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assessment of alternatives
development concept plan
may 1979

STORAGE

GLEN CANYON
LONE ROCK

NATIONAL RECREATION AREA / UTAH · ARIZONA

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ON MICROFILM

DEPARTMENT OF THE INTERIOR

ASSESSMENT OF ALTERNATIVES
DEVELOPMENT CONCEPT PLAN
LONE ROCK

GLEN CANYON NATIONAL RECREATION AREA
UTAH AND ARIZONA

Prepared by

Rocky Mountain Regional Office
and
Glen Canyon National Recreation Area
National Park Service

5/21/79
Date

Glen T. Bean
Regional Director
Rocky Mountain Region

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I. SCOPE OF THE PROJECT

A. Statement of the Problem

Lone Rock, a remote sandy beach in the upper end of Wahweap Bay, has traditionally been used for random, nonfee camping. Visitors wishing to launch their boat and camp near the water front were permitted to do so. Since 1975, visitation has grown rapidly and with it, an increase in management problems relating to sanitation, off-road vehicle use, crowding, and protection activities. During the 1977 visitor year, a peak use of 980 persons per day was recorded. As a result, resource impact became pronounced and management problems increased. It has been the determination of park and regional managers that the Lone Rock site can no longer satisfactorily offer the random uncontrolled type of recreation use that it has in the past without further damage to the site's natural resource base. Therefore, it is necessary to develop visitor use facilities that provide for a more controlled and maintained type of recreational use at Lone Rock.

B. Planning Objectives

The following objectives were developed so that Glen Canyon National Recreation Area will be managed to the benefit of the recreation visitor and the natural resources. The alternatives for development at Lone Rock are evaluated by how well they achieve these objectives:

1. The park's ecosystems will be kept in as natural a state as possible, consistent with recreational and commercial uses.

2. The park visitor will be offered opportunities for a wide range of outdoor recreational experiences that he or she can enjoy safely and at his or her own convenience.

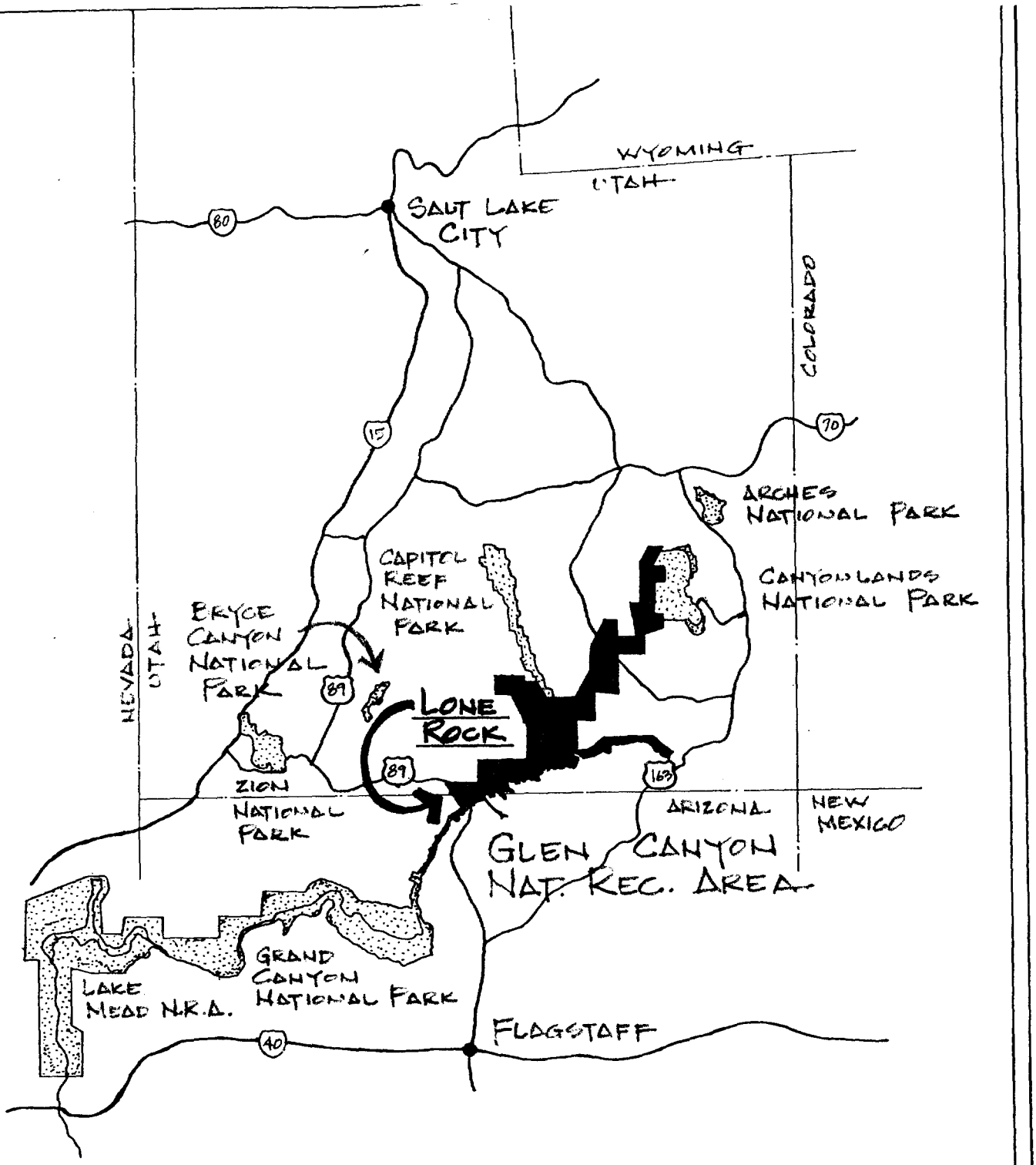
3. Visitor experiences will be clearly consistent with the conservation of the area's natural and cultural resources.

4. Commercial facilities and services within the recreation area that are necessary for the visitor's use and enjoyment will be provided through the use of concessions. Concession developments will be limited to those necessary and appropriate for public use and enjoyment and be consistent with the preservation and conservation of the area.

5. A maximum level of visitor safety and protection pertaining to lake access and boating will be provided.

6. In compliance with governing state and Federal laws, a healthy and sanitary environment will be perpetuated.

7. All visitors will be provided with equal opportunities and diverse recreational experiences including those relating to the lake's shoreline.



GLEN CANYON NATIONAL RECREATION AREA

LONE ROCK

DEVELOPMENT CONCEPT PLAN

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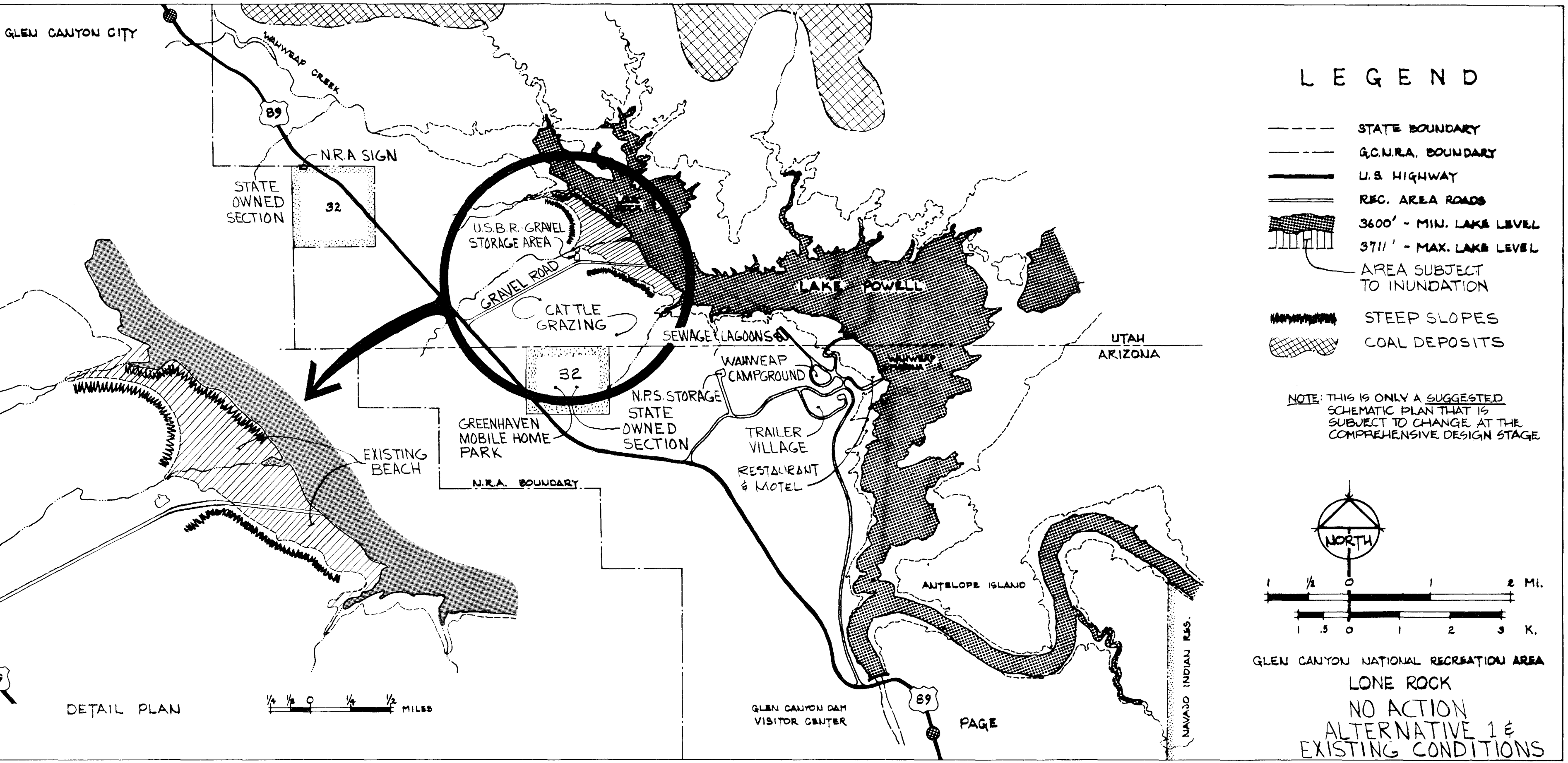
MAP 1



GLEN CANYON NATIONAL RECREATION AREA

LONE ROCK
NO ACTION ALTERNATIVE 1 & EXISTING CONDITIONS

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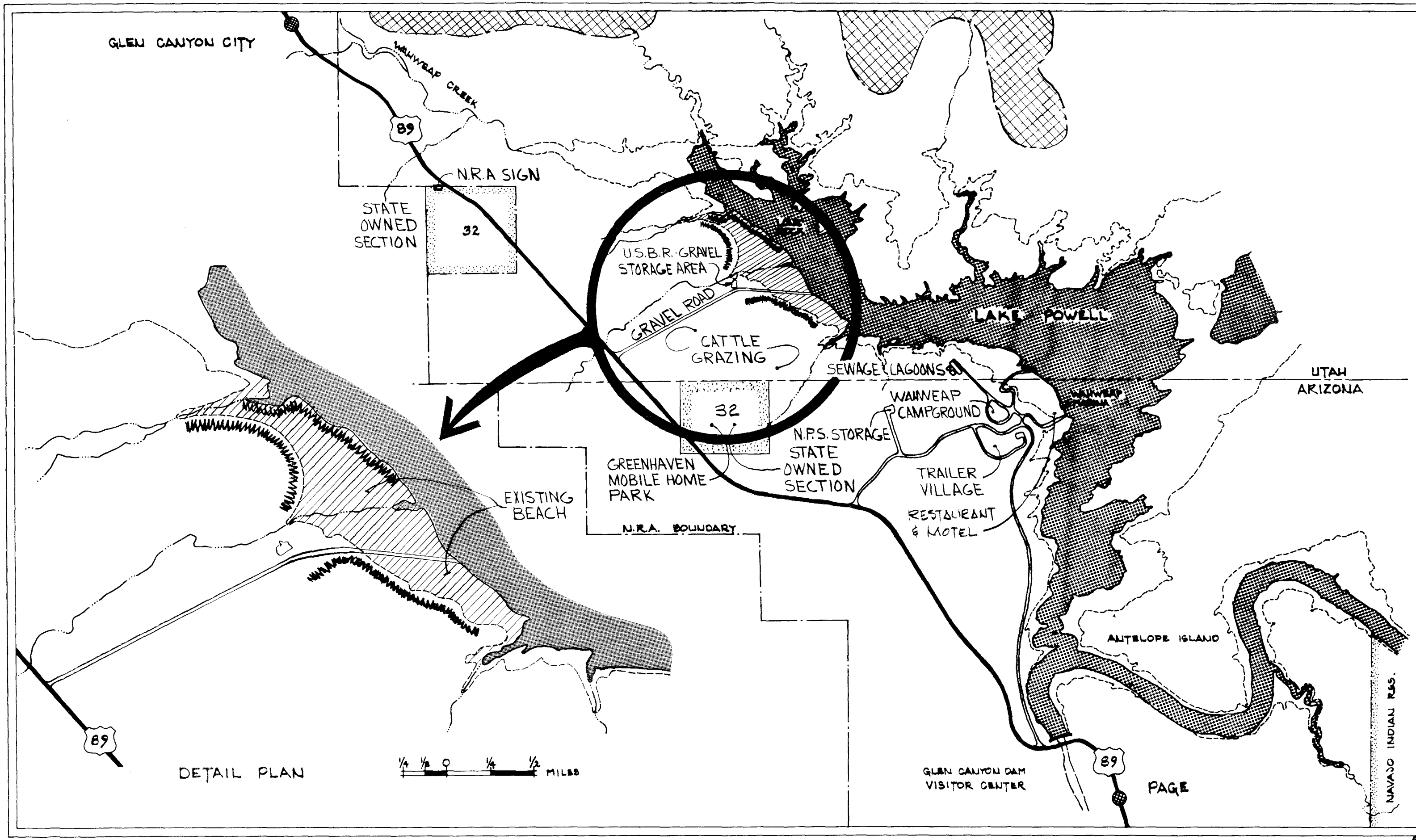
MAP 2



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The site's overmantle is loess sand deposited from extensive sand dunes to the west of Lone Rock. Soil tests have not been conducted on the site and there are no known developed soil horizons. Therefore, estimates of soil depth, fertility, and stability are not available.

D. Water Resources

Much of the Lone Rock site is subject to periodic inundation because of the possibility of up to a 150 foot vertical lake fluctuation. Glen Canyon Dam has a potential to impound to a maximum high water mark of 3,711 feet m.s.l. Only portable facilities can be developed below this level (See Figure 1).

There is no information available on the quantity or quality of groundwater at Lone Rock. However, a producing well has been dug at the Greenehaven development, two miles away.

E. Climate

Lone Rock is in arid to semi-arid, high desert country with annual percipitation averaging from 4.5 to 6.5 inches. Mean annual temperatures in the region range from 30 to 40 degrees F. in January to 80 and 90 degrees F. in August. Extremes in temperature can vary from near zero in the winter to 115 degrees F. in July and August. Prevailing wind direction is from the southwest with winds ranging from light to calm in winter to strong and gusty in spring and intermittent throughout the remainder of the year.

F. Vegetation

The general ground cover at Lone Rock consists of a mixture of xerophytic plants including yucca, cacti, and sagebrush. Grasses common to the area are sand dropseed, Indian rice grass, and other similar dry area grasses. The vegetation at the Lone Rock site is that of a transition type from the lower Sonoran to upper Sonoran with dominance of upper Sonoran types. It is typical high desert vegetation of Great Basin Sage, blackbrush, Indian rice grass, yucca and associated forbs. During periods of average or sufficient precipitation vegetative cover is about 40 percent.

In addition to the native vegetation, the exotic Russian Thistle and Tamarisk became established within the lake fluctuation zone. Numerous wildflowers bloom in profusion on the mesas, dunes, and along streambeds in season. None are listed as threatened or endangered species.

G. Wildlife

The Lone Rock site is frequented by common desert mammals such as badger, coyote, fox, Cottontail and Jack Rabbits, Kangaroo Rats, Grasshopper Mice, Pack Rats, and other small rodents. Birds utilizing the site include several species commonly found on the sage/blackbrush flats. The Golden Eagle is among several raptor species which hunt over a portion of the site. The endangered Peregrine Falcon has been observed in the vicinity

of Wahweap Bay but is not known to utilize the Lone Rock beach site. The Superintendent of Glen Canyon National Recreation Area, in a memorandum dated February 13, 1978, reports that the Rocky Mountain Peregrine Recovery Team feels the Peregrine population will not be adversely affected by development in this area (See Coordination, Section IV). Bald Eagles, a winter migrant to Lake Powell, have not been observed in Wahweap Bay.

Wahweap Bay fish species include Rainbow Trout, Largemouth Bass, Striped Bass, Walleye, Crappie, Bluegill, and Carp.

H. Cultural Resources

A comprehensive archeological survey of the area has been programmed for the summer of 1979. Any cultural resources discovered during this survey will be protected and preserved prior to and during development phases in accordance with Executive Order 11593. If cultural resource remains are discovered, redesign of alternatives may be necessary.

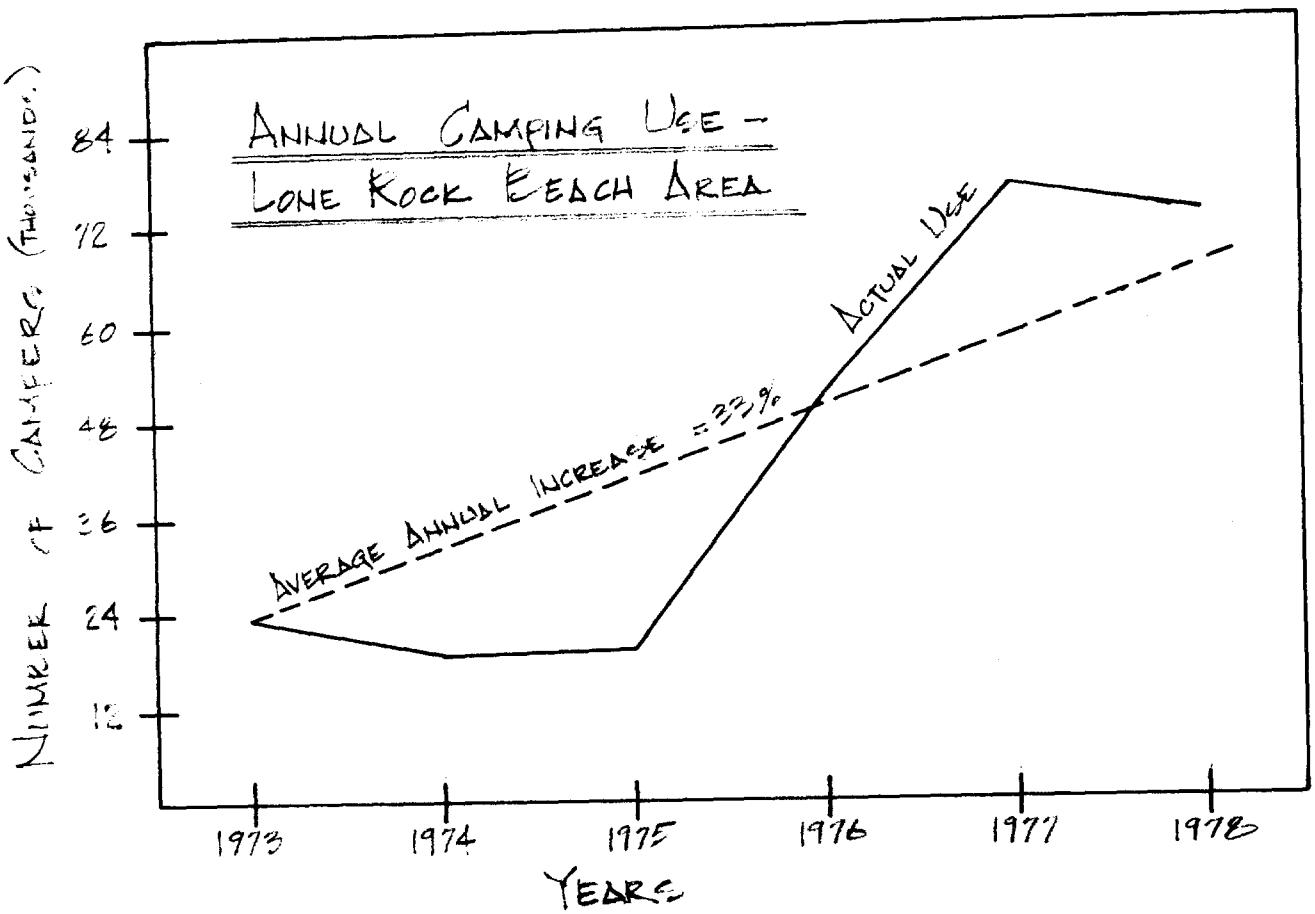
The most recent annual issue of the National Register of Historic Places (February 6, 1979) does not list any properties that will be affected by development at Lone Rock.

The Navajo Tribe has provided Glen Canyon National Recreation Area with a list of Native American Sacred Religious Sites in the area. No known such sites were listed near Lone Rock beach.

I. Visitor Use

In 1978, Glen Canyon National Recreation Area was visited by 2,211,818 visitors who participated in activities ranging from boating, fishing, and swimming to camping, sightseeing, and hiking. About 83% of Glen Canyon's visitation (1,846,242) was received at the Wahweap--Lone Rock area. This compares with 1977's visitation where Wahweap--Lone Rock also received 83% of Glen Canyon's total visitation (1,759,676).

The Lone Rock site has had an average annual use increase of 33% since 1973. (See Graph, Page 5). The site experienced a drastic visitor use increase during 1976 and 1977. Since 1977, visitation to the site has remained at a very high level. The site's carrying capacity is defined in the General Management Plan as 4,200 persons per day.



J. Outline of Planning Events

Following this planning effort, subsequent planning for the Lone Rock area should be accomplished in the following sequence:

1. Selection of alternative and preparation of Development Concept Plan

2. Preparation of Comprehensive Site Design (Developed Area Plan) including:

   a. Preliminary Studies
      (1) Topographic Analysis (1"=100' scale--2' contour interval)
      (2) Soils Analysis
      (3) Water Availability and Quality Analysis (groundwater supplies)
      (4) Archeological Survey
      (5) Flood plain studies (in accordance with Executive Order 11988)

   b. Comprehensive Site Plans for the total proposed development area

3. Programming of Funds (10-238's)

4. Construction in phases

III. ALTERNATIVES

This section describes four alternate methods of development for responding to recreation and resource needs at Lone Rock. They range from a "No Action" proposal to a "Maximum Development" proposal (See Maps 2 through 5).

Each alternative represents a stage of development at Lone Rock with "No Action" being the present situation and "Maximum Development" being the highest phase of development. Development will be carried out in successive phases as represented by Alternatives 1 through 4. Management will decide at which phase the development will stop by selecting an alternative. Construction will not occur all at once but will be staged. For example, not all sites of the campground will be constructed at one time, rather units of perhaps 50 sites will be constructed at each phase of development.

An assessment of associated impacts for each alternate stage of development is illustrated on the following pages and summarized in the table at the end of this section.

III. Alternative 1--NO ACTION: This alternative retains the existing level of development at the Lone Rock site and does not propose any additional recreation facilities. It assumes that existing patterns of random, unstructured recreation use at the site will continue with a minimum level of NPS management.

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Random recreation use of the beach area will continue. Impacts resulting from uncontrolled use include trampled vegetation, compacted soils, decreased air quality due to automobile exhaust, and denuded hillsides from motorized vehicular use.	On-site park personnel could prevent some of these impacts.	Some vegetation will be trampled, soils compacted, and hillsides denuded due to random visitor use. Erosion and visitor safety hazards could result.	Uncontrolled visitor use in the short-term would cause long-term degradation of the site.	Existing soils and vegetation would be lost.
No clearing of soils or existing vegetation will be needed because no additional development will occur.	None.	None.	None.	None.
Uncontrolled visitor use will continue to put increased management pressure on the park for maintenance, law enforcement, and safety personnel.	None.	Additional funds and manpower to maintain and manage area.	None.	Funds and manpower to maintain area.

III. Alternative 1--NO ACTION: This alternative retains the existing level of development at the Lone Rock site and does not propose any additional recreation facilities. It assumes that existing patterns of random, unstructured recreation use at the site will continue with a minimum level of NPS management.

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Heavy visitor use supported by only portable sanitation facilities could create public health hazards and pollution problems.	Intensified maintenance program to facilitate trash removal and sanitation upkeep will reduce health and pollution hazards.	Heavy visitor use will create some health and pollution problems due to incapabilities of supporting facilities.	Heavy visitor use would exceed portable facility capabilities and cause long-term pollution and health problems.	None.
Economic gains will be experienced by private enterprise outside the recreation area. These entities will be offering needed visitor services outside the park that are not supplied inside the recreation area.	None.	None.	None.	None.
Water quality of Lake Powell may be degraded by extensive vehicular use near waterline, and poor sanitation conditions.	None.	Water quality of Lake Powell may be slightly degraded by automobile emmissions and oil spills and poor sanitation conditions.	None.	None.

III. Alternative 1--NO ACTION: This alternative retains the existing level of development at the Lone Rock site and does not propose any additional recreation facilities. It assumes that existing patterns of random, unstructured recreation use at the site will continue with a minimum level of NPS management.

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Continuing to allow random camping along the shoreline will encourage use by visitors who enjoy that type of use but will reduce the variety of recreational opportunities for the majority of visitors.	None.	The variety of recreational experiences for visitors at Lone Rock beach will be reduced by continuing to allow the present random camping use along the shoreline.	None.	None.
The current low visual quality of the site will continue with the presence of trailers and recreational vehicles on the shoreline.	None.	The presence of trailers and recreational vehicles on Lone Rock beach will continue to be an adverse visual intrusion to the natural landscape quality of Lake Powell and its surrounding.	None.	None.

III. Alternative 2--MINIMUM DEVELOPMENT: This alternative provides for a minimum level of recreation facility development at the Lone Rock site including a paved access road, permanent sanitary facilities, a side-launch boat ramp and portable day-use facilities near the shoreline. It allows for continuation of the existing pattern of random, unstructured recreation use, requiring a minimum level of NPS management. Access will be via the existing road and public use will continue to be restricted to the south side of Little Wahweap Creek. (See Map, Page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Approximately 15.5 acres of existing native vegetation will have to be cleared to construct paved entrance road, side boat launch, sanitation facilities, and graveled parking lot.	Existing vegetation will be saved wherever possible. Reseeding and mulching will be done on cleared areas.	Some existing native vegetation will still be lost due to construction activities.	The short-term loss of existing vegetation could cause long-term erosion of topsoil thus diminishing successful revegetation.	Existing vegetation will be lost.
Topsoil will be lost due to accelerated erosion caused by clearing activities for development.	Reseeding and mulching could retard erosion that might be accelerated as a result of topsoil losses.	Some existing topsoil will still be lost due to clearing.	The short-term loss of existing topsoil could cause long-term erosion creating sediment problems in the lake and reduced success of revegetation.	Existing topsoil will be lost.
Disturbance of 15 acres of wildlife habitat (birds and small mammals) due to construction of facilities and public use.	Revegetation of disturbed areas. Restrict public use at critical habitat areas.	Disturbance of wildlife habitat is unavoidable.	Long-term recreation use of the area will cause long-term adverse impacts on wildlife.	Permanent facility construction will cause an irretrievable commitment of the site's wildlife habitat resource.
Noise and dust will be created during construction periods.	Construction could be scheduled to take place during off-peak visitor seasons. Noise and dust will be (cont'd.)	Noise and dust created by construction activities will produce adverse aesthetic impacts to the imme- (cont'd.)	None.	None.

III. Alternative 2--MINIMUM DEVELOPMENT: This alternative provides for a minimum level of recreation facility development at the Lone Rock site including a paved access road, permanent sanitary facilities, a side-launch boat ramp and portable day-use facilities near the shoreline. It allows for continuation of the existing pattern of random, unstructured recreation use, requiring a minimum level of NPS management. Access will be via the existing road and public use will continue to be restricted to the south side of Little Wahweap Creek. (See Map, Page).

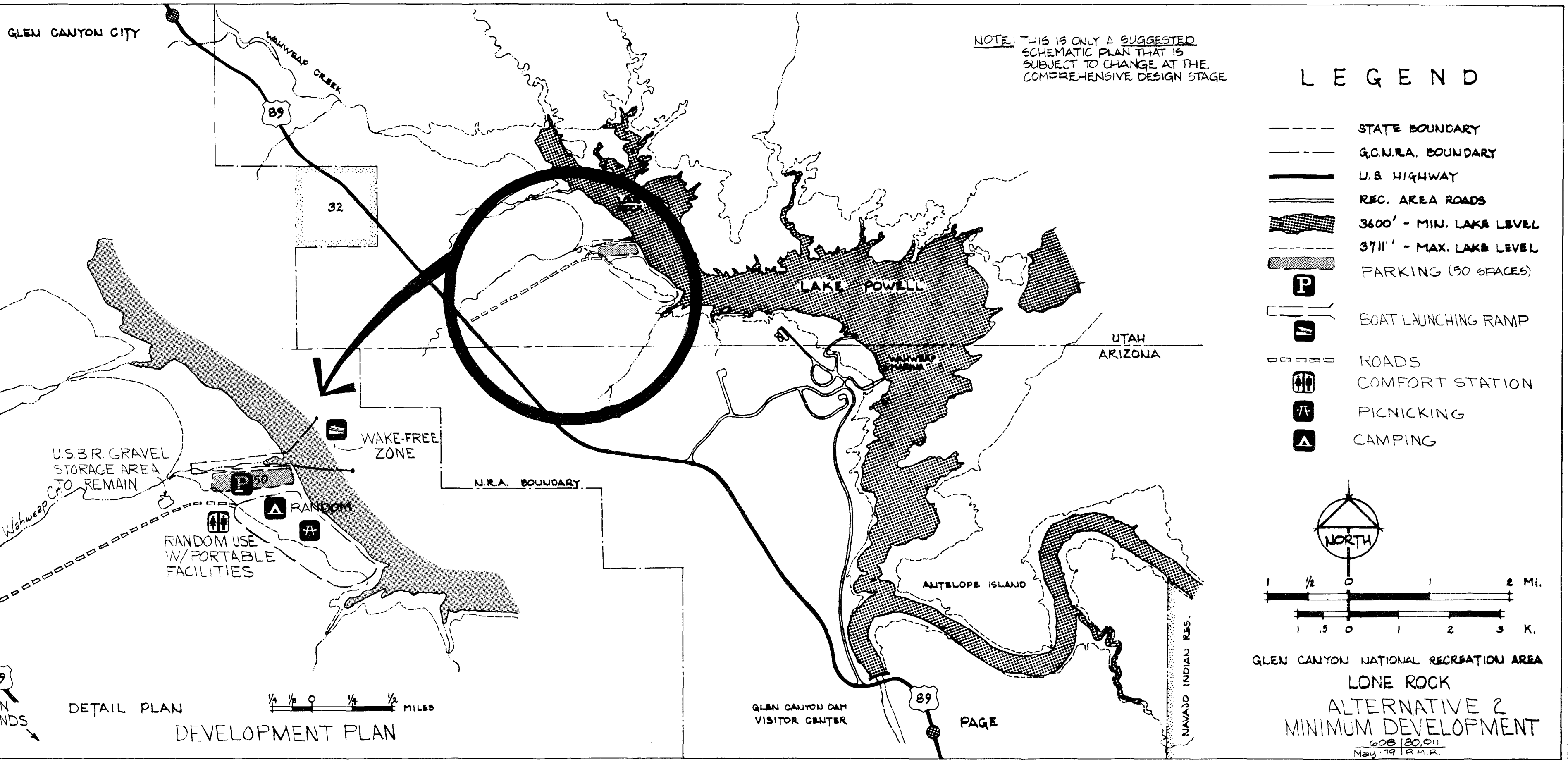
IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
	confined to immediate zone of construction.	diate zone of construction.		
Dust and fumes caused by recreation use will degrade air quality in immediate vicinity of Lone Rock beach.	None.	Some degradation of air quality from fumes and dust will be caused by visitor use.	None.	None.
Decrease in visual quality will be caused by the presence of permanent recreation facilities.	Facilities will be designed to blend with the natural landscape to the extent possible.	Decrease in visual quality is unavoidable.	Long-term use of permanent facilities will cause long-term adverse visual quality impact.	Permanent facility construction will cause an irretrievable commitment of the site's natural visual character.
Random use of the beach area will continue. Impacts resulting from uncontrolled use include trampled vegetation, compacted soils and denuded hillsides from motorized vehicular use.	On-site park personnel could prevent to a small degree some of these impacts.	Some vegetation will still be trampled, soils compacted and hillsides denuded due to random visitor use. Erosion and visitor safety hazards could result.	Uncontrolled visitor use in the short-term would cause eventual long-term degradation of the site.	Existing soils and vegetation would be lost.
Recreation use will be limited to the existing beach site south of Little Wahweap Creek which is easily inun- (cont'd.)	Pedestrian bridge access could be provided to the north side of Little Wahweap Creek.	Most recreation use would continue to be concentrated at the existing beach area.	None.	None.

III. Alternative 2--MINIMUM DEVELOPMENT: This alternative provides for a minimum level of recreation facility development at the Lone Rock site including a paved access road, permanent sanitary facilities, a side-launch boat ramp and portable day-use facilities near the shoreline. It allows for continuation of the existing pattern of random, unstructured recreation use, requiring a minimum level of NPS management. Access will be via the existing road and public use will continue to be restricted to the south side of Little Wahweap Creek. (See Map, Page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
dated due to lake fluctuations.				
Minimal development with uncontrolled use will put an increased management pressure on the park for maintenance, law enforcement and safety personnel.	None.	Additional funds and manpower to maintain and manage minimally developed and controlled area.	None.	Funds and manpower to maintain area.
Minor construction may increase erosion thereby causing minor sediment accumulation in Lake Powell.	Decrease in water quality of Lake Powell from sedimentation should be minor and only occur during construction phases.	There will be some increase in sedimentation in Lake Powell from minor construction of access road, boat launch, and sanitary facilities.	None.	None.
The absence of planned concession facilities within the Lone Rock site will stimulate private interest economies offering needed visitor services outside of the recreation area.	None.	None.	None.	None.

Alternative 2--MINIMUM DEVELOPMENT: This alternative provides for a minimum level of recreation facility development at the Lone Rock site including a paved access road, permanent sanitary facilities, a side-launch boat ramp and portable day-use facilities near the shoreline. It allows for continuation of the existing pattern of random, unstructured recreation use, requiring a minimum level of NPS management. Access will be via the existing road and public use will continue to be restricted to the south side of Little Wahweap Creek. (See Map, Page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Funds, materials, and manpower will be needed to implement proposed development.	None.	Expenditures of construction funds, materials and manpower.	None.	Funds, materials, and manpower.
Development will be kept to a minimum thereby decreasing adverse impacts on the site from construction activities.	None.	None.	Short-term small-scale development could become incapable of handling long-term increases of visitor use in the future.	None.
Continuing to allow beach-front, random camping will encourage use by visitors who enjoy that type of activity, but will reduce the variety of recreational opportunities for visitors.	None.	The variety of recreational experiences for visitors at Lone Rock beach will be reduced by continuing to allow the present random camping beach-front use.	None.	None.
The current low visual quality of the site will continue with the presence of trailers and recreational vehicles on the shoreline.	None.	The presence of trailers and recreational vehicles on Lone Rock beach will continue to be an adverse visual intrusion to the natural landscape quality of Lake Powell and its surroundings.	None.	None.



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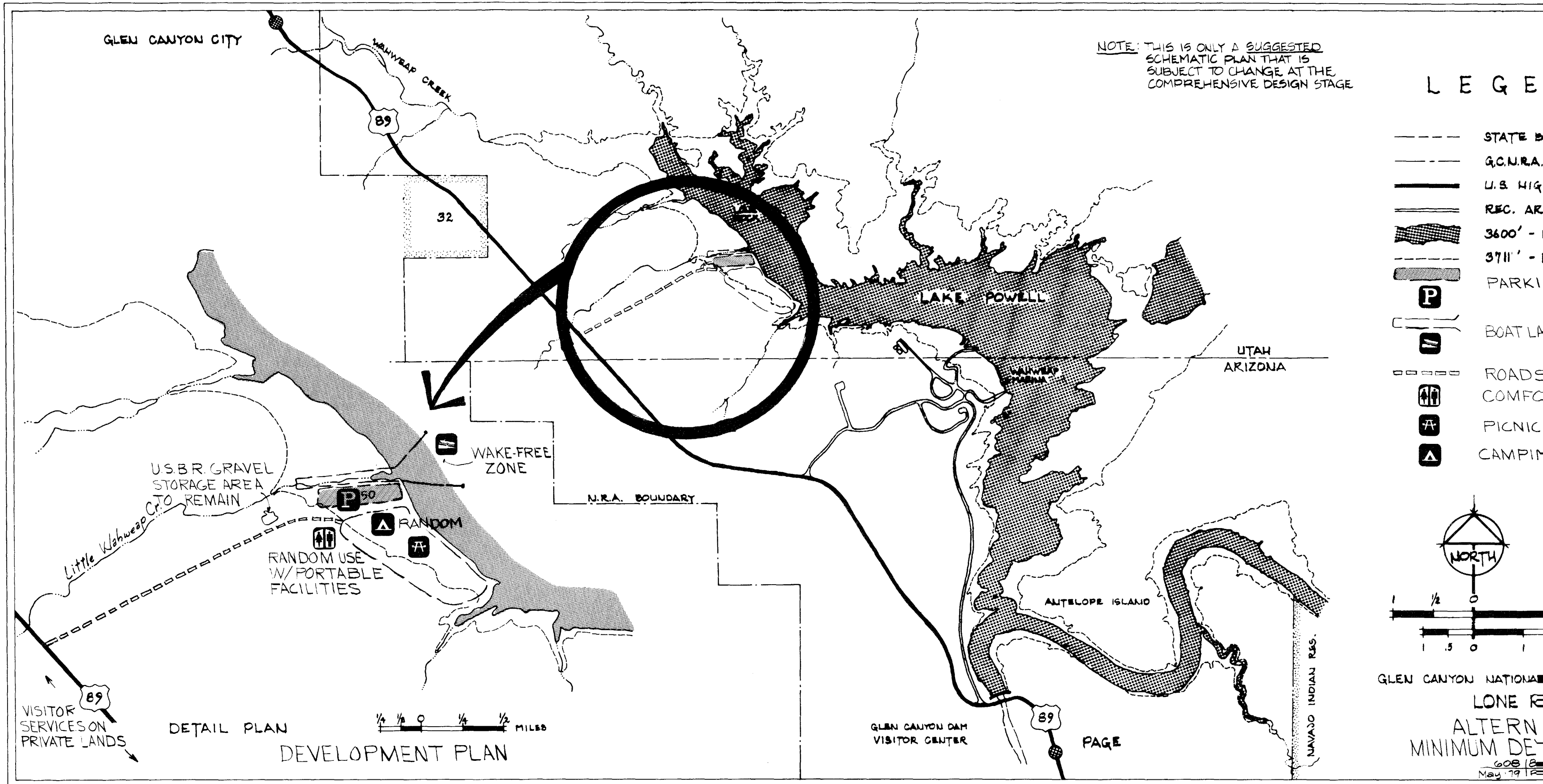

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III. Alternative 3--PARTIAL DEVELOPMENT: This alternative provides development of facilities to serve a partial level of recreation use at Lone Rock. Facilities include a paved access road, 250-unit campground, sanitary facilities, a side-launch boat ramp, fuel and courtesy docks, and day-use facilities. Grazing will be phased out on adjacent NRA lands. The existing U.S.B.R. gravel pile will be relocated. Development will allow for day-use recreation use along the beach with camping use restricted to formal campgrounds. Primary access is via a new road from the existing Wahweap Developed Area with secondary access via the existing gravel road on-site. (See Map, Page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Approximately 50 acres of existing native vegetation will have to be cleared to construct new paved road from Wahweap, improve existing road, construct a 250-unit campground, boat ramp, and graveled parking lots.	Existing vegetation will be retained wherever possible. Reseeding and mulching will be done on cleared areas.	Some existing native vegetation will still be lost due to construction activities.	The short-term loss of existing vegetation could cause long-term erosion and topsoil loss thus diminishing revegetation success.	Existing vegetation will be lost.
Topsoil will be lost due to accelerated erosion caused by clearing activities for development.	Reseeding and mulching could retard erosion that might be accelerated as a result of topsoil losses.	Some existing topsoil will be lost due to clearing.	The short-term loss of existing topsoil could cause long-term erosion creating sediment problems in the lake and reduce successful revegetation.	Existing topsoil will be lost.
50 acres of existing wildlife habitat will be disturbed by facility construction and increased public use of the Lone Rock area.	Revegetation of disturbed areas. Restrict public use in critical hatitat areas.	Disturbance of wildlife habitat is unavoidable.	Long-term recreation use of the area will cause long-term adverse impacts on wildlife.	Permanent facility construction will cause an irretrievable commitment of the site's wildlife habitat resource.
About 7,000 acres of grazing land will be lost to permittees now grazing in this area.	None.	Grazing permittees will lose 7,000 acres of rangeland.	Short-term loss of grazing land vs. long-term enhancement of area through protection of natural	Economic loss of grazing permittees.

(cont'd.)

III. Alternative 3--PARTIAL DEVELOPMENT: This alternative provides development of facilities to serve a partial level of recreation use at Lone Rock. Facilities include a paved access road, 250-unit campground, sanitary facilities, a side-launch boat ramp, fuel and courtesy docks, and day-use facilities. Grazing will be phased out on adjacent NRA lands. The existing U.S.B.R. gravel pile will be relocated. Development will allow for day-use recreation use along the beach with camping use restricted to formal campgrounds. Primary access is via a new road from the existing Wahweap Developed Area with secondary access via the existing gravel road on-site. (See Map, Page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
			resources.	
Grazed areas will be able to follow natural succession and impacts to grasses and soils in this area will be reduced.	None.	None.	Short-term loss of grazing land vs. long-term enhancement of area through protection of natural resources.	None.
Noise and dust will be created during construction periods.	Construction could be scheduled to take place during off-peak visitor seasons. Noise and dust will be confined to immediate zone of construction only.	Noise and dust created by construction activities will produce adverse aesthetic impacts to the immediate zone of construction.	None.	None.
Reduction in the site's visual quality will be caused by the presence of permanent recreation facilities and non-native landscape plantings.	Facilities will be designed to blend with natural landscape. Landscape plantings should reflect native vegetation to extent possible.	Some decrease in visual quality is unavoidable.	Long-term use of permanent facilities will cause long-term visual quality impacts.	Permanent facility construction will cause an irretrievable commitment of the site's natural visual character.
Some decrease of visitor impact to natural resources due to controlled camping and developed facilities	None.	None.	None.	None.

(cont'd.)

III. Alternative 3--PARTIAL DEVELOPMENT: This alternative provides development of facilities to serve a partial level of recreation use at Lone Rock. Facilities include a paved access road, 250-unit campground, sanitary facilities, a side-launch boat ramp, fuel and courtesy docks, and day-use facilities. Grazing will be phased out on adjacent NRA lands. The existing U.S.B.R. gravel pile will be relocated. Development will allow for day-use recreation use along the beach with camping use restricted to formal campgrounds. Primary access is via a new road from the existing Wahweap Developed Area with secondary access via the existing gravel road on-site. (See Map, Page).

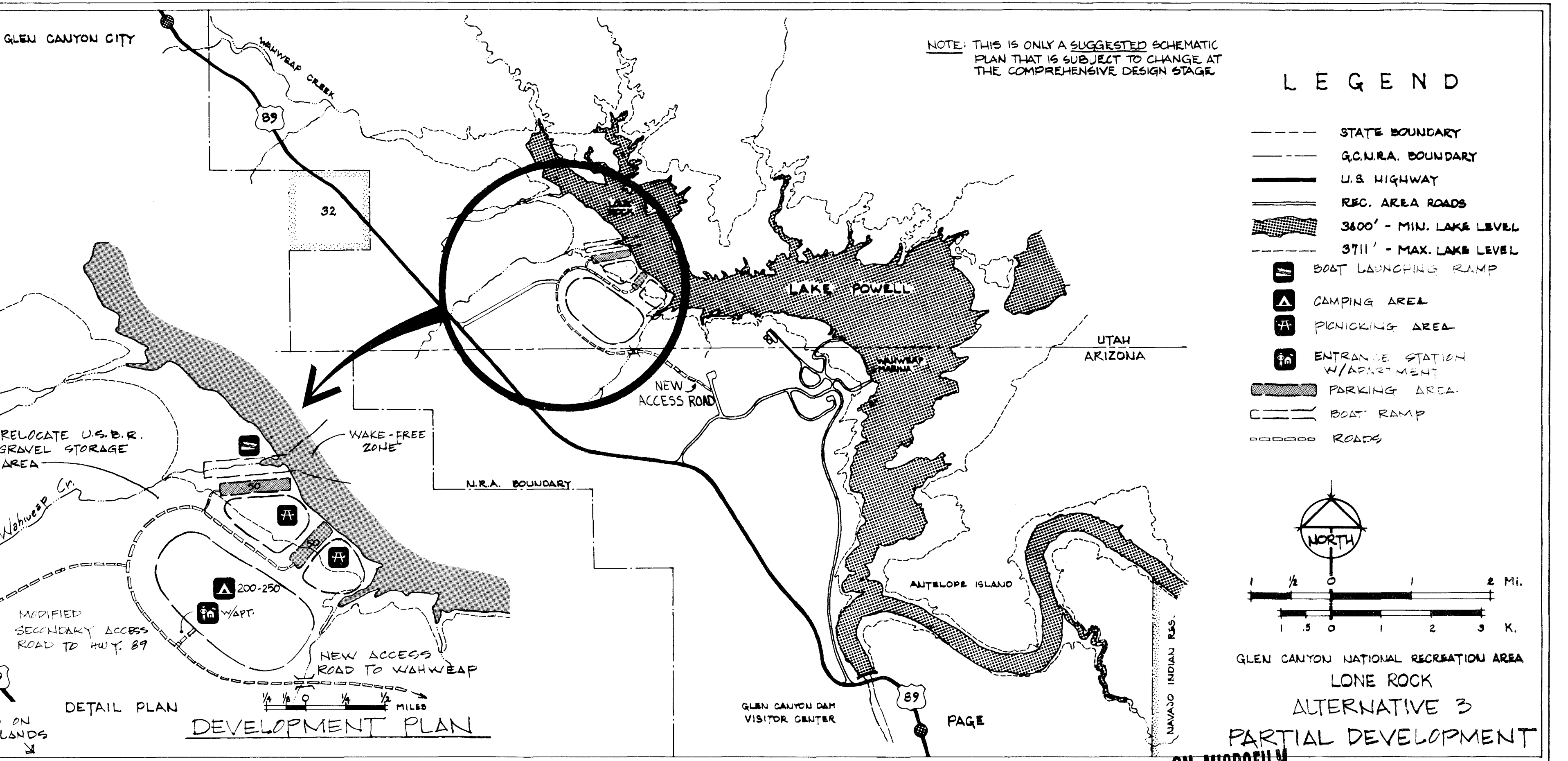
IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
that concentrate use in one designated area.				
Recreation use will be restricted to the south side of Little Wahweap Creek including the existing beach site.	Pedestrian bridge access could be provided to north side of Little Wahweap Creek.	Most recreation use would continue to be concentrated at the existing beach area.	None.	None.
Camping use will be restricted to formal campgrounds with day-use only at the lake shoreline.	None.	Experience of camping on beach area near waterfront will be eliminated.	Short-term elimination of beach camping vs. long-term protection of natural resources and visitor safety by designating use to a developed controlled area.	None.
Additional park personnel will be needed for 24 hour management of the campground.	None.	Manpower and funds to employ 24 hour management of campground.	None.	Manpower and funds will be irreversibly committed.
Private interests located outside of Glen Canyon NRA will lose those funds charged for visitor services that will be offered by the concessioner in the Lone Rock area.	None.	Economic loss to outside interests.	Short-term economic loss to enterprises outside the park with eventual long-term economic gains to the same interests due to the attractiveness of the developed recreation site.	Minimal economic loss to private interests will result from concessioner offering needed services inside recreation area.

III. Alternative 3--PARTIAL DEVELOPMENT: This alternative provides development of facilities to serve a partial level of recreation use at Lone Rock. Facilities include a paved access road, 250-unit campground, sanitary facilities, a side launch ramp, fuel and courtesy docks, and day-use facilities. Grazing will be phased out on adjacent NRA lands. The existing BR gravel pile will be relocated. Development will allow for day use recreation use along the beach with camping use restricted to formal campgrounds. Primary access is via a new road from the existing Wahweap Development Area with secondary access via the existing gravel road on-site (See Map, Page)

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Economic gain to concessioner by developing another area of income.	None.	None.	None.	None.
Funds and manpower will be needed to relocate Bureau of Reclamation gravel storage to another location near the dam.	None.	Funds and manpower to remove gravel storage will be needed.	None.	Funds and manpower to remove gravel storage will be irretrievably lost.
Dust and fumes caused by recreation use will degrade air quality in immediate vicinity of Lone Rock beach.	None.	There will be some degradation of air quality.	None.	None.
Major construction may increase erosion thereby causing minor sedimentation in Lake Powell.	Sedimentation should be minor and only occur during construction.	There will be some increase in sedimentation of Lake Powell caused by major construction of campground and other proposed facilities.	None.	None.
Paving of walkways and roads, and landscaping with trees and shrubs will reduce the amount of soil lost by wind erosion.	None.	None.	None.	None.

III. Alternative 3--PARTIAL DEVELOPMENT: This alternative provides development of facilities to serve a partial level of recreation use at Lone Rock. Facilities include a paved access road, 250-unit campground, sanitary facilities, a side launch ramp, fuel and courtesy docks, and day-use facilities. Grazing will be phased out on adjacent NRA lands. The existing BR gravel pile will be relocated. Development will allow for day use recreation use along the beach with camping use restricted to formal campgrounds. Primary access is via a new road from the existing Wahweap Development Area with secondary access via the existing gravel road on-site (See Map, Page)

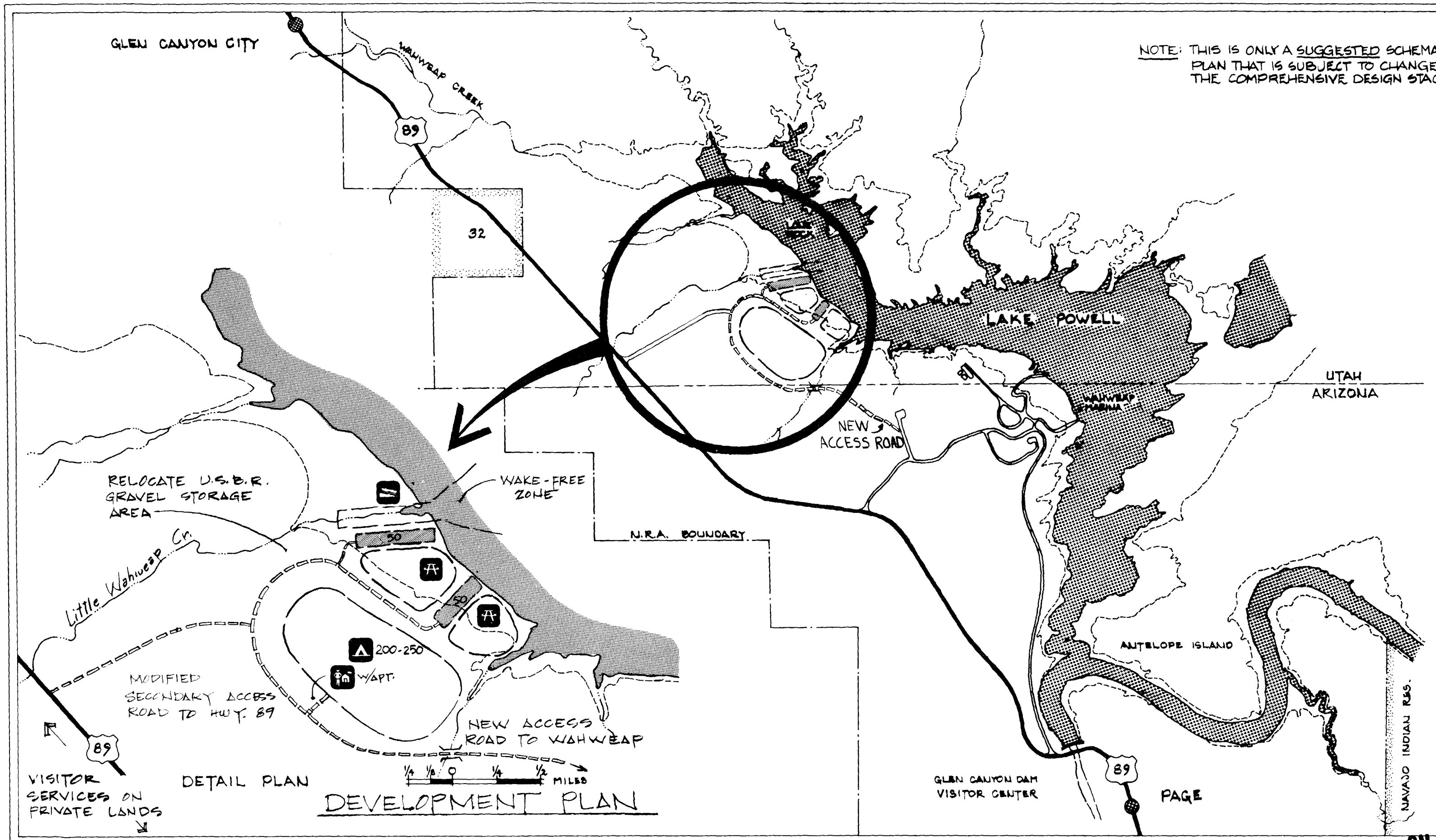
IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Discontinuing random beach front camping at Lone Rock will not satisfy the visitor who enjoys that type of use but will encourage more diverse recreation opportunities for visitors.	None.	Visitors who enjoy random beach front camping will not be allowed to participate in this activity at Lone Rock.	None.	None.



ON MICROFILM

23 608 80,012
May '79 AMA

MAP 4



ON MICROFILM

III. Alternative 4 - MAXIMUM DEVELOPMENT: This alternative provides for a maximum level of recreation facility development at the Lone Rock site. Facilities include a paved access road, 800-unit campground, sanitary facilities, side launch boat ramp, concessioner operated supply store, fuel and courtesy docks, and day-use facilities near the lake's shoreline. Grazing will be phased out on adjoining national recreation area lands. The existing Bureau of Reclamation pile will be relocated. This level of development would allow for use of the Lone Rock area to its full carrying capacity. Overnight use will be restricted to formal campgrounds with day-use activities near the beach. Access will be via the existing access road (See Map, page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Approximately 177 acres of existing native vegetation will have to be cleared to construct paved access road, 800-unit campground, boat ramp, parking lot and supply store.	Existing vegetation will be saved wherever possible. Reseeding and mulching will be done on cleared areas.	Some existing native vegetation will still be lost due to construction activities.	The short-term loss of existing vegetation could cause long-term erosion of topsoil thus diminishing successsful revegetation.	Existing vegetation will be lost.
Some topsoil will be lost due to accelerated erosion caused by clearing activities for development.	Reseeding and mulching could retard erosion that might be accelerated as a result of topsoil losses.	Some existing topsoil will be lost due to clearing.	The short-term loss of existing topsoil could cause long-term erosion creating sediment problems in the lake and reduced successful revegetation.	Existing topsoil will be lost.
177 acres of the site's wildlife habitat will be disturbed by facility construction and increased public use.	Revegetation of disturbed areas. Restrict public use in critical habitat.	Disturbance of wildlife habitat is unavoidable.	Long-term recreation use of the area will cause long-term adverse impacts on wildlife.	Permanent facility construction will cause an irretrievable committment of the site's wildlife habitat resource.
About 7,000 acres of grazing land will be lost to permittees now grazing in this area.	None.	Grazing permittees will lose 7,000 acres of rangeland.	Short-term loss of grazing land vs. long-term enhancement of area through protection of natural resources.	Small economic loss of grazing permittees.

III. Alternative 4--MAXIMUM DEVELOPMENT: This alternative provides for a maximum level of recreation facility development at the Lone Rock site. Facilities include a paved access road, 800-unit campground, sanitary facilities, side launch boat ramp, concessioner operated supply store, fuel and courtesy docks, and day-use facilities near the lake's shoreline. Grazing will be phased out on adjoining national recreation area lands. The existing Bureau of Reclamation pile will be relocated. This level of development would allow for use of the Lone Rock area to its full carrying capacity. Overnight use will be restricted to formal campgrounds with day-use activities near the beach. Access will be via the existing access road (See Map, page)

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Grazed areas will be able to follow natural succession and impacts to grasses and soils in this area will be reduced.	None.	None.	Short-term loss of grazing land vs. long-term enhancement of area through protection of natural resources.	None.
Dust and fumes caused by visitor use will degrade air quality in immediate vicinity of Lone Rock beach.	None.	There will still be some degradation of air quality caused by visitor use.	None.	None.
Noise and dust will be created during construction periods.	Construction could be scheduled to take place during off-peak visitor seasons. Noise and dust will be confined to immediate zone of construction only.	Noise and dust created by construction activities will produce adverse aesthetic impacts to the immediate zone of construction.	None.	None.
Reduction of the site's visual quality will be caused by the presence of permanent recreation facilities and non-native plantings.	Facilities will be designed to blend with natural landscape. Landscape plantings should reflect native vegetation to extent possible.	Some decrease in visual quality is unavoidable.	Long-term use of permanent facilities will cause long-term adverse visual quality impacts.	Permanent facility construction will cause an irretrievable committment of the site's natural visual character.

III. Alternative 4--MAXIMUM DEVELOPMENT: This alternative provides for a maximum level of recreation facility development at the Lone Rock site. Facilities include a paved access road, 800-unit campground. sanitary facilities, side launch boat ramp, concessioner operated supply store, fuel and courtesy docks, and day-use facilities near the lake's shoreline. Grazing will be phased out on adjoining national recreation area lands. The existing Bureau of Reclamation pile will be relocated. This level of development would allow for use of the Lone Rock area to its full carrying capacity. Overnight use will be restricted to formal campgrounds with day-use activities near the beach. Access will be via the existing access road (See Map, page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Decrease of visitor impact to natural resources due to controlled camping and developed facilities that concentrate use in one designated area.	None.	None.	None.	None.
Recreation use will be spread out over the entire Lone Rock site, providing a more diverse recreation potential.	None.	None.	Recreation use will be spread out in short-term causing long-term management problems and more visitor impacts to the site.	None.
Camping use will be restricted to formal campgrounds with day-use only permitted within the lake fluctuation zone and shoreline.	None.	Experience of camping on beach area near water front will be eliminated.	Short-term elimination of beach camping vs. long-term protection of natural resources and visitor safety by designating use to developed, controlled area.	None.
Additional personnel needed for 24 hour management of campgrounds and supply store.	None.	Manpower and funds to employ 24 hour management of campgrounds and supply store.	None.	Manpower and funds will be irreversibly committed.

III. Alternative 4--MAXIMUM DEVELOPMENT: This alternative provides for a maximum level of recreation facility development at the Lone Rock site. Facilities include a paved access road, 800-unit campground. sanitary facilities side launch boat ramp, concessioner operated supply store, fuel and courtesy docks, and day-use facilitier near the lake's shoreline. Grazing will be phased out on adjoining national recreation area lands. The existing Bureau of Reclamation pile will be relocated. This level of development would allow for use of the Lone Rock area to its full carrying capacity. Overnight use will be restricted to formal campgrounds with day-use activities near the beach. Access will be via the existing access road (See Map, page).

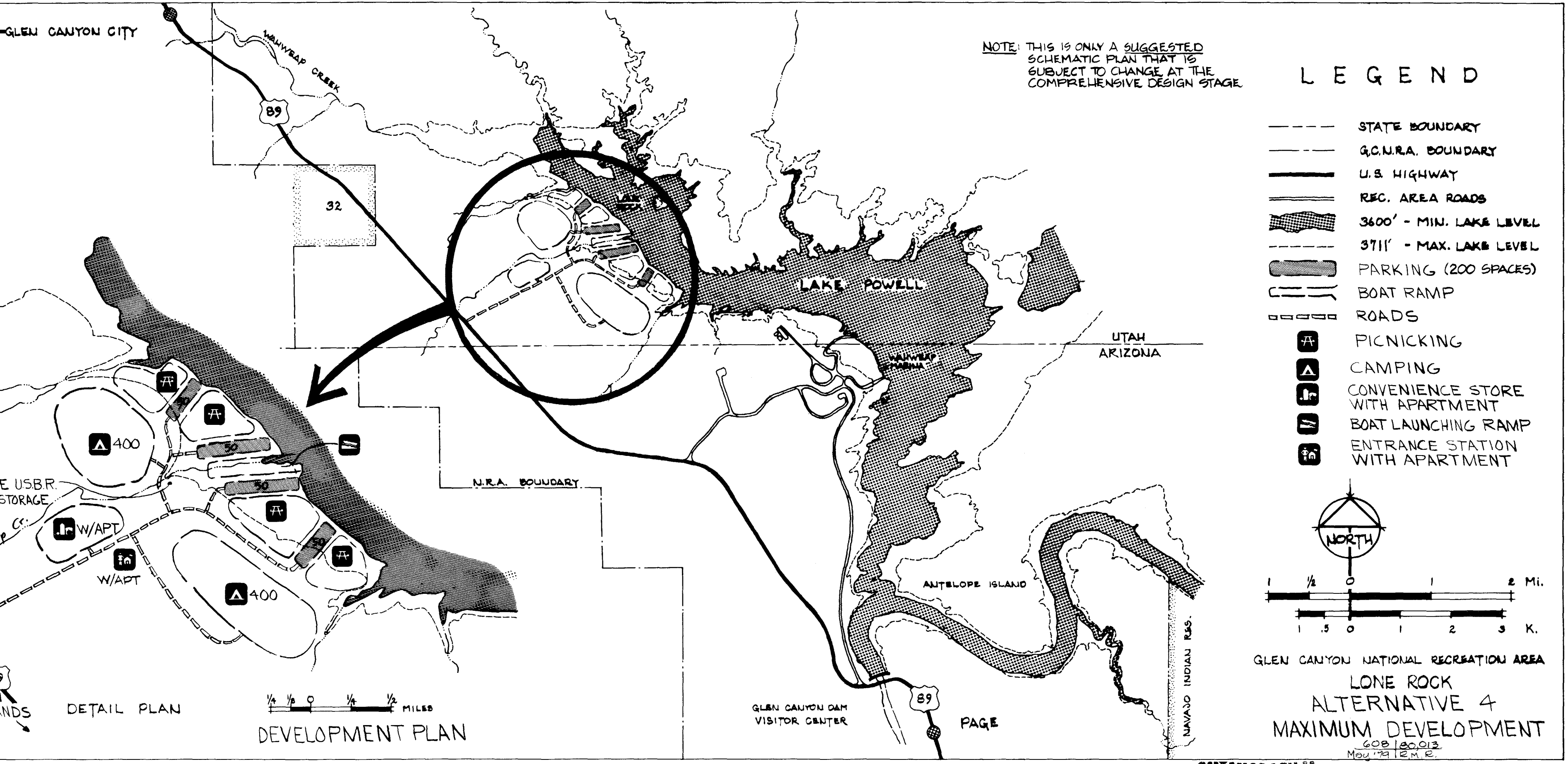
IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Private interests located outside of Glen Canyon NRA will lose those funds charged for visitor services that will be offered by the concessioner in the Lone Rock area.	None.	Economic loss to outside interests.	Short-term economic loss to enterprises outside the park with eventual long-term economic gains to the same interests due to the attractiveness of the developed recreation site.	Minimal economic loss to private interests will result from concessioner offering needed services inside recreation area.
Added income to concessioner from additional enterprise in Lone Rock area.	None.	None.	None.	None.
Funds, materials, and manpower to plan and construct new development.	None.	Funds, materials, and manpower will still be used to implement development.	None.	Funds, materials, and manpower will be committed to the development.
Funds and manpower will be needed to relocate Bureau of Reclamation gravel storage to another location near the dam.	None.	Funds and manpower to remove gravel storage will be needed.	None.	Funds and manpower to remove gravel storage will be irretrievably lost.

III. Alternative 4--MAXIMUM DEVELOPMENT: This alternative provides for a maximum level of recreation facility development at the Lone Rock site. Facilities include a paved access road, 800-unit campground, sanitary facilities. side launch boat ramp, concessioner operated supply store, fuel and courtesy docks, and day-use facilities near the lake's shoreline. Grazing will be phased out on adjoining national recreation area lands. The existing Bureau of Reclamation pile will be relocated. This level of development would allow for use of the Lone Rock area to its full carrying capacity. Overnight use will be restricted to formal campgrounds with day-use activities near the beach. Access will be via the existing access road (See Map, page).

IMPACTS	MITIGATING MEASURES	UNAVOIDABLE ADVERSE IMPACTS	SHORT TERM USE VS. LONG TERM PRODUCTIVITY	IRREVERSIBLE/ IRRETRIEVABLE COMMITMENTS
Major construction may increase erosion thereby causing minor sediment accummulation in Lake Powell.	Decrease in water quality of Lake Powell caused by sedimentation should be minor and should only occur during construction phases.	There will be some increase in sedimentation caused by major construction of campground and other proposed facilities at Lake Powell.	None.	None.
Paving of walkways and roads, and landscaping with trees and shrubs will reduce the amount of soil lost by wind erosion.	None.	None.	None.	None.
Discontinuing random shoreline camping at Lone Rock will not satisfy the visitor who enjoys that type of use, but will encourage more diverse recreation opportunities for more visitors.	None.	Visitors who enjoy random shoreline camping will not be allowed to participate in this activity at Lone Rock.	None.	None.

NATURAL RESOURCE IMPACTS						SOCIAL RESOURCE IMPACTS						
Vegetation	**Topography and Soils**	**Wildlife**	**Air and Water**	**Grazing**	**Aesthetic**	**Recreation Use**	**Management Efficiency**	**Sanitation**	**Cultural**	**Economic Stimulus**	**Response to Objectives**	**Costs**
Trampled vegetation; denuded hillsides	Compacted soils		Possible water pollution from auto use near shoreline. Air quality decrease from exhaust		Visual quality decrease to some by trailers and RV's lined up on Lone Rock beach	Retain random recreation use, thus limiting to one type of activity and reducing opportunities for all visitors. Use limited to one area.	Increased maintenance and protection requirements.	Overused portable facilities		Private enterprise outside of park will benefit	Meets objectives: 1,2,3,5,9,10 Does not meet objectives: 4,6,7,8	(SEE APPENDIX A)
Lose 15 acres of vegetation; trampled vegetation; denuded hillsides	Disturb about 15 acres of topsoil; compacted soils	Disturbance of habitats (15 acres)	Possible water pollution from auto use near shoreline and sedimentation caused by minor construction. Air quality decrease from exhaust & dust during construction		Noise & dust; Visual quality decrease due to lined up trailers and RV's on beach & permanent sanitation facilities	Retain random recreation use, thus limiting to one type of activity and reducing opportunities for all visitors. Use limited to one area.	Increased maintenance and protection requirements.	Off-site sewage disposal and treatment.	Following completion of a cultural resource inventory and evaluation of the Lone Rock development area, full consideration must be afforded any such impacts.	Private enterprise outside of park will benefit	Meets objectives: 1,2,3,5,6,8,9,10 Does not meet objectives: 4,7	$ 2,125,370
Lose about 50 acres of vegetation	Disturb about 50 acres of topsoil	Disturbance of habitats (50 acres)	Possible water pollution from sedimentation caused by major construction. Air quality decrease due to auto exhaust & dust during construction	Lose 7,000 acres of grazing land	Noise & dust; Visual quality decrease due to permanent recreation facilities	Controlled use offers more diverse recreation opportunities for more visitors; use limited to one area.	Additional personnel for campground management; increased maintenance and protection requirements.	On-site sewage treatment.	Following completion of a cultural resource inventory and evaluation of the Lone Rock development area, full consideration must be afforded any such impacts.	Short term economic loss to private interests; long-term gain to those interests due to attractiveness of area; economic gain to concessioner.	Meets objectives: 2,3,4,5,6,7,8,9 Does not meet objectives: 1,10	$ 7,899,320
Lose about 177 acres of vegetation	Disturb about 177 acres of topsoil	Disturbance of habitats (177 acres)	Possible water pollution from sedimentation caused by major construction. Air quality decrease due to auto exhaust & dust during construction	Lose 7,000 acres of grazing land	Noise & dust; Visual quality decrease due to permanent recreation facilities	Controlled use offers more diverse recreation opportunities for more visitors; use limited to one area.	Additional personnel for campground and supply store management; increased maintenance and protection requirements.	On-site sewage treatment.	Following completion of a cultural resource inventory and evaluation of the Lone Rock development area, full consideration must be afforded any such impacts.	Short term economic loss to private interests; long-term gain to those interests due to attractiveness of area; economic gain to concessioner.	Meets objectives: 2,3,4,5,6,7,8,9 Does not meet objectives: 1,10	$14,173,380

Alternatives	NATURAL RESOURCE IMPACTS						SOCIAL RESOURCE IMPACTS					
	Vegetation	Topography and Soils	Wildlife	Air and Water	Grazing	Aesthetic	Recreation Use	Management Efficiency	Sanitation	Cultural	Economic Stimulus	Response to Objectives
Alternative 1 NO ACTION	Trampled vegetation; denuded hillsides	Compacted soils		Possible water pollution from auto use near shoreline. Air quality decrease from exhaust		Visual quality decrease to some by trailers and RV's lined up on Lone Rock beach	Retain random recreation use, thus limiting to one type of activity and reducing opportunities for all visitors. Use limited to one area.	Increased maintenance and protection requirements.	Overused portable facilities		Private enterprise outside of park will benefit	Meets objective 1,2,3,5,9,10 Does not meet objectives: 4,6 7,8
Alternative 2 MINIMUM DEVELOPMENT	Lose 15 acres of vegetation; trampled vegetation; denuded hillsides	Disturb about 15 acres of topsoil; compacted soils	Disturbance of habitats (15 acres)	Possible water pollution from auto use near shoreline and sedimentation caused by minor construction. Air quality decrease from exhaust & dust during construction		Noise & dust; Visual quality decrease due to lined up trailers and RV's on beach & permanent sanitation facilities	Retain random recreation use, thus limiting to one type of activity and reducing opportunities for all visitors. Use limited to one area.	Increased maintenance and protection requirements.	Off-site sewage disposal and treatment.	Following completion of a cultural resource inventory and evaluation of the Lone Rock development area, full consideration must be afforded any such impacts.	Private enterprise outside of park will benefit	Meets objectiv 1,2,3,5,6,8,9, Does not meet objectives: 4,
Alternative 3 PARTIAL DEVELOPMENT	Lose about 50 acres of vegetation	Disturb about 50 acres of topsoil	Disturbance of habitats (50 acres)	Possible water pollution from sedimentation caused by major construction. Air quality decrease due to auto exhaust & dust during construction	Lose 7,000 acres of grazing land	Noise & dust; Visual quality decrease due to permanent recreation facilities	Controlled use offers more diverse recreation opportunities for more visitors; use limited to one area.	Additional personnel for campground management; increased maintenance and protection requirements.	On-site sewage treatment.	Following completion of a cultural resource inventory and evaluation of the Lone Rock development area, full consideration must be afforded any such impacts.	Short term economic loss to private interests; long-term gain to those interests due to attractiveness of area; economic gain to concessioner.	Meets objecti 2,3,4,5,6,7,8 Does not meet objectives: 1
Alternative 4 MAXIMUM DEVELOPMENT	Lose about 177 acres of vegetation	Disturb about 177 acres of topsoil	Disturbance of habitats (177 acres)	Possible water pollution from sedimentation caused by major construction. Air quality decrease due to auto exhaust & dust during construction	Lose 7,000 acres of grazing land	Noise & dust; Visual quality decrease due to permanent recreation facilities	Controlled use offers more diverse recreation opportunities for more visitors; use limited to one area.	Additional personnel for campground and supply store management; increased maintenance and protection requirements.	On-site sewage treatment.	Following completion of a cultural resource inventory and evaluation of the Lone Rock development area, full consideration must be afforded any such impacts.	Short term economic loss to private interests; long-term gain to those interests due to attractiveness of area; economic gain to concessioner.	Meets object 2,3,4,5,6,7, Does not mee objectives:



NOTE: THIS IS ONLY A SUGGESTED SCHEMATIC PLAN THAT IS SUBJECT TO CHANGE AT THE COMPREHENSIVE DESIGN STAGE

LEGEND

- STATE BOUNDARY
- G.C.N.R.A. BOUNDARY
- U.S. HIGHWAY
- REC. AREA ROADS
- 3600' - MIN. LAKE LEVEL
- 3711' - MAX. LAKE LEVEL
- PARKING (200 SPACES)
- BOAT RAMP
- ROADS
- PICNICKING
- CAMPING
- CONVENIENCE STORE WITH APARTMENT
- BOAT LAUNCHING RAMP
- ENTRANCE STATION WITH APARTMENT

NORTH

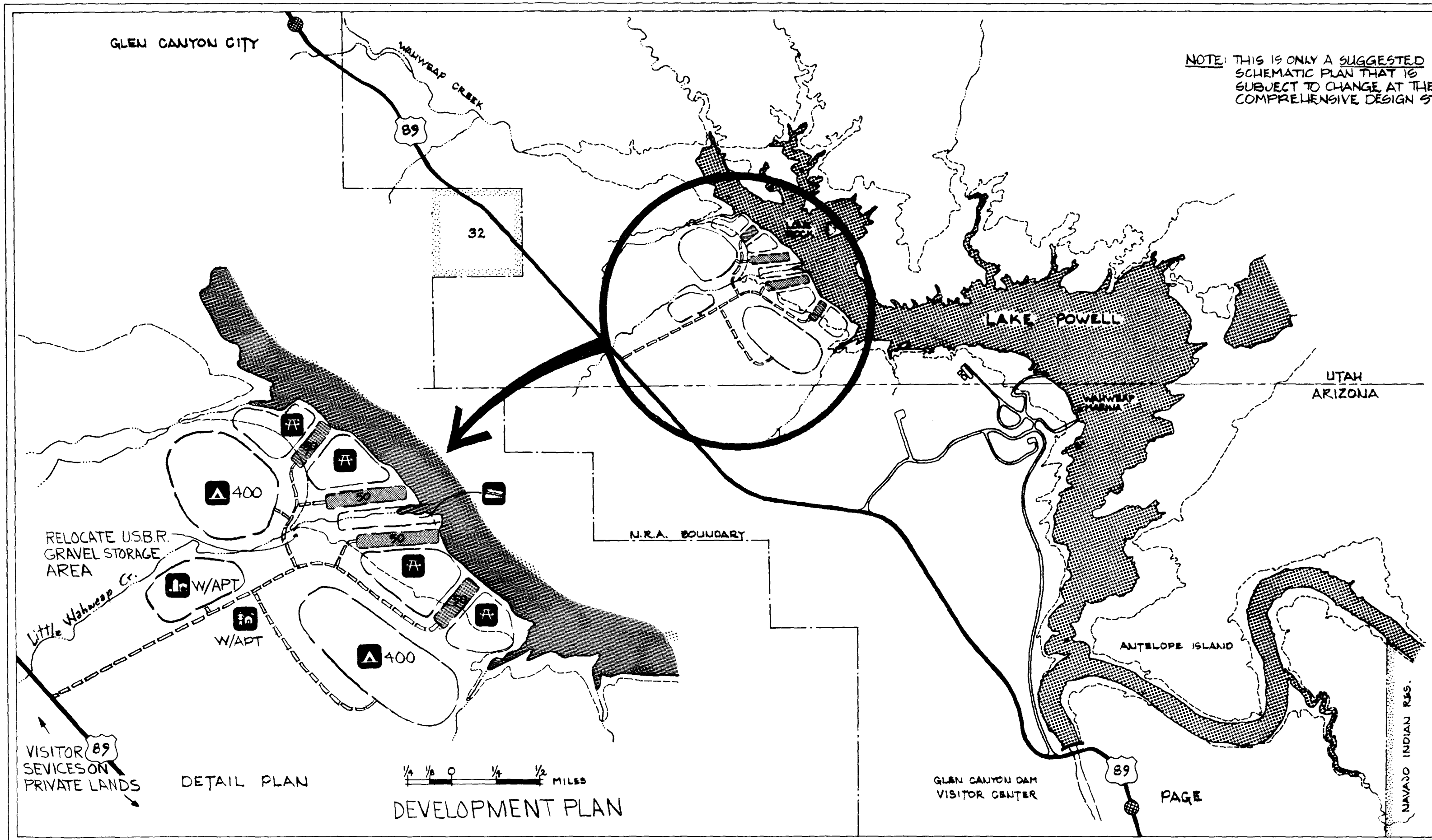
1 1/2 0 1 2 Mi.

1 .5 0 1 2 3 K.

GLEN CANYON NATIONAL RECREATION AREA

LONE ROCK
ALTERNATIVE 4
MAXIMUM DEVELOPMENT

608 | 80,013
May '79 | R.M.R.



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IV. COORDINATION

A. Public Involvement Plan

Full coordination of all aspects of this planning effort is intended. This intention is supported by a plan for public and government agency involvement. Copies of the assessment of alternatives on the development concept will be sent to the following for their review and comment:

1. Federal Government:
   a. Department of Agriculture - Forest Service
   b. Department of the Interior - Bureau of Land Management, Heritage Conservation and Recreation Service, and Fish and Wildlife Service
   c. Department of Transportation - Federal Highway Administration
   d. Environmental Protection Agency
   e. Department of Energy
2. State Government:
   a. Utah State Clearinghouse
   b. Utah State Historic Preservation Officer
3. Local Government:
   a. Kane County Commissioners
   b. Cities of Page, Arizona, and Kanab, Utah
4. Other:

   Copies of the assessment of alternatives will be made available to all interested organizations and individuals upon request by mail.
5. Notice of Intent and public meeting locations will be posted at Lone Rock beach so users of area will be notified.

Preliminary concept proposals for the Lone Rock site were presented to the Kane County, Utah, Commissioners during June of 1978. Public workshops at Los Angelos, California, and the local communities are planned for the summer of 1979 to obtain input on the selection of alternatives for the development concept plan. Following public workshops, in-house selection, and plan reivew, the completed development concept plan will be available to the public upon request.

B. Correspondence

The following official correspondence applies to this assessment.

United States Department of the Interior
BUREAU OF RECLAMATION
UPPER COLORADO REGION
CRSP POWER OPERATIONS OFFICE
P.O. BOX 1477
PAGE, ARIZONA 86040

IN REPLY
REFER TO: GC-460
775.

JUL 21 1978

Memorandum

To: Superintendent, Glen Canyon National Recreation Area

From: Acting Project Power Operations Manager

Subject: Lone Rock Development Concept Plan (Your letter dated July 3, 1978 - L 7617-LR)

We have no objection to the Lone Rock aggregate stockpiles being relocated as you proposed. Since this material is select, we would request a review of the removal contract before it is issued. The present aggregate stockpile area near the dam may have to be enlarged some to accommodate this material but there is ample room for this immediately north of the existing fence.

The Lone Rock stockpiles consist of 4,900 cubic yards of #4 - 3/4" aggregate, 4610 cubic yards of 3/4" - 1 1/2" aggregate and 3370 cubic yards of sand for a total of 12,880 cubic yards, which converts to approximately 22,500 tons. Our most recent estimate of hauling cost is 10 cents per ton mile. The two stockpile areas are approximately nine miles apart. To this you would have to consider loading costs, site preparation costs, if an enlarged area is needed, and shaping costs of the relocated stockpiles.

If we can be of further assistance please let us know.

Thomas Hamlet

United States Department of the Interior
FISH AND WILDLIFE SERVICE
AREA OFFICE COLORADO—UTAH
1426 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138

In Reply Refer To
W1621
X-7617 - Lone Rock

February 27, 1978

MEMORANDUM

TO: Superintendent
Glen Canyon National Recreation Area
Box 1507
Page, Arizona 86040

FROM: Area Manager

SUBJECT: Lone Rock Development - Impact on Peregrine Falcon Eyrie

We have again reviewed the possible impact of the proposed Lone Rock beach development with Al Heggen, Utah Division of Wildlife, and Gerald Craig, Recovery Team Leader. They agree that the project will not affect the peregrine or its habitat; therefore, unless changes are made in the proposal, consultation with the Fish and Wildlife Service will not be required.

Since advice on this matter has been obtained from the Service's Recovery Team, we do not believe that it is appropriate or necessary for the Team Leader to sign the attached document. Mr. Craig agrees, since it would be placing him in the position of having to sign off on many similar situations.

We do commend you for the close coordination with the Utah Division of Wildlife on the matter. Once they have entered into a cooperative agreement for Endangered Species funding, they will be even better prepared to take the lead in a monitoring or management program for the peregrines.

We appreciate your interest and concern for endangered species; please feel free to contact us if we can be of any further assistance.

Robert H Smith

N1621 February 13, 1978

Memorandum

To: Area Manager, CO-UT Area, U.S. Fish & Wildlife Service

From: Acting Superintendent, Glen Canyon NRA

Subject: Determination of Effect - Lone Rock Development

We write pursuant to a conversation among Assistant Area Manager White, Glen Canyon's Resource Specialist Supernaugh and Rocky Mountain Peregrine Recovery Team Leader Craig at the Denver Recovery Workshop in January. At that time all parties reviewed the National Park Service's Draft Development Concept Plan for Lone Rock in order to identify special problems that may be posed for Peregrine populations resident near that locality.

As a result of those informal consultations, it seemed the consensus of all concerned that a resident Peregrine population would not be adversely affected by our plans. It seemed, rather, to be the feeling that formalizing the Lone Rock camping situation and eventual on-site NPS supervision might better curtail certain undesirable activities presently engaged in.

It is our determination that future development of the Lone Rock beach portion of Lake Powell's Wahweap arm does not constitute an activity or program affecting a listed endangered species or its critical habitat and thus does not require formal consultation as referenced under Section 7 of the Endangered Species Act of 1973 or Title 50, part 402.04.

Joe L. Kennedy

V. BIBLIOGRAPHY

Visitor Use Records, Glen Canyon National Recreation Area park files, 1973-78.

Draft Environmental Statement for General Management Plan, Glen Canyon National Recreation Area, National Park Service, DES 77-28.

APPENDIX A

COST ESTIMATES

All costs identified herein are based on the Class "C" estimates guide prepared in 1979 by the Denver Service Center and in consultation with professional cost estimators within the Denver Service Center and the Rocky Mountain Regional Office.

In an effort to establish some frame of reference to the cost of the various alternatives of this assessment the following Class "C" estimates are presented. These costs are based on general concepts; therefore, when more detailed documents and plans are developed more comprehensive estimates will be prepared. These cost figures are to be used for future years--not to exceed October 1982.

COST ESTIMATE			LONE ROCK MINIMUM DEVELOPMENT		
ITEM	UNIT	UNIT COST	EXIST. FACIL.	PROPOSED FACILITIES QUANTITY	PROPOSED FACILITIES COST
ROADS & PARKING					
24' wide asphalt road	mile	$350,000		2	$ 700,000
Gravel parking area	space	670		50	33,500
LAUNCHING FACILITIES					
14' wide side-launch boat ramp (estimate)	lane	600,000		1	600,000
Courtesy dock (8' x 50')	sq. ft.	40		400	16,000
PICNIC AREA					
Portable tables	each	250		50	12,500
Ranger Station	each	45,000		1	45,000
UTILITIES					
Water well & pump	each	39,000			39,000
Restrooms, Vault	each	7,500		3	22,500
Trash receptacles	each	200		20	4,000
Trailer sanitary dump station	each	40,000		1	40,000
MISCELLANEOUS					
Fencing	lin. ft.	4		21,000	84,000
Relocate gravel storage area	L.S.	30,400			30,400
Signs (estimate)	L.S.	2,000			2,000
Pedestrian trails	mile	12,000		.5	6,000
Subtotal					$1,634,900
Design & Admin. (15%)					245,235
Contingencies (15%)					245,235
TOTAL					$2,125,370

COST ESTIMATE				LONE ROCK PARTIAL DEVELOPMENT	
ITEM	UNIT	UNIT COST	EXIST. FACIL.	PROPOSED FACILITIES	
				QUANTITY	COST
ROAD & PARKING					
24' wide asphalt road	mile	$ 350,000		4	$ 1,400,000
Gravel parking area	space	670		100	67,000
Bridge (30' x 120')	sq. ft.	85		3,600	306,000
LAUNCHING FACILITIES					
14' wide side-launch boat ramp	sq. yd.	50		12,000	600,000
Courtesy dock (8' x 50')	sq. ft.	40		400	16,000
CAMPING AREA					
Campsites, complete	each	4,000		250	1,000,000
Tree plantings	each	200		800	160,000
Resident entrance station with apartment	each	47,500		1	47,500
PICNIC AREA					
Portable tables	each	250		100	25,000
UTILITIES					
Water well and pump	each	39,000		1	39,000
Water distribution	lin. ft.	20		5,500	110,000
Water treatment	L.S.	30,000		1	30,000
Sewer lines	lin. ft.	17		5,500	93,500
Sewage treatment	L.S.	1,300,000			1,300,000
Sewer lift stations	L.S.	60,000			60,000
Irrigation system	acre	4,500		50	225,000
Electrical service	lin. ft.	10		10,000	100,000
Restrooms, Waterborne	each	45,000		7	315,000
Trash receptacles	each	200		30	6,000
Trailer sanitary dump station	each	40,000		1	40,000
MISCELLANEOUS					
Fencing	lin. ft.	4		21,000	84,000
Relocate gravel storage area	L.S.	30,400			30,400
Signs	L.S.	10,000			10,000
Pedestrian trails	mile	12,000		1	12,000

COST ESTIMATE			LONE ROCK PARTIAL DEVELOPMENT		
ITEM	UNIT	UNIT COST	EXIST. FACIL.	PROPOSED FACILITIES	
				QUANTITY	COST
Subtotal					$ 6,076,400
Design & Admin. (15%)					911,460
Contingencies (15%)					911,460
TOTAL					$ 7,899,320

COST ESTIMATE				LONE ROCK MAXIMUM DEVELOPMENT	
ITEM	UNIT	UNIT COST	EXIST. FACIL.	PROPOSED FACILITIES	
				QUANTITY	COST
ROADS & PARKING					
24' wide asphalt road	mile	$ 350,000		3	$ 1,050,000
Gravel parking area	space	670		200	134,000
Bridge (30' x 80')	sq. ft.	85		2,400	204,000
LAUNCHING FACILITIES					
14' wide side-launch boat ramp	sq. yd.	50		24,000	1,200,000
Courtesy dock (8' x 50')	sq. ft.	40		800	32,000
CAMPING AREA					
Campsites, complete	each	4,000		800	3,200,000
Tree plantings	each	200		3,000	600,000
Resident entrance station with apartment	each	47,500		2	95,000
PICNIC AREA					
Portable tables	each	250		100	25,000
UTILITIES					
Water well and pump	each	39,000		1	39,000
Water distribution	lin. ft.	20		17,600	352,000
Water treatment	L.S.	30,000			30,000
Sewer lines	lin. ft.	17		17,600	299,200
Sewage treatment	L.S.	1,700,000			1,700,000
Sewer lift stations	L.S.	60,000			60,000
Irrigation system	acre	4,500		160	720,000
Electrical service	lin. ft.	10		10,000	100,000
Restrooms, Waterborne	each	45,000		18	810,000
Trash receptacles	each	200		40	8,000
Trailer sanitary dump station	each	40,000		1	40,000
MISCELLANEOUS					
Concessioner store with apartment	L.S.	56,000		1	56,000
Fencing	lin. ft.	4		21,000	84,000
Relocate gravel storage area	L.S.	30,400			30,400
Signs	L.S.	10,000			10,000
Pedestrian trails	mile	12,000		2	24,000

COST ESTIMATE			LONE ROCK MAXIMUM DEVELOPMENT		
ITEM	UNIT	UNIT COST	EXIST. FACIL.	PROPOSED FACILITIES	
				QUANTITY	COST
Subtotal					$10,902,600
Design & Admin. (15%)					1,635,390
Contingencies (15%)					1,635,390
TOTAL					$14,173,380