Timpanogos Cave National Monument

Operations Overview

2004

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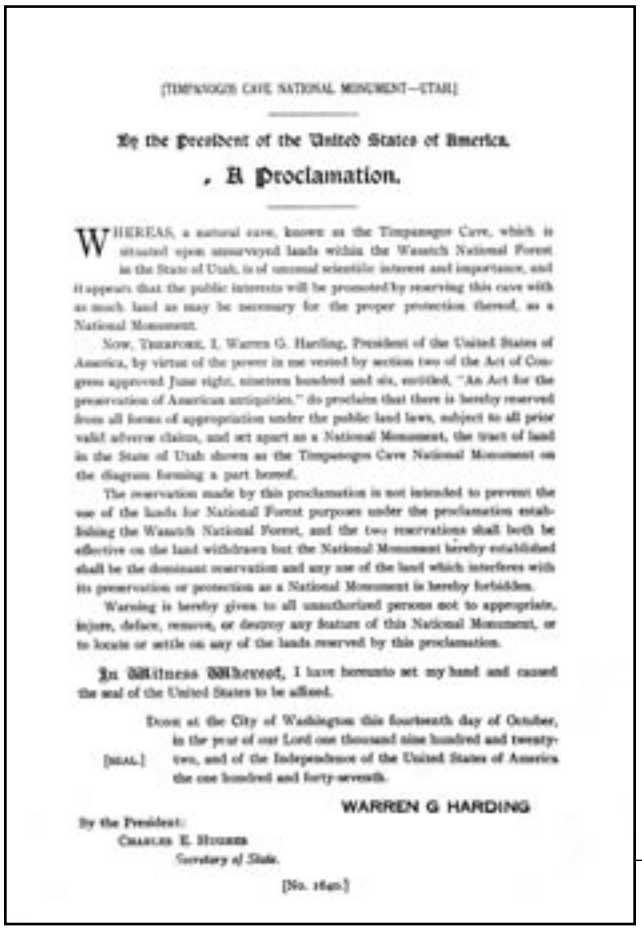
Timpanogos Cave National Monument

Monument Overview

Timpanogos Cave National Monument is one of 389 units of the national park system administered by the National Park Service, U.S. Department of the Interior. The national park system preserves nationally significant natural, cultural and recreational resources. These resources constitute an important part of America's heritage, character, and future. Timpanogos Cave National Monument is a vital part of the national system of resources protected for their many inherent and social values.

Timpanogos Cave National Monument was established by Presidential Proclamation No. 1540, signed by President Warren G. Harding on October 14, 1922. The Proclamation reserved Timpanogos Cave and "as much land as may be necessary for the proper protection" of the cave because the cave "is of unusual scientific interest and importance" and the "proper protection" of the cave serves the "public interests". At the time of the Proclamation, Timpanogos Cave was within the Wasatch National Forest managed by the U.S. Forest Service. The Proclamation further states that the reservation of land for the National Monument was "not intended to prevent the use of the lands for National Forest purposes under the proclamation establishing the Wasatch National Forest, and the two reservations shall both be effective on the land withdrawn but the National Monument . . . shall be the dominant reservation".

By Executive Order No. 6166, dated June 10, 1933, all national monuments were placed under the jurisdiction of the Department of the Interior. On July 1, 1934 Timpanogos Cave National Monument was transferred to the National Park Service. In so doing, the lands within Timpanogos Cave National Monument fell under the provisions of the National Park Service Organic Act of 1916. The Organic Act requires that national park units be managed in a manner that will conserve the natural and cultural resources and provide for public use and enjoyment. The Organic Act provides additional purpose to Timpanogos Cave National Monument but the Proclamation of 1922 remains the dominant purpose of the monument reservation.



[TIMPANOGOS CAVE NATIONAL MONUMENT—UTAH.]

By the President of the United States of America.

A Proclamation.

WHEREAS, a natural cave, known as the Timpanogos Cave, which is situated upon unsurveyed lands within the Wasatch National Forest in the State of Utah, is of unusual scientific interest and importance, and it appears that the public interests will be promoted by reserving this cave with as much land as may be necessary for the proper protection thereof, as a National Monument.

NOW, THEREFORE, I, Warren G. Harding, President of the United States of America, by virtue of the power in me vested by section two of the Act of Congress approved June eight, nineteen hundred and six, entitled, "An Act for the preservation of American antiquities," do proclaim that there is hereby reserved from all forms of appropriation under the public land laws, subject to all prior valid adverse claims, and set apart as a National Monument, the tract of land in the State of Utah shown as the Timpanogos Cave National Monument on the diagram forming a part hereof.

The reservation made by this proclamation is not intended to prevent the use of the lands for National Forest purposes under the proclamation establishing the Wasatch National Forest, and the two reservations shall both be effective on the land withdrawn but the National Monument hereby established shall be the dominant reservation and any use of the land which interferes with its preservation or protection as a National Monument is hereby forbidden.

Warning is hereby given to all unauthorized persons not to appropriate, injure, deface, remove, or destroy any feature of this National Monument, or to locate or settle on any of the lands reserved by this proclamation.

In Witness Whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington this fourteenth day of October, in the year of our Lord one thousand nine hundred and twenty-two, and of the Independence of the United States of America the one hundred and forty-seventh.

[SEAL.]

WARREN G HARDING

By the President:
CHARLES E. HUGHES
Secretary of State.

[No. 1540.]

Mission

The mission of the National Park Service at Timpanogos Cave National Monument is derived from the Proclamation described above, the National Park Service Organic Act and succeeding legislation, and from significance statements developed for the monument that describe the national park values to be preserved. The mission for Timpanogos Cave National Monument is consistent with, and more specific than, the mission of the National Park Service stated in the National Park Service Strategic Plan.

The Mission of the National Park Service

The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

Purpose Of Timpanogos Cave National Monument

- Protect the Timpanogos Cave system to assure preservation of national resources of scientific interest and importance in such manner as serves the public interest.

- Conserve the natural and cultural resources of the monument, inclusive of the cave system, and provide for the public use and enjoyment of the resources by this and future generations.

Significance Of Timpanogos Cave National Monument

- The Timpanogos Cave system is a man-made joining of three natural caves that contain at least 42 types of cave formations, an unusually large variety. The cave features include previously unnamed formations, dramatic and rare colors, and unusual combinations of delicate helictites and anthodites in quantities not found in other developed National Park Service managed caves.

- Formation of the Timpanogos Cave system is believed to be the result of rising thermal waters contacting the water table at the intersection of geologic bedding planes and faults. This process is unusual among National Park Service managed caves. Through dissolution and redeposition of minerals at varied depths and percolation rates and by varied infiltration methods, the caves were heavily decorated with fantastic combinations of colors and formations.

- The discovery of the Timpanogos Cave system and subsequent mining and destruction of cave formations in Hansen Cave lead to the establishment of a citizen conservation organization focused on preservation of the caves, their place in history and future recreation in American Fork Canyon, Utah, and the nation. Unusual efforts by the citizens led to the request to preserve the caves being realized by Presidential Proclamation in only 31 days. Early facility development and operation of the monument was accomplished by the citizen organization.

- The 1.5 mile-long trail to the cave ascends 1,067 feet from pre-Cambrian through late Mississippian-aged rocks, providing one of the best exposed, easiest accessed and varied geologic records in the nation.

Timpanogos Cave National Monument Mission Statement

At Timpanogos Cave National Monument, the National Park Service preserves the outstanding cave formations, geological processes, and historical values of the Timpanogos Cave system and associated features for the recreational and educational enjoyment, scientific value, and inspiration of this and future generations.

Mission Goals

The mission of Timpanogos Cave National Monument will be assured through accomplishment of goals. The mission goals listed here are service-wide goals intended to accomplish the agency mission, and are adopted by Timpanogos Cave for the Monument's mission goals. These broad goals describe the desired condition to be attained by achieving the annual goals detailed in this plan. There are six mission goals for Timpanogos Cave National Monument.

- Natural and cultural resources and associated values at Timpanogos Cave National Monument are protected, restored and maintained in good condition and managed within their broader ecosystem and cultural context.

- The National Park Service at Timpanogos Cave National Monument contributes to knowledge about natural and cultural resources and associated values; management decisions about resources and visitors are based on adequate scholarly and scientific information.

The Great Heart of Timpanogos

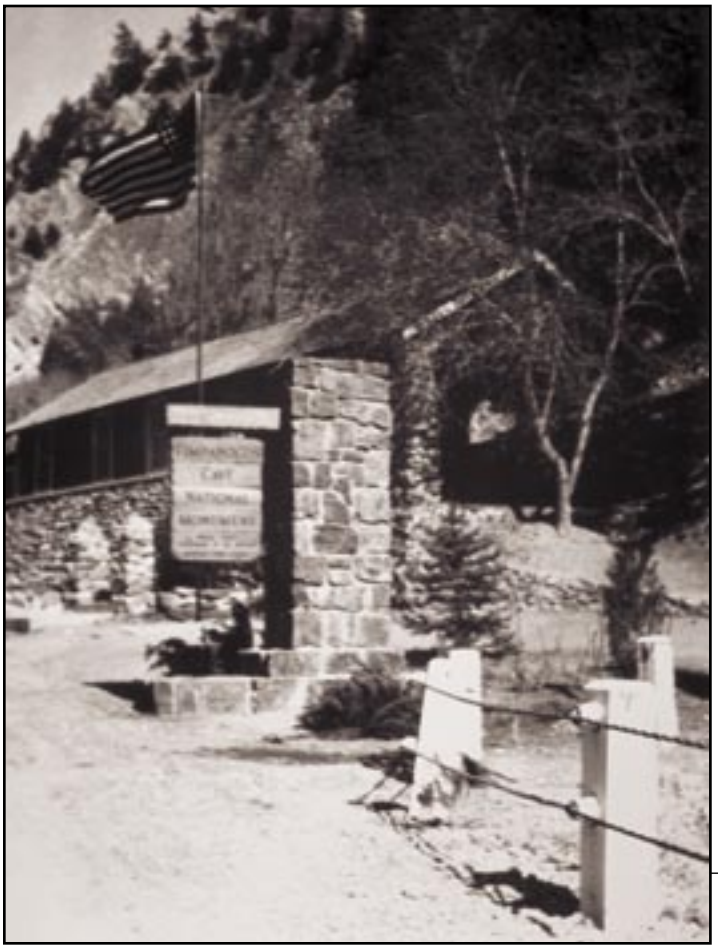
Mission

- Visitors to Timpanogos Cave National Monument safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.

- Park visitors and the general public understand and appreciate the preservation of Timpanogos Cave National Monument and its resources for this and future generations.

- The National Park Service at Timpanogos Cave National Monument uses current management practices, systems, and technologies to accomplish its mission.

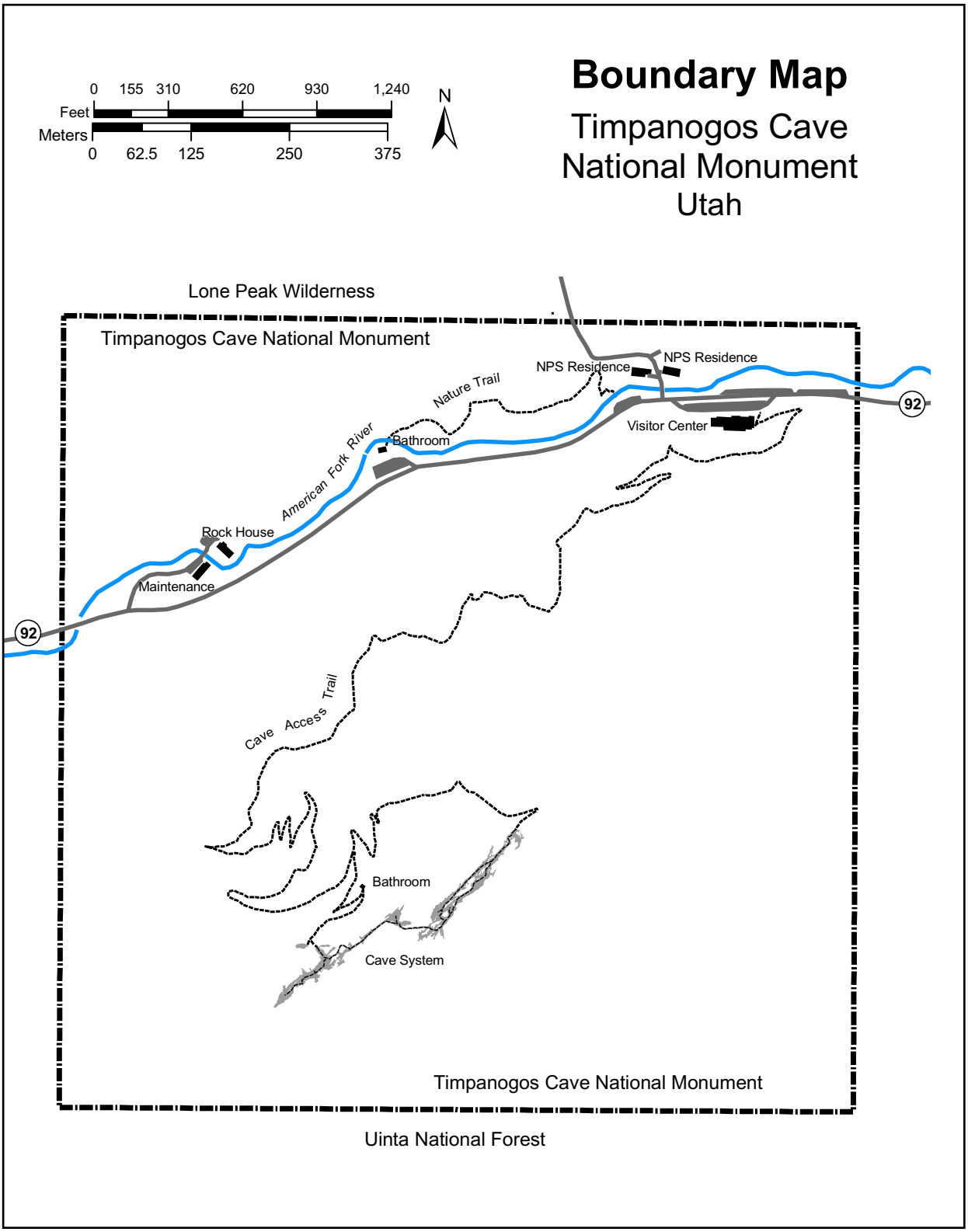
- The National Park Service at Timpanogos Cave National Monument increases its managerial resources through initiatives and support from other agencies, organizations, and individuals.



The original Visitor Center at Timpanogos Cave

Vicinity Map

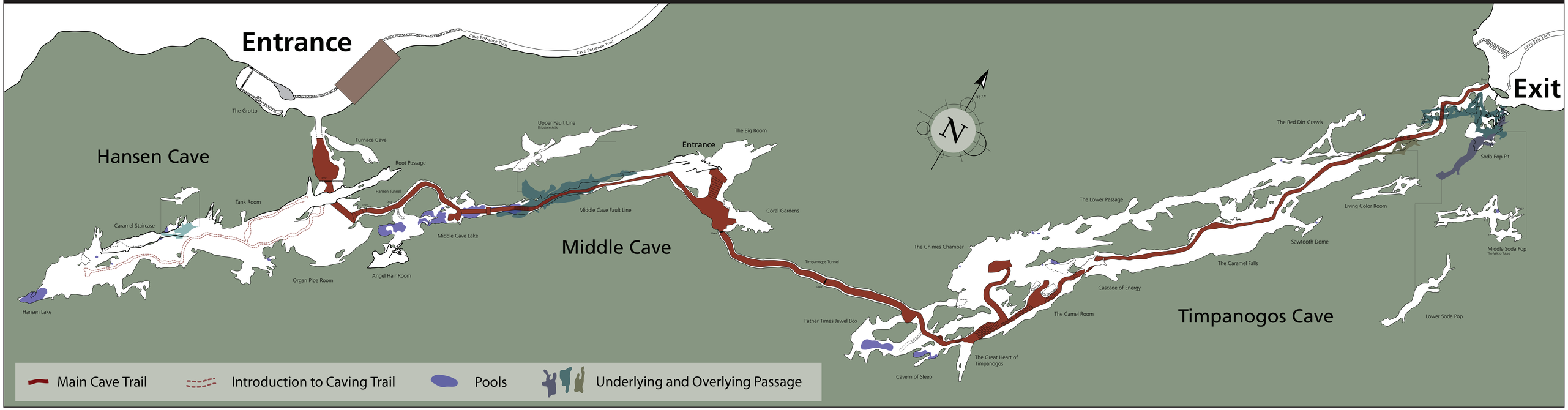
Boundary Map



Cave Map

Opposite Page

Timpanogos Cave National Monument



Administration

Personal Services

FY04 PROGRAMMED PERSONAL SERVICES
August 26, 2004

Position	Grade	Cost to Gov't	Funding Source
PERMANENT			
Superintendent	GS-13	$102,337	ONPS
Administrative Officer	GS-11	$ 60,677	ONPS
Administrative Clerk	GS-5	$ 43,151	ONPS
Chief Ranger	GS-11	$ 85,481	ONPS
Chief of Interpretation	GS-11	$ 73,093	ONPS
Chief of Maintenance	GS-11	$ 58,933	ONPS
Maintenance Worker	WG-8	$ 57,663	ONPS
Revenue & Fee Business Specialist	GS-9	$ 29,053	NPS Fee Demo
		$ 28,227	USFS Fee Demo
PERMANENT SUBJECT TO FURLOUGH			
Maintenance Worker	WG-5	$ 42,844	ONPS
TERM			
Physical Scientist	GS-9	$ 49,474	ONPS
		$ 6,073	SEPAS
Physical Scientist	GS-5	$ 41,498	SEPAS

Personal Services

Position	Grade	Cost to Gov't	Funding Source
SEASONAL			
Resource Management			
Biological Technician	GS-4	$ 13,089	SEPAS
Park Ranger	GS-4 (2)	$ 24,245	SEPAS
Rangers			
Park Ranger – EMT (PT)	GS-5	$ 570	ONPS
Maintenance			
Laborer – STEP	WG-3	$ 11,849	NPS Fee Demo
Laborer	WG-3 (3)	$ 31,948	NPS Fee Demo
Visitor Services			
Visitor Use Assistant	GS-5 (2)	$ 17,325	NPS Fee Demo
Visitor Use Assistant	GS-5	$ 5,130	USFS Fee Demo
Visitor Use Assistant	GS-4 (6)	$ 61,300	NPS Fee Demo
Visitor Use Assistant	GS-4 (5)	$ 33,035	USFS Fee Demo
Visitor Use Assistant – STEP	GS-4 (1)	$ 14,786	USFS Fee Demo
Interpretation			
Park Ranger	GS-5 (2)	$ 20,285	USFS Fee Demo
Park Ranger	GS-4 (17)	$ 128,747	NPS Fee Demo
Park Ranger	GS-4 (2)	$ 13,291	USFS Fee Demo
Park Ranger	GS-4	$ 5,810	SEPAS
Park Ranger (PT)	GS-4 (4)	$ 7,499	USFS Fee Demo
Park Ranger	GS-4 (2)	$ 25,000	ONPS

COST TO GOVERNMENT TOTALS

ONPS	$599,223
SEPAS	$ 90,715
NPS Fee Demo	$280,222
USFS Fee Demo	$122,253
TOTAL	$1,092,413

11 - Full Time Employees
51 - Seasonal Employees

Budget

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
ONPS								
Congressional Base	496,000	524,000	545,000	582,000	617,000	648,000	659,000	663,000
Base Adjustments	-5,000	-5,200	-5,500	-6,600	-6,200	-6,500	-7,600	-9,900
Uniform Assessments/EAP	-8,600	-13,200	-13,000	-17,800	-15,600	-14,000	-14,100	-13,900
Carryover (04)	35,694	42,293	46,474	14,745	6,433	-1,593	1,300	1,300
Base Increase from IMR								40,000
Total Revised ONPS Budget	518,094	547,893	572,974	572,345	601,633	625,907	638,600	680,500
Fund 20								
Cost of Collection	84,000	Eliminated						
Fee Demo								
80% Revenue	129,373	312,703	297,049	350,357	303,120	328,865	285,840	292,000 (Estimate)
80% Carryover		97,260	191,634	89,925	34,068	49,645	89,334	23,315
Fee Demo Authorization	129,373	409,963	488,683	440,282	337,188	378,510	375,174	315,315
Adjusted Sub-Total	731,467	866,779	950,739	910,627	817,332	888,157	895,126	995,815
Add-ons								
Line Item Construction (510,000 enacted FY1998)		9,225	33,235	4,131	3,409	0	292,988	86,338
Special Projects					39,271	53,699	174,227	128,286
Partnership Fee Demonstration					192,068	154,712	116,800	148,970
Donations								
Donations	2,408	2,422	3,170	4,170	4,206	5,440	4,741	5,960
Total Adjusted Budget	733,875	878,426	987,144	918,928	1,056,286	1,102,008	1,483,882	1,365,36

Maintenance

Cave Projects

Cave Lighting System

Maintenance is responsible for all electrical work within the cave system, including switches, junction boxes, light fixtures, light bulbs, wiring, panel boxes, fuses, fuse holders, and wiring. The cave environment is near 100% humidity and causes continual corrosion and system failures. The entire lighting system needs replacing about every 5 to 10 years.

Cave Entrance Shelter

The serious hazard of rock fall at the cave entrance, the primary gathering point for cave tours was addressed in 2003 with the construction of an entrance shelter. The 20 by 40 foot open structure of large rough-cut beams and stone support columns is the most significant construction in the monument in over 20 years. The shelter is in keeping with the historic character of the monument and blends very well with the surrounding cliffs. Benches were installed under the shelter creating a very safe, comfortable and aesthetic rest area for visitors to sit and enjoy the canyon view and talk other people while they wait for their tour to begin. The shelter has very high structural strength to withstand rockfall and snow load. It protects visitors from rockfall, rain and the harsh summer sun. In its first season the shelter already became a focal point of visitors who use it to know where they are on the trail and as a desirable destination. The completed shelter is of very high quality work and will become a significant historic feature of the monument.

Repairing feature lights in Middle Cave

The new cave entrance shelter

Trails

The monument has about 3.5 miles of trail. The cave trail includes the trail to the caves, trail through the caves and a return trail from the cave exit. The cave trail traverses a steep canyon wall, has three tunnels and is subjected to frequent rockfall and avalanche. Annual repairs are made to the surface pavement, footings, retaining walls, trashcans, benches, and handrails. Annual repairs are also made to the ¼-mile nature trail.

Rock Walls

Timpanogos Cave has miles of rock walls. Some rockwalls are historic features. Rock-walls are a mix of dry stacked and wet laid (mortared) walls. With constant erosion hillside ground shifting in the monument, the repairs are never ending. Repairs to rock walls is time consuming and specialized work requiring a high level of trade skill.

Making repairs to the visitor center parking lot

Making repairs to the cave trail

Buggy for making repairs on the cave trail

Facilities

Signs

Maintenance maintains, restores and constructs all park signs. Maintenance also maintains the highway signs and posts within the park. Maintenance restores and removes old signs by sanding, rerouting, painting and re-finishing. All work is done by hand and with aid of a computerized engraving machine.

Buildings and Utilities

Maintenance is responsible for all park buildings and utilities; everything from the visitor center to park housing. Maintenance maintains the structures, painting, roofing, siding, plumbing, electrical, and water/sewer system. This includes repair and maintenance on historic features from entrance monuments to the rock house.

P A S T

Three maintenance employees, one WG-8 as a mentor/trainer, and two WG-5's as trainees have completed the Preservation and Skills Training program (PAST). The program trains new or current employees in the preservation of historical structures. It gives the employees the skills and knowledge to maintain structures to the standards set down by the Secretary of the Interior's standards for historic preservation. The employees also bring those skills to their home park to apply to other projects.

Visitors reading new wayside signs along the cave trail

Historic rock house in the monument

Safety

Hazcom

All maintenance personnel have had the formal training and been certified in hazardous materials communication. All staff are provided hazcom training through the maintenance division. All the aspects set down by the Hazcom training have been implemented.

Safety

The Chief of Maintenance functions as the monument's safety officer. Safety is the highest priority in all divisions and maintenance supports all operations in assuring good safety practices are followed. When maintenance does a job analysis, the safety of each job is documented before work begins.

Maintenance worker preparing to clean out the rock trap

Interpretation

Interpretation

Cave Tours

Cave tours are the primary interpretive service provided at the monument. From May through October averages of 6,500 tours are given. Last season 63,240 people took tours. The thematic tours are 55 minutes in length. Up to 20 visitors are allowed on each tour. There is also an Introduction to Caving tour that offers a "wild" cave experience. Five visitors at a time go on this tour that explores an off trail section of the cave system.

Evening Programs

Evening Programs are offered through the partnership with the Uinta National Forest. Throughout the summer programs are offered every Friday, Saturday and Monday. They are presented primarily at the monument's visitor center. Some of the programs are presented at other locations within the monument and national forest. Interpretive rangers present a wide range of topics all relating to various aspects of the area or the monument. Programs are well attended with a total of 1,938 visitors last summer. Local newspapers and radio stations advertise each week's programs.

Informal Interpretation

Informal interpretation is also conducted along the cave trail, nature trail, and on the visitor center deck. Interpretive rangers are trained to interact with the public on a continual basis outside of the formal presentations they give.

Passive Interpretation

The Canyon Nature Trail brochure is available to visitors free of charge. This thematic brochure, offered in English and Spanish, educates visitors about the various habitats found in the canyon. Since 2002 twelve new wayside exhibits have been installed along the cave trail. The waysides replaced older ones developed in the 1970's that had become outdated. The new waysides highlight natural and cultural features of the monument. A site bulletin about the geology of the monument is also available. A virtual tour of the park, including the caves, is available through a quick link on the monument's homepage.

Seasonal Interpretive Training

Over several seasons the interpretive staff have been trained using the Interpretive Development Program principles. The IDP works as the foundation on which all interpretive products are created. Many of the staff have submitted interpretive products and have demonstrated certification in various modules of the IDP.

Ranger guiding cave tour

Junior Ranger Program

The Junior Ranger activity booklet was first made available in 2001. The 12-page booklet is free to children and once completed they are awarded their choice of a badge or patch, as well as a certificate. The booklet has been very popular with young visitors and parents. There are also special Junior Ranger presentations every Saturday morning throughout the summer. These are hands on activities on a wide range of topics from caves to wildlife. Special guests such as Smokey Bear often visit.

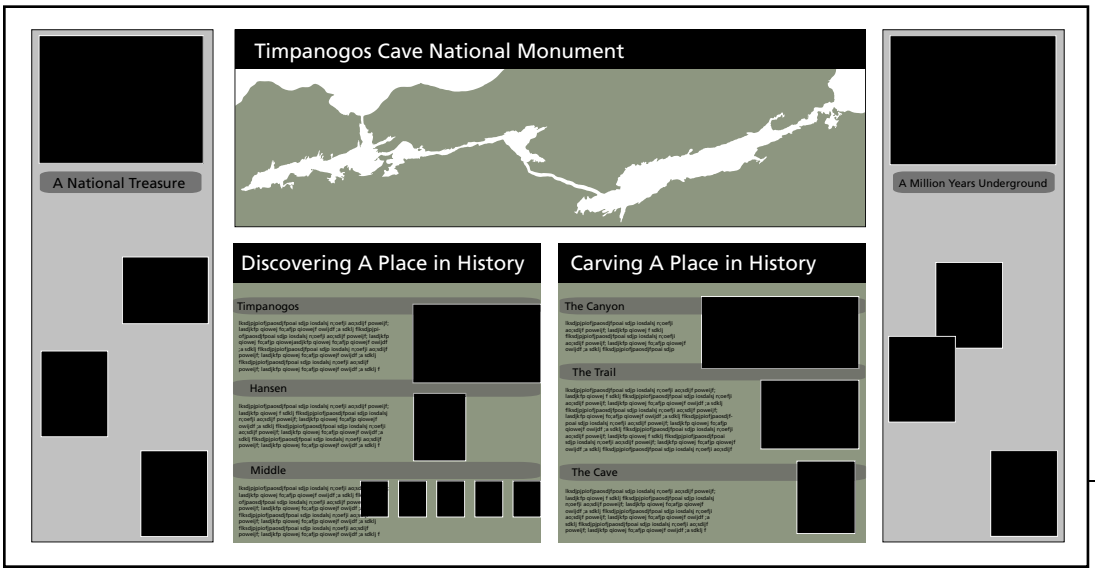
Ranger leading Junior Ranger activity

Park Ranger with Junior Ranger receiving certificate

Ranger showing a turtle at an evening program

New Visitor Center Exhibit

A SEPAS grant was used to develop a new exhibit for the current visitor center. The previous exhibit had been installed when the "temporary" visitor center was put in place. The information and design was outdated. The new exhibit was researched and developed by interpretive staff with assistance from the Resource Management Division. The exhibit is comprised of five acrylic panels produced through a local vendor. It incorporates information on the discovery of the caves and the establishment of the monument. In addition, it highlights some of the most intriguing aspects of the caves and includes a cave map for reference.



Layout for the new visitor center exhibit

Visitor Center and Fee Management

Visitor Center Operations

The visitor center staff provide an orientation video on a new plasma television screen, an advance ticket sales system that allows the public to purchase tickets 30 days in advance of their arrival, an accessibility video, patio talks, special programs for organizations, and career day presentations.

The GS-9 Supervisory Revenue and Fee Business Specialist oversees one GS-5 and ten GS-4s seasonal visitor use assistants and co-supervises four GS-4s Forest Service employees. The visitor use assistants provide visitor information, assistance, informal interpretation, tour sales, and operate the visitor center.

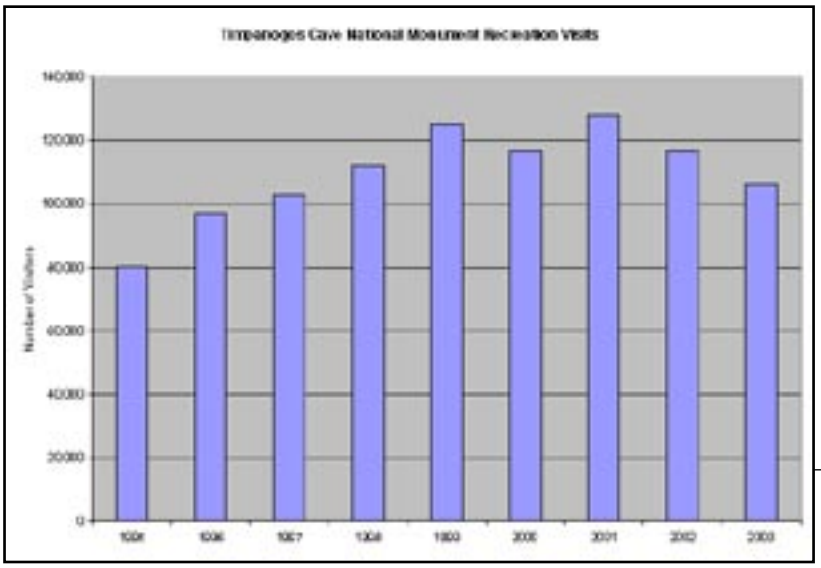
Timpanogos Cave National Monument is completely surrounded by the Uinta National Forest. As the only visitor contact station in the canyon, information on the forest service campgrounds, hiking trails, horse transfer stations, roads, and off road opportunities is dispensed from the monument's visitor center.

Educational Fee Waivers

Each year over 200 applications for educational fee waivers are received and processed at the monument. Approximately 5,000 students and teachers tour the cave system each year on educational fee waivers or as paying groups. Information on the educational fee wavier program and the application can be found on the monument's web site.

Cooperating Association

Western National Parks Association helps the monument provide visitors with quality interpretive programs and a wide selection of theme related publications. Two part-time seasonal WNPA employees work in the sales area of the visitor center. Each year WNPA sales total over $17,000, of this revenue Timpanogos Cave receives $2,000 in the interpretive support account. The reprinting of the Canyon Nature Trail brochure in Spanish, Planning Your Visit brochure, Junior Ranger booklet, research grants, and other publications support have all been funded through WNPA.



Volunteer in Parks Program

Each year over 100 volunteers contribute over 2,000 hours of service in all aspects of monument operations.

Volunteers have assisted with projects such as: Swinging Bridge Picnic Area maintenance, cave trail mats cleaning, snow and rock removal from the cave trail, painting the visitor center, trash pick-up, and removal of exotic plant species.

The successful early morning hikers volunteer program continues to be popular with an average of 50 volunteers a year hiking the cave trail at first light and removing litter and reporting any unsafe conditions.

Timpanogos Cave National Monument was selected as one of eight parks to participate in a new senior ranger program. Working through the Mountainland Retired Senior Volunteer Program (RSVP) and supported by a part-time seasonal employee, the volunteer program teaches and trains youth volunteers about caving ethics, conservation and management techniques with the assistance of RSVP senior volunteers. The youth volunteers follow rangers on interpretive tours through the cave system, assisting in answering questions, ensuring resource protection and visitor safety, and providing emergency medical assistance. The program has been very successful and has become an important part of cave operations.

Volunteers removing non-native plants from the monument

Volunteer helping visitors in the visitor center

Fee Demonstration

In 1995 and 1996, Timpanogos Cave National Monument turned away over 10,000 visitors from cave tours each year. Inadequate funding lead to seasonal staff reductions and a shorten season. After being chosen as a fee demonstration park, the cave tour fee for adults and juniors was raised by $1.00 (from $5.00 to $6.00, and $4.00 to $5.00 respectively) and a fee of $3.00 was initiated for children ages 2-5. A new fee of $15.00 was added to the fee structure for a new introduction to caving tour.

Prior to seeing the benefit of the fee demonstration program, Timpanogos Cave National Monument was financially stretched to the point that serious consideration was being given to closing the monument and going to a caretaker only facility. The financial benefit of the Recreation Fee Program cannot be overstated. The fee demonstration program has resulted in revenues sufficient to keep the monument operational, hire sufficient staff for a full season, and address maintenance backlogs.

Interagency Recreation Fee Demonstration Program

Timpanogos Cave National Monument is a key player in a highly successful interagency recreation fee demonstration project. Together with the Uinta National Forest, Utah Department of Transportation and Utah County government, the monument manages the American Fork Canyon-Alpine Loop Corridor recreation fee area.

Both Forest Service and National Park Service employees staff the entrance stations. National Park Service employees count, verify, and deposit collected funds into a Forest Service account.

Managed under U.S. Forest Service authority, 100% of the revenue is retained and spent within the management area. Over the past five years nearly two million dollars has been collected. Funds are made available to Timpanogos Cave National Monument for personnel costs to help run the fee program and conduct projects. Revenue is spent on projects selected from recommendations made by all partners and the public.

Entrance station at mouth of American Fork Canyon

Resource Management

Science and Resource Management

Science and Resource Management at Timpanogos Cave National Monument follows the park's mission statement, "to preserve the outstanding cave formations, geological processes, and historical values of the Timpanogos Cave System and associated features for the recreational and educational enjoyment, scientific value, and inspiration of this and future generations." Since the cave is our primary resource, most of our activities focus on cave preservation and protection. Significant time is spent on cave monitoring, research, and restoration.

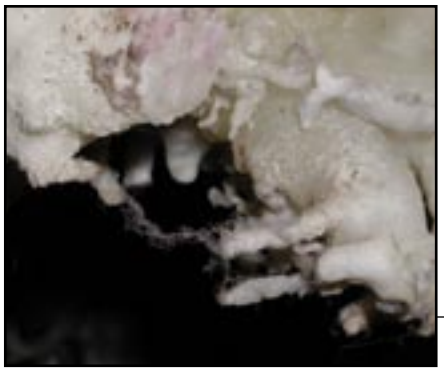
The Science and Resource Management Division, "cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world." We seek partnerships to enhance the understanding and protection of nation's caves and karst resources. Since Timpanogos Cave National Monument is the only federally operated cave in Utah, we strive to be the state experts in cave and karst preservation, education, and research.

Cami Pulham collecting water samples in Middle Cave Lake

Jon Jasper collecting water samples in Hansen Lake

Cave Restoration and Cleaning

Due to development of cave trails and approximately 70,000 people a year visiting the caves, cave resources are being degraded from the introduction of foreign debris and altered drainages. This foreign debris discolors cave features, dries out speleothems, and provides a food source for opportunistic cave biota. To prevent irreversible damage to cave resources, the monument has an annual GPRA goal to restore 3,000 sq ft of cave surfaces by removing algae growth, lint accumulation, and mud accumulation.



Lint accummulating on Helictites

Cami Pulham using a paintbrush to remove lint

Trap used to catch trail grime

Lint and hair being removed from tunnel

Jason Mateljak using a shovel to remove silt and debris from Middle Cave Lake

Cave Environmental Monitoring

To provide access for visitors after the caves were discovered, the caves' entrances have been enlarged, tunnels have been blasted, and trails have been cemented. These modifications have greatly changed the cave's environment. The monument studies the changes in temperature, humidity, drip rates, and airflow using various types of dataloggers. Small changes in the cave's stable ecosystem can permanently alter critical habitats and lead to decay of the cave's formations. To mitigate the environmental effects, the monument has reconstructed the cave gates and installed airlock doors to its tunnels.

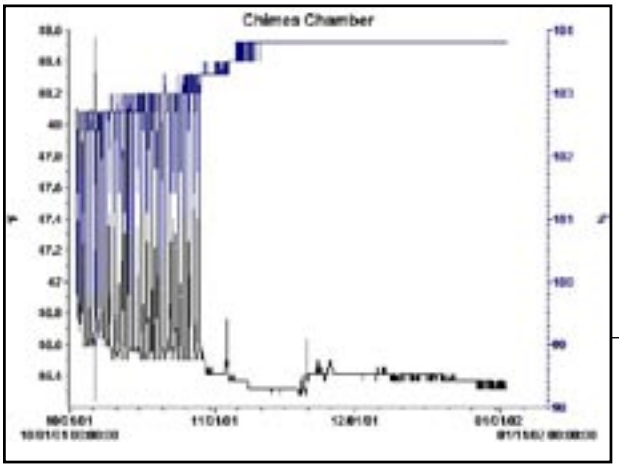
Water quantity and quality are being monitored. Drip rates are measured using tipping buckets to quantify recharge rates and the drainage basin size. Water quality sampling occurs to check for presence of contamination. The only significant contaminant is the presence of coliform counts found in the cave's pools. Further research is ongoing.

Long term-monitoring of geologic features also occurs through the use of about 100 patented photomonitoring points. These anchored stainless-steel stations allow replicated photos to be taken over time and analyzed for change.

Cave Photomonitoring Station

Collecting water quality data

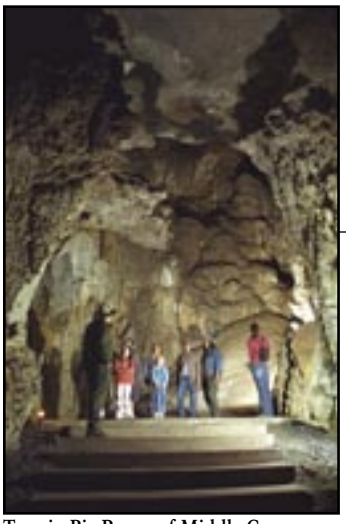
Installing a new cave gate



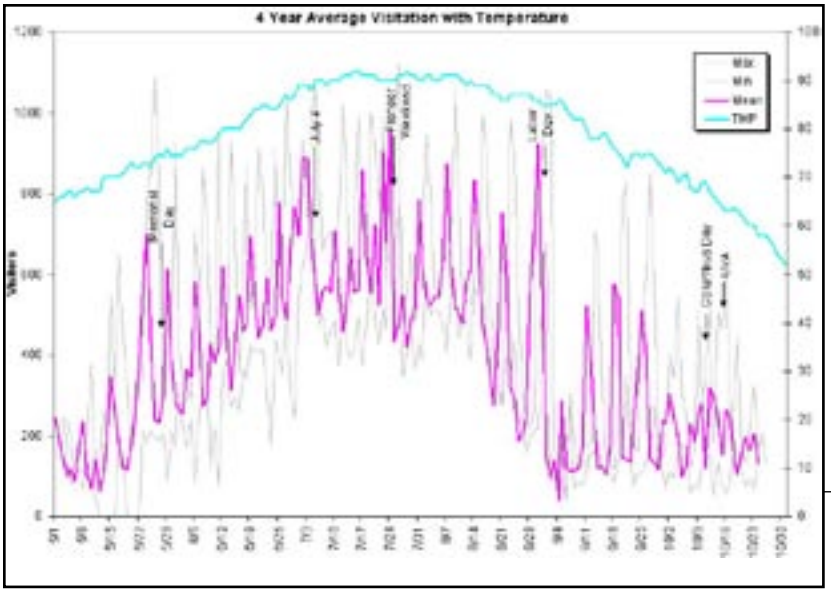
Temperature data showing 2.5°F fluctuation during tours

Cave and Karst Issues

Guiding over 70,000 visitors through the confines of a fragile cave environment during a six month season has created an extreme need for creating a comprehensive Cave Management Plan. For over 80 years, the monument has developed and led tours through the Timpanogos Cave System without any science-based planning. Funding proposals and OFS requests have been submitted to complete a comprehensive Cave Management Plan that will ensure that issues affecting cave resources, such as trail development, trail maintenance lighting, tour sizes, ecosystem health, safety concerns, watershed management, restoration activities, research, and off-trail uses, will be addressed and considered for all operations.



Tour in Big Room of Middle Cave



High visitation days accommodated up to 1120 visitors/day

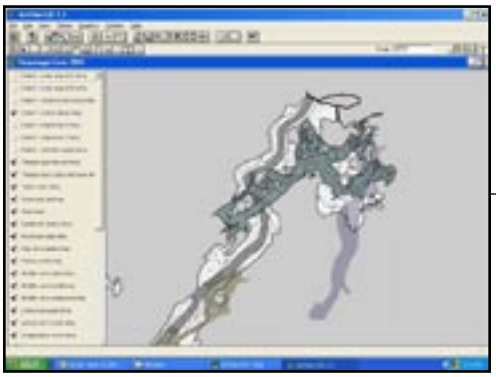
Cave Inventory and Research

Accurate and detailed resource information is critical to park managers. A GIS program was implemented to organize long-term data. Professional inventories of the cave's invertebrate and microbial communities are being conducted to understand the cave ecosystem.

The GIS program was established through ESRI Environmental Conservation Grants in 2000. Additional SEPAS GIS funding to use ESRI ArcPAD and a PocketPC to inventory the cave's significant features was awarded. A high resolution GIS layer of the Timpanogos Cave System was created and features such as cultural resources, rare or unusual formations, water and photomonitoring stations, and lighting systems are being inventoried. We are also using GIS technologies to track cave projects in Resource Management, Maintenance, Interpretation, and academic research.

Because of discussions with monument staff, the I&M Program included an inventory of the cave's invertebrates. The Northern Colorado Plateau Network contracted with Dr. Riley Nelson of Brigham Young University to inventory the invertebrates of the Timpanogos Cave System.

Another topic being researched is the role of microbes in caves. Caves are unique worlds where different microbial communities can exist. Through a grant, PhD Candidate, Megan Porter at Brigham Young University is researching the difference in microbial communities from "pristine" and "disturbed" cave locations. This knowledge may allow us to develop a vital sign that will lead us to see the early ecosystem shifts at the most basic microbial communities.



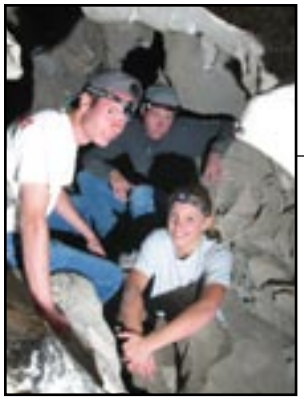
Cave map in ESRI ArcView GIS

Microbes grown from Hershey's Kiss

Cave crickets collected during the invertebrate survey

Partnerships

Timpanogos Cave National Monument is taking a leading role in providing expertise and experience in cave management to other federal and state agencies. Assistance is being provided to the Salt Lake BLM office with the gating and management of Crystal Cave. Upon completion of the EA, Timpanogos Cave National Monument staff will be leading the installation of the BLM's gate. The Utah Division of Fish and Wildlife contacted us about assisting in a statewide bat survey with our Anabat detector expertise. University of Utah's Natural History Museum is using our cave expertise in designing an exhibit on Utah caves. The exhibit will educate people on proper caving techniques and ethics, as well as, special interests of Utah caves. The exhibit will be opening in the spring of 2005. We are also working with Chuck Acklin, National Speleological Society (NSS) Young Group Liaison , to produce a Safe Caving Program for Scouts.



Nutty Putty Cave visitors

Teaching cave vertical techniques

Formation repair at Crystal Ball Cave

Chuck Acklin teaching scouts safe caving

Cami Pulham giving a caving program to Girl Scouts

Managing Cultural Resources

Several projects to preserve the park's history are ongoing. Over the next 2 years, the cataloging all of the backlog museum items will be completed. The project will add over 1200 items to our collection and allow our yearly museum GPRA goal to catalog 100 items to be exceeded.

Additionally, the writing of a comprehensive administrative history has been initiated. This publication will cover the park's prehistory, designation, and history of the all the divisions. A future project is expanding our recordings of oral histories from aging individuals that guided the park's development and operations.

The museum's 1930 soda pop bottle

Arlo Shelley has worked 55 years at Timpanogos Cave NM

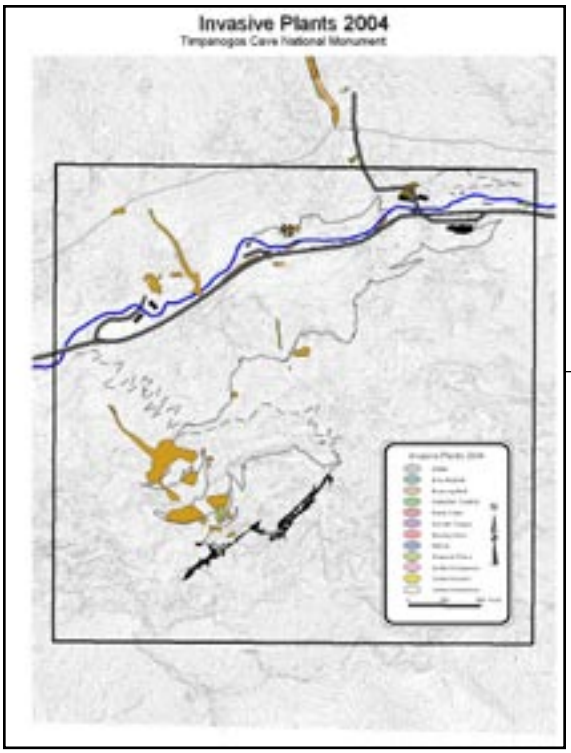
A historic photo showing soda pop being sold at the cave

Sharlene and Alan Walker recieving an award for donations to the monuments history

Vegetation Management

Invasive plants choke out native vegetation, and create a great threat to the park's ecosystem. In the past 3 years, the monument has begun to combat its invasive plants. At least 22 invasive plants have been identified within the monuments 250 acres. Our GPRA exotic plant goals are to control 5 acres of invasive plants and revegetate 1 acre each year. Our effort has reduced Toadflax and Spotted Knapweed by over 50%.

During this winter, we completed a draft Vegetation Management Plan. The plan outlines the long-term plan for controlling invasive plans, revegetation of disturbed areas, and Environmental Assessment (EA). The plan should be ready for review by the end of the fiscal year.



Map showing the distribution of invasive plants

A truck load of weeds

Before and after photo showing the reduction in Dalmation Toadflax

Public Outreach

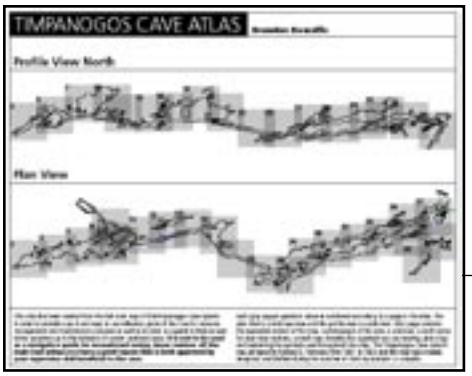
The Science and Resource Management Division continually looks for ways to enhance its outreach capability. This year we have been increasing the quality and quantity of our publications and presentations. Some of our new publications are the Resource Review newsletter, Timpanogos Reflections canyon newspaper, a wildflower guide, the new cave "safety" ticket, Resource Management website, and the new cave map and atlas.

Most all of our staff has been giving professional public presentations. Jon Jasper gave a presentation on *Portable Cave GIS* and *Restoring a Disturbed Cave* at the Cave Management Symposium in Gainsville, Florida. Jon and Brandon Kowallis gave presentations at the National Speleological Society (NSS) Convention in Marquette, Michigan. Jon presented with Megan Porter on the results of the microbial survey that won the award, "Best Presentation on a Show Cave," and Brandon presented on cave photography techniques and cave mapping shortcuts.

The new cave "safety" ticket

The joint NPS/NFS canyon newsletter

Science and Resource Management Newsletter



Timpanogos Cave Map Atlas

Wildflower trail guide

Fire Management

In the summer 2000, a fire broke out in the neighboring community of Alpine from a refuse burn. This fire ran up to the top of the mountain within minutes. The leading fire's edge was located just above the Administrative Office. The fire created a heightened awareness for the continuing need of Fire Management.

A draft Fire Management Plan for Timpanogos Cave National Monument has just been completed. Due to the high use of the canyon, all fires will be suppressed and prescribed burns will not be practiced. The monument has a Fire Cache to support about 12 firefighters.

This summer, to improve the overall fire safety, many trees were trimmed or removed around the monument's facilities to create defensible space.

Fire approaching Timpanogos Cave NM

Trimming to create defensible space

Project Proposals

Over the last four years, the Science and Resource Management Division has shown significant growth and results due to the success in project proposal writing. As the funding has increased, so has the staffing, training opportunities, quality equipment, and the complexity of projects.

However, the division is without a permanent position. Long-term programs cannot be implimented without a permanently funded division. Funding science and resource management has been the monument's highest priority funding request for six years.

Funded Projects

Restoring Cave Resources
Project Years 2005 to 2006; SEPAS $38,500

Creating Orientation Videos
Project Year 2005; SEPAS $12,000

Restoring Cave Drainages
Project Years 2003 to 2005; SEPAS $114,000

Complete Catalog Backlog
Project Year 2004; SEPAS $23,900

Monitoring Cave Water Quality
Project Years 2003 to 2004; SEPAS $19,980

Inventorying Cave Features
Project Year 2004; SEPAS $9,200

Writing a Vegetation Management Plan
Project Year 2004; SEPAS $10,00

Administrative History
Project Year 2003; SEPAS $35,000

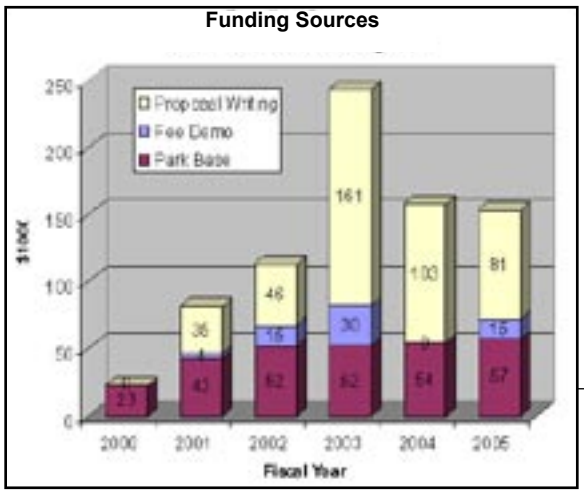
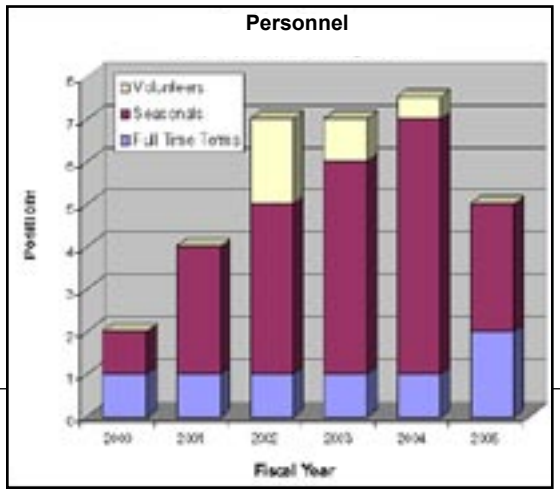
Installing Cave Handrails
Project Years 2002 to 2003; SEPAS $20,000

Installing Cave Gates
Project Years 2002 to 2003; SEPAS $10,000

Controlling the Spread of Invasive Plants
Project Years 2002 to 2003; SEPAS $10,000

Monitoring Microbial Diversity
Project Year 2003; Funding through SEPAS $9,940

Writing a IPM Plan
Project Year 2003; Funding through SEPAS $10,000

Interpreting Bat Calls
Project Year 2002; WPMA $6,916

Cave Restoration
Project Year 2001 to 2002; SEPAS $10,000