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A RESORT VILLAGE
FOR
BIGHORN CANYON NATIONAL RECREATION AREA
MONTANA-WYOMING

Undergraduate Thesis in Architectural Design

By
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Submitted to the School of Architecture as partial fulfillment of the requirements for the degree of Bachelor of Architecture

at

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A RESORT VILLAGE
FOR
BIGHORN CANYON

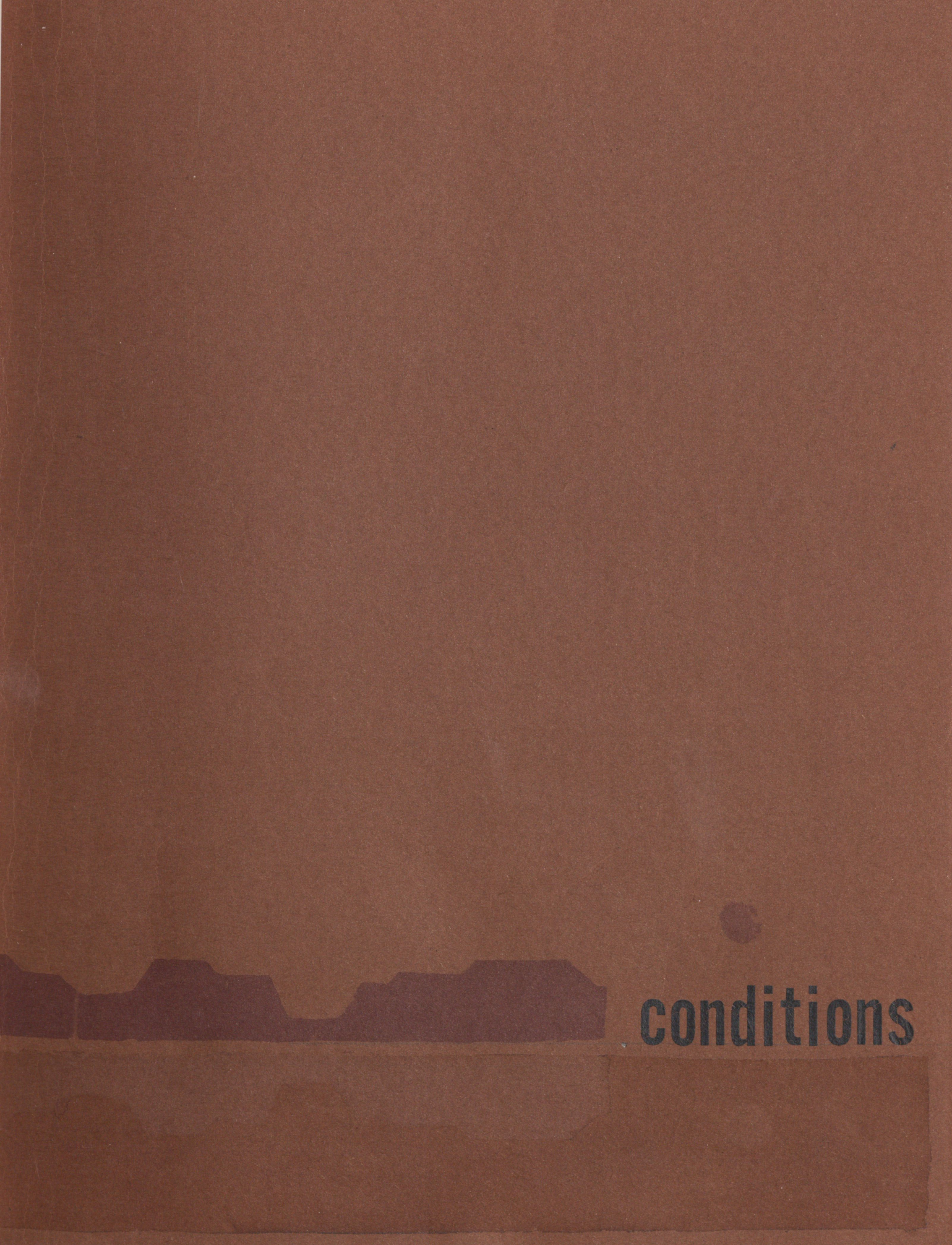
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conditions

1.0. CONDITIONS CREATING A NEED FOR THE RESORT

The amount of leisure time available to the middle and upper class America is at an all-time high now and is expected to increase rapidly in the near future. Tourist, or vacation business, now ranks as the highest income producer in over one-half of the states and ranks highly among contributors of basic income to both Wyoming and Montana. By 1975, over eight-million visitors are expected to visit Montana, compared to four-million in 1966 (2). What is causing this increase? Better and faster transportation, a higher standard of living, more leisure time - a four-day work week is soon expected, and more tourist facilities are opening all the time. The most exciting recreational area to open recently in Montana is the Bighorn Recreational Area near Billings, Montana.

A member of the National Parks System, the Bighorn Canyon Area has long had a reputation for its magnificent scenery. With the completion of Yellowtail Dam, a 550-foot concrete thin-arch dam built at the canyon entrance near Ft. Smith, Montana in 1965, the powerful, winding Bighorn River was tamed into a complacent, deep-blue reservoir. Extending from Ft. Smith to Lovell, Wyoming, the scenic waterway offers 71 miles of fishing, water-skiing, boating, and sightseeing. Most of the canyon area is owned jointly by the National Park Service and the Crow Indian Tribe.

This area is nearly a wilderness area and is only accessible by horseback and by boat. A few primitive jeep trails wind through the Pryor Mountains on one side and the Bighorn Mountains on the other side. However, a committee formed by area businessmen, Crow Tribal officials, and Park rangers is now promoting a scenic drive along the western edge of the canyon that will connect Lovell to Billings, Montana. The road will cross the Bighorn River below the dam and connect into Montana Secondary 313 at Ft. Smith.

Although the area was not established with a profit motive in mind, tourists will spend a good deal of money in the area for equipment, accomodations, and services. By developing and

utilizing the many historic, scenic, and recreational points of interest in the canyon as well as in the immediate area, this area will be a major attraction to tourists and natives, who in turn will provide the base for demand for tourist facilities such as motels, restaurants, camping facilities, stores, boat rentals,etc.

The development of Bighorn Canyon will not only increase the income of the Tribe in particular, but also will generate many jobs for the employment-starved Indians.

With this potential market in mind, a major tourist facility should be built in the near future which would utilize the many attractions in the area and open this recreational gold mine in southern Montana.

1.1 recreational opportunities

The main attraction for the resort area will be the canyon area, or the natural facility. Any facilities that the resort offers will only enhance the stay of the tourist.

A recent study by the Outdoor Recreational Resources Review Commission in Washington, D.C. established a hierarchy of outdoor interests. (Table I, pg. 3)

The Black Hills Resources Study of 1967 listed sightseeing (driving and walking incl.) as the top recreational attraction in this area. Three-fifths of the tourist's time is engaged in this activity. Following in descending order are (2) camping, (3) swimming, (4) hiking, (5) picknicking, (6) fishing, (7) boating, (8) hunting, (9) winter sports,(10) water skiing.(4)

The greatest attraction in Bighorn Canyon would be sightseeing. All of the top ten recreational pastimes could be offered within 5 - 10 miles of the resort.

Scenic boat trips as well as by auto, horesback, or on foot could take in the breathtaking splendor of the canyon walls, historical Indian lore, and various historical monuments within a one-hour's drive. Of particular interest within the canyon is the awsome Devil's Canyon with 2200-foot walls.

TABLE I OUTDOOR INTERESTS (2)

ACTIVITY	ANNUAL DAYS/ PERSON	PER CENT POP. 1961
Passive Outdoor Pursuits		
Driving for pleasure	20.73	52
Walking for pleasure	17.93	33
Sightseeing	5.91	42
Picknicking	3.53	53
Nature walks	2.07	14
Outdoor sports events (spectator)	3.75	24
Theatrical events (spectator)	.39	9
TOTAL	54.88	
Backwoods Recreation		
Camping	.86	8
Hiking	.42	6
Mountain climbing	.09	-
Hunting	1.86	13
TOTAL	3.23	
Water Sports		
Fishing	4.19	29
Swimming	6.47	45
Canoeing	.12	2
Sailing	.11	2
Other boating	1.95	222
Water skiing	.41	6
TOTAL	13.28	
Winter Sports		
Snow skiing	.07	2
Sledding and tobogganning	.51	9
Ice skating	.55	7
TOTAL	1.13	
Physically Active Sports		
Horseback riding	1.25	6
Bicycling	5.17	9
Outdoor games	12.71	30
TOTAL	19.13	

The canyon is formed by the river cutting between the Pryor and Bighorn Mountains, which offer big-game hunting, camping, and fishing. These pastimes would attract visitors from beyond the regional zone of influence (200-mile radius).

Visitor participation in water skiing, boating, and swimming is perhaps the greatest active recreational opportunity the canyon has to offer. Boat ramps have been constructed in Wyoming and Montana, with the most recent and potentially most accessible to be completed this summer two miles from the dam site and one mile from the resort area.

Snowmobiling is the newest winter sport and potentially the most suitable for the Bighorn - Pryor snow conditions. Skiing is doubtful, although a thorough study of the snow and slope suitability would have to be make before the area's potential could be realized.

1.2. nearby attractions

Bighorn Canyon lies only 100 miles east of a very popular tourist attraction - Yellowstone and Teton Parks. This region is one of the centers of western tourism. The Park Service has estimated the effect Yellowstone and Teton will have on Bighorn Canyon and thereby have come up with a tourist estimate. (Table II, pg. 5)

Other nearby attractions that are nationally-known and would attract outside the regional zone are Glacier National Park (450 miles), Black Hills National Monument (200 miles), and Custer Battlefield (40 miles) where General Custer and 275 men of the 7th Cavalry went down to defeat at the hands of Chief Crazy Horse, Sitting Bull, and their followers. This massacre has recieved large nationwide publicity as part of our heritage and is rapidly becoming a national tourist attraction.

1.3. similar recreational facilities in the area

There are no major recreational areas or state parks in

TABLE II TOURIST ESTIMATE(1)

YEAR	YELLOWSTONE VISITORS	TETON VISITORS
1969	2,193,894	3,134,354
1970	2.40 million	3.3 million
1971	2.52 million	3.4 million
1972 2.64	2.64 million	3.6 million
1973	2.76 million	3.8 million
1974	2.88 million	4.0 million
1975	3.00 million	4.2 million

YEAR	BIGHORN CANYON	
1967	projected: 150,000	actual: 180,000
1968	180,000	200,000
1969	146,000	(construction period)
1970	500,000	
1973	675,000	
1977	868,000	

the immediate vicinity of Bighorn Canyon. The only comparable body of water in the immediate vicinity is the Jackson Lake area south of Yellowstone Park. Its mountainous setting is very popular, but should not be a serious threat because of the distance (250 miles) between lakes and the diverse and unique recreational opportunities offered by the canyon. No other reservoirs are planned in the vicinity of Bighorn Lake (1)

1.4. estimated recreational use

A recent study of the National Parks System by Ronald F. Lee has indicated that there are four types of accasions for outdoor recreation.

Vacation - a vacation is considered to be any leisure time of more than three days. The median length is from nine to ten days. 43% of U.S. families took vacations last year. 80% of these took their own cars. Family travel predominates. 40% of the vacations

involved long distances. One-third remained in the state. (Total travelers - 80 million)

Trip - a trip is considered to be at least overnight. A traveler is more likely to sightsee on a vacation. (Total travelers - 111 million)

Outing - any trip not extending overnight. (Total travelers - 810 million)

Occasion - any short trip of 2 - 3 hours. (Total not available) SOURCE: (4)

Travel time is important in the study of recreation because the zone of influence of the canyon will determine the number of visitors. The Bighorn Canyon is readily accessible to twelve urban areas of 25,000 people or more within a 250-mile radius. The following table includes total population within pertinent zones.(9)

OCCASION	TOTAL POPULATION	TRAVEL-TIME TO BCRA
Local boater	50,000	0 - 1 Hr.
Weekend boater	420,000	1 - 3 Hrs.
Vacation boater	N.A.	3 - 5 Hrs.

An estimate of the projected population within a 100-mile radius was made by the Bureau of Reclamation; it shows a 110% increase from 1960 - 1970, and a 150% increase from 1960 to 2000. The table below shows the rural and urban distribution within a 100-mile radius of Bighorn Canyon.(9)

STATE	1960 POP.	1970 EST.	2000 EST.
Montana	116,489	129,000	183,000
Wyoming	62,119	65,000	80,000
TOTAL	178,608	194,000	263,000

During the 1970 recreation period from May to October, the Bureau estimates the canyon will experience 560,000 "visitor days".

A "visitor day" is considered to be the use of facilities, services, and conveniences within the canyon area for recreation purposes by a visitor during a 24-hour period.(9)

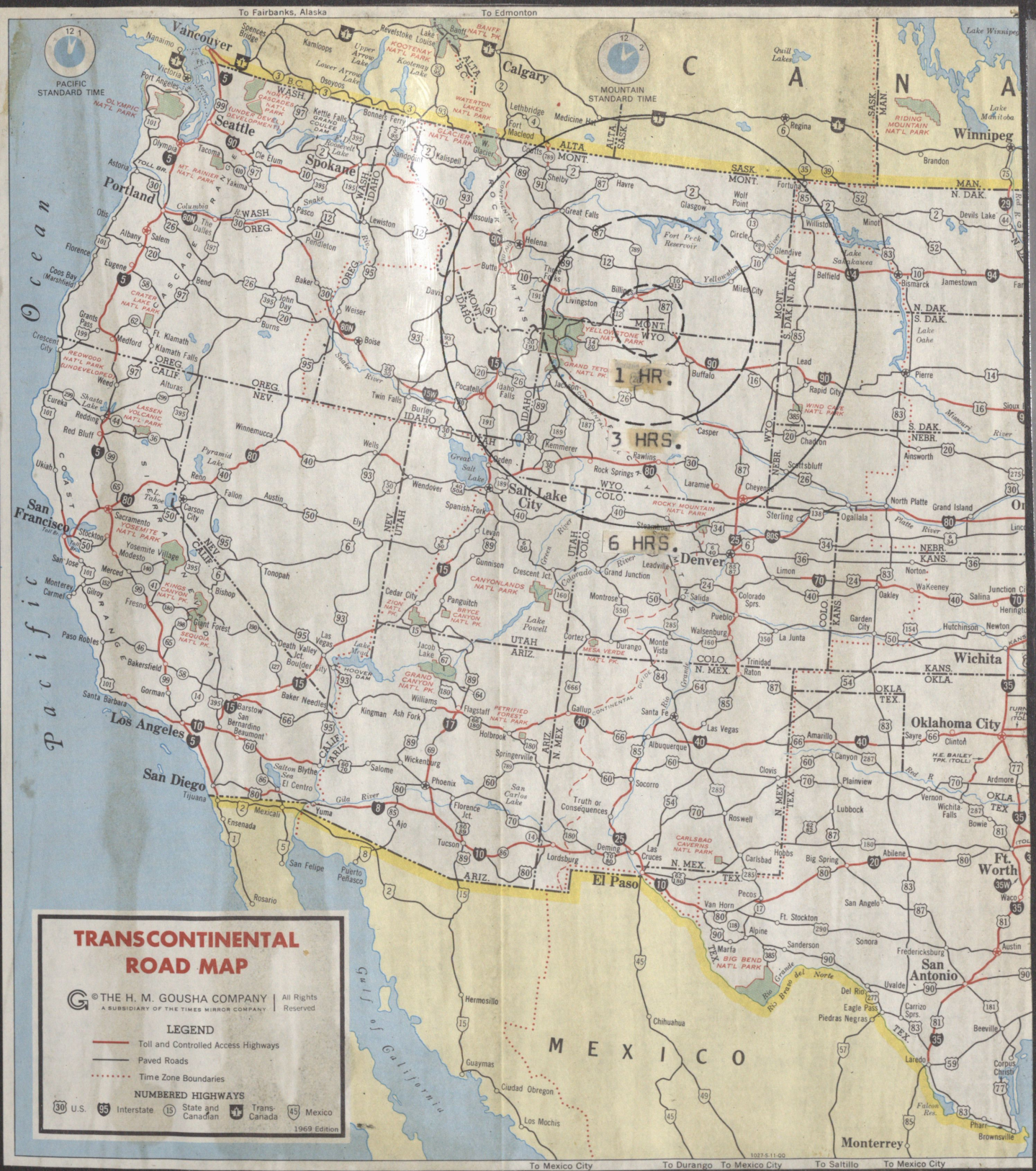
AREA	VISITOR DAYS / REC. PERIOD
Regional zone (100-mile radius)	154,000
Bordering territory (300-mile rad.)	176,000
Out-of-state (excl. Wyoming)	230,000
TOTAL	560,000

In an economic study made for the National Parks in 1962, the visitor's expense for lodging was broken down as in the following table.(7)

LODGING	PER CENT VISITORS	NO. OF NIGHTS	NO. OF PERSONS	$/PERSON	$/NIGHT
Camping	14.2	3.2	3.8	14.35	4.93
Friends & relatives	15.0	5.7	3.4	52.26	10.08
Hotel	6.3	3.3	2.6	46.84	15.59
Motel	54.8	2.4	3.2	33.11	15.10
Tourist home	1.9	4.6	3.6	53.23	12.73
Trailer	7.8	5.4	3.8	22.82	4.65
TOTAL	100.0	AVG. 4.1	3.4	37.10	10.51

1.5. summary

Bighorn Canyon Recreational Area promises to be one of the major recreational headquarters in the Northwest. Local residents originally drove 300 miles to find a comparable facility. With the canyon area gaining popularity and increased use, a major tourist facility in the form of a resort is needed to serve these visitors.



TRANSCONTINENTAL ROAD MAP

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LEGEND

Toll and Controlled Access Highways

Paved Roads

Time Zone Boundaries

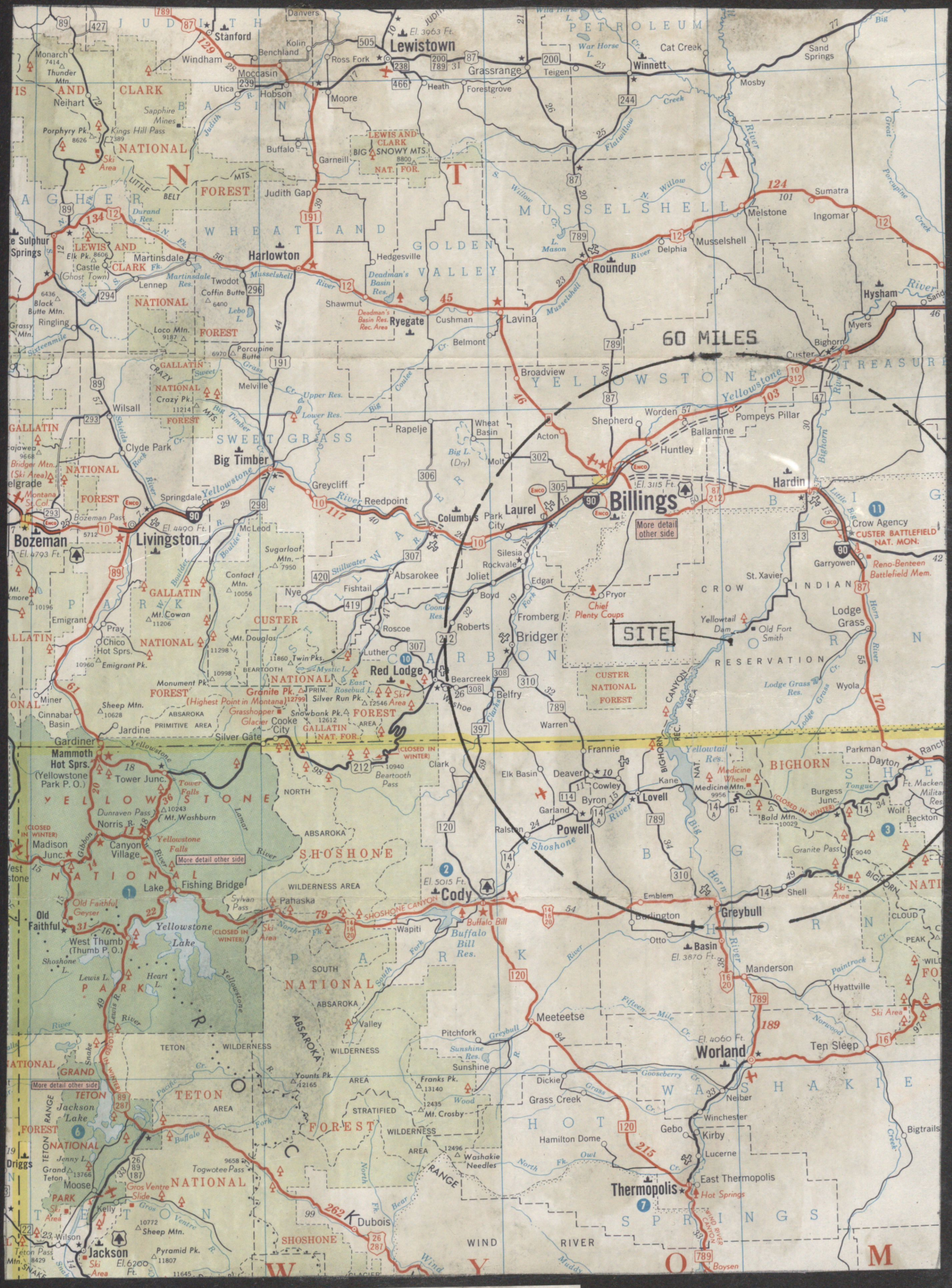
NUMBERED HIGHWAYS

30 U.S. | 95 Interstate | 15 State and Canadian | Trans-Canada | 45 Mexico

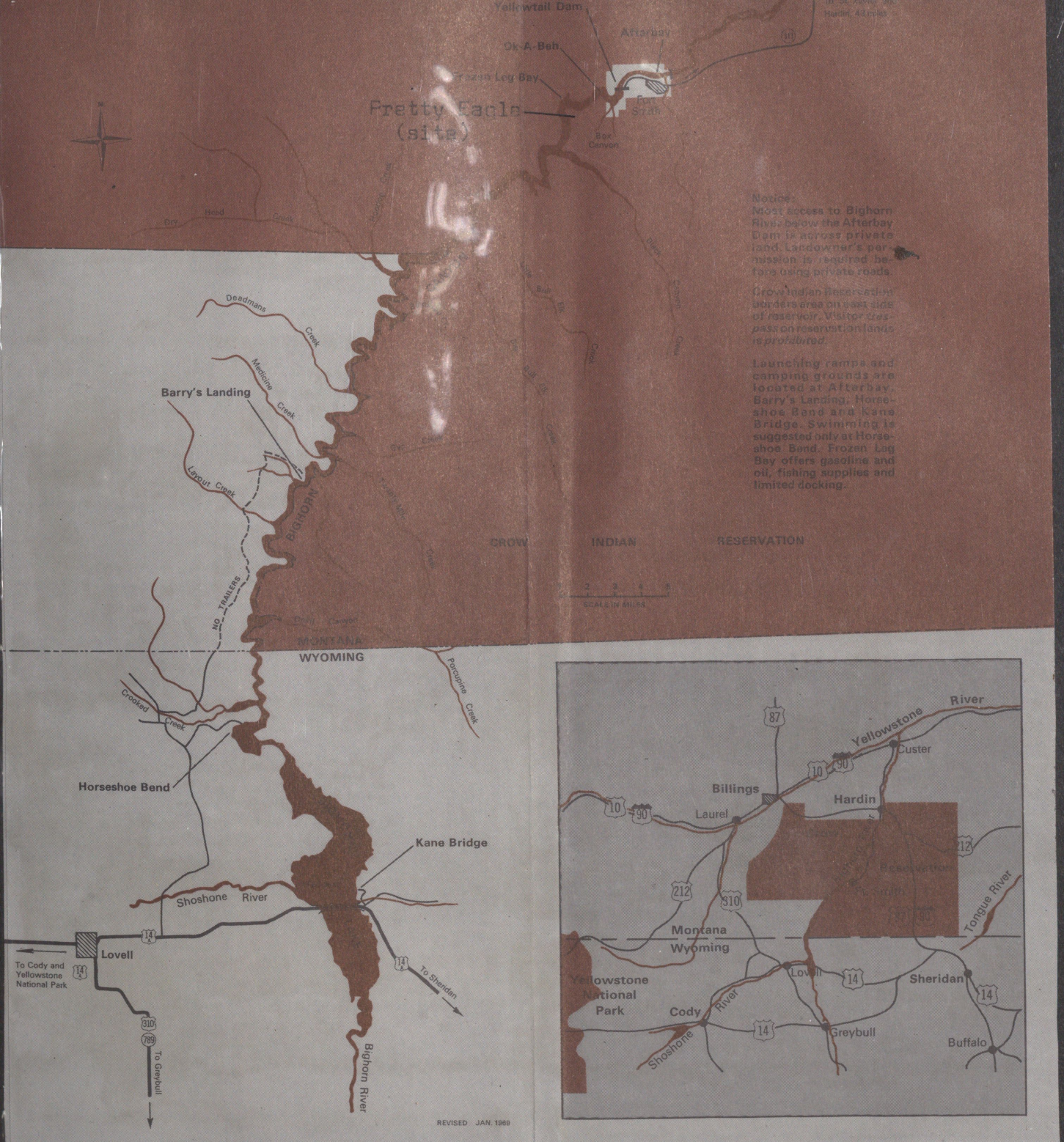
1969 Edition

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NATIONAL MAP



REGIONAL MAP


Yellowtail Dam
Afterbay
Ok-A-Beh
Frozen Leg Bay
Pretty Eagle
(site)
Box Canyon
Notice:
Most access to Bighorn River below the Afterbay Dam is across private land. Landowner's permission is required before using private roads.
Crow Indian Reservation borders area on east side of reservoir. Visitor trespass on reservation lands is prohibited.
Launching ramps and camping grounds are located at Afterbay, Barry's Landing, Horseshoe Bend and Kane Bridge. Swimming is suggested only at Horseshoe Bend. Frozen Leg Bay offers gasoline and oil, fishing supplies and limited docking.
Deadmans Creek
Medicine Creek
Barry's Landing
Layout Creek
BIGHORN
NO TRAILERS
CROW INDIAN RESERVATION
SCALE IN MILES
MONTANA
WYOMING
Porcupine Creek
Crooked Creek
Horseshoe Bend
Kane Bridge
Shoshone River
Lovell
To Cody and Yellowstone National Park
To Sheridan
To Greybull
Bighorn River
REVISED JAN. 1980
Yellowstone River
Custer
Billings
Hardin
Laurel
Tongue River
Montana
Wyoming
Yellowstone National Park
Cody
Shoshone River
Greybull
Buffalo
Sheridan

AREA MAP



locale

2.0. LOCAL CONDITIONS

Recently, Yellowtail Reservoir was renamed Bighorn Lake by the Board on Geographic Names of the Department of the Interior. The reason for the change was based on a request by the Crow Tribal Council in 1967. The Crows based their request on the legend of Big Metal, the boy who was rescued by a band of Bighorn sheep when his stepfather pushed him off the rim of the Bighorn Canyon.

According to the story, the leader of the band of sheep, whose hooves were of a shiny metal, told the lad that the Crow people would always have good fortune, so long as the waters of the river in the canyon were known by the name of Bighorn - but should the name ever be changed, ill fortune would plague the tribe. (15)

Yellowtail Dam was named after Robert Yellowtail, former tribal chairman and chief negotiator for the facility.

2.1. location

Bighorn Canyon is located in the saddle formed by the joining of the Pryor Mountains on the west and the Bighorn Mountains on the east. Yellowtail Dam is at the mouth of the canyon 41 miles south of Hardin, Montana. The canyon extends upstream about 50 miles into Bighorn Basin, six miles south of the Montana-Wyoming border.

Scheduled airlines serve Cody, Wyoming to the south and Billings Montana, 50 miles to the north.

Transcontinental buses serve Cody, Greybull, Lovell, and Powell, Wyoming, and Hardin and Billings, Montana. (see map)

2.2 description

A story in the December, 1969 issue of All Outdoor mentions Bighorn Lake as seen by an out-of-state boater, L.A.Wilke. Wilke is a retired Texas newspaper man who travels around







the U.S. finding places he believes those who like the outdoors will enjoy and publishes his views in All Outdoors, a monthly magazine. Here are a few paragraphs from the story:(16)

> "I doubt if there is another 46-mile remote trip in the contigous United States that will equal Bighorn in rugged splendor. The water most of the time is a deep blue, and the depth is some 300 feet in most places. It moves fairly fast because of the drop in elevation. It also is fed by scores of small streams from both the Bighorn and Pryor Mountains...."
>
> "As our party moved down the lake that day last July, we almost sunburned our tonsils, looking at the grotesque shapes of the walls of eroded stone. They seem to carry every line of the west and form some of the wierdest shapes. With a little imagination you can find an elephant, a cathedral entrance, or even the face of an Indian."
>
> "There are high pillars where wind and rain have cut through the formations for centuries. Some of these are badly cracked and leaning. You wonder what would happen if a jet flew over and broke the sound barrier. Some of the old-timers say there are landmarks that have toppled into the water following a severe thunderstorm."
>
> "We had intended to fish some on that trip down the lake, but the study of nature was too interesting to bother with unpacking rods and reels."

Bighorn Canyon is in the transition zone of the Northern Rocky Mountain plant growth. In the semi-arid plateaus leading to the mountains, cottonwoods, box elders and willows can be found along tributary streams and in the valleys, with sage-brush and prairie grass the predominant ground cover.

On the hillsides (3800 - 4500 feet), juniper, mountain mahogany, chokecherry, sumac, and buffalo berry bushes are found with sage and prairie grass the predominant ground cover.

Lodgepole, ponderosa, and limber pine, fir, and spruce on the surrounding mountains (4500 - 7200 feet) provide a dark green backdrop. From May to July, wildflowers are abundant on the open meadows.

Wildlife abounds in the area - mule deer, black bear, grouse, chukkar, Hungarian partridge, pheasant, waterfowl, cottontails, coyotes, muskrats, beaver, and mink. Wild horses, descendants of early ranch stock, roam along the Pryor Range. 70 elk were

Scenic overland route



Scenic water route



recently transplanted into the area from Yellowstone National Park. A bison range in the Bighorns has existed sporadically due to Brucellosis plagueing the herd.

The reservoir has become an excellent fishing area but the best fishing still lies in the tributary streams. These waters abound in trout - brook, brown, rainbow, native - crappie, bass, pike, perch, and catfish. A five-mile stretch of the Bighorn River directly below the afterbay dam is soon to be designated a "blue-ribbon trout stream". (1) (12)

2.3. geological history

The canyon and neighboring mountain ranges were formed during the "Bighorn Uplift Period". The Bighorn Mountains on the east and the Pryors on the west were formed by separate structural units of a large anticlinal arch which extends from southern Montana into central Wyoming. The largest of these are the Bighorns.

As the anticline was being formed, the river maintained its course, carving out the spectacular cliffs which in some places loom a half-mile high over the river. These colorful cliffs contain many fossils, relics of times when this region was a shallow sea, a coastal area of tropical marshes, or dinosaur-inhabitated conifer forest. Textbook examples of the earth's changing face stand out sharply, making the canyon a geologist's delight. Exposed rocks span more than 500 million years. (12)

2.4. history

Man inhabitated the canyon area nearly 5,000 years ago. Teepee rings, pictographs, flintworkshop areas, medicine wheels, and aboriginal trails are all mute evidence that the original inhabitants were the Crow, or Absarokee Indians. There are six buffalo jumps in the area and two sites where "vision quests" were held on the canyon rim up until only a century ago.

The Crows came from North Dakota and were firmly established

when the first white man appeared in 1805. Charles Francois LaRocque met the Crows at the mouth of the Bighorn near the present town of Custer, Montana. The following year, Captain William Clark of the Lewis and Clark Expedition explored the mouth of the Bighorn River. John Colter, who left the expedition to trap the canyon area, returned to St. Louis to tell of the unlimited wildlife in the Bighorn Valley and the herds of Bighorn sheep in the canyon area.

Upon the return to St. Louis of the Lewis and Clark Expedition, an outburst of fur trapping brought the white man to the Bighorn Valley. The Bighorn River was used quite often as a water highway from the Bighorn Basin to the Yellowstone River (and then down the Missouri and Mississippi Rivers to St. Louis). Due to the heavy rapids in the canyon, and constant Indian threats, this part of the river never became a popular avenue of commerce, even during the fur-trade era.

The discovery of gold in western Montana in the 1860's established the Bozeman Trail as a means of supply and access between Fort Laramie, Wyo., and Virginia City, Mont. This trail, traces of which can still be seen on the right bank of the river, forded the Bighorn about three miles below the dam site.

In 1866, an infantry post, Ft. C.F. Smith, was established downstream from the trail as the northernmost of a chain of forts built to protect travelers from the Sioux and Cheyenne warriors - who considered the trail an encroachment on their hunting grounds. (10)

> "The only major ingagement the post had with the Indians was during the summer of 1867. A small party was working in a hayfield about 2½ miles from Ft. Smith. They had built a flimsy corral about 100 feet square to hold the horses and mules. In the middle of the afternoon about 1500 Sioux drove the small haying party into the corral and proceeded to make a determined attack. The nineteen whites hid behind the logs and stubbornly held off the charges. Two soldiers foolishly insisted on standing up to fight like men and were shot down. By late afternoon the Indians gave up. The number of white losses were

32 horses and mules, and three soldiers. Sioux carried away their dead, as was the custom, but losses were said to be very high." (10)

The fort was abandoned in 1868 when, after two years of isolation, blizzards, and constant threat of attack, troops were withdrawn to southern Wyoming. Almost before the soldiers were out of sight, Sioux set fire to whatever would burn. All that remains today are the low mounds and stone foundations which mark the outline of the old buildings.

Indian skirmishes continued for twelve years until they were finally morally and physically defeated. The Indians were then confined to reservations - among which is the Crow Reservation bordering the east side of the canyon.

The Homestead Act, which made 160-acre tracts available to settlers, opened up the Bighorn Valley and Basin to a new era - cattle ranching.

With the new era came the outlaw, or cattle rustler. Two famous rustlers operated auound the Bighorn Valley and were recently immortalized in a Hollywood production - "Butch Cassidy and the Sundance Kid", or George LeRoy Parker and Harry Longabaugh. These two were members of the "Hole-in-the-wall gang" that operated out of Hole-in-the-wall country near Thermopolis, Wyoming. (10)

2.5. current land use

About two-thirds of the land surrounding the canyon is owned by the Crow Tribe. The rest of the land is either privately - owned grazing land, or land administered by the National Park Service.

The resort site of this proposal lies on Indian land.

Yellowtail Dam:

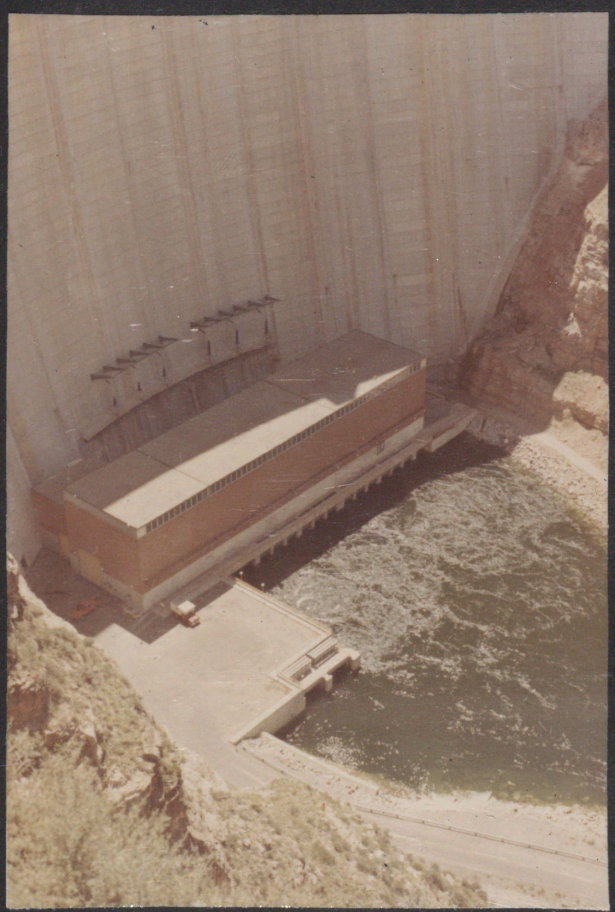
Yellowtail Dam is a 525-foot, concrete, thin-arch dam. The dam is the highest in the Missouri River Basin and third highest in the world. The dam creates the largest reservoir in volume - 1,375,000 acre-feet - on the tributary system of the Missouri River. A member of the Missouri River Basin Project - an overall plan to utilize the waters of the Missouri, the reservoir is used to generate power, aid irrigation, recreation,

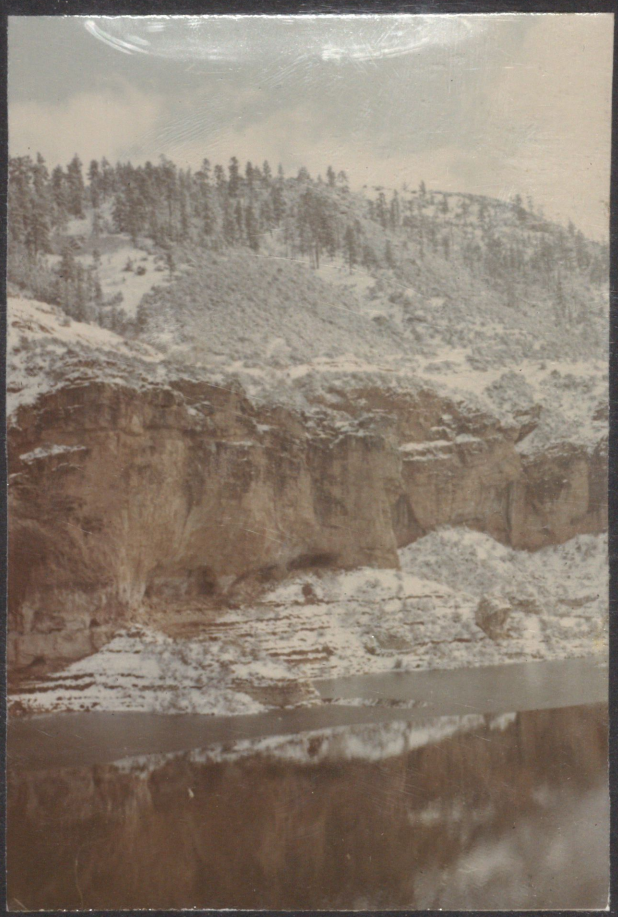


LEFT - Behind Yellow-tail Dam

LO.LFT. - Yellowtail Powerhouse

LO.RT. - Winter on the Bighorn





enhance fish and wildlife, retain sediment, and flood control.

The last concrete was poured in 1965 and the dam was dedicated on October 31, 1968. 63,000 acres of the canyon area have been established as the Bighorn Canyon National Recreation Area, administered by the National Park Service.(1) (13)

Bighorn Lake:

The clear-blue reservoir, formed by the damming of the Bighorn River, is nearly 400 feet deep at the damsite. 70% of the canyon walls along the 195-mile shore are inundated by the lake, but in some cases, still drop 2200 feet from prairie to river level.

The source of water for the lake is mostly spring runoff from snowfall in the Bighorn Basin. The water will be at its highpoint in May, June, and July (3640 feet). Minor inflows from cloudbursts during the summer raise the level to its maximum.

During the Winter, the lake drops to its yearly low of 3614 feet above sea level, or a fluctuation of 26 feet. During the spring and summer, the lake may drop as much as eight feet in one week to meet irrigation needs.(13)


site

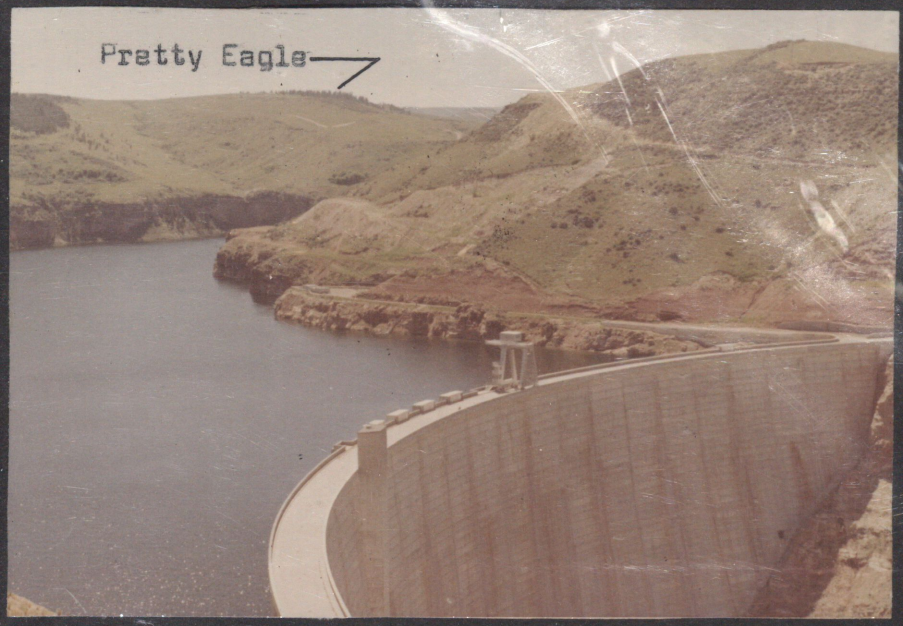
3.0 SITE CONDITIONS

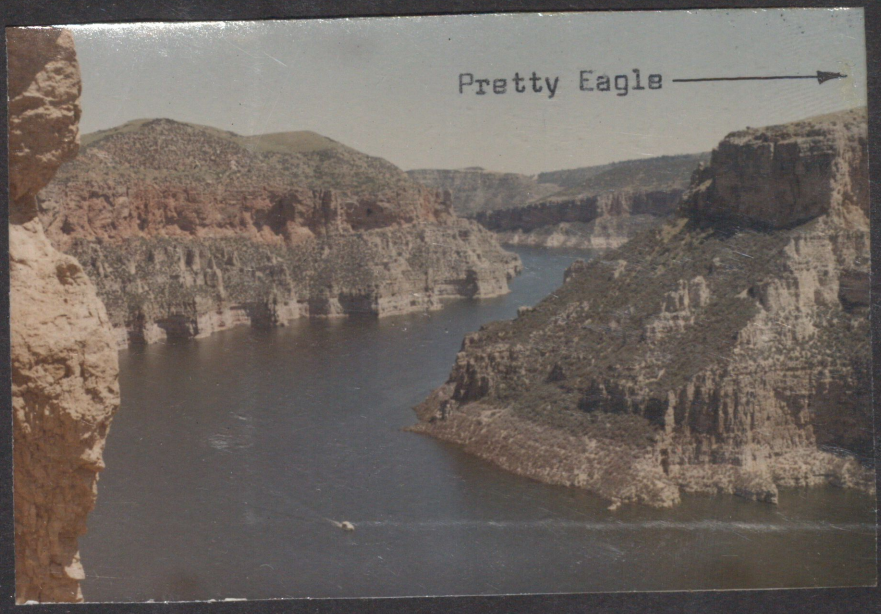
The location of the resort is a site agreed upon by the Crow Tribe and the National Park Service.(1) Located two miles west of the dam and one mile south, the site, known as "Pretty Eagle", has one of the most spectacular views of the canyon. The Park Service is now completing a road that will connect the dam to Pretty Eagle and eventually beyond. Also being completed is the only accessible marina and boat dock within 40 miles of the dam. The marina, known as "Ok-a-beh", is one-half mile north of Pretty Eagle. Ok-a-beh is a narrow point of land that is the only area of the canyon near the dam that slopes toward the water rather than dropping off into it. Until the completion of the marina facility this summer, boaters are using Frozen Leg Bay across the canyon. Frozen Leg is an undesirable marina because of the treacherous access to it. A crude road winds down a nearly vertical cliff and requires a professional driver to be at the marina at all times to guide cars with boat-trailers down the canyon wall. The marina facility will not be a part of this problem, but will be incorporated into it.

3.1. history

The name, "Pretty Eagle" is a name given by the Crows in honor of a medicine man. The point of land (see photos) was used for centuries as a "vision quest" site. Still remaining are two rock cairns on the east and west end of the ridge where medicine men would fast in hopes they would have a vision that would help guide the Indians through troubled times. One story is that the cairns, about two feet high, were located on the east and west because of the orientation to the rising and setting of the sun and moon, Indian deities. Little is known, however, about the ancient Indian religion so most "knowledge" is merely speculation.(9)

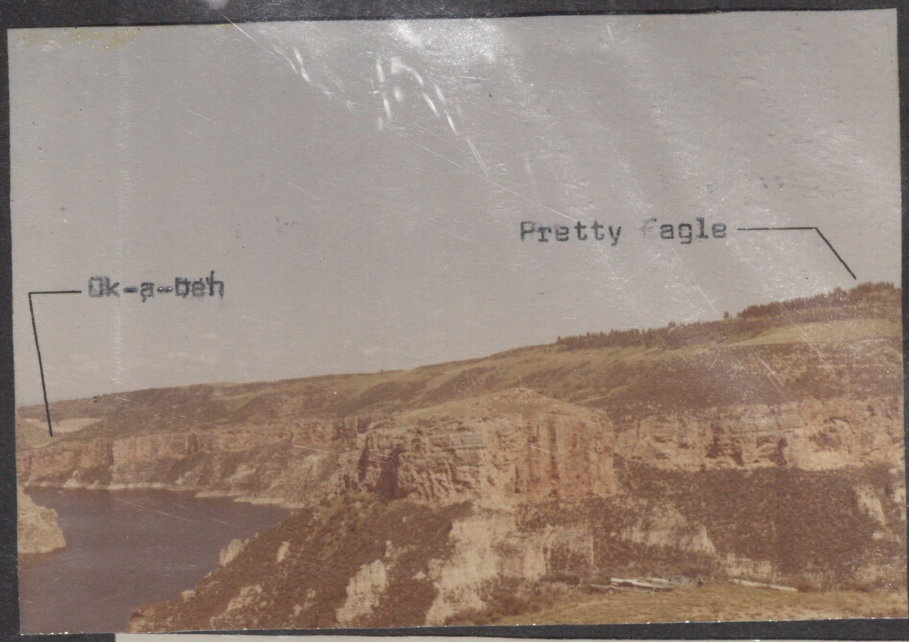
3.2. description of site





TOP - View above Yellowtail Dam toward Pretty Eagle.

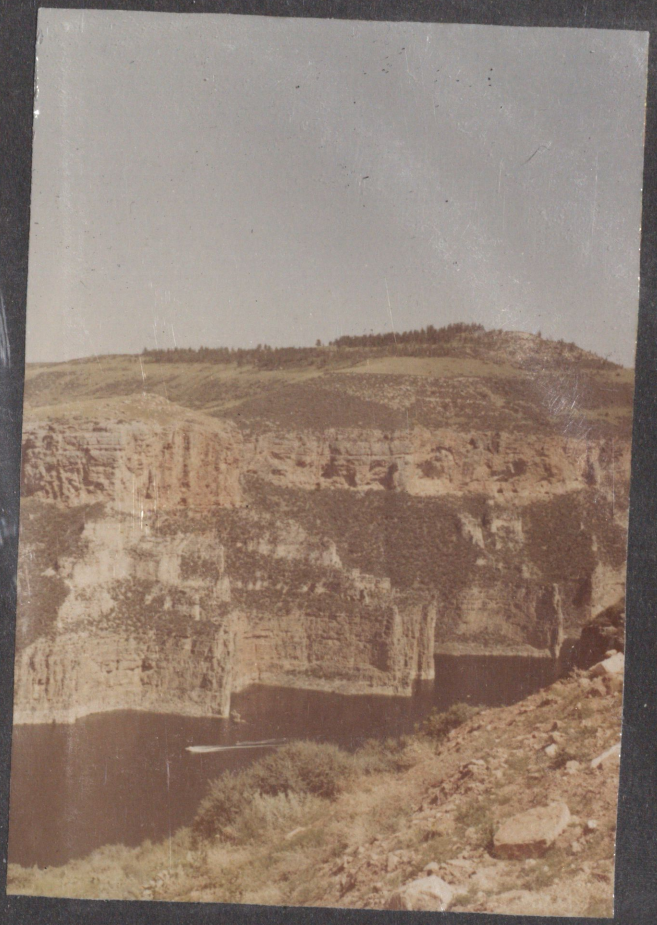
BOTTOM - View above Frozen Leg Bay of Ok-a-Beh and Pretty Eagle.

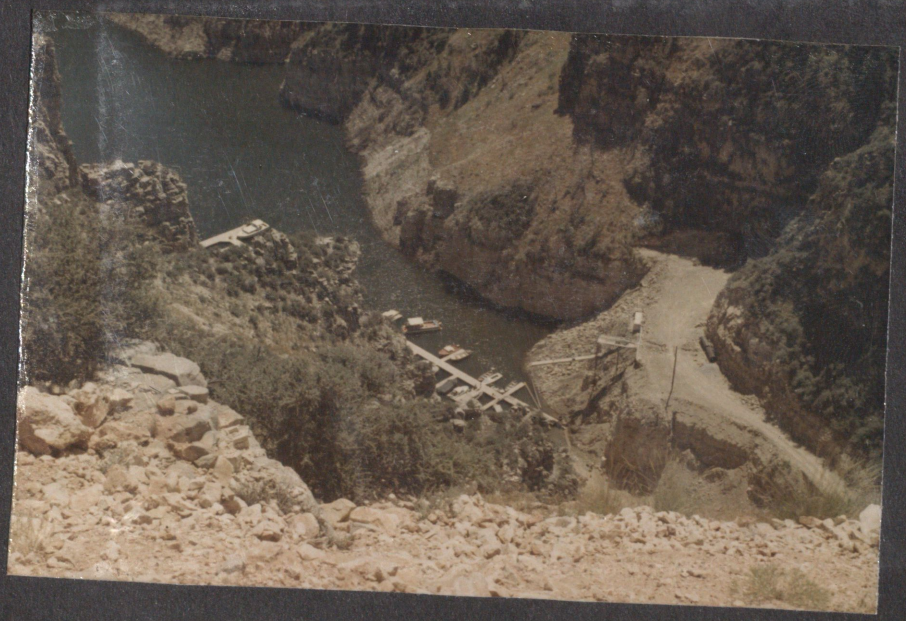




TOP - Pretty Eagle looking
East from Frozen Leg

BOTTOM - Pretty Eagle looking
SE from Frozen Leg





TOP - Pretty Eagle (site)

BOTTOM - Frozen Leg Bay

Pretty Eagle is considered to be that ridge lying on the highest point of land in the area. There are no legal boundaries in the immediate area so the description will involve only "the ridge".

The ridge is bordered by cliffs dropping off into the reservoir on the north and west. The south is hilly and forested for one mile before it too drops off into Black Canyon. The east opens up onto a meadow and foothills of the Bighorn Mountains.

The site is covered with prairie grass and sagebrush. Mountain mahogany and juniper bushes abound with a few buffaloberry bushes. The point is quite forested, with ponderosa and lodgepole pine the most predominant.

A sandstone face, or wall, about 6 - 8 feet high runs along the northern edge of the ridge. On the east and west points of the ridge there are two rock cairns which I will incorporate into my design.

The highest point on the ridge is approximately 4484 feet above sea level, with the median reservoir elevation at 3626, or a drop of over 800 feet vertically at a displacement of about 1000 feet horizontally.

The soil is mostly shallow loam and stony.(9)

3.3 views

The main reason for picking this site is the observation-tower quality of it. By being the highest point in the immediate area and lying at the bend of the canyon, excellent views are offered in every direction. The main purpose of the resort is to view, not to be viewed so this aspect is important in the design.

3.4. climate

No exact figures are available in the vicinity of the site, however the Hardin Weather Recording Station and the Billings Climatological Report contain complete figures for a very similar



VIEW - West from the site



VIEW - East from the site



VIEW - South from the marina road



VIEW - South from the site



VIEW - Typical vegetation

area.

The climate can generally be said to be typical of Northern Geat Plains. The climate by seasons is as follows:

Spring - cloudy, cool, quite damp with the last killing frost coming in May.

Summer - occasional evening thunderstorms, hot afternoons with abundant sunshine.

Autumn - very similar to spring, but less damp, snow usually comes in September, but doesn't remain on the ground until November.

Winter - very cold, frequent blizzards but Chinook winds keep the snow from collecting.

The average daytime temperature during the recreation period of May to October is 78^{0} F., and the average nightime temperature for the same period is about 62^{0} F.

Over 60% of the annual daylight hours have sunshine.

Precipitation is mainly in the form of snowfall which occurs from October to April.

Frost depth in winter is 5½ feet.

The growing season is 146 days.

The construction season is from March to November, or about 220 days.

Infrequent thundershowers are the source of nine inches of precipitation during the summer months. The remaining six inches is a result of snowfall.

Since the site is on a high ridge, runoff will not be a major problem in the immediate site.

Prevailing winds come from the northwest. Ft. Smith has had trailers overturned from 75 mph winds, but up on the plateau where the site is the wind should not be as strong. The forested knoll will cut the wind down, but it will still be a factor due to the wind-tunnel effect of the canyon.(1) (11)

3.5. access to the site

Access to the canyon area presently consists of two highways

TABLE III TEMPERATURE[11]

MONTH	AVG. MAX. TEMP.	AVG. MIN. TEMP.	AVG. TEMP.
January	26°	5°	16°
February	44°	17°	30°
March	48°	20°	34°
April	56°	30°	43°
May	70°	43°	52°
June	79°	51°	65°
July	89°	54°	72°
August	87°	52°	70°
September	72°	42°	56°
October	65°	33°	49°
November	51°	22°	36°
December	46°	10°	28°

TABLE IV PRECIPITATION IN INCHES[11]

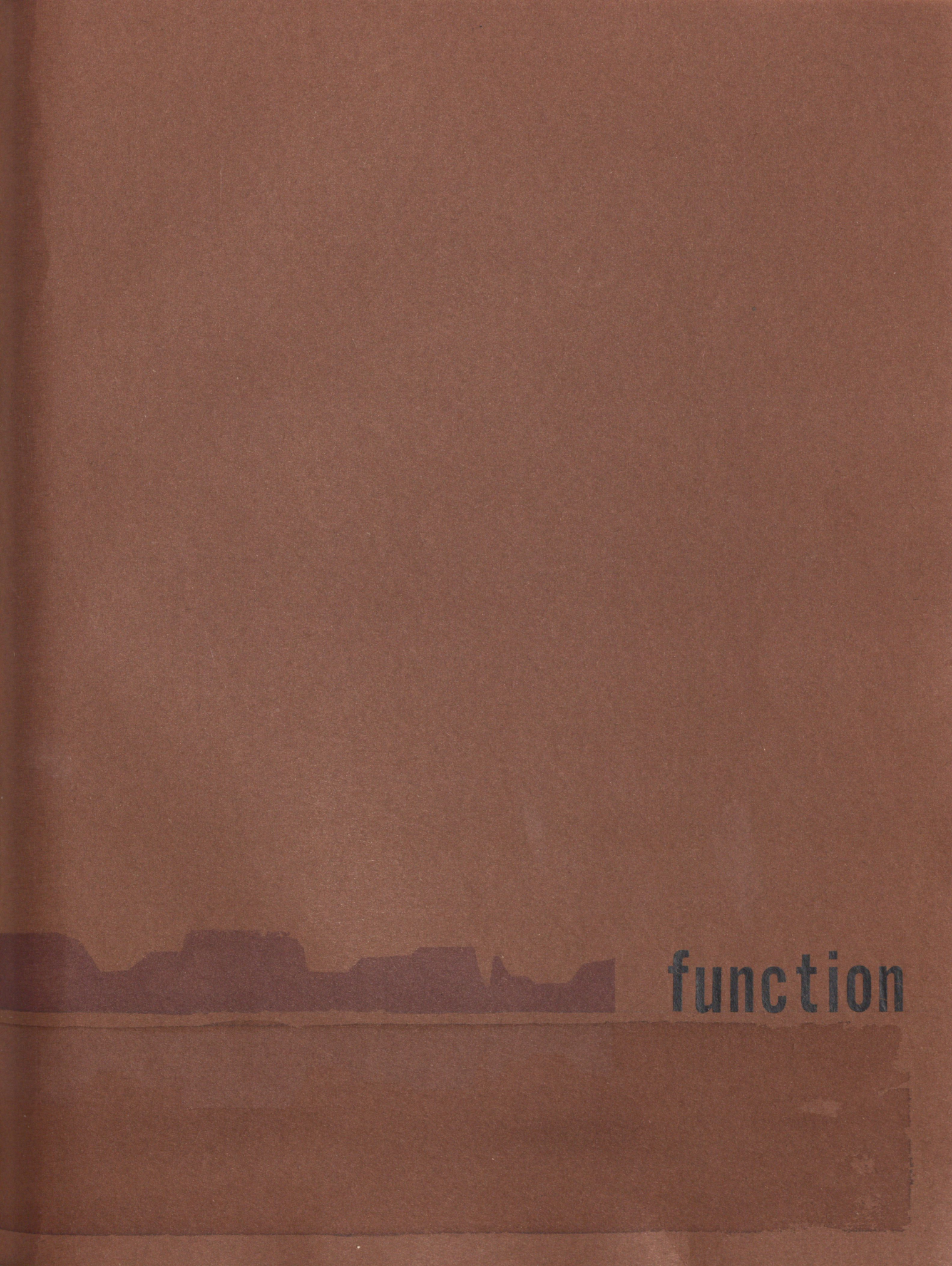
MONTH	AVG. MAX.	AVG. MIN.	AVG.
January	.35	.27	.31
February	.27	.26	.26
March	.78	.26	.52
April	1.22	.75	.98
May	1.72	.65	1.18
June	2.83	2.03	2.43
July	1.48	1.20	1.43
August	1.32	1.12	1.22
September	1.57	1.30	1.43
October	.87	.45	.66
November	.86	.56	.71
December	.55	.25	.40

- Montana secondary 313, a paved highway running 41 miles south of Hardin, Montana that ends at the mouth of the canyon, and U.S. secondary 14a, a paved highway connecting Lovell to the tail of the reservoir. Any other access to the area is restricted to jeep trails or merely overland.

The Bighorn Canyon Association is presently negotiating with Washington, D.C. for federal funds to construct a much-needed scenic highway that would connect Ft. Smith, Mont.,at the damsite, to Lovell, Wyo. at the end of the reservoir. This highway would follow the west side of the rims with several scenic turnouts. Eventually a road will be built to connect the damsite with Billings, Montana - 40 miles.

The resort, however, is on the east side of the canyon. Presently a road is being constructed from Ft. Smith to the top of the plateau. This road is primarily being built to provide access to Ok-a-beh, the marina being constructed. The resort would need about a 1000-foot turnout from this road. This road will be completed by September, 1970. The marina facilities will be completed by 1971.

There are no utilities presently at the site. Water can be easily drilled for and a sewage disposal facility in the form of a drain field could be run to the east. Electricity is available two miles away at the damsite. Telephone lines run to Ft. Smith and these also would be available two miles from the site.(1)


function

4.0. FUNCTION OF THE VILLAGE

The village as a resort must fulfill the obligations of the only Lower Bighorn Canyon recreational center. As was mentioned earlier, the Middle Bighorn Canyon will eventually be served by a facility at Barry's Landing, and the Upper Bighorn Canyon will be served by major facilities at Lovell, Wyoming.

These obligations could be listed as priorities:

(1) serve as tourist headquarters for the Lower Canyon area and Yellowtail Dam

(2) act as a major center for Southern Mont. - Northern Wyo. residents to hold conventions, or retreats for rest and recreation

(3) employment of Crow Indians and source of income for the Tribe.

(4) educational vehicle for learning the amenities of environment, nature, Indian culture and heritage, history of the region

As a village, the facility should provide a self-sustaining atmosphere for the guest. As such, the village will provide housing, food, entertainment, and any supplies needed by a guest. In other words, the tourist should not have to leave the village for any wants - all will be provided.

4.1. number and type of clientele

The number of visitors to Bighorn Canyon estimated for the year 1975 is about 750,000. Since the village is mainly concerned with overnight visitors, 23%, or 173,500 visitors will be the number considered.

Of these overnight visitors, only 60% will stay in a motel - hotel, or 104,100 visitors.

The bulk, or 85%, will come during the "recreation period" of May to September - aperiod of 150 days. With 85%, or 88,485 visitors, in 150 days, the visitor per day quota for the entire recreational area would be 525 visitors per day.

Physically, the Bighorn Canyon Recreational Area can be divided into three regions, with three major facilities. Since this region is at the bulk of travel (Yellowtail Dam), a little over one-third of the total visitors to the area will be considered. This brings the probable capacity of the village to 250 visitors.

The main business of the resort will probably come from three areas: middle-class tourist, sportsmen, and conventioneers.

The overall atmosphere of the crowd in this case, will be "reserved luxury", or very comfortable living. As the table on page seven of this report concludes, an average visitor to a recreational area spends about $45.00 over three days, or $15.00 a night for lodging only. Although the resort operates year-round, the bulk of income will occur during the recreation period.

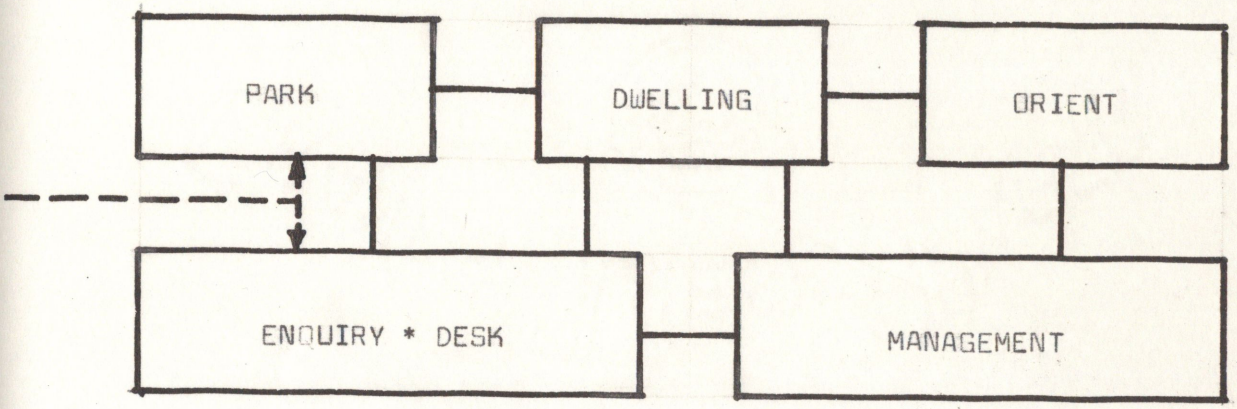
4.2. program of activities

There exists a basic itinerary for every transient arriving at a place of lodging. The village will be designed with all facilities and related spaces serving the activities of the guest. Discussed here are action - reaction statements abstractly stated rater than concretely. (e.g. dimensions, square-footage, numbers, etc. will be excluded)

On arrival, the guest will basically desire:

(1) to enquire about lodging, rates, facilities
(2) to be shown accommodations
(3) park and unpack
(4) orientation to village's recreational program and relation to the lake

As a reaction to this, the program suggests an entry area that is non-confusing to the traveler so that traffic jams will not occur. It also suggests ample parking near the supervisory headquarters as well as near the occupants' private lodging. Some type of information of explanatory material should be within easy access to the guest.



ENTRY SPACE RELATIONSHIP

Spaces for these activities may include:

(1) parking for 125 cars and roads, drives through the complex

(2) management area

(2.1) staff's quarters

(2.2) desk for registering, communication

(2.3) storage for files, records, documents

(3) dwelling units for 200 persons

(4) orientation guides, viewing stations

After initial settling procedures are completed, the guest will desire various services of the resort:

(1) relaxation and resting opportunities

(2) use of additional (besides the canyon and natural) areas for recreation

(3) dining and drinking

(4) source of purchasing conveniences and goods

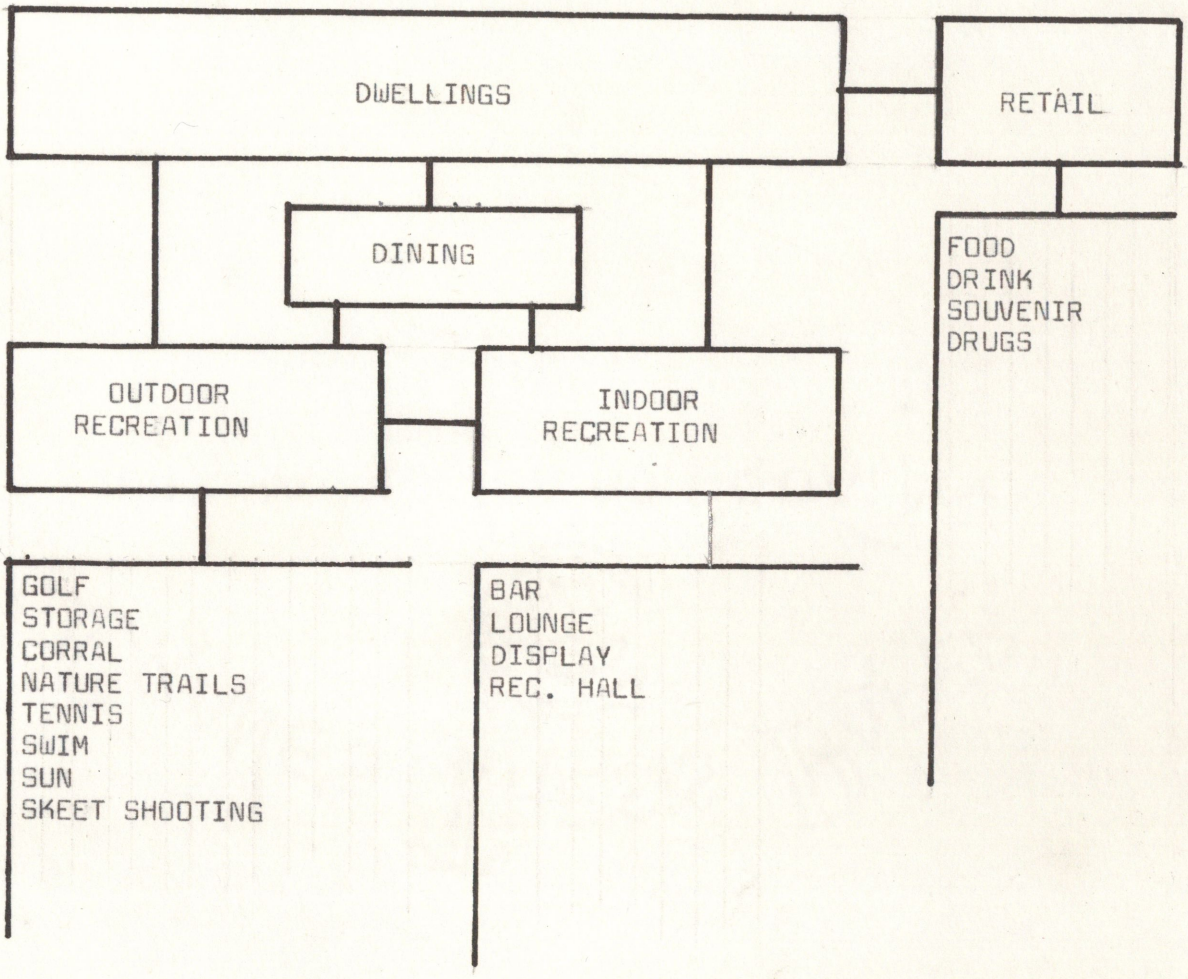
(5) socializing activities planned and areas provided

(6) entertainment provided

(7) basic service to increase pleasure of stay

These wants of the guests may be met by means of a central area that all guests can reach easily, plus facilities and service to provide for these activities.

Related to the central area or areas, will be provided means of excape from the man-made environment of the village to the more natural recreational activities - or involvement with nature.



RECREATION SPACE RELATIONSHIP

Spaces and orientation for these activities:

(1) dwelling for 200 persons

(2) outdoor recreation

- (2.1) two tennis courts
- (2.2) swimming and reflecting pool with sun deck
- (2.3) skeet-shooting range
- (2.4) corral, barn, pasture - pack trips
- (2.5) storage for golf carts and snowmobiles
- (2.6) eighteen-hole golf course
- (2.7) nature trails

(3) indoor recreation

- (3.1) bar, dance floor
- (3.2) entertainment - Indian music, western band

folk-singer, TV, pool tables, Indian crafts, barbecues

(3.3) socializing, lounging, and viewing area

(3.4) display and demonstration area

(3.5) recreation hall

(4) dining facilities for 250 guests

(5) retail area for groceries, drugs, liquor, and souvenirs

When the guest's stay has terminated, the basic procedure of arrival will be reversed:

(1) packing and loading

(2) checking out

(3) departure

The same facilities may be used for arrival and departure, but should not interfere with each other.

The intention of the designer is that Crow Indians be the sole source of employees at the village. Since the facility will most likely be owned and operated by the Crows, the power of hiring and firing will be left to them. A small party of employees will be permanently attached to the village while the majority will be seasonal help - ideal to students.

An employee's "stay" at the resort will be much akin to the guest's. In fact, a mingling of the two groups is much desired by the designer, and so many facilities will be duplicated. However, the employee's job will be to "serve" the guest, and so discrimination will occur in various areas of the resort.

Accommodations for the employee will be separated physically and spatially from the guest. Some employees, probably the permanent ones,will be married, and so will be provided private lodging. The majority though, will stay in the equivalent of a three-party lodge. Three has been known to be the most satisfying arrangement since it establishes a balance between the separation and intermingling of employees so that employees retain their identity while forming friendships.

Employees inherently have freedom in the facility not available to the guests and so should be provided private areas not accessible to the paying guest.

Assignments and duties will be matched to the employee's

capabilities, so skilled, non-skilled, and semi-skilled labor will be in demand:

(1) food preparation (native food)
(2) food serving
(3) drink serving
(4) stocking
(5) maintainance (lodge, cabins, wrangling, mechanical)
(6) clerical
(7) sales
(8) entertainment (craftsmen, artists, musicians, dancers)
(9) guides and supervisors
(10) management

Because the employee is involved with the area for a much longer period of time than the guest, his knowledge and enjoyment of the area will be increased immensely by areas provided for relaxation, recreation, socializing designed separately and purposely for the employee.

4.3. esthetics

The resort village is located in an area of tremendous scale, beauty, and pure majesty. Any attempt of the architect to design a monumental structure would merely come off as a joke. As was stated earlier, the village should view, not be viewed.

With maximum view in mind, the resort should blend into, rather than dominate the hill.

Indian culture is all-important. (Why do people tour Italy?....to see Italian culture) With Indian arts and crafts displayed subtly, a "western" or natural flavor will be achieved through the use of rough, exposed, and simple structure, but a warm and comfortable atmosphere will prevail. A durable and luxurious interior is desired in the spaces, but not plush.

The experience of staying in the village should acquaint the visitor with confrontations with nature and history through pleasant surroundings.

The village should stage the recreation. The village is a vehicle.

4.4. RELATIONSHIP TO NATIVE CULTURE

Probably the first recorded information on the Crow culture was madeiin June of 1833, when Prince Maximilian, a scientifically trained German explorer, arrived at Ft. Clarke in what is now North Dakota. Near Ft. Clarke, a Mandan Indian village and a neighboring Hidatsa village were hosting friendly Crow visitors.

Maximilian and his party paid a visit to the Crow village and sought out the chief - Rotten Belly. Maximilian was invited to Rotten Belly's lodge and the ceremonial pipe was passed in honor of the white visitors.

> "The haughty bearing of the Crow impressed Maximilian, as did their craftsmanship. He admired the women's porcupine-quill embroidery and the men's bows of elk or mountain-sheep horn, some of which were covered with the skin of a rattlesnake; and the draftsman of the expedition sketched a quiver decorated with a quill rosette.
>
> From Charbonneau, a white man settled for thirty-seven years among the Hidatsa, the traveller gleaned some facts about the sister tribe, which he eked out with information otherwise unobtainable. The Crow, he learned, were very closely related to the Hidatsa, with whom they had once formed a single people. But in contrast to these upper Missouri villagers, they never planted anything except a little tobacco. As hunters of buffalo and other game they roamed over the Yellowstone and Big Horn country, extending toward the sources of the Cheyenne River and the Rocky Mountains. Altogether their number was set at between 1000 and 1200 warriors, corresponding to a population of 3250 to 3560, housed in 400 lodges. Of horses they owned 9000 to 10000. Dogs were overabundant, - poor Maximilian estimated the number in the single band he saw at 500 to 600; but unlike some other tribes, the Crow never ate them.
>
> Morally, Maximilian's informants gave the Crow an indifferent character: Though they never killed whites, they did not scruple to rob them; their women rivaled in debauchery only by the Arikara; and perverts were common.
>
> There were no fewer than eight men's societies, such as the Bulls, Kit-foxes, Ravens, and Big Dogs. Novices, Maximilian noted, had to buy membership, partly by surrendering their wives to the old stagers. He also learned some of the

religious practices. Smoking was ritualized: no one ever took more than three puffs at a time; each man always handed the pipe with a ceremonious sweep to his left-hand neighbor; and a pipe was never smoked if a pair of shoes were hung up in the lodge. Tobacco was one of the three holiest pbjects of worship, hence all children wore a small package of it as an amulet necklace. Two other great supernaturals were Sun and Moon. To the sun a man always offered an albino buffalo cow if he had succeeded in killing one. The dead were placed on scaffolds set up in the prairie.

As to political relations, the Cheyenne, Blackfoot, and Dakota were hostile; the Hidatsa and Mandan, allies, from whom the Crow had long secured European goods, bartering in exchange their superfluity of horses. But a short time before Maximilian's visit a special post, Ft. Cass, had been erected on the Yellowstone to minister to Crow trade." (13)

Although the present-day Indian does not live the same as his buffalo hunting ancestors, the speech, beliefs, and social customs are held intact. Many younger Indians are being schooled in universities but still retain their native traditions.

VISTA workers on the reservation are presently setting up kindergarten programs to teach English to pre-schoolers because often times only the Crow language is spoken at home. This has presented many problems in public schools.

Indian athletes in High School still pray for each other before basketball and football games as was the tradition of praying for each other before a war in days past. (2,3) These and many more customs practiced on the reservation today look very suspicious to the lay public.

I feel that the exposure to the Indian working and living in his natural environment would do much to educate the visitor to the reservation. Ancient customs such as dances, sweat lodges, foods, rites and festivals could all be experienced during the recreation period at Pretty Eagle. In this light, the main educational facility at the resort would be the employee.

4.4.1. religion

The Crow religion does not widely differ from other native religions with the exception for the lack of ancestor-worship and bloody sacrifices. The sun, moon, and the tobacco plant were the three main deities of the Crow. When death occured, the body was placed on a high scaffold in the prairie as an offering or gesture to the sun.

However, one distinct belief of the Crow Indian was the need for a personal vision quest. This was an attempt to meet divinity face to face. To any major catastrophe or time of need, a revelation was sought. To take a few random samples:

> "A legendary hero who has been spurned by a supercilious beauty at once goes to a solitary rock, is blessed by a spirit, and becomes a great man. Another lover meets an elk, who teaches him to charm all women, so that the haughty maiden is now seized with an uncontrollable passion for her erstwhile victim. When a cruel chief steps on an orphan's neck, the poor boy at once gives notice to his kin: ' My elder brothers, give me moccasins, give me arrows, I am going for a vision. Don't worry about me, some time I'll return.' A bear takes pity on him, and enables him to turn the tables on his enemy. Again, when a Crow is killed in a clan feud, his brother departs; successively blessed by a bear, a jackrabbit, and a hawk, he returns to slay the murderer. A mythological gambler who has lost at play not only his property but his wife, seeks supernatural power, and by the grace of a white-headed eagle retrieves his losses. Finally, an orphan taunted for his poverty by a wealthy bully seeks redress in the mountains, gains the favor of several spirits, returns triumphant from the warpath and confounds his enemy." (13)

As success results from revelations, so conversely failure is due to their lack.

Growing up with a firm belief in the need for a revelation, youths sought them in this traditional style:

> " Most probably he would set out for a lonely mountain peak, fast, thirst, and wail there. The Crow word for the enterprise is birici'sam, which means, 'not drinking water'. Almost naked, the god-seeker covered himself with a buffalo robe at night as he lay on his back facing the east, his resting place being framed by rocks. Rising at daybreak, he sat down towards the east. As soon as the sun rose, he laid his left forefinger on a stick and chopped off a joint. This he put on a buffalo chip and held it out towards the Sun, whom he addressed as follows: 'Uncle, you see me. I am pitiable. Here is a part of my body, I give it to you, eat it. Give me something good. Let me live to old age, may I own a horse, may I capture a gun, may I strike a coup. Make me a chief. Let me get good fortune without trouble.' Then, to quote from a legend: ' The blood from his forefinger came in sprays. When the the sun was further up, he fainted. The blood oozed out of him. That day he lay unconscious till evening. When it got cool, he rose. That night he was so cold he could not sleep. For all of three nights he had no vision whatsoever. On the fourth night he was so cold he could not sleep till midnight had passed; then he slept.' And in his sleep he is taken into a tipi to recieve a blessing." (13)

Pretty Eagle is a vision quest site. Legend has it that a youth named Pretty-Eagle used the site for a quest and later became a powerful leader of his people.

The place of revelation is not a rare find since revelations were made on many of the surrounding hills. Therefore, no formal "forest service" preservation is planned for the rock; only the fact that knowing a revelation occured there and the place is untouched and left in its natural state.

4.4.2. design

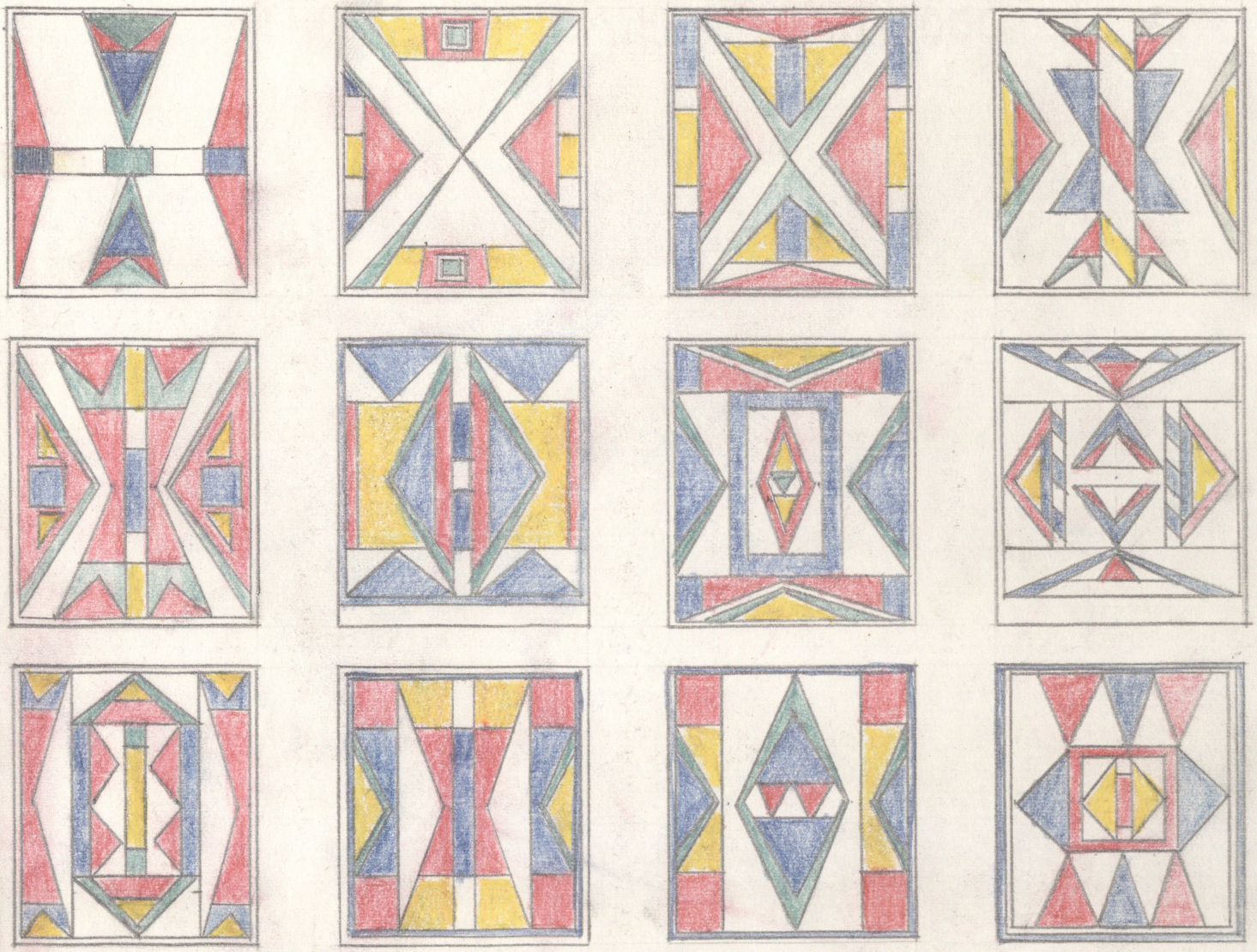
Probably the most popular form of design and decoration occured on the "parfleche", which was a rawhide carrying case

for pemmican, dried meat, and other foods, although designs were frequently embroidered on tents, clothes, medicine bags, and other paraphenalia.

On these rawhide bags, the designs were symmetrical patterns painted in black, red, green, dark blue, and yellow. These patterns differed widely from the Hidatsa, Blackfoot, Cheyenne, and Western Dakota - all the tribes with whom the Crow had constant contacts. The Hidatsa and Dakota designs are shown on the following page to be compared with the Crow. Crow designs are usually a central design - that is no bisection of design occurs as with the Hidatsa. A Crow design typically favors a large hourglass in the middle with an isosceles triangle on each side. Another typical arrangement has three horizontal layers; a stripe enclosing a triangle lies above as well as below a framed rectangle with a central diamond and flanked by isosceles triangles. These designs are closely related to the Wyoming Shoshone in origin.

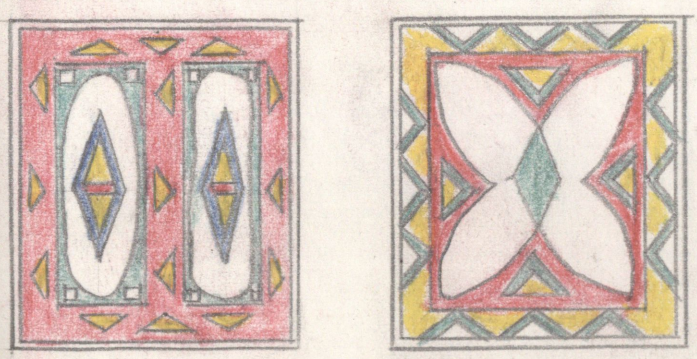
One of these designs is used as a logogram for the entire resort. This logo is a colorful design that would be displayed on the wall of the entrance court in the resort.

These designs form a model after which blankets, carpets, etc. can be patterned.



CROW PATTERNS

Typical designs painted on parfleche. Differs from the typical designs of the Hidatsa and Dakota.



HIDATSA OR DAKOTA

summary

5.0. SUMMARY

In keeping with the idea of blending into rather than dominating the hillside, the massing of the elements was designed to follow the vertical and horizontal lines of the rocks as well as the verticality of the pine trees which cover the site. As one approaches the site, the view of the surrounding canyon is lost in the trees and bushes of the site. The parking is kept on the crest of the hill so all activities surround the parking with their "backs" to it. This allows direct contact with nature from the buildings.

Basically, the indoor activities are on the western end of the site, where a view of the canyon is available for 180 degrees. The outdoor activities are on the eastern end of the site with the rooms located in between.

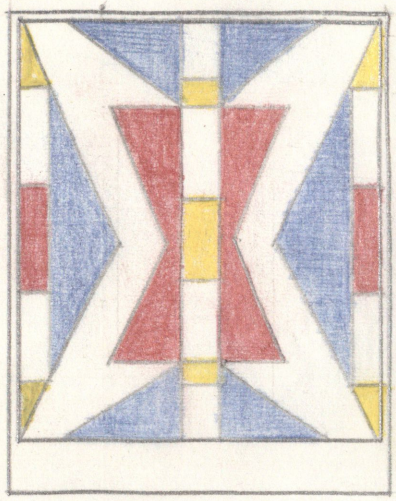
As the tourist enters the resort, the only buildings offering entrance from the parking are the registration desk, top floor of rooms, store, and the circular stairways. By descending the stairways from the entrance court, one descends the hill to the level of the coffee shop, lounge, and restaurant. lowerstill is the bar and lower level of rooms. The stairway opens onto a pedestrian walk which runs parallel to the rooms. On the eastern end of the site, the walk opens onto a large clearing where swimming, tennis, and barbecue facilities are located. This open area also serves as an outdoor gathering for the guests.

The employee's quarters are located near the horse stables in the heavily-forested area north of the main complex.

In keeping with natural quality of the site, the designer felt the golf course and skeet shooting range should be excluded in this design problem. The golf course demands a vast manicured landscapedwhich is not in keeping with the natural foliage. The skeet and trap ranges, I felt were too dangerous in the immediate vicinity and would intrude on the silent majesty of the area.

As an immediate transition between the hectic, dynamic

Letterhead proposed for the resort using the logogram.



pretty eagle

big horn canyon

travel activities and the contrasting static, peaceful stay at the resort, a large circular reflecting pool is located between the registration area and rooms, and the parking and drive area. A mosaic pattern in the bottom of the pool will add a dash of color to the otherwise drab, whitewashed court.

The materials chosen for the buildings are adobe brick walls with shake shingle roofing. All structure is exposed, with rough-sawn timber beams.

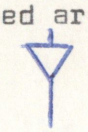
Adobe is a relatively new building material in this area and could be termed experimental. Adobe has been used in the Southwest because the Indian way of life there was not as nomadic as the Northern Indians. Also, a waterproof additive has been discovered which makes the brick practical for this wetter climate. If the design were to be built, however, tests would have to be run to determine the strength and durability of the bricks.

Adobe was chosen because of its natural insulating qualities, natural color, and incomparable texture. Adobe can be made anywhere in the world as long as the soil is predominantly clay rather than sand. Asphaltic stabilizer is added to the mud to make the dried brick waterproof. Straw is deleted from this adobe because it only acts as "breather tubes" to dry the inside of the brick after the rains.

The height of the structure demands that the walls be at least 12" thick. The compression strength of the brick depends on the quality of the soil used. However for this resort I will stay with the hypothetical 12".

Each brick is formed separatly in a wooden form 4"x12"x18" and after a month or more of drying in the sun, the brick can be altered to odd sizes by splitting with a hatchet.

Clay tile is used to complement the adobe and carpet is used in seating or rest areas.

A logogram (a symbol used to represent a phrase or word) was developed from typical Crow patterns. The detailed logo is used as is shown on the preceding page for menues, advertisements, or any other place as a representative symbol of the Pretty Eagle resort. There is no native interpretation of the pattern, but the elements used are taked from the Crow symbol of an eagle. (Eagle symbol - ).

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