



# Echoes

The official newspaper of  
Dinosaur National Monument

15th Edition  
2002-2003

## 4 River Ecology

The Green River plays a central role at Dinosaur National Monument. It's fabled canyons and rapids provide magnificent scenery and thrilling white water rafting. The river is also home to four species of endangered native fish. Managers are trying to make sure it remains their home.

## 7 Paleontology

Sauropod dinosaurs were the largest animals to ever walk the earth, yet their massive skeletons are almost always found missing the skull. A new sauropod skull discovery here has given delighted scientists a rare piece of the puzzle from the "Age of Reptiles".

## 14 Jones Hole

This rare canyon oasis is a showcase of many of the features that make Dinosaur such an unforgettable place. Enjoy the clear, rushing creek, prehistoric rock art, wildlife such as bighorn sheep and mule deer, and a four-mile trail that takes you to the banks of the Green River.

- General Information...2
- Camping & Hiking...3
- Boating the Rivers...5
- Native Americans...6
- Mail-Order Publications...8,9
- State of the Park...10,11
- Kid's Page...12
- Pioneer Memories...13
- Native Species...15
- Visitor Centers...16
- Scenic Drives...16

# Discover the Diversity of Dinosaur National Monument

By Donna Breslin  
Green River District Naturalist

YOU'VE FINALLY MADE IT! MAYBE YOU HAD PLANNED your trip to Dinosaur National Monument for a long time, or maybe the kids—who are crazy about dinosaurs—set you on the path. Chances are you've spent a good bit of time on the road wondering if that "monument" is in Utah or Colorado. And where is that place with all those big dinosaur bones?

Within Dinosaur's vast boundaries, there are 330 square miles of spectacular natural beauty with distinct biological communities. These communities are home to plants that provide food, shelter and shade to an array of wildlife—in the air, on the land, underground, and in Dinosaur's streams and rivers. Each community is in carefully evolved natural balance, yet each interacts with adjoining communities to create a diverse ecosystem for even greater numbers of species. Just like you, Bald Eagles, Sandhill Cranes, and countless species of song-birds, come and stay for varying periods, enjoying the resources of the park, before moving on to another environment.

Colorful geologic formations display a billion-year-old record: evidence of tumultuous changes in the earth's crust. These changes set the stage for a succession of life forms which developed, flourished and ultimately gave way to those that exist today. Fossilized plant and animal remains provide compelling evidence of these vanished environments.



Attending a ranger-led program, such as this one at the Quarry Visitor Center, is a good way to learn the story behind the scenery.

Early residents of the area, such as prehistoric Indians, explorers, fur-traders, and homesteaders, have left behind evidence of their own: ruins of their homes, artifacts from their lives, and accounts of their passage. Some of these people looked for ways to provide for their needs, to find passages to distant places, to learn about what happened long ago, or to simply enjoy solitude and spiritual renewal. Visitors today share similar hopes and dreams with those who came before.

In the two park visitor centers you can see many exhibits and three-dimensional maps. Hiking trails feature provocative signs that will prompt you to ponder your surroundings as well as the impact of humans on the land. It's likely that you'll wish for personal contact with a ranger, and a chance to express your thoughts. The best way to realize this wish is by taking part in interpretive programs.

Throughout the day during the summer season, and on most evenings, rangers present talks and guided walks—some especially geared for kids. Presenters bring to each program their knowledgeable, personal perspective on favorite subjects

## Welcome

Welcome to Dinosaur National Monument, one of the many special places managed by the National Park Service which preserve the natural, scenic and cultural heritage of our nation. As the name implies, Dinosaur is best known as one of the finest windows into the world of dinosaurs to be found anywhere on earth.

There is more to Dinosaur, however, than bones. This is a wonderful place for a family to vacation—uncrowded and unusually quiet. Trails, scenic drives and white water rafting are only some of the ways to explore the park's wild and rugged landscape. Discover prairie dogs, mule deer and bighorn sheep. Try deciphering 1,000 year-old Indian rock art or explore a settler's homestead. Splashing rivers and creeks bring sustaining moisture to cottonwoods which in turn offer their cooling shade to the traveler.

I know you will find Dinosaur to be a place of wonder and enchantment.

*Chas Cartwright*

Superintendent  
Dinosaur National Monument

## DINOSAUR: A Special Place

There are several reasons why Dinosaur is such a significant part of our national heritage. How many can you name? Look for boxes like this one that contain clues, and see how many you find.



National Park Service  
U.S. Department  
of the Interior

### Dinosaur National Monument

Comprised of canyons and high desert plateaus reaching across Utah and Colorado, Dinosaur National Monument is a legacy of rivers, past and present. Here, preserved in rocks 150 million years old, is a time capsule from the world of dinosaurs, and so much more.

**Superintendent**  
Chas Cartwright

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4545 E. Highway 40  
Dinosaur, Colorado 81610

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(970) 374-3003

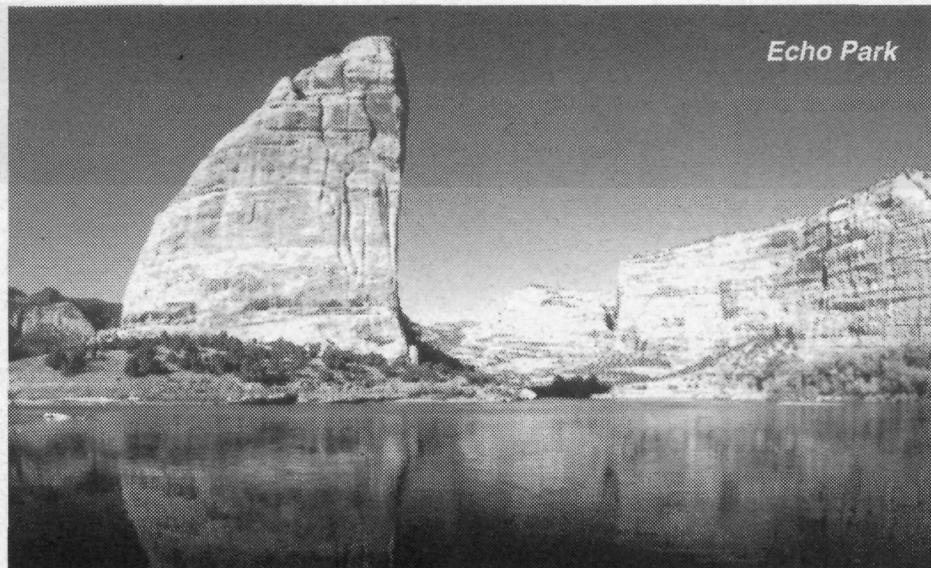
**Headquarters Phone**  
(970) 374-3000

**River Office**  
(970) 374-2468

**Dinosaur Quarry Visitor Center**  
(435) 781-7700

**Park Web Site**  
[www.nps.gov/dino](http://www.nps.gov/dino)

The National Park Service cares for special places saved by the American people so that all may experience our heritage.



Echo Park



**In case of EMERGENCY dial 911**



## Safety



**During your visit to Dinosaur you will likely be exposed to extreme heat and sunlight, and risk dehydration.** The best precaution is to drink lots of water (One gallon a day is recommended), take rest breaks in the shade, and wear a hat and apply sunscreen throughout the day.



**Take extra care when hiking or otherwise exploring the park.** Wear good hiking boots, have a map, and let someone know where you are going. Watch where you are stepping, test your footing, and be careful where you sit or put your hands. There are things here that cut, poke, sting, and bite.



**Wading or swimming in the Green or Yampa rivers is dangerous** because you risk drowning. The water is cold, the currents are strong, and the murky waters conceal obstacles that can entrap you.

**While driving, give your full attention to the road at all times.** This is impossible if you are looking at the scenery, reading a map, or are tired. Take your time and **obey speed limits.** Drive defensively, keeping an eye out for wildlife or livestock. Always use turnouts to enjoy the scenery or read a map.

  
Intermountain  
NATURAL  
HISTORY  
Association

## Echoes

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15th Edition, 2002-2003

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## Parlez vous...?

Information about Dinosaur is also available in **German, French, Spanish and Japanese**



## Access

**Disabled visitors** may drive directly to the Quarry Visitor Center. *The Quarry's upper gallery is not wheelchair accessible.* Ask for a brochure with information on those exhibits and on access to other park areas.

## Regulations

**Please take time to review the important information on this page concerning safety and park regulations. It is your responsibility to be familiar with this information. More importantly, it will help ensure your safe enjoyment of Dinosaur National Monument.**

**Because this national monument and its resources belong to everyone, we require that people not collect or disturb any animal, plant, rock, fossil, or any other natural, historical, or archeological feature.**

**VEHICLES** of all kinds, including 4-wheel drives, motorcycles and bicycles, must stay on designated roads. Some older dirt roads have been closed to let vegetation grow back. All motor vehicles and their drivers must be properly licensed.

**CAMP** only in designated sites and do no digging or leveling. Keep all vehicle wheels on the pavement or gravel when provided. There is a maximum of eight people per campsite.

**WILDLIFE** must be treated with respect, and may not be molested, fed, or disturbed in any way, both for their protection and yours. Even small, "cute" animals may carry diseases.

**FIRE** has an important role in the healthy ecology of natural landscapes, but a campground is no place for a wildfire! Campfires may be built only in fire pits or grate boxes. They must be kept small and never be left unattended, even for a minute. Wood—dead or alive—may not be gathered.

**BACKCOUNTRY CAMPING** requires a free permit which is available at visitor centers. The size of groups is limited to 10 to reduce site damage.

**PETS** and wildlife do not mix. Pets must be leashed (maximum length 6 feet) or otherwise restrained at all times. Pets are not allowed on trails or in the backcountry, and leashed pets are restricted to areas within 100 feet of developed roads. Pets should not be left tethered and unattended without shade and water.

**HUNTING** is not allowed. Weapons of any kind (including BB and pellet guns, bows, and slingshots) must be completely unloaded and fully cased or broken down. Traps, explosives, fireworks and firecrackers are also prohibited.

**WATER** is a precious resource in this desert area. With the exception of the Green and Yampa rivers never bathe or wash clothes or dishes in a water source.

# Hiking Trails

(Distances given are round-trip)

## 1—DESERT VOICES

A moderate 2-mile hike which begins at the Split Mountain boat ramp area. Sweeping views of colorful desert and thought-provoking interpretive signs highlight this trail. Some signs were done by and for kids.

## 2—HOG & BOX CANYONS

One mile and 1/4-mile-long respectively. Easy walks into narrow, shady canyons at the Josie Morris cabin historic site.

## 3—SOUND OF SILENCE

A challenging 2-mile route which calls upon hikers to find their way by locating a series of landmarks. Introduction to the unique aspects of desert hiking.

## 4—COLD DESERT

An easy 1/4-mile trail which begins at park headquarters and explores the ecology of this high-altitude desert.

## 5—PLUG HAT TRAIL

Easy 1/4-mile walk. Views of Uinta Basin; introduction to piñon-juniper forest community.

## 6—HARPERS CORNER

Spectacular views of deep river canyons await those who make this moderate 2-mile hike. A park highlight.

## 7—JONES HOLE

Moderate 8-mile trail begins at national fish hatchery. Path follows a clear rushing creek through soaring Jones Hole Canyon. Features trout fishing, Indian rock art, and backcountry camping.

## 8—GATES OF LODORE

An easy 1 1/2-mile hike leads to impressive viewpoint of the Green River as it enters the dark red Canyon of Lodore.

## Safety & Etiquette

Carrying water is a good idea on any hike. Natural water sources are scarce and may contain the parasite, *Giardia*. Before drinking water from any natural source boil it for 10 minutes or use a 1-micron filter.

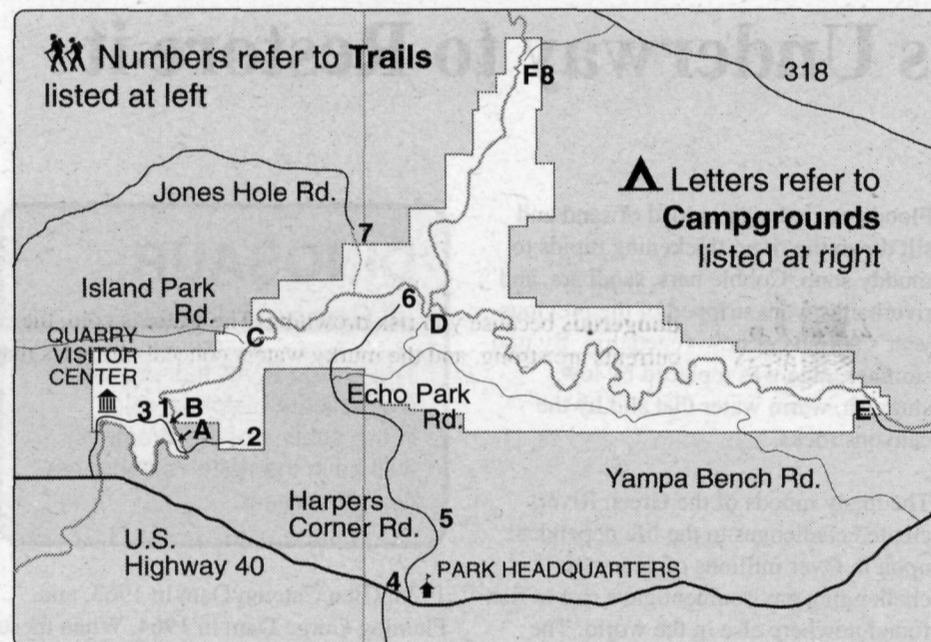
Plant life and soils are fragile because of the dryness here. **Where trails exist, stay on them**, and do not cut across switchbacks. When hiking, walk in single-file to minimize the effect of your footprints, and stay in wash bottoms, on slickrock or animal trails wherever possible.

Avoid walking on microbotic soil—lumpy, dark-crust areas that are actually gardens of tiny spore-bearing plants. One footstep may destroy a half-century or more of their growth.

# Trails and Campgrounds



Hikers in Jones Hole can view some of the best Fremont rock art in the park. For travelers who have spent a lot of time in the car, taking a break to stretch your legs is essential to fully appreciating all that Dinosaur has to offer.



After a day of sightseeing, visitors relax at the Green River Campground.

# Campgrounds

## A—GREEN RIVER

Eighty-eight sites in cottonwood grove along Green River, 5 mi. east of Quarry. Facilities include modern restrooms, tables, fireplaces and drinking water. *Summer ranger talks, handicapped site.* \$12 per site, per night.\*

## B—SPLIT MOUNTAIN

Four group campsites available by reservation only. \$10 reservation fee; \$25 per site, per night. Located 4 miles east of Quarry. Modern restrooms, tables, fireplaces and drinking water. \*

## C—RAINBOW PARK\*\*

Two shaded sites near boat ramp on Green River. Vault toilets, tables and fireplaces. No water, no fee.

## D—ECHO PARK\*\*

Magnificent site, accessible only by steep, rough dirt road—*check on conditions*. Seventeen sites, including handicap, walk-in, and group (by reservation only.) Vault toilets, tables and fireplaces. Drinking water. \$6 per site, per night. \*♦

## E—DEERLODGE PARK

Eight sites among cottonwood grove on Yampa River. Vault toilets, tables and fireplaces. No water, no fee.♦

## F—GATES OF LODORE

Seventeen sites on Green River. Vault toilets, tables, fireplaces and drinking water. \$6 per site, per night. \*♦

\* Water turned off from fall through spring due to freezing temperatures. No fee when water turned off.

\*\* Access via rough dirt roads, **not suitable for trailers, motor-homes, or other large vehicles. IMPASSABLE WHEN WET.** When dry, these roads can be driven by most vehicles.

♦ You must carry out your own garbage.

## Notes for Campers

**Backcountry campsites** at Ely Creek in Jones Hole may be reserved at the Quarry or by phone, (435) 781-7700. Backpackers may camp in areas that are at least 1/4 mile off any road or trail. Further restrictions apply and a free permit is required. **Group Sites** at Split Mountain and Echo Park are by reservation only; call (435) 781-7759.

Firewood may not be collected in the Monument but may be purchased at Green River and Split Mountain campgrounds. Fire is a real danger in this dry land. Camp stoves are recommended to minimize fire danger and environmental damage. Dispose of wastewater in toilets.

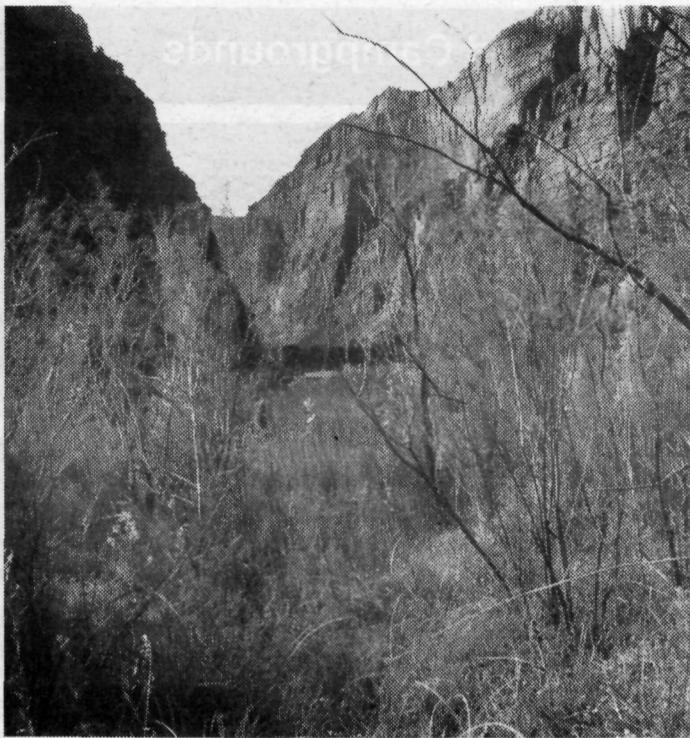


Photo at left, taken in 1872 by the Powell Expedition, shows normal, barren condition of Green River sandbar. Photo at right, taken in the same spot in 1993, shows how regulation of flows from Flaming Gorge Dam has allowed vegetation to flourish on the sandbar.

## How the Green River Has Changed, and the Efforts Underway to Restore it

By David Whitman, Chief Naturalist

OVER FOUR MILLION YEARS AGO, the Green River was a chisel sculpting rock into the beautiful, deep, shear-wall canyons. The river nourished and punished a green ribbon of life along its banks. It was a highway for nutrients, pollen, seeds, fish, birds, American Indians, trappers, and government explorers and dam surveyors. It's changed now, in subtle ways.

The Green River was once a many-faceted, watery jewel. Its winter face was diminutive, cold and clear, turning white when it was cold enough to freeze the top two or three feet of the river to solid ice. In March its face began to change as the river rose, swollen with snowmelt from the Wind River Range in Wyoming. The river's flooding rage peaked in early June and calmed itself as the water slowly receded through July. The spring torrent sculpted the river's channel and life.

Floods carried a great load of sand and silt down the river, thickening rapids to muddy soup. Cobble bars, sandbars, and riverbanks were stripped of the previous year's sprouts of new vegetation. By mid-summer, rage was replaced by low, sluggish, warm water that slid by the canyons rocks.

The many moods of the Green River created challenges to the life dependent upon it. Over millions of years this challenging environment gave rise to fish found nowhere else in the world. The river was home to 13 unique species of minnow, sucker, trout, and sculpin groups. These fish evolved into an interlocked community, balanced delicately amongst themselves, and attuned to the personality of the river.

Enter dams—big ones—Hoover Dam in

### DINOSAUR: A Special Place

The Green River has played a significant historical role in the settling of the West, as well as in the nation's conservation movement.

1935, Glen Canyon Dam in 1963, and Flaming Gorge Dam in 1964. When these massive concrete plugs were built only a few lonely voices anticipated that there might be serious environmental consequences downstream on the Green and Colorado rivers.

When Flaming Gorge Dam was completed it created a host of ecological

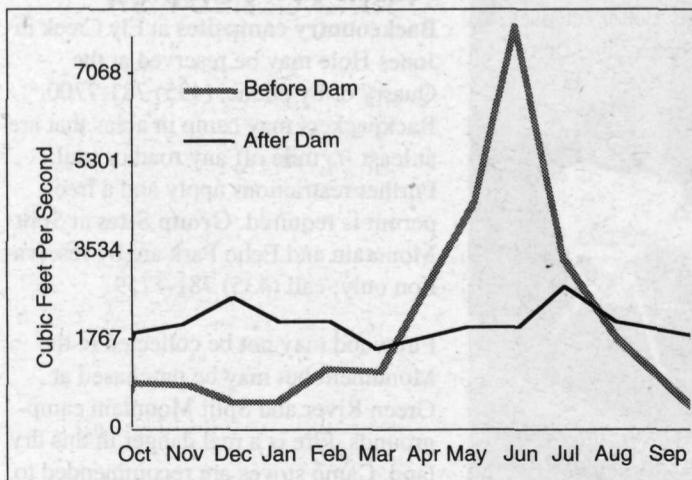
changes in the river and riparian communities. The controlled releases of water from the dam did not match the pre-dam spring flows, and the river banks were no longer seasonally scoured of vegetation. Fish no longer received natural signals to migrate up the Green, and the spawning gravel bars became unusable by four native fish which are now on the federal endangered species list: the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker.

A particularly damaging biological result of depleted spring flows on the Green River is its effect on migration and spawning of the Colorado pikeminnow and razorback sucker. Radio telemetry studies show that each year individual pikeminnows migrate up to 200 miles to the same cobble bar to spawn. There, the eggs develop in the gravel, and later the baby fish ride the current downstream. Baby pikeminnows are guided by instinct to seek out flooded areas called backwaters where they can enjoy warmer waters and feed on plankton. These microscopic organisms are far more abundant in flooded backwaters than in the main river channel.

The dam's elimination of seasonal floods allowed vegetation to become established on riverbanks and sandbars that were previously kept barren. Over time this increase in vegetation has narrowed the river channel. Some of these new plants are exotic, non-native species. Tamarisk is one such invader. It grows in dense communities that crowd out native vegetation such as cottonwood tree seedlings. Cottonwood regeneration now no longer occurs along the Green River in Browns Park. The eventual loss of these trees will deny food, perches, nesting cavities, and dens for scores of wildlife that live along the river.

The endangered fish research completed in the 1980s has pointed biologists toward several strategies that will assist the recovery of native fish and revive the Green River and its ecosystem. Foremost of these is to maintain the natural flow characteristics of the Yampa River—in

See *Green River*, page 5



Annual hydrograph of the Green River comparing average pre- and post-dam regulation daily mean water discharges.



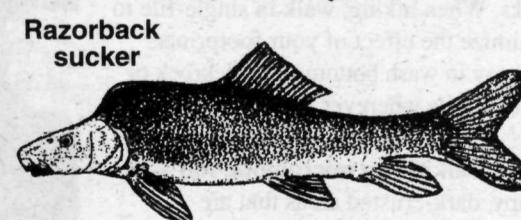
Colorado pikeminnow



Bonytail

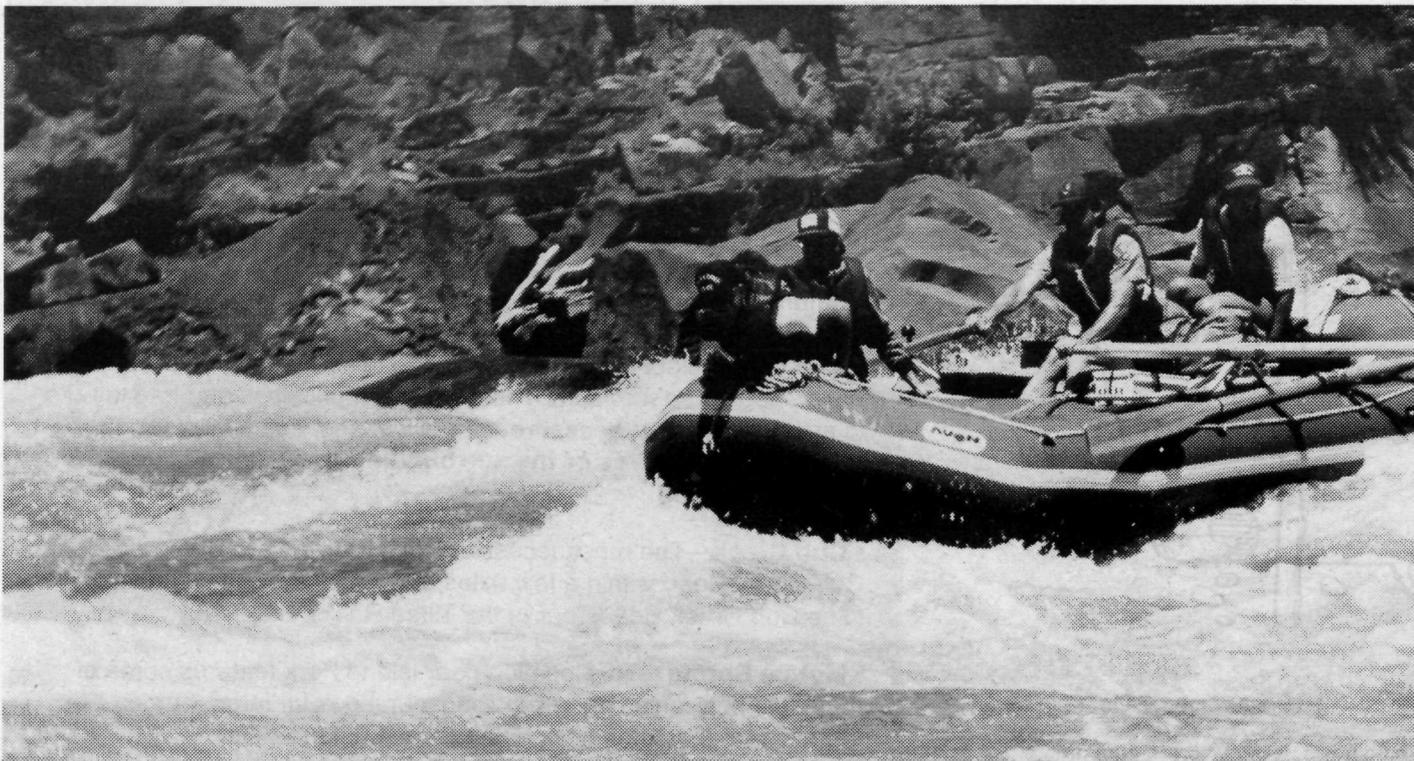


Humpback chub



Razorback sucker

Dinosaur's endangered fish. The distinctive crest behind the heads of some of these may have functioned like a "keel" to help the fish maintain position in fast-moving water.



Dinosaur's famed Canyon of Lodore features legendary Green River rapids such as Hells Half Mile.

## Boating the Rivers: From Mild to Wild

MUCH OF DINOSAUR NATIONAL Monument is a desert, but the best way to see it is by boat. This paradox is due to the Green and Yampa rivers. There are several places where you can drive or hike to see these canyons, but floating through them is the most intimate way to experience their beauty and solitude.

The Green and Yampa are white water rivers; floating them requires proper equipment and skill. Thus, for safety as well as for preservation of the canyons' wilderness qualities, a permit is required for all boating on the rivers in the Monument.

One alternative is to join a guided trip offered by one of the several river running companies authorized to provide this service. River trips in Dinosaur range

from several hours to several days, depending on the portion of the river being floated.

It would be hard to find any other two canyons as close together but as different

*One way to experience the rivers is to join a guided trip offered by any of several authorized companies.*

in scenery as Lodore and the Yampa. The walls of Lodore are dark-red, rising in giant stairsteps from the river, whereas the Yampa slices through light-colored sandstone that forms sheer, sometimes

overhanging cliffs. On some stretches the river is as quiet as a lake but at Warm Springs Rapid and several others it gives boaters a wild ride.

Split Mountain Gorge, just nine river miles between Rainbow Park and the Split Mountain takeout ramp, is the shortest of Dinosaur's canyons, and makes a popular day-trip. The Green flows briskly through Split Mountain, and several rapids provide roller coaster-like rides.

If you are interested in doing it yourself you can apply for a permit by calling the River Office at (970) 374-2468. For a guided river trip, contact any of several privately operated concessioners. A brochure listing these businesses is available at any ranger facility. ♣

### Green River

*Continued from page 4*

other words, not to dam it or otherwise significantly increase water depletions. To do so would eliminate the fragmented endangered native fish spawning habitat which remains, and doom these four ancient species to extinction. Another priority is to monitor the Yampa River for changes in water quality such as pH level that can affect native fish.

The US Fish and Wildlife Service recommended a new strategy for releases from Flaming Gorge. To help revive the Green River's ecosystem and endangered fish populations, they propose that releases from Flaming Gorge should parallel the runoff from the Yampa, a naturally flowing river. When the Yampa River is flooding with spring runoff,

releases from Flaming Gorge should be quickly increased, in incremental stages, until the Yampa runoff peaks. After the Yampa peaks, releases from Flaming Gorge should gradually be reduced. Thus the fluctuation of the seasonal water flow in the Green will mimic the natural flow in the Yampa.

Time will tell if these measures will

#### **DINOSAUR: A Special Place**

The Yampa is the last free-flowing river in the Colorado River System. Its natural flows help sustain several species of endangered fish.

allow our endangered fish to make a comeback. There are many environmental factors, only some of which are directly related to Flaming Gorge Dam. It may be that in the future, water releases from the dam can be increased so that periodic floods are generated to scour riverbanks and sandbars and transport sediment. Major releases—even for a short duration—can perhaps help us fight exotic plants along the river, create plant-free silt beds for cottonwood tree seeds, and restore sandbars and fish spawning cobble bars. Someday, Flaming Gorge Dam may play a major role in reviving the Green River. ♣

To obtain a copy of the Operation of the Flaming Gorge Dam Environmental Impact Statement, or to comment, contact Beverly C. Heffernan at [bheffernan@uc.usbr.gov](mailto:bheffernan@uc.usbr.gov).

### Fishing Regulations

Fishing in Dinosaur National Monument is regulated by the states of Utah and Colorado. Depending where you are in the monument, the regulations for that state apply.

#### On the Utah side...

- Each person 14 years of age and older must have a Utah fishing license to fish any waters on the Utah side of Dinosaur National Monument.
- Juveniles, age 6 through 13, may fish without a license when with an adult and take 1/2 the adult limit.
- Only artificial flies and lures may be used in Jones Hole Creek; bait is prohibited. The daily limit for Jones Hole is two trout of which no more than one may be a brown trout greater than 15 inches.

#### On the Colorado side...

- Each person 16 years of age and older must have a Colorado fishing license to fish any waters on the Colorado side of Dinosaur National Monument.
- Juveniles under 16 years may fish without a license when with an adult and take 1/2 the adult limit.

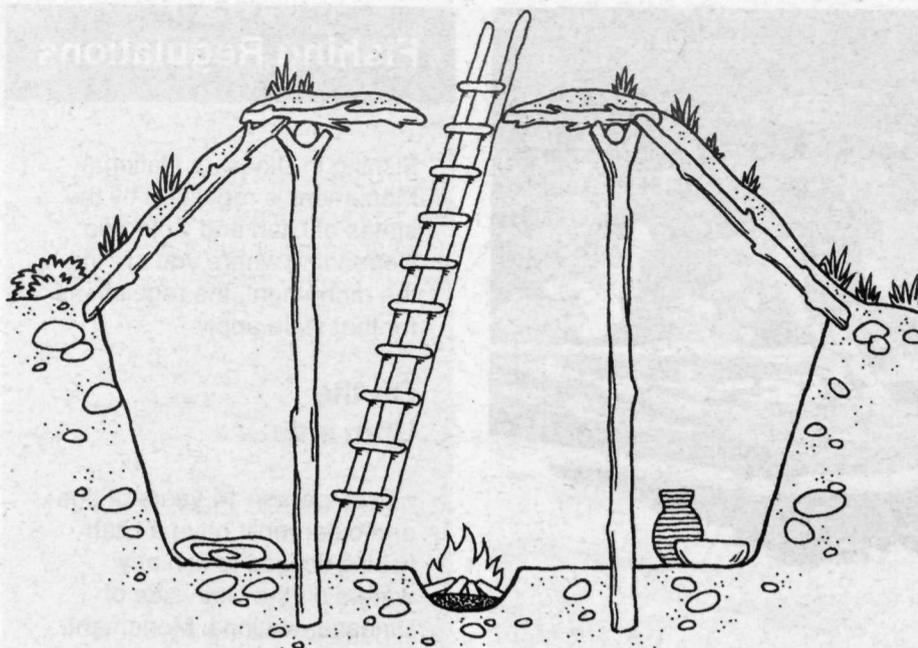


#### ENDANGERED FISH

Several endangered fish species are present in the Green and Yampa rivers of Dinosaur National Monument.

The angler is responsible for recognizing these fish and returning them unharmed to the water.

See article and illustrations on page 4.



Cut-away diagram of generalized Fremont pit house.

## Understanding Dinosaur's Prehistoric Peoples

By Wayne Prokopetz, Park Archeologist

### THROUGHOUT DINOSAUR

National Monument there can be found stirring evidence of prehistoric peoples who inhabited this region for thousands of years. Even before the early farmers, called the Fremont People, occupied the canyons and rivers of the Monument, the Desert Archaic Tradition flourished here for at least 6,000 years.

The people of the Archaic period were hunters and gatherers. They practiced a way of life that made full use of the rich resources of the region. Depending on the time of year, Archaic peoples exploited the seasonally abundant plants and animals. They hunted deer, mountain sheep, rabbits, and ducks. They gathered piñon nuts, grass seeds, and plant greens. Some archaeologists believe these people grew the earliest corn in the West. We see evidence of their passage in the tools they left behind. Archaic hunters left *atlatl* dart points, nets and throwing sticks, while gatherers left behind baskets and grinding stones. The Archaic people were expert basket makers; some baskets were even waterproof.

Understanding the Desert Archaic period can help to explain much of Dinosaur's past. Archaeologists know of many sites dating to the Archaic period at Dinosaur. Still, few sites are fully known as none are excavated. One question we have is when did the Archaic people first appear in what is now the Monument? We believe that the Archaic people are the descendants of the earliest big game hunters who roamed this region around 10,000 B.C. Where did they come from? We know that Fremont farmers lived here around A.D. 950, but what caused the

change from the Archaic to the Fremont periods? When did these people become farmers and potters?

Archaeologists have more questions than answers about the Archaic past at Dinosaur. One way we answer these questions is to identify patterns in the remains excavated from archaeological sites. By excavating, archaeologists can date the appearance of a new technology, such as the use of particular arrow points or pottery making procedures or the appearance of corn agriculture. We estimate a pattern in a region when sites of similar age provide similar results. For example, we observe a partial pattern in the way Archaic peoples used their environment. We know that they frequently moved their camps. In doing so they must have met other groups, exchanging ideas and traded goods. Many of these materials were assimilated into the archaeological record at a site. We can learn from this record through the careful study of stone tools, animal bones, and plants from Archaic sites.

### DINOSAUR: A Special Place

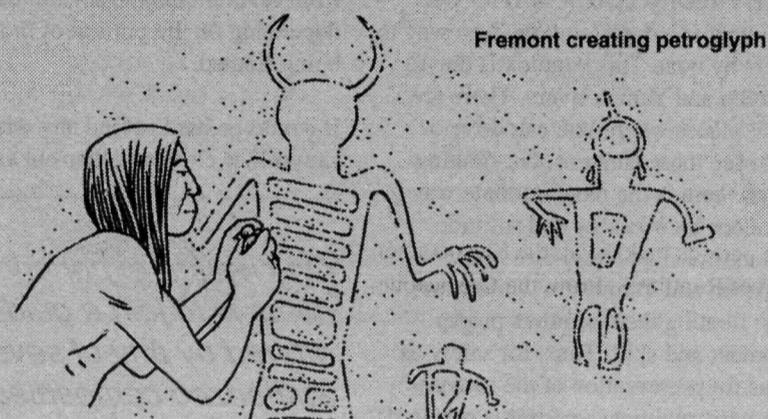
The archeological resources of the park represent one of the most complete records of human occupation and development in North America known anywhere.

## Where to See Prehistoric Rock Art

Evidence of this area's early human inhabitants can be found etched and painted on sandstone walls throughout Dinosaur National Monument. Most of the "rock art" found here is in the form of **petroglyphs**, designs carved into the rock. More rare—perhaps because these are more easily weathered—are **pictographs**, created by applying pigment to the rock surface.

Listed here are some of the best places to see rock art in Dinosaur—but please do so with care. These sites are priceless and fragile links to ancient peoples. Please treat them with respect. **Never touch the artworks themselves or the surrounding rock; this accelerates their weathering.**

- **Cub Creek**—The most accessible rock art sites are scattered along Cub Creek Road within a few miles of the Quarry Visitor Center. (See Cub Creek Road/Tour of the Tilted Rocks, page 16.)
- **McKee Spring**—This location near Island Park features some of the finest petroglyph panels in Dinosaur. Look for large, human-like figures and geometric designs on the sandstone cliffs.
- **Jones Hole**—Hiking the Jones Hole Trail will take you to some fine, rare examples of Fremont pictographs.
- **Echo Park**—The distinctive Pool Creek petroglyphs can be seen right along the Echo Park Road, between the old Chew Ranch and Echo Park itself. These faint, pecked patterns are particularly unique.



## Ute Creation Story

### The Beginning of All People

Once there were no people in the world, so Sinawaf, the Creator, began a project. He began to collect and cut sticks up in little pieces and put them in a large bag. He did this for a long time until the bag was full.

His brother Coyote was watching the whole time. Sinawaf told him that this was a special project and not to look in the bag.

One day when Sinawaf was away, Coyote crept over to where Sinawaf had placed the bag and peeked in. Many people burst out of the bag. They were wild and would not listen to Coyote, who was pleading for the people to return to the bag. The people only kept pouring out and running wild. They spoke different languages and scattered all over the world.

When Sinawaf returned and found the empty bag he was angry with Coyote for not listening to him. Sinawaf said, "The people were not ready to come into the world. They were to be placed evenly across the land. The trouble you have caused will create wars, and the people will try to gain land from each other."

Sinawaf picked up his empty bag and discovered deep within it a few people remained. To those people Sinawaf said, "This small tribe shall be known as the Nooch (Ute). You will be very brave because the people in the world are not complete, and you will be able to overcome them. I will place you high in the mountains so that you will be close to me." This is how the Utes came to live in the mountains of Utah and Colorado.

Excerpted from Ute Tribe Public Relations Information Handout.

# Rare Skull Sheds New Light on the World of Sauropod Dinosaurs

By Dr. Dan Chure, Research Scientist  
Dinosaur National Monument

SAUROPOD DINOSAURS, THOSE immense quadrupedal, long-necked, long-tailed, plant-eating beasts known popularly as "brontosaurus", are by far the largest animals to have ever walked the earth. Sauropods were immensely successful animals and are one of the longest-lived dinosaur lineages, lasting some 160 million years. Sauropods spread across the world, with their fossils known from all continents except Antarctica.

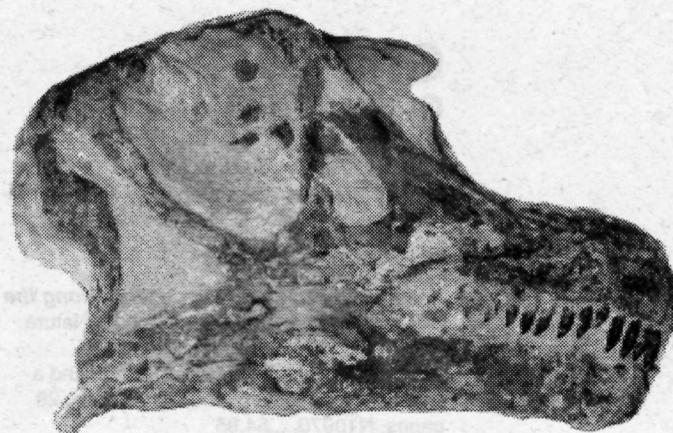
However, in spite of their popularity with the public and the great scientific interest in sauropods, much remains to be discovered about these huge creatures. One of the major scientific mysteries about sauropods has to do with their skulls. For reasons not well understood, sauropod skulls were often lost soon after death and are rarely found. Of the some 200 species of sauropods which have been named by scientists, less than a dozen have skulls known for them. Many of the sauropod skulls that have been discovered come from the rocks of the Jurassic Period, the middle of the three periods making up the Mesozoic or "Age of Reptiles." From the Cretaceous Period, the last of the three periods of the Mesozoic, only four sauropod skulls are known from anywhere in the world. Thus it was an exciting event when one of these rare jewels was found in Dinosaur National Monument two years ago.

The amazingly well preserved skull was found not far from the famous Dinosaur Quarry which is enclosed within the Visitor Center at Dinosaur National Monument. Currently under study by NPS Research Scientist Dr. Dan Chure, it is the only sauropod skull known from the last 80 million years of the Mesozoic in North America! The skull probably belongs to a species new to science, provides much new data on evolution in sauropod dinosaurs, and is of great interest to scientists around the world.

The site where the skull came from was discovered in 1977, but extensive excavations, done by NPS staff, began

## DINOSAUR: A Special Place

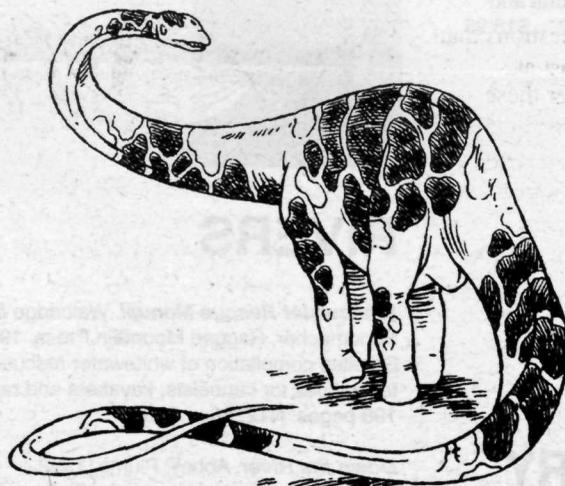
The Dinosaur Quarry is an internationally significant fossil site representing an important window into the world of Jurassic dinosaurs.



Digitally enhanced photo of the new sauropod skull.

only a three years ago. The quarry contains a second, less well preserved, sauropod skull as well as many disarticulated sauropod bones from the backbone and limbs. All these fossils were originally buried in the sediments of a riverbed which has turned into a hard sandstone. Excavation of the bones by paleontology staff members Scott Madsen and Ann Elder, as well as volunteers, is difficult and has required power tools such as rock saws and pneumatic drills, and transporting them back to the laboratory often requires helicopters.

While the hard sandstone has preserved the fossils well, it also makes removing them from the rock a difficult task. Back in the lab at the Quarry Visitor Center, preparation by Park Geologist



Sauropod dinosaurs, such as *Diplodocus* shown here, were the largest animals to ever walk the Earth.

Scott Madsen has taken several years on some specimens, with much additional work remaining. Nevertheless, the skull at least is out of the rock and—like all fossils collected here—will remain in the museum at Dinosaur National Monument, only a few hundred yards from where it was discovered.

The excavations at the quarry will continue for probably another ten years. There is no way to predict what other wonders will be found during these excavations, but it has already produced one of the most sought after kinds of dinosaur fossils — a skull of one of the largest land animals in the history of life.

In addition to this spectacular skull, the Quarry Visitor Center at Dinosaur National Monument encloses a large quarry containing some 1500 dinosaur bones uncovered but left in-place, just as they were discovered. These bones are from the Jurassic Period, some 20 million years older than the new sauropod skull, but most of them also belong to sauropods, showing that Dinosaur National Monument is indeed a place where giants once walked. \*

## Morrison Project Peels Back the Layers of a Lost World

Buried in the rocks of the Morrison Formation of Dinosaur National Monument are the remnants of a long lost world. This ecosystem was populated by brontosaurus, the largest land animals that ever lived, fierce meat-eaters, and bizarre armored dinosaurs.

Rediscovering and understanding this lost ecosystem is a major focus of Dinosaur National Monument's current paleontological studies. Since 1990, the Morrison Ecosystem Project (MEP), a multi-disciplinary, multi-institutional, international study of the Morrison Ecosystem, has attempted to answer some basic questions.

*Q: How widespread is the Morrison Formation?*

A: The Morrison was deposited across 1,000,000 km<sup>2</sup> in the Intermountain West. Morrison outcrops occur in Oklahoma, New Mexico, Arizona, Utah, Colorado, Wyoming, South Dakota, and Montana.

*Q: How old is the Morrison Formation?*

A: This has been the subject of considerable debate. The MEP has produced over 100 new radiometric dates, including dates from recently discovered volcanic ashes near the base of the formation. As a result, we now know that the Morrison took about 7 million years to accumulate, from 148 to 155 million years ago.

*Q: What kind of plants did the dinosaurs eat?*

A: One of the great problems for paleontologists has been to figure out what plants the giant brontosaurus dinosaurs ate. Unfortunately, plant fossils are extremely rare in the Morrison Formation and only about 30 plant species had previously been found.

By breaking down rock to chemically extract any fossil pollen and spores, paleontologists have now identified over 250 species of Morrison plants, an eightfold increase! Analysis shows that all sites are dominated by the spores of one group of plants—ferns. This abundance and diversity has shown that it was the lowly ferns, and not towering trees, that fed the dinosaurian behemoths.

*Q: What kinds of animals lived with the dinosaurs?*

A: The MEP discovered a wide range of dinosaur contemporaries, such as clams, snails, algae, ostracods, crayfish, insects, salamanders, frogs, lizards, turtles, crocodiles, and mammals. A number of the species discovered were totally new to science.

*Q: What was the climate like during Morrison times?*

A: Because of continental drift, the intermountain west was then about 650 km (400 mi) further south. Studies suggest the Earth was appreciably warmer than today and the MEP reveals that the atmospheric carbon dioxide concentration was higher than it is now. Much of the Morrison was in a rain shadow and the climate was semi-arid to arid. Water may have been seasonally abundant but was generally scarce.

*Q: Where can I find out more about the Morrison Ecosystem Project?*

A: Refer to symposium volume: Carpenter, Chure, and Kirkland. (editors) 1998. The Upper Jurassic Morrison Formation: An Interdisciplinary Study. *Modern Geology* (Special Issue) Part I/volume 22 (nos. 1-4): 553 pp., Part II/volume 23 (nos. 1-4): 537 pp., or see web site at <http://gopher.coloradostate.edu/~cwis70/morrison.html>.

Prices stated are subject to change without notice. When ordering, please include catalog number listed to left of price. Books are

paperback unless otherwise noted. Call toll-free, 1(800)845-DINO, to place your order or to receive a complete catalog.

## DINOSAUR National Monument

### OF GENERAL INTEREST

**Dinosaur: The Story Behind the Scenery** Hagood & West, K.C. Publications, 1990. Full-color introduction to the Monument, both the Quarry and the canyon country. 48 pages. N11940.....\$7.95

**Echo Park: Struggle for Preservation.** Cosco, Johnson Books, 1995. The story of the controversy over, and eventual defeat of, efforts to build a dam within Dinosaur. 144 pages. N10831.....\$7.95

### DINOSAURS & PALEONTOLOGY

**Dinosaur: The Dinosaur National Monument Quarry.** West & Chure, DNA, 2001. Origin, discovery, development, and dinosaurs of the Quarry; illustrated with photos and original art. 52 pages. Revised! N10458.....\$7.95

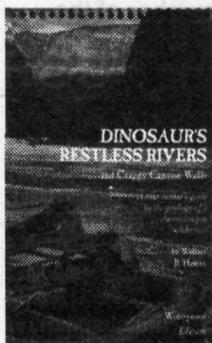
**Dinosaurs and Dinosaur National Monument: A Resource Packet for Students and Teachers.** West, DNA, Revised 1998. A compendium of information, activity sheets, and class project ideas. 60 pages. N10658.....\$4.95

**Dinosaur Mountain: Graveyard of the Past.** Arnold, Clarion Books, 1988. History of the discoveries at the Dinosaur National Monument Quarry. Ages 7-12. Hardback, 48 pages. N10508.....\$15.95

### MAPS

**Dinosaur National Monument Topographic Map.** USGS. Scale 1:62,500.  
• Standard edition, 1973. N6210.....\$7.00  
• Shaded relief, 1966. N6200.....\$7.00

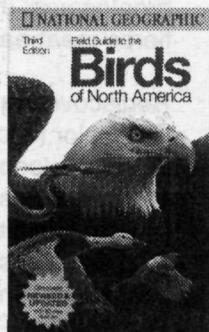
**Dinosaur National Monument Trails Illustrated Map.** Scale 1:78,125. Ponderosa Publishing, 1989. Waterproof, tearproof topographic map with hiking routes, river miles, camps, and natural history information. N6130.....\$9.95



### RIVER GUIDES

**Dinosaur's Restless Rivers and Craggy Canyon Walls.** Hansen, Dinosaur Nature Association, 1996. Explore the canyons of the Green and Yampa with the region's top geologic expert. Waterproof, 104 pages. (Includes free *River Journal* for recording your river trip experiences.) N10734.....\$16.95

**Dinosaur River Guide.** Evans & Belknap, Westwater, 1993. Strip maps of the Green and Yampa rivers, showing rapids, points of interest, river lore. Waterproof, 64 pgs. N10528.....\$17.95



## WILDLIFE and Plants

**Audubon Field Guide to the Southwestern States.** Alden and Friederici, Knopf, 1999. An essential guide to the natural world of Arizona, Nevada, New Mexico and Utah. 448 pages. N10102.....\$19.95

**Field Guide to the Birds of North America (Revised—Third Edition).** National Geographic Society. 464 pages. C10203.....\$21.95

**Sagebrush Country: A Wildflower Sanctuary.** Taylor, Mountain Press, 1992. Full-color guide to the wildflowers, grasses and forbs of the sagebrush steppe. 212 pages. C11808.....\$14.00

**A Natural History of Western Trees.** Peattie, Houghton Mifflin, 1981. Thorough guide to native species with essays on natural and social history. 752 pages. C11472.....\$18.95



## AREA HISTORY and Archaeology

**Canyon Country Prehistoric Indians.** Barnes & Pendleton, Wasatch Publishers, 1979. Profiles of the Anasazi and Fremont peoples. 255 pages. N10243.....\$9.50

**The Dominguez-Escalante Journal.** Warner, Univ. of Utah Press, 1995. Chronicle of the remarkable 1776 Spanish Crown expedition through Colorado, Utah, Arizona and New Mexico. 154 pages. C10788.....\$12.95

**Utes: The Mountain People.** Pettit/Johnson Books, 1994. History and culture of the Ute people. 178 pages. N12204.....\$11.95

**The Bassett Women.** McClure, Ohio University Press, 1985. The story of Josie Bassett Morris, who lived at Cub Creek for half a century, and others in her family. N10143.....\$9.95

**Legacy on Stone: Rock Art of the Colorado Plateau and Four Corners Region.** Cole, Johnson Books, 1990. Describes rock art and cultures of prehistoric and modern people of the canyon country. 280 pgs. N11322.....\$15.95

## GEOLOGY General/Regional

**Geologic History of Utah.** Hintze, Brigham Young University, 1988. Scholarly and comprehensive introduction to Utah's spectacular geology. 202 pages. N11023.....\$15.00

**Fossil Butte National Monument: Along the Shores of Time.** Ambrose, Dinosaur Nature Association, 1998. A look at the unique ecosystem preserved at Fossil Butte, and a history of its discovery and excavations. 28 pages. N10970.....\$4.95

**Visual Dictionary of the Earth.** Dorling Kindersley, 1993. Colorfully illustrated guide to the Earth and its processes from the inside out. Hardback, 64 pages. C12220.....\$18.95

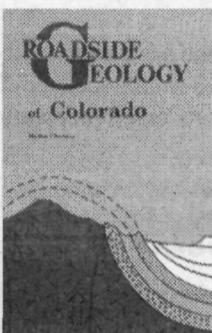
Roadside Geology series. Mountain Press. Each book describes geologic features seen from selected highways in that state.

• **Roadside Geology of Utah**

Chronic, 1990. 326 pages. N11758.....\$18.00

• **Roadside Geology of Colorado**

Chronic, 1980. 334 pages. N11753.....\$18.00



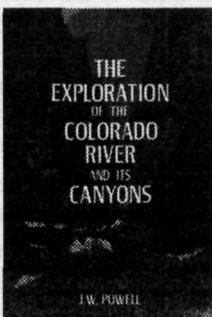
## RIVERS

**Whitewater Rescue Manual.** Walbridge & Sundmacher, Ragged Mountain Press, 1995. Detailed compilation of whitewater rescue techniques for canoeists, kayakers and rafters. 198 pages. N12266.....\$16.95

**Down the River.** Abbey, Plume, 1982. Ed Abbey lends his unique voice to thoughts about rivers and river trips. R10791.....\$12.95

**Cadillac Desert: The American West and its Disappearing Water.** Reisner, Penguin, Revised 1993. Classic exposé of the history, politics, and intrigue behind the damming of rivers and irrigation of the West. 582 pgs. N10228.....\$15.95

**The Exploration of the Colorado River and Its Canyons.** Powell, Dover Publications, 1961. John Wesley Powell's historic 1869 descent of the Green and Colorado rivers. 400 pages. N10888.....\$9.95



## DINOSAURS and Paleontology

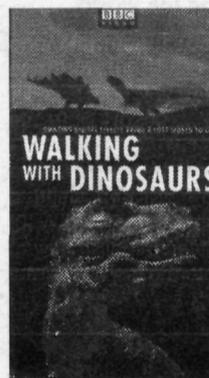
**The Ultimate Dinosaur Book.** Lambert, Dorling Kindersley, 1993. General reference to all known dinosaurs. Hardback, 192 pgs. N12074.....\$29.95

**Dinosaur Worlds.** Lessem, Boyds Mills Press, 1996. Discover the latest findings about new and familiar dinosaurs. Hardback, 192 pages. N10565.....\$19.95

**A Look Inside Dinosaurs.** Clark, Reader's Digest, 1995. Unique visual reference takes young readers on a vivid journey of discovery about dinosaurs from inside out. 19 pages, hardback. N11369.....\$10.99

**Magic School Bus in the Time of the Dinosaurs.** Cole, Scholastic Inc., 1994. Ms. Frizzle takes her class back in time to learn about dinosaurs. 48 pages. N11397.....\$4.99

**Creatures of Long Ago: Dinosaurs.** Sibbick, National Geographic Society, 1980. Beautifully illustrated "pop-up" book for kids. Hardback, 12 pages. N10355.....\$16.00



## VIDEOS

**Dinosaur: Fossils and Paleontology in Dinosaur National Monument.** DNA, 1989. Discovery, history, and dinosaurs of the Quarry, and a behind-the-scenes look at recent paleontological work in the Monument. VHS, 27 minutes. N0200.....\$14.95

**Fossil Lake: Paleontology and Preparation at Fossil Butte National Monument.** DNA, 1991. Expert paleontologists explain the origin and study of the beautifully preserved fossil fish. VHS, 17 minutes. N0230.....\$14.95

**Walking With Dinosaurs.** BBC, 1999. Acclaimed television production uses state-of-the-art digital effects to bring a lost world to life. VHS, 180 min. N0330.....\$24.95

**Jurassic Utah.** Bosworth Comm., 1994. A tour of Utah's rich and varied deposits of Jurassic-era dinosaur fossils. VHS, 58 minutes. N0236.....\$14.95

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# About the Intermountain Natural History Association



The Intermountain Natural History Association (INHA) operates the bookstores at the Quarry Visitor Center and Dinosaur National Monument headquarters, and also at Fossil Butte National Monument in Wyoming. INHA is a non-profit organization whose purpose is to provide educational and interpretive materials for park visitors. A portion of profits from all sales are donated to the National Park Service at Dinosaur and Fossil Butte.

These funds help to purchase items as large as the cast skeletons of *Allosaurus* and *Camarasaurus* for the Quarry exhibits, and as small as a roll of film or a videotape for documenting resource management projects. The artwork for the Quarry exhibits, many roadside and trailside displays, numerous free informational materials, and this newspaper have also been purchased or produced through donations from INHA.

INHA's bookstores offer a variety of publications dealing with the resources of Dinosaur and Fossil Butte, including paleontology, archeology, plants and wildlife, geology, river running, and more. All items offered for sale are carefully reviewed by subject matter experts, and must be found educational in nature and of excellent "interpretive" value. This means that the item will not only help the visitor better understand the varied resources of the park but through this appreciation will then be supportive of efforts to properly preserve and manage them.

Our organization was founded in 1956 as the Dinosaur Nature Association. In 1999 DNA expanded its cooperative relationship with the National Park Service to begin serving the USDA Forest Service at the Ashley, Wasatch-Cache, and Uinta national forests, and the Bureau of Land Management at the John Jarvie Ranch Historic Site. To better reflect these relationships, in 2002 DNA officially became the Intermountain Natural History Association.

## INHA Membership

There are six levels of membership available in INHA:  
Basic ..... \$25    Contributing .... \$50    Sustaining .... \$100  
Sponsor .... \$250    Patron ..... \$500    Benefactor . \$1000

All members receive a copy of the Dinosaur National Monument newspaper, as well as the spring and fall INHA newsletters and catalogs. Those at the Contributing level and above will also receive the twice-yearly *Plateau Journal*, an award-winning magazine which highlights the natural history of the Colorado Plateau. Membership is good for one year and entitles the holder to a 15% discount on purchases in INHA's bookstores.

The primary benefit of INHA membership is the knowledge that your support directly helps preserve our natural heritage. Call or use the form below to become an INHA member.

## POSTERS

**Echo Park, Dinosaur National Monument.** Gnass, Impact, Dinosaur Nature Assoc. Aerial photo of Steamboat Rock rising above the Green River in the heart of Echo Park. 18"x24" N2330.....\$4.95

**Canyon of Lodore, Dinosaur National Monument.** Telford, Dinosaur Nature Association, 1995. Photo of the Green River rolling through the brooding red Gates of Lodore. 18"x24" N2305.....\$4.95

**Colorado River Basin Poster.** DNA, 1995. The Colorado River System is clearly illustrated along with the web of dams and diversions which control its waters. 20"x29" N2310.....\$7.95

**Sacred Sites.** DNA, 1996. Images of some of the spiritually inspiring Fremont Indian rock art found at Dinosaur National Monument. 18"x24" N2400.....\$4.95

**Dinosaur Quarry mural posters.** Dawson, DNA, 1990. Reproductions of the colorful murals in the Dinosaur Quarry. Four titles:

• **A Glimpse of the Past**

Portrays river floodplain landscape of the area in late Jurassic time, showing all the local dinosaurs. Two sheets make 12"x70" horizontal poster. N2120.....\$4.95

(The following are each 12"x 36" horizontal.)  
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• **Old Bones, New Ideas.** Stegosaurus, Camptosaurus and Dryosaurus. N2140.....\$2.95

• **The Large and the Small.** Diplodocus and Dryosaurus. N2130.....\$2.95

• **The Giants.** Diplodocus, Barosaurus, Camarasaurus & Apatosaurus. N2110.....\$2.95

**Correlated History of the Earth.** Pan Terra, 1994. Remarkable, comprehensive look at the history of the Earth, including geologic and biologic changes through time. 28"x38" Laminated. C2038.....\$19.95

## MAIL ORDER FORM

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### Why Fees?



Quarry Visitor Center exhibits are being enhanced by the fee program.

Dinosaur National Monument, like other national parks and recreation areas, is being cared for today and preserved for future generations by the American people. This dual objective—use and preservation—comes at a price. Protecting our natural and cultural heritage while ensuring that everyone visiting these areas has a safe, enjoyable and educational experience costs money.

Even as the number of visitors continues to climb, government funding available for necessities such as road and building repairs, campground maintenance, visitor protection, and other services has not kept pace with demand. In 1996, to address these needs, Congress directed the U.S. Department of the Interior to implement the Recreation Fee Demonstration Program in three of its agencies—the National Park Service, the Bureau of Land Management, and the U.S. Fish and Wildlife Service. The program will help spread some of the costs for managing these lands among those who use them.

Managing our public lands is a major financial investment. While most of that investment comes from the general tax base, those who use these areas derive a greater benefit from—and place a greater burden on—resources than the public at large. These new fees redistribute that burden so that users pay an increased share of the costs.

*The Recreation Fee Demonstration Program helps spread out the costs of managing public lands among those who use them.*

The Recreation Fee Demonstration Program will:

- Allow a significant portion of the fees collected at a public area to be spent directly on that area.
- Allow each agency to develop fair and equitable fee collection programs.
- Allow each agency to collect fees

efficiently and to determine the activities to be covered by fees.

The fees will be used for:

- Repairs to roads, buildings, campgrounds and trails
- Improved signs and exhibits
- Educational programs, guided walks and other visitor activities
- Stabilization and restoration of historic structures
- Visitor safety and protection

Specific projects to be undertaken at Dinosaur National Monument include:

- Rehabilitation of the Josie Bassett Historic Cabin
- Casting of our new, juvenile Allosaurus skeleton for display at the Quarry Visitor Center
- New roadside interpretive signs
- A new Headquarters Visitor Center DVD program
- A phased rehabilitation of facilities at Green River and Split Mountain campgrounds. 🍂

### Fire Management



Overgrazing in the 1920s and 30s, accompanied by fire suppression, has bequeathed an explosive legacy to the rangelands of the West. Accumulated shrubbery, plant debris, and fallen trees have created conditions ripe for wildfires of an intensity unimaginable before the summer of 1988, which saw the scorching of Yellowstone National Park and much of the Rocky Mountains.

Overgrazing has suppressed fire-tolerant

grasses and allowed fire-intolerant sagebrush and juniper to proliferate. Species of plants which depend on fire for soil enrichment and reproduction no longer thrive. Birds and other animals which rely on such plants for shelter and food are faced with diminishing habitat.

Decades of scientific research have shown resource managers that fire is a necessary process in plant and animal communities. Within Dinosaur National

Monument, the Prescribed Fire Management Program includes preservation of naturally functioning ecological processes—including fire. Wildfires which threaten human life, property or historical or cultural sites, are immediately suppressed, but carefully monitored prescribed fires are used to meet objectives such as hazardous fuel reduction, eradication of noxious, non-native plants, rejuvenation of overgrazed landscapes, and restoration of species diversity. 🍂

### Pepperweed Pullers



Volunteers pose with a giant bag of pepperweed they pulled.

Some of Dinosaur's visitors have been observed tearing out plants by their roots and we couldn't be happier about it. These generous volunteers were recruited in the summer of 2001 to help clear noxious exotic plants from areas of the Green River Campground, and an historic site near the Quarry Visitor Center.

Under the direction of park staff, a total of 321 volunteers spent nine days pulling up perennial pepperweed, one of 55 exotic plant species found in Dinosaur National Monument.

Park Botanist Tamara Naumann calls aggressive exotic species "one of the greatest threats to natural areas on public lands." An exotic species is one that is

not native to an area. An aggressive exotic species is one that is able to out-compete native species and significantly reduce the population of native species.

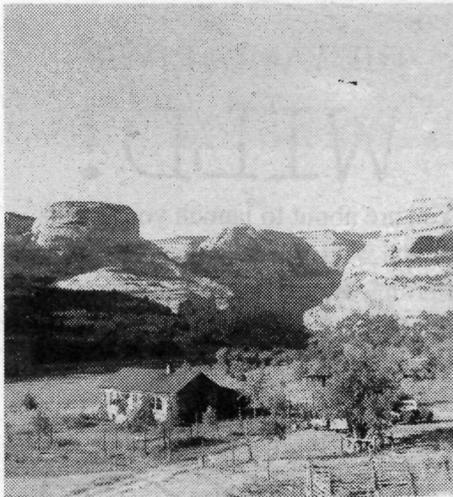
About half of the Green River Campground has now been cleared of pepperweed, and there is a plan to duplicate the effort in the summer of 2002 to complete the eradication—maybe you would like to help us?

*Visitors—as well as wildlife—deserve a natural environment in their national parks*

Looking farther into the future, we foresee the monument partnering with visitors to remove other exotic species such as Russian olive and tamarisk trees beside the Green River adjacent to the campground. In a few years, it may be possible to render the campground a weed-free zone that requires only periodic monitoring and removal of new invasive weed sprouts.

Visitors—as well as wildlife—deserve a natural environment in their national parks. 🍂

### Subdivisions in Your Park



Mantle Ranch on the Yampa River.

When Dinosaur National Monument was expanded in 1938, the monument encompassed several tracts of private property. In order to move forward with the monument expansion, these tracts became inholdings rather than being acquired by the federal government. One of the private property owners is the Mantle family. They have owned property in Castle Park and the Red Rock area since the early 1900s.

The Mantle family has decided to subdivide their two tracts of property within the monument and offer lots for sale. Thirty-one lots ranging in size from 2 to 6 acres will be sold on the 164-acre

“Mantle Ranch Subdivision” in Castle Park. Some lots overlook the Yampa River from the cliffs above, while other lots are situated along the river. Most of

*The proposed “Red Rock Subdivision” may be built along the Yampa River.*

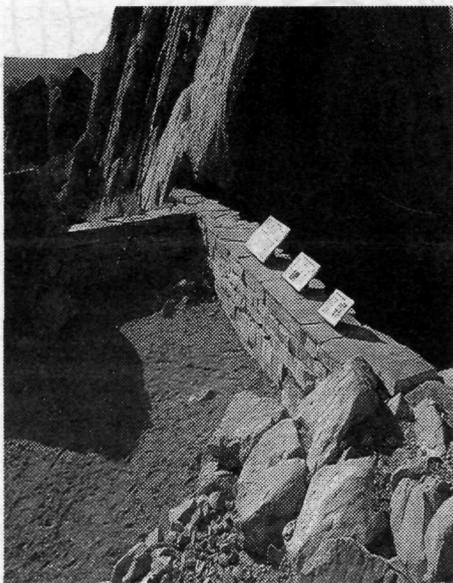
these lots will be viewed by river runners and by visitors gazing from the Mantle Cave overlook.

The 360-acre “Red Rock Subdivision”,

located between the Billiard Table and Red Rock Bench along the Yampa Bench Road, consists of fifty-five lots ranging in size from 5 to 8 acres. Visitors traveling on the Yampa Bench Road will view some of these lots.

Park management is very concerned about the impacts the subdivisions will have on the scenic landscape, archeological sites, wildlife, rare and threatened species, as well as the visitor experience. Ongoing efforts are being made to resolve this issue with the Mantle family so that the rural character of these two tracts of private land is retained. ♣

### Trail Maintenance



Archeological site known as Swelter Shelter.

Yampa River District Maintenance Supervisor Gary Mott reports that in 2001, Dinosaur secured two funding grants which will allow new trail construction at a rock art site on Cub Creek and another in the Yampa Bench backcountry.

The improvement of existing trails and the construction of new routes is made available through funding from the Public Land Corp program (PLC). Money from the collection of national park entrance fees is used by the PLC to fund projects employing young people from around the world working in America’s national parks.

Over the past two years, trail upgrades have been completed at some of the more

popular destinations along the “Tour of the Tilted Rocks” interpretive auto tour, namely at the Swelter Shelter, and stops #13 and #14 that showcase the Cub Creek petroglyphs.

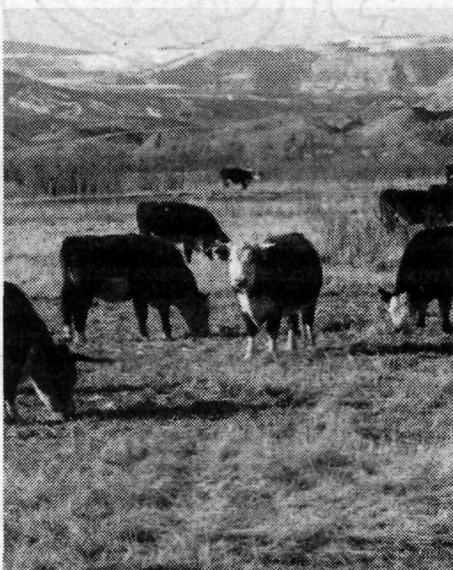
*Trail upgrades have been completed at some of the more popular destinations along the “Tour of the Tilted Rocks”.*

Projects funded for 2002 include construction of the Bull Canyon Trail connecting the Yampa Bench Road with Harding Hole on the Yampa River, and a

connecting route in the Red Wash west of the Split Mountain Campground. This new route will connect the Sound of Silence Hiking Route with the Desert Voices Trail for a more prolonged hiking opportunity in the Red Wash area.

Dinosaur National Monument gratefully acknowledges the State Trails Offices of both Utah and Colorado, which have partnered with Dinosaur funding to develop both routes being constructed this year. ♣

### Livestock Plan



Cattle on winter range.

When Dinosaur National Monument was expanded in 1938 from 80 acres to over 210,000 acres, it encompassed land that was grazed by livestock, mostly cattle. Since 1938, the monument has managed livestock grazing following National Park Service policies. Dinosaur, however, had not developed a Livestock Management Plan (LMP) and grazing Allotment Management Plans (AMP) that would direct the future management of livestock, yet ensure the preservation of significant natural and cultural resources.

This year, monument managers have begun the process of writing a LMP and AMPs. The first step in the process is to complete and Environmental Impact Statement (EIS), which will identify the

*Dinosaur is developing a livestock management plan and needs your comments.*

preferred management alternatives for the Livestock Management Plan.

To complete the EIS we must by law obtain and consider comments from the public. Some of the major issues that the EIS must address are: effects of grazing on soil and water resources; effects on threatened and endangered species; effects on riparian (streamside) communities; effects on proposed wilderness; and what effects grazing has on introduc-

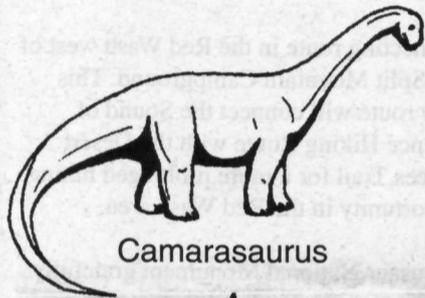
tion or propagation of invasive (nonnative) species. Also, would archeological and historical sites be affected? Would there be conflicts with recreation users? What would be the socio-economic outcome?

You are invited and encouraged to give us your opinion about how livestock should be managed. In this copy of *Echoes*, find a public comment insert that you can complete and mail in. In each visitor center there is a display that provides information and a comment form you can complete and mail in. All comments must be received by August 31, 2002. The more input we receive from the public the better our Livestock Management Plan will be. ♣



## How much do YOU know about dinosaurs?

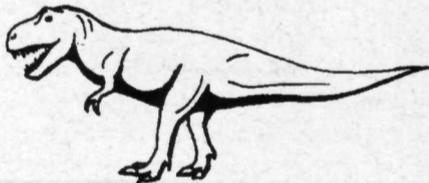
Which of the dinosaurs shown below are found at Dinosaur National Monument? (Color or circle these) Which one isn't found here and why?



Camarasaurus



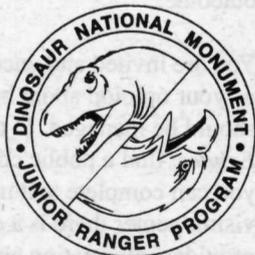
Stegosaurus



Tyrannosaurus

*Answer: Tyrannosaurus rex is not found here though his "cousin" Allosaurus is. T-rex lived millions of years after the dinosaurs found in the Quarry.*

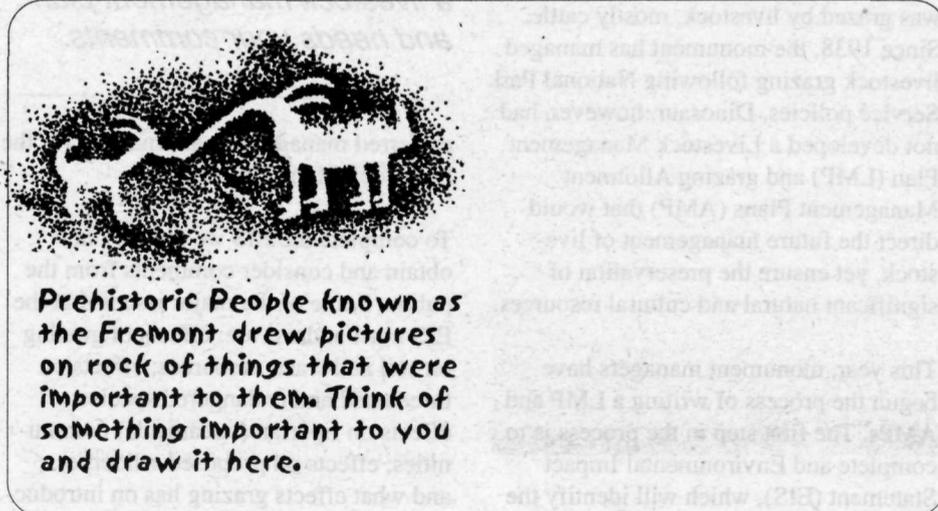
Want to learn MORE about dinosaurs and other cool stuff? Find out if you've got what it takes to become an official JUNIOR RANGER! Ask how at any visitor center.



# Dinosaur Biological Diversity Word Search

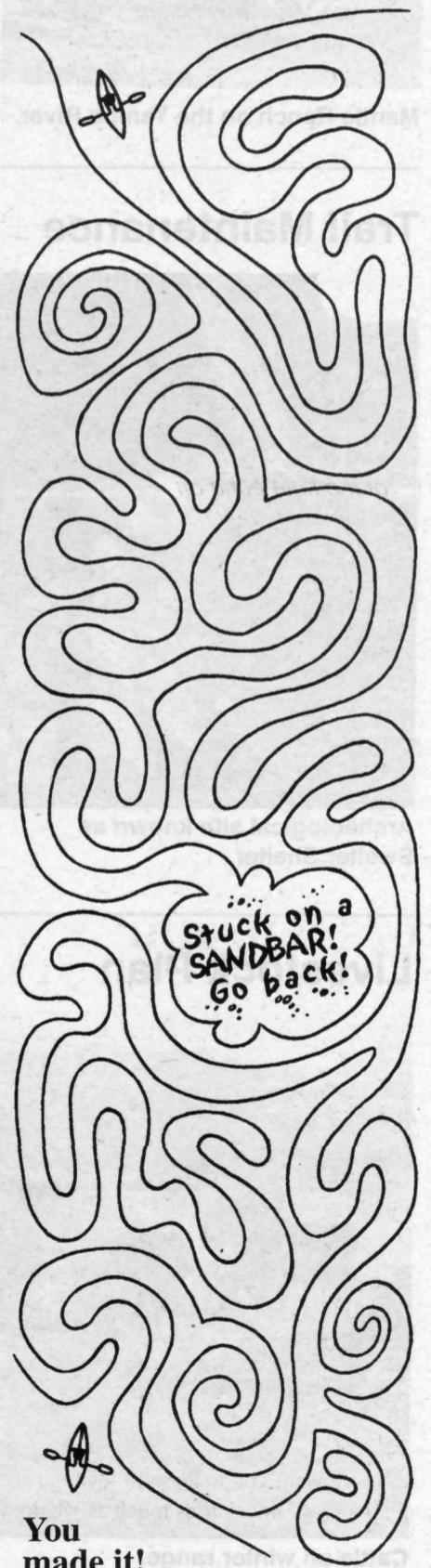
Biological diversity is important to a healthy ecosystem. See how many of the 30 plants and animals listed below which live in Dinosaur National Monument you can find in the word search puzzle. The more you can find, the more healthy your ecosystem will be. Remember, **all words go either ACROSS or DOWN**. Check the box in front of each species you find.

- |  |                                      |                                      |
|--|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> CANADA GOOSE      | <input type="checkbox"/> PRONGHORN   | <input type="checkbox"/> ELK         |
| <input type="checkbox"/> MORMON CRICKET    | <input type="checkbox"/> BALD EAGLE  | <input type="checkbox"/> COYOTE      |
| <input type="checkbox"/> GOPHER SNAKE      | <input type="checkbox"/> OSPREY      | <input type="checkbox"/> JUNIPER     |
| <input type="checkbox"/> BIGHORN SHEEP     | <input type="checkbox"/> MAGPIE      | <input type="checkbox"/> BEAVER      |
| <input type="checkbox"/> SAGEBRUSH LIZARD  | <input type="checkbox"/> SAGEBRUSH   | <input type="checkbox"/> PRAIRIE DOG |
| <input type="checkbox"/> PEREGRINE FALCON  | <input type="checkbox"/> BOXELDER    | <input type="checkbox"/> PINYON PINE |
| <input type="checkbox"/> MOUNTAIN LION     | <input type="checkbox"/> PINYON JAY  | <input type="checkbox"/> RAVEN       |
| <input type="checkbox"/> PARK ROCKCRESS    | <input type="checkbox"/> DOUGLAS FIR | <input type="checkbox"/> BOBCAT      |
| <input type="checkbox"/> RAZORBACK SUCKER  | <input type="checkbox"/> CHOKECHERRY | <input type="checkbox"/> CANYON WREN |
| <input type="checkbox"/> DESERT COTTONTAIL | <input type="checkbox"/> MULE DEER   | <input type="checkbox"/> BADGER      |



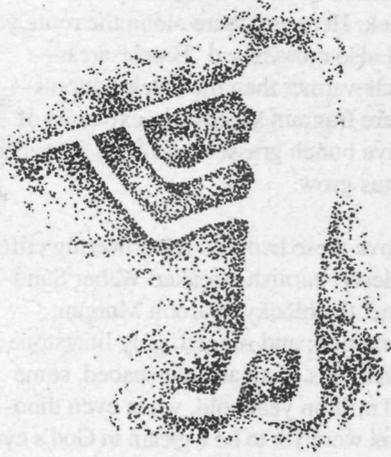
## THE YAMPA RIVER IS WILD!

You are about to launch your kayak on the wild Yampa River—but finding where it eventually flows into the Green River may be harder than you think! Can you do it?



You made it!

## Music of the Petroglyphs



*For a thousand years  
the flute player has played  
his lovely, eerie tune  
for the three princesses  
and the carloads of tourists.*

*Set high on a mountain wall  
carved deep in the varnish  
for all to hear.*

*The princesses stand and listen,  
caught in a spell  
that stops time forever.*

*The flute player weaves his magic  
never ending  
always holding them captive.*

*The melancholy sounds  
of the flute echo off  
the mountain walls.*

*The three princesses,  
held in purgatory.*

*They never dance.*

By park visitor Sandra England

## Diversity of Dinosaur

*Continued from page 1*

from astronomy to zoology. Rangers can help you to learn what those weird-looking bugs are on Harpers Corner Road, or how paleontologists know where to look for dinosaur bones. Maybe you're wondering: "What will I see at the end of the trail at Harpers Corner?" or "What's so special about Jones Hole?"

One of the first things any visitor should do is to check the schedule of programs and try to visit some of these places with a ranger. Park staff members are eager to help you plan and enjoy your experience here; we want you to learn to love the diversity of Dinosaur as much as we do.



Josie Bassett (above) in front of her cabin in 1953. Undated photo at right shows Josie chopping wood, her only source of heat.



## Josie's Cabin: Preserving the Memories of a Pioneer Lifestyle

By David Whitman, Chief Naturalist  
Dinosaur National Monument

AT THE END OF DINOSAUR NATIONAL Monument's Cub Creek Road is an old cabin nestled in a shady oasis. The cabin is empty now, and in disrepair, but it continues to tell a story of one pioneer woman's life in this isolated, beautiful red rock canyon.

Josie Bassett grew up in Browns Park, some 35 miles northeast of Cub Creek. Her parents were some of the earliest pioneers in the area when they started up their small ranch in Browns Park in 1877. Josie learned to love the outdoors: riding horses, herding cattle, and everything else that make up the tough but satisfying responsibilities of ranch life.

Josie eventually married and had two sons, Crawford and Herbert. Married life, however, proved disappointing for Josie, as did living in towns. She was more

comfortable with ranch life and the independence that comes from being close to the land.

By 1914, Josie's children were grown, and she found herself without a place of her own. With the help of her neighbors and son Crawford, Josie staked out a homestead

Independence and isolation can come at a price, however. One day in 1964, while feeding her horse, Josie fell and broke her hip. She dragged herself into the cabin and lay there alone for three days until her grandson found her and got help. While recovering in Salt Lake City, Josie fell again, struck her head and died at the age of 90, as one of the region's last pioneer women.

The little cabin at the end of the road is now part of Dinosaur National Monument. It is a kind of memorial to the pioneers who preceded us and who enjoyed the beauty of the land but also coped with isolation, loneliness, suffering, and sometimes death.

Josie's cabin is threatened, however. Over the years water has crept into its foundation and walls, causing the logs to rot and sag. The National Park Service has developed a preservation plan for the cabin to arrest this deterioration and restore the cabin to its home-like appearance.

You can help save a part of this pioneer past by placing a donation in one of the "Save Josie's Cabin" donation boxes located inside monument visitor centers, as well as at the cabin itself. A cooperative effort between Dinosaur



Rough, hand-notched logs testify to a life of hard, physical work.

National Monument and the non-profit Intermountain Natural History Association is gathering donations to stabilize and restore the historic structure. The fundraising goal is \$100,000. Donations will be used to improve drainage, replace rotten logs, straighten walls, replace the roof, and install new windows.

The story of Josie's Cabin is part of the history of this region, and of America and its people. To find out more about how you can help be a part of protecting that history, contact the Intermountain Natural History Association at (435) 789-8807.



Josie Bassett

### DINOSAUR A Special Place

The geologic record at Dinosaur is the most complete of any national park and creates conditions necessary for a unique biological diversity.

## Tracking the Beaver is a Tale of Two Rivers

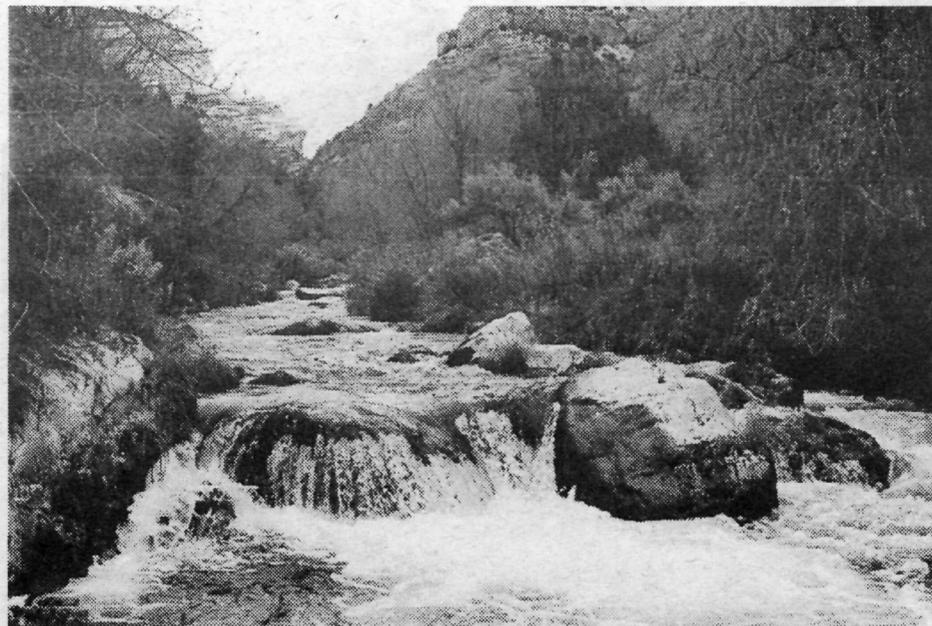
*(The following report is taken from the field journal of biologist Stewart Breck who participated in a study of beaver in Dinosaur Natl. Monument.)*

• **5 June, 8:00 PM, Deerlodge Park.** Before me lies a scene of peace and tranquility: the Yampa River in early evening. The Yampa is free-flowing, free to flood, free to operate as she always has. Because the Yampa is unique, many are coming to study how it operates. People now realize that the dams we have built have a major impact downstream, the Green River being a prime example. Flaming Gorge Dam has stopped the floods and created a different ecosystem below it. The cottonwood trees no longer regenerate. With the floods gone, seeds no longer have suitable sites to germinate and the few young trees that do attempt to grow get chewed down by beaver.

• **26 June, 4:30 AM, Brown's Park.** Radio-telemetry has proved to be an invaluable tool for following the nocturnal activities of the beaver. These all-night vigils are exhausting, but we now know a great deal about territories, population, and feeding activities in each river. The preliminary conclusion: the Green River provides a more stable environment than the Yampa, and beaver populations have grown because of this.

• **7 December, 10:00 PM, Deerlodge Park.** Found another radioed beaver dead yesterday. Mountain lion kill. That makes two killed on the Yampa and zero on the Green this season. Who would of thought that the free-flowing nature of the Yampa would influence the ability of mountain lions to capture beaver? As the Yampa drops in late summer, broad sand bars, created during the high water, separate the cottonwood and willow from the river. Beaver on the Yampa have to travel over these sand bars to get food; easy pickings for a lion. It's a hard life for the beaver but it keeps them in check, keeps them from chewing down all the trees. Contrast this to the Green River where flow regulation has created in-stream islands full of willow and easy foraging for beaver. The few young trees that attempt to grow along the Green now are mowed down in short order.

Tonight the air is cold and it is only a matter of time till the Yampa completely freezes over. Its time to leave for the winter and already I look forward to returning next spring. ♣



Jones Hole Creek's clear, spring-fed waters make music in the canyon year-round.

## Jones Hole: Canyon Oasis Puts on a Good Show

*By Clint McKnight, Publications Specialist  
Intermountain Natural History Association*

COULD A TRIP TO JONES HOLE BE the highlight of your visit to Dinosaur National Monument? Consider this list of "attractions": Soaring canyon walls; a clear, rushing stream; Prehistoric Indian rock art; bighorn sheep and mule deer; diverse ecosystems ranging from shady, riparian woods to warm, grassy benches; a national fish hatchery; and an easy four-mile trail which takes you through these and other wonders to the banks of the Green River.

Jones Hole—named for a local outlaw who found this a good place to "hole up"—is about a 1 hour drive from the Dinosaur Quarry Visitor Center.

Parking is at the Jones Hole National

Fish Hatchery where trout are raised for transplanting in lakes and streams throughout the eastern Uinta Mountains. This facility is open to the public and warrants a restroom stop before embarking on the trail. Here you can also fill up your water bottles (the creek water is beautiful but unsafe for drinking.) Also, be sure to pick up a trail guide at the parking lot information kiosk.

After passing the outdoor raceways (where ravens sometimes stop to snatch a meal) the trail begins where Jones Creek emerges from its underground passage. The water is unexpectedly cold and clear, and provides this canyon with an oasis-like quality that cannot fail to be appreciated on a hot day.



Rocky Mountain bighorn sheep have lived in this canyon for at least 1000 years, or so the Fremont pictograph at right would suggest.



Shortly, you will pass into Dinosaur National Monument. The trunks of the leafy grove you walk through here support a surprising abundance of mosses; further evidence of the cooling effect of Jones Creek. Here and there along the route you will also cross raised "bench" areas—much warmer than the creek bottoms—where fragrant sagebrush, expanses of native bunch grasses, and even flowering cactus grow.

Above these benches rise towering cliffs of desert varnish-streaked Weber Sandstone; the blocky, maroon Morgan Formation; and rugged, grey limestone which tells of an ancient seabed, some 310 million years old, when even dinosaurs were yet to be a gleam in God's eye.

This is a wonderful place to walk quietly and be alert for wildlife and its signs. You may see coyote scat on the trail, glimpse a harmless gopher snake racing through the grass, or observe beaver-chewed tree trunks. Listen for the high, far call of birds such as the canyon wren. I have come as close to bighorn sheep here as anyplace in the Rocky Mountains. Once, as I simply stood on the trail, two large rams butted heads not 10 yards away. Their crashing duel sounded like gunshots, but it is the lack of hunting in this wildlife sanctuary that encourages bighorn and other animals to allow such closeness by people.

Just after crossing the creek on a wooden footbridge you can see some fine examples of 1000-year old Fremont People rock art. Bighorn have apparently been common in the canyon for a long time, for there is a particularly nice painted image (called a pictograph) that appears to show a ram with a great set of horns. And is that a hunting dog at its heels? It's fun to wonder about the meanings of these ancient images. *(Please help us by doing your part to preserve Dinosaur's fragile and irreplaceable rock art. Never touch the art itself or even the rock around the images.)*

At about the halfway point to the Green River you will come to a small, back-country campsite (A free permit is required to camp here. Ask about availability at either the Quarry or Headquarters visitor center.) Here you can take a short detour to tiny Ely Creek Falls; just follow the turnoff to Island Park.

Depending on your time and stamina, this may be a good place to begin your return trip, which would make for a hike of about 3.6 miles. Or, you may choose to continue down the trail another 2.2 miles to the Green River. This is the tail-end of what explorer John Wesley Powell named Whirlpool Canyon in 1869.

Either way, the sounds of the babbling creek will guide your route, and will remain with you, along with many other fond memories of Jones Hole. ♣



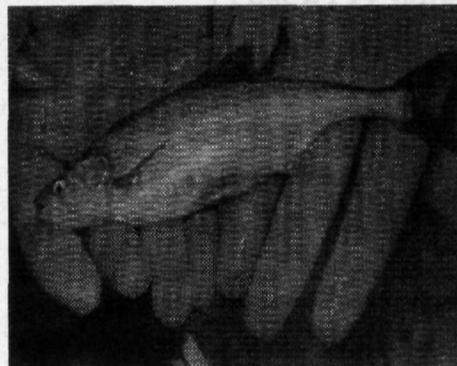
Photos courtesy of U.S. Fish & Wildlife Service

## Rare Fish Return to Dinosaur's Rivers

By Stephen Petersburg  
Resource Management Specialist

IN JULY OF 2000, ONE OF THE WEST'S rarest fish species was returned to the Green and Yampa rivers. Five thousand hatchery-reared juveniles of the endangered bonytail (*Gila elegans*) were released in the lower Yampa River near Echo Park in Dinosaur National Monument. Another 5,000 were released in lower portions of the Browns Park National Wildlife Refuge immediately north of the monument. These releases will be augmented by additional releases in future years in an attempt to re-establish wild populations of bonytails.

The bonytail, one of four endangered large-river fishes in the Colorado River system, had been virtually extirpated from wild riverine habitats. The other three endangered species are Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), and humpback chub (*G. cypha*). The state



Top, U.S. Fish & Wildlife staff release endangered fish into the Green River. Above, a hatchery-raised juvenile bonytail.

of Utah listed the bonytail as protected in 1974, and the state of Colorado listed it as endangered in 1976. In 1980, the bonytail was federally listed as endangered under the Endangered Species Act of 1973.

The bonytail is a member of the minnow family *Cyprinidae*. It has a streamlined body that narrows markedly toward the tail. Its back is gray or olive, its sides are silvery, and its belly is white. Its large fins are characteristic. Bonytails may reach lengths of greater than 61 cm (24 in.) and may live nearly 50 years. They are closely related to other chub species in the Colorado River System, and intergrades with the humpback chub and the roundtail chub (*G. robusta*) have frustrated geneticists for many years.

Dams in major river channels such as the Flaming Gorge and Glen Canyon dams are the proximate cause of the decline of the endangered Colorado River fishes. Many characteristics of riverine habitats are altered by dams and the new habitats favor nonnative fish species, many of which compete with the endangered species or prey on them. The bonytail was once common from the lower reaches of the Colorado River to well upstream of Dinosaur National Monument. One of the last riverine areas that wild bonytail occupied into the late 1960s was around Echo Park. Remnant popula-

### DINOSAUR A Special Place

The park protects a unique, biologically diverse natural ecosystem at the confluence of three distinct physiographic regions.

## Alien Plants Threaten Native Ecosystems

By Tamara Naumann, Park Botanist

THE EASY MOBILITY THAT DEFINES OUR MODERN LIFESTYLE has created an unintended and potentially devastating environmental problem. Unconstrained by mountain ranges and oceans as in days past, a few aggressive plant and animal species have moved, with our help, out of their own environments, and now threaten to overwhelm native plants and animals in their new habitats.

These newcomers have often originated in similar habitats in Eurasia or the Mediterranean, but arrive here without the natural enemies that keep them in check in their native homes. Such aggressive, or "weedy" species can cause great disruptions in our natural areas, altering ecosystem processes and displacing or eliminating native species.

Economic losses resulting from weed invasions in agricultural systems amount to many millions of dollars every year. Losses to some of our most treasured natural areas—our national parks—are more difficult to quantify or even to recognize. Here in Dinosaur National Monument the unique flora and fauna associated with the Yampa and Green river corridors are threatened by invasion of salt cedar (also called tamarisk) and perennial pepperweed. These alien plants are crowding out the native cottonwoods, willows, grasses and wildflowers that supported a once-thriving community of birds, mammals, reptiles, and insects.

Riparian areas are not the only habitats compromised by noxious weed invasions. Russian knapweed has invaded a large area near the Josie Bassett historic cabin; important wetland habitat has been adversely affected, and a rare orchid—the Ute ladies'-tresses—is vulnerable to this pernicious and aggressive weed.

As we study the ecology of weed invasions, we become more aware of the interwoven relationships among all living things. And as we begin to understand the risks to the species and ecosystems our national parks were set aside to protect, we are faced with realization that we are not so very far removed from this threat to habitats upon which we all depend for our food, fiber, recreation, and aesthetic nourishment. ♣



Park Botanist Tamara Naumann inventories invasive plant species found in Dinosaur.

tions have persisted in reservoirs in the Lower Colorado River Basin and in hatcheries.

Stocking the rivers with the bonytail is a cooperative effort by the U.S. Fish and Wildlife Service, National Park Service, Colorado Division of Wildlife, and Utah Division of Wildlife Resources. The fish were raised in the Wahweap Fish Hatchery of the Utah Division of Wildlife Resources near Page, Arizona. The Colorado Division of Wildlife and the U.S. Fish and Wildlife Service trans-

ported the fishes to the release sites where the NPS assisted with the releases. The agencies are members of the Upper Colorado Recovery Implementation Program which is comprised of federal and state agencies, environmental groups, and water and power-user organizations in Colorado, Utah, and Wyoming. The goal of the program is the recovery of endangered fish species while allowing development of water resources for human uses. ♣

## Visitor Centers

The Dinosaur Quarry is your ticket back in time. Park Headquarters is the gateway to Dinosaur's canyon country.



### The Dinosaur Quarry

This unique and historic structure was built over the world-famous dinosaur quarry discovered by Earl Douglass in 1909. Some 1,500 dinosaur bones are exposed here and can be seen just as they lay when fossilized 150 million years ago.

The Quarry features numerous exhibits about its dinosaurs and their environment. Additional displays tell the history of the excavations initiated by Industrialist Andrew Carnegie, and the eventual National Monument designation by President Woodrow Wilson. There is a working paleontology lab where visitors can sometimes see paleontologists at work, and a bookstore.

The Quarry is open daily. Summer season hours, from Memorial Day to Labor Day, are 8:00 AM to 7:00 PM. There is an entrance fee to this portion of the park. Winter hours are 8:00 AM to 4:30 PM (Closed Thanksgiving, Christmas Day and New Year's Day.)

For further information call (435) 781-7700.



### Monument Headquarters

The administrative headquarters of Dinosaur provides information on the scenic canyon areas. There is also a park orientation film and bookstore. (There are no fossil bones in this visitor center or in this portion of the park.)

Information about boating opportunities on the Green and Yampa rivers are available from the River Office located here, or by calling (970) 374-2468.

Open daily 8:00 AM to 4:30 PM during the summer; closed weekends and holidays in winter. There is no fee to enter this portion of the park. For further information call (970) 374-3000.

## Scenic Drives

### CUB CREEK ROAD

Desert, dinosaurs, and more; discover what else the monument has to offer along the Tour of the Tilted Rocks. This self-guiding auto tour begins near the Quarry Visitor Center and provides views of Split Mountain, the Green River, prehistoric rock art, and a pioneer homestead site. There are also trails ranging from easy Hog Canyon to the challenging Sound of Silence.

**TIME:** 1 to 3 hours **DISTANCE:** 22 miles round-trip

**ROAD CONDITIONS:** Paved until last 2 miles which are narrow and dusty

**VEHICLE REQUIREMENTS:** Suitable for all vehicles

**LEG STRETCHES:** Desert Voices Nature Trail, Sound of Silence Hiking Route, and Hog Canyon

**HOT TIP:** Pick up a *Tour of the Tilted Rocks* brochure.

### HARPERS CORNER ROAD

From the Headquarters Visitor Center (where a booklet for this scenic drive may be purchased), the road winds up and around Plug Hat Butte. Here there are picnic tables and a short nature trail. The road then climbs gradually over open uplands toward the canyon rims where overlooks provide panoramic views of the gorges carved by the Green and Yampa rivers. *Note: This is open range. Be alert for livestock and deer on the road.*

**TIME:** 2 to 4 hours **DISTANCE:** 62 miles round-trip

**ROAD CONDITIONS:** Paved road

**VEHICLE REQUIREMENTS:** Suitable for all vehicles

**LEG STRETCHES:** Cold Desert Trail, Plug Hat Nature Trail, Ruple Point Trail

**HOT TIP:** Don't miss the Harpers Corner Trail (see page 3).

### ECHO PARK ROAD

From Harpers Corner Scenic Drive, the Echo Park Road makes a dizzying plunge into the heart of the Monument. Unique geologic features, prehistoric rock art, and the dramatic setting for the confluence of the Green and Yampa rivers below Steamboat Rock await those who journey to Echo Park.

**TIME:** 2 hours from Harpers Corner Scenic Drive.

**DISTANCE:** 26 miles round-trip.

**ROAD CONDITIONS:** Unpaved, steep, winding and narrow; *IMPASSABLE WHEN WET!*

**VEHICLE REQUIREMENTS:** Can be driven with caution in vehicles having good ground clearance; not suitable for trailers, motor-homes, or other large vehicles.

**SIDE TRIPS:** 6 to 8-mile round trip hike through Sand Canyon. Ask a ranger for details.

**HOT TIPS:** This drive will bring you to the historic Chew Ranch (on the National Register of Historic Places) and the refreshing cool air of Whispering Cave. Take water.

### ISLAND PARK ROAD

Island and Rainbow parks reveals the quieter side of the Green River. See historic Ruple Ranch, and superb prehistoric rock art at McKee Spring. Island Park Road is reached from the Quarry by exiting the Monument and following Brush Creek Road toward Vernal.

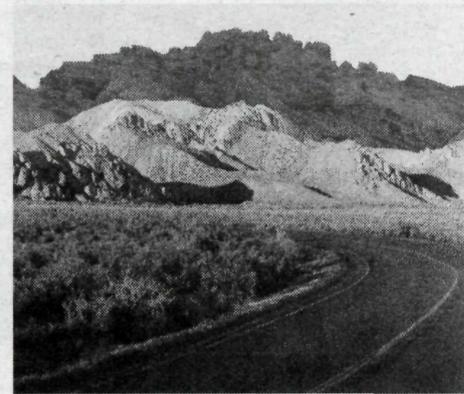
**TIME:** 2 hours. **DISTANCE:** 51 miles round-trip to Rainbow Park; add 11 miles for Island Park.

**ROAD CONDITIONS:** Unpaved, rough dirt and gravel road; *IMPASSABLE WHEN WET!*

**VEHICLE REQUIREMENTS:** OK for most passenger vehicles. Not for trailers or motor-homes.

**SIDE TRIPS:** Connects with road to Jones Hole; 33 miles of paved road to fish hatchery and Jones Hole Trail (see page 3).

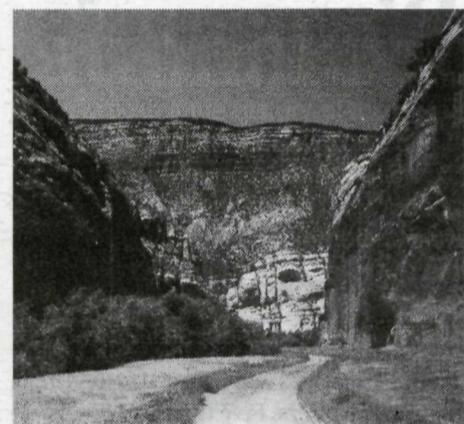
**HOT TIP:** Road leads to the launch site for one-day boat trips.



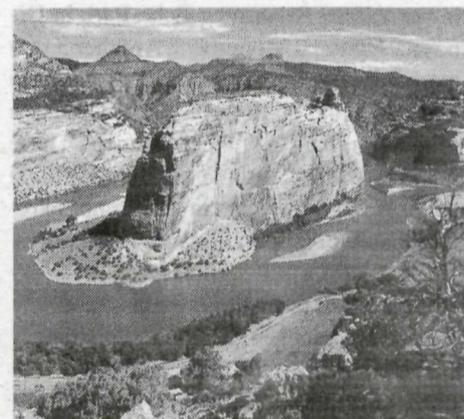
Split Mountain and Cub Creek Road



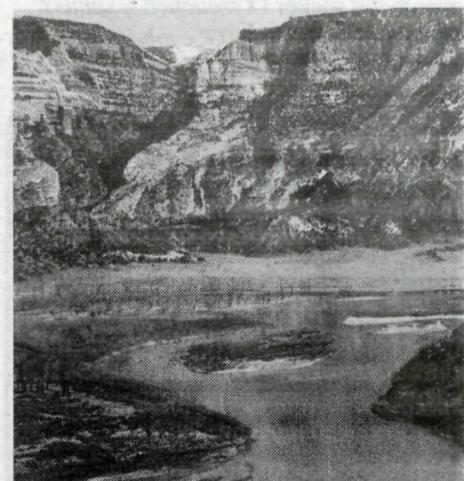
View from Harpers Corner Road



Echo Park Road



Steamboat Rock, Echo Park



Green River and Island Park

Photo by Bill Michem, Dragon Trail PhotoGraphics