

The park's natural environment is a combination of dynamic and interacting elements. An inventory of these elements provides a clearer understanding of these factors and how they are affected by and influence human use. Following each element of the natural environment is a list of management implications. These are included as a summary of the most important influences each element exerts on planning and managing park use. These implications can be viewed as constraints upon park development.

TOPOGRAPHY

Most of the park is characterized by steep mountains and U-shaped valleys. These U-shaped valleys were formed by the erosive forces of glaciers dating back a million years. About 73 square miles, or roughly ten percent of the park, is still covered with the remains of these glaciers and ice fields. Most active is the Eagle Glacier which is retreating at an average rate of 100 feet (30.5 meters) per year, and Eklutna Glacier, which is retreating at an average rate of 72 feet (22 meters) per year.

Visitors can see geologic features which are the result of glacial activity, including erratics (large boulders) found on hilltops or other unlikely places, braided streams, glacially-carved lakes, mountain ridges, and valleys. Prominent mountain peaks in the park range in elevation to over 8,000 feet (2,400 meters).

This is a partial list of official and local names of the better known peaks of Chugach State Park

Baleful Peak	7,900	2,370	Pioneer Peak	6,398	1,900
Bashful Peak	8,005	2,400	Pleasant Mountain	6,425	1,930
Beezelebub	7,280	2,184	The Ramp	5,240	1,570
Bellicose Peak	7,640	2,290	Rendezvous Peak	4,050	1,215
Bird Peak	5,505	1,656	Mt. Rumble	7,530	2,260
Bold Peak	7,522	2,250	Suicide Peak (North)	5,065	1,674
Calliope Mountain	6,810	2,040	Suicide Peak (South)	5,005	1,500
Cantata Peak	6,410	1,920	Temptation Peak	5,300	1,590
Eagle Peak	6,955	2,090	Thunderbird Peak	6,575	1,975
Mt. Eklutna	4,110	1,235	Twin Peak (East)	5,873	1,760
Flattop Mountain	3,600	1,180	Twin Peak (West)	5,401	1,620
Harp Mountain	5,001	1,500	The Wedge	4,660	1,400
Mt. Magnificent	4,285	1,285	Whiteout Peak	7,135	2,140
Magpie Peak	5,812	1,750	Mt. Williwaw	5,445	1,640
The Mitre	6,650	2,010	Wolverine Peak	4,455	1,335
O'Malley	5,150	1,545			
Organ Mountain	6,980	2,095			
Peril Peak	7,040	2,110	Mt. Yukla	7,535	2,260

There are 27 distinct drainage basins over one square mile in size, and over 70 lakes within the park boundary. Eklutna Lake, nearly 7 miles (11 kilometers) long and 1 mile (1.6 kilometers) wide, and with a surface area of 3,400 acres (1377 hectares), is the largest lake in the park. This natural lake provides electrical power to the municipalities of Anchorage and Palmer. Ship Creek provides a major portion of Anchorage's municipal water supply with a summer flow of 186,000,000 gallons (706,800,000 liters) per day and a winter flow of 6,600,000 gallons (25,000,000 liters) per day.

Numerous waterfalls occur throughout the park. Many become most spectacular after winter breakup or after the frequent rainshowers that occur in the higher elevations of the park. Thunderbird Falls, the best known and most frequently visited of the park's waterfalls; roars continuously until winter cold freezes it into a magnificent icicle.

Beneath the rock glacier at the headwaters of Peters Creek, the U.S. Geological Survey indicates the possibility of two small glacially-dammed lakes (ice covered lakes) which could be released without warning. Any development or activity within the drainage must take this into account.

At one edge of the park is Turnagain Arm, a body of slightly salty water that provides a study in the dynamics of nature as the cloud forms, sky color, tides, vegetation and the Arm itself are in continuous change, creating an area of high visitor interest and appeal within the park. The Arm has one of the highest tidal variations in the world, and presents a unique interpretive opportunity. Tidal bores occur during very low tides, especially during the months of June, July and August. Lunar pull, wind intensity and direction, and the venturi effect of the Arm combine with the extreme tidal variations to create bore tides. Bores appear as an incoming wall of water up to 10 feet (3 meters) high, spanning the width of the Arm, and travelling up the Arm at a speed of up to 15 miles (24 kilometers) per hour.

The Chugach Mountains provide a spectacular and enticing backdrop for the Anchorage metropolitan area. This view, providing aesthetic enjoyment for many, is an immeasurable but very real value of the park. In turn, visitors in the park can enjoy spectacular views of metropolitan Anchorage, Mount McKinley, Turnagain and Knik arms, and Cook Inlet.

Implications

- * The park offers superb examples of glacial geology.
- * Steep mountain faces are susceptible to landslides and avalanches. Use areas and facilities should avoid these sites and associated dangers.
- * Facilities should not be located in areas subject to high water tables or flooding.

SOILS

A knowledge of soil types is important in locating specific sites for facility construction and areas for concentrated activities. As of this writing, detailed soils information for the park is wholly lacking. As more specific site selection is made for the facilities and activities recommended in this plan, appropriate soils analyses should be made.

Soils within the park include shallow soils over bedrock, shallow soils over gravelly or stone base, fibrous peat soils, and clay soils. Some are poorly-drained while others are well-drained.

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Steep slopes and poorly drained soils represent a large portion of the park and impose severe limitations on placement of structures and intense activities. Areas of well-drained soils and slopes of less than 12 percent are best suited for structures and can tolerate high use.

Soil compaction resulting from heavy use, such as around campgrounds, picnic sites, trailheads and viewpoints, can become a serious problem resulting in reduced vigor of vegetation, increased surface water runoff, increased erosion and high levels of water turbidity. Knowledge of soil type and susceptibility to compaction will avoid or reduce the problem.

Other soil characteristics affecting recreation planning and use include wetness, permeability, slope, surface texture, depth to bedrock and rockiness. The U.S. Soil Conservation Service provides guidelines for analyzing soil types as to their ability to sustain recreation uses.

IMPLICATIONS

- * The lack of adequate soil data necessitates complete on-site studies prior to the final planning stages of any development in Chugach State Park.
- * Areas subject to high water tables, including flood plain areas, bogs and marshes should be closely scrutinized as saturated soils often necessitate large and costly fills when development occurs.
- * All development plans should consider soil compaction and its effects upon vegetation, erosion, water quality and wildlife.
- * Areas in alpine tundra zones have thin soils. Development should not occur in these areas unless other environmental factors and needs warrant use for specific purposes.
- * Permafrost must be considered in the siting of all park facilities.

CLIMATE

The extreme southeastern portion of the park receives approximately 160 inches (425 centimeters) of precipitation annually while some areas to the north and west may receive as little as 12 inches (30 centimeters). Highest rainfall can be expected in July, August and September, each month averaging just over 5 inches (16 centimeters). The majority of snow falls between November and February. Mean annual snowfall for nearby Anchorage is 70 inches (180 centimeters). Within the park, large variations in snow depth occur due to elevation differences, winds, slope orientation and proximity to the marine influence of Prince William Sound. The greatest chance for clear skies occurs during the months of March, April and May.

Temperatures in the park can vary from summer highs of 85 degrees F (23 C) to lows of -50 degrees F (-45 C) in winter. Subject to the influences of wind, elevation, slope aspect and temperature inversions, much "localized weather" occurs throughout the park.

Persistent winds, particularly in January, occur in the valleys, mountain passes, on ridges and mountain peaks. High elevation winds are predominately from the south while valley winds are channeled, blowing down the valleys from higher to lower elevations. Winds at lower elevations, where most facilities will be located, average between 6 and 8 miles per hour with higher velocities occurring in May and June. Local landforms and vegetation can strongly influence these conditions.

Implications

- * Winds are strongest in mountain passes and at the mouths of valleys. Facilities located in these areas should be designed to withstand strong winds, blowing snow, snow load and other severities of weather.
- * Wind generated waves can occur suddenly at Eklutna Lake, creating a hazard to boaters.
- * Winds associated with cold air drainage create cold pockets in the bottoms of valleys and other confined low-lying areas.
- * Unwary or unprepared climbers or other park visitors are most susceptible to exposure from wind and cold.
- * Heavy summer rains associated with afternoon thunder showers occur frequently in summer.

VEGETATION

Between sea level and 2,000 feet (600 meters), most of the park is heavily forested. In the southern area adjacent to Turnagain Arm, a typical Sitka spruce-mountain hemlock forest dominates. This is thought to be the farthest north occurrence in North America of these forest species. The remainder of the park is a mixture of white spruce, black spruce, Alaska paper birch, balsam poplar, black cottonwood, aspen, mountain ash, alder and dwarf mountain hemlock. Localized areas of poor drainage create areas of black spruce and muskeg while above the treeline dense brush composed of willow and alder dominates. Above 2,000 feet (600 meters), alpine tundra plant species cover the ground over a thin layer of soil. Where more severe environmental conditions exist, rocks, often covered with lichens and ice, dominate the landscape.

Implications

- * Black spruce bogs, muskeg areas, marshes and other poorly drained sites are costly sites to develop, and generally should be avoided.
- * Wildlife often concentrate in or near muskeg and marshes. Human use should be directed away from these sites.
- * Black spruce bogs, muskeg areas, marshes and other poorly drained areas are heavily infested by mosquitoes and other insects during the summer season.
- * Removal of vegetation for park developments should be minimized to reduce windthrow, soil compaction and aesthetic impact.
- * Alpine tundra is fragile and can sustain only very limited use.
- * Wildflowers and berries are a strong attraction to park visitors.

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- * Low lying forested areas of white spruce and paper birch are important winter habitat for many wildlife species. High impact recreation should avoid these areas, or should be restricted to designated trails or corridors.
- * Black cottonwood and mountain hemlock are susceptible to snow loading and limb breakage during winter. Park developments must consider this factor.
- * Fires are a potential danger to drier areas and may burn for months or years beneath the surface of dry peat, duff or highly organic soils.

FISH & WILDLIFE

Approximately 80 species of birds have been identified in the park. Of these, approximately 20 have been identified as year-round residents. Easy access to the high country gives park visitors a chance to see birds such as the gray-crowned rosy finch, wheatears, and ptarmigan. Golden eagles and bald eagles are park residents, as well as hawks, owls, woodpeckers, grouse, ducks, and many species of warblers and other songbirds.

Some streams and lakes in the Park contain king, silver, pink, red and chum salmon, dolly varden, grayling, rainbow trout and whitefish. Beluga whales, harbor seals and sea lions are occasional visitors in the early summer to Turnagain Arm waters.

Terrestrial animals include moose, Dall sheep, mountain goat, grizzly and black bear, coyote, wolf, red fox, lynx, wolverine, mink, weasel, land otter, marten, porcupine, marmot, parka squirrel, red squirrel, beaver, and others. Recent human pressure has reduced beaver to very limited numbers. The reintroduction of beaver into suitable areas of the park is being considered.

Implications

- * All riverine habitat sites, including areas of balsam poplar, cottonwood, willow and alder, should be protected from substantial disruption to protect habitat for land otter, beaver, lynx and mink.
- * Since its establishment, the park has been open to hunting, trapping and fishing, with restrictions on the use of motorized conveyances. The mode of access will continue to be an important factor in wildlife management.
- * The presence of Dall sheep, moose and grizzly bear within 10 miles of Anchorage will affect facility siting to best protect and interpret these animals.

HAZARDS

Avalanches have claimed five lives in the Park between 1971 and 1978, and present the greatest single hazard to park visitors. During the same period at least 25 others are known to have survived after being caught in avalanches. Avalanches are most likely to occur on steep slopes during and after a heavy and prolonged snowfall. With a knowledge of the conditions under which avalanches are most likely to occur and the locations where they are known to occur, the well informed park visitor can carry on winter activities in relative safety.

Winter activities in the park offer additional hazards associated with reduced daylight, cold temperatures and the effects of wind chill.

Other potential natural hazards within the park include land slides, falling rocks (especially at the snout of Eklutna Glacier), streams which swell during spring, summer and fall afternoons as the sun and warming temperatures increase the melt of ice and snow, bears and other wildlife, glaciers with their hidden crevasses, turbid air currents, and sudden and severe inclement weather year-round.

The exposed mud flats along Turnagain Arm are dangerous due to extreme and rapid tidal variations and the possibility of becoming mired in the mud and drowning with the incoming tide. The rapidly advancing tide can also trap unwary hikers along the Arm who venture too far out on rocks or spits of land and become cut off from the land.

Boating in Turnagain Arm is extremely hazardous, especially in small boats which are easily capsized by rough water. Eklutna Lake can also present a hostile environment for small boats when the winds generate large and sometimes unexpected waves. The last mile of Eagle River before the Glenn Highway is Class III whitewater and presents a hazard to those who are unsuspecting or unprepared.

The steep cliffs along Turnagain Arm can present hazards to hikers and rock climbers, and are subject to landslides, falling rocks and avalanches. These same hazards are present throughout the park where steep slopes and unstable soil and rock are found.

Additional hazards to park visitors are created by careless use of firearms while hunting, target shooting (prohibited throughout the park), setting traps carelessly or in areas subject to heavy use, and by the careless building of fires (prohibited throughout the park except in designated areas).

Implications

- * Locating structures or encouraging the winter gathering of people in known or suspected sites of avalanche occurrence should be rigorously avoided.
- * The most destructive avalanches occur during and after heavy and prolonged snowfall. Extra precautions should be taken during these times by park personnel. Information should be released to appropriate media to inform the public of these hazards.
- * An active public information program, through the use of brochures, signing, media and public displays, should be carried on to inform park users of such hazards as weather, avalanches, bears and other wildlife, falling rocks, slides, fires, water swollen streams, use of firearms, boating and others, particularly when and where such hazards are likely to affect the most people.
- * The site selection for all bridges, trails and other proposed structures, facilities and activity areas should be made with regard for the hazards mentioned above.