

## **The Rising Range**

Rocky Mountain scenery offers a myriad of dramatic vistas, but few more impressive than the Teton skyline. As the Teton Range rose through sporadic earthquake-producing jolts, the valley called Jackson Hole subsided. Because of the way the mountains formed. no foothills hide jagged peaks and broad canyons. At the base of the range, large lakes mirror the mountains on calm summer days, doubling their prominence.

During the immense span of time before the mountains' rise, vast seas repeatedly advanced and retreated, leaving behind a thick, nearly flat blanket of sedimentary rock layers. Between 60 and 70 million years ago ancestral mountains rose here as a broad, northwest-trending arch, and the last seas retreated eastward, Jackson Hole east of the arch became the site of enormous sheets of gravel interspersed with thick volcanic ash, lava, and freshwater lake sediments. Enormous tensional faults fractured these formations, and 9 million years ago today's Teton Range started rising. Broken sedimentary layers of ancient sandstone, shale, dolomite, and limestone still cap each end and the backside of the range. The sandstone remnant atop Mount Moran, over 6,000 feet above the valley, once connected to the same sandstone layer that now lies an estimated 25,000 feet below the valley floor. In addition to this great displacement along the Teton fault, another zone of faults within the range thrust the central peaks even higher. Wind, water, ice, and glaciers long ago stripped sedimentary layers off the central peaks, uncovering basement rock nearly as old as the Earth itself. Resistant granite, sculpted into the Grand Teton and adjacent peaks, towers as the central range's exposed core

Cascading water initially cut steep, V-shaped gorges throughout the rising range. Changes in the Earth's Rocks of all sizes, falling onto and plucked by these moving glaciers, increased their grinding power. The flanks of the range display scoured canyons that dive toward the valley. Upon leaving confining canyons, the larger glaciers spread onto the valley floor, while melting at a speed equal to their flow. An immense volume of unsorted rock, transported and dumped by these glaciers in a conveyor-belt action, formed natural dams. These now encompass lakes called Leigh, Jenny, Taggart, Bradley, and Phelps. Similarly, a lobe of the extensive Yellowstone snowcap extended southward as a broad glacier which deposited rock as



morainal ridges, damming meltwaters to create Jack-

South of Jackson Lake, torrential meltwaters washed away moisture-holding clay from the cobble debris that previous glaciers spread down the valley. Sage-

## Along the Snake

The Snake River originates in the wilderness near the south boundary of Yellowstone and meanders into Jackson Lake. From its exit through the dam the Snake runs swiftly eastward above the filled-in trough gouged by a massive Ice Age glacier. At Moran Junction the river turns abruptly southwest and flows down the broadened bed of the ancestral Snake, which diagonally bisects Jackson Hole. Today's river erodes hard cobbles with only a fraction of its original force

From Jackson Lake the Snake winds in braided channels for 27 miles within the park. Slower moving waters insure essential habitat for numerous aquatic animals and plants. Beavers, otters, and trout swim by moose feeding on aquatic plants. Native Snake River cutthroat trout, a distinct subspecies of the cutthroat, depend on the park's natural aquatic system for survival. Trout consume aquatic insects, invertebrates, and small fish Bears, eagles, ospreys, and otters in turn feed on the trout.

Low-growing willows thrive among tall cottonwood, spruce, and aspen trees. Riverbanks show ever changing checkerboard patterns of plant succession be cause of flooding and channel shifting. These natural ecological disturbances create a mix of plant communities that benefits the moose and beavers. Were it



The geologic forces and natural systems that interact to produce inspiring scenery also nurture a remarkable diversity of animals. In spite of a short growing season, the Greater Yellowstone Ecosystem supports the largest elk herd remaining in the world. Many elk summer in the park. A small herd of buffalo also summers in the park and winters near the elk south of the park. Moose meander beside canyon streams when warmth permits but seek protection from frigid winds in valley bottomlands. Pronghorn that traverse sagebrush flats must migrate southward over mountain passes to survive. Seldom seen black bears, and an occasional grizzly north of Mount Moran, forage in canyons and woodlands to store body fat for winter sleep.

*i*ldlife

Bald eagles and ospreys fish and nest along the Snake River. A few eagles endure the cold months. Each spring great blue herons return to their rookery at the Oxbow Bend. Trumpeter swans, the largest North American waterfowl, build sizable pond-level nests: when ice prevails they depend on warm springs in the region. Beavers dam streams to create ponds that benefit Canada geese, mallards, cinnamon teal, and a multitude of summer and migratory waterfowl.

The Greater Yellowstone Ecosystem, which includes the Teton Range and Jackson Hole, remains as the largest essentially intact natural area in the temperate zones of the Earth. Evergreen forests and wild rivers abound. Elk, buffalo, bears, eagles, and swans that once thrived nationwide now survive on this sland of hope. They symbolize the remaining wilderness. Their survival, and the ecosystem that supports them, will mean much to future generations

Wildflowers in an amazing variety and profusion bloom through the warm months. Sagebrush butter cups follow receding snowpack. Springbeauties, ye

lowbells, and steershead blossom closely behind

growing close to the ground for protection from

Towering more than a mile above the floor of the valley known as Jack son Hole, the Grand Teton rises to 13,770 feet above sea level. Seve

Nearly 3,000 elk summer

in the park. Free ranging

and migratory, elk spend

all summer gaining weight

coming winter. A few

of the park, the alpine forget-me-not

to sustain them through

on peaks reach above 12,000 feet elevation. high enough to support a dozen mountain glaciers. In contrast to the abrupt tern face, the west

inches of snow trigger

migration to the National

Elk Refuge immediately south of the park. Fall mi

gratory herds sometimes

nber 200 or more.

side of the range slopes gently, showing the angle of tilt of this block resulting from the faulting process that created these mountains. Youngest of

the mountains in the Rocky Mountain system, the Teton Range displays some of North America's oldest rocks. e by Pat O'Hara

# History

People entered Jackson Hole an estimated 12,000 years ago. Archeological evidence indicates that small groups repeatedly hunted and gathered plants in the valley from 5,000 to 500 years before the present. During historic times no one tribe claimed ownership to Jackson Hole, but Blackfeet, Crow, Gros Ventre, Shoshone, and other Native Americans living on surrounding lands used this neutral valley during the warm months. Severe winters prevented habitation.

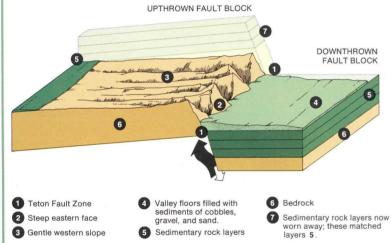
Historians credit John Colter as the first white man in the valley, entering in the winter of 1807-1808. Moun-



Pierce Cunningham ranched near Spread Creek about 1889. He circulated a petition in 1925 among local land owners asking Wyoming or the Federal Govern ment to set the valley aside "for the education and enjoyment of the Nation as a whole. A self-guiding trail explores the Cunningham Cabin Historic Site.

ain men followed and trapped valley beaver. Brigades of trappers traversed this crossroads of the western fur trade until the era ended about 1840. Valley settlement began in 1884. After 1900, some settlers

season. Meadows of scarlet gilia, balsamroot, lupine arkspur, and wild buckwheat bloom in multiple com binations of red, yellow, blue, purple, and white. Following the valley display, many of the same wild flowers flourish in meadows along canyon traiis. Visitors to the alpine zone discover brilliant cushions of color that hug the ground, including the official flower



Two rectangular blocks of the Earth's crust moved like giant trap doors, one swinging skyward to form the mountains, the other hinging downward to cre ate the valley. Wind, rain, ice, and glaciers con-stantly eroded the rising range, Meanwhile, enormous glaciers and torren tial meltwaters flowed southward carrying cob-bles, gravel, and coarse sand. These periodically leveled the floor of the sinking valley.

climate caused long periods when snowfall exceeded melting, precipitating glaciers in sizes beyond imagination. Glaciers advanced, and in warmer times receded, in mountain gorges and out across the floor of Jackson Hole. Southward-flowing ice more than 2,000 feet thick filled the valley, overriding buttes and surrounding mountains. Only the high Teton peaks pro-



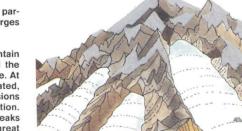
truded through engulfing ice. Mountain glaciers, particularly during the last Ice Age, widened steep gorges into broad, U-shaped canyons

Over a comparatively short span of time, mountain glaciers of the last major glacial period shaped the Teton skyline more than any other erosional force. At upper elevations, where the most snow accumulated, the heads of the glaciers scooped out depressions and frost wedging augmented their quarrying action. Sheer cirque walls, rugged ridges, and jagged peaks reflect the slow, dynamic carving by these great masses of moving ice.

rain and melting snow percolate rapidly. Lodgepole pines and subalpine firs stand on morainal ridges that contain more fine-grained soil. On alpine slopes trees and flowers struggle in fragile soil, where weather limits growth. At all elevations geology and water determine vegetation, which in turn controls the variety and distribution of wildlife.

brush identifies these washed areas of less soil where

At upper elevations a dozen re-established glaciers lowly flow from the cirques cut by Ice Age giants. Schoolroom Glacier, so named for its easily observable classic characteristics, represents but one page of the living textbook that includes the accessible rock of the Teton Range, Jackson Hole, and adjoining features. This rock offers the most complete geologic record in North America. Future events will include infrequent earthquakes that signal movement along the fault zone, as the Teton Range continues to rise. Wind, water, and ice will sculpt ancient rock into a different, but no less impressive skyline.



Moose like to eat willows along rivers and streams. When bulls raise their heads while feeding on underwater aquatic plants in ponds, water pours off their palm-shaped antlers. Killdee feed and nest in wet areas, as their well cam-

> bottom, yellowbelly marmot, coyote, and pronghorn.

late snowstorms or frost. Brilliant color covers the valley floor during late June, the peak of the wildflo Jeff Gnass

not for these continual natural changes, spruce would dominate along the banks, crowding out the willows and cottonwoods favored by moose and beavers. The summer riverbottom teems with diving, wading, and woodland birds. During darkness owls and other predators hunt in this riparian ecosystem.

Born of wilderness snowpack, the Snake River swells with meltwater. Trappers and settlers called it the Mad River, more than a challenge to cross during the spring. Today's challenge is to protect this powerful. life-supporting river.



ouflaged eggs suggest.

Shown at right are, top to





Native American art at the Colter Bay Visitor Center. Exhibits illumi

liefs, and lifestyle of numerous North Ameri-can nations, especially the Plains Indians.

realized that "dudes winter better than cows" and started dude ranches.

In 1929, much of the Teton Range received protec tion through the establishment of the park. After years of debate Congress added the Jackson Hole portion n 1950. Prehistoric people came to feed the body Today's visitors nourish the spirit. Management of the park honors the mandate to protect, for the enjoyment of future generations, the natural systems that produce the scenery and wildlife.



## Visiting the Park

Visitor centers at Moose and Colter Bay issue permits and provide assistance and information daily from mid-May through September. Moose Visitor Center is open daily the rest of the year on a reduced schedule and displays original oils by area artists. Park headquarters adjoins Moose Visitor Center. Colter Bay Visitor Center exhibits an extensive collection in its Indian Arts Museum and offers audiovisual programs

Publications for sale at each visitor center by the Grand Teton Natural History Association include the official national park handbook, Grand Teton, and Association publications: Creation of the Teton Landscape, Early Days in Jackson Hole, and Teton Trails. Write to P.O. Drawer 170, Moose, WY 83012, for a complete list of books and maps. Earnings from this nonprofit corporation support the park's research and educational work.

Teewinot, the free park newspaper, offers current information on a host of subjects, including natural history, camping, and self-guiding trails. Teewinot also contains a comprehensive list of concession services, notably lodging, restaurants, stores, gas stations, and mountaineering and float trip services

Ranger-led activities offer increased understanding and appreciation of park resources. The Teewinot lists a variety of talks, walks, hikes, demonstrations, and other programs conducted from mid-June through September. Slide-illustrated campfire programs cover a wide range of topics at Gros Ventre, Signal Moun-, and Colter Bay Amphitheaters

Wayside exhibits at many turnouts along main park roads identify major peaks and explain natural features. Turnouts also insure safe parking for viewing and photographing the mountain scene.

Teton Science School offers a wide variety of in-depth courses at the Grand Teton Environmental Education Center. This nonprofit school employs highly qualified instructors to teach a year-round spectrum of topics related to the Teton Range and Jackson Hole. Courses for all ages in natural history and ecology stress field study supplemented by informal lectures. Summer seminars last 3 to 5 days and usually cover geology, plants, animals, birds, and photography. For information and schedules, write to the Director, Teton Science School, P.O. Box 68, Kelly, WY 83011, or call (307) 733-4765.

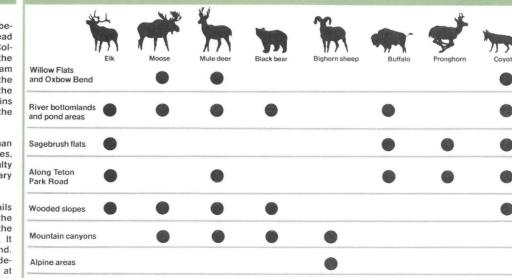
### rails

Self-guiding trails provide insight into the story be hind the scenery. Booklets available at each trailhead describe prominent features bordering the 2-mile Colter Bay Nature Trail, and discuss history along the 1/2-mile Menor's Ferry and the 1/2-mile Cunningham Cabin Trails. Trailhead locations are shown on the park map. The Cascade Canyon trail begins at the south end of Jenny Lake, and the booklet explains natural features up to Lake Solitude, 9 miles from the trailhead.

Trails traverse the valley and mountains for more than 200 miles. They provide access to backcountry lakes, streams, canyons, and camping zones. Trail difficulty levels range from easy to strenuous, and lengths vary from hikes of a few minutes to several days.

Visitors who take the time to hike mountain trails discover the magnitude and hidden qualities of the peaks and canyons. The Teton Crest Trail runs from the south boundary of the park to Cascade Canyon. It offers extensive views of the range and distant land. Visitors unaccustomed to high elevations may descend to the Crest Trail from the top of the tram at Teton Village. Rewarding trails in Granite and Death Canyons connect the Crest Trail to the Valley Trail.

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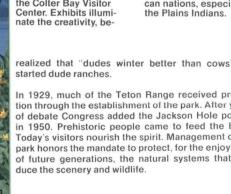
Early morning and evenings are best times to see many species

## Vinter

Winter dominates the Teton country for more than half the year. Deep snows from the west cover the backside of the range. Winds often howl past high peaks.Storm clouds may hide the mountains for days, but, after they pass, cold, clear air permits unsurpassed views. Lower temperatures and avalanche potential make mountain travel risky for those without proper knowledge, skills, and equipment.

Crosscountry skis and snowshoes permit safe travel to exceptionally quiet, often windless valley vistas. In central Jackson Hole an average of 4 feet of snow covers sagebrush and fallen trees. Nightly temperatures often fall below -25°F during December and January, but low humidity and the warming sun greatly lessen the effects of the cold. Moose, covotes, and snowshoe hares make tracks in freshly fallen snow. Seeing them enriches any ski trip.

Moose Visitor Center distributes the map of park ski trails, along with information on weather, avalanche and road conditions. Plows clear the main park road. but the roads at the foot of the range, and in Yellowstone, remain closed by snowpack until spring. Also at Moose, rangers provide snowshoes for twice-weekly hikes to help visitors appreciate winter in the park.



#### **Grand Teton** Write to the Superintendent, Grand Teton National Park, P.O. Drawer 170, Moose, WY 83012 for assis-tance or information, or call (307) 733-2880. Basic information about the park is available in German, French, Spanish, or Japanese. The Superintendent of Grand Teton alco administers the John D. Postofol Wyoming Grand Teton also administers the John D. Rockefel ler, Jr., Memorial Parkway. Water Safety Floating the Snake River within the park is allowed only in hand-propelled Wildlife and Wildflowers Feeding wildlife is pro-Vehicles and Pets Camping Climbing Camping is permitted in six park campgrounds. All except Jenny Lake (tents Motorboats are permitted on Jackson, Jenny (8 h.p. maximum), and Phelps Water in all streams and Fishing is allowed in most Wildflowers are part of Pets must be kept on a leash (maximum length 6 feet) at all times. Pets are Climbing mountains is a technical sport requiring proper knowledge, expe-Swimming in park waters Drive only on established Oversnow vehicles must is generally a cold expe-rience. Swimming is per-mitted in all lakes except Jenny and Taggart. Shal-low areas of Jackson, be registered yearly at the Moose or Colter Bay Vis-itor Centers. A state snowlakes, although clean and cool, should not be drunk park lakes and streams. A Wyoming fishing lithe park's natural setting and add a special touch roadways and observe all posted speed limits. Use hibited. Animals in the park are part of preserved only) will accommodate trailers, RVs, and tents. Campgrounds are oper-ated on a first-come, firstboats and rafts but never Lakes. Hand-propelled craft are permitted on Jackson, Jenny, Phelps, Emma Matilda, Two unless properly treated. Untreated water may con-tain *Giardia*, *Campylo*cense is required and rience, physical condition, and equipment. Climbers must sign in before and and protected natural of color to the mountain caution when passing binot permitted in public in inner tubes. Each craft must be registered yearly systems. Let animals find natural foods. Many small may be purchased at the Moose Village Store, the and valley scenery. Reg-ulations prohibit the cycles. Dawn and twilight are excellent times to obmobile registration is also required. Snowmobiles buildings, on trails, in the backcountry (which be-gins 250 feet from roads), destruction, injury, dis-turbance, or removal of public property or natural features including plants, animals, or rocks. Fire-wood may be collected for personal use if the bacter, and other harmful organisms. These can cause severe gastrointes-tinal distress. Before be-String, and Leigh Lakes have reasonable water temperatures during July and August, but there are Signal Mountain Lodge, at the Moose or Colter mammals can carry disserve wildlife, so watch are permitted on the immediately after each served basis. Advance re-servations are not ac-Bay Visitor Centers. Al-though the Snake may Ocean, Taggart, Bradley, Bearpaw, Leigh, and String Lakes. Sailing, eases and should never be touched. Larger aniand the Colter Bay Tackle Shop, Visitor centers other drivers for sudden stops. Pull vehicles well off the road into the paved park's unplowed roads and in the Potholes area on ranger-led activities, or in visitor centers. They climb. The Jenny Lake Ranger Station is the center for climbing informals can be quick, power-ful, and unpredictable. Approaching too closely are prohibited in boats on rivers and lakes other than Jackson Lake. Never have information on specepted. Backcountry not seem powerful on the when snow conditions camping is permitted only in designated areas. A surface, only exper-ienced floaters should atwindsurfing, and water skiing are allowed only ing used, untreated water must be brought to a boil cial park fishing regula-tions, bait restrictions, or gravel turnouts to ob-serve wildlife and scenery permit. Maps of permit-ted snowmobile routes mation and registration from June through midno swimming areas with lifeguards. Swimming in the Snake River is not permit is required for all on Jackson Lake. A per-mit is required for all craft. creel limits, and open leave pets unattended. Pet regulations are strictly enforced. tempt this swift, cold to kill harmful organisms. can result in serious for personal use if the or to take photographs. are available at Moose September. Solo climb-Be alert for large animals crossing the roads. overnight trips. recommended. seasons. tree is dead and down ing is not advised. injury GPO: 1987-181-415/60034 Do not use this map for Self-guiding nature trail Distances are shown between markers. Gasoline 🖞 Marina Turnout or overlook Ranger station Food service Campground backcountry hiking. Buy USGS topographic maps at visitor centers. Store A Picnic area G Stables Glacier/snowfield ▲ Tent only campground Jnpaved road To West 1 Mile YELLOWSTONE NATIONAL PARK ov. 1 to Ap South En JOHN D. ROCKEFELLER, JR. WINEGAR HOLE Grassy Lake Re WILDERNESS AREA MEMORIAL PARKWAY Flagg Ranch Lake of the Wood No trailers or large RVs on one lane portion. Snake River 9615ft 2931m Steamb Mounta 7872ft 2399m TARGHEE FORESIT NATIONAL TETON NATIONAU FOREST Lizard Cro TETON WILDERNESS AREA Æ Arizona Arizona NO' GRAND TETON 88 Æ 8274ft 2522m NATIONAL PAL Leeks Marina JEDEDIAH SMITH Colter Bay Visitor Center WILDERNESS AREA (A) and View Point son Lake Lodge Medical Clinic Raynolds Peak 10910ft 3325 m ow Bend Turn Elk Island Jackson Lake J TU

**Grand Teton National Park** 

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