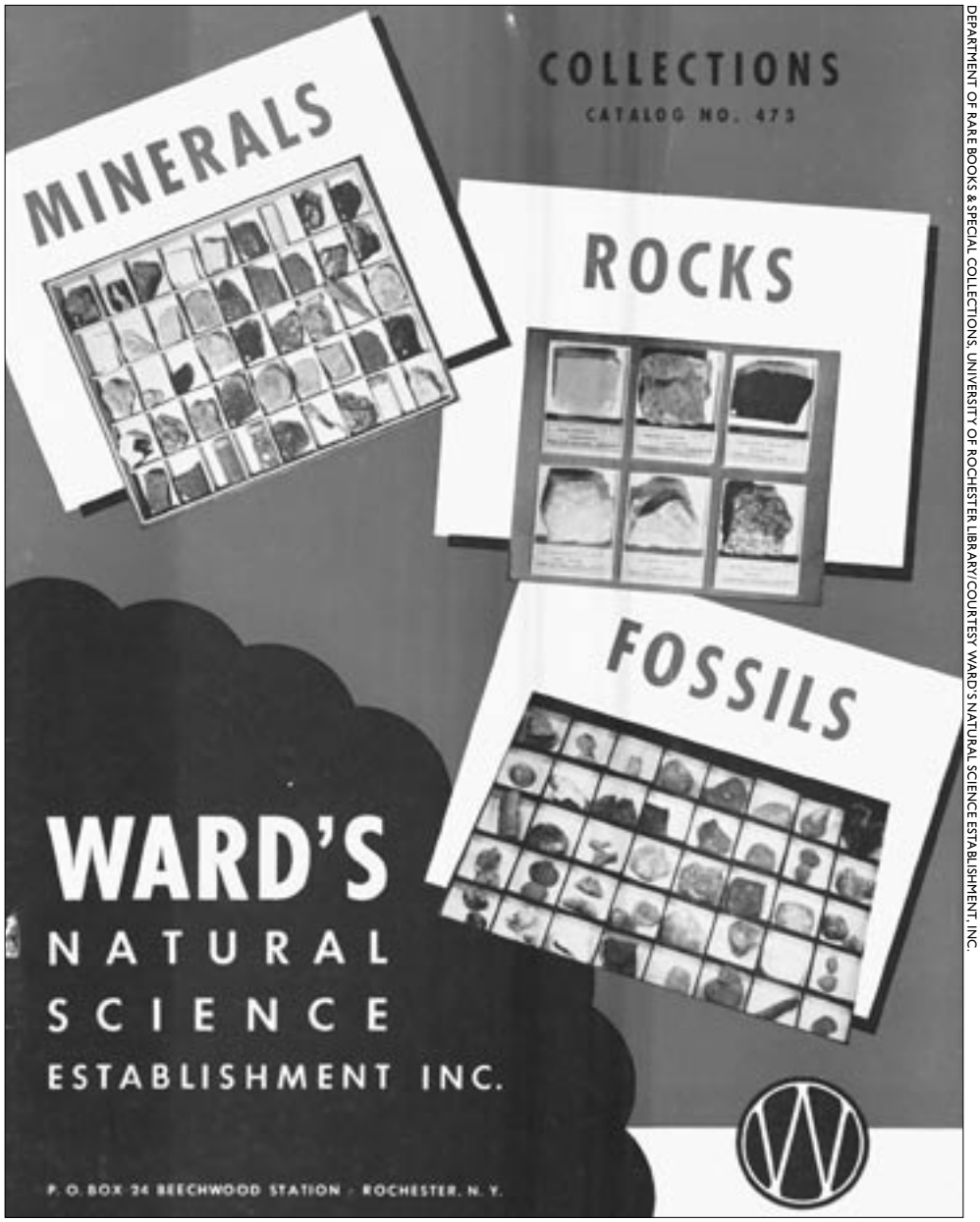
The postwar era saw a process of formalization in research permitting.

During this same period, University of Wyoming professor John Scott obtained permission to study *Diphyllobothrium* tapeworms found in local bears, pelicans, gulls, and fish. Superintendent Edmund Rogers offered any necessary assistance with Scott's collection of tapeworm eggs from the feces of bears and birds, as it was believed at the time that the tapeworms often discovered in the intestinal tracts of park bears made them ravenous, and thus were a major cause of the park's considerable "bear problem," which has since proven not to be the case.

The postwar era saw a process of formalization in research permitting. Now, a park representative, typically the Chief Naturalist, sent a prospective collector an application to be filled out, signed, and returned prior to obtaining a permit. By 1951—possibly as early as 1946—collectors also had to identify themselves as either Class A or Class B applicants.[16] Class A permits allowed the collection only of plants, rocks, or minerals as designated in the permit, and were available to applicants who could establish a connection with a public museum or a scientific or educational institution. A Class A permit did not allow collection of any kind of animal life, with the exception of insects, spiders, and, to some extent, fish. Park regulations permitted researchers, like other park visitors, to collect a certain number of fish. A researcher wanting to collect more than the legal limit of fish had to apply for a Class B

permit.[17] Class B permits, which were less restrictive, were available only to federal employees. They allowed collection of animal life in addition to the items sanctioned by Class A permits, with the caveat that the NPS director had to approve the collection of species identified as "vanishing." Otherwise, the park superintendent issued permits following approval by the regional director.

Non-federal employees who wished to collect animal life had to apply, through a separate process, for "collaborator" status. This was apparently such a cumbersome undertaking that park officials often advised people seeking such permits to try and get their specimens from another researcher already approved with Class B status, or to wait and see if an NPS employee could make the collection for them. The NPS essentially hired those who actually managed to acquire collaborator status as non-salaried federal employees with temporary appointments of between six months and three years.[18] Like other federal employees, they were fingerprinted and required to sign a loyalty oath.



DEPARTMENT OF RARE BOOKS & SPECIAL COLLECTIONS, UNIVERSITY OF ROCHESTER LIBRARY/COURTESY WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.

A 1948 Ward's catalog. Another catalog from that year offered for sale Yellowstone specimens that had been traded to Ward's by the Smithsonian.

Under the new, formalized system, a series of conditions accompanied each permit. Collections had to be gathered out of sight of the public and in such a manner as not to damage the environment. Researchers had to use all specimens they collected for scientific or educational purposes only, and make them available to the public by depositing them in a museum or at a scientific or educational institution after use. Further, the NPS reserved the right to designate the repository. The days of adding to one's private collection with official approval were gone.[19]

Commercial Challenges

A 1948 incident concerning the improper disposition of collected specimens provides an instructive example of the kinds of situations the NPS was trying to avoid with the new permitting process. In its May 1948 sales catalog, Ward's Natural Science Establishment, Inc., offered for sale "an interesting series of the remarkable siliceous sinters (Opal, var. Geyserite) and calcareous sinters (Travertine)…from the Yellowstone National Park, Wyoming…these specimens were collected under a government permit from several of the world famous hot springs and geyser basins."[20] Through correspondence with the company (in the course of which the NPS asked Ward's to cease and desist its advertising and sales of the specimens), NPS officials discovered that the company had procured its collection from the Smithsonian's National Museum of Natural History.

As it turned out, the museum had an abundance of Yellowstone material collected in the 1880s and 1890s by Arnold Hague, and around 1905 by the Smithsonian's secretary, very little of which was ever on display. Space issues and a recent lack of demand from public institutions had led W.F. Foshag, the museum's head curator for geology and mineralogy, to trade some of the Yellowstone collection to Ward's in exchange for mineral specimens that were underrepresented at the Smithsonian.[21] After talking with NPS geologist Dr. Max Bauer, Foshag offered to give the rest of the museum's excess specimens back to the park. Bauer recommended that the NPS back a truck up to the Smithsonian to collect the materials and then dispose of them in any fashion guaranteed to keep them off the market—either by storage or destruction.

Bauer recommended that the NPS back a truck up to the Smithsonian to collect the materials and then dispose of them in any fashion guaranteed to keep them off the market—either by storage or destruction.

Of course, park officials had not heard the end of private mineralogists' desires for Yellowstone specimens. In 1957, the NPS had to fend off the overtures of the Stansi Scientific Company, which had declared its intent to acquire 200 pounds of Yellowstone obsidian by paying the Gardiner School's science club 25 cents per pound to collect it in the park. When science club advisor V.M. Matross refused to go along with the deal, on grounds that such collecting would be illegal, company representative Harold Callahan wrote to the NPS, saying that Matross must be mistaken, because he personally had seen obsidian for sale outside the park. Thus, he indignantly informed agency officials, "we would like authorization." Needless to say, he did not get it.

In the early 1950s, the NPS moved to quell a different kind of potential exploitation of park resources when it prohibited visitors from using Geiger counters while in the park, as was occasionally happening.[22] Although this sudden phenomenon may have simply stemmed from popular interest about the new science of nuclear technology, and curiosity about its application in the strange environment of Yellowstone, the use of Geiger counters technically constituted uranium prospecting, and was thus specifically forbidden except in the hands of permitted researchers. Superintendent Edmund Rogers asked a University of Wisconsin chemistry professor who proposed to use a Geiger counter for research in Yellowstone to submit, with his permit application, "positive statements to the effect that these counters are being used purely for scientific research and study and not for prospecting purposes…in addition, we will have to be assured by you in writing that the information which you obtain from your research studies will not be made available to any persons desiring to prospect for ore commercially or utilize uranium or any other fissionable material that your study might indicate as being present in Yellowstone National Park."[23] It is still illegal for anyone visiting a national park to possess or use a mineral or metal detector, magnetometer, side scan sonar, other metal detecting device, or subbottom profiler.

Growing Pains

Printed on the back of each collecting permit application was the NPS's mission statement in regard to research: "It is the intention of the National Park Service to further scientific research within the areas administered by it, and to cooperate with technical workers to the fullest extent compatible with its charge to preserve all species of flora and fauna and all geologic material in a natural state, insofar as is possible." In 1960, however, a few researchers applying for collecting permits in Yellowstone began to suspect that research was not really as welcome as the mission statement indicated. Not only was Superintendent Lemuel "Lon" Garrison's staff turning down requests that they provide researchers with small collections of specimens, as had been done in the past, they were also rejecting a lot of applications. Garrison blamed the high

J.R. STACY/COURTESY USGS

Requests for permits rose after the 1959 Hebgen Lake earthquake.

rejection rate on too much interest, telling prospective researcher Charles Thornton that since the Hebgen Lake earthquake of August 1959, the park had been inundated with requests from people wanting to collect geological specimens; that "in just one day last fall [the Chief Naturalist] received and denied 11 requests...If every applicant made a collection in the Park, in a very short time Yellowstone would be depleted of its choice specimens now in place in a natural state. For this reason we have found it necessary to refuse the many requests unless the collecting is done by our personnel and is placed on government loan to an institution or is a part of a systematic research project in cooperation with the National Park Service where scientific knowledge of primary significance on a local or national basis is involved."[24] Faced with unusual local circumstances, it appears that Garrison established an informal set of criteria regarding appropriate and inappropriate research uses of the park.

The disparity between what Garrison told him and what he had read on the back of his permit application was not lost on Thornton, a National Science Foundation grantee from Pennsylvania State University who wanted to collect volcanic rocks in Yellowstone and had encountered no similar resistance during his previous research at Lassen and Crater Lake national parks and Death Valley National Monument. Thornton told this to Pennsylvania Senator Joseph S. Clark, who had offered, in his letter of congratulations to Thornton as an NSF grant recipient, to assist him in any way he could. Garrison soon received a letter from NPS Associate Director Hillory Tolson asking him to explain himself in the Thornton matter. The original permit had been disapproved, Garrison explained, "because of a lack of material to convince us that such collection was scientifically important to the university's world-wide collection of volcanic rocks." After hearing from Senator Clark, however, park officials suddenly recognized the significance of Thornton's work; he received his permit five days later.

Simultaneous with the Thornton affair, Garrison and his staff were in a wrangle over the application of Ross Hutchins, head of Mississippi State University's Zoology and Entomology Department. In the spring of 1960, Dr. Hutchins had applied to make a small collection of insects while in the park photographing ants and caddisflies for *National Geographic* magazine. The chief naturalist (on behalf of the superintendent) denied his permit, "on the basis that a need has not been presented establishing the necessity for a scientific study and collection in Yellowstone National Park which would enhance local knowledge or add to scientific knowledge on a national basis."[25] By late June, Garrison was again hearing from upper management in regard to his office's rejection of a collecting permit. Invoking the Thornton case, Regional Director Howard Baker admonished Garrison that while he recognized that approving or disapproving permits was his prerogative, "we fail to see…how activities of bona fide scientists can damage the natural values which we all value so highly…It would be unfortunate if it became generally believed…that Congressional endorsement [i.e., Clark's support of Thornton] has become a requirement for scientific research work in the National Parks."[26]

Garrison told Baker that in 1959, field personnel had criticized Chief Naturalist Robert McIntyre for being too liberal in granting collecting permits, hence the increased stricture during the present year. He also expressed frustration with the current permitting process, which was conducted wholly by mail. Garrison felt it was crucial to differentiate between persons seeking to conduct legitimate scientific research in the park from professors who just wanted to collect a few souvenirs while on holiday in Yellowstone, and suggested that permits be granted only pending the results of a personal interview conducted upon a potential researcher's arrival in the park.[27] In apparent anticipation of concurrence, Chief Naturalist McIntyre informed his district managers that the personal interview requirement was now park practice.[28] Acting Regional Director Frank Childs soon instructed them to stop, however, explaining that a researcher's signature on a permit application was adequate verification that s/he met the required qualifications, and that it was difficult to refuse a permit to a qualified researcher. Childs declined to endorse Garrison's desire to make permits contingent upon personal interviews.[29]

Garrison felt it was crucial to differentiate between persons seeking to conduct legitimate scientific research in the park from professors who just wanted to collect a few souvenirs while on holiday in Yellowstone.

A New Era: Research, Institutionalized

The atmosphere toward researchers in Yellowstone seems to have warmed by 1963, when park officials decided to convert the Lamar Buffalo Ranch into a research station, primarily for use by outside researchers studying ungulates in that area of the park. By April of that year, park staff had plans to enlarge the development and use parts of the existing maintenance shed, second ranger residence, and bunkhouse for the research station. The residence was for use by researchers, the shed for storage, and the bunkhouse for laboratory use, following a remodeling project. A 12-unit trailer court was proposed for an area beyond the existing corral, along with a four-unit apartment to house additional research personnel.[30] The NPS's assistant director gave final approval to the project in October

1963. The park's chief naturalist expected the facility and a few trailer sites to be ready by July 1 for use by scientists Kenneth Greer, studying physiological effects following the park's elk reduction program; John Craighead, studying elk migration; Dr. Fichter, conducting antelope behavioral studies, and Kent McKnight, researching the taxonomy and ecology of Yellowstone's fleshy fungi.[31] By August of that year, the bunkhouse had been remodeled as a research center. By the late 1970s, however, managers decided that the park would be better served by converting the facility to its current use as the home of the Yellowstone Association Institute, as the researchers for whom it had been created had generally proven reluctant to base their operations there.[32]

The amount of paperwork associated with research permitting had begun to proliferate in the late 1950s, when each year, the NPS's Washington Office required each park to submit a "priority list" for its research program. All active and proposed research projects were to be listed, regardless of whether federal employees or outside researchers were conducting them, and whether or not they received federal funds (Table 1). The chief naturalist assigned both a number and a priority ranking to each project; each priority number had to be supported with a project report sheet filled out by its researcher. The paperwork load appears to have reached its apex in 1964, with the advent of the Resource Studies Program (RSP), based out of Washington, D.C.

- Aging of travertines found from Terrace Mountain to Gardner River (Harmon Craig, Univ. of Chicago)
- Ants of high altitudes (Gerald Scherba)
- Bighorn sheep distribution (Helmut Buechner)
- Boiling reactions of superheated pools to various metals (Ralph Scorah & David Love, University of Missouri)
- Clovers of Wyoming (Carl Gilbert, Wyoming Agricultural Experimental Station)
- Condition and trend of winter range for Firehole and Hayden Valley bison herds (Walt Kittams, NPS biologist)
- Development of life forms using primitive algae from thermal waters (J.R. Vallentyne, Queens University, Canada)
- Development of Yellowstone mammal and bird collection (park staff)
- Ecological study of animal life forms associated with hot springs and travertine areas at Mammoth (Joseph Murphy, University of Nebraska)
- Effects of DDT used for spruce budworm control upon terrestrial and aquatic insects (Kittams)
- Factors affecting aspen reproduction on northern Yellowstone range (Kittams)
- Fossil flora studies (Erling Dorf)
- Grasses of Wyoming (Alan Beetle, University of Wyoming)
- Grebe Lake fisheries studies (USFWS)
- Hydrogen isotopes in thermal waters (F. Begemann, Institute for Nuclear Studies, University of Chicago)
- Insects of Yellowstone (Fred Hartig, American Museum of Natural History)
- Movements of northern Yellowstone elk as shown by tagging and recoveries (Kittams)
- Paleontological and stratigraphic study of the Madison formation (USGS)
- Physical changes occurring on the Mammoth Hot Spring terraces (Clarence Allenson & park staff)
- Plants of Yellowstone National Park (W.B. McDougal & Mrs. Herma Baggley)
- River fisheries studies (USFWS)
- Sheepeater Indians (Ake Hullkrantz, Sweden)
- Social behavior of marmots (Kenneth Armitage)
- Studies of thermophilic bacteria (Cal Georgi & Associates)
- Study of feces of Yellowstone mammals (John Moore, L.A. Polytechnic Institute)
- Study of high temperature algae (A.H. Hansgen, University of Texas)
- Study of Norris Geyser Basin and preparation of a publication and map of the area (park staff)
- Study of protozoans found in thermal waters (Austin Phelps, University of Texas)
- Survival of northern Yellowstone elk (Kittams)
- Topographic mapping of Yellowstone (USGS)
- Trend in thermal activity in Firehole River Geyser Basins (park staff)
- Trend of Gallatin winter range (Kittams)
- Trend of northern Yellowstone winter range (Kittams)
- Volcanoes of Sunlight Basin (USGS)
- Yellowstone Lake fisheries studies (USFWS)
- Yellowstone herbarium development (Ray Davis, University of Idaho & park staff)

Proposed (awaiting funding and personnel):

- Antelope food study
- Antelope seasonal distribution and factors influencing herd vigor
- Black bear distribution and habits
- Detailed mapping of thermal areas
- Functional behavior of geysers in geyser basins along Firehole River
- Grizzly bear population and habit study
- Rocky Mountain bighorn study

Table 1. Compendium of research projects underway as of April 16, 1956.

The new program required the responsible park employee to submit a Resource Study Proposal for each study occurring in or proposed to occur in the park during each fiscal year, and to place each of those studies on a Priority List, as had been the case in the past. The accompanying instructions on how to prepare Resource Study Proposals and Priority Lists comprised seven pages of text, with an additional two pages explaining how to prepare the status report required for all research projects.[33] Soon after distributing the new instructions, the Washington office put out a call for an immediate accounting of all personnel directly or peripherally involved in Resource Studies activities, followed by another seven-page memo explaining the purposes and objectives of the Resource Studies Program—"to carry out studies which will aid in solving [a] multitude of problems and help to clear the obstructions in the way of Mission accomplishment"—and the five phases of a Resource Studies Project, also illustrated in a handy flow chart (Figure 1).[34] The regional director had to approve projects proposed by agency employees; projects undertaken by external researchers did not need approval at that level, but still had to be documented on an RSP form.

Of course, the Resource Studies Program was much more than an exercise in paperwork generation. Its institution coincided with a reinvigoration of the NPS's own science program, which had experienced halcyon days during the 1930s, but seen its support dwindle with the onset of World War II and the postwar concentration on facilities improvements (i.e., the Mission 66 program). In 1964, Congress increased the NPS's research budget from $29,000 to $80,000. This increase came on the heels of two commissioned reports released in 1963—the Robbins Report, compiled by the National Academy of Sciences, and the Leopold Report, compiled by the Secretary's Advisory Board on Wildlife Management, both of which strongly advocated that the NPS amplify research conducted in the parks, both internal and external, to facilitate sound, scientifically-based decision and policy making. Because the NPS's mandate of preservation and use generates unique resource management questions and situations relative to those of other agencies and institutions, the Robbins Report also recommended that the NPS develop a program of

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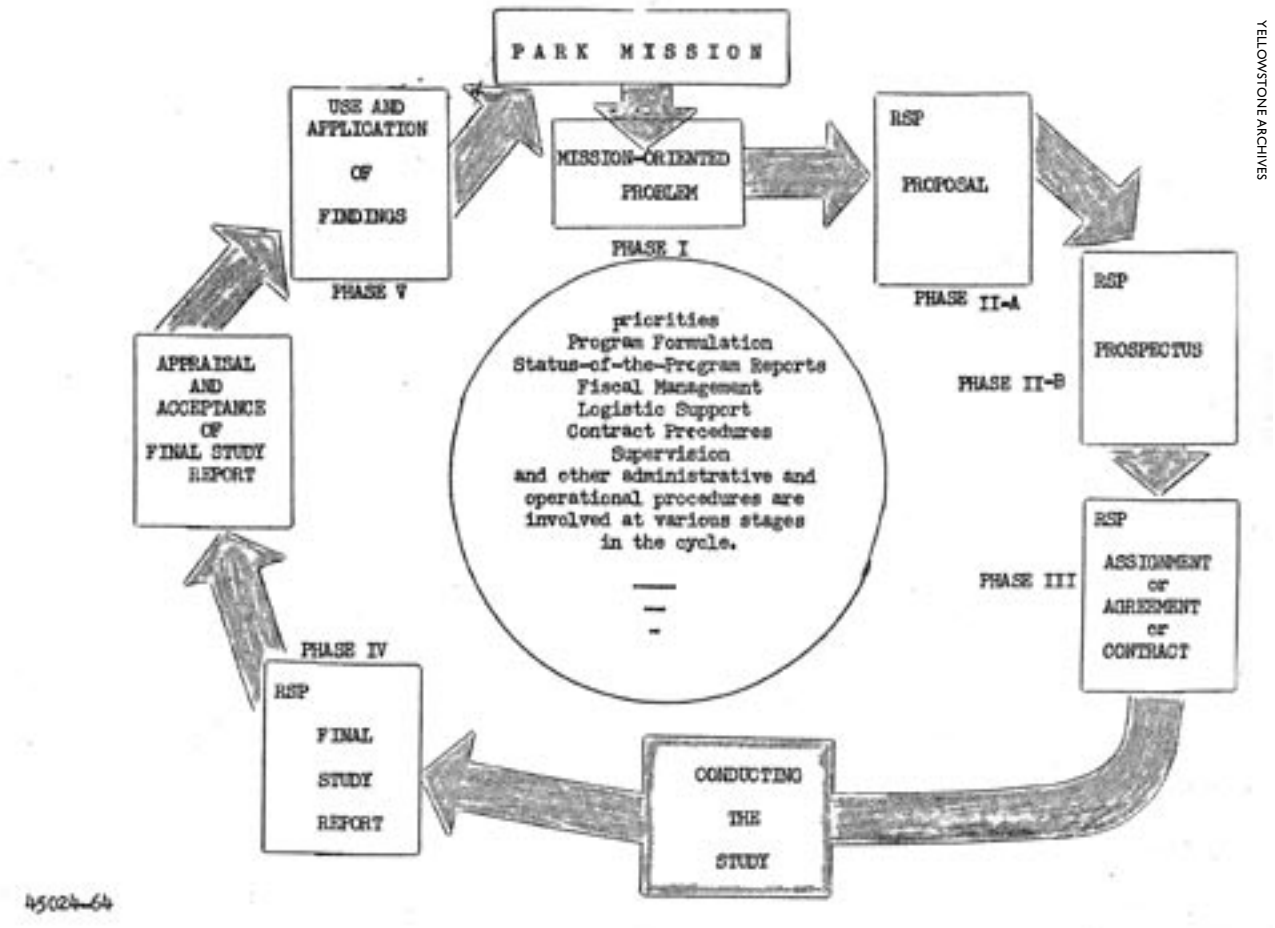

Figure 1. Flow chart of the five phases of a Resource Studies Project, 1964.

"mission-oriented research—" research specifically designed to address park-related issues, and geared toward improving management and interpretation of park values.[35] The report simultaneously encouraged the NPS to benefit from the specialized knowledge of external scientists and admonished the agency against relying solely on outsiders to provide research useful for management purposes. It left open, however, the question of exactly what role the opinions and findings of independent scientists should play in agency decision making—a point that would soon become pivotal in Yellowstone. Following the new appropriation, the NPS introduced the Resource Studies Program, as well as programs to study threatened species and the feasibility of species reintroduction, and revived the NPS *Fauna* series initiated in the 1930s by Wildlife Division founder and chief George Wright.[36]

In 1965, on the occasion of the Resource Studies Program's first anniversary, NPS Director George Hartzog sent a blanket memo recounting the program's first year and explaining that the mountain of paperwork generated in 1964 was the result of efforts to get the program off the ground; in the future, he promised, the load would be lightened (although each park still had to submit 14 copies of each Resource Study Proposal to its regional Resource Studies Advisor for distribution that year).[37] Now that the program was up and running, he argued, the NPS could start reaping the benefits of an organized and orderly system that would allow parks to identify research needs by pinpointing major issues and problem areas. "It is here that you, as a manager, can make a major contribution," Hartzog wrote. "Be alert to the requirements for studies that arise out of your management and your development programs. Are you developing a new area in the park, for example? Are you sure the development site is not of such scientific value as to justify your proposing a different location? What will the development do to the ecology of the surroundings?"[38] Questions like these prefigured those that compliance with the National Environmental Policy Act would require in the coming years; as such, the creation of the Resource Studies Program came at a time when research was increasing in its importance to federal agency management. In addition, a new item was added to the Resource Study Proposal form: "Anticipated Benefit to Service." Along with addressing a resource-related problem, in other words, proposed research had to pose a benefit to the NPS to be approved. Those benefits often proved enormous; in Yellowstone, this rich period for research included the revolutionary grizzly bear studies of John and Frank Craighead, as well as the groundbreaking discoveries of Thomas Brock, to be discussed later.

Turf Wars and their Residual Effects

When Superintendent Jack Anderson arrived in Yellowstone from Grand Teton National Park in 1967, he brought Glen F. Cole with him to be the park's supervisory biologist. Together, Anderson and Cole had a mission in Yellowstone: to implement the recommendations set forth in the Leopold and Robbins reports.[39] By 1969, they were engaged in a tussle with grizzly bear researchers John and Frank Craighead over the terms of the Craigheads' Memorandum of Understanding (MOU), which addressed important aspects of their research permit. The Craigheads had begun their now-famous grizzly studies in 1959, through a partnership with the park that was spearheaded by park naturalist David de L. Condon and then-Superintendent Garrison. Under the terms of their MOU, and to the minds of Condon and Garrison, all parties would benefit from the arrangement—the Craigheads could use the park to conduct their research, and the park could gain much-needed scientific information on the grizzly, as well as recommendations on how best to manage it.

The Robbins Report simultaneously encouraged the NPS to benefit from the specialized knowledge of external scientists and admonished the agency against relying solely on outsiders to provide research useful for management purposes.

By the time those recommendations were made in 1967, however, the park had a new superintendent (Anderson) and a new set of management policies that made Anderson and Cole reluctant to implement what they saw as the brothers' "unnatural" management methods; namely, actively attempting to centralize grizzly populations around managed garbage dump sites as a means of maintaining grizzly habitat and minimizing human–bear interactions, in conjunction with a series of other suggestions designed to maximize the conservation of individual bears.[40] In light of the new resource management

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The 1959–71 grizzly bear research by John and Frank Craighead produced invaluable data as well as long-term controversy.

policies then taking hold in the parks (sometimes described as "natural regulation"), NPS Chief Scientist Robert Linn chided the Craigheads: "management recommendations must reflect the policies that have been established…Recommendations… offered to an agency should fall within the parameters set by policies, because if they do not fall within such parameters, the administrators of the organization will find it difficult to accept the recommendations."[41]

With the recent adoption of mission-oriented research as a primary NPS goal, park managers sometimes felt free to suggest that researchers adjust their project proposals accordingly. Permit applications instructed aspiring researchers to provide the park with a detailed prospectus of their project, describing their field operation, type of equipment to be used, type of areas to be researched, type of access needed, disturbance that might be caused to natural features, and any other information on the physical activities used in carrying out the research, as well as the purpose and disposition of the resulting research report.[42] In response, it was not unusual for researchers to get letters back from park officials containing such statements as, "In presenting your current proposal we note the incorporation of some of our thinking. We appreciate this and are encouraged to suggest an additional idea," or "The data you propose to gather in Yellowstone appears to have value for us in meeting our goals."[43]

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In 1969, Superintendent Anderson sent John Craighead a letter accompanying his MOU renewal asking that the researchers begin to remove conspicuous markings from their study animals to the greatest extent possible, so that the park might optimize its natural appearance in time for its 1972 centennial.[44] For the Craigheads, this was problematic; they had pioneered the use of telemetry collars and used identifying ear tags, and these markings were paramount to the efficient execution of their research. They weren't alone; Anderson and Cole told other researchers during this period that they could not mark animals as part of their study, and sometimes approved permits in part because their applicants did not intend to mark animals. Even the park's own biologists were restricted from conspicuously marking animals, though there is evidence that they may not have been inclined to do so, anyway.[45] The Craigheads were also unhappy with park managers' disinclination to implement most of their scientific recommendations, and made their feelings widely-known through the national media. After a couple more years of research, the Craigheads declined to sign a subsequent MOU renewal agreement, arguing that the NPS had become too controlling, and concluded their work in the park.

The disagreements between Yellowstone's managers and the Craigheads were so well-publicized in the news media that after their departure a widespread, enduring mythology developed that the NPS had "thrown the Craigheads out of the park," and was generally anti-research, especially when it came to outside researchers. Whether these claims were true, or the park's research program was simply suffering from the once-bitten, twice-shy effects of a bad break-up, or whether there is some other explanation, it does appear that the number of research projects in progress was comparatively low in the years following the brothers' 1971 departure. In 1970, there had been 84 research projects ongoing in the park, 64 of them by outside researchers; according to NPS Chief Naturalist William Dunmire, this meant that Yellowstone had one of the most vigorous agency and academic research programs existing in the NPS at that time.[46] In 1973, the total was down to around 50, with 33 conducted by outside researchers.[47] It would rise from there, however; in 1975, there were 60 projects based out of 31 different institutions—in 1978, 67 projects.

Centralized Directives

Permits of the early 1970s required that research not only be carried on out of public view, but also, in the spirit of "natural regulation," be as non-manipulative as possible, with nothing done "that would preclude an ecological system from ultimately returning to a natural state."[48] The regulations permitted only representatives of large universities and public museums to collect and, as had been the case since early on, park managers asked researchers to check in with park representatives at Mammoth Hot Springs upon their arrival in the park.

By 1978, the restrictions had been liberalized a bit. In that year, collecting permits were issued not only to Knud Aunstrup, a manager for Denmark's Novo Industries, who revealed only that his desired samples of mud and hot springs would be used for "scientific investigations," but also to a man wishing to bring 18 high school students to the park to collect plant samples. At the same time, research biologist Dr. Mary Meagher frequently directed would-be rock collectors to roadside pull-outs outside park boundaries—where, Meagher advised, they were likely to find the specimens they needed without having to take them from inside the park. All of this was in accordance with the servicewide *NPS Management Policies 1978,* which specified that park officials should issue or deny permits on the basis of the scientific validity of the proposal, rather than on the credentials of the people applying for them, and allow a limited amount of collecting by students

in science classes at all educational levels. The management policies also stipulated that research projects must not have lasting or significant physical impacts on park resources, and that researchers should use parks only for studies that could not be performed outside them.[49]

To some degree, the 1978 management policies simplified the permitting rules; for example, they appeared to have relieved NPS administrators of the Class A and B permitting system, used to differentiate federal employees from independent researchers.[50] Permit records show, however, that the Class A and B system was used in Yellowstone at least through 1982.[51] Sometime between 1983 and 1987, park administrators ceased this practice—long bemoaned by NPS officials and prospective researchers alike as cumbersome, confusing, and somewhat arbitrary—probably as part of a more general reform of the Code of Federal Regulations that occurred during that time. It is worth noting that the number of Category A permits issued had fallen to single digits during the late 1970s and early 1980s, perhaps reflecting what has been described elsewhere as a dark period for research funding in Yellowstone.[52] In addition, enforcement of the Class A and Class B conditions had dissipated since their institution, but especially in recent years.[53]

In 1984, within the Ranger Division, Yellowstone National Park created the Division of Research, under which it was proposed that three new positions be created: a research biologist, specifically to deal with ungulate issues; a research geologist, specifically to deal with water rights issues; and a clerk-typist, because "currently five researchers are supported by one secretary, who despite best efforts, cannot keep up with the workload. The addition of two more professionals will make this workload intolerable."[54] The park superintendent also suggested that three existing positions be re-classified: supervisory research biologist to research biologist, to focus on bison, bighorn, and the park's ecological history; physical science coordinator to supervisory research geologist; and geologist to research geologist (geothermal). Serendipitously, this action accorded with the *NPS Management Policies 1988,* which called for NPS natural and social science programs to produce applied research necessary for making sound management and planning decisions. In that document, scientists, rather than being permitted to "use parks for studies that cannot be performed outside the parks" (as in the 1978 management policies), were "encouraged to use the parks for scientific studies," albeit still encouraged to "direct their research toward park management objectives."

Five years later, in March 1993, Yellowstone's managers reorganized the park's research and resource functions to create the Yellowstone Center for Resources (YCR), the initial goal of which was to put park scientists under the direction of university-based Cooperative Park Studies Units (CPSUs). There were several reasons for this. Removing scientists from the supervision of government managers, who might potentially be influenced by politics, would help to ensure that the NPS produced science independent of management's possible desires—a longstanding point with NPS critics.[55] The change was also designed to improve scientific output by ensuring that researchers could concentrate on scientific projects, rather than being drawn into park-related bureaucratic work such as consulting and planning projects.[56]

Today, each research permit application is subject to at least three, and as many as five levels of review.

The Yellowstone CPSU was to be based at Montana State University (MSU) in Bozeman. Back at the park, the YCR would encompass a new, professionalized resource management function. Later that year, however, Secretary of the Interior Bruce Babbitt reassigned all DOI scientists to create the National Biological Survey (NBS). As a result, Yellowstone lost 11 scientists who were to populate the MSU CPSU, along with the $1.7 million earmarked to support them. To fill the gap, YCR officials looked to hire resource managers with advanced degrees who could fill a scientific role while performing the majority of their work within the realm of resource management, rather than research. The NBS was short-lived, and was soon absorbed into the U.S. Geological Survey's Biological Resources Division.[57]

Initial YCR branches included natural resources, cultural resources, advanced resource technology (today's spatial analysis center), professional support, and planning and compliance (since removed from the YCR organizational structure and currently divided between the Superintendent's Office and a new Division of Planning, Compliance, and Landscape Architecture). In 1997, following an extensive, interdisciplinary review of the research permitting process, YCR added a "research support" function, whose purpose is to issue and track research permits and provide support to permitted researchers in the park. The review committee also established a formalized, standardized process for research permit review and issuance. In part, this was a response to a balloon in the number of research permits issued annually in the 1980s, when the count shot from 81 to 298 in a span of just six years (numbers are approximate—see Figure 2).

Today's Procedures and Challenges

Today, each research permit application is subject to at least three, and as many as five levels of review. The Research Permit Office (RPO) staff receives applications, checks them for completeness, including peer reviews, and prepares a summary of the proposal for submission to the Research Review Interdisciplinary Team, consisting of representatives from the divisions of Maintenance, Planning, Interpretation, Visitor

Protection and Resource Management, and the Yellowstone Center for Resources. The team's purpose is to determine whether the proposed research could result in adverse effects on park resources, park operations, or visitor experiences. If the team has concerns about the terms of the proposal, RPO staff go back to the researcher to see if methodologies and other details can be negotiated to make them acceptable. If the team recommends approval of the proposal, it is forwarded to the director of the Yellowstone Center for Resources (YCR), who holds a delegated authority from the park superintendent to sign research permits. In cases where research has the potential to be disruptive, sensitive, or controversial, the YCR director may seek additional guidance from the park's Resource Council, an interdisciplinary team of division chiefs whose purpose is to determine whether proposed projects qualify for Categorical Exclusions under the National Environmental Policy Act (NEPA), or would require an Environmental Assessment or other NEPA action. Permit proposals deliberated and recommended for approval by the Resource Council are then sent back to the YCR director for signature, with the appropriate NEPA documentation signed by the park's superintendent.[58] The research permitting process is governed by legislation including but not limited to NEPA, the Wilderness Act, the National Parks Omnibus Management Act of 1998, NPS Director's Order 77, and the U.S. Code of Federal Regulations. Regulations require all permitted researchers to submit an IAR at the end of each year.

Estimated Number of Permitted Research Projects in YNP, 1954–2003

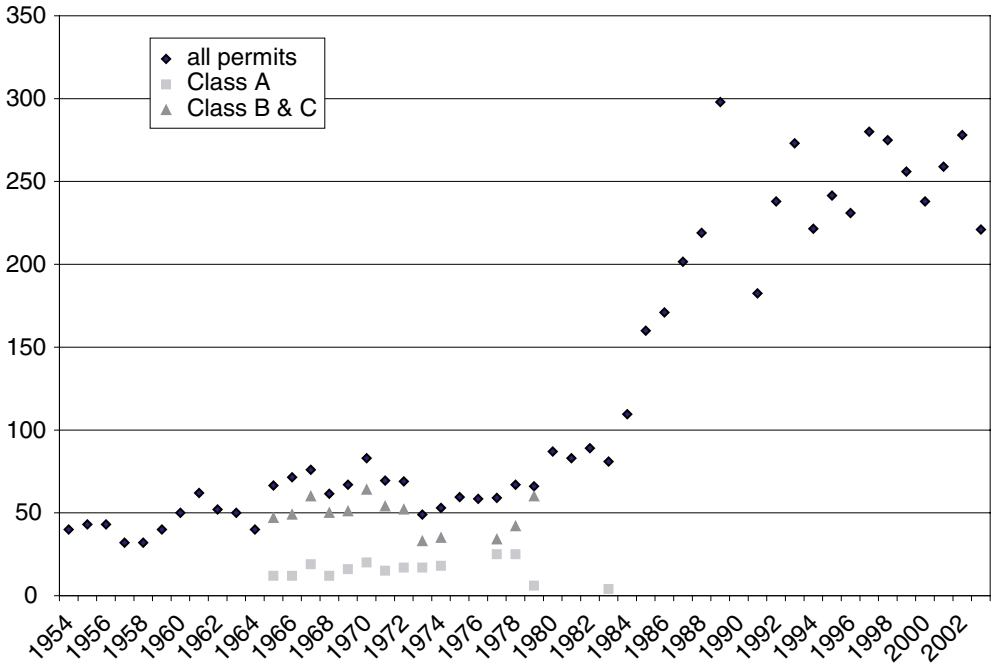

Figure 2. Graph showing the number of research permits issued each year as reflected by the Superintendent's Annual Research Reports and Investigators' Annual Reports. Although the graph provides a general idea about trends in research permit numbers, it is important to note that fluctuations may result from many factors, including changing ideas and policies defining what kind of research requires a permit. In previous decades, for example, permits were issued to people conducting historical research in the park's library and archives; this kind of research no longer warrants a permit. On the other hand, non-reportage on the part of researchers may result in artificially deflated numbers. Because this data was compiled from several sources, it should again be emphasized that these are estimated numbers designed to give an overall impression.

Under the NPS's Resource Studies Program (RSP), research projects were reported as being either Class A, Class B, or Class C. Class A projects were those conducted by NPS or other federal agency personnel that had been identified as park priorities and awarded Resource Studies support. Class B and C projects were conducted by independent researchers. Class B projects were also identified as park priorities and awarded Resource Studies support; Class C projects were not reported through the RSP. As is evident here, the number of permitted research projects conducted by independent researchers consistently outnumbered those conducted by agency personnel during the contentious years of the RSP, with the total number of projects reaching a low of 50 in 1973.

At the turn of the twenty-first century, awash in paperwork, YCR managers decided to investigate a computer-automated permitting system. Under a contract with the park, researchers at the Idaho National Engineering and Environmental Laboratory developed an operating system that was subsequently adopted as the servicewide Research Permit and Reporting System. Park research coordinators can use the system to receive and organize electronic permit applications, proposals, and peer-reviews from applicants; post and maintain the type of research the park is most interested in attracting; post and maintain park-specific conditions applicable to every permit issued by the park; post an information bulletin used to notify investigators of special conditions or events that could impact planned fieldwork (road closures, area

closures, safety-related notices, etc.); process and track permits and denied applications; manage the park IAR database; search the servicewide IAR database; search the servicewide permit database to confirm currently active permits and previously-approved studies conducted at other parks; and report annual accomplishments by investigators through IARs.

Members of the public can access a special section of the system to review permit application requirements and procedures; review general conditions applicable to all scientific research and collecting permits issued by NPS; review park-specific conditions applicable to research and collecting permits; review park information bulletins containing notices that may impact planned fieldwork; search the type of research parks are most interested in attracting; search the IAR database to review previous research accomplishments before planning a new study; complete an application for permission to conduct a study in a specific park; submit electronic copies of study proposals and existing peer-reviews; and look up the name, phone, email, FAX, and mailing address of the research coordinator at a park.[59]

In recent years, park managers have encountered a research permitting situation that is both highly sensitive and highly controversial, as some believe it raises questions that strike at the heart of the NPS mission and the reason for the park's founding. At issue is the question of "bioprospecting," sometimes defined as scientific research that looks for a useful application, process, or product in nature.[60] The issue has its roots in 1966, when researcher Thomas Brock discovered *Thermus aquaticus,* a microorganism capable of surviving in temperatures extreme enough to kill most other living organisms, in a Yellowstone hot spring. After learning to grow *Thermus aquaticus* in the laboratory, Dr. Brock donated a living sample to the American Type Culture Collection (ATCC), a global nonprofit bioresource center that provides biological products, technical services, and educational programs to private industry, government, and academic organizations around the world.

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In 1985, the Cetus Corporation obtained a sample of *Thermus aquaticus* from the ATCC for use in developing the Polymerase Chain Reaction (PCR) process that would prove instrumental in the evolution of DNA sequencing. Cetus employee Kary Mullis developed the Polymerase Chain Reaction (PCR) in the 1980s as a novel technique for rapidly amplifying DNA. Rapidly amplifying, or replicating, a particular strand of DNA to a billion exact copies overnight gives a scientist enough of the material to seriously study; the innovation brought Mullis a Nobel Prize, and the field of biology a revolution.[61] The breakthrough ingredient was a new substance Mullins named *Taq* polymerase, after *Thermus aquaticus.* The PCR method depends on alternating high temperatures and low temperatures, and *Taq* polymerase was the only substance Mullins could find that did not break down at high temperatures. The high temperature cycle separates the DNA strands, and the low temperature cycle allows primers—specially-designed, dyed molecules that attach to targeted sections of DNA—to bind to the separated strands. DNA polymerase then begins the replication process. After several other steps, the genetic codes of different alleles from the original DNA are then known.[62] Today, DNA sequencing, developed with the aid of a resource originating in Yellowstone National Park, is a multibillion dollar business.


NPS

Today, 25% of research permits relate to microbiology.

The park, however, has seen no financial benefit from that enterprise—a fact that has led to calls for "benefits-

sharing" agreements to be established between national parks and any future researchers whose in-park discoveries might prove similarly profitable. Such agreements ensure that a park receives benefits when the results of research conducted in that park lead to the development of a commercially valuable product. In 1995, park managers concluded that Cooperative Research and Development Agreements (CRADAs), authorized under the Federal Technology Transfer Act, would be one of several legal and appropriate ways to implement benefits-sharing agreements.

The National Parks Omnibus Management Act of 1998 authorizes the NPS to negotiate benefits-sharing agreements with researchers, and in 1999, as part of a CRADA, employees of the Diversa Corporation, a biotechnology company that develops new technologies to discover and modify genes from many environmental sources, including Yellowstone National Park, used DNA analysis to develop a pedigree for Yellowstone's restored wolves. Under the terms of the agreement, the park did not pay for this service, which it could not have otherwise afforded. Today, the DNA pedigree helps park managers better understand the dynamics of the Yellowstone wolf population in many ways.[63] For instance, it allows them to definitively identify which genetic lines of wolves are most successful, to know if new wolves found in the Greater Yellowstone Area (GYA) were descended from Yellowstone's restored population, and to know if wolves found outside the GYA dispersed from that population.

In 1998, however, the Edmonds Institute, joined by the Alliance for the Wild Rockies and the International Center for Technology Assessment, filed a lawsuit in federal court challenging the Yellowstone/Diversa CRADA. Concerned that the NPS was "participating in the commercialization and privatization of life," and believing that any kind of contract negotiations between the NPS and private institutions should be transparent to the public, the plaintiffs alleged that the CRADA violated the Federal Technology Transfer Act, the NPS Organic Act, the Yellowstone National Park Organic Act, and the National Environmental Policy Act.[64] The case was ultimately dismissed with prejudice; the NPS is currently in the process of writing a servicewide Environmental Impact Statement on benefits-sharing. This document is expected to be released to the public in draft form sometime in 2004, whereupon the next chapter in the history of research permitting in Yellowstone will be written.

Conclusion

In many ways, the history of research permitting in Yellowstone has paralleled the history of the park's management—and sometimes the nation—in general. In the park's early days, standards were fairly loose; permitting was more of a tool used by the army to impose order on a state of chaos than a rigorous process of application and approval. In effect, however, it functioned as a means of resource protection. During his seminal administration, Superintendent Horace Albright set the tone and precedent for the future of NPS permitting policy—as he did for so many other NPS practices—based on his experiences and values. The postwar federal bureaucracy boom drove the evolution of research permitting starting in the 1950s; in the coming decades, progressive ideas about management possibilities combined with staunch adherence to bureaucratic implementation to create a kind of progressive conservatism within the context of science and resource management. This resulted in hard times for the NPS during an era when challenges to authority—especially government authority—were widespread throughout the nation. Policy in more recent decades has been marked by a breakdown of traditional internal–external divisions—a state of affairs partially fueled by budgetary realities leading park managers to encourage research that the NPS cannot afford to perform but from which it can benefit. And today, as in all aspects of life, technology presents the permitting process with heretofore unseen challenges to be examined through interdisciplinary agency and public forums.

At its core, research permitting is always about controlling other-than-ordinary access to park resources, with the goal of ensuring—and ultimately, improving—their conservation.

At its core, research permitting is always about controlling other-than-ordinary access to park resources, with the goal of ensuring—and ultimately, improving—their conservation. The types of benefits to be gleaned from research in the parks, from information about what visitors are thinking to data on the movements and habits of grizzly bears to the development of technologies that may improve the lives of people worldwide, make it clear that conducting and permitting research are central to the NPS mission of providing benefit and enjoyment to the people while ensuring the conservation of park resources. Research contributes to both those aspects, making it a responsibility rather than a luxury. That does not mean that every project must be approved; employing deliberation, discretion, and thoughtful decision making about the control over special resource access is the mirror of that responsibility. Over the past century, park managers have been routinely criticized either for guarding their resources too closely in regard to research, or giving researchers too much latitude; this is to be expected. Permission constitutes a leap of faith, and the line between domination and negligence can prove narrow for those charged with walking it.

YS

Acknowledgements

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MARK BIEL

Alice Wondrak Biel is a writer-editor for the Yellowstone Center for Resources. She holds a Ph.D. in geography from the University of Colorado at Boulder and is currently at work on her first book, a cultural history of bears and people in Yellowstone. She lives in Bryce Canyon National Park, Utah, with her husband Mark.

Endnotes

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[2] Aubrey L. Haines, *The Yellowstone Story: A History of Our First National Park,* rev. ed., vol. I (Niwot, Colo.: University Press of Colorado in cooperation with The Yellowstone Association for Natural Science, History & Education, Inc., 1996), 326.

[3] Document 8127, National Archives, Yellowstone National Park (hereafter NAYNP).

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[8] Ibid., 65.

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[17] Edmund Rogers to William Sigler, August 31, 1956, File A0915 Collecting Permits 1954–1957, Box A-253, NAYNP.

[18] "Notification of Personnel Action," March 22, 1965, File A9015, Box A-202, NAYNP; Assistant Director to All Field Offices, January 31, 1955, Box A-253, NAYNP.

[19] Paul Franke to Stella Streeter, June 3, 1949, File 732 Geology 1940, Box N-346, NAYNP; "Conditions Upon Which This Collecting Permit is Issued," File 732.03.1, Box N-346, NAYNP.

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[21] C. Max Bauer to John Doerr, November 12, 1948, ibid.

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[23] Edmund Rogers to John A.S. Adams, May 19, 1952, ibid.

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[36] R. Gerald Wright, *Wildlife Research and Management in the National Parks,* (Chicago: University of Illinois Press, 1992), 25.

[37] Wilfred D. Logan to All Field Offices, Midwest Region, June 4, 1965, ibid.

[38] George Hartzog to All Field Offices, March 29, 1965, ibid.

[39] Glen F. Cole, "Perspective: Glen F. Cole, Yellowstone National Park Biologist, 1967–1976," *Yellowstone Science* 8, no. 2 (2000): 13–18.

[40] John J. and Frank Craighead, "Management of Bears in Yellowstone National Park," 1967, File Bear Management 1968, Vertical Files, Yellowstone National Park Bear Management Office (YNPBMO).

[41] Robert Linn to John Craighead, October 13, 1969, File N-22, General Research (other than historical), Box A-202, NAYNP.

[42] William Dunmire to David Canham, February 12, 1969, File N-22 General Research (other than historical), Box A-202, NAYNP.

[43] Jack Anderson to Norman Sloan, December 8, 1969, ibid.; Jack Anderson to Walter Mueggler, August 31, 1973, File A9015 Permits Collecting 1973, Box A-312, NAYNP.

[44] Jack K. Anderson to John J. Craighead, April 7, 1969, File N-22 General Research (other than historical), Box A-202, NAYNP.

[45] Glen Cole to Bob Linn, November 26, 1974, File N22, Box N-89, NAYNP.

[46] William Dunmire to Jack Anderson, August 7, 1970, File N-22 General Research—General, Box N-311, NAYNP.

[47] Superintendent's Annual Reports, Box N-11, NAYNP.

[48] Jack Anderson to Robert Gorden, May 23, 1973, Box N-152, NAYNP.

[49] *NPS Management Policies 1978,* sec. VII–20, 2–78. YNP library.

[50] Bayless, 1999.

[51] Various documents, File A9015 Collection Permits 1980, Box N-312, NAYNP.

[52] Mary Meagher to Nathaniel Reed, November 30, 1982, File "Bear Management 1982," Vertical Files, YNPBMO.

[53] John D. Varley, personal communication, April 1, 2004.

[54] Superintendent to Regional Director, July 20, 1984, File A6427, Box A-130, NAYNP.

[55] Michael Milstein, "Shakeup in Park Research," *Billings Gazette,* March 21, 1993, p. 3C.

[56] John D. Varley, personal communication, June 7, 2004.

[57] Ibid.

[58] Yellowstone National Park, Research Permit Review Procedures, rev. March 2002.

[59] <http://inside.nps.gov/programs/function.cfm?fun=92&div=34&prog=253&page=home>.

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[61] John D. Varley, personal communication, April 16, 2004.

[62] Ibid.

[63] Material in this paragraph is adapted from information found at <http://www.nature.nps.gov/benefitssharing/index.htm.>.

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Harry R. Horr and the Promotion of the National Park

R. Brad Coon

YELLOWSTONE ARCHIVES, YELL 9357

F.J. Haynes stereograph of "Horr and McCartney's Hotel," 1885.

HISTORIAN Lee Whittlesey has identified G.L. Henderson as Yellowstone's first "interpreter" but, with a slight change of perspective, it is possible that honor might be given to H.R. Horr, another early personality in the park's story.[1] After all, Horr's residence within Yellowstone's boundaries predated its establishment as a national park and, as this essay will demonstrate, he apparently had no hesitation in describing Yellowstone's features to anyone willing to listen (particularly if they were willing to pay to hear him).

One of the complications that prevents Horr from being more generally recognized as an interpreter is the scant documentation regarding his involvement with Yellowstone and his residence in Montana. So few documents bearing his name have survived that considerable confusion exists even over his given name. Known variously as "Henry" or "Harry," H.R. Horr left a confusing trail for researchers in the public record and, until now, not a single piece of original personal correspondence has been discovered.[2] However, due to a fortuitous accident, one of Horr's correspondents preserved a personal letter that has recently come to light in the Merrill G. Burlingame Special Collections of Montana State University. While examining other materials, a previously unnoted letter authored by Horr was found. This remarkable document, while disappointingly brief, gives new insight into Horr's character and his involvement with the early history of Yellowstone National Park.

Henry Riddle Horr was born in Youngstown, New York, on September 20, 1842.[3] Some time after his birth, he moved with his family to Dubuque, Iowa. He apparently received a good education there, if his subsequent careers and eloquence are any evidence. During the Civil War, Horr received a warrant as sergeant with the First Independent Battery of the Iowa Light Artillery, but his military career ended when he received a painful groin wound at the Battle of Pea Ridge, Arkansas, on March 7, 1862.[4]

Judging from his first appearance in the public record in Montana, Horr may have returned to Dubuque and studied law for a time after leaving the army. He arrived in the Montana Territory in 1867, along with his brother, Captain Joseph Latshaw Horr, Company F, 13th U.S. Infantry.[5] The 1868 Helena City Directory listed Henry R. Horr of Iowa as a lawyer on Main Street, and also included a short historical sketch of the town written by him.[6] By 1870, Horr had moved to the Gallatin Valley. The 1870 census recorded him as "Henry R. Horr," a New York-born white male, 28 years of age, owning property worth $1,600, and employed as a clerk in a store, most likely the post sutlery (trading post) at Fort Ellis, where his brother had been stationed.[7] Although years later he would claim to be among the party that rescued Truman Everts, Horr was more likely at Fort Ellis when the other members of the Langford-Doane-Washburn expedition returned from the Upper Yellowstone without Everts in October 1870, and probably heard about the fabulous geologic wonders they had seen.[8] Horr arrived at the Mammoth Hot Springs in early 1871 and, along with James C. McCartney, claimed the terraces for their own.[9] They established what was variously known as "Horr and McCartney's Hotel," "Mammoth Hot Springs Hotel," and "National Park Hotel."[10] Unfortunately for Horr and McCartney, Congress set aside the entire Yellowstone region as a national park in 1872, effectively putting an end to the entrepreneurs' hopes of becoming rich from the tourists and invalids who would pay to use the "curative waters."

That same year, a group of citizens from the Bozeman area nominated Horr for the position of superintendent of

Yellowstone National Park, and in the bombastic manner which was so often associated with Horr, proclaimed him "an old mountaineer—one who is thoroughly acquainted with this marvelous region—the first white man who penetrated this region with a view to permanent settlement."[11] The Interior Department instead awarded the position to Nathaniel P. Langford, and although one source suggests Langford appointed Horr and McCartney as the park's custodians in 1874, it cannot be corroborated.[12] Horr eventually left it to McCartney to care for the "hotel" and returned to Bozeman, where he acquired a reputation as a humorist and lecturer.[13] It was during this period that Horr began calling himself in print "Harry R. Horr" or more briefly, "H.R. Horr."

He circulated his own petition in Bozeman to support another attempt to obtain the position of superintendent of Yellowstone National Park.

Horr continued his efforts to profit from Yellowstone and its wonders in 1874, when newspaper articles mentioned his intention to set up a "museum" with live animal displays on the park's periphery. Shortly afterward, he announced his plans to tour New York as a lecturer with a panorama of the park.[14] Panoramas were popular in the nineteenth century and generally consisted of a large scroll covered with painted scenes. As a narrator described the various scenes, the scroll was unrolled, often accompanied by various props and sound effects. An 1875 newspaper announcement of one of his humorous lectures saw yet another variation in his personal nomenclature when the former army sergeant referred to himself as "Major" Harry R. Horr.[15] The "promotion" appears to have been temporary, as no subsequent citation used that rank.

After another stint in Helena, Horr was back in Bozeman in 1880, where he married Aurilla J. Davis on July 21.[16] The following year, he circulated his own petition in Bozeman to support another attempt to obtain the position of superintendent of Yellowstone National Park.[17] The petition described Horr as "a gentleman of education, a writer, and lecturer…Republican in politics and was wounded in Federal service." Further, it claimed that he had done "more than any one person to bring that [Yellowstone] region into notice." Curiously, Horr felt the need to write a letter to send to the Interior Department vociferously denying allegations of drunkenness.[18]

Although Horr felt confident of receiving the position, he again failed and moved with his brother to the upper Yellowstone, where they founded the town of Horr in 1887.[19] The town processed coal from nearby mines—apparently with some success, as during an 1884 visit to Bozeman, the Bozeman *Avant Courier* noted he was "the present Coal King of Montana."[20] The same article indicates he was then resident in Cinnabar and had recently become a father. A second son was born on May 23, 1886, in "Upper Yellowstone, Montana."[21]

Some mystery still surrounds his final years. He would eventually leave Montana and move to Seattle.[22] He died there and was buried in the Grand Army of the Republic cemetery. Unfortunately the grave marker lacks the date of his death.[23] Considering Horr's status as one of the first "permanent" settlers in Yellowstone National Park, along with his repeated efforts to link his fortunes with the park's development, any original document he created is important in understanding the region's history. This newly discovered letter, dated March 13, 1876, was addressed to William W. Alderson in Bozeman. Alderson had been one of the earliest settlers in Bozeman, was instrumental in the choice of the town's name, and became the editor of the *Avant Courier* on February 8, 1877. In the letter, Horr sought Alderson's endorsement in support of "setting up a Panorama of the Park" for an unnamed easterner.

The single note, a mere scrap in the compiled documentation on Yellowstone's early history, is all the more delightful for the way it amply demonstrates Aubrey Haines's assessment of Horr as "quite a wag" by neatly displaying brevity as the soul of wit.[24]

Transcript of the letter:

(Sub Rosa)

Helena M.T.
March 13th 1876.

Dear Sir.

A certain party residing in
one of the Eastern States has written me
in reference to the getting up of a Panorama
of the Park, and the inquisitive cuss wishes to
know if I am one of the Dan Boone kind—
if I really lived in the Park. and if I have
any ability as a lecturer. I answered
his communication in a modest manner and
enclosed a list of names of residents of Montana
to whom he could write to ascertain these things.

Pardon me for the liberty I took in placing
your name among them. If he writes to
you, I will not ask that you answer by saying
that I can see Boone Carson and that ilk,
and go them several hundred slain red skins better.—
that I have resided in the Park since the first
trip of Lewis & Clark and that as a lecturer old
Demosthenes and Susan B. Anthony compared to
me are sad failures for I know you won't
oblige me by doing it. But give me as
good a word as you can & believe me

Major W W Alderson — Yours Truly
Bozeman M.T. — H.R. Horr[25]

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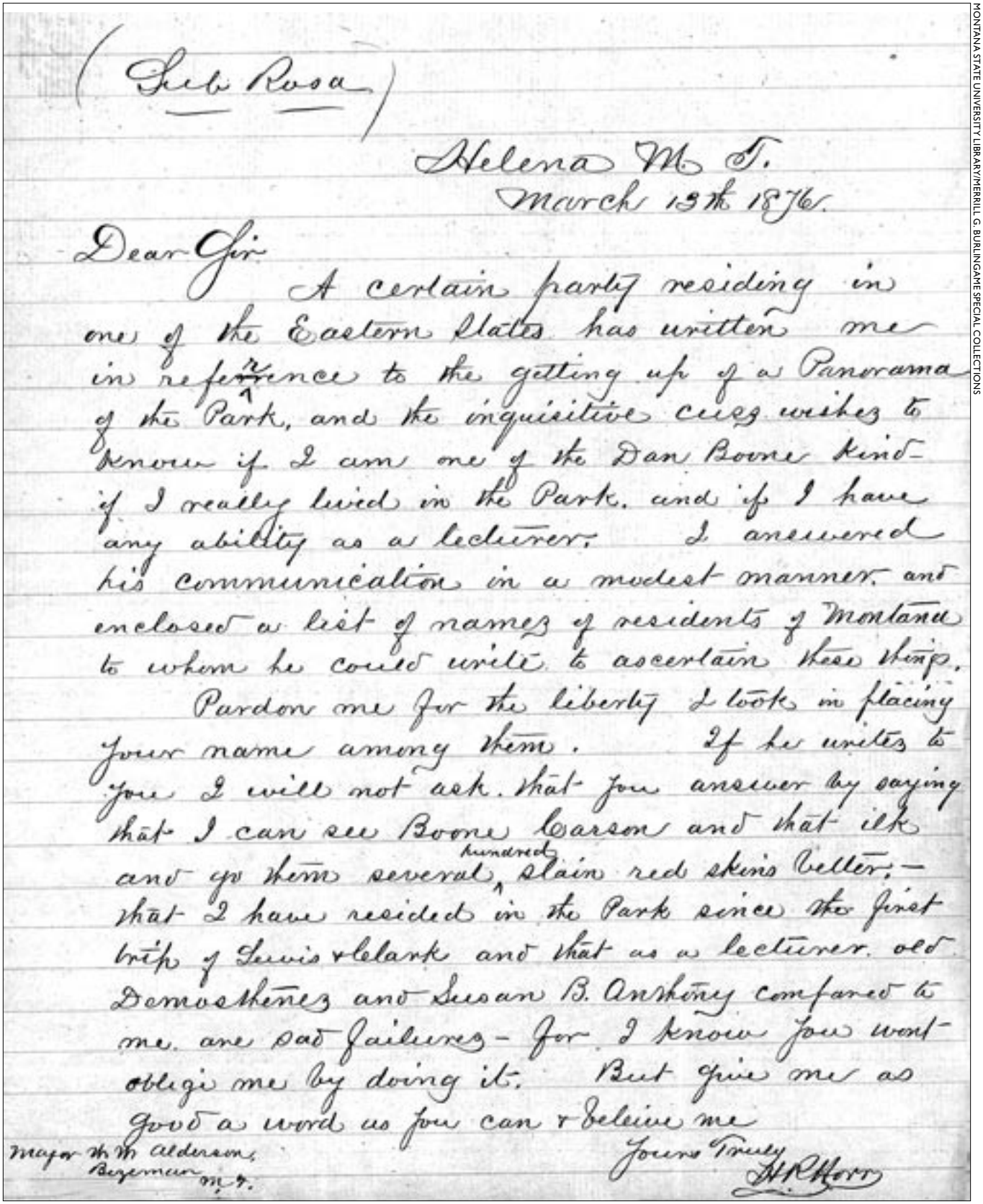


(Sub Rosa)

Helena M. T.
March 19th 1876.

Dear Sir

A certain party residing in one of the Eastern States has written me in reference to the getting up of a Panorama of the Park, and the inquisitive cuss wishes to know if I am one of the Dan Boone kind- if I really lived in the Park, and if I have any ability as a lecturer. I answered his communication in a modest manner, and enclosed a list of names of residents of Montana to whom he could write to ascertain these things.

Pardon me for the liberty I took in placing your name among them. If he writes to you I will not ask that you answer by saying that I can see Boone & Carson and that ilk and go them several hundred slain red skins better;- that I have resided in the Park since the first trip of Lewis & Clark and that as a lecturer, old Demosthenes and Susan B. Anthony compared to me, are sad failures - for I know you would oblige me by doing it. But give me as good a word as you can & believe me

Yours Truly
H.R. Horr

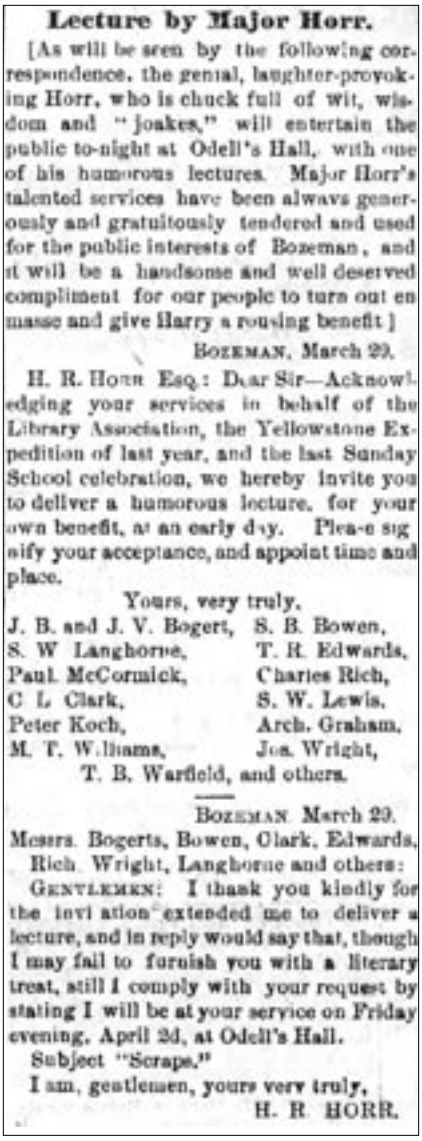
Major W. W. Alderson,
Bozeman
M. T.

MONTANA STATE UNIVERSITY LIBRARY/MERRILL G. BURLINGAME SPECIAL COLLECTIONS

This letter from Horr to William W. Alderson recently came to light in the Merrill G. Burlingame Special Collections of Montana State University. It is one of few surviving documents bearing the name of H.R. Horr.

COURTESY OF AUTHOR

Brad Coon is a reference librarian at Montana State University in Bozeman, Montana. He has a background in Native American studies and linguistics. He has degrees in anthropology and linguistics from Indiana University and did graduate work at the University of Chicago. He is currently finishing a book about the oldest Aztec religious songs. Since arriving in the Yellowstone area, he has developed a strong interest in the history of the park and the local environment.



Lecture by Major Horr.

[As will be seen by the following correspondence, the genial, laughter-provoking Horr, who is chuck full of wit, wisdom and "joakes," will entertain the public to-night at Odell's Hall, with one of his humorous lectures. Major Horr's talented services have been always generously and gratuitously tendered and used for the public interests of Bozeman, and it will be a handsome and well deserved compliment for our people to turn out en masse and give Harry a rousing benefit.]

BOZEMAN, March 29.

H. R. Horr Esq.: Dear Sir—Acknowledging your services in behalf of the Library Association, the Yellowstone Expedition of last year, and the last Sunday School celebration, we hereby invite you to deliver a humorous lecture, for your own benefit, at an early day. Please signify your acceptance, and appoint time and place.

Yours, very truly,

J. B. and J. V. Bogert, S. B. Bowen,
S. W. Langhorne, T. R. Edwards,
Paul McCormick, Charles Rich,
C. L. Clark, S. W. Lewis,
Peter Koch, Arch. Graham,
M. T. Williams, Jos. Wright,
T. B. Warfield, and others.

BOZEMAN March 29.

Messrs. Bogerts, Bowen, Clark, Edwards, Rich, Wright, Langhorne and others:

GENTLEMEN: I thank you kindly for the invitation extended me to deliver a lecture, and in reply would say that, though I may fail to furnish you with a literary treat, still I comply with your request by stating I will be at your service on Friday evening, April 2d, at Odell's Hall.

Subject "Scrape."

I am, gentlemen, yours very truly,

H. R. HORR.

MONTANA STATE UNIVERSITY LIBRARY/MERRILL G. BURLINGAME SPECIAL COLLECTIONS

Harry Horr was also a noted humorist in the Bozeman, Montana, and Yellowstone areas. (From Bozeman's *Avant Courier,* April 2, 1875, p. 3.)

Endnotes

[1] Lee H. Whittlesey, "The First National Park Interpreter: G.L. Henderson, 1882–1902," *Montana the Magazine of Western History* 46, no. 1 (1996): 26–41.

[2] Anecdotal evidence suggests that there has occasionally been speculation that Henry R. Horr and Harry R. Horr were two different individuals, Lee H. Whittlesey (p.c.) has discovered communications in the public record confirming they are one and the same, U.S. House, letter dated May 15, 1896, 54th Cong., 1st sess., H. Rept. 1846, (Washington, D.C.: U.S. Government Printing Office, 1896), 11–12.

[3] Sandra Hoard, "Hoard Family: Desc of Robertus Hore - Gen 19," September 16, 2002 <http://sjhoard.tripod.com/hoardfamily/id8.html>, entry number 750, accessed on September 27, 2002.

[4] United States War Department, *War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, ser. 1, vol. 8 (Washington, D.C.: U.S. Government Printing Office, 1880–1907), 265.

[5] Records of the Office of the Secretary of Interior relating to the Yellowstone National Park 1872–1886. Reel 4. Appointments Division, letters received concerning superintendents, 1872–86, File No. 234. Joseph L. Horr was the Captain of F Company, 13th United States Infantry. "Returns from U.S. Military Posts, 1800–1916, Fort Ellis 572–574." Adjutant General's Office, Washington, D.C.

[6] *Historical Sketch and Essay on the Resources of Montana Including a Business Directory of the Metropolis.* (Helena: Herald Book and Job Printing Office, 1868), 147.

[7] Montana 9th Census, 1870, 110; Haines (p. 133) indicates Horr was an employee of the post sutlery at the time of the Everts rescue. Aubrey L. Haines, *The Yellowstone Story,* vol. 2, (Yellowstone National Park, Wyo: Yellowstone Library and Museum Association in cooperation with the Colorado Associated University Press, 1977).

[8] Lee Whittlesey (p.c.) confirms that Harry Horr was not the discoverer of Mammoth Hot Springs, which had earlier been described by Everts and Peale.

[9] John Vesuvius. "Harry Horr's Hot Springs Claim," *Avant Courier,* January 11, 1883, p. 1, col. 2–3.

[10] Haines, 196.

[11] Records of the Office of the Secretary of Interior relating to the Yellowstone National Park 1872–1886. Reel 4. Appointments Division, letters received concerning superintendents, 1872–86, letter dated May 2, 1872.

[12] Doris Whithorn, "James C. McCartney: Mayor of Gardiner, Montana," *Twice Told on the Upper Yellowstone,* vol. I. (Livingston, Montana, 1994), 67. Horr wrote a 10-part humorous column, usually but not always called "Around the Campfire" for the *Avant Courier* from September 9–December 15, 1881.

[13] "Married," *Avant Courier,* April 2, 1875, p. 3, col. 3.

[14] "National Park in the Centennial," *Avant Courier,* July 31, 1874, p. 3, col. 1; "The National Park Panorama," *Avant Courier,* August 7, 1874, p. 3, col. 3.

[15] "Married," *Avant Courier,* April 2, 1875, p. 3, col. 3.

[16] *Avant Courier,* July 28, 1880, p. 3, col. 5.

[17] *Avant Courier,* February 10, 1881, p. 3, col. 3; Records of the Office of the Secretary of Interior relating to the Yellowstone National Park 1872–1886. Reel 4. Appointments Division, letters received concerning superintendents, 1872–86, File No. 234. The letters and petitions written in support of this nomination are interesting because this is one of the few instances where Harry R. Horr is referred to as Henry R. Horr as well as the more common "H.R. Horr."

[18] Ibid.

[19] *Avant Courier,* March 24, 1881, p. 3, col. 2. Horr indicated he would probably place his headquarters at Fire Hole Basin in the park, but this never happened.

[20] *Avant Courier,* October 23, 1884, p. 3, col. 3.

[21] "Born," *Avant Courier,* May 27, 1886, p. 3, col. 7.

[22] Whithorn (p. 48) indicates without any citation that Horr penned a dime novel about Calamity Jane and applied for a post office at Horr in 1887. Doris Whithorn, "Christmas Horror at Horr," *In Celebration of Our Past* (Bozeman, Mont.: Gallatin County Historical Society, 1994).

[23] Row D28, Plot 148. Sons of Union Veterans of the Civil War. "Governor Isaac I. Stevens Camp #1, Washington State Camp-at-Large, Alphabetical List of Internees G.A.R. Cemetery–Seattle, Washington. "December 3, 2000 <http://home.attbi.com/~suvcw/seacem1.html>, accessed September 20, 2002.

[24] Haines, 133.

[25] Merrill G. Burlingame Papers, 1880–1890, 2245, Box 7, Folder 7, Merrill G. Burlingame Special Collections, Montana State University Libraries, Bozeman.

TERRY MCENEANEY

NATURE NOTES

Recent Additions to the Yellowstone Bird Checklist, and Raven Predation of Grebes

Terry McEneaney

Whooper Swan

THE WHOOPER SWAN (*Cygnus cygnus*), from Eurasia, is the ecological counterpart of the trumpeter swan (*Cynus buccinator*) in North America. Both taxa are considered superspecies, defined eloquently by world-renowned avian ecologist Ernst Mayr as a "monophyletic group of very closely related and largely or entirely allopatric (i.e., ranges do not overlap) species." Due to their long isolation from trumpeter swans, dating as far back as the Pleistocene, whooper swans evolved to be easily distinguished from trumpeters.

The whooper swan also differs from the trumpeter swan in the breadth of its distribution. It is a remarkably long-distance migrant. The northernmost broad nesting range of this species stretches from the tundra-like habitat of Iceland, slightly covering above the Arctic Circle through the boreal forest/taiga zone of Scandinavia, extending all the way to northeast Siberia, including the Kamchatka Peninsula and the Gulf of Anadyr. The southernmost limit of the nesting range extends to Mongolia and Kazakhstan. Whooper swans typically winter in Iceland and in western and central Europe south to the Baltic Sea, and east through the Black, Caspian, and Aral seas to coastal China and Japan.

In North America, the whooper swan has been reported mainly in Alaska, where it has nested on the westernmost island of Attu. Wintering records are becoming more numerous in North America, particularly in the western third of the continent. A report on the status of the whooper swan in North America is in preparation, and is expected to be published by the author in the winter of 2004–05.

On November 26, 2003, while conducting weekly swan surveys that have extended over the last 18 years, the author came across a bird with the following characteristics in "the Narrows" area of Hayden Valley: a swan the size of a trumpeter swan, in all white plumage with faint gray tinges on the neck, with black legs and a black bill with a bright lemon-yellow, soft rhamphothecal material encompassing the eye. The lemon-yellow coloration extended from the base of the upper mandible to the eye and top border of the bill, tapering to the nostrils and finally ending up ventrally and distally to the nares, forming what appeared to be a lemon-yellow triangular patch on the bill. At the interface of the bill and the forehead was a fine, thin, black border of soft rhamphothecal material. The lower mandible looked black; however, a ventral examination of the lower mandible revealed a triangular, lemon-yellow patch, largest at the base of the bill and tapering off to a fine point approximately one third the length of the lower mandible. The bird even called and made a "whoo-oup" sound near some bugling trumpeters.

The author knew the identity of the bird immediately, having traveled 3,400 miles to look for whooper swans in Alaska in 2000. Whooper swan records in the lower 48 states have always been suspect, as private propagators raise these birds in captivity, and they occasionally escape. A review of whooper swan captivity records in the area revealed that this bird was most likely wild, since all local feral whooper swans could be accounted for. Also, the whooper was accompanied by 503 wild trumpeter swans, some with known origins in northern Canada (the group contained marked trumpeters). In addition, Yellowstone National Park is one of the most hostile North American environments in the winter, so a captive bird would have a difficult time surviving due to the diversity of predators and the severe weather.

The whooper swan remained in Yellowstone throughout the winter of 2003–04, traveling from the Yellowstone River in Hayden Valley to the Firehole River near Biscuit Basin, then returning to Hayden Valley before departing. It was last seen on March 1, 2004. It is estimated that 600–700 visitors had the opportunity to view this remarkably rare bird.

Whooper swans have been known to fly at high elevations and cover large distances in a single flight. How the whooper swan ended up here is pure speculation; however, the most plausible theory is that the bird may have been pushed in by a Siberian storm blast. (A very rare Siberian accentor (*Prunella montanella*) was seen in Paradise Valley, Montana, only 30 miles away, during the same storm.) The whooper swan is one of the rarest birds ever to be recorded in the history of Yellowstone ornithology. Proper

documentation was crucial to the validity of this record.

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Laughing Gull

The laughing gull (*Larus atricilla*) is a medium-sized, hooded gull that breeds along the Atlantic seaboard from New Brunswick to Florida, and the Gulf–Caribbean coastline that includes the West Indies and islands off Venezuela, and from Florida through Texas south to the Yucatan of Mexico. This bird derives its name from the laugh-like sound it emits when it calls. It also breeds along the Pacific coast from the mouth of the Gulf of California (formally Salton Sea, California) south along Sonora to Colima, Mexico. Their winter distribution is further south, from North Carolina to the Amazon Delta of Brazil on the Atlantic coast, and from Baja California Sur to northern Peru on the Pacific coast.

Casual records of the laughing gull become less numerous west of the Mississippi River, further inland from the Pacific coast, and north of the Gulf of California. The American Ornithologists' Union (1998) states, "Casual in the Hawaiian Islands; on the Pacific coast north to Washington; in the Ravillagigedo Islands (Socorro Island, Mexico), Clipperston Island; in the interior of North America from southeastern Oregon, northcentral California, south Nevada, Arizona, New Mexico, eastern Montana, eastern Colorado, North Dakota, James Bay and West Virginia southward: to the interior lakes of Middle America; and north to Newfoundland and Greenland."

Nearly all the casual records of the laughing gull are at low elevations, typically below 5,000 feet mean sea level. However, on August 9, 2002, at 11:00 AM, the author observed a laughing gull on the sandy beaches of Mary Bay on Yellowstone Lake by the author. This record is unique, as it is the first sighting of a laughing gull in Yellowstone National Park. It is also a very unusual high-elevation record (7,733') of the species in the Rocky Mountains.

The bird was first described in the author's field notes and sketch (Figure 1) as a medium-sized gull larger than a Franklin's gull (*Larus pipixcan*), in first summer/second winter plumage. The bird had the following characteristics: long head; long, black drooping bill, with a pronounced gonydeal angle; long, dark gray legs; white tail with broad black terminal band extending the entire width of the tail; long primary projection past tail, with minute white diamonds starting to show on the tips of the four outer dark primaries; two dark gray skull straps—the darkest and broadest being on the hindneck, and the weaker and thinner strap lying dorsal and posterior to the eye; two thin, faint eye arcs; dark eyes; a thin, brown mantle "V"; gray greater coverts; brown lesser and median coverts; tertial crescents white with narrow even borders; and a gray tinge to the flanks and breast.

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Lesser Goldfinch

On October 10, 2003, a lesser goldfinch (*Carduelis psaltria*) was detected in a lodgepole pine/aspen stand on the west shore of Yellowstone Lake. This small, stocky passerine with a small, dark, conical bill is slightly smaller than a pine siskin (*Carduelis pinus*). The bird had the following characteristics: overall body color, yellow with a pronounced black cap; greenish nape and mantle; dark black wing linings with a cream-colored wing bar on each wing; white spot at the base of the primaries, some white tertials as well; chin, throat, breast, and belly bright yellow;

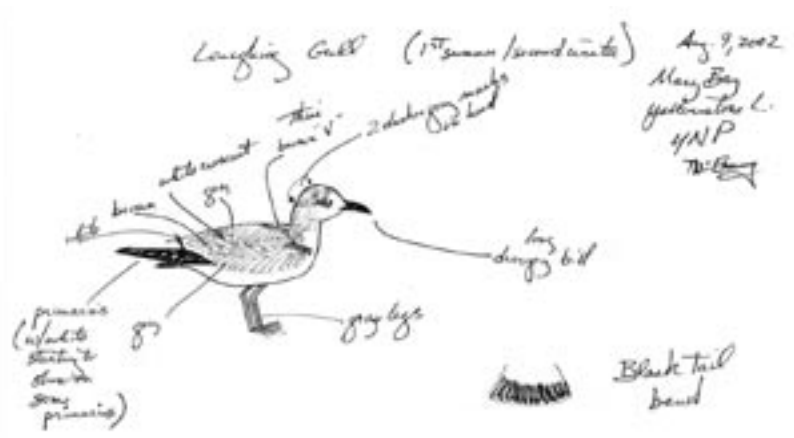

Figure 1. Park ornithologist Terry McEneaney sketched the laughing gull he observed in his field notebook.

and whitish-yellow undertail coverts. The bird appeared to be an adult male. When it flew with pine siskins, the bold white patches in the dark wings and tail were visible. This species has recently been increasing its range. The northernmost extent of the summer range of the lesser goldfinch is southern Oregon, Idaho, and Wyoming, but sightings are becoming more frequent in these states and Montana.

Raven Predation of Eared Grebes

In North America, common raven (*Corvus corax*) food habits are well documented (Bent 1964, Boarman and Heinrich 1999, Heinrich 1989, McEneaney 1995, Nelson 1934). However, much less is known about how ravens capture prey (Bent 1964, Boarman and Heinrich 1999, McEneaney 1995). Even less is known about common raven predation at high elevations such as Yellowstone National Park (McEneaney 1995). After spending nearly two decades studying birds in the park, the author witnessed the following impressive act of avian predation.

On May 1, 2001, hundreds of eared grebes (*Podiceps nigricollis*) were migrating through Yellowstone. This was a highly unusual number of grebes anytime in the park. Eared grebes typically avoid this high mountain environment in the spring due to the unpredictable weather, and migrate through the valleys instead. The park was still covered in a blanket of winter snow. Although technically spring, it was still somewhat like winter in the park, and Yellowstone Lake, which typically thaws out mid- to late May, was still frozen. The sky was partly cloudy, with winds in a northwesterly direction. As the grebes maneuvered through the snow squalls, some began to land in the cloud shadows on the ice covering the West Thumb of Yellowstone Lake, confusing the frozen lake for open water. One by one, the grebes landed on the ice, spreading over an area of approximately 520 hectares. The grebes were unable to take off because the ice was too slippery for their lobed feet, and take-off requires that their feet make contact with open water.

TERRY MCENEANEY

One of the eared grebes trapped on the ice of Yellowstone Lake in May 2001.

From 11:10 AM to 2:10 PM, 141 eared grebes were observed stranded on the ice. At 11:20 AM, one common raven flew out to one of the stranded grebes and pulverized the bird with its long beak until it was dead. The raven left the dead grebe, moved to a live one close by, pecked it in the head until it was dead, then moved to another grebe. At 11:40 AM, three other ravens joined in. Two adult bald eagles (*Haliaeetus leucocephalus*) appeared at 11:30 AM and began consuming raven-killed grebes. The eagles did not attack live grebes, but acted more as scavengers. The four ravens killed 92 of the 141 stranded eared grebes within a three-hour period in this manner. After killing the 92nd grebe, the ravens began to dismantle their prey, caching the grebe remains in the snow along the shore of Yellowstone Lake. At the end of the day, all 141 eared grebes had been killed.

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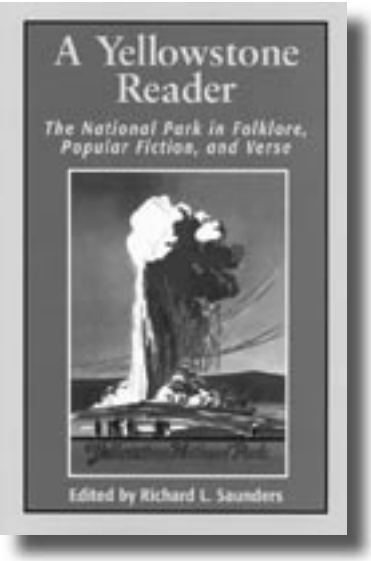
COURTESY OF AUTHOR

Terry McEneaney is the staff ornithologist for Yellowstone National Park, and author of three books, *Birds of Yellowstone, Uncommon Loon,* and *Birding Montana.* He is a member of both the Montana and Wyoming bird records committees.



Book Review

A Yellowstone Reader: The National Park in Folklore, Popular Fiction, and Verse

Edited by Richard L. Saunders

Tamsen Hert

(Salt Lake City, UT: The University of Utah Press, 2003. xv plus 309 pages, notes, indexes. $17.95 paper.)

YELLOWSTONE. Thousands of articles and books have been written documenting its history. Hundreds of guidebooks lured travelers to Wonderland through the years. Most publications describe the park as it was, and is. A small fragment of published materials, however, are fictional accounts of this place. In *A Yellowstone Reader,* Richard Saunders has compiled a remarkable anthology of folklore, verse, and novels examining 130 years of Yellowstone fiction.

Saunders chose examples that "illuminate distinct periods in Yellowstone's cultural history of tourism," and works "that even an interested reader would find difficult to secure in the original." Many libraries, however, do have copies of some of even the rarest titles.

The anthology is divided into four chapters. The first, "Folklore and Verse," includes selections from Jim Bridger's tall tales and Charles Van Tassell's "Truthful Lies of Yellowstone Park." The second chapter, "Novels and Series Fiction," includes the dime novel "Diamond Dirk; or the Mystery of the Yellowstone." Published in 1878, this is one of the earliest and rarest examples of fiction set in Yellowstone.

Chapter three, "Short Stories," uses material by well-known authors of their time—Emerson Hough, Owen Wister, and Douglas H. Thayer. While other publications can be difficult to locate, short stories can be even harder to find.

The fourth chapter is an annotated bibliography. The book concludes with two indexes: subject and character, and author. A combined index would probably have been more convenient for readers. Also, there are some characters that are not in the index.

For each piece reproduced in the book's main section, Saunders provides not only the bibliographic citation but also some background on the author. In some cases, he places the material in a historical context. The discussion of each work is amply end-noted and many times provides explanations about geysers, park policies, or definitions—material that a reader unfamiliar with Yellowstone will find most useful. I only identified one mistake in his notes—the Fountain Hotel did not close in 1909, but operated through 1916, and was razed in the mid 1920s.

Anyone with an interest in Yellowstone will want to read this anthology. The visitor will enjoy descriptions of touring the park in an earlier era, while the Yellowstone faithful will seize the opportunity to learn more. For those providing instruction about the park, it will be useful in courses in American studies, American history, and literature. It will also be beneficial to librarians and archivists who maintain collections of Yellowstone publications.

One of its shortcomings is the lack of illustrations. Cover images showing how the original work appeared would have enhanced each entry. Also, a comprehensive list of libraries (including a contact name) holding Yellowstone fiction collections would have been useful to the interested reader and researchers.

Identifying Yellowstone fiction is not easy. In most libraries, works of fiction are not classified by geographic location. This anthology provides a good starting point in identifying those materials. As time progresses, new titles will be written and other works will be discovered, and these will be added to the body of literature Saunders is calling Yellowstone fiction.

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KEN HERT

Tamsen Emerson Hert holds Master's degrees in American history and library science. She is the Wyoming bibliographer at the University of Wyoming Libraries, where she is also responsible for the Grace Raymond Hebard Collection. She has been doing research in Yellowstone for over 10 years and is working on a history of the park's hotels, lodges, and camps with park historian Lee Whittlesey.

FROM THE ARCHIVES

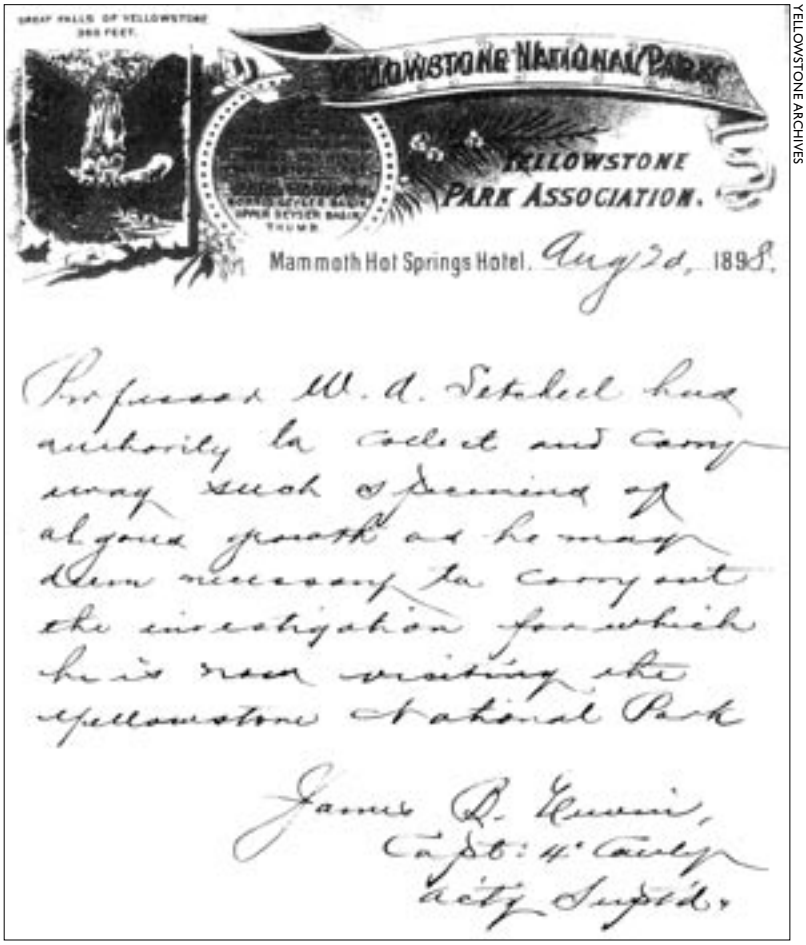
"As a country for sight seers, [Yellowstone] is without parallel. As a field for scientific research it promises great results, in the branches of Geology, Mineralogy, Botany, Zoology, and Ornithology. It is probably the greatest laboratory that nature furnishes on the surface of the globe."

—Gustavus C. Doane, 1870
Army lieutenant

"Aug 2d, 1898

Professor W.A. Setchell has authority to collect and carry away such specimens of algous growth as he may deem necessary to carry out the investigation for which he is now visiting the Yellowstone National Park.

James B. Erwin,
Capt: 4th Cavalry
Actg Suptd."



YELLOWSTONE ARCHIVES

This 1898 research permit is one of the first known such permits to be granted for research collections in Yellowstone National Park. It is also interesting because it is written on Yellowstone Park Association letterhead, rather than U.S. government letterhead.

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In this issue

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DR. RUSSELL CUHEL/UNIVERSITY OF WISCONSIN–MILWAUKEE

The Bridge Bay spires were first documented by the University of Wisconsin–Milwaukee/Marquette University/YNP hydrothermal vent team in 1997. This specimen (2½ feet tall) has been sectioned into an "exploded view" to reveal its hydrothermal origins. Both active and inactive venting areas are common in certain areas of Yellowstone Lake today.

This fall, *Yellowstone Science* takes a peek at the park's new Heritage and Research Center.

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