

ACKNOWLEDGMENTS

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PREFACE

Kodachrome Basin State Park is one of Utah's most unique scenic areas. The park's towering monolithic spires and rainbow-hued rock formations provide unparalleled scenic beauty. Visitors enjoy this unique desert experience within quiet, uncrowded and clean surroundings. Within the past two decades however, park visitation increased significantly. In 1980, 17,352 individuals visited Kodachrome Basin. By 1993, visitation jumped to 66,315, an increase of about 282 percent above the 1980 levels. The advent of the adjacent Grand Staircase-Escalante National Monument in 1996 will likely increase pressures on this sensitive and unique scenic area.

Planning for an outstanding natural resource such as Kodachrome Basin State Park is required for the protection of this unique area and to ensure the efficient and effective expenditure of state and private funds. It is necessary for the long-term protection and public enjoyment of Kodachrome's unique geology and land forms that are of great interest to the recreating public in Utah, and for our out-of-state and international guests.

This **Resource Management Plan (RMP)** is required by the Utah State Legislature and the Board of the Utah Division of Parks and Recreation to guide short and long term site management and capital development. The planning process recommends limits of acceptable change or modification, and a future vision for the park. Specifically, the process: **(1) recognizes impacts will result from use and enjoyment of the site; (2) questions how much and what types of impacts may be accommodated while providing reasonable protection of the resources for future visitors; (3) seeks sustained quality and value; and (4) seeks to determine the conditions under which this can be attained.**

A Kodachrome Resource Management Team, consisting of community leaders, interested users, local residents and agency representatives, was formed to develop a vision for the park, identify issues, and provide managerial recommendations.

The team developed a future vision to guide management actions at Kodachrome Basin State Park. Under this vision, it was determined that all activities should:

1. preserve the park's scenic beauty and protect its geological, historical, biological, and cultural attributes;
2. maintain its remote and uncrowded characteristics;
3. provide adequate interpretation and education for visitors; and;
4. ensure that all future development of facilities and infrastructure meets expected visitor needs and does not detract from the park's scenic beauty, solitude and unique natural and cultural characteristics.

Team recommendations were reached by consensus and included input from the public and other government agencies. These recommendations will guide management of the park over the next two decades. They are intended to be dynamic and will evolve concurrently with park and local community development and as individual portions of the vision statement are achieved.

Recommendations contained within the plan will be implemented under the direction of the Utah Division of Parks and Recreation. This plan is intended to be a useful, workable document that will guide management of the park into the 21st century.

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EXECUTIVE SUMMARY

In June 1999 representatives from the Utah Division of Parks and Recreation met with community stakeholders from the Garfield and Kane County area to initiate a resource planning effort for Kodachrome Basin State Park. The planning process was based on public input and involvement. The Kodachrome Basin State Park Resource Management Planning Team - a citizen-based team representing community leaders, interested users, local residents and agency representatives - was at the core of the process. The recommendations contained in this document represent several months of work by the team as well as direct public input.

The plan provides recommendations which are founded upon four primary vision elements that will guide future management of Kodachrome Basin State Park. These elements focus on:

- C Preserving the park's scenic beauty and protecting its geological, historical, biological, and cultural attributes.
- C Maintaining the park's remote and uncrowded characteristics.
- C Providing adequate interpretation and education for visitors.
- C Ensuring that all future development of facilities and infrastructure meets expected visitor needs and does not detract from the park's scenic beauty, solitude and unique natural and cultural characteristics.

These elements are geared toward preserving the park's unique resource values while providing the visitor with a safe, enjoyable experience. Achievement of these vision elements will require the continued support of users, community leaders and the Division of Parks and Recreation.

The planning team issued several specific recommendations in support of the plan's vision elements. Six issue areas form the basis of the team's recommendations. Each issue area with its accompanying recommendations are outlined as follows:

C NATURAL RESOURCE MANAGEMENT

- < Minimize impacts to rare plant species within the park
- < Introduce measures to minimize erosion from flooding and runoff
- < Protect the park's diverse cultural resources
- < Protect the park's watershed

C EDUCATION, INTERPRETATION AND INFORMATION

- < Update and enhance park maps, informational brochures and interpretive displays
- < Expand efforts to more effectively present Kodachrome and the adjacent area

C FACILITIES DEVELOPMENT

- < Improve traffic flow and access within the park
- < Ensure that the park has sufficient and reliable water supplies
- < Develop more day use facilities to better accommodate increasing day-use demand
- < Construct a combination contact station and visitor center at park entrance
- < Evaluate need for additional directional signs
- < While current campground is adequate for short-term needs, evaluate the feasibility of an additional campground loop in the future; work with private sector to accommodate current visitor camping needs
- < Identify and develop new trails; effectively maintain existing trails
- < Install additional fencing as needed
- < Expand current concession facilities in a manner consistent with the mission and vision of the park

C STAFFING, OPERATIONS AND FUNDING

- < Ensure that there are sufficient levels of staff to effectively carry out the park's mission and vision
- < Build effective partnerships with the legislature, local governments and local business or other private sources to obtain needed funds

C LAND ACQUISITION AND USE

- < Identify and acquire adjacent School and Institutional Trust Lands (SITLA) and Bureau of Land Management (BLM) lands to meet current and future recreational

needs of park visitors

- < Ensure that use on adjacent lands is consistent with the park's mission and vision

C COLLABORATIVE PARTNERSHIPS

- < Advocate for all-weather accessible roads on frequently used federal roads adjacent to the park
- < Establish formal, interactive relationships with the BLM, the Grand Staircase-Escalante National Monument (GSENM), county and local government, and private landowners to deal with issues affecting the park
- < Enhance signing on Highway 12

Implementing some of these recommendations will be dependent upon acquiring new funding sources. There may be keen competition for funding or other unforeseen priorities and contingencies that could affect implementation.

The plan's success is dependent upon the continued support of park stakeholders. Efforts must be made to preserve park resources, interact with local communities and strive to meet the expectations of park visitors. The recommendations contained within this plan were based upon an open and collaborative process. It is imperative that this collaborative spirit continue as the plan's components are implemented.

MISSION STATEMENT

Mission Statement:

The mission of Kodachrome Basin State Park is to provide visitors a safe, satisfying and educational opportunity to interact in a natural setting while preserving, protecting and interpreting the unique resources.

Team members developed the mission statement on the premise that Kodachrome Basin State Park is more than just a site for recreation. It is also an area rich in unique natural attributes. Accordingly, the team determined that while the park should provide visitors a safe, satisfying recreational experience, it should also provide visitors with a “hands-on” opportunity to interact in a natural

setting. Such an experience will heighten awareness of the need to preserve and protect the park’s unique resources.

VISION STATEMENT

A vision statement is similar to a compass; it charts a destination, sets the team on the correct course of action, and it provides the means to determine how closely team recommendations will follow that charted course. Utilizing the basic principles in the mission statement, the team developed a vision statement to guide development of the plan’s recommendations. The vision statement provides the foundation for recommendations that balance recreational demands with preservation of the park’s scenic beauty, solitude, and unique natural and cultural characteristics.

Vision Statement:

The future vision of Kodachrome Basin State Park is to:

- T Preserve the park’s scenic beauty and protect its geological, historical, biological, and cultural attributes.
- T Maintain its remote and uncrowded characteristics.
- T Provide adequate interpretation and education for visitors.
- T Ensure that all future development of facilities and infrastructure meets expected visitor needs and does not detract from the park’s scenic beauty, solitude, and unique natural and cultural characteristics.

RESOURCE MANAGEMENT PLAN PURPOSE AND PROCESS

Purpose of the Plan

This Resource Management Plan is intended to help guide the Utah Division of Parks and Recreation's stewardship obligations for Kodachrome Basin State Park. Planning for the park is essential given the recent rapid increases in visitation that have occurred over the past eight years.

Kodachrome Basin State Park is no longer an obscure, out-of-the-way recreation area. Road and infrastructure improvements made within the last decade have greatly improved accessibility to the area. In 1980, 17,352 individuals visited Kodachrome Basin. By 1993, visitation jumped to 66,315 - an increase of about 282 percent above the 1980 levels. While visitation rates have flattened out somewhat over the past four years, it is expected to surpass the 70,000 mark within the near future.

The park is situated within easy visitor access of numerous national parks, monuments and recreation areas as well as national forests, wilderness areas, other state parks, recreation areas and other attractions. In fact, the vast majority of park visitors are simultaneously visiting nearby Bryce Canyon and Zion National Parks, as well as Lake Powell and Lake Mead National Recreation Areas. The new Grand Staircase-Escalante National Monument - which is directly adjacent to the park - will likely lead to additional visitation at the park due to the monument's proximity and relatively sparse visitor/camping accommodations. Consequently, failure to effectively deal with these dynamic changes today will only lead to more complex problems in the future.

A number of issues ranging from natural resource management to staffing, operations and funding were identified by various sources including input from planning team members as well as the public-at-large through public meetings and opinion surveys. Team members aggregated at least 30 major issues into six distinct categories dealing with: natural resource management; education and information; facilities development; staffing, operations and funding; land

acquisition and use; and collaborative partnerships. This plan addresses each of these issue areas. It will provide flexible guidelines for the management and development of the park over the next 10 to 20 year period. More importantly, it will provide this direction on the foundation of continued public input and consensus of key stakeholders, rather than by the unilateral auspices of the Division of Parks and Recreation.

The Planning Process

Planning for an outstanding natural resource such as Kodachrome Basin State Park is required for the protection of this unique area and to ensure the efficient and effective expenditure of state and private funds. It is necessary for the long-term protection and public enjoyment of Kodachrome's unique geology and land forms that are of great interest to the recreating public in Utah, and for our out-of-state and international guests. This Resource Management Plan (RMP) is required by the Utah State Legislature and the Board of the Utah Division of Parks and Recreation to guide short and long-term site management and capital development.

The Utah Division of Parks and Recreation's master planning document, *Frontiers 2000*, delineates the required planning actions needed to effectively meet customer recreational and leisure needs as the agency moves into the new millennium. The document identifies resource management planning as an essential action to be completed for each park within the agency's system. Under the guidance of *Frontiers 2000*, each RMP is to designed around one core concept: meeting the needs and expectations of customers, citizens of the state of Utah and visitors while protecting each park's unique resource base. In short, the process is "customer driven and resource-based."

The planning process recommends limits of acceptable change or modification, and a future vision for the park. Specifically, the process: (1) recognizes impacts will result from use and enjoyment of the site; (2) defines how much and what types of impacts may be accommodated while providing reasonable protection of the resources for future visitors; (3) incorporates values of resource sustainability, quality facilities, education and interpretation for visitors; and (4) seeks to determine the conditions under which this can be attained.

In June 1999, Division representatives met with community stakeholders to familiarize them with the proposed process and the need for creating an RMP for Kodachrome Basin State Park. During this meeting the Division solicited the names of community members and various users with an interest and expertise in the park to serve as members of a Resource Management Planning Team. Team members were selected for a variety of reasons ranging from technical expertise to interest in the park. All team members participated on a voluntary basis and expressed a willingness to sacrifice a significant portion of their time and expertise to the process. Nine individuals were selected to serve on the planning team and three representatives from the Division served as staff to the team.

ABOUT THE PARK

Park History

Prior to its designation as a state park, the area was known locally as Thorley's Pasture for a rancher named Tom Thorley who ran cattle in the basin. However, individuals from the National Geographic Society visiting the area in the late 1940s were struck by the magnificent colors of the area and informally called it Kodachrome Flat after the color film made popular by the society's magazine. It was rumored that Kodak was not pleased with the unofficial moniker so local citizens changed the name to Chimney Rock after one of the rock spires within the area. The rumors about Kodak's concerns with the use of its product name turned out to be unfounded when it became known that the company actually liked the idea. Eventually, the area became officially known as Kodachrome Basin State Park.

In the 1930s, the Civilian Conservation Corps (CCC) constructed a dirt road into the area. Shortly thereafter, the area became a favorite picnic spot for local visitors. Kodachrome Basin also increased in popularity as visitors from nearby Bryce Canyon National Park began to visit the area. With the increasing popularity of the area, the Utah State Park and Recreation Commission identified Kodachrome Flat as a potential state park site in its 1959 Blue Ribbon Report. In 1963, the Commission acquired the area from the Bureau of Land Management.

With the completion of pavement on State Route 12 that connected Boulder to Capitol Reef National Park in 1985, visitation to the region increased significantly. In fact, park visitation virtually doubled shortly thereafter.

Physical Setting and Facilities

Kodachrome Basin State Park is located about nine miles off State Route 12, to the southeast of Cannonville, Utah, some 300 miles from Salt Lake City. The park covers 3,120 acres that include towering monolithic spires or "chimneys" and rainbow-hued rock formations that form a striking contrast to incredible blue skies. Numerous rocks and coves offer solitude, quiet and unique desert beauty. The park offers excellent opportunities for activities such as hiking,

mountain biking, horseback riding, geologic study, and photography.

The park's campground is surrounded by towering sandstone cliffs and shaded by large junipers and pinon pines. The campground has 26 developed campsites with amenities that include drinking water, restrooms, hot water showers, a sewage disposal station, picnic tables, barbecue grills and fire pits. There are four group sites that can accommodate up to 150 people.

A park concessionaire offers horseback riding, horse-drawn coach rides, food, camper supplies and ice. Nearby attractions include the Grand Staircase-Escalante National Monument, Bryce Canyon National Park, Grosvenor Arch, Paria Canyon, movie sets and ghost town remains.

Some of the area's most striking features are the towering monolithic spires called "chimneys." These columns of layered stone are so tall and narrow that they appear precariously balanced against earth and sky.

In addition to the chimneys, Kodachrome contains many geological formations that can be seen in the park's cliffs. These formations - sandstone cliffs, coves and arches - are accessible to visitors via the park's numerous trails.

Climate

The park is located in a high, semidesert environment that is marked by well-defined climatological "seasons." Maximum daytime temperatures range from about 86 degrees in July to about 42 degrees in January. Minimum temperatures range from about 52 degrees in the summer to about 16 degrees in winter. Average annual precipitation is about 12 inches per year. The summer months of July through September are frequently the wettest months due to the "monsoonal" moisture that often invades the area from the southwest. It is during this time that the park experiences short but intensive downpours that often result in local flash floods and washouts.

Park Visitation

Kodachrome experienced a sharp increase in visitor growth in the early 1990s. In 1980, 17,352 individuals visited Kodachrome Basin.

By 1993, visitation jumped to 66,315, an increase of about 282 percent above the 1980 levels. This sharp increase began in 1990 where visitation rose by about 151 percent during the years 1990, 1991 and 1992. These increases may be partially attributed to road improvements on Highway 12 and - perhaps more significantly - major improvements (including paving and installation of a key bridge over the Paria River) to the road from Cannonville leading into the park

Figure 1: Total Visitation, Kodachrome Basin State Park, 1980 -1998

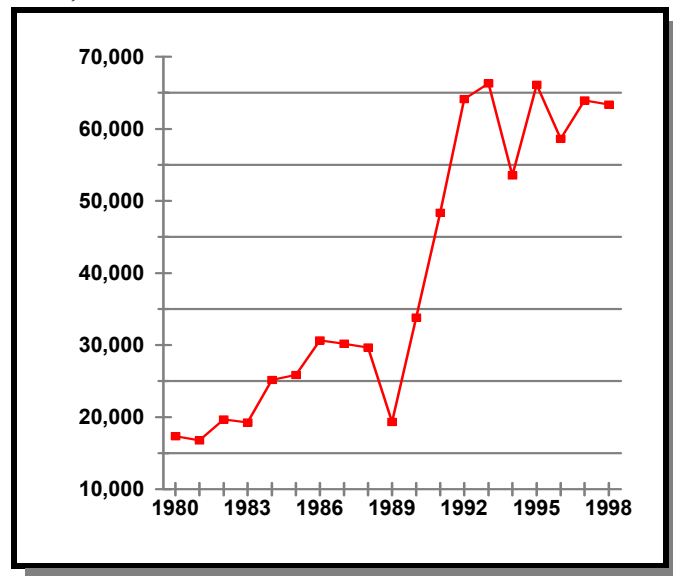
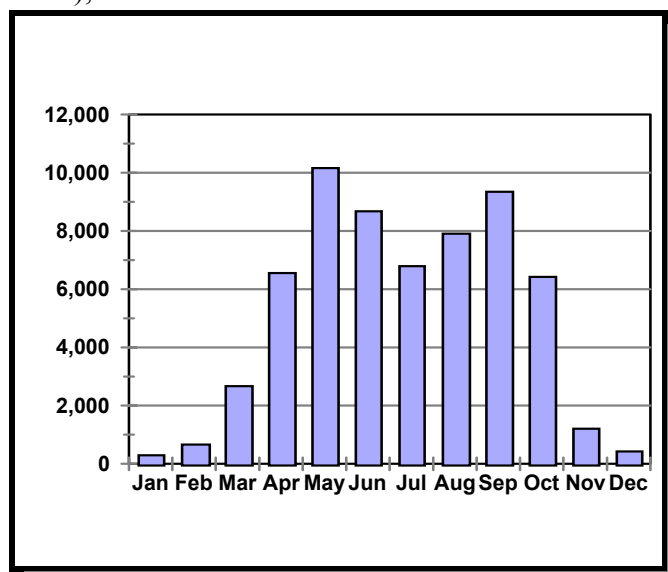


Figure 2: Average Monthly Visitation (1994 - 1998), Kodachrome Basin State Park



entrance. By 1993, visitation to the area leveled off from the previous rates of increase. Average visitation between the period 1993 through 1998 was about 62,000 visitors which is fairly consistent with the current rates (63,380 for 1998).

Most visitation occurs between April and October with May and September being the peak months. In fact, visitation peaks in May, drops off somewhat during the summer months and then rises again in September to levels that approach those of May. Average

visitation for May over the past five years has been about 10,162. Similarly, average visitation for September over the same period was about 9,352. During the summer months of June, July and August, visitation averages about 8,000 individuals per month. Area visitation drops off sharply in the late fall months of November and December and the early winter months of January and February.

Relationship to the Community and Surrounding Areas

Kodachrome is located in northern Kane County in close proximity to the small communities of Cannonville, Tropic and Henrieville. These towns make up what is called the Bryce Valley and are bordered by Bryce Canyon National Park, the Grand Staircase-Escalante National Monument and the Dixie National Forest. State Route 12 (which is a designated Scenic Byway) links these towns and leads visitors to a wide variety of beautiful scenery and terrain.

The area was originally settled in the late 1870s by Mormon pioneers. Native Americans claimed that the Paria Valley had a favorable climate, arable land, extensive grazing opportunities, as well as water, timber and coal resources. Taking advantage of the information, pioneers settled along the Paria River and over the next 10 years, several villages began to spring up. Of the original settlements, only Cannonville and Henrieville survived. The town of Tropic was founded in 1892 and incorporated in 1902.

Demographics and Socioeconomic Impact

All three of these adjacent towns are located in Garfield County which has a population of 4,386. Tropic, Henrieville and Cannonville have a combined population of 699, about 16 percent of total county population. Tropic, with a population of 397 is the largest of the three adjacent towns followed by Henrieville (population 161), and Cannonville (population 141). While Garfield County is Utah's fourth largest county in terms of land area, it is also the least dense in terms of population - less than one person per square mile.

Services and government account for about two-thirds of Garfield County's employment. Ruby's Inn near Bryce Canyon National Park is the county's largest employer followed by the

Garfield County School District, the U.S. Forest Service, the National Park Service and Garfield County. Of the three towns adjacent to Kodachrome, Tropic appears to contain the greatest amount of tourist-related economic activity. Tropic has several lodges, motels, retail shops and numerous outfitter or tour guide establishments. Most of this economic activity appears predominantly linked to Bryce Canyon National Park. A more thorough examination of economic impact will be displayed in the following survey results section.

PARK RESOURCES

One of the Kodachrome Basin Planning Team's primary vision elements is to preserve the park's scenic beauty and protect its geological, historical, biological, and cultural attributes. To do this, the planning process calls for an inventory and analysis of park resources. It is essential that management decisions affecting the park's natural environment be made upon the foundation of reliable

scientific information about the park's diverse natural resource base. This section provides an analysis of Kodachrome's geological, biological, and archeological/cultural resources. A natural hazards analysis is also included.

Vision Element:

Preserve the park's scenic beauty and protect its geological, historical, biological, and cultural attributes.

Geological Resources

Kodachrome Basin State Park is located in the Colorado Plateau section of Utah and in the heart of what is referred to by geologists as the "Grand Staircase." The park contains various exposed formations ranging from the middle Jurassic Period (180 million years ago) to the upper Cretaceous Period (95 million years ago).

The oldest layers of exposed rock are part of the Carmel Formation. These layers were deposited in an inland sea that once covered the region. The Carmel Formation is characterized by the presence of solid layers of gypsum which form red and white colored cliffs in the park's lower elevations.

The Entrada Formation, which lays on top of the Carmel Formation, is perhaps the park's most colorful formation due to its red, slick rock appearance. This formation consists of three members: the Gunsight Butte, Cannonville and Escalante. Most of the sedimentary pipes found at the park occur in this formation.

The Henrieville Sandstone Formation is a white-tan deposit that lies in the upper portions of the park. This formation dates back to the Jurassic period and was deposited by rivers and streams flowing through the area. This formation is virtually un-noticeable in the park's main portions. However, Grosevnor Arch located south of the park, occurs in this strata.

The Dakota and Tropic Shale Formations make up the top two rock layers exposed in the park. These formations were deposited approximately 95 million years ago. During this period, a vast seaway covered much of North America including most of Utah. These formations contain a wealth of fossil evidence providing information about numerous marine organisms that previously thrived within this ancient seaway.

The large columns of sedimentary rock known as “spires” or “chimney rocks” are perhaps the most notable of all park features. Geologists refer to these spires as “sedimentary pipes,” referring to the processes responsible for their formation. At least 67 sedimentary pipes have been identified within the park and adjacent areas.

Different theories exist regarding the formation of the spires. Some geologists theorize that they were originally ancient geyser plugs, vents, or tubes that filled with limestone and were encased by Entrada sandstone. Eventually, the underground geysers and springs dried out and were filled with sediment which eventually solidified. Since their formation, the sandstone encasement gradually eroded away, leaving the limestone core standing alone. Other geologists theorize that an earthquake or other nearby earth moving event caused a liquification of the underlying sedimentary layers. Weaker areas within the upper layers allowed a columnar type of intrusion of the older rocks, sediments and layers from below. These intrusions and the surrounding rock resolidified. Through the years, the upper sandstone layers weathered away leaving behind the columnar intrusions of older rock. The result was numerous columns or “chimneys” of various shapes and sizes that range from between six to 170 feet in height.

Biological Resources

The park supports a variety of desert plant and animal life. Those plant species that thrive in the

park have adapted to the area's dry climate. While the populations of different animal species are somewhat limited due to the lack of open water supplies, there is still a great amount of animal diversity within the park.

The Utah Division of Wildlife Resources (DWR) conducted field surveys of Kodachrome Basin State Park during July 1999. The purpose of these surveys was to identify and document the various plant and animal species occurring within the park. The field surveys targeted all plant and animal habitats within the park's geographical boundaries. A variety of research techniques and methodologies were employed to inventory the diverse plant and animal populations within the park. These methods included photographic documentation as well as collection of live specimens. The research also included a review of literature and other documentation regarding plant and animal species previously reported to occur within the park boundaries.

C Flora

The park supports over 140 different species of desert plants including juniper, pinon, sagebrush, rabbitbrush, cliff rose, yucca, and prickly pear cactus, as well as native grasses and many seasonal wildflowers that have adapted to the dry climate. A complete list of plant species can be found in Appendix A. Two plant species of special interest - Stella's pepper-plant (*Lepidium montanum* var. *stellae*) a member of the mustard plant family and Nipple phacelia (*Phacelia mammillarensis*) a waterleaf plant - were found within the park.

Two other species - Meager camissonia (*Camissonia exilis*) and Kodachrome bladderpod (*Lesquerella tumulosa*), which are found on nearby federal land, are also of interest. Meager camissonia is on the BLM's Sensitive Species List and is currently being tracked by DWR. Although it was not found in the park, potential habitat exists within the park. Similarly, Kodachrome bladderpod is a federally listed endangered species and is likewise tracked by DWR. While this species is found near the park's southern boundary, there does not appear to be potential habitat for this species within the park.

DWR recommends that management actions for these species - particularly for Stella's pepper-

plant and Nipple phacelia - be considered in the planning of future projects. Consequently, the analysis focuses on these two plant species found within park boundaries.

< **Stella's pepper-plant**

Stella's pepper-plant is currently being tracked by DWR's Natural Heritage Program because of its narrow distribution. The species is known to occur in scattered locations within the park and to the southwest on Skutumpah Terrace and vicinity. It typically grows in pinon-juniper communities, scattered shrubs, perennial herbs, and bunch grasses at elevations ranging between 5,577 and 6,234 feet. In the park, Stella's pepper-plant was observed over the ridge to the southwest of the Nature Trail alcove, and also at the south end of the park on the first mesa top, immediately east of the park's access road (see Plate 1, "Unique Flora" in map section).

While not currently a species for consideration under the Federal Endangered Species Act (ESA), Stella's pepper-plant is unique to the area. **The Department of Natural Resources (DNR) strongly recommends that actions be taken to minimize threats to this species so that onerous federal listing actions can be avoided under the ESA.**

< **Nipple phacelia**

Nipple phacelia is a waterleaf plant that grows on gypsiferous soils in salt and mixed desert shrub communities with occasional perennial herbs at elevations ranging between 4,003 to 6,004 feet. Nipple phacelia was observed at one location near the park's south end on a steep mesa slope immediately east of the main entrance road (see Plate 1, "Unique Flora" in map section).

Like Stella's pepper-plant, Nipple phacelia is a rare species. **Again, DNR strongly recommends that actions be taken to minimize threats to this species to preclude onerous federal listing actions.**

DWR was impressed with the Nature Trail interpretive station - particularly the information it provides regarding the park's biological soil crusts. DWR recommends that additional

interpretive displays be constructed along the trail on the east side of Kodachrome Flat where these crusts are particularly spectacular. They also recommend that the Nature Trail Guide be updated to inform visitors about soil crusts within the park.

C Fauna

Wildlife within the park is somewhat limited in numbers due to the lack of open water supplies. Resident mammals include rock squirrel, black-tailed jackrabbit and desert cottontail. Mule deer and gray fox have been observed in the park and adjacent areas from time to time. Occasionally, mountain lion tracks can be found in the remote canyon areas.

Birds are the most common animal found within the park. DWR researchers identified more than 25 bird species including chukar, pinon jay, American kestrel and great horned owl. While not native to the park, ravens, vultures, and golden eagles can often be seen soaring overhead throughout most of the year. Sagebrush lizard, eastern fence (or plateau) lizard and side-blotched lizard are the park's primary resident reptile species. A complete list of animal species is found in Appendix A.

DWR notes that the intermittent stream resulting from overflow of the park's water tank/reservoir may be of considerable value to wildlife. DWR also recommends actions to reduce impacts of trespassing cattle (for example in the vicinity of Chimney Rock). Such actions will enhance the viability of the park's ecosystem.

Archeological Resources

The park contains no significant archeological remnants of ancient cultures. A cultural resource inventory of the park was conducted in July 1999 by Division experts. The inventory included a file search of records at the Utah Division of State History as well as a pedestrian survey of primary park areas that may be developed within the foreseeable future. The inventory revealed that there was no record of previously recorded sites or cultural resource inventories within the areas of potential development (it should be noted that additional analysis may be required as specific development sites are more clearly identified).

Natural Hazards Analysis

A natural hazards analysis was conducted during the fall of 1999 by the Division of Comprehensive Emergency Management. The study focused on the risks associated with potential fire or flood events at the park.

Preliminary results indicate that many of Kodachrome's campsite facilities may be considered potential wildfire burn areas, particularly those in close proximity to pinon-juniper vegetation. The findings suggest that about 50 percent of the campsite fire pits/rings and barbecue grills appear to be wildfire ignition sources. Current standards for wildfire established by the Division of Forestry, Fire and State Lands recommend clearings of at least three feet around fire rings and six feet above the grills. For Kodachrome, however, these standards may not be adequate. A wind-swept wildfire could ignite nearby vegetation - cottonwoods, junipers, pinyons, and sage - and move quickly through the campgrounds. It is recognized that disturbance to the natural settings around these campsites should be minimized. However, under the current situation, there appears to be a present significant wildfire burn potential. It was recommended that fire safety standards unique to the park be developed and implemented.

The findings also indicate that current flood protection appears to be largely cosmetic and may be inadequate for 100-year storms. Analysts noted that several campsites are located adjacent to active flood channels. It was recommended that campsites be moved away from these flood channels as a large flow from a substantial storm could inundate campsites and place campers at unusual risk.

VISITOR SURVEY RESULTS

Kodachrome Basin State Park 1999 Visitor Survey Highlights:

- / Kodachrome does not appear to be a “destination” park. Rather, it is one stop among many
- / Almost two-thirds of Kodachrome visitors stay for one day or less
- / More than two-thirds of Kodachrome’s domestic visitors reside outside of Utah
- / About 30 percent of Kodachrome’s visitation is international
- / Sightseeing, hiking, camping and photography are the predominant recreational activities
- / Approximately 78 percent of survey respondents spent money in nearby communities

Summary of Results

The Division of Parks and Recreation administered a visitor survey during the peak visitor months of 1999. The survey was implemented to develop a better understanding of visitor needs, concerns, and socioeconomic impact on local communities. Survey results were incorporated into the planning process in the development of recommendations. It is important to note that the survey results reflect visitor use patterns during the study period (e.g., peak visitation period between May and September) only. Moreover, several factors contributed to a slightly lower than normal response rate. Consequently, one must be careful in using the results to draw generalized conclusions

about the population of users who visited Kodachrome during the study period.

With these limitations in mind, respondents noted several items of interest which are summarized below. This information provides important insight about visitor use patterns, activities, needs and concerns.

C Kodachrome does not appear to be a “destination” park

Rather, most survey respondents (92 percent) identify Kodachrome as one stop within a larger tour of the area. About five percent indicated that they viewed the park as their primary destination. In fact, a majority of respondents also visited Bryce Canyon National Park, Zion National Park, Grand Staircase-Escalante National Monument and Capitol Reef National

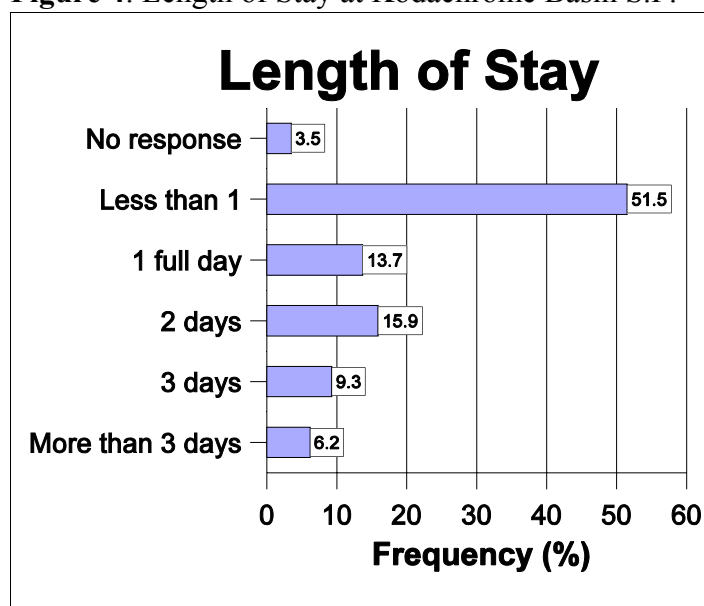
Monument.

C Most Kodachrome visitors are “day-users”

It appears that the vast majority of Kodachrome visitors stay for one day or less. About 52 percent of the respondents indicated that they stayed at the park for less than one whole day while about 14 percent indicated they stay for one full day (see figure 3). These findings correspond with day-use visitation in many of the Division’s other southwest region parks. Day-use visitation appears to be trending upward within most of these parks.

C Most Kodachrome Visitors Live Outside of Utah

Figure 4: Length of Stay at Kodachrome Basin S.P.



Among domestic (e.g., those living within the United States) visitors, Utah residents accounted for 28.5 percent of survey respondents. While Utah respondents represent the largest group from any single state, 71.5 percent of the domestic survey respondents reside in another state. Visitors from California represented about 20 percent of total respondents while visitors from Arizona (6.3 percent), Oregon (5.1 percent) and New York (4.4 percent) rounded out the top five. Respondents from 26 other states account for the

remaining 36 percent of participating domestic visitors.

More than 28 percent of all survey respondents were of international origin. German respondents accounted for almost half of the international visitors.

C Sightseeing, Hiking, Camping and Photography Appear to be the Predominant

Recreation Activities

Survey respondents listed sightseeing, hiking, camping and photography as their preferred recreation activities during their stay. About 75 percent indicated that they prefer to engage in these four activities while at the park. The most commonly used areas of the park include the campground, Shakespeare Arch, Chimney Rock (technically not within park boundaries), the Trailhead Station, and the nature trail. Each of these areas accommodate the four preferred activities listed above.

C Most Respondents Spent Money in Nearby Communities

Respondents provided information on expenditures (by their entire group) for motels/hotels, campgrounds, restaurants, vehicles, activities, and supplies. More than 77 percent indicated that they made such purchases in nearby towns. The majority of respondents spent money in either Tropic (36.1 percent), Panguitch (30.4 percent) or Cannonville (22 percent). The average total amount spent per group was \$116.27. A distribution of expenditures is shown in figure 5. It is important to note that reported expenditures varied considerably among the survey respondents. Moreover, the reported \$116.27 average expenditure figure includes those respondents (20 percent) who did not

Figure 6: Distribution of Visitor Spending in Nearby Towns by Expenditure Category

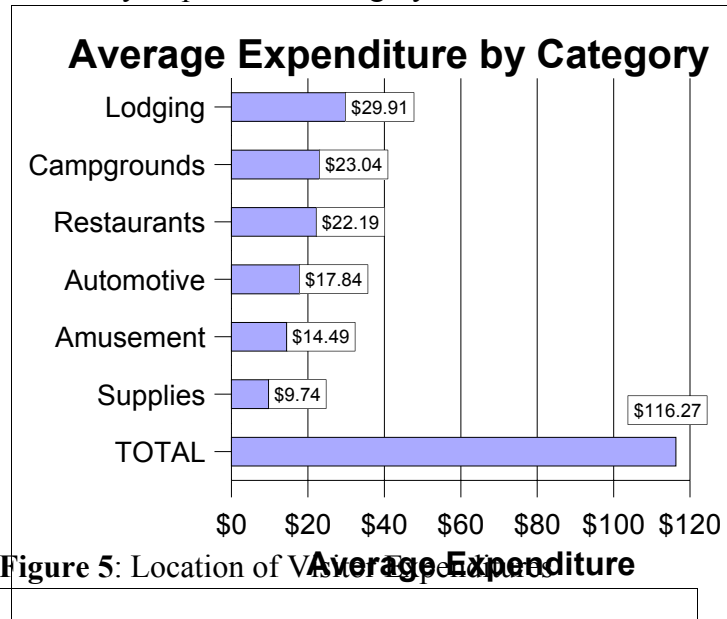
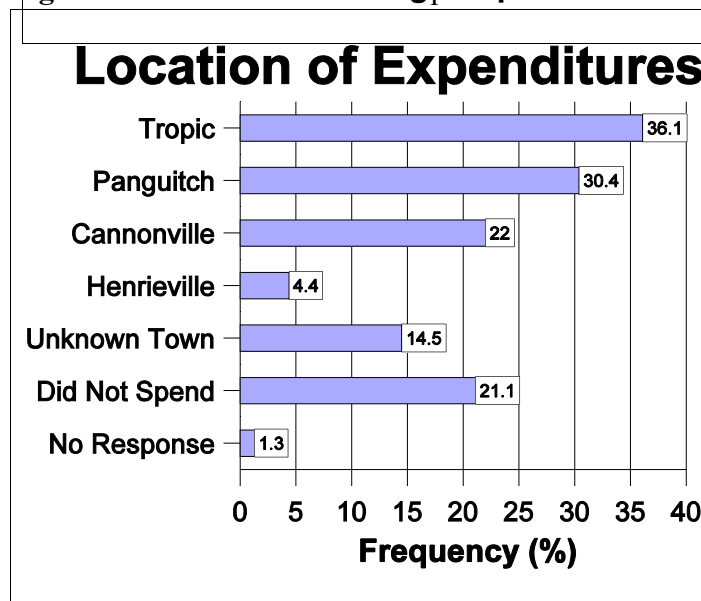


Figure 5: Location of Visitor Expenditures



spend any money in nearby towns.

According to visitor survey data, average group size was 3.2 individuals. Dividing this figure into the total amount spent per group (\$116.27), results in an average expenditure per person of about \$36.33.

Economic Impact

There were approximately 63,380 visitors to Kodachrome Basin State Park in 1998. Assuming that 77 percent of the 1998 Kodachrome visitors made purchases locally in connection to their visit to the park, we would find that about 48,803 visitors spent trip-related monies in nearby communities. Under these assumptions, total visitor impact during 1998 is calculated as follows:

C 48,803 visitors multiplied by \$36.33 visitor expenditure/trip amounts to about \$1,773,013 in total expenditures within the area.

To put total impact in perspective, we may look at how these expenditures compare to total annual sales within Garfield County (the county in which these communities are located). In 1998, gross taxable sales within Garfield County amounted to \$67,964,766. Consequently, Kodachrome's total 1998 visitor expenditures (\$1,773,013) would account for about 2.6 percent of the county's gross taxable sales.

One of the major shortcomings of this analysis is that we were unable to identify whether local visitor expenditures were directly connected Kodachrome Basin State Park. As was shown above, one of the most striking results of the survey was that only a small proportion (about 5 percent) of visitors indicated that Kodachrome was their primary destination. The vast majority of survey respondents indicated that Kodachrome is one stop within a larger tour of the area. As a result, it is difficult to determine if these expenditures would not have taken place anyway regardless of Kodachrome. Additional study is needed to more accurately assess visitor expenditures that are directly attributable to the park.

ISSUES AND RECOMMENDATIONS

A number of issues ranging from natural resource management to staffing, operations and funding were identified and addressed in this plan. Each of these issues were identified by various sources including input from planning team members as well as the public-at-large through public meetings and opinion surveys. Team members and the general public identified approximately 30 issues which were aggregated into six distinct categories. An analytical technique used to determine the park's strengths, weaknesses, opportunities and future threats (otherwise known as a "SWOT" analysis) was used to help develop these issues. A specific description or statement summarizing each issue or problem was constructed to clearly identify and articulate the problem at hand.

A number of constraints (e.g., available funding, sufficiency of staff, existing water supplies, etc.) will need to be addressed prior to issue resolution. Team members, planning staff and division experts identified some of the limiting factors that may hinder implementation of a specific team recommendation.

From these issues, and with the constraints in mind, the planning team developed specific recommendations. The team's recommendations were arrived at by consensus of opinion. Furthermore, team members agreed to ensure that recommendations are consistent with the vision elements listed within the mission and vision statements.

The six issue areas that form the basis of the team's recommendations include: natural resource management; education and information; facilities development; staffing, operations and funding; land acquisition and use; and collaborative partnerships. A key recommendation that should be mentioned here involves the formation of a Kodachrome Advisory Committee. Team members felt that such a group will be needed to help implement several of the recommendations listed in the plan and provide continuity to the process (the specific recommendation to form this group can be found in the following Collaborative Partnerships section). This committee will be referenced in many of the various recommendations. A discussion of specific team issues and

recommendations under each issue area follows.

Natural Resource Management

C Issue: Vegetation protection and enhancement

Under this issue it was determined that rare and unique plant species living within park boundaries should receive adequate protection to prevent future population declines. There is also concern about the need to maintain adequate levels of vegetation within park areas prone to erosion, human disturbance or identified for future facilities development.

Issue Area: Natural Resource Management

Key Issues:

- Vegetation Protection and Enhancement
- Erosion Control
- Cultural Resource Protection
- Watershed Protection

< Recommendations

Team members noted actions to minimize impacts to rare plant species found within the park. Furthermore, disturbed areas should be revegetated with native plant species. Specifically:

1. Overall management should be focused so as to prevent potential future listing of the plants on the Federal Endangered Species List

- C Develop a management plan to protect Stella's pepperplant and Nipple phacelia from disturbance and impact
- C Clearly identify sensitive locations/habitat areas; manage traffic at these areas; close if necessary
- C Educate public/visitors about each plant's value and their rare and unique characteristics; seek public assistance by staying on trails, not collecting souvenirs, restricting off-road motorized use; utilize photos of the plants to educate public/visitors

2. Identify and replant any disturbed areas with native species

C Issue: Erosion Control

During the summer months, the park is typically subject to frequent and intense thunderstorm activity. These brief but often heavy storms result in washouts along roads or significant soil erosion near trails, campgrounds or other facilities. Moreover, erosion is a concern for future development that may occur at the park (see Natural Hazards Analysis, p. 17, for related issues and recommendations concerning flood and fire risks).

< Recommendations

It was recommended that key areas - with a focus on safety first - be evaluated and prioritized to minimize the impact of flooding and erosion. Team members also agreed that further studies of visitor impacts upon the park's cryptobiotic soils should be conducted. Specific recommendations are as follows:

1. Prioritize critical erosion areas based on safety, use, facilities, etc.; trails, roads, campgrounds/facilities should be included; Actions to control park erosion include the following steps (when appropriate):

- C Ensure that an evaluation of erosion impacts/required mitigation is included in any potential development project at the park
- C Revegetate disturbed areas with native species; plant native grasses to hold the soil; utilize volunteers/community service groups for such projects
- C Use rock-type gabions or rock placement (rip-rap) to protect the soil
- C Look at the need for placement of catch basins to help stop/channel water



A twilight view of one of Kodachrome's "Sandpipes" (also referred to as "Chimneys").

- C Provide water turn-outs on trails and/or near facilities; ensure that barrow ditches and drain culverts along roads are cleaned before flooding season starts

2. Evaluate impacts on the park's cryptobiotic soils

C Issue: Cultural Resource Protection

While the park contains no known remnants of ancient civilization, it was felt that a need exists to identify, understand and protect cultural links between the park and nearby local communities. Efforts to articulate local cultural history will provide visitors unfamiliar with the area a better understanding and appreciation of the complex and dynamic interaction between the area's past, present and future inhabitants and the surrounding environment.

< Recommendations

Interaction with the local community is the key element in developing a better understanding of the area's cultural history. Team members identified the following recommendations:

1. Include local historical/cultural aspects in interpretive efforts

- C Develop an interpretive display along main (Kodachrome) road describing Civilian Conservation Corps-related activities/projects (utilize the Chimney Rock display as a model)
- C Identify/interpret park linkages with the local ranching history; Possible interpretive sites include:
 - < Eagle View trail
 - < Proposed visitor contact station

2. Continue interaction and involvement with local communities/local citizens groups

- C Promote contemporary social and cultural links with local communities
- C Use Kodachrome Basin State Park Advisory Committee to articulate cultural linkages
- C Contribute to a column in the local newspaper (on a quarterly basis) to keep people informed and educated about park-related events
- C Park staff should periodically provide informational programs to local schools

and service clubs

- C Involve citizens and schools to help identify actions to articulate and display cultural history of the park and adjacent communities

C Issue: Watershed Protection

The park's water supply dried-up during the summer of 1999. Although new water resources were eventually found, it became clear that there is a need to ensure that the area's watershed is protected and that water of a suitable quality can be obtained and maintained.

< Recommendations

The team identified actions to protect water quality within the park and to ensure that the park's water supply - which originates outside of park boundaries - is of sufficient quality. The following recommendations were developed:

1. Within park boundaries:

- C Evaluate facilities, roadways, new development and recreational use impacts to prevent surface and groundwater contamination

2. With respect to the watershed that is the source of the park's culinary water system:

- C Work with landowners (BLM, GSENM) to protect watershed and associated water supply

Education, Interpretation and Information

C Issue: There is currently a lack of accurate park maps

Visitors often express a need for more detailed information about the park and its trails, campgrounds and related facilities. To

meet visitor needs, more accurate park maps that provide information on locations, direction and

Issue Area: Education,
Interpretation and
Information

Key Issues:

- Lack of accurate park maps
- Lack of interpretive information
- Need for better marketing/exposure

distances for trails, sites, facilities as well as adjacent points of interest should be developed.

< ***Recommendations***

It was determined that the park's mapping needs be evaluated and that accurate, high-quality maps be developed appropriately. Again, there was an emphasis on coordination with outside entities as well as Division personnel to achieve mapping and information goals. Team members identified a number of steps to meet these needs:

1. Identify mapping needs and produce accurate/professional quality, visitor-friendly maps (for trails, facilities, and roads)

- C Utilize GPS work to map all park roads, trails, features and facilities; also determine trail distances (coordinate with the Division's Planning and Public Affairs Sections for information)
- C Evaluate map and brochure needs for the park; If need exists, the following map/brochure attributes should be considered:
 - < Numeric or symbolic legends corresponding to a number/symbol posted along the trail that allow visitors to determine location
 - < Addition of foreign language text "inserts" to brochures/maps
 - < Distinguish trails using a color-coded scheme (with similarly color-coded numerical/symbolic delineators)
 - < While the use of trail signs/delineators is appropriate, placement should be minimized to prevent degradation of the park's scenic values
- C Seek partnerships with local communities, Garfield County Travel Council, or other appropriate entities to obtain input and funding for the production of maps
- C Utilize interns or volunteers to help provide accurate mapping data
- C Update (as needed) all relevant information; ensure that it is accurate
- C Provide maps at the proposed Visitor Contact Station that allow a self-guided drive or hike through the park

C Issue: There is currently a lack of adequate interpretive information

Visitors frequently indicate that they would like to see more information about park history, area history, park resources, geology, wildlife, botany, trail descriptions, cultural resources, and other applicable information. The park currently lacks detailed and accurate interpretive information regarding these subjects. Additional interpretive information - brochures, trail guides, interpretive displays, foreign language assistance - is needed.

< ***Recommendations***

Team members identified actions to ensure that visitors are supplied with adequate information about the park's natural and historical features. It was recommended that information be distributed by various means such as brochures, interpretive displays and on-site programs.

Team recommendations specify the following activities:

1. **Identify brochure needs; ensure that visitors are provided with a sufficient amount of educational information about the park's natural features, including: park history; area history; geology; wildlife; botany; paleontology; trail descriptions; cultural resources; and other information as applicable**
2. **Develop professional quality interpretive displays at:**
 - C The proposed visitor contact station
 - C Trailheads (via development of informational kiosks as needed)
 - C Day-use parking and turnaround areas
 - C Other sites as needed
3. **Identify collaborative opportunities for development of interpretive efforts**
 - C Identify interpretive research and funding opportunities, utilize Southern Utah University, interpretive grants, heritage grants, etc.
 - C Explore opportunities for foreign language translation as needed
 - < Utilize volunteers, universities, National Guard, etc.
4. **Establish weekly campfire programs at the park**
 - C Locate a site - preferably near power sources and within close proximity of the campground - and construct an amphitheater that has the ability to show slides, presentations, etc.

- C In addition to park staff, involve outside agencies, volunteers, or others to give campfire programs

5. Complete a basic paleontological survey of relevant park areas

C Issue: Need for better marketing and exposure

Team members identified a need to present the park's unique features and attributes on a more widespread basis. While one of the team's objectives is to maintain the park's uncrowded characteristics, it is felt that Kodachrome Basin should be better connected with other nearby recreational attractions (Bryce Canyon, Grand Staircase-Escalante National Monument, etc.).

< Recommendations

Under these recommendations, an emphasis was placed on luring more visitors to the area - particularly in the off-season - by more effective marketing of positive park features that clearly distinguish Kodachrome from other nearby recreation areas (which may not be as attractive during the "shoulder" seasons). Such an emphasis will help visitors define expectations before they enter the gate. Collaboration with local citizens, local leaders, private business and other public and private entities is key in effectively "spreading the word" about Kodachrome and the surrounding area.

1. Expand available information about the park; define what visitors may expect to encounter or experience at the park beforehand

- C Collaborate with various agencies or entities
 - < Coordinate with Garfield County to expand travel brochures they currently produce (with regards to information about the park)
 - < Create Internet links to National Park Websites or other local travel sites
 - < Organize a "show-me"/familiarization tour for local businesses, local schools, local citizens and tour operators
 - < Coordinate efforts with the Kodak and Fuji film companies to gain more exposure and obtain private funding
 - < Coordinate with tour operators to market a "three state park tour" (e.g.,

Kodachrome, Escalante, Anasazi) along Highway 12

- < Advocate for schools to develop a tourism course for credit
- < Distribute Kodachrome maps to local tourist attractions, show tourists how to get to the park
- < Provide a coupon to local citizens to visit the park (free of charge) so they will become more familiar with the park and its associated resources
- < Explore possibility of developing a high quality poster (about the park) to be distributed in outlying areas.

C Limit park advertising/keep marketing low key until additional funding is available for new facilities

C Promote a day-use pass valid for more than just one park; sell through businesses which they can market as part of a total tour package

C Coordinate efforts with the Division's Public Affairs and Volunteer Services sections for development of interpretive information and marketing efforts

- < Ensure that Kodachrome information is available on the Division's website

2. Focus marketing efforts to expand visitation during "off" season by emphasizing distinguishing park attributes:

C Emphasize differences or advantages not found at nearby parks:

- < Small size, warmer wintertime climate, unique geology/"western" scenery, solitude

Facilities Development

Overview

While a need exists to accommodate the increasing number of visitors, the planning team recommends that development should not negatively impact park solitude or its uncrowded atmosphere. For example, it was determined that any potential expansion of current facilities - campgrounds in particular - must have privacy as the top design criteria. Designers must also utilize natural features such as trees and topography to separate (or consolidate) visitor sites. It was also recommended that Division staff analyze the park's carrying capacity using the National Park Service's "Visitor Experience Model" as development occurs.

Issue Area: Facilities Development

Key Issues:

- Inadequate roadways
- Insufficient, undependable water supply
- Need to better accommodate day use
- Need for a visitor contact station/visitor center
- Need for additional directional signs
- Additional camping facilities
- Need for additional trails
- Install additional fencing
- Expand current concession facilities

C Issue: Current park roadways are inadequate

There is concern that current park road design does not effectively handle traffic volume or flow. A significant portion of day-use traffic flows through the existing campground loop. In fact, the campground loop is a major "turn-around" point for traffic. This has negatively impacts camper safety, privacy and is an inconvenience to motorists. Several visitors expressed concern about all-weather accessibility along roads leading to the adjacent Chimney Rock and Grosevnor Arch sites (which are not within park boundaries). Emergency crews from nearby communities were also concerned about the limited access of the park's confined roadways.

< Recommendations

Team members recommend that the following actions be implemented to improve traffic flow and access within the park:

1. Develop a vehicle turn-around outside of existing campground

- C Road traffic should be clearly separated to minimize traffic flow into the campground
- C Place appropriate road signs to clearly distinguish the turn-around area from the campground (campground should be delineated as a turn-off from the main road)
- C The proposed turn-around should accommodate day-use parking including buses.
- C Turn-around will serve as a trailhead access and should also include picnic areas for day-use
- C Divisional facilities and construction experts should study the area for feasibility, size and placement



Proposed turn-around area including Eagles View Trailhead

2. Pave Priority Roads

- C The road to Shakespeare Arch should be paved
- C The road to Chimney Rock should be paved (note that both roads terminate outside of park boundaries hence, paving each road *entirely* would be dependent upon associated land acquisition)

3. Maintain and upgrade unpaved roads for year-round travel

C Issue: The park has an insufficient, undependable water supply

As mentioned earlier, the park's current water supply (a spring-fed well) dried up during the summer of 1999. Supply was resumed by plumbing deeper into the existing well. However, this well is questionable as a long-term source of water. There are additional concerns regarding water quality, conveyance and storage. Current park facilities cannot effectively operate without a sufficient and reliable water supply. The lack of sufficient, reliable water resources will likely prohibit the development of additional facilities.

< ***Recommendations***

The planning team adopted four recommendations to ensure that the park has access to water sources, that water resources are conserved and that supplies are commensurate with visitor needs:

- 1. The park needs to obtain a workable, long-term/permanent easement from BLM to ensure access to the park's water line and spring area (water source)**
 - C Obtain an expanded permit to provide future maintenance of water system on BLM lands
 - C Monitor and prove-up on existing water rights
- 2. Ensure that water - both in terms of quality *and* quantity - meets well-designed facility needs**
 - C Enhance the park's water storage capacity through construction of new water storage facilities; determine appropriate tank size/storage needs taking into consideration site selection and placement
 - C Increase size of pipeline (if warranted)
 - C Explore other water sources in case current sources are unavailable
- 3. Adopt and utilize water conservation measures in all facilities and limit landscaping practices requiring excess amounts of water (particularly grass)**
 - C Employ landscaping practices that minimize water use
 - C Install low-flow plumbing fixtures
 - C Coordinate with the Divisions of Water Resources and Water Rights for guidance
- 4. Develop political support for park water issues by coordinating with legislators, congressional delegation, local officials, the governor's office or other appropriate entities**

C Issue: Need to better accommodate day use

Survey research shows that approximately 65 percent of park visitors stay at the park for one day or less. However, facilities to accommodate such visitors - parking, picnic areas, restrooms - are lacking at the park.

< ***Recommendations***

1. **Accurately identify day use needs and identify potential location for sights to ensure that the park maintains its uncrowded characteristics. Potential day use development should include the following actions:**
 - C Develop a traffic turnaround area that includes sufficient day-use parking, trailhead access, and shaded picnic facilities
 - C Develop a parking area south of Trailhead Station
 - C Expand the Shakespeare Arch parking area
2. **Develop partnerships with communities, schools and private businesses (Kodak in particular) to assist with funding needs**

C Issue: Need for a Visitor Contact Station

A visitor contact station is needed to more effectively collect entrance fees and provide visitors with park-related information. Such a facility should also serve as a visitor center to educate and inform visitors about the park and enhance communication and contact with park staff. This facility will result in a more efficient dispersal of information.

< ***Recommendations***

Team members identified a need for both a contact station and a visitor center during the issue development phase. The team ultimately recommended that these two facilities be combined to serve a dual role. Specific recommendations were developed as follows:

1. **A contact station should be a top priority and could be constructed to serve the same purpose as a visitor center. This facility should:**
 - C be sufficiently staffed
 - C have designated hours of operation
 - C consider potential retail attributes
2. **The facility should be placed near the park's main entrance.**
 - C the station should be located near the main road junction that lies approximately 3,000 feet north of the current fee station.

3. Facility design should provide for the following aesthetic features:

- C adequate parking; visitor safety; an un-cramped, welcoming atmosphere that is “customer friendly”; allow for future expansion

C Issue: Need for additional directional signs within the park

The park currently lacks adequate directional signs providing information regarding location, direction and distances. This issue was a frequent concern for many of the survey respondents.

< Recommendations

Team members acknowledge that signs are an issue. However, there was consensus among the group that this issue requires additional study. Moreover, sign placement within the park must conform to the attributes listed in the mission/vision statement. With these issues in mind, the team identified the following recommendations:

1. Study the need for additional signs; If need is determined:

- C Identify directional/distance sign needs for roadways
- C Identify directional/distance sign needs for trails
 - < Install numbered directional signs that correspond with trail/park maps to ensure visitors do not get lost or can find their way around the area; signs should correspond to maps
 - < Accurate trail information with strategically-placed guiding features
 - < Include mileage on maps or signs as needed
- C Include the use of volunteers for placement of signs
- C If more signs are needed use older “period” materials and methods rather than modern day-glow types or metal – reinforce a “park-based” landscape architecture style

C Issue: Additional camping space developed as visitation increases

There is a concern that the park will lack adequate camping space as visitation increases. Park management notes that camping space is limited during the peak season.

< ***Recommendations***

Team members determined that additional campground development is not an immediate need and rather should be viewed as an action that should take place in the long term (e.g., in the next five years or so). Team members generally felt that other current facilities development needs were more apparent in the short term. It was emphasized that campground development must adhere to the same constraints listed above, namely, accommodating visitors without disrupting area solitude. With these constraints in mind, the team listed the following recommendations:

1. Develop additional camping as needs increase

- C Any additional campsites should be disbursed for privacy -- do not expand facilities to the extent of creating an overcrowded situation
- C Evaluate the feasibility of implementing a new campground loop at either the “flat” area located near the junction or near the existing campground area (with hookups only for campground host site)
- C Provide additional restroom and shower facilities - commensurate with potential campsite expansion
- C Encourage private enterprise to handle the excess demand for more camping in the area, particularly the “high impact” campers (i.e., large recreational vehicles requiring large amounts of space with hookups) or other diverse camping experiences



C Issue: Need for additional/well-marked, well-defined trails

The park needs to develop additional trails and clearly identify ADA-accessible trails. Concern was also expressed about “dispersed” use occurring off of designated trails.

< Recommendations

Team members identified potential sites for new trails. It was also determined that a general trail plan should be developed to deal with current trail usage as well as new construction and maintenance. The following recommendations were identified:

1. Periodically update inventory of existing trails

2. Determine trail development/maintenance needs; if need exists:

- C Develop a clear trail plan
- C Evaluate “dispersed” trails currently being used by hikers and determine if they should be closed or included in the park’s trail system
- C Sign closed areas appropriately (example: “Revegetation Area”)
- C Prioritize trails or areas for development
- C Prioritize upgrade and maintenance needs
- C Utilize volunteer programs to assist with trail development and maintenance (e.g., schools, special interest groups, clubs, etc.)
- C Re-open trail to Henrieville (note this would require collaboration with BLM, GSENM and private land owners) and use appropriate signs/interpretation with particular attention focused on articulating cultural history
- C Potential Trail Development Sites:
 - < Hogan Temple “spur” (off existing Panorama trail)
 - < Trail from Chimney Rock to existing Eagle View trail (contingent upon acquisition of SITLA, BLM/GSENM cooperation and feasibility)
 - < Alternate trail to Shakespeare Arch (contingent upon campground development in “flat” area)
- C Identify and mark ADA-accessible trail (nature trail) on maps and signs

C Issue: Need for additional fencing at park

Additional fencing is needed at the park. Fencing will help protect park resources and enhance visual aesthetics.

< Recommendations

Team members determined that a rail-type fence should be installed near the park's entrance. Another fence should be installed at the park's eastern boundary to better manage grazing activities. Specific recommendations are as follows:

- 1. Install a rail fence (for at least 100-200 feet) at entrance to enhance aesthetic value**
- 2. Fence east portion of park (on boundary line); If appropriate, negotiate to establish grazing rights with the Division**

C Issue: Need for expansion of concession facilities

Increasing visitation has created a need to expand current concessionaire facilities to more effectively meet customer demands. For example, many patrons express a need for an indoor lounge and restroom area.

< Recommendations

Limited expansion of the current facilities was recommended to handle current visitor demand. Long-term needs cannot be clearly identified at this time. It was suggested that the concessionaire develop a long-range plan and work with park staff as well as the proposed Kodachrome Advisory Committee as long-term needs become apparent. Specific recommendations are to:

- 1. Determine future concession needs in accordance with Mission/Vision Statement**
 - C Allow building expansion for lounge area and restroom upgrades**
 - C Long-term development requests should be approved by the Kodachrome Advisory Committee and Division personnel**

Staffing, Operations and Funding

C Issue: Need for adequate park staff

Park staffing needs will increase as RMP components are implemented, visitation increases and management needs change. For example, an interpretive position is needed to effectively implement desired interpretive/educational programs.

Issue Area: Staffing, Operations and Funding

Key Issues:

- Need for adequate park staffing
- Limited funding sources

< Recommendations

It is anticipated that at least one full-time-equivalent (FTE) employee position will be needed to carry out many of the recommendations listed within this plan. Additional seasonal help will be required as well. Recommendations were developed as follows:

- 1. Complete a staffing needs analysis; Prepare a plan to evaluate and strengthen support for funding and staffing, commensurate with developments/enhancements to park**
- 2. Increased staffing is needed to provide visitor services particularly during the evening hours, e.g., a staffed contact station for most of the day and into the evening (contingent upon development of contact station)**
 - C Need for additional seasonal time
 - C Need for an interpretive ranger (this needs to be an FTE)
 - C Need for a clerk/receptionist for proposed contact station (may be a seasonal position)
- 3. Separate management responsibilities from Escalante State Park**
- 4. Utilize volunteers to meet additional staffing needs**
 - C Local students/interns/school career programs
 - C Utilize retirees

C Issue: Difficulties in obtaining adequate funding

Implementation of the resource management plan is largely contingent upon the Division's ability to obtain capital development funds, personnel funding, grants, partnership monies, private sponsorships or other funding sources. Such funding is constrained by legislative priorities, Division of Facilities, Construction and Maintenance priorities, Departmental priorities and the availability of external funding.

< ***Recommendations***

Team members noted that the scarcity of funds will require a prioritization of development projects recommended within this document. Enlisting support of legislators is a key goal. The recommendations were listed as follows:

1. **Complete a facilities development plan to determine capital development funding needs (based on the recommendations included in the completed RMP)**
 - C Prioritize facilities needs
 - C Integrate park needs into the Divisional capital facilities priorities list
 - C Explore funding partnerships using local representatives via organization of a local funding team to identify and approve funding sources (may be an adjunct responsibility to the proposed Kodachrome Advisory Committee)
 - C Develop legislative support for funding
2. **With implementation of RMP development components, bring key legislative committee members to the park to strengthen understanding of proposals**
 - C Distribute copies of RMP to legislators
3. **Seek alternative funding through partnerships**

Land Acquisition

C Issue: Adjacent Bureau of Land Management (BLM) Areas

Increasing visitation and use within the park's confined present boundaries may lead to

Issue Area: Land Acquisition

Key Issues:

- Adjacent Bureau of Land Management areas
- School and Institutional Trust Lands Administration (SITLA) Areas
- Adjacent Land Use

increased congestion and a subsequent decline in visitor solitude. Adjacent BLM lands may need to be acquired to accommodate visitor growth and help maintain the park's uncrowded characteristics. Acquisition will also provide improved access to key park features and will help park staff manage the area more effectively.

< ***Recommendations***

The team identified several adjacent BLM parcels that should be acquired to expand the park's trail system. Obtaining support from the congressional delegation will be key to the successful implementation of this recommendation. Specifically:

1. Acquire parcels associated with the North Eagle View Trail and lands southeast of the park including Shakespeare Trailhead

- C Work with Divisional Lands Coordinator
- C Coordinate with Governor, DNR administration, legislators, and congressional delegation to support a trade or purchase
- C Enter agreement with BLM to acquire or manage recommended lands

C Issue: School and Institutional Trust Lands (SITLA) Administration Areas

One of the most well-known features of the area - Chimney Rock - is not within park boundaries. Chimney Rock lies within a section of SITLA lands that is directly adjacent to park boundaries. In fact, visitors must enter the park to access the site (which is maintained by park staff). Although it is not within the park proper, Chimney Rock is one of its main attractions. Consequently, efforts should be made to acquire the site as part of the park.

< ***Recommendations***

1. Acquire identified SITLA lands

- C Develop congressional/legislative support to help acquire identified SITLA lands
- C Partner with counties and request a transfer of SITLA lands
- C Work with the Division's Lands Coordinator to tackle these issues

C Issue: Adjacent Land Use

There is a concern that future use on lands adjacent to the park - both public and private - may not be consistent with park values. Inconsistent development or use may detract from the park's scenic beauty or may negatively impact its unique resources.

< Recommendations

Team members noted concern that potential mining operations on federal lands near the park may be inconsistent with the team's mission and vision. Moreover, several BLM parcels "buffer" the park and the GSENM. To ensure consistency of use, the team recommends the following:

1. **Prioritize parcels which are of greatest concern and negotiate accordingly with the appropriate owner**
2. **Identify and follow Divisional land use policies**
3. **Develop an Memorandum of Understanding (MOU) with BLM to manage lands consistently**
C Advocate for compatible use as defined by the Mission/Vision Statement
4. **Maintain an open dialogue with BLM as well as communities and the counties**
5. **Maintain a good working relationship with local cattle operators**
6. **Work with adjacent private landowners to assure that potential development does not conflict with the mission and vision of the park**

Collaborative Partnerships

Overview

Team members identified three primary issues which require cooperation and interaction with government entities and

Issue Area: Collaborative Partnerships

Key Issues:

- Need for all-weather accessible roads
- Interaction with the Bureau of Land Management/Grand Staircase-Escalante National Monument, Counties, Local Communities and Private Landowners
- Directional Signs on Highway 12

private landowners: accessibility of roads within the Grand Staircase-Escalante National Monument; establishment of interactive relationships with the federal and local governments and private landowners to deal with matters that may affect the park; and appropriate signing on Highway 12. The recommendations developed under this area more clearly define the Division's role in advocacy and coordination with issues typically beyond the scope of park management.

C Issue: Need for all-weather accessibility on roads to the south and west of the park

The nearby Cottonwood Wash road which runs south of Highway 12 through the Grand Staircase-Escalante National Monument into Kane County is a frequently utilized route. However, it is often inaccessible during periods of bad weather. Moreover, park staff are called upon to assist with the recovery of stranded motorists. There are similar concerns regarding access and use of the Skutumpah/Kodachrome road.

< Recommendations

While these roads fall beyond park boundaries, park staff are often the only individuals within the vicinity that can render assistance to stranded motorists. Consequently, to minimize both the safety hazards to motorists and reduce park management time and related costs associated with rescue, the team recommends that the roads be improved for all-weather access. The team acknowledges that this recommendation is based on advocacy and is beyond the jurisdictional purview of the park. The team further acknowledges that two separate planning processes - one for the Grand Staircase-Escalante National Monument and the second, a transportation plan for Kane County - previously dealt with many other issues including economic and resource protection issues. Both plans recommended limited maintenance on these roads.

1. The Kodachrome Basin State Park Planning Team advocates for all-weather access along the Cottonwood Wash road

C Rationale: Visitor safety (rescue responsibility); visitor access/opportunity

C The Division/Park Management should utilize appropriate interagency forums to

advocate position (specifically forums involving Garfield and Kane counties, UDOT, BLM and GSENM)

C The Division/Park Management should continue to support counties in their efforts to improve roads

C Park Management should keep accurate records of visitor problems

2. The Kodachrome Basin State Park Planning Team advocates for all-weather access along the Skutumpah/Kodachrome road

C Rationale: Visitor safety (rescue responsibility); visitor access/opportunity

C The Division/Park Management should utilize appropriate interagency forums to advocate position (specifically forums involving Garfield and Kane counties, UDOT, BLM and GSENM)

C The Division/Park Management should continue to support counties in their efforts to improve roads

C Issue: A need exists for an interactive relationship between Kodachrome Basin State Park, the Grand Staircase-Escalante National Monument (GSENM), BLM, Counties, Local Communities and Private Landowners

There is a need for enhanced interagency cooperation between Kodachrome Basin State Park, BLM, counties, local communities and private landowners. BLM lands - including the Grand Staircase-Escalante National Monument - encompass the park's boundaries. Management practices and policies vary - often significantly - between the state and the federal government. This has become especially acute with the advent of the monument in 1996. As a consequence, activities that may be acceptable within Kodachrome Basin State Park may not be congruent with BLM/Monument policy or vice versa. Moreover, there is a wealth of information regarding interpretation/education, resources, recreation opportunities, visitation, safety, etc., which could be shared. Such cooperation would reduce the likelihood of conflict and would help each agency manage its affairs more efficiently.

Kodachrome Basin State Park has many impacts - socioeconomic, roads and other infrastructure,

etc. - upon Kane and Garfield Counties as well as local communities such as Cannonville, Tropic and Henrieville. It is essential that interactive relationships be established to capitalize on issues such as tourism, linkages to other area recreation sites, and efficient infrastructure maintenance and development.

There is also a need for the park to ensure proper coordination and interaction with private landowners. Clearly, management actions occurring within park boundaries may significantly impact nearby landowners (and vice versa). Coordination between the park and its private neighbors is essential to minimize conflict and misunderstanding.

< ***Recommendations***

The planning team recognizes that the park needs to be intimately involved in the actions of outside entities regarding issues that may have impact. It is essential that the park enhance its relationship with its neighbors to effectively communicate and coordinate important issues and implement the recommendations contained within this plan. Accordingly, the following recommendations were developed:

1. Organize a Kodachrome Advisory Committee comprised of area stakeholders to implement RMP components and deal with other issues as they arise

- C The committee will be guided by the Kodachrome RMP Mission/Vision statements
- C The committee will advocate for park needs with local/state/federal governments and private stakeholders

2. Continue to effectively communicate, interact, coordinate, and maintain good relationships with BLM/GSENM

- C The Park Manager and Kodachrome Advisory Committee is involved with and expresses concerns and ideas with formal BLM/GSENM interagency planning/management committee
- C Park Manager/Kodachrome Advisory Committee seek other forums for interagency/public participation

3. **Coordinate with BLM on road issues for areas that access or are adjacent to the park**
 - C Define responsibilities for search, rescue, and emergency medical services (includes State Parks, counties, GSENM, BLM)
 - C Formalize responsibilities under a Memorandum of Understanding or contract
4. **Continue to interact with and maintain good relationship with counties (particularly Kane County) and local communities**
 - C Initiate more outreach/interpretive programs through schools
 - C Utilize the Kodachrome Advisory Committee to work on these issues
 - C Ensure that all potential participants are informed about accomplishments and future plans (no surprises)
 - C Work with counties on road improvements necessary to ensure access to the park from all directions
5. **Pursue formal participation in Garfield County's interagency meetings**
6. **Maintain good relations with private land owners and permittees (outfitters, guides and grazing)**
 - C Coordinate on issues related to land development, roads, easements, stock tanks, fencing, etc.

C Issue: Need for Additional Directional Signs on Highway 12

Many park visitors have difficulty locating Kodachrome Basin State Park because Highway 12, the main artery feeding the park, lacks sufficient directional and mileage signs. Consequently, there is a need enhance directional signage along Highway 12.

< Recommendations

To deal with this issue, it is recommended that the Division/Park Management:

1. **Coordinate with Utah Department of Transportation on implementation of signing**
 - C Find partnerships with Garfield County Travel Council, local communities and other appropriate entities

- C Park staff should develop a list of needed signs
- C Contact UDOT with sign list
- C Consider alternative funding options for the signs (or wait for UDOT)

CONCLUSION

This plan is a blueprint to help implement the planning team's recommendations. As such, it outlines the initial steps to be taken in concert with users, local communities and other interested users to preserve park resources, effectively educate visitors, enhance customer service and properly develop facilities to meet the park's wide ranging user needs.

The recommendations contained in this plan conform to the team's mission of providing visitors a safe, satisfying recreational experience while allowing them opportunities to learn about and interact with the park's unique resources. This central theme was considered with the development of each recommendation.

The plan's recommendations effectively deal with current trends concerning day use, facility needs and enhancement of education/interpretation efforts. However, it is crucial that adequate funding be received to implement these goals and accommodate visitor needs. As stated earlier, the plan's success is dependent upon the continued support of park stakeholders. Stakeholders must continue their efforts to preserve park resources, interact with local communities and strive to meet the expectations of park visitors in the midst of a rapidly growing community of recreation-oriented citizens. The recommendations contained within this plan were based upon an open and collaborative process. It is imperative that this collaborative spirit continue as the plan's components are implemented.

It is also imperative that the document be reviewed on a regular basis to ensure its viability, relevance and usefulness. This document has sufficient flexibility to be amended in response to changing resource conditions, visitor needs and expectations, community needs and agency priorities. Such amendments may occur under the auspices of The Utah Division of Parks and Recreation working in conjunction with the proposed Kodachrome Advisory Committee. Any such changes will include input from park visitors, local citizens, community leaders, park management or other stakeholder with interests relevant to the operations and maintenance of the park.

References

- Bahr, Rosalind (Rosie). (1999). Kodachrome Basin State Park: Visitor Survey Results, October 1999. (Salt Lake City: Utah DNR, Division of Parks and Recreation).
- Bannan, Jan. (1995). Utah State Parks: A Complete Recreation Guide (Seattle, WA: Mountaineer Publishing), pp. 178-182.
- Bryce Canyon Natural History Association. (1999). Mystery in Stone: Geology of Kodachrome Basin State Park, (Bryce Canyon, UT), informational pamphlet prepared for Kodachrome Basin State Park.
- James, William. (1999). Interim Report: Field Survey of Kodachrome Basin State Park. (Salt Lake City: Utah Department of Natural Resources [DNR], Utah Natural Heritage Program, Division of Wildlife Resources), pp. 8-16.
- Latady, William R. (1999). A Cultural Resource Inventory of the Proposed Kodachrome Campground: Kodachrome Basin State Park. (Boulder: Utah DNR, Division of Parks and Recreation, Heritage Resource Section, Anasazi State Park).
- May, Fred, Ph.D. (1999). Interim Report: Natural Hazards Analysis of Escalante and Kodachrome Basin State Parks. (Salt Lake City: Utah Division of Comprehensive Emergency Management).
- National Oceanic and Atmospheric Administration. (1991). Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, Utah, 1961 - 1990. (Asheville, N.C.), Climatology of the United States, Circular #81.
- State of Utah. (1959). Report of the Utah State Park and Recreation Commission. (Statewide inventory of 118 potential state park sites, 1957-59 by Blue Ribbon Committee) (Salt Lake City: Utah State Park and Recreation Commission), p. 80.
- _____. (1996). County Profiles: Garfield County. (Internet Website) (Salt Lake City, UT: Governor's Office of Planning and Budget, Demographic and Economic Analysis Section)
- _____. (1996). County Profiles: Kane County. (Internet Website) (Salt Lake City, UT: Governor's Office of Planning and Budget, Demographic and Economic Analysis Section)
- _____. (1999). Taxable Retail Sales, Services and Purchases in the State of Utah: Calendar Years 1994 Through 1998 and 4th Quarter 1998. (Salt Lake City: Utah State Tax Commission - Research Publication 99-18), pp.18, 22.

Utah Division of Parks and Recreation. (1998). Snow Canyon Resource Management Plan. (Salt Lake City: Utah DNR, Division of Parks and Recreation).

_____. (1980 - 1999). "Data gathered from Utah State Parks and Recreation Visitation Reports, 1980 - 1998." (Salt Lake City: Utah DNR, Division of Parks and Recreation).

_____. (1999). Goblin Valley Resource Management Plan. (Salt Lake City: Utah DNR, Division of Parks and Recreation).

_____. (1996). Frontiers 2000: A System Plan to Guide Utah State Parks and Recreation into the 21st Century. (Salt Lake City: Utah DNR, Division of Parks and Recreation), p. 38.

Young, John V. (1989). State Parks of Utah: A Guide and History (Salt Lake City: University of Utah Press), pp. 109-111.

Zarekarizi, Susan. (1999). "Unpublished series of draft GIS maps for Kodachrome Basin State Park for planning and management analysis," (Salt Lake City: Utah DNR, Division of Parks and Recreation).

MAPS

Plate 1 Unique Flora

Plate 2 Facilities of Kodachrome Basin State Park

Plate 3 Proposed Day Use Areas

Plate 4 The Trails of Kodachrome Basin State Park

Plate 5 Proposed Trails

Plate 6 Land Ownership

APPENDIX A

Biological Field Surveys: Kodachrome Basin State Park

**ZOOLOGICAL AND BOTANICAL INVENTORIES OF
KODACHROME BASIN STATE PARK**

Final Report

by

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29 February 2000

INTRODUCTION

To facilitate the resource management planning process for Kodachrome Basin State Park, the Utah Division of Parks and Recreation (UDPR) entered into a cooperative agreement with the Utah Division of Wildlife Resources (UDWR) for UDWR to conduct field surveys of plants and animals occurring in the Park. Surveys were conducted by UDWR's Utah Natural Heritage Program (UTNHP); this report presents the results of those surveys. Plant and animal checklists for Kodachrome Basin State Park are included at the end of this report, in Appendices A and B respectively.

STUDY AREA

Kodachrome Basin State Park lies in the Colorado Plateau Ecoregion of southeastern Utah. It is characterized by temperature extremes and aridity, and is lacking permanent surface water with the exception of an overflow-stream from the Park's water system. The plant communities are primarily piñon-juniper / mixed desert shrub, salt desert shrub, piñon-juniper / grass, grass / forb, big sagebrush, and black sagebrush. Substrates are fine textured clay soils, sandy clay, gravel, and sandstone. The fine textured soils were observed to occasionally support spectacular displays of biological soil crusts. Precipitous slopes (with occasional gravel-boulder alluvium), sandstone outcrops, and striped gypsum hills dominate the Park. The elevation of the study area ranges between 1718 m (5635 ft) and 2002 m (6570 ft).

PLANT INVENTORY

Methods

The UTNHP botanist conducted the botanical inventory of Kodachrome Basin State Park on 15, 16, and 17 July 1999, and on 15 and 16 September 1999. The inventory was conducted by hiking to and then searching the various plant communities within the Park.

Prior to 1999, a former member of the Kodachrome Basin State Park staff prepared a ring binder of plant pieces and photos entitled "Kodachrome State Park Wildflowers." The plants from the binder that were not observed by the UTNHP botanist during the 1999 botanical inventory are included separately in the attached plant checklist (Appendix A). Furthermore, a previous project completed by the UTNHP botanist in 1989 immediately adjacent to the Park's southern boundary provides a third list of

plants. These plants are potentially within the Park, and are listed separately in Appendix A.

Results

Due to the lateness of the initial visit, spring annual species had come and gone, and most perennials were in fruit or dispersing seed. Identifications were sometimes only determinable to genus, or only to species where varieties were available. A complete list of the plant species observed is included in Appendix A. Notable plant species observed are discussed below.

Stella's pepper-plant, *Lepidium montanum* var. *stellae*. Although not currently a species of concern to any Federal agency, this plant is on the Tracking List of the Utah Natural Heritage Program. In the Park, it was observed along and in the vicinity of the north end of the Coach Trail opposite the Nature Trail alcove, and again at the south end of the Park on the first mesa top immediately west of the Park's access road (see Figure 1). It is likely to be found at other locations in the Park. Stella's pepper-plant is known only from a very narrow distribution in Kane County; from scattered locations immediately south of the Park boundary and to the southwest on Skutumpah Terrace and vicinity. Throughout its range, it grows on gypsiferous outcrops, on down-slope soils influenced by those layers (sometimes sandy wash bottoms), and, less frequently, on accumulated duff under piñons and along drainage channels. Soils vary from clay, to sandy silts, to fine sands with a high gypsum content. It grows in piñon-juniper communities with scattered shrubs, perennial herbs, and bunch grasses at elevations ranging from 1700 m (5577 ft) to 1900 m (6234 ft).

Nipple phacelia, *Phacelia mammillarensis*. Although not currently a species of concern to any Federal agency, this plant is on the Watch List of the Utah Natural Heritage Program. This plant was observed at a single location in the Park, i.e., at the south end of the Park on the steep precipitous west slope of the of the first mesa immediately west of the Park's main access road (see Figure 1). It has a narrow distribution in Kane and Garfield counties. This species grows on gypsiferous soils in salt and mixed desert shrub communities with occasional perennial herbs at 1220 m (4003 ft) to 1830 m (6004 ft) elevation (Welsh et al. 1993).

Meager camissonia, *Camissonia exilis*. The meager camissonia is on the BLM's Sensitive Species List and on UTNHP's Tracking List. Although it was not found in the Park, it has been found nearby, and potential habitat exists within the Park.

Kodachrome bladderpod, *Lesquerella tumulosa*. This plant, Federally-listed as Endangered and on UTNHP's Tracking List, is found very near the Park's southern boundary. It is not known from the Park, however, and there does not appear to be potential habitat for this species within the Park.

Recommendations

The locations of nipple phacelia and Stella's pepper-plant at the south end of the Park are at an isolated location where habitat impacts from Park visitors and development are currently not a concern. The second site of Stella's pepper-plant, at the north end of the Coach Trail alcove, is in the vicinity of visitor activities. During 1999, however, it appeared that Park visitors were remaining on designated trails in the area, and no impacts to the plants were occurring. The nipple phacelia and Stella's pepper-plant in Kodachrome Basin State Park do not appear to need any special management at this time. It is recommended, however, that the presence of these species be considered in the planning of future projects within the Park.

The Nature Trail has a stop that provides a brief interpretation of biological soil crusts. There are, along a trail on the east side of Kodachrome Flat, additional areas where the crusts are particularly spectacular. It is suggested that additional interpretation could be provided at one of these more spectacular displays. An update of the Nature Trail Guide could also inform visitors that soil crusts can be observed at other locations in the Park.

Further Study

Due to the lateness of the initial visit, spring annual species had come and gone, and most perennials were in fruit and dispersing seed. Future botanical inventory should include the period of April through June, a period of time during which numerous additional plant species will likely be found in the Park.

ANIMAL INVENTORY

Methods

Two UTNHP zoologists conducted animal inventories in Kodachrome Basin State Park on 11 July 1999, and on 28, 29, and 30 August 1999. Inventories included both day and night survey methods and activities. Day searches were conducted by hiking (searching for mollusks, amphibians, reptiles, birds, and mammals), and nocturnal methods included live-trapping (for small mammals) and driving roads (searching for amphibians, reptiles, and mammals).

Results

Mollusks

We did not find any evidence of mollusks in Kodachrome Basin State Park. The Park is too dry for most species of mollusks that occur in Utah, and substrates adequate to support most mollusks, which are calciphiles and usually thrive only where limestone is readily available, are not present in the Park.

Amphibians

Great Basin spadefoot, *Spea intermontana*. We found a large adult of this species at 9:59 p.m. (daylight savings time), 28 August 1999, 3.5 mi west of the entrance to Kodachrome Basin State Park (only 1.0 mi from the nearest point on the Park boundary) on the Cannonville Road. On 11 July 1999, about 9:45 p.m. (daylight savings time), we briefly glimpsed an anuran (frog or toad) before it disappeared into the stream near the campground and the start of Eagle's View Trail; we believe that it was this species.

Reptiles

Sagebrush lizard, *Sceloporus graciosus*. This species is abundant and widespread in Kodachrome Basin State Park. We observed at least 14 individuals of this species on 28 August 1999 along the Panorama Trail (including the Big Bear and Cool Cave loops). On 29 August we saw at least three on the Shakespear Arch Trail, at least two on the Angel's Palace Trail, and at least four on the Nature Trail.

Eastern fence lizard, *Sceloporus undulatus*. This lizard is fairly common in Kodachrome Basin State Park. We found one near the Park staff residences on 11 July 1999, two along the Panorama Trail on 28 August 1999, and, on 29 August 1999, one along the Shakespear Arch Trail and another along the Angel's Palace Trail.

Side-blotched lizard, *Uta stansburiana*. This species is fairly common in Kodachrome Basin State Park. On 29 August 1999 we found two on the Shakespear Arch Trail and two or three on the Eagle's View Trail.

Plateau striped whiptail, *Cnemidophorus velox*. This lizard appears to be uncommon and localized in Kodachrome Basin State Park. We observed two individuals on 29 August 1999 among scattered junipers along the lower part of Eagle's View Trail, near the trailhead at the campground (see Figure 2). This lizard is only nominally a species; it is actually an all-female clone, reproducing asexually by parthenogenesis. It is listed on the state "Utah Sensitive Species List" (UDWR 1998) as a species of special concern due to declining populations and limited distribution.

Gopher snake, *Pituophis catenifer*. We captured a small adult of this species (about 3½ ft long) at 9:49 p.m. (daylight savings time), 29 August 1999, just outside the Park on the Cannonville Road, 0.6 mi west of the Park entrance and only 0.2 mi from the nearest point on the Park boundary. (We also found a western rattlesnake [*Crotalus viridis*] on the Cannonville Road several miles northwest of the Park, and, though we did not detect this species in Kodachrome Basin State Park, it almost certainly does inhabit the Park.)

Birds

Note: Because of their ability to fly, birds of almost all species eventually appear in unlikely places. Furthermore, most of the bird species that are known in Utah are migratory. Our work in Kodachrome Basin State Park began near the end of, or even after, the nesting season for most birds in Utah, and many of our bird observations are difficult or impossible to interpret in terms of the seasonal status of the particular species (i.e., breeding vs. non-breeding, resident vs. transient or migratory, and so forth). This is complicated by the fact that the timing of seasonal behaviors of birds, such as nesting and migration, varies greatly among species, with few, if any, species being exactly alike in the timing of their annual movements and behavior. Additionally, many birds, whether they are migratory or not, exhibit post-nuptial wandering; that is, they may move to unexpected places and into unexpected habitats after nesting is completed. We have tried, wherever possible in the following accounts, to evaluate the bird records in terms of the status of the species in Kodachrome Basin State Park, but in many cases the statuses are uncertain. Clear understanding of the statuses of the birds in Kodachrome Basin State Park will require thorough and extended study of the Park's avifauna, as discussed at the end of this report.

American kestrel, *Falco sparverius*. We observed a single individual of this small falcon at the Park staff residences on 11 July 1999. This species may breed in the Park.

Chukar, *Alectoris chukar*. We saw several of these introduced upland game birds in the campground and another individual along the Grand Parade Trail on 11 July 1999. They are year-round residents, and it can be assumed that they breed in the Park. The species is native to Asia and eastern Europe.

Mourning dove, *Zenaida macroura*. We observed four of these doves along the Grand Parade Trail late in the afternoon of 11 July 1999 and another individual on the ground in the parking area at the head of the Panorama Trail on 28 August 1999. The species probably nests in Kodachrome Basin State Park.

Great horned owl, *Bubo virginianus*. In the late afternoon of 11 July 1999 we found two juveniles of this species, barely old enough to be out of the nest, on a sandstone ledge near the end of the Grand Parade Trail, which demonstrates that this species nested in Kodachrome Basin State Park. At 9:05 p.m. (daylight savings time) that same

evening we saw an adult of this species in a tree at the Park staff residences. On 28 August 1999 at 8:42 p.m. (daylight savings time), we observed an adult as it flew across the Park road just south of the Trail Head Station. At 6:05 a.m. (daylight savings time) we heard this species calling near the Park staff residences. All of these observations were within very short distances of each other (probably - $\frac{1}{4}$ to $\frac{1}{2}$ mi) and likely involved a single family of owls—one or both parents and their young.

White-throated swift, *Aeronautes saxatilis*. We saw several of these extremely fast-flying birds soaring above the Grand Parade Trail very late in the afternoon of 11 July 1999. This species probably nests in Kodachrome Basin State Park.

Black-chinned hummingbird, *Archilochus alexandri*. We closely observed a female hummingbird that appeared to be this species in a canyon near the end of the Grand Parade Trail on 11 July 1999. On 29 August 1999 we saw another hummingbird that we believe was this species perched in the top of a juniper near the restrooms in the campground, and later that day we saw an unidentified hummingbird, probably this species, at a nectar feeder at the camp hosts' trailer. It is very likely that this species nests in the Park, and it is the only species of hummingbird that is very likely to do so, although other hummingbirds such as the broad-tailed (*Selasphorus platycercus*) probably pass through the Park.

Northern flicker, *Colaptes auratus*. The afternoon of 11 July 1999 we observed this species in the top of a dead juniper at the Park staff residences. This moderately large woodpecker, which often descends to the ground to eat ants and other foods, may nest in Kodachrome Basin State Park.

Gray flycatcher, *Empidonax wrightii*. The afternoon of 28 August 1999 we observed an individual of this species in a juniper along the Panorama Trail. It is very likely that this tyrant flycatcher breeds in Kodachrome Basin State Park.

Ash-throated flycatcher, *Myiarchus cinerascens*. We saw three or more individuals of this species together in junipers at the start of the Grand Parade Trail, near the Park road, on 11 July 1999. It is possible that they were a family of one or more adults with their one or more fledged young. This species almost certainly nests in Kodachrome Basin State Park.

Western kingbird, *Tyrannus verticalis*. On 11 July 1999 we observed one (or more) of these tyrant flycatchers in the campground. Later the same day we saw another individual perched in the top of a sagebrush along the Grand Parade Trail. This species probably nests in the Park.

Western scrub-jay, *Aphelocoma californica*. We saw one of these jays flying over the junipers along the lower part of the Eagle's View Trail at midday on 29 August 1999. This jay probably nests in Kodachrome Basin State Park.

Pinyon jay, *Gymnorhinus cyanocephalus*. In the late afternoon of 11 July 1999 we saw possibly two flocks of these very social jays in the junipers along the Grand Parade Trail; the first group appeared to consist of about 10 to 12 birds, and, much later, the second, if it was not the same flock seen earlier, seemed to number about 15 to 20 individuals. We also observed a lone individual as it flew over the ridge top of the Eagle's View Trail around noon on 29 August 1999. This species probably nests in the Park.

Common raven, *Corvus corax*. We saw four of these birds along the Big Bear Loop of the Grand Parade Trail on 28 August 1999; the ravens seemed to remain together as two pairs, and one of the pairs flew to and disappeared in a large, horizontal crevice in the cliff face as we watched. We also saw two ravens soaring together above the Eagle's Nest Trail on 29 August 1999, and we heard the vocalizations of this species on the Angel's Palace Trail later that day. It is highly likely that this species nests in Kodachrome Basin State Park.

Juniper titmouse, *Baeolophus griseus*. We saw one or two of these birds in junipers along the Grand Parade Trail on 11 July 1999 and another individual, also in a juniper, along the Panorama Trail on 28 August 1999. This species very likely breeds in Kodachrome Basin State Park.

Bushtit, *Psaltiriparus minimus*. Late in the afternoon of 11 July 1999 we observed two bushtits in a juniper along the Grand Parade Trail. It is highly probable that this species nests in the Park.

Rock wren, *Salpinctes obsoletus*. We observed three individuals of this species along the Grand Parade Trail on 11 July 1999 and four on the Big Bear Loop of the Panorama Trail as well as two more elsewhere on the Panorama Trail on 28 August 1999. It is highly probable that this bird breeds in Kodachrome Basin State Park.

Canyon wren, *Catherpes mexicanus*. Late in the afternoon of 11 July 1999 at the Park staff residences we heard the distinctive song of this wren. It likely nests in Kodachrome Basin State Park.

Bewick's wren, *Thryomanes bewickii*. We observed two of these wrens in a juniper along the Panorama Trail on 28 August 1999, and we found one singing in piñons at Shakespear Arch on 29 August 1999. The species probably breeds in Kodachrome Basin State Park.

Blue-gray gnatcatcher, *Poliophtila caerulea*. We saw one individual of this species in a juniper along the Panorama Trail on 28 August 1999 and another in piñons along the Shakespear Arch Trail on 29 August 1999. This species likely nests in Kodachrome Basin State Park.

Plumbeous vireo, *Vireo plumbeus*. The morning of 30 August 1999 we observed an individual of this species singing in a juniper at the Park staff residences, and later we saw two individuals in a cottonwood not far from where we had seen the first bird. This species may nest in the Park, or these birds may have begun post-breeding movement from their breeding territories elsewhere, in preparation for fall migration out of Utah. The fact that one was singing is only weakly suggestive of the possibility that they may have nested in Kodachrome Basin State Park.

Black-throated gray warbler, *Dendroica nigrescens*. On 11 July 1999 we observed an adult of this species with its fledgling in a juniper along the Grand Parade Trail, which demonstrates that the species nests in Kodachrome Basin State Park.

Yellow warbler, *Dendroica petechia*. We saw two individuals of this species in junipers at the Eagle's View Trailhead, near the campground, on 29 August 1999. Although it is possible that this warbler nests in Kodachrome Basin State Park, these were probably transient or migrating birds.

Chipping sparrow, *Spizella passerina*. On 11 July 1999 we saw two of these sparrows in junipers along the Grand Parade Trail and heard others. We found this species near the Park staff residences on 11 July 1999 and again on 28 and 29 August 1999. On 29 August 1999 we identified at least one individual of this species in a mixed flock of native sparrows in sagebrush and other shrubs south of Chimney Rock. This species may breed in the Park, and the July observations are suggestive of this possibility, although nesting would have been completed by that time. Native sparrows usually form mixed flocks only in the non-breeding seasons, and mixed flocks are especially common in winter; the 29 August observation suggests that fall movement of this species—migration or staging for migration—had already begun.

Brewer's sparrow, *Spizella breweri*. We saw at least one of these sparrows in a mixed flock in sagebrush and other shrubs south of Chimney Rock on 29 August 1999. Although this species may breed in Kodachrome Basin State Park, our single observation of it in the Park, as part of a mixed flock, is only suggestive of post-breeding movement (migration).

Black-throated sparrow, *Amphispiza bilineata*. On 11 July 1999 we watched an individual of this species as it sang in the top of a dead juniper along the Grand Parade Trail. This sparrow likely breeds in Kodachrome Basin State Park.

Brown-headed cowbird, *Molothrus ater*. On 29 August 1999 near the junction of the dirt roads that lead to Shakespear Arch and Chimney Rock, we saw a group of four individuals of this species on the ground following a cow, which is typical behavior for this bird, which feeds on grasshoppers and other insects flushed from the grass by cattle. This brood parasite probably breeds in Kodachrome Basin State Park, laying its eggs in the nests of perhaps many of the suitable host bird species that occur in the

Park. Many anthropogenic alterations of the environment, including livestock grazing, favor this species.

House finch, *Carpodacus mexicanus*. Along the Grand Parade Trail on 11 July 1999 we heard the distinctive song of this bird. It probably nests in the Park.

Lesser goldfinch, *Carduelis psaltria*. We saw one of these birds in a juniper along the Grand Parade Trail on 11 July 1999 and several others near the Park staff residences later the same day. We observed this species again at the Park staff residences on 28 August 1999. On 29 August 1999 we saw one of these finches fly from a juniper to a cottonwood on the Nature Trail. This species probably nests in Kodachrome Basin State Park.

Mammals

Desert cottontail, *Sylvilagus audubonii*. We saw this species on 11 July 1999 along the Grand Parade Trail and near the Park staff residences, on 28 August 1999 again near the residences, and on 29 August 1999 along the Shakespear Arch Trail, on the Park road south of the campground, and near the Eagle's View Trailhead.

Black-tailed jackrabbit, *Lepus californicus*. On 29 August 1999 we observed one of these hares on the Park road just south of the Trail Head Station, and on 30 August we saw two on the Park road south of the campground and one at the Park staff residences.

Cliff chipmunk, *Tamias dorsalis*. We saw two of these chipmunks past Panorama Point off the Panorama Trail on 28 August 1999 and one near Shakespear Arch, one at the summit of Eagle's View Trail, and two on Angel's Palace Trail on 29 August 1999. All of these chipmunks were in moderately steep, rocky situations among boulders and in most cases junipers or piñons.

White-tailed antelope squirrel, *Ammospermophilus leucurus*. We observed one individual of this species among scattered junipers at the Shakespear Arch Trailhead on 29 August 1999.

Rock squirrel, *Spermophilus variegatus*. We saw one of these large, saxicolous ground squirrels atop a boulder along the Grand Parade Trail on 11 July 1999.

Little pocket mouse, *Perognathus longimembris*. We saw, but unsuccessfully attempted to capture, an individual of this species on the Park road at the junction with the Cannonville road at 9:17 p.m. (daylight savings time), 29 August 1999. The habitat at this location includes sagebrush and other shrubs. This find is of interest because Kodachrome Basin State Park is near the limits of the distribution of this pocket mouse.

Ord's kangaroo rat, *Dipodomys ordii*. We encountered two of these kangaroo rats on the paved Park road the night of 29 August 1999, one of which we succeeded in capturing. The first was at 9:22 p.m. (daylight savings time), 0.25 mi south of the dirt road east to Shakespear Arch and Chimney Rock, and the second, an adult female, which we captured, was at 9:34 p.m. (daylight savings time), 0.15 mi north of the same dirt road. We saw several other individuals of this species outside, but near, Kodachrome Basin State Park on the Cannonville Road the same night.

Deer mouse, *Peromyscus maniculatus*. We live-trapped a juvenile male of this species south of the Park staff residences in a flat area of grasses and scattered sagebrush on 28 August 1999.

Canyon mouse, *Peromyscus crinitus*. We captured three of these beautiful mice (a subadult male, an adult male, and an adult female) in Sherman live traps set in a steep, boulder-strewn draw on the slope southeast of the campground and south of Eagle's View Trail on 30 August 1999. This species probably occurs throughout the Park in steep, rocky situations with little vegetation. (Although we did not succeed in capturing it in the Park, another species in the deer mouse group, the piñon mouse [*Peromyscus truei*], probably also occurs in Kodachrome Basin State Park; it would be expected in areas dominated by piñons and junipers.)

Arizona woodrat, *Neotoma devia*. We trapped two of these pack rats (an adult male and an adult female) on 30 August 1999 in the same trapline where we captured the canyon mice discussed above, the habitat being the same: boulders in a steep draw on the slope southeast of the campground. We also saw evidence of woodrats (their stick nests, "latrines", etc.) at Old Indian Cave, near Shakespear Arch, along the rock faces near the Park staff residences, and along the Angel's Palace Trail, indicating that this species is widespread in its occurrence in Kodachrome Basin State Park. This species was formerly included in another species, the desert woodrat (*Neotoma lepida*).

Common gray fox, *Urocyon cinereoargenteus*. We saw an individual of this species run across the paved Park road at the cattleguard south of the Trail Head Station at midday (12:57 p.m., daylight savings time), 29 August 1999. We also saw tracks that we believe were of this species at the Shakespear Arch Trailhead on 29 August 1999. (On 30 August 1999 Tom Shakespear [UDPR] told us of a red fox [*Vulpes vulpes*] that he had, early that morning, seen dead on the road on the south side of Cannonville, 0.4 mi south of State Highway 12, and we found and examined the road-killed fox. This location is about 10 mi northwest of Kodachrome Basin State Park, and the habitat is quite different from any habitats in the Park, being mainly pastures, agricultural fields, and scattered houses and farm buildings, but there is at least the possibility that the red fox may occur in the Park. Probably, however, competition with the common gray fox and the coyote [*Canis latrans*], would put the red fox at a great disadvantage in Kodachrome Basin State Park, and it may not be present in the Park.)

Mule deer, *Odocoileus hemionus*. We did not observe this deer in Kodachrome Basin State Park, but we did find tracks of this species near Cool Cave on 28 August 1999.

Discussion

We did not detect any introduced pest species in Kodachrome Basin State Park; in fact, the only exotic species that we did find in the Park was the chukar, which has been intentionally introduced in Utah as a game bird. There could, of course, be exotic pest species in the Park that we may have missed, but the Park appears to be zoologically quite healthy.

Recommendations

Kodachrome Basin State Park seems, from the zoological perspective, currently to be very well managed, and we can offer only two suggestions, both of which are of a rather minor nature.

First, if water could be kept at all times in the intermittent stream that flows as overflow from the reservoir tank east around the north side of the campground and thence southward, it would be of considerable value to the wildlife of the Park. We are aware, however, that water is not abundantly available and realize that this may not be possible.

Second, reducing impacts of trespassing cattle to Kodachrome Basin State Park (for example, in the vicinity of Chimney Rock) would promote ecosystem health in such a dry and fragile environment.

UDPR should work with Bruce Bonebrake, UDWR Southern Region Habitat Manager, to ensure that the final Kodachrome Basin State Park Resource Management Plan is optimally beneficial to wildlife in the Park.

Further Study

Any future zoological inventory of Kodachrome Basin State Park should be scheduled for, or should at least include, the period April to mid-June. Many animal species are best detected during spring and early summer, for at least the following reasons:

- Many anurans (frogs and toads) breed in spring, some of them exclusively so, and some of them are readily detectable only when breeding.
- Many reptiles, especially many snakes, are more active and more easily found in spring and early summer than at other times of the year.
- The peak of bird nesting occurs during this period, and conservation of birds in Kodachrome Basin State Park should give highest priority to the birds that breed in the Park.

- Small mammals are more easily trapped during this season. Those that hibernate or estivate are active then. Seed-eating species are more disposed to enter traps because available foods are scarce, unlike in late summer and fall when seeds are most available.

Complete inventory of the avifauna of Kodachrome Basin State Park would require year-round surveys or at least surveys in all seasons. This is because, in a temperate climate such as that of Utah, many birds migrate, some of them elevationally (and usually for short distances) and many of them latitudinally (involving long distances). Migration results in the seasonal presence of these birds—some as winter residents, some as migrants or transients (in spring and in late summer–fall), and some as “summer” (i.e., breeding) residents—in Kodachrome Basin State Park.

Appendix

Kodachrome Basin State Park Animal Checklist

compiled by Ben Franklin, Utah Natural Heritage Program

DICOTS

Amaranthaceae -- Amaranth Family

Amaranthus blitoides (prostrate pigweed). Weedy.

Amaranthus retroflexus (redroot pigweed). Adventive.

Anacardiaceae -- Cashew Family

Rhus aromatica var. *trilobata* (skunkbush, squawbush)

Apiaceae -- Parsley Family

Cymopterus purpureus var. *purpureus* (variable spring-parsley)

Asclepiadaceae -- Milkweed Family

Asclepias cryptoceras (pallid milkweed)

Asclepias subverticillata (whorled milkweed)

Asteraceae -- Sunflower Family

Ambrosia acanthocarpa (bur ragweed)

Artemisia bigelovii (Bigelow's sagebrush)

Artemisia nova (black sagebrush)

Artemisia tridentata var. *tridentata* (big or common sagebrush)

Aster glaucoides (blueleaf aster)

Aster pauciflorus (alkali aster)

Brickellia microphylla var. *scabra* (rough brickellbush)

Chaetopappa ericoides (rose-heath)

Chrysothamnus linifolius (spreading rabbitbrush)

Chrysothamnus nauseosus ssp. *graveolens**

Chrysothamnus nauseosus ssp. *hololeucus**

Chrysothamnus viscidiflorus ssp. *axillaris** (slenderleaf rabbitbrush)

Chrysothamnus viscidiflorus ssp. *viscidiflorus** (viscid rabbitbrush)

Cirsium arizonicum var. *arizonicum* (Arizona thistle)

Conyza canadensis var. *glabrata* (horseweed). Weedy.

Erigeron divergens var. *divergens* (spreading daisy)

Erigeron pumilus var. *condensatus* (vernal daisy)

Gaillardia parryi (Parry's blanketflower)

Gaillardia pinnatifida (Hopi blanketflower)

Gaillardia spathulata (basin blanketflower)

Gutierrezia sarothrae (broom snakeweed)

Haplopappus acaulis var. *acaulis* (stemless goldenweed)

Haplopappus aremerioides var. *armerioides* (thrifty goldenweed)

Helianthus petiolaris ssp. *fallax* (prairie sunflower)

Hymenopappus filifolius var. *cinereus* (hyalinherb)

Hymenoxys richardsonii (Colorado rubberweed)

Lactuca seriola (prickly lettuce; adventive)

Lygodesmia grandiflora var. *dianthopsis* (western rushpink)

Machaeranthera grindelioides var. *grindelioides* (gumweed aster)

Psilostrophe sparsiflora (greenstem paperflower)

*Senecio flaccidus** (threadleaf groundsel)

Sonchus oleraceus (common sow-thistle). Adventive.

Stephanomeria exigua (annual wirelettuce)

Stephanomeria tenuifolia var. *tenuifolia* (slender wirelettuce)

Taraxacum officinale (common dandelion). Adventive.

Townsendia incana (silvery townsendia)

Tragopogon dubius (yellow salsify, goatsbeard). Adventive.

Berberidaceae -- Barberry Family

Mahonia fremontii (Fremont's mahonia)

Boraginaceae -- Borage Family

Cryptantha flava (yellow cryptanth)

Cryptantha spp. There are several(?) additional species.

Brassicaceae -- Mustard Family

Arabis spp. (rockcress)

Descurainia pinnata (pinnate tansy-mustard)

Lepidium montanum var. *stellae* (Stella's pepperplant) - On UTNHP Tracking List.

Lesquerella intermedia (Watson's bladderpod)

Malcolmia africana (African mustard). Adventive.

Stanleya pinnata var. *pinnata* (prince's plume)

Thelypodium integrifolium var. *affine* (cousin thelypody)

Cactaceae -- Cactus Family

Echinocereus triglochidiatus var. *melanacanthus* (claretcup)

Opuntia polyacantha var. *polyacantha* (central pricklypear)

Pediocactus simpsonii (Simpson's hedgehog cactus, Simpson's footcactus)

*Sclerocactus parviflorus** (smallflower fishhook cactus)

Capparaceae -- Caper Family

Cleome lutea (yellow beeplant)

Cleomella palmeriana (Palmer's cleomella)

Caryophyllaceae -- Pink Family

Arenaria fendleri var. *eastwoodiae* (Eastwood's sandwort)

Chenopodiaceae -- Goosefoot Family

Atriplex argentea (silver orach)

Atriplex canescens var. *occidentalis* (four-wing saltbush)

Atriplex confertifolia (shadscale)

Ceratoides lanata (winterfat, white-sage)

Halogeton glomeratus (halogeton). Adventive.

Kochia scoparia (summer-cypress). Adventive.

Salsola pestifer (Russian thistle, tumble-weed). Adventive.

Suaeda torreyana (Torrey's seepweed)

Zuckia brandegei var. *brandegei* (siltbush)

Zuckia brandegei var. *plummeri* (Plummer's siltbush)

Convolvulaceae -- Morning Glory Family

Convolvulus arvensis (bindweed). Adventive.

Cupressaceae -- Cypress Family

Juniperus osteosperma (Utah juniper)

Elaeagnaceae -- Oleaster Family

Elaeagnus angustifolia (Russian olive, oleaster). Introduced.

Shepherdia rotundifolia (roundleaf buffaloberry)

Ephedraceae -- Ephedra Family

Ephedra viridis var. *viridis* (green ephedra, Mormon tea, Brigham's tea)

Euphorbiaceae -- Spurge Family

Euphorbia fendleri (Fendler's euphorb)

Fabaceae -- Legume Family

Astragalus ceramicus var. *ceramicus* (painted milkvetch)

Astragalus lonchocarpus (great rushy milkvetch)

Astragalus mollissimus var. *thompsoniae* (wooly locoweed)

Astragalus praelongus var. *praelongus* (stinking milkvetch)

Astragalus spp. At least two additional species.

Medicago lupulina (black medic, hop clover). Introduced.

Melilotus alba (white sweet-clover). Introduced.

Oxytropis lambertii var. *bigelovii* (Lambert's locoweed, purple locoweed)

Psoralidium lanceolatum var. *stenophyllum* (slenderleaf scurfpea)

Gentianaceae -- Gentian Family

Swertia utahensis (Utah swertia)

Hydrophyllaceae -- Waterleaf Family

Phacelia mammillarensis (nipple phacelia) - On UTNHP Watch List.

Linaceae -- Flax Family

Linum subteres (Utah yellow-flax)

Loasaceae -- Stickleaf Family

Mentzelia pumila var. *lagarosa* (lax stickleaf)

Malvaceae -- Mallow Family

Malva neglecta (cheese mallow). Adventive.

Sphaeralcea coccinea (common globemallow)

Sphaeralcea parvifolia (Nelson's globemallow)

Oleaceae -- Olive Family

Fraxinus anomala (singleleaf ash)

Onagraceae -- Evening-primrose Family

Gaura parviflora (willow gaura, lizardtail)

Oenothera pallida var. *pallida* (pale evening-primrose)

Oenothera spp. (evening-primrose)

Orobanchaceae -- Broomrape Family

Orobanche ludoviciana (Louisiana cancerroot)

Pinaceae -- Pine Family

Pinus edulis (pinyon, two-needle piñon)

Plantaginaceae -- Plantain Family

Plantago patagonica (Purshes' plantain)

Polemoniaceae -- Phlox Family

Gilia longiflora (longflower gilia)

Gilia subnuda (carmine gilia)

Gilia spp. A small annual.

Phlox spp.

Polygonaceae -- Buckwheat Family

Eriogonum alatum (winged buckwheat)

Eriogonum cernuum (nodding buckwheat)

Eriogonum corymbosum var. *aureum* (golden buckwheat)

Eriogonum corymbosum var. *corymbosum* (Fremont's buckwheat)

Eriogonum microthecum var. *foliosum* (slender buckwheat)

Eriogonum spp. Remnants of two annuals observed.

Portulacaceae -- Purslane Family

Portulaca oleracea (purslane, pusley, mother-of-millions). Weedy.

Ranunculaceae -- Buttercup Family

Delphinium andersonii var. *scaposum* (pale larkspur)

Rosaceae -- Rose Family

Purshia mexicana var. *stansburyana* (cliff-rose)

Purshia tridentata (bitterbrush)

Sarcobataceae -- Greasewood Family

Sarcobatus vermiculatus (greasewood)

Scrophulariaceae -- Figwort Family

Castilleja linariifolia (linearleaf paintbrush)

Cordylanthus wrightii (Wright's bird's beak)

Penstemon spp.

Verbascum thapsus (woolly mullein). Adventive.

Solanaceae -- Potato Family

Solanum sarrachoides (hairy nightshade). Adventive.

Tamaricaceae -- Tamarisk Family

Tamarix chinensis (tamarisk, salt-cedar, tamarix). Introduced.

Verbenaceae -- Vervain Family

Verbena bracteata (prostrate vervain)

MONOCOTS

Agavaceae -- Agave Family

Yucca angustissima (narrow-leaved yucca)

Yucca baccata (datil yucca). Cultivated?

Liliaceae -- Lily Family

Calochortus nuttallii (sego lily, Nuttall's mariposa)

Poaceae -- Grass Family

Andropogon gerardii (big bluestem)

Aristida purpurea (purple threeawn, no-eatum)

Bouteloua gracilis (blue gramma)

Bromus tectorum (cheatgrass, downy chess, cheat). Adventive.

Elymus salinus (Salina wildrye, bullgrass)
Festuca octoflora (sixweeks fescue)
Hilaria jamesii (galleta, curlygrass)
Hordeum jubatum (foxtail barley)
Muhlenbergia pungens (sandhill muhly)
Phragmites australis (common reed)
Polypogon monspeliensis (rabbitfoot grass). Adventive.
Sporobolus airoides var. *airoides* (alkali saccaton)
Sporobolus flexuosus (mesa dropseed)
Stipa comata (needle-and-thread)
Stipa hymenoides (Indian ricegrass, ricegrass)

The following are in “Kodachrome State Park Wildflowers,” a ring binder of plant parts and photos compiled by a former UDPR employee. These plants were not observed by the UTNHP botanist during the 1999 botanical survey.

Asteraceae -- Sunflower Family
Erigeron utahensis (Utah daisy)

Boraginaceae -- Borage Family
Cryptantha capitata (?)

Liliaceae -- Lily Family
Calochortus aureus (golden mariposa)

Scrophulariaceae -- Figwort Family
Penstemon comarrhenus (dusty penstemon). Possibly *P. strictus* (Rocky Mountain penstemon).

The following were collected by the UTNHP botanist south of the Cannonville Road in 1989 while surveying for *Lesquerella tumulosa* and *Lepidium montanum* var. *stellae*. They are all likely to be within the Park’s boundary:

Boraginaceae -- Borage Family
Cryptantha fulvocanescens (yellow-hair cryptanth)
Cryptantha humilis (dwarf cryptanth)

Brassicaceae -- Mustard Family
Physaria newberryi (Newberry’s twinpod)

Fabaceae -- Legume Family

Astragalus amphioxys (crescent milkvetch)

Astragalus bisulcatus var. *major* (Johnson milkvetch)

Astragalus lentiginosus (freckled milkvetch). Will be either variety *araneosus* or *palans*.

Astragalus wardii (Ward's milkvetch)

Hedysarum boreale var. *boreale* (northern sweetvetch)

Lupinus pusillus (dwarf lupine, rusty lupine). Variety unknown.

Hydrophyllaceae -- Waterleaf Family

Phacelia ivesiana (Ives' phacelia)

Onagraceae -- Evening-primrose Family

Calylophus lavandulifolius (lavandula evening-primrose)

Camissonia exilis (meager camissonia)

Oenothera caespitosa var. *crinita* (Jones' evening-primrose)

Polemoniaceae -- Phlox Family

Gilia inconspicua (floccose gilia)

Polygalaceae -- Milkwort Family

Polygala subspinosa (cushion, or showy milkwort)

Scrophulariaceae -- Figwort Family

Penstemon carnosus (fleshy penstemon)

Penstemon ophianthus (Loa penstemon)

Penstemon utahensis (Utah penstemon)

Unless marked with an *, scientific and common names are based on:

Welsh, S.L., N.D. Atwood, S. Goodrich and L.C. Higgins [editors]. 1993. A Utah Flora (2nd ed., revised). Provo, Utah: Brigham Young University. 996 pp.

Appendix B

Kodachrome Basin State Park Animal Checklist

compiled by George V. Oliver and William R. Bosworth, III, Utah Natural Heritage Program

Amphibians

Great Basin spadefoot, *Spea intermontana*

Reptiles

Sagebrush lizard, *Sceloporus graciosus*

Eastern fence lizard, *Sceloporus undulatus*

Side-blotched lizard, *Uta stansburiana*

Plateau striped whiptail, *Cnemidophorus velox* - On Utah Sensitive Species List.

Gopher snake, *Pituophis catenifer*

Birds

American kestrel, *Falco sparverius*

Chukar, *Alectoris chukar*

Mourning dove, *Zenaida macroura*

Great horned owl, *Bubo virginianus*

White-throated swift, *Aeronautes saxatilis*

Black-chinned hummingbird, *Archilochus alexandri*

Northern flicker, *Colaptes auratus*

Gray flycatcher, *Empidonax wrightii*

Ash-throated flycatcher, *Myiarchus cinerascens*

Western kingbird, *Tyrannus verticalis*

Western scrub-jay, *Aphelocoma californica*

Pinyon jay, *Gymnorhinus cyanocephalus*

Common raven, *Corvus corax*

Juniper titmouse, *Baeolophus griseus*

Bushtit, *Psaltiriparus minimus*

Rock wren, *Salpinctes obsoletus*

Canyon wren, *Catherpes mexicanus*

Bewick's wren, *Thryomanes bewickii*

Blue-gray gnatcatcher, *Polioptila caerulea*

Plumbeous vireo, *Vireo plumbeus*

Black-throated gray warbler, *Dendroica nigrescens*

Yellow warbler, *Dendroica petechia*

Chipping sparrow, *Spizella passerina*

Brewer's sparrow, *Spizella breweri*

Black-throated sparrow, *Amphispiza bilineata*

Brown-headed cowbird, *Molothrus ater*

House finch, *Carpodacus mexicanus*

Lesser goldfinch, *Carduelis psaltria*

Mammals

Desert cottontail, *Sylvilagus audubonii*

Black-tailed jackrabbit, *Lepus californicus*

Cliff chipmunk, *Tamias dorsalis*

White-tailed antelope squirrel, *Ammospermophilus leucurus*

Rock squirrel, *Spermophilus variegatus*

Little pocket mouse, *Perognathus longimembris*

Ord's kangaroo rat, *Dipodomys ordii*

Deer mouse, *Peromyscus maniculatus*

Canyon mouse, *Peromyscus crinitus*

Arizona woodrat, *Neotoma devia*

Common gray fox, *Urocyon cinereoargenteus*

Mule deer, *Odocoileus hemionus*

APPENDIX B

Cultural Resource Inventory