



Design Report

Prepared For
DEPARTMENT OF GENERAL ADMINISTRATION
STATE OF WASHINGTON

JULY 1976

Richard Haag Associates, Inc.
Royston, Hanamoto, Beck and Abey
LANDSCAPE ARCHITECTS

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PREFACE

A recommended plan for the restoration of Capitol Lake has been described in preceding documents prepared by CH2M HILL for the Department of General Administration. The restoration plan has now been augmented by supporting plans for recreational development of the in-basin fill areas. These lakeside and in-basin disposal sites were selected partly because of their extraordinary potential for supporting passive open space recreation activities and wildlife habitat within Olympia and Tumwater.

To assist the department in developing a comprehensive recreation plan for these areas, the consulting firms of Richard Haag Associates and Royston, Hanamoto, Beck, and Abey have prepared a specific plan of action. This design report describes the development and final form of the plan.



CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations for the recreational development of Capitol Lake were reached after studying the proposal for restoring Capitol Lake¹ and analyzing the varied potential for recreational development afforded by the recommended dredging.

RECREATION FACILITIES AND ACTIVITIES

We recommend the following:

- *Develop the lakeside fill sites.* These lakeside fill locations have little potential for adverse effects on water quality and will increase the land surface available for park and marsh.
- *Establish new marsh areas*
- *Establish major landscaped areas to act as noise buffers from Interstate 5 and the Deschutes Parkway*
- *Enhance the separation between traffic flow and pedestrian circulation*
- *Provide greater access to the Capitol Lake shoreline*
- *Connect and integrate the Capitol Campus into the Capitol Lake open space area.* The Capitol grounds, Capitol Lake, and environs will become the garden of the Capitol.
- *Develop an interpretive program.* This will inform Capitol Lake visitors about the natural relations between man, the fish production in the lake, the native wildlife, marsh habitats, and sensitive environmental situations, and the importance of the lake in accommodating its varied aquatic and terrestrial life forms.
- *Incorporate into the design a recreational trail system for bicycles and pedestrians.* These trails should encompass as much of the shoreline as possible.
- *Create major vistas from the Capitol Campus to the lake and establish vistas from the lakeshore to the Capitol.*
- *Preserve significant historic and prehistoric sites along the Capitol Lake shoreline and within the project area for future research and preservation.*

¹ CH2M HILL. July 1976. *Capitol Lake restoration, design engineering report.* A report for the Washington State Department of General Administration.

- *Build an underwater fish viewing room.* This could be located at the side of the Fifth Avenue dam to accommodate people watching the return of the fall salmon.
- *Develop the Percival Cove gravel pit as a site for future recreation use.*
- *The Department of General Administration should negotiate with the Burlington Northern Railroad to acquire use of its property as an extension of the Capitol Lake Park between the lake and the railroad marshalling yard.* The marshalling yard, either remaining in its present configuration or being reduced to only two tracks, would remain as an element of visual interest, passive recreation, and train watching.
- *Coordinate the proposed development of the Capitol Lake recreation areas, especially in the upper basin, with development of the Tumwater City Park.*
- *Coordinate the proposed recreational development in both the upper and middle basins with projected improvements of the I-5 interchange.* This should be done especially within right-of-way areas to be contoured and landscaped by the Washington State Highway Department.
- *Maintain the consistency of current land use and zoning except where changes are desirable for recreation planning.* This would increase the land area controlled under the Thurston County Regional Shoreline Management Plan and the amount of shoreline designated as a "Conservancy Environment."¹

MANAGEMENT POLICY GUIDELINES

The Department of General Administration should review the existing policies and regulations governing Capitol Lake and consider implementing the following management policies regarding Capitol Lake and the Capitol Lake Recreation Area. The policy guidelines should include maintenance, regulations, and general policing and law enforcement.

¹ Except for the northeastern corner of the lower basin, which is designated "Urban Environment," the shoreline of Capitol Lake is designated Conservancy Environment by *The Thurston region shoreline management master program*, prepared for the Thurston Regional Planning Council by the Citizen's Advisory Committee for Shoreline Management for the Thurston region, revised draft, April 1974.

Capitol Lake Maintenance

The state should undertake an annual maintenance program to remove logs, stumps, and other pieces of large debris from the lake and the Tumwater Falls area. This removal would take place in the late spring following the period of high water runoff and prior to the warm summer months when such debris could be a serious hazard to all navigation, even by shallow draft boats. State maintenance personnel, rather than private contractors, should perform the work because of its imprecise nature in terms of quantities to be removed, and because of the difficulty in marking all potentially hazardous submerged objects. Any debris encountered during this annual cleanup could be removed quickly without the constant problem of adding items to a private contract.

Recreation Area Maintenance

In the initial phase of the work, building maintenance will be required on the comfort station at the southwest corner of the middle basin and the interpretive center at the northwest corner of the Capitol Campus. Following completion of construction, all comfort stations will require daily cleaning and inspection. Between one-half and one hour each day should be allocated to maintenance of these facilities. Two additional comfort stations are programmed for future development, one at the Percival Cove gravel pit site and one at the beach area at the southeast corner of the lower basin. Maintenance time for these structures will be the same.

Capitol Campus grounds maintenance personnel should be responsible for all maintenance to the Capitol Lake Park areas. It is estimated that 1-1/2 men¹ will be required to maintain the park area added by initial recreation development. Because the Department of General Administration is responsible for the lake and its shoreline, it is highly desirable that department personnel maintain all the park areas as they do with the Capitol Campus. If state personnel do not do the entire job, the cities of Olympia and Tumwater would each need to hire an additional maintenance man to maintain those park areas within their city limits. The state would still need personnel to maintain the interpretive center and the powerhouse fill area.

General Policing and Law Enforcement

The campus police should be responsible for policing both Capitol Lake and the Capitol Lake Park area. They should

¹ One additional maintenance man full time, one man half time. For a breakdown of maintenance costs, see the Cost Estimates section of this report.

maintain a boat at the powerhouse for periodic patrols of the lake and enforcement of boating regulations. The campus police should also maintain small motorized vehicles, such as electric golf carts enclosed for all-weather protection, for patrol of the bicycle/foot trail network. Policing for large special events such as Lakefair should be a joint effort among the Capitol Campus police, the City of Tumwater police, and the City of Olympia police.

Regulations

In general, all power boats should be eliminated from the upper basin. Power boating and water skiing should be curtailed in the middle and lower basins. Specific proposals have been developed for each basin.

Upper Basin

No power boats should be permitted on the upper basin. Boating in the upper basin is to be limited to canoes and rowboats.

Middle Basin

Power boating should be restricted to "no-wake" running. This would eliminate drag boats, water skiing, and high-speed, high-noise boating. This type of policy would permit troll fishing without the enforcement problems inherent in trying to regulate motor size or type, or a specific speed limit. Enforcement of no-wake running could be handled by the campus police patrol. The consultants believe that water skiing should be removed from the lake entirely.

Canoeing, rowboats, and sailboats could be permitted in the middle basin. Trailered boats could be launched only at the boat launch facility in the northwest corner of the middle basin. Special events such as Lakefair could request the Department of General Administration to allow high-speed boating events in conjunction with their festival.

Lower Basin

All motorboating except trolling should be prohibited. A second launching ramp for car-top boats would be located on the east shore adjacent to existing parking facilities.

The department should allow responsible concessionaires to rent canoes and rowboats on this basin. Lakeshore rental areas could be leased to concessionaires on a seasonal basis.

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COMPREHENSIVE RECREATION MASTER PLAN

This recreation master plan is contingent on acceptance of the recommended dredging disposal in lakeside areas proposed in the *Design Engineering Report*. Construction of new areas for recreational use depends entirely on this disposal.

The landscape architectural consultants are in agreement on the merits of the recommended dredging plan and the expressed goal of maintaining an open water surface in the upper basin. With properly detailed drawings and specifications, the marsh areas, aquatic habitats, and sensitive breeding, nesting, and feeding areas could be reestablished within a relatively short time. Disruptions to fish, bird, and wildlife patterns would only be temporary. Success of the upper basin dredging in terms of the environment will to a great extent be determined by the control over the project. Construction inspection by the landscape architect and field consultants will control the contractor's progress. The availability of a biologist for field consultation is also imperative to minimize work interruptions and delays. For example, field supervisors could point out nesting areas of waterfowl, so that the contractor could redirect his dredging work to avoid these areas until the young birds had left their nests. This close association between owner, consultant, and contractor will be most essential to the entire project.

Capitol Lake was created by an act of the legislature. To conform to this legislative mandate, maintenance is required to preserve the lake. The marsh environment in the upper basin as it exists today will not remain static. It is possible that within 8 to 10 years, it will have silted in so that only a river channel and terrestrial vegetation remain.¹

To maintain the marsh environment as an ongoing phenomenon requires periodic maintenance, restoring water levels for proper growth of the various plants, and removing vegetative debris accumulation at certain time intervals. In this instance, man's intervention may preserve a sensitive environmental area rather than destroy it.

RECREATION PLAN

At completion, this development program will add public recreation lands around Capitol Lake totaling over 37-1/2 acres of landscaped grounds, 17 acres of low-maintenance meadow-grass-and-tree-planted areas, and 9 acres of additional marsh land (figure 1). Also added will be numerous fishing locations on the lakeshore and 8,400 feet of accessible

¹ U.S., Department of the Interior, Geological Survey, *Sediment transport by streams in the Deschutes and Nisqually River Basins*, Washington, 1974.

shoreline. Two beaches with a total of one-quarter mile of waterfront are proposed. Initial development plans propose unsupervised and unguarded beaches. However, if heavy use or public desire calls for lifeguards and supervised swimming, the Department of General Administration and the park staffs of Olympia and Tumwater will make the appropriate manpower allocations. A system of trails designed to tie the various recreation areas together will add nearly 9-1/2 miles to the bicycle and walking trails around the lake.

Provisions for the Handicapped

All facilities are to be designed to accommodate the handicapped. It is important to remember that a handicap exists whenever there is a physical or mental impairment. This includes not only persons who use wheelchairs, but also the blind, deaf, mentally retarded, or otherwise impaired. The importance of outdoor recreation for the handicapped has been described by the National Park Service:¹

The benefits of outdoor recreation for these people are the same as they are for anyone: change of environment, introduction to new knowledge, stimulation to pursue new interests, relaxed social interaction that can possibly lead to a greater understanding between different types of people, and a pushing outward of the boundaries of their particular worlds.

While the benefits of outdoor recreation are the same for all,

...the needs for these benefits may be greater among the very people who cannot engage in outdoor recreation because their needs have not been met. Those who have some physical or mental impairment are quite often underdeveloped socially, physically, mentally, or culturally due to a lifestyle that has been restricted partly by the impairment and partly by a world that has not been designed for them. Any effort to ease the latter restrictions will contribute to the easing of the former restrictions by allowing these people greater self development.

In a recreation design of this type, there is no one correct solution for all people because handicapped persons all have different abilities and desires and receive different types of training. This plan attempts to combine features applicable to all the handicapped. All the paved bicycle foot trails, all the recreation areas, and all the buildings are designed

¹ Beechel, Jacque. July 1975. *Interpretation for handicapped persons*, College of Forest Resources, Cooperative Park Study Unit, National Park Service Pacific Northwest Region, p. 3.

to accommodate the needs of the ambulatorily limited so that these persons will not have to plan their activities around a few limited facilities. All of the parking areas will include parking stalls designated for the handicapped. Curb cuts, protected by bollard barriers in the parallel parking bays, will allow wheelchair access to the asphalt-paved bicycle/foot trail. Pathways will approach the water and will have curbed edges to protect the water side. There will be numerous turnouts from the paths. The 10-foot width of the bicycle/foot trail will provide ample turnaround room. Grades for the bicycle/foot trail will not exceed state and Federal standards. All comfort stations and picnic shelters will provide facilities for the handicapped and will have on-grade access. Some trails should not be paved, but rather be as natural as possible while still being safe. The great majority of blind persons prefer the challenge of this type of trail.¹

The interpretive program both at the visitor interpretive center and along the trail system can be a major part of the recreation experience. The key to a successful interpretive program is communication.

The following aids to the handicapped should be included in the interpretive program.

Blind

Partially sighted people can read signs with large print (18 point or larger). For totally blind persons verbal communication is required. One method found to be successful is the use of cassette tape players for interpretive messages. "The player is carried by the visitor and the location of each interpretive station is indicated by each message, concluding with mention of the number of feet to the next station."² The alternative is conducted walks, with the blind visitor accompanied by a sighted person. These two types of trails have reported the greatest success in communication with blind persons.

Deaf

Communication with deaf persons requires personal contact with an interpreter. The interpreter should have a working knowledge of fingerspelling and/or the Language of Signs. Films can be made comprehensible to deaf visitors by making an inset in the corner of each frame with a person signing. All the concepts expressed in the interpretive program must be made comprehensible to the deaf visitor.

1 Documented by Beechel.

2 Beechel, op. cit., p. 20.

Mentally Retarded

Successful trails and interpretive displays must translate the information to the level of comprehension appropriate to the particular group. As stated in Beechel's report, "Such custom tailoring is possible only through the use of personal guides - either agency personnel or the people accompanying the group or individual."¹ Recreation opportunities that can be shared by the whole family are especially important for the mentally retarded child: "Outdoors, the retarded member of the family is equal."² For interpretive trails, the most important factor is the quality and amount of involvement allowed. The most satisfactory method of interpretation will allow total involvement: "...to be able to put their arms around a tree and maybe sit on a branch will help them understand about a tree."³

Ambulatorily Limited

Signs, personal guides, and audio equipment have all been successful in communicating with people who have ambulatory problems. Signs must be mounted at a height which enables a person in a wheelchair to read them. The height of a person in a wheelchair should be considered throughout the design of an interpretive program. If there are items meant to be touched or handled, they must be within reach of an individual in a wheelchair. Parking lots should be as close as possible to the facility they are meant to serve, preferably less than 350 feet away. Interpretive trails should not be longer than one-half mile, and should have a cutoff midway. Because persons confined to wheelchairs must drink a lot of liquids, restrooms and drinking fountains should be conveniently located. For a half-mile trail, one restroom and one drinking fountain would be sufficient.

In general, handicapped persons do not want special facilities because they constitute segregation and because they are often unnecessary for most of the handicapped.⁴ All facilities should be designed for all the senses and detailed to accommodate everyone. Such facilities will be more satisfying to all visitors and result in more effective interpretation.

Upper Basin

The development of the upper basin fill areas is shown in figure 1. It will not be possible to reach the newly created island by foot. The alternative of connecting the island to the mainland at Tumwater City Park was rejected because of

1 Beechel, op. cit., p. 20.
2 Ibid, p. 25.
3 Ibid.
4 Ibid, p. 30.

the fragile habitat to be reestablished on the island. The protective groin area on the southeast side of Tumwater City Park will be a public-use area. Its elevation above the water will accommodate picnic tables and allow a trail to loop along the water's edge to the end of the groin, back to the west, and along the south edge of a new marsh area. This new marsh area of over 4 acres will be located in an area of existing low-lying land subject to periodic flooding. At the boat ramp site, a view point on the water will be established.

Of all the public recreation areas around Capitol Lake, the Tumwater City Park site has the potential for including the widest range of recreational opportunities. Located in the upper basin, it borders the richest and most diversified wildlife habitat on the lake. This site also has major historical and cultural significance as the first permanent settlement north of the Columbia River and the end of the Oregon Trail.

Preservation of the unique biological processes and wildlife habitat in the upper basin is a critical concern, but to serve the community, the Tumwater City Park must be capable of handling heavy demand. The 7-acre open meadow play area planned for this site will be suitable for all types of casual recreation activity. Nearly 3 acres of wooded picnic area will be included in the development program. Both family and large group picnicking could easily be accommodated. Near the picnic areas would be structured play areas for children with climbing, sliding, balancing, and swinging activities. A children's water feature such as a wading pool with fountain spray jets would also be desirable. Parking facilities for 40+ cars would be provided initially.

The Tumwater Historic Commission has proposed acquisition of an historical house within the Tumwater Park site and development of the house as a major historical and cultural interpretive center. Graphic displays such as old photographs; maps and drawings; short films depicting archeological diggings, development of the new market settlement, and lake restoration could be shown. A scale model of the original Tumwater settlement (New Market) could be constructed. Buildings in the model could correspond to a guided trail throughout the park with markers to indicate positions of the original structures.

Interpretive displays relating to the marsh and upper basin could be incorporated into the nature study area in the southwest corner of the middle basin. The trail along the west edge of the marsh and another boardwalk across a portion

of the marsh would connect to the trails in the middle basin. Interpretive stations could be added as this park development is completed.

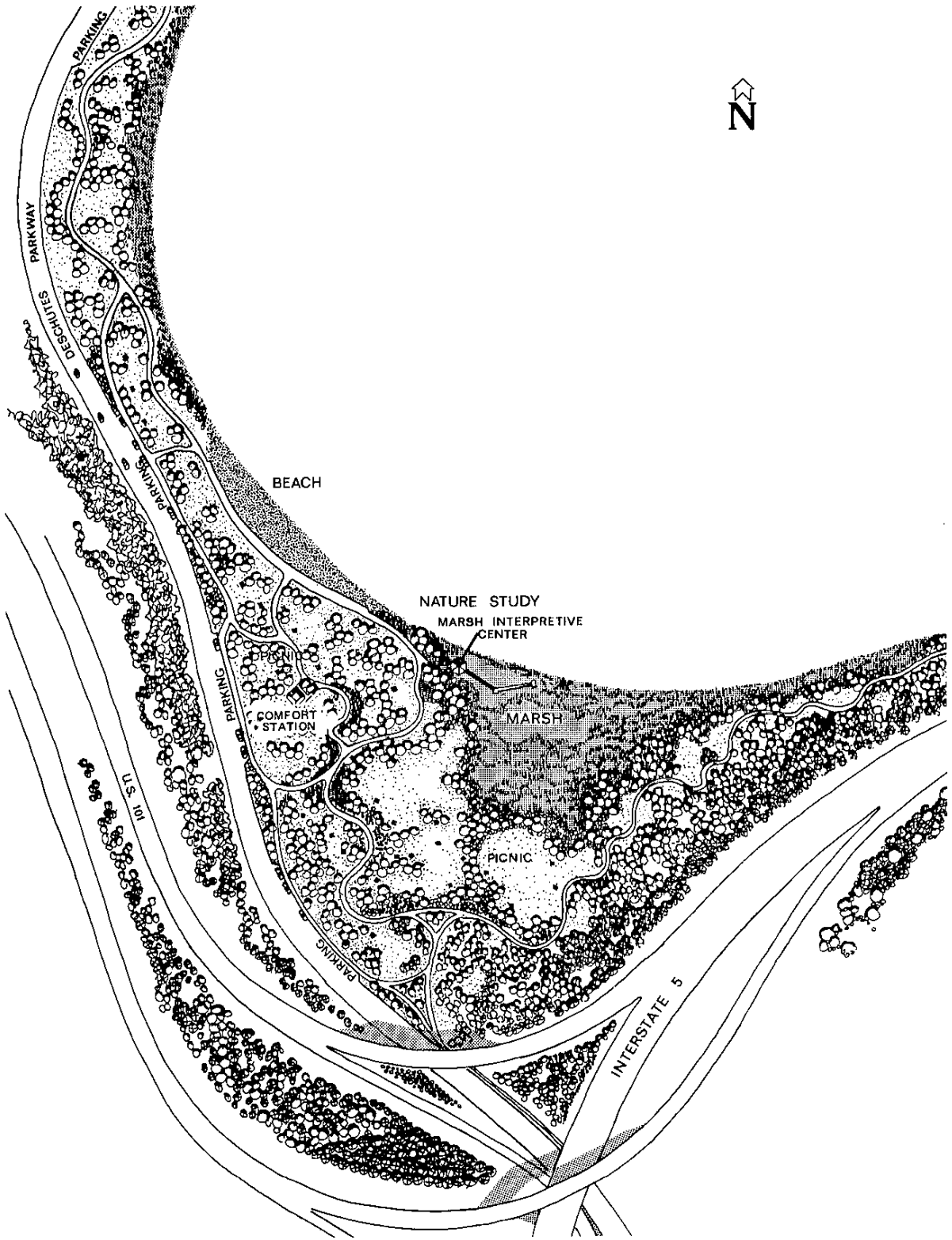
A new footbridge crossing the river near the old brewery will allow a 5-foot-wide, crushed-rock hiking trail to follow the railroad siding around the east side of the upper basin. This trail will be high on the slope to minimize encroachment on bird feeding and nesting areas. A pedestrian bridge will be suspended below the freeway overpass to complete the circuit around the upper basin. A trail link will rise along the freeway embankment, cross the railroad tunnel and Capitol Way, and continue on to the Olympia watershed. When the watershed area is eventually developed, it will already be connected by the trail link to the Capitol Lake park system. The freeway embankment will have extensive plantings.

Middle Basin

The southwest corner of the middle basin will receive the major amount of dredge fill (figure 2). The freeway embankment will be heavily planted to mitigate noise and eliminate the scrub landscape of Scotch Broom and blackberries. Hardy native species such as Douglas fir, shore pine, vine maple, Norway maple, Amur maple, London plane tree, red Osier dogwood and sumac will be the primary plant materials. Coordination of all work will be closely tied to the proposed expansion of the I-5 interchange. The recreation consultants, through close contact with Washington State Highway Department landscape architects, have developed appropriate plant lists¹ and planting schedules for work within the I-5 right-of-way.

A system of berms and mounds will separate this area from the Deschutes Parkway. Widening of the western shoreline reduces the conflict between people and vehicles. Linear parking bays will be built at various intervals along the parkway to reduce pressure on existing parking facilities. A 4-1/4-acre marsh will be located along the water's edge, with a winding trail between the marsh and the woods. A view platform and walkway will penetrate the marsh for bird watching and nature study. This boardwalk will penetrate about 100 feet into the marsh. As the shoreline continues to the west, a 600-foot beach will be constructed. The 10-foot-wide, asphalt-paved bicycle/foot trail will become a promenade along the back edge of this beach. The trail will wind through wooded and open areas as it moves up the west shore. At Lakeridge Drive this trail branches and crosses

¹ See appendix D for survival percentages of various plants on nonirrigated freeway embankments.



Recreation Plan for
Southwest Corner of
Middle Basin **2**

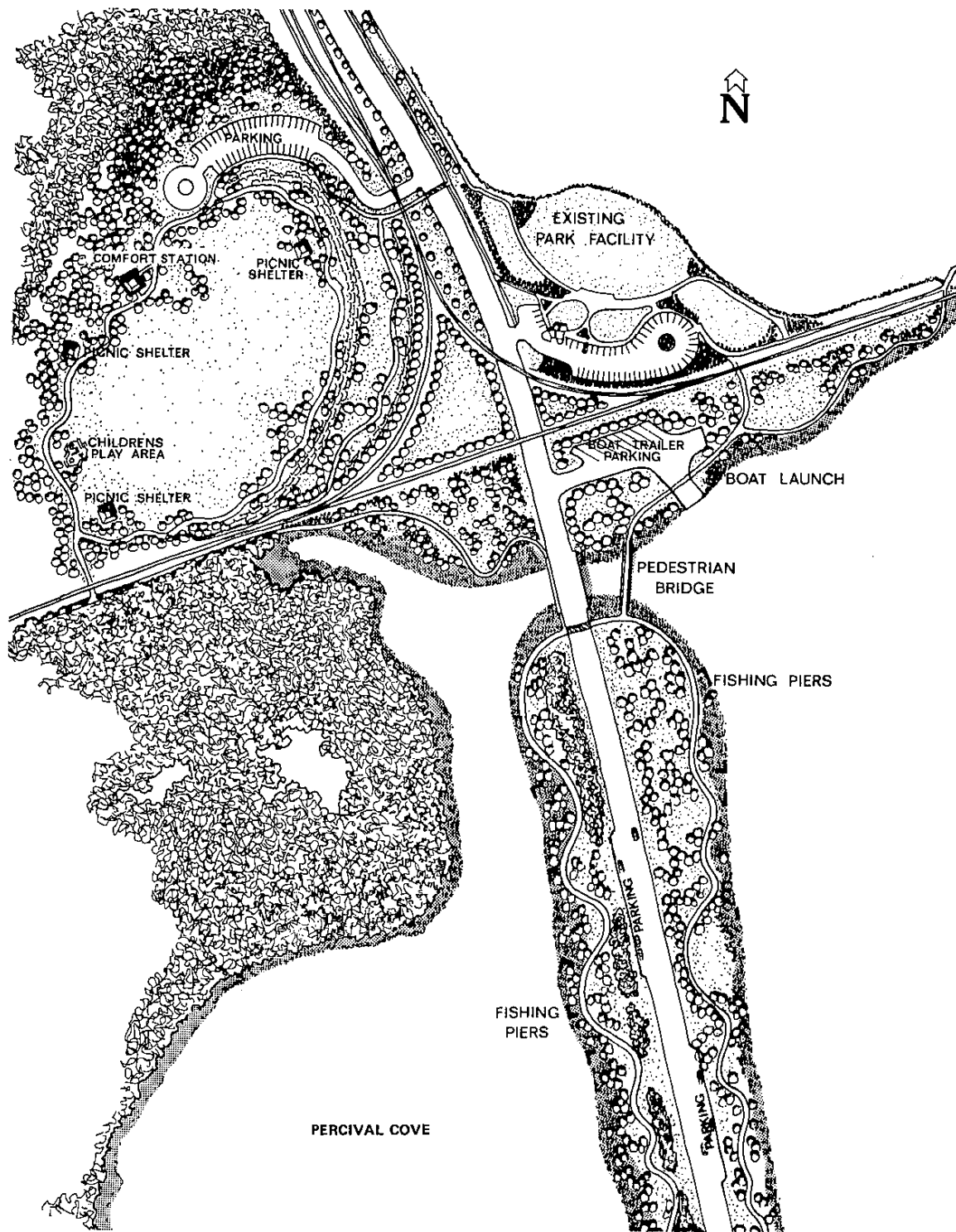
the parkway to also run along the east side of Percival Cove. Here there are intermittent cleared and planted areas, the trail being nearer the road at the cleared areas to allow plenty of room for fishermen. Because the two trails do not approach the roadside at any one point, the potential hazard of people running across the parkway to get from one trail to the other is reduced (see figure 3).

On the lakeside shore, fishing piers will be built. The fill area at the north end of Percival Cove will become a landscaped picnic area and the trail through here will continue to the west between Percival Creek and the railroad track to run into the west Olympia residential neighborhoods. The northwest corner of the middle basin will have a new footbridge crossing the outfall from Percival Cove. Enlargement of the northwest corner of the middle basin and establishment of multiple wooden piers will provide additional fishing areas. The lakeside trail will connect to the existing trail and footbridge that parallels the Burlington Northern Railroad track.

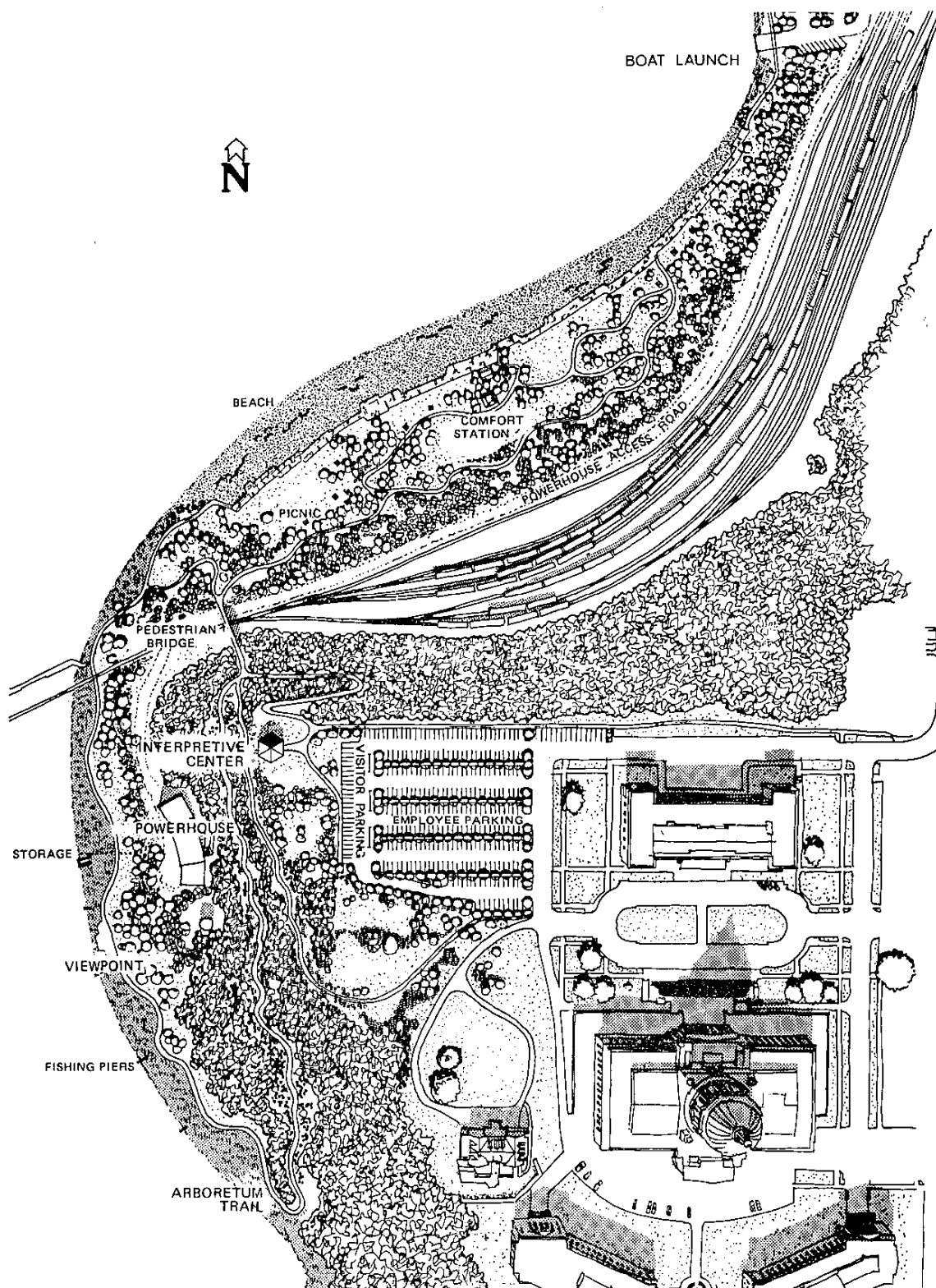
Below the power station on the eastern shore, multiple fishing piers, a major view point, and a soft unstructured edge characterize the fill area. A twisting, turning path winds up the hillside from the powerhouse through massed plantings of dogwood, rhododendron, and azaleas. This walk will be a continuation of the Capitol gardens--an arboretum trail through a garden of northwest ornamental plants (see figure 4).

The configuration of the large parking lot on the northwest corner of the Capitol grounds will be modified and, at the outermost edge of the hill crest, a view point and interpretive center will be constructed. This center will be a two-level wood and masonry building with large, open view decks to the north and west. It would also have interior pictorial displays describing the lake's history, the fish-rearing facility at Percival Cove, and the recreation areas around the lake. Maps will show the trail system, walking times, and distances. The center will also provide dynamic views over the lower basin and portions of the middle basin.

Trails from the view point will lead to the Capitol building and continue to another overlook view point, then follow the rim of the basin behind the library to a street end. On the north side of the interpretive center, another trail switching back across the face of the slope will cross over the Burlington Northern tracks on a pedestrian bridge and continue on to Capitol Lake Park.



Recreation Plan for Percival Cove,
Percival Cove Gravel Pit, **3**
Northwest Middle Basin



Recreation Plan for
Powerhouse, Capitol Campus,
Southeast Corner of Lower Basin **4**

Lower Basin

Across the parkway from the public waterfront facility, the Percival Cove gravel pit will be filled and terraced to provide a 4-acre open play meadow with the potential to handle some organized sports activities (figure 3). A natural amphitheater-type space will be graded into the existing contour of the land. A children's play area will be added, and a parking area for 40+ cars will be built. A bicycle/foot trail will surround this entire area and also connect across the Burlington Northern tracks to the trail into the west Olympia neighborhoods. The Percival Cove gravel pit will also have three covered picnic shelters. These open wooden buildings will each have barbecue facilities and four large picnic tables. This site offers optimal conditions for large group picnicking and should be developed accordingly. The picnic shelters, a comfort station, and the broad open play meadow all in proximity provide a setting not to be found at any other location around the lake. This site offers an additional safety feature for large family gatherings in that there is no shoreline adjacent to the picnic areas.

At the Fifth Avenue Dam an underwater fish-viewing room will allow visitors to watch salmon returning to spawn. The plan offers the option of a Fifth Avenue pedestrian crossing that would allow the foot trail to continue north under the Fourth Avenue viaduct to the west waterway channel area with its opportunities for picnicking, casual strolling, and contact with the saltwater shoreline. The parking lot at the northeast corner of the basin will be retained until replacement parking areas can be located for the state employees. Plantings at the swimming area will be supplemented, and street tree plantings in the blocks adjacent to the public park will provide a link with the old town square. The parking configuration of the existing lot to the southeast of the beach will be realigned to allow for planting islands between the rows of cars. The bicycle/foot trail will continue around the southeast corner of the lower basin between the water and the railroad tracks.

A major landscaped berm will rise between the Burlington Northern marshalling yard and the water. The high point of this berm will support a pedestrian bridge that will cross to the Capitol grounds, and the north face will slope gradually down to a beach over 1,000 feet long (see figure 4). The bicycle/foot trail link on the water side will be a promenade dividing the beach from the landscaped area. The 3-1/2 acres of gentle slopes will be a combination of play meadows and sequestered picnic groves. A foot trail will run along the berm's heavily planted south side facing the marshalling yard so that people can safely watch the activity of the

trains. In the northeast quadrant of the lower basin, a larger underwater fountain jet will create a major visual focal point.

RECREATION PLAN FOR INITIAL DREDGING

The sites selected for disposal of initial dredging material are indicated on figure 5. All fill and recreation development work in the upper basin will be completed in the initial dredging phase. Rapid completion of this work will limit disruption of wildlife habitat and feeding areas to only one season. Migratory species that return annually could be expected to reestablish themselves in the upper basin as long as development work with its associated noise and activity is not continued over a prolonged period. Early completion of this work will also allow the City of Tumwater maximum flexibility in planning and constructing its park facility.

In the middle basin, the majority of the southwest corner fill will be completed during initial dredging. All fills along the freeway embankment will be completed and grading of berms and trails finalized. The marsh area and the bird-watching stations can be constructed.

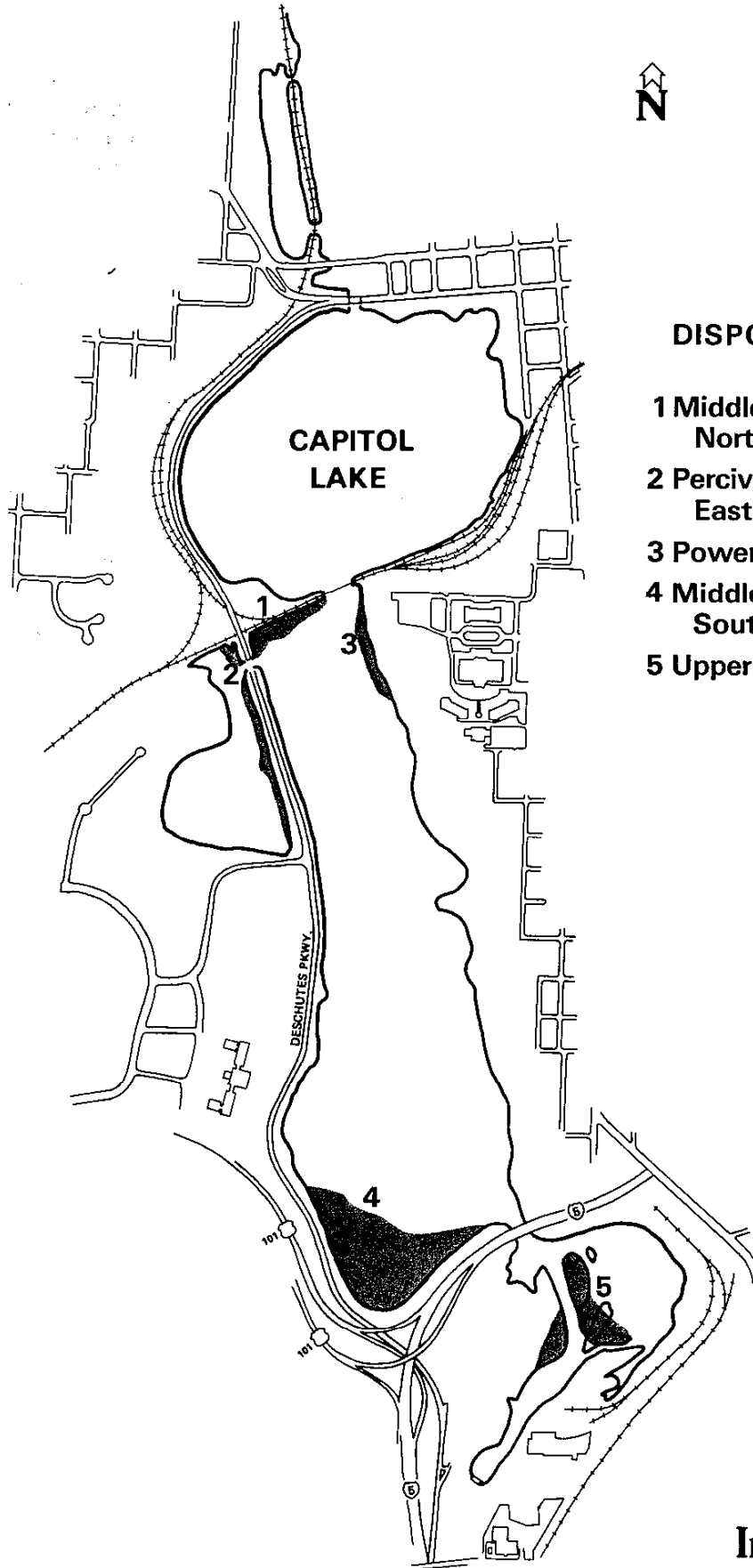
The other fill areas at the powerhouse and at the northwest corner of the middle basin will be completed during initial dredging. Landscaping and construction of the wood fishing piers will occur in the northwest corner. At the powerhouse fill, one view point can be completed and the nature walk to the Capitol Campus built and planted.

All proposed work within Percival Cove will be completed in this initial phase, including the foot trail extension from Lakeridge Drive and the wood fishing piers.

AUTOMOBILE PARKING

One of the primary objectives of the recreation development plan is to provide greater access to the water's edge and more usable land along the lakeshore. The consultants have outlined the following program for automobile parking:

- New park sites developed within the basin are to be designed for people use and wildlife habitat, not for parking cars.
- New parking areas will not be designed to handle maximum day-use situations; they will only support average day-use conditions. Maximum use situations will call for special parking allowances.



DISPOSAL SITES

- 1 Middle Basin
Northwest Corner**
- 2 Percival Cove
East Bank**
- 3 Powerhouse Fill**
- 4 Middle Basin
Southwest Corner**
- 5 Upper Basin Island**

- All parking around the middle basin should be along the Deschutes Parkway in bays laid out to accommodate parallel parking only.
- Parking at the upper basin should be restricted to areas designated on the Tumwater City Park plan.
- Boat trailer parking should be provided only in the northwest corner of the middle basin.
- The recreation plan parking program will not reduce parking spaces assigned to Capitol employees.

Demand for parking space could be eased if alternative forms of transportation are used. Routes for alternative forms of transportation will link the new park areas and supplement automobile access. There are numerous links with the surrounding neighborhoods along the bicycle/ foot trail. If public transportation routes can be provided along the Deschutes Parkway, they will provide quick and easy access to park facilities. For special events such as Lakefair it is recognized that additional parking on the grass will be required. The area along the west side of the parkway could accommodate a considerable number of vehicles, as could land within the Burlington Northern right-of-way. Parallel parking on either side of the Deschutes Parkway would accommodate over 380 cars.

With respect to the Capitol Campus, a 1970 comprehensive planning study¹ recommends that the scale of movement should be oriented to the pedestrian and that surface parking should be eliminated on the west Capitol Campus for other than short-term visitors. This could be done if underground parking is supplied between the Legislative Building, the Public Lands Building, and the Public Health Building. Supplementary remarks to a 1968 freeway access report by Victor O. Gray and Company, Consulting Engineers, suggested underground parking would be feasible as long as construction stayed as far away as possible from the footings supporting the Capitol rotunda and dome. These remarks also discuss the potential underground parking garage and its construction problems.

Whether or not underground parking occurs, removal of surface parking in this northwest area of the Capitol Campus is still a desirable goal. The fact that the major addition to this lot was programmed to be only temporary, thus installed with little thought toward its impact on the landscape, supports its eventual removal. What could have been a pleasing vista from the Governor's mansion is obstructed by

¹ Walker/McGough/Foltz, Architects and Lyerla/Peden, Engineers. 1970. *Comprehensive planning study, Washington State Capitol Campus; a history and guide 1965-1970, Olympia, Washington.*

asphalt and cars. What should be the major visitor interpretive center, view point, and entrance to the Capitol Lake Park system from the garden of the Capitol is now a dump site for old building materials and garden litter.

This condition should be corrected as development of the powerhouse fill area occurs. Because the Department of General Administration assigns leased parking space in this lot, removal of large portions would be difficult, if not impossible, to implement.

The consultants propose an alternative configuration for this parking lot. When the greenhouse facility is moved to the east campus, the bedding plant area now occupying vital land between the Judicial Office Building and the employee parking lot will also be removed. By constructing new parking stalls in this area and removing the westernmost bays from the existing lot, a balance of parking can be maintained while freeing the promontory on the northwest corner of the bluff for construction of the interpretive center and view point. Additional visitor and tour bus parking could also be provided near this facility. Although visitor parking has not been surveyed in detail, there is every indication that it is deficient.¹ This additional visitor parking would also help match visitor parking location with demand.

ACTION PROGRAM AND CAPITAL IMPROVEMENT PROGRAM

Funding

Funds for this recreation development program are being sought through the Interagency Committee for Outdoor Recreation (IAC) for appropriation during the 1979-1981 biennium. In November of 1977, the IAC will send out budget requests to the various state agencies, including the Department of General Administration, which have authority² to develop and operate lands for public and outdoor recreation. Budgets from these agencies are due back to IAC by 1 April 1978. The IAC committee will meet and act on the funding requests in June 1978. This capital budget request formulation by IAC then goes to the Office of Program Planning and Fiscal Management in August 1978. The request is then incorporated into the governor's budget, which goes to the legislature in December 1978. A budget bill from the legislature could be expected out of the session by April of 1979. Monies appropriated by the legislature then become available to the various state agencies 1 July 1979. The actual project

1 Howard, Needles, Tammen and Bergendoff, and Transportation Development Associates, Inc. April 1975. *Parking control and operation study, State Capitol Campus, Olympia, Washington*, p. 9.

2 R.C.W. 43.99.020.

application could first be considered by the IAC in March 1979, but this is predicated on the knowledge that the requested funds will be available in July 1979. For March application, the legislature would have had to pass out the budget bill prior to this first IAC funding review session. The actual application document must be submitted on or before the previous 1 November,¹ in this case 1 November 1978.

Recreation development funds for this project program may receive up to 50-percent matching funds as grants-in-aid from the Federal government. The principal source of Federal funds being investigated by the consultants is the Land and Water Conservation Fund administered by the Bureau of Outdoor Recreation for the Department of the Interior. The IAC is assisting the consultants in identifying other potential sources for future funds. The following potential sources are being investigated.

- Land and Water Conservation Act (Federal)
- Open Space Act (Federal)
- Marine Recreation Land Act, Chapter 5, Laws of 1965 (Initiative 215) (State)
- Chapter 12, Laws of 1963, Ex. Sess. (Referendum 11), Outdoor Recreational Bond Issue (State)
- Other Federal and state sources of funds or assistance²

Because of this project's staged nature over a 20-year period, each stage must be treated separately and approved by both the IAC and any Federal assistance programs prior to construction.

In the case of the Percival Cove gravel pit, it is advantageous to acquire this property while it is still available and undeveloped even though recreational development may not be planned for several years. Acquisition of this property could receive matching funds under the Land and Water Conservation Fund; however, the portion of matching funds designated for acquisition would not be paid until development of outdoor recreation facilities has been initiated because of the pit's use as a spoils site for dredging material. Another potential source of funds is the Bureau of Outdoor Recreation. Although bureau requirements stipulate that landfill procedures be completed within 3 years, the unusual nature of the filling operation by biennial maintenance dredging of the lake must be approved as an acceptable "extenuating circumstance"³ to prolong this time limit for filling.

¹ Interagency Committee for Outdoor Recreation, State of Washington. *Grant-in-aid procedural guidelines, 1973 edition, revised 1975*. 03.03.010 Application Submittal Deadlines.

² For sources of funds administered by the IAC, see IAC, *op. cit.*

³ U.S., Department of the Interior, *Bureau of Outdoor Recreation Manual*, Part 640, Chapter 2, Paragraph 8 (640.2.8).

Implementation

Application to the IAC before November of 1978 will constitute the formal application for consideration of funding. Because state agency budget requests are formulated before August 1978 in order to be considered in the 1979 legislative session, it is important for the IAC to receive actual and estimated cost estimates prior to the November application. Formulation of the IAC capital budget begins 1 April 1978; therefore, the Department of General Administration will incorporate these project cost estimates into their agency funding request prior to that date. These estimates will include all work proposed for the initial phase of recreational development. IAC review of the recreation plan may be completed by March 1979. Preparation of construction documents and specifications will proceed after IAC approval. Permit applications will be submitted late summer or fall 1979, with construction to follow approval. The project could qualify for up to 50-percent Federal matching funds. However, the initial 50 percent would not have to come out of the state's general fund. Because the Department of General Administration is a state agency granted the authority to develop and operate facilities for outdoor and public recreation, it is eligible to receive funds directly from the Outdoor Recreation Dedicated Fund. This account, separate from general revenue funds, is for recreation purposes only. Monies for this fund come from the unrefunded portions of marine gas taxes, state bond monies for outdoor recreation, Ref. 18, and land and water conservation fund monies. This fund is divided 50-50 between local and state agencies. The 50 percent going to the state agencies is divided up into shares for each separate agency and from the individual agency to the various development projects.

Six-Year Capital Improvement Program

Setting up priorities under a six-year capital improvement program is required for IAC funding of recreation projects. The following program of priorities is given for each year from 1980 through 1985.

Program Year 1 (1980)

Projects

Priority

Phase I Initial Dredging Sites

- A. Area Southwest corner of the middle basin

- | | | | |
|----|------|--|---------------------------------|
| | Work | Comfort station and utilities
Beach
Picnic facilities
Landscaping and irrigation
as necessary | IAC Priority II, 2 ¹ |
| B. | Area | Southwest corner of the
middle basin | |
| | Work | Marsh restoration with nature
study center and boardwalk
to viewing stations | IAC Priority II, 3 |
| C. | Area | Northwest corner of middle
basin | |
| | Work | Boat ramp construction in
middle basin; boat trailer
parking facilities | IAC Priority IV, 1 |
| D. | Area | Northwest corner of middle
basin; east bank of Percival
Cove; northeast corner of
Percival Cove | |
| | Work | Development of facilities for
fishing access | IAC Priority IV, 2 |
| E. | Area | Northwest corner of middle
basin; east bank of Percival
Cove; northeast corner of
Percival Cove; powerhouse | |
| | Work | Development of picnic areas,
shoreline view points, etc., for
water-oriented activities; also
Capitol Lake Interpretive Center
as a focal point and introduction
to the recreation activities of the
lake. | IAC Priority IV, 3 |
| F. | Area | All Phase I disposal sites | |
| | Work | Development of bicycle and foot
trail system along the lakeshore | IAC Priority VIII |

Total Area

31.2 acres, of which 24.5 acres replace existing water surface

1 The Capitol Lake area is already "open" to public use, but is not truly accessible and usable for as broad a range of recreational activities as feasible. See IAC *Capital Budget Instructions for Outdoor Recreation Account Requests*, November 1975, pg. 6.

Total Cost

Acquisition - none¹

Development (by project letter)

A.	\$	583,200
B.		35,200
C.		38,500
D.		8,500
E.		384,400
F.		90,700
		<hr/>
		\$1,140,500 Phase I Total

Anticipated Funding Source

The project could qualify for up to 50-percent Federal matching funds.

Program Year 2 (1981)

Projects

None - No biennial maintenance dredging performed in the preceding year

Program Year 3 (1982)

Projects

Priority

Phase II Maintenance Dredging Sites (Partial Completion)

Area	Southwest corner extension of the middle basin	
Work	Beach and picnic area completion	IAC Priority II, 2

Total Area

2.4 acres, of which 1.2 acres replace existing water surface

Total Cost

Acquisition - none

Development - \$79,000

¹ Acquisition of Percival Cove gravel pit is included in the Phase I restoration cost.

Anticipated Funding Source

The project could qualify for up to 50-percent Federal matching funds.

Program Year 4 (1983)

Projects

None - No biennial maintenance dredging performed in the preceding year

Program Year 5 (1984)

Projects

Priority

<u>Projects</u>	<u>Priority</u>
Area West shore of middle basin	
A. Work Development of facilities for fishing access	IAC Priority IV, 2
B. Work Development of picnic areas, shoreline access; includes earthwork, landscaping, and irrigation to support water-oriented activities	IAC Priority IV, 3
C. Work Pedestrian bridge; continuation of bicycle/foot trail	IAC Priority VIII

Total Area

4.1 acres, of which 2.6 acres replace existing water surface

Total Cost

Acquisition - none

Development (by project letter)

A.	\$ 2,875
B.	100,000
C.	<u>34,325</u>

\$137,200 Total

Anticipated Funding Source

The project could qualify for up to 50-percent Federal matching funds.

Program Year 6 (1985)

Projects

None - No biennial maintenance dredging performed in the preceding year

COST ESTIMATES

Budgetary Cost Estimates

Budgetary cost estimates were developed for the various individual fill areas. The costs are summarized in table 1 and are arranged in two phases. Phase I includes all of the initial fill sites. Phase II includes all maintenance dredging sites.

Table 1. BUDGETARY COST ESTIMATES^a

	<u>Labor</u>	<u>Materials</u>	<u>Contingency</u>	<u>Total</u>
<u>PHASE I (Program Year 1)</u>				
<u>Upper Basin</u>				
Island	\$ 19,345	\$ 8,295	\$ 4,150	\$ 31,790
<u>Middle Basin</u>				
Northwest corner	32,024	27,701	8,960	68,685
Powerhouse	134,234	97,526	34,764	266,524
Southwest corner	300,432	255,223	78,845	604,500
<u>Percival Cove</u>				
Northeast corner	20,780	19,945	6,110	46,835
East bank	<u>56,904</u>	<u>49,346</u>	<u>15,940</u>	<u>122,190</u>
Total Initial Recreation Development	\$563,719	\$428,036	\$148,769	\$1,140,524
<u>PHASE II</u>				
<u>Middle Basin (Program Years 3 and 5)</u>				
Southwest corner	37,010	31,090	10,215	78,315
West shore	64,893	54,407	17,900	137,200
<u>Lower Basin (Program Years beyond 6-Year C.I.P.)</u>				
Southeast corner	253,410	185,790	65,880	505,080
Percival Cove gravel pit	<u>209,442</u>	<u>160,368</u>	<u>55,470</u>	<u>425,280</u>
Total Recreation Development for Maintenance Dredging Areas	\$564,755	\$431,655	\$149,465	\$1,145,875

^a The budgetary cost estimates are total development costs based on July 1976 prices. The construction estimates included in these costs have a 15-percent construction contingency. See appendix B for detailed construction cost estimates.

Maintenance Costs

Maintenance costs for the initial 27.8-acre¹ development and additional areas totalling 26.9 acres are estimated at \$625 per acre in July 1976 dollars for high-maintenance (lawn) areas and \$100 per acre for low-maintenance (meadow grass and natural plantings) areas. It is reasonable to expect maintenance costs to escalate 6 percent annually for the 20-year study period. For the three bienniums included in the 6-year Capital Improvement Program, the total maintenance costs would average \$28,480 per biennium. Costs for the 1979-1981 biennium would be \$25,200; for the 1981-1983 biennium, \$27,980; and for the 1983-1985 biennium, \$32,260.

Benefits

Development of the proposed recreation area will generally benefit recreation users of the Olympia-Tumwater-Lacey area. Projections made by the project architects for the year 2000 indicate that peak usage would approach 11,000 per day in the summer, with average daily summer usage of 5,500 and winter usage of 1,500.

These estimates were based on current observations coupled with population and park capacity forecasts, and assume optimal utilization of developed areas.

The economic value of a general recreation day "involving primarily those activities attractive to the majority of outdoor recreationists," ranges from \$0.75 to \$2.25 (1973 dollars).²

In addition to general recreation benefits, special recreation benefits such as salmon fishing will increase. Easier access to the lake and a larger supply of fish should attract more fishermen. A specialized recreation day such as fishing is valued at \$3.00 to \$9.00.³ The park should also draw tourists visiting the Capitol Campus if easy access is provided.

Besides general enhancement of the Capitol Campus and Olympia business district, the development of recreation property usually has an impact on surrounding property values. Although developments of this type are not necessarily considered amenities to residential areas, attractive parks with adequately buffered activity areas will usually have a positive influence on surrounding land values.

1 The upper basin island and other marshes are no-maintenance areas and are not included in the estimates.

2 U.S. National Archives, Water Resources Council, *Establishment of principles and standards for planning*, Federal Register, Vol. 38, No. 174, 10 September 1973.

3 Ibid.

DAY-USE STANDARDS

User standards intended to make parks attractive to all types of persons have been developed in nearly every state. User statistics such as visitors per acre of land, swimmers per acre of beach, and picnic tables per acre are gathered. However, Capitol Lake is a unique situation because the 20-year-long development plan requires that recreation standards be geared to time. This means the standards on environmental and aesthetic quality must evolve in relation to the holding capacity of the park land. The particular design elements and amenities will be determined both by the unique natural qualities of the lake and its holding capability and by the expressed desires of the people of Olympia, Tumwater, and Thurston County.

Initially, because of the primary emphasis on activities within a short walking distance of vehicle parking, the capacity of certain areas will be limited by the number of automobile parking spaces available. As public transportation service expands and increases, amenities may increase because of less space reserved for the automobile.

Limiting amenities and facilities at present will leave some areas essentially undeveloped, but not unvegetated. With an expanding community population, the holding of some space in reserve may be beneficial.

ALTERNATIVES WITHIN THE PLAN

In the development of this plan, most decisions regarding alternatives for activities and facilities were based on a determination of active versus passive recreation. A telephone survey determined that the primary emphasis should be on passive forms of recreation. This led to a formulation of desired activities oriented toward passive recreation. Compatibility was another criterion; fishing is compatible with picnicking, picnicking with swimming, swimming with nature study, but very little is compatible with power boating and its noise levels.

Another consideration involved the allotment of land areas between landscaped zones, marsh, and naturalized plantings. Allocation for human use was the primary concern, but provisions for new marsh areas were made in the hope that some species displaced by dredging in the upper basin could find a comparable habitat and relocate in the middle basin. No firm boundaries have been established to separate landscaped areas from naturalized plantings or marsh. Estimates of capital improvement costs and maintenance costs have directed the consultants toward a minimum of high maintenance items such as grass lawns running down to the water's edge.

Naturalized and aquatic plantings are the preferred shoreline treatment from a maintenance and cost standpoint, and are a more appropriate wildlife habitat. Within landscaped areas the site characteristics must match the various activities in the plan. Picnic areas may be in many locations, but beaches must be located with respect to summer sun positions, prevailing winds and wind-sheltered areas, and shoreline areas where water circulation will be improved by the dredging and spoils deposition.

In some instances, desirable design features had to be eliminated. For example, a trail link along the east shoreline of the middle basin for walking and access to fishing may be the most desirable use. But this trail link was excluded from the recreation plan because of conflicts with private ownership interests along the eastern shoreline and the related problems of policing and security for the various homeowners.

Facilities such as shelters and covered picnic tables for use during winter or other periods of inclement weather have been added to the plan as a result of recommendations from public meetings. Other design decisions such as relocation of the boat ramp were a combination of the decision to restrict the use of power boats in the upper basin and of public comments urging the removal of boat trailer parking from the Tumwater City Park site as well as requesting a centralized boat launching facility between the lower and middle basins.



BACKGROUND INFORMATION

Capitol Lake is located in the cities of Olympia and Tumwater, Washington, immediately south of Budd Inlet. Authorized in 1949 by the state legislature, the lake was formed in 1951 by completion of the Fifth Avenue Dam. Capitol Lake is an integral part of the Deschutes River; in fact, the lake is essentially a wide place in the former Deschutes River tidal flats. It has been established as a class A water system by the Washington Department of Ecology. The Fifth Avenue Dam provides a saltwater barrier that can be opened to allow a periodic influx of salt water for anadromous fish release. This influx is also important for controlling development of rooted aquatic plants, particularly in the lower and middle basins.

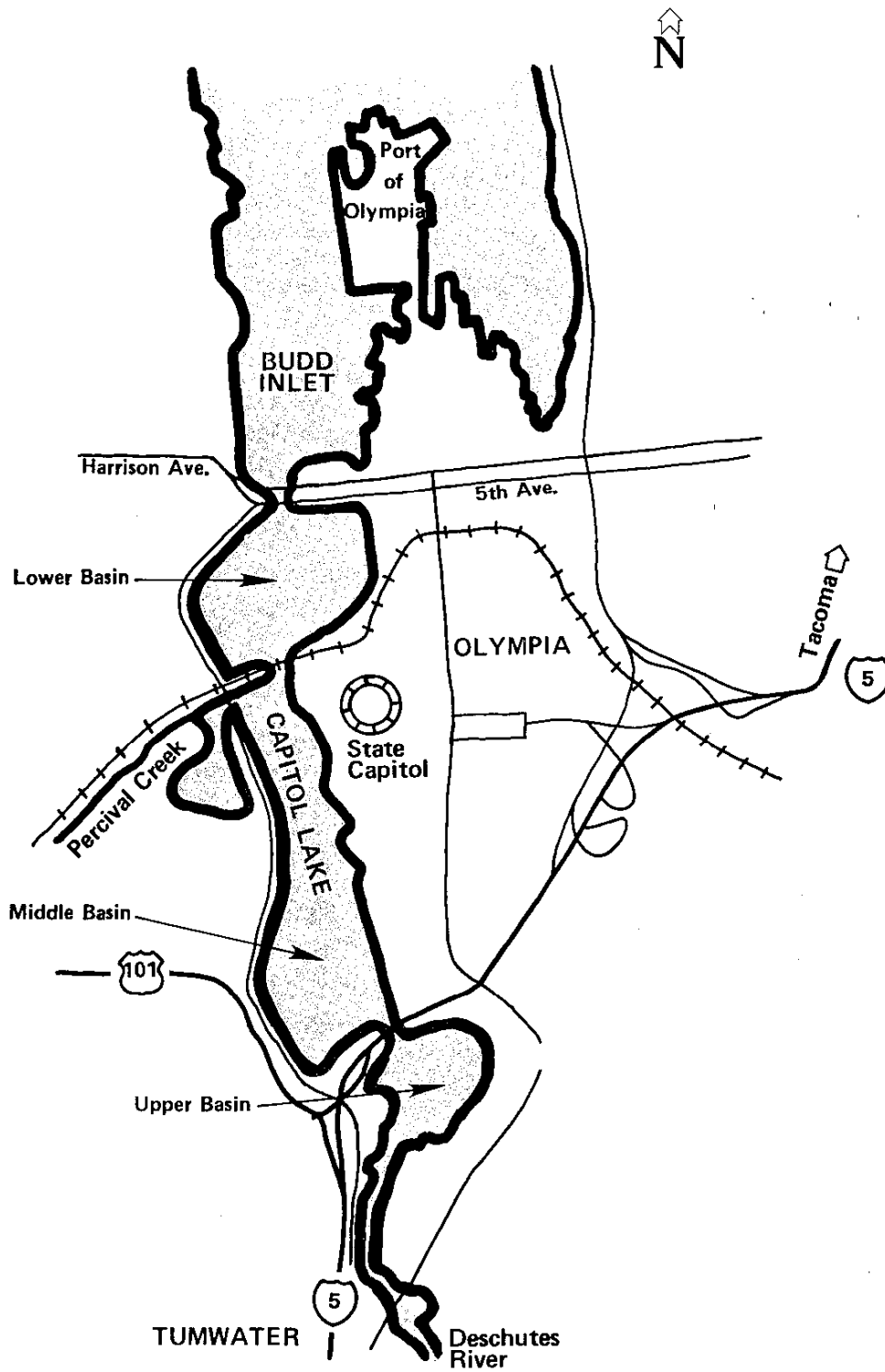
Capitol Lake is divided by transportation corridors into three basins: upper, middle and lower (see figure 6). The Interstate-5 bridge separates the upper from the middle basin, and the Burlington Northern Railroad bridge crosses the lake between middle and lower basins. Percival Cove lies west of the middle basin and drains into it.

Capitol Lake is a unique resource because of its location in the capital city, its proximity to the surrounding Thurston County metropolitan area, its aesthetic appeal, the natural beauty of Tumwater Falls, and its value as a major landscape feature of the State Capitol Campus grounds.

The two major uses of the lake, public recreation and anadromous fish rearing, depend on maintaining high water quality. The lake is one of the state's most important fish-rearing impoundments, and the annual fall migration of spawning Chinook salmon draws crowds of spectators. Most of the shoreline is publicly owned, allowing for numerous recreation activities both on and around the water.

The Deschutes River, which contributes approximately 90 percent of total water input to the lake, is relatively nutrient-rich and carries a high sediment load that varies with the flow. The accumulation of sediment over a 25-year period has significantly reduced the water volume of Capitol Lake and seriously reduced the lake's ability to produce natural fish food. In addition, sandbars, muck deposits, and islands created by this sedimentation have restricted active water sports. Failure to control this sedimentation and remove existing accumulations will eventually result in complete loss of the lake environment.

The restoration of Capitol Lake as a valuable and versatile resource to the State of Washington is the primary objective of all of the various agencies and groups having an interest



in Capitol Lake. The *Design Engineering Report* addresses itself to the specific engineering aspects and alternatives available to achieve the desired restoration. In many aspects the *Design Engineering Report* recommendations parallel the recommendations of the Washington State University report¹ on the water quality of Capitol Lake; both of these reports should be considered as primary technical background material on which this recreation plan is based.

GOALS AND OBJECTIVES

Although well endowed with water resources, the shorelines of Washington State are among the most valuable and fragile of Washington's natural resources. Because of Capitol Lake's popularity, its proximity to a major population concentration, and the water-oriented opportunities it offers, the restoration of Capitol Lake and its enhancement as a major conservancy recreation area should be an item of high priority at both the local and state levels. The restoration process described in the *Design Engineering Report* provides the foundation for a significant multiple-use recreation area.

Goals of Outside Agencies

The recreation program encompasses all three of the top priority items listed by the Interagency Committee for Outdoor Recreation (IAC). Under the program, the amount of shoreline readily accessible to the public at Capitol Lake will be increased; the entire recreation area will be developed to provide for a variety of day-use activities and at completion will support high-density use; and the shoreline development will provide recreational opportunities for activities such as swimming, boating, and nature study, as well as relating closely to the adjacent land areas. All development will be in accordance with the guidelines established for conservancy environments,² providing substantial contact between people and the water as well as establishing new marsh areas to replace those environmentally sensitive areas disturbed in the initial restoration phase.

1 Hydraulics Research Section and Environmental Research Section, Washington State University, September 1975. *Hydraulic and water quality research studies and analysis of Capitol Lake sediment and restoration problems*. A report for the Washington State Department of General Administration.

2 Washington Shoreline Management Act, 20 June 1975, WAC 173-16-040(4)(b)(ii) conservancy environment; and WAC 173-16-060(14) landfill.

The Capitol Lake Executive Committee, representing twenty public and private organizations, has also recommended goals aimed at protecting Capitol Lake. These goals are:

- The recognition of Capitol Lake as a key part of the Capitol Campus and therefore of statewide significance
- Preservation of the visual quality, wildlife, active and passive uses, and other environmental characteristics of the lake
- Preservation of the biological processes within the upper basin, except in the areas required for desilting operations
- Conservation of the terrestrial vegetation within the entire visual basin of Capitol Lake
- Protection of the lake's key fish propagation areas, such as Percival Cove
- Encouragement of land uses that will decrease sediment loading within the Deschutes River Basin

The City of Olympia comprehensive plan¹ of August 1975 has also listed short- and long-range objectives for the lake. These are:

- Capitol Lake should be rehabilitated and enhanced as a recreational resource.
- View points from which Budd Inlet and other significant natural landmarks can be seen should be designated and protected.
- Preservation of waterfront and view points for public use should be a high priority of the city and the Olympia Parks Department. Olympia's water resources should be enhanced by well-designed water-related shoreline land use.
- The Capitol Campus and Capitol Lake should be more fully utilized for tourist activities.
- There should be design linkages between downtown and the Capitol Lake and harbor areas.
- A citywide bicycle and pedestrian circulation network should be established.

¹ Olympia City Commissioners, Olympia Planning Commission, and Thurston Regional Planning Council Staff. August 1975. *The Plan for Olympia*.

- The Capitol, downtown, port, Capitol Lake, and brewery should be linked in one continuous network, facilitating automobile, bicycle, and pedestrian circulation.
- An open space network linking points of interest in the urban area should be developed.
- Methods of increasing public access to the shorelines and view points and of preserving open space other than by fee simple acquisition should be identified and utilized.
- Land not suited for development because of ecological, soil, and/or topographical conditions should be protected as public open space. Steep slopes, especially in areas with potential slope instability or soil-settling problems, should be zoned as open space. Ravines should be preserved in their natural condition and protected as greenbelts wherever possible.
- Building in ravines should be discouraged.
- Department of Fisheries and other programs that manage production of shellfish and salmon in both natural and artificial environments should be supported.

Achievement of these already established goals will result in benefits to the residents of the cities of Olympia and Tumwater, the residents of Thurston County, and visitors from throughout Washington and neighboring states.

Short-Term Goals of Recreation Plan

The following short-term goals have been established for the initial stage of this project:

- Implementation of an erosion control and planting program immediately following deposition and grading of the spoils
- Development of the passive recreation potential of the lake environs
- Through the restoration of the lake, acquisition and development of additional shoreline for recreational use
- Development of additional access to the water

- Establishment of new marsh habitats for birds and wildlife
- Establishment of new vegetation and planted landscape areas
- Development of a beach area in the middle basin
- The beginning of integration of the Capitol Campus into the community landscape setting
- Establishment of new scenic vistas around the lake
- Preservation of the existing view points
- Incorporation into design elements and facilities of educational communications relating to the fish propagation facilities, the aquatic and marsh habitats, the wildlife, and the bird life of the conservancy area
- Establishment of the master plan framework for increasing open space areas in the Capitol Lake visual basin
- Development of on-grade access to all facilities and of curbless access to the paved trails for handicapped persons

Long-Range Goals of Recreation Plan

After the initial dredging operations have been completed, maintenance dredging over the next 20 years should complete formation of the projected in-basin disposal areas. As the recommended areas are filled, they will be incorporated as recreation and open space areas for the enjoyment of all the population. Long-range goals include:

- A continued increase in the freshwater shoreline frontage available and accessible to the public through the maintenance dredging program; completion of all phases of the project before exporting dredging material
- Acquisition of additional properties within the visual basin for disposal of dredged material as recommended in the *Design Engineering Report*, and development of these areas for recreational uses
- Complete integration of the State Capitol and the Capitol Campus into the community landscape and the open space system surrounding Capitol Lake.

- This objective should be completed along with development of the fill areas contiguous with the Burlington Northern marshalling yard
- Integration of the Capitol Lake project area with the community by means of greenbelt extensions to compatibly link natural and urban areas
- Grading and landscaping of all fill sites as they are completed to minimize their initial visual impact

RECREATION PLAN DEVELOPMENT

The following activities were undertaken to develop a comprehensive recreation plan:

- Review of the comprehensive plans for the City of Olympia, the City of Tumwater, Thurston County, and other previous reports for available data and information
- Field inspections of the lake and its environs for environmental analysis
- Review of public surveys, including the *Survey of Community Attitudes Towards Parks and Recreational Use in Thurston County* by C. Montgomery Johnson Associates and *Capitol Lake Opinion Survey* by GMA Research Corporation (see appendix C)
- Acquisition of citizen input from public presentations and workshops (see appendix C)
- Development of preliminary recreation plans for a complete program of initial and maintenance dredging disposal
- Preparation of cost estimates
- Incorporation into the dredging contract of recommendations and specifications for restoring marsh habitats and establishing aquatic vegetation in the fill areas
- Preparation of a funding request on the recreational development portions of this project for submittal to the IAC
- Presentation of recommendations in a report

During plan development, the preliminary restoration and recreation plans were presented to the following organizations:

Muskoxen (A group representing key federal and state agencies concerned with development)
Tumwater Historical Commission
Tumwater Park Commission
Audubon Society
Capitol Lakefair Committee
League of Women Voters
Tumwater City Council
Olympia City Council
Thurston County Planning Commission
South Capitol Neighborhood Association
Open Public Workshop



DESCRIPTION OF THE PLANNING AREA

The area encompassed by this recreation plan is referred to as the Capitol Lake visual basin; the visual basin is that area surrounding the lake and visible from the water. It is confined roughly by the crests of the wooded slopes (the feathered edge). The visual basin area is approximately 1,000 acres. The basin is a multifaceted area and, for the purposes of this plan, it can be considered a scenic corridor, a recreation corridor, and a transportation corridor.

CLIMATE

The climate of the Capitol Lake area is typical of the entire Puget Sound region, and is characterized by mild, wet winters and warm, dry summers. Normal temperature ranges and precipitation reflect the moderating influence of the predominantly marine weather system. Daytime temperatures fluctuate around 40 degrees to 52 degrees F during the winter, and in the 70's and 80's during the summer. Night-time temperatures generally fall into the low 30's during the winter and the 40's and 50's during the summer. Continental air masses occasionally push into this area and produce unusually high summer or low winter temperatures. Average annual precipitation is about 50 inches; 85 percent falls during the months of October through April. The remaining summer months usually receive 2 inches of rainfall or less per month. Prevailing winds are from the south and southwest. Within the visual basin, certain microclimate areas caused primarily by low-level wind deflection from the surrounding uplands create sheltered areas that are desirable for activities such as picnicking and swimming.

Selected climatological data¹ from the Olympia Airport are presented in table 2.

EARTH

Capitol Lake is situated within the Puget trough in a deep gorge cut by the Deschutes River in glacial deposits laid down during periods of intermittent glacial activity. This unconsolidated fluvial and glacial material is of the Pleistocene Age. With the retreat of the last continental ice sheets the sea level rose, turning the mouth of the gorge into a marine bay (Budd Inlet). A delta formation was initiated at the mouth of the Deschutes River. After Capitol Lake was formed in 1951, sediment deposition by the Deschutes River became largely confined to the lake.

¹ Pacific Northwest River Basins Commission, Meteorology Committee. June 1968. *Climatological Handbook Columbia Basin states hourly data*. Volume 3, parts A and B.

Table 2. SELECTED CLIMATOLOGICAL DATA FROM THE OLYMPIA, WASHINGTON, AIRPORT WEATHER STATION

	Annual	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temperature (°F)													
Average Daily Maximum	62.2	45.1	49.6	54.5	62.3	68.6	72.6	79.7	78.9	72.6	62.3	52.4	47.5
Average Daily Minimum	39.3	31.1	32.2	34.0	37.6	41.6	45.5	48.0	47.8	44.4	40.5	35.2	33.9
Extreme High	100	60	72	76	81	90	94	100	100	94	82	69	58
Extreme Low	3	4	12	14	24	26	31	35	34	27	20	18	3
Precipitation (in.)													
Normal Total	52.37	7.85	6.62	5.40	2.96	2.01	1.79	0.76	0.89	2.09	5.28	7.67	9.05
Maximum Month	19.84	19.84	13.18	10.13	4.78	5.83	6.48	2.68	5.45	5.23	10.08	15.51	14.32
Minimum Month	0.00	0.84	2.54	0.48	0.37	0.15	0.04	T	0.00	0.06	1.55	1.39	2.28
Wind (mph)													
Mean Speed	6.7	7.5	7.3	7.5	7.3	6.6	6.5	6.0	5.8	5.5	6.1	6.7	7.5
Maximum Speed	60	55	45	50	46	39	32	39	26	35	58	60	41
Direction	SSW	SSW	SSW	SSW	SW	SW	SSW	SW	SW	SW	SSW	SW	SSW

SOILS

The bottom of the lake consists of fine-grain sediments, with coarser sediments lining the main channel of the Deschutes River. Clayey silts and sandy silts are found along the lakeshore, in all shallow areas of the upper basin, and in the off-channel portions of the middle basin and Percival Cove. Sands and gravels lie under the deeper channels of Capitol Lake and Percival Cove. The glacially derived materials rimming Capitol Lake have weathered to loamy fine sand and gravelly, sandy loam soils. Soil types are shown in figure 7.

GROWTH AND DEVELOPMENT

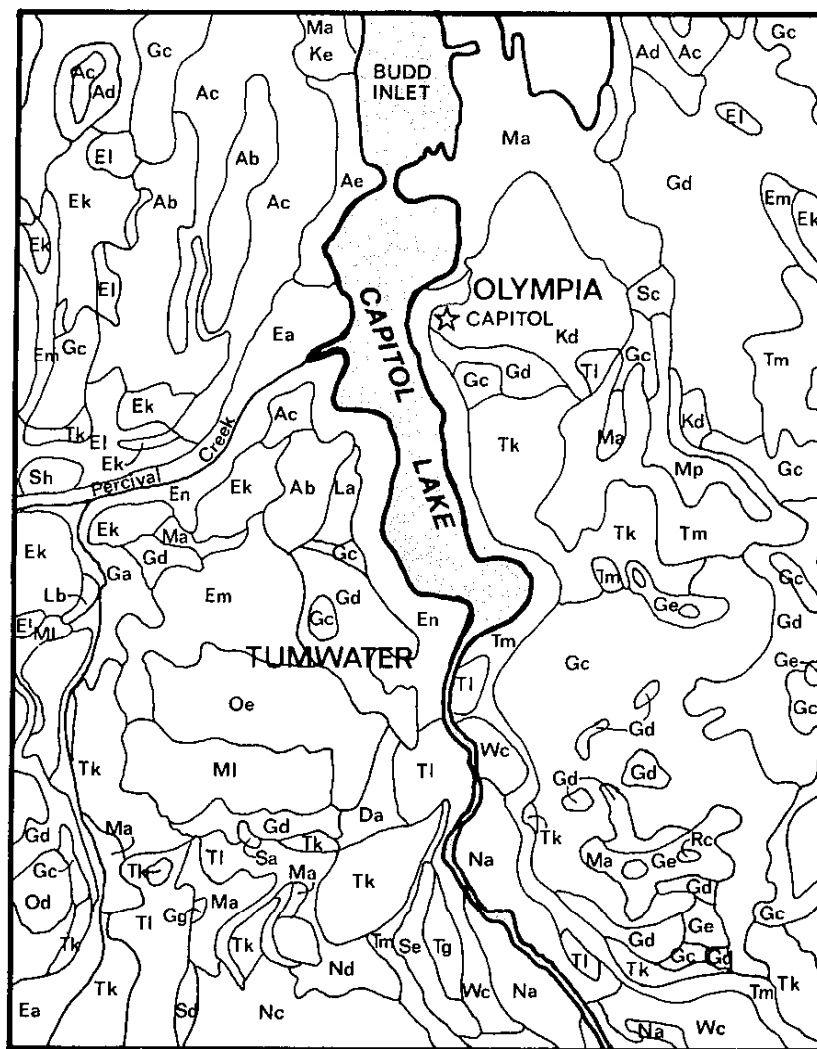
History

Several historical themes and trends have shaped Olympia's past and continue to shape its relationship with its neighborhoods, its nearby cities, and the state. The Olympia-Tumwater area was the end of the Oregon Trail, and was the first area north of the Columbia River to be permanently settled. In 1947, Olympia, then called Smithfield, and Tumwater (New Market) were linked by trail. In 1850 Smithfield was renamed Olympia, and by popular vote in 1853 it was resolved that Olympia would be the seat of county government. Olympia was incorporated in 1859 and continued to be the geographic center of the territory. Another vote in 1860 confirmed that residents wanted the territorial capital to remain in Olympia. In 1889 Olympia was named the state capital. Many structures from these periods were built in the Capitol Lake area; some are shown in figure 8.

The potential of Olympia remains unrealized. The slow but continued growth that has been characteristic of the region has been accompanied by relatively slow development. The discovery of gold in California (1848), the decision to locate the railroad terminus in Tacoma (1873), and the discovery of gold in Alaska (1898) are three of the more important historic events which helped deflect major population influx to areas other than Olympia. The centralization of state offices in the city and the creation of the Evergreen State College, along with statewide growth, have contributed recently to an increase in growth pressures.

Present

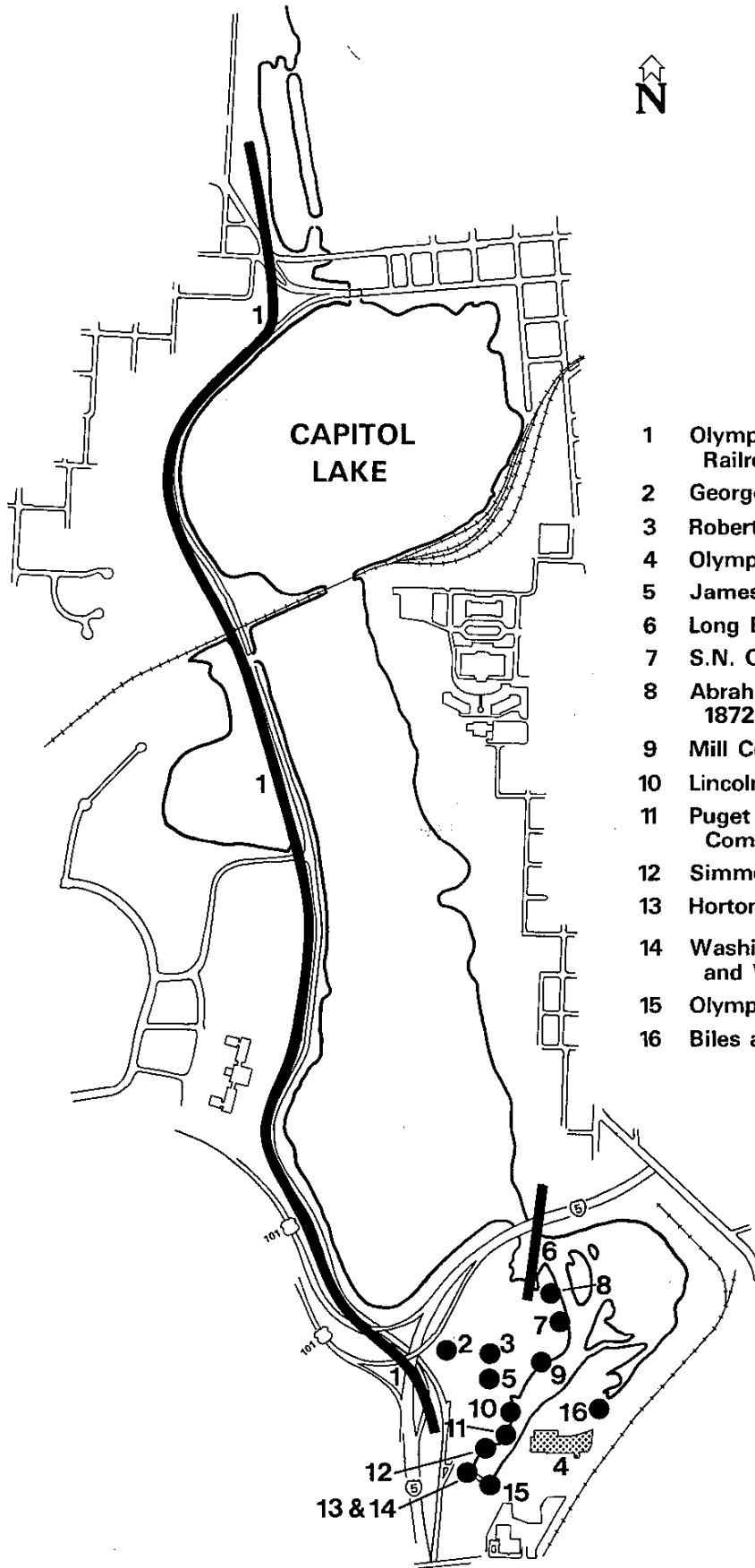
In the last decade Olympia has grown 26.5 percent to reach a population of approximately 25,000. It is now the metropolitan center of the southern Puget Sound region. Government employment and government-related services remain the mainstay of the local economy. Olympia is also the commercial and industrial center of the southern Puget Sound



LEGEND

- | | |
|---|--|
| Ab Alderwood gravelly sandy loam, 0–3% slopes | Ml Melbourne stony loam, 15–30% slopes |
| Ac Alderwood gravelly sandy loam, 3–15% slopes | Na National pumicy loam, 2–6% slopes |
| Ad Alderwood gravelly sandy loam, 15–30% slopes | Nc Newberg fine sandy loam, 0–3% slopes |
| Ae Alderwood gravelly sandy loam, 30–50% slopes | Nd Newburg loam, 0–3% slopes |
| Ek Everett gravelly sandy loam, 0–3% slopes | Oe Olympic stony clay loam, 15–30% slopes |
| El Everett gravelly sandy loam, 3–15% slopes | Sa Semiahomoo muck, 0–3% slopes |
| Em Everett gravelly sandy loam, 15–30% slopes | Sd Semiahomoo muck shallow over |
| En Everett gravelly sandy loam, 30–40% slopes | Tanwax peat, 0–3% slopes |
| Gc Giles fine sandy loam, 0–3% slopes | Se Sinclair gravelly fine sandy loam, hilly, |
| Gd Giles fine sandy loam, 3–15% slopes | 15–25% slopes |
| Kd Kitsap silt loam, 3–15% slopes | Tk Tumwater loamy fine sand, 0–3% slopes |
| La Lynden loamy sand, 0–3% slopes | Tl Tumwater loamy fine sand, 3–15% slopes |
| Lb Lynden loamy sand, 3–6% slopes | Tm Tumwater loamy fine sand, 15–30% slopes |
| Ma Made land | Wc Wilkeson loam, rolling, 6–15% slopes |

Soil Types in the
Capitol Lake Area **7**



- 1 Olympia-Chehalis Valley Railroad - 1878
- 2 George Biles House - 1860
- 3 Robert Esterly House - 1895
- 4 Olympia Brewery - 1896
- 5 James Ott House - 1895
- 6 Long Bridge - 1860
- 7 S.N. Cooper Mill - 1886
- 8 Abraham Whitemarsh Mill - 1872
- 9 Mill Complex - 1870
- 10 Lincoln Flour Mill - 1864
- 11 Puget Sound Milling Company - 1847
- 12 Simmons Mill - 1846-1847
- 13 Horton Pipe Factory - 1868
- 14 Washington Waterpipe Mfg. and Water Company - 1870
- 15 Olympia Light and Power - 1905
- 16 Biles and Carter Tannery - 1860

region. At one time facing a decline in viability, the Port of Olympia has diversified its activities and significantly improved and expanded its shipping capabilities.

The Central Olympia Revitalization Effort (CORE) has proposed extensive regional shopping center facilities for the downtown area and design improvements throughout the downtown area to link together the major activity centers.

Future

Olympia is facing the prospect of a population increase from 25,259 (1975) to approximately 38,000 (1995). With continued good planning, the city's true potential as a capital city will be realized. The comprehensive plan for Olympia recommends that Capitol Lake provide a link between the brewery complex, the Tumwater recreation area, the State Capitol Campus, the county courthouse complex, the central business district, and the port. In a planning report,¹ the following outlook is given:

"Visitors and residents alike could walk the tree-lined lake edge, admiring the superb Capitol dome and the skyline of Olympia. The marbled architecture and the colorful gardens and fountains of the Capitol Campus would provide pleasure to residents and visitors alike."

The planning report also calls for retaining forest stands within the city, and for little or no development on lakes, marshes, ravines, and steep hillsides. All of these are important provisions of this recreation plan.

¹ Olympia City Commissioners, Olympia Planning Commission, et al. 1975. *The Plan for Olympia*, pg. 7.

■ ■ RECREATION OPPORTUNITIES WITHIN THE ■ ■ PLANNING AREA

INVENTORY

Based on current populations and projections to 1995, the neighborhoods surrounding Capitol Lake show both a current and anticipated deficiency in recreation and park facilities. The current deficiency is 17.3 acres and by 1995 this deficiency could increase to 26.2 acres. At the community level, incorporation of some of the larger school sites helped produce some surplus in net usable recreation facilities. However, the problem facing all the neighborhoods and communities is the lack of passive recreation areas. The proposed recreation plan will add 30 acres of landscaped park, open space, and forest; 15 acres of marshlands and conservancy area; and 8,400 feet of additional lake shoreline for recreation. The critical need for passive recreation areas in the inner city cannot be overstated. Existing recreation facilities are shown in figure 9, and a breakdown of existing and projected recreation facilities on both inner neighborhood and greater community levels, as discussed in *The Plan for Olympia*, is shown in appendix A.

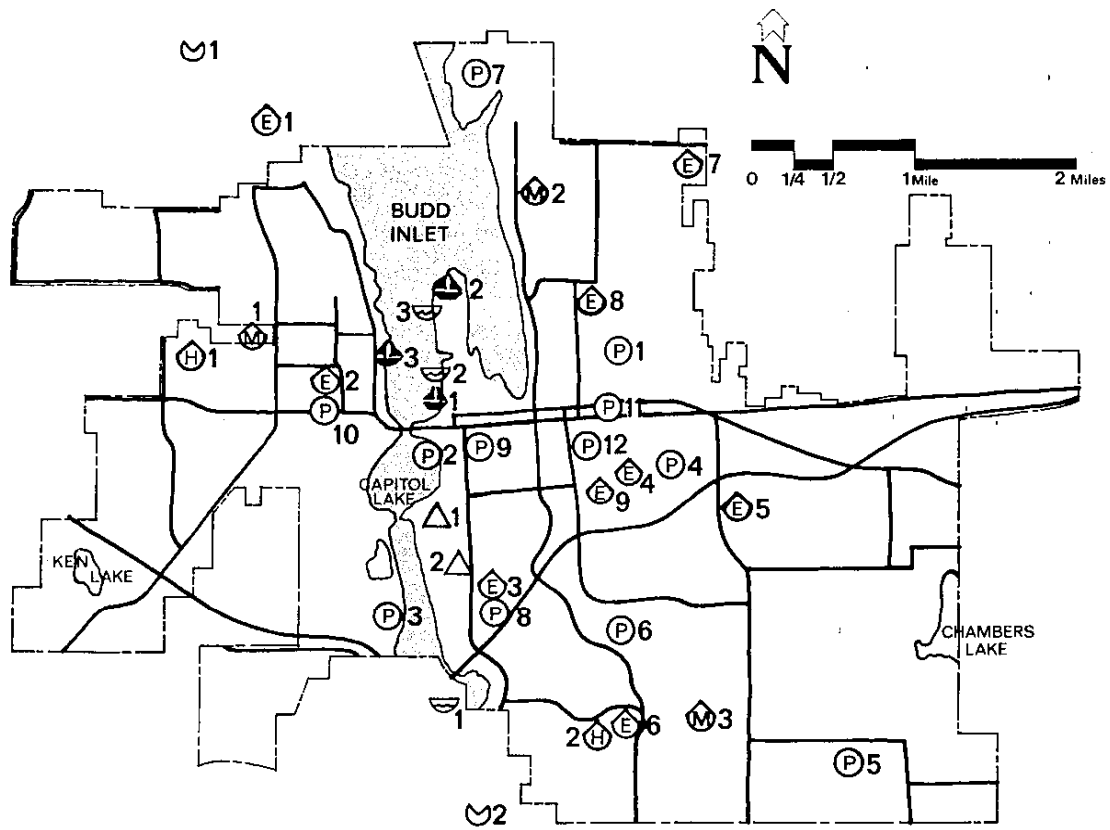
Completion of the recreation development plan as described in this report will keep pace with population growth by providing sufficient developed park facilities. Completion of the Phase I work will change the current deficiency in park facilities to a surplus. Concentrating on Capitol Lake development will allow the Olympia watershed site and the Priest Point Park site to remain major open space reserves.

DEMAND AND NEED

In the category of major urban parks, the Olympia-Tumwater area has two existing sites and one potential site. These three sites have a combined total area of 430 acres; only 37 are currently developed. It is significant that the entire 27 acres of Capitol Lake Park and Deschutes Parkway are totally developed; this demonstrates a heavy user demand. Capitol Lake Park also has the city's only public swimming area, an attraction that has often recorded over one thousand persons a day during the summer season. In terms of usage, this park is one of the city's most successful. The deficiency of passive recreation areas in the surrounding neighborhoods is expected to add to the impact of an enlargement of this park area.

A comprehensive survey recently completed by C. Montgomery Johnson Associates¹, for which more than 50 percent of the

¹ C. Montgomery Johnson Associates, March 1976. *Survey of community attitudes towards park and recreational use in Thurston County*. See appendix C.



LEGEND

(P) CITY PARKS

1. Bigelow Park
2. Capitol Lake Park
3. Deschutes Parkway
4. Lions Park
5. Little Baseball Athletic Park
6. Olympic City Watershed
7. Priest Point Park
8. Stevens Field
9. Sylvester Park
10. Woodruff Park
11. Olympia Community Center
12. Old Washington Jr. High Complex

(E) ELEMENTARY SCHOOLS

1. Brown
2. Garfield
3. Lincoln
4. Madison
5. McKinley
6. Pioneer
7. Rogers
8. Roosevelt
9. St. Michael's School

(M) JUNIOR HIGH SCHOOLS

1. Jefferson
2. Reeves
3. Washington

(H) HIGH SCHOOLS

1. Capitol
2. Miller

(S) MARINAS

1. Fiddlehead
2. Olympia
3. West Bay

(B) BOAT LAUNCHES

1. Capitol Lake
2. Fiddlehead Marina
3. Olympia Marina

(Δ) MAJOR HISTORICAL SITES

1. State Capitol Campus
2. State Capitol Museum

(G) GOLF COURSES

1. Olympia Golf and Country Club
2. Tumwater Valley Golf Course

respondents were from the Olympia-Tumwater area, indicated the following desired recreational need priorities:

- Nearly two-thirds of the respondents felt there was a need for more outdoor recreational facilities, and outdoor facilities were judged as being more needed than indoor.
- The two highest "need more" items are beach access to salt water and to fresh water. Respondents favored acquisition by a ratio of nearly 9 to 1.
- The three existing highest priority items for development are bike lanes on existing roads, park facilities at existing county park sites, and nature trails/arboretum.
- The great majority of respondents felt that funding for parks and recreation programs was too low.
- Fishing, bike riding, and boating were the top three vote-getters in the category of "most important outdoor activity." General use of recreational park and waterfront areas for activities such as picnicking, playground use, and walking placed sixth in the voting. Tennis was seventh and swimming eighth. Scenic driving and sight-seeing tied for 22nd position with no preference.
- Individual respondents commented on the lack of bike trails, running/jogging trails, nature trails, and hiking trails.
- A desire for "beach access without boats" was expressed as well as the need for "fishing docks;" "protected waters for canoeing;" "sailboating;" and "fresh and salt water picnicking areas (away from) motors, swimming, noise, hustle and bustle."
- Over 70 percent of the respondents owned a bicycle or had one available for use.

A second survey¹ recently completed by GMA Research Corporation of Bellevue for CH2M HILL confined itself to residents within the Olympia-Tumwater area. In general, the objectives of this survey were to measure awareness, familiarity, usage, activity and behavior patterns, likes and dislikes of the population regarding Capitol Lake, and to measure the needs and interests among the population for selected

¹ GMA Research Corporation. May 1976. *Capitol Lake opinion survey.*

improvement concepts. This survey is shown in appendix C. The results of the survey support the following observations:

- More than eight out of ten persons surveyed are familiar with the Capitol Lake area, and the more than nine out of ten familiar with Capitol Lake have visited the lake at some time.
- Area respondents are most likely to picnic, view fish, swim, or fish. They are least likely to watch trains and water ski.
- Respondents indicated a preference for quiet, non-obtrusive lake activities such as swimming, picnicking, and fishing. The strongest opposition is to high-profile, noisy activities such as water skiing, motorboating and train watching.
- When asked what they liked most about Capitol Lake, respondents answered that it was "pretty" more than twice as often as they chose the second place item. Scenery and swimming tied for second place.
- In replying to the question of what they did not like about Capitol Lake, respondents who had specific objections answered that the lake was too shallow, was full of silt, was dirty, and was polluted.

A third questionnaire distributed to everyone attending public meetings on the recreation and restoration plans has investigated how closely the goals and objectives of the Capitol Lake Task Force correspond to the feelings of the respondents. The questionnaire also determined priorities for recreational activities appropriate to the Capitol Lake environs. The results are in appendix C.

Although human demand and need may be the determinants for funding and priorities for recreation facilities and activities, demands and needs of wildlife must be carefully weighed for economic impact and environmental significance.

Percival Cove is one of the Washington State Department of Fisheries' largest and most profitable fish-rearing impoundments; three major salmon culture programs are conducted in the basin.¹ About 6 million fish were reared in Percival Cove in 1973. The dredging work proposed for the middle basin alone is estimated to increase fish production by 50

¹ CH2M HILL. July 1976. *Capitol Lake restoration draft environmental impact statement*. A report for the Department of General Administration. pp. 16-18.

percent, raising the value of the lake's sport and commercial salmon catches by up to \$450,000 per year.¹

In addition to the major salmon-rearing industry and its important economic benefits, Capitol Lake and its environs are a home for wildlife and numerous species of resident and seasonal birds. In the area between the I-5 bridge and Tumwater Falls (the upper basin), the Black Hills Audubon Society has identified over 40 winter resident species and 23 spring and summer resident species.

The recreation program has addressed itself to the potential conflict between man and wildlife by recognizing the importance of the marshes and conservancy areas and limiting or eliminating active recreation from these sensitive areas. It is anticipated that marsh restoration, landscaping, and major tree plantings will increase breeding, nesting, and feeding areas for those species temporarily displaced.

¹ *Ibid*, p. 18.

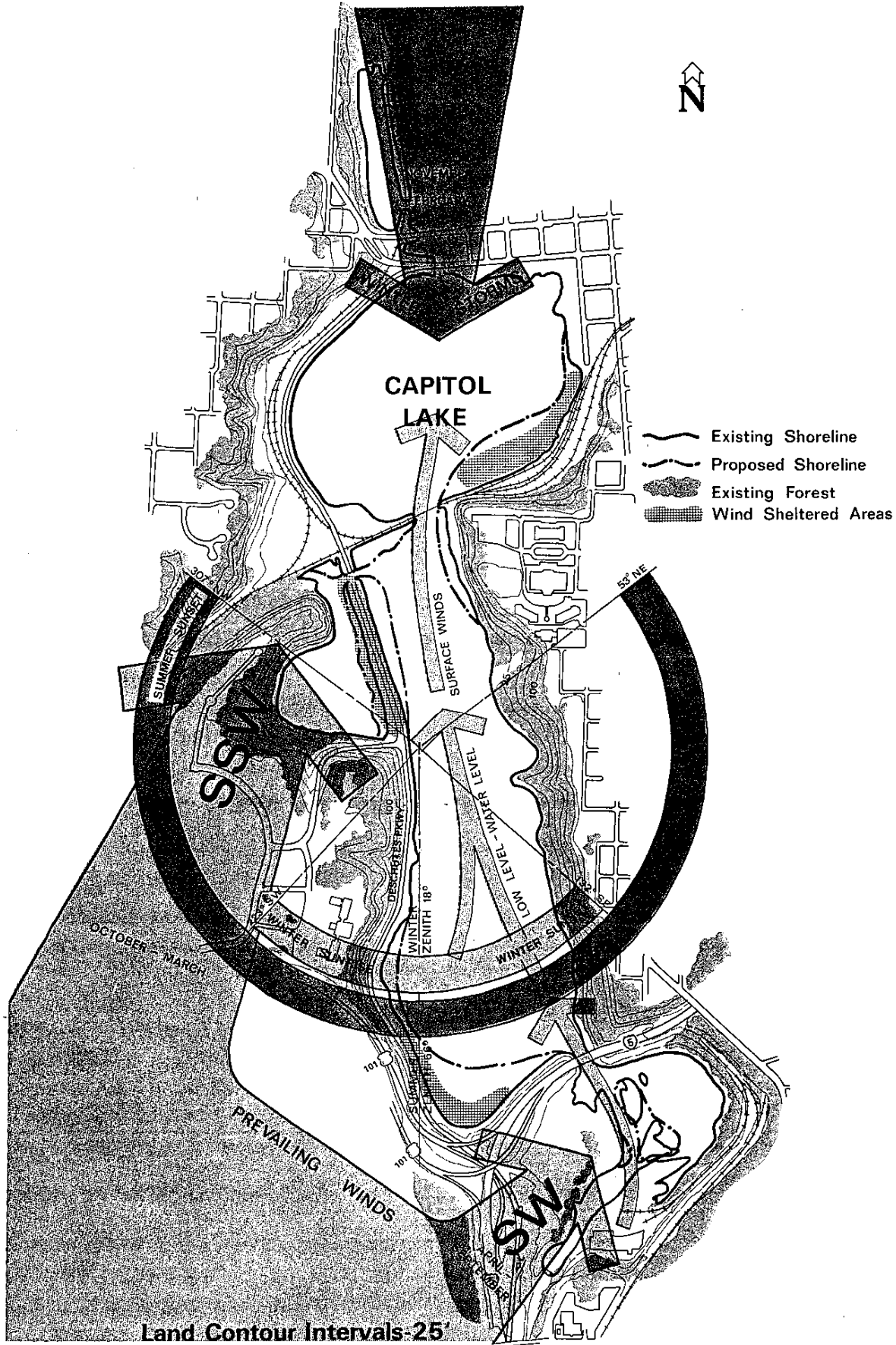
PHYSICAL CONSTRAINTS

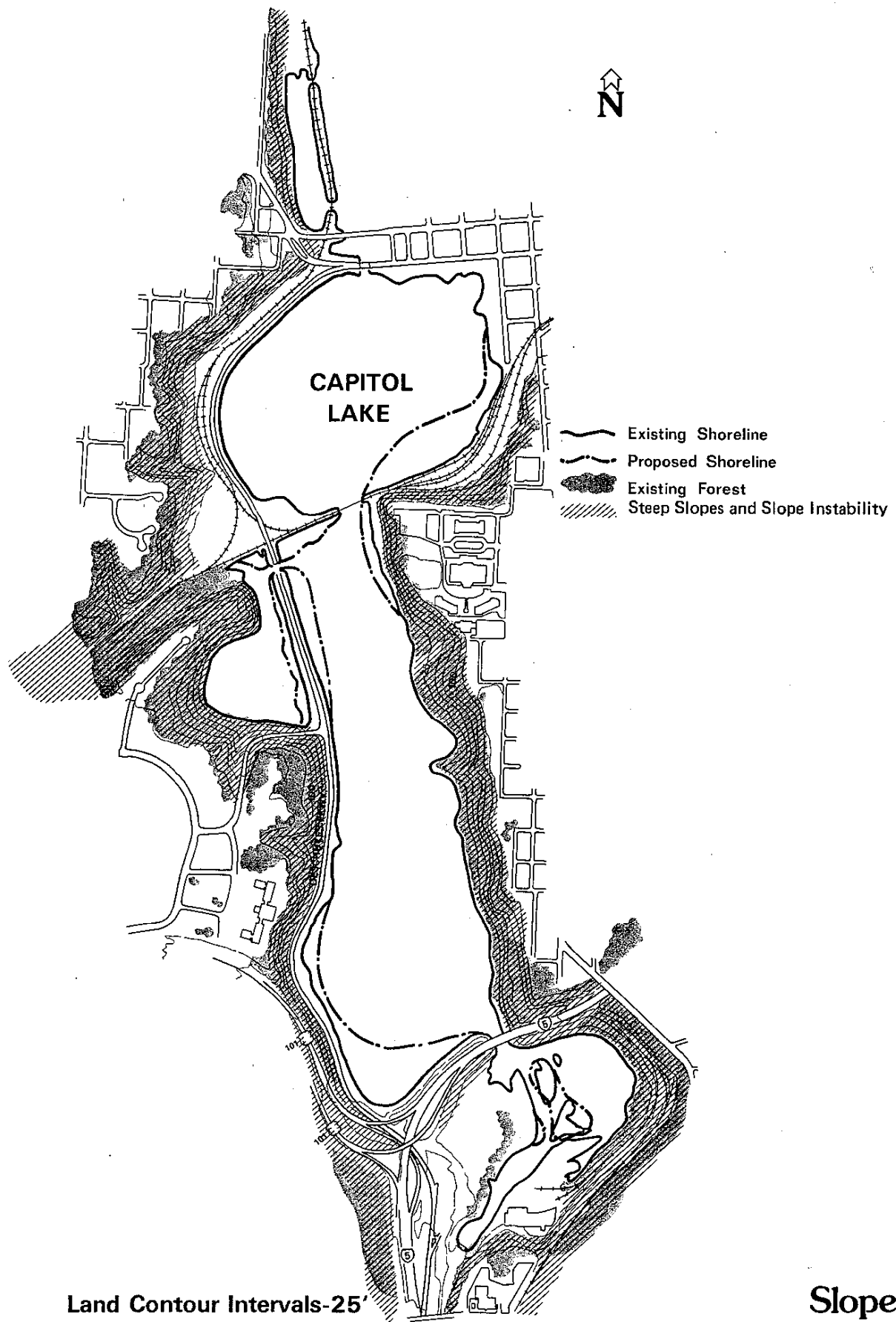
Sun angles are shown in figure 10. They range from the summer sunrise at 53 degrees (NE) to summer sunset at 307 degrees (NW) and from a winter sunrise at 132 degrees (SE) to winter sunset at 223 degrees (SW). The long summer days may have up to 16 hours of sunlight, while winter daylight is barely 8-1/2 hours. On the average, the percentage of clear daylight hours is only 19 percent in December; the July percentage is 62. The winter sun reaches a zenith of only 18 degrees, the summer sun 66 degrees. All of the areas indicated in the master plan for future swimming beaches will receive summer sun even though the land-to-water orientation is northerly.

Prevailing winds are from the south-southwest, with a strong winter flow from October to March. November is the exception, when there is a shift to the southwest (see figure 11). Summer winds prevail from the southwest, with June being the exceptional month when the flow moves back to south-southwest. Topography of the Capitol Lake basin modifies these prevailing winds to a certain extent. High ground southwest of the middle basin directs the lower level winds into the I-5 corridor and the Deschutes River channel, causing the wind direction to shift south. The fill for the I-5 bridge between the upper and middle basin also redirects water level breezes through the bridge in a south-southeast direction. The freeway embankment shelters the southwest corner of the middle basin from practically all wind. The steep bank around Percival Cove and the heights of the county courthouse site keep the corridor between the cove and the middle basin in a wind-sheltered area. And in contrast to the existing Capitol Lake Park swimming beach, the Burlington Northern site is sheltered from prevailing winds by the heights of the Capitol Campus, the building masses, and the wooded slopes.

The steep wooded slopes which so enhance the visual quality of the Capitol Lake basin will also preclude development from encroaching on the water edge. *The Plan for Olympia* has identified all of these slopes as unstable and not suitable for development (see figure 11). The slopes and their soils pose severe limitations for roads, buildings, and septic tanks. These slopes and Capitol Lake itself also lie within an area designated as environmentally hazardous; that is, an area identified by the *Olympia Area Land Capability Study*¹ as being the least suitable for development because of the potential for serious environmental damage. The high cost of hillside development is the principal reason these slopes and their forest cover have been spared

1 *The plan for Olympia*, op. cit., map plate.





Land Contour Intervals-25'

Slopes **11**

to this point. It is hoped that farsighted land use planning will continue to preserve these forests within the city.

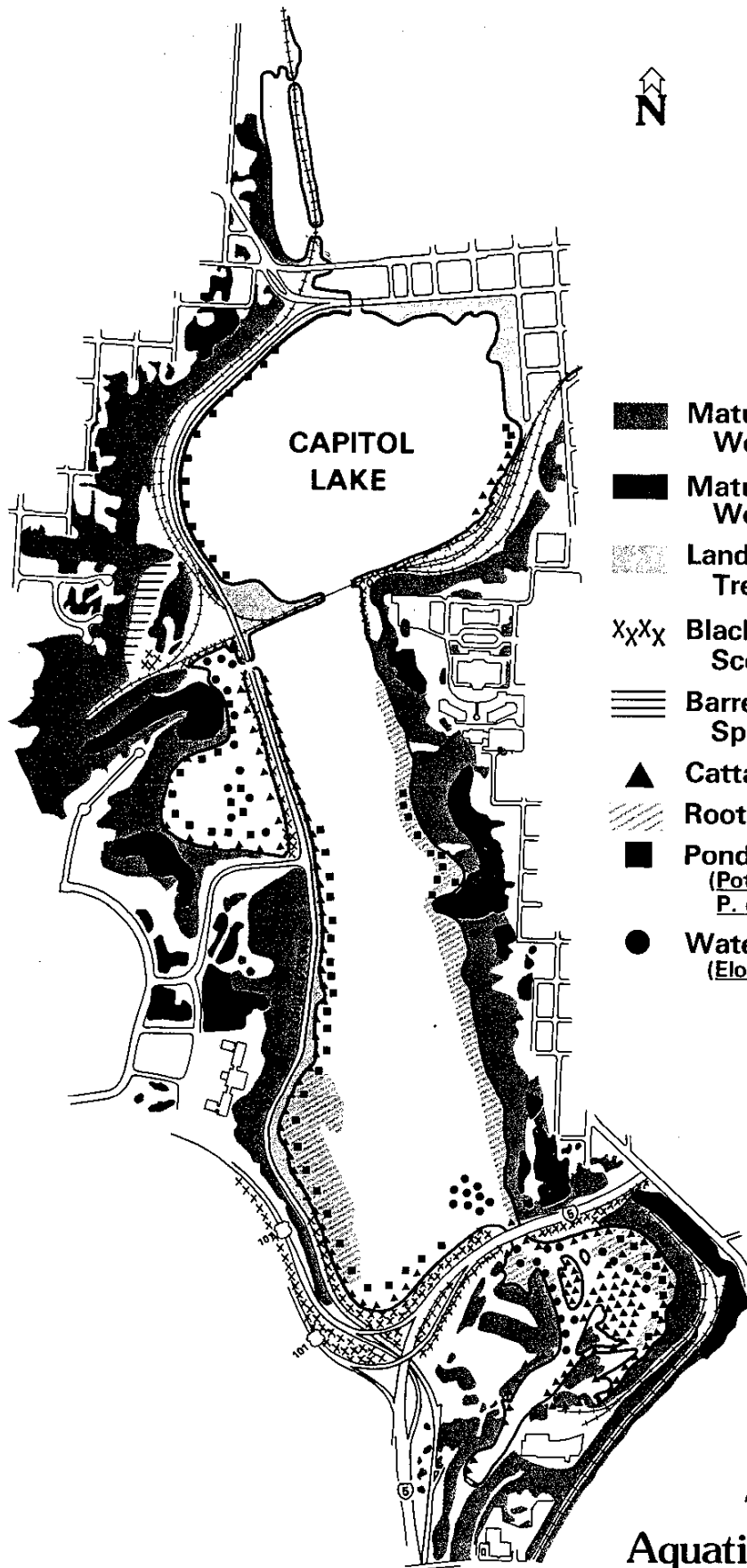
This forest and vegetation cover at the rim of Capitol Lake form the visual basin. The various major vegetation types are shown in figure 12. The vegetation is typical of the Pacific Northwest, with some identifiable areas that are either predominantly mixed deciduous woods or mixed conifer woods. In general, the tall evergreen overstory made up of fir, hemlock, and cedar is supported by deciduous alder, various species of maple, dogwood, poplar, beech, and oak. The forest floor is a mix of deciduous shrubs, evergreen groundcovers, ferns, and mosses. It is the large conifers that provide the "feathered edge" around the basin. This landscape character is unique to the Pacific Northwest and should be preserved.

The most evident manmade constraints are the various transportation corridors crossing and bordering the lake. The Deschutes Parkway along the west side of the lake serves as an alternate north-south traffic route for Olympia's central business district. The parkway is classified as a local street, not an arterial. In addition, connections to other streets at the south and north ends of the lake are poor and rely heavily on the bridges in the vicinity of the Olympia Brewery.¹ Currently available parking along the parkway is limited or restricted, causing many fishermen and boaters to park on the landscaped area. I-5 crosses the lake on an elevated bridge that also divides the upper basin from the middle basin. Railroad activity is also present in the Capitol Lake basin, acting as a noise generator and as a barrier and potential hazard to lake users. The major railroad activity takes place in the Burlington Northern marshalling yard at the southeast corner of the lower basin. The Burlington Northern bridge separates the middle basin from the lower basin, and switching and yard tracks surround three-fourths of the lower basin. One track also follows Percival Creek as it rises to the west from the lake basin.

NOISE

The noise levels in the lake area have been analyzed both for existing conditions (1975) and for projected conditions in the year 2000. As a background to this analysis, appendix E describes noise effects on human health, the measurement of noise, and the methodology used in the analysis.

¹ *Capitol Lake Restoration, Draft Environmental Impact Statement, CH2M HILL.*



Noise impacts associated with the proposed recreation plan result primarily from recreation-oriented traffic. No proposed uses, with the possible exception of the amphitheater and boating, would be expected to produce objectionable noise levels. The possible uses of the Percival Cove gravel pit area are not sufficiently known at this time to permit any evaluation of potential noise. The use of motorboats would be severely restricted or prohibited by the recreation plan, so that noise contributions should be insignificant from this source.

The plan-related increases in noise levels for the year 2000 are shown in table 3. In most cases this increase is negligible.

Table 3. NOISE IMPACTS

	Noise Levels (dBA ^a at 100 ft)							
	1975		2000				Increase From	
	L ₅₀ ^b	L ₁₀ ^c	No Park		With Park		Park Traffic	
		L ₅₀	L ₁₀	L ₅₀	L ₁₀	L ₅₀	L ₁₀	
Fourth Avenue	62	74	68	77	69	77	1	0
Fifth Avenue	62	74	63	74	62	74	-1	0
Deschutes Parkway North	52	56	54	58	56	59	2	1
Deschutes Parkway Middle	52	56	54	58	56	58	2	0
Deschutes Parkway South	51	55	53	57	54	58	1	1
Lakeridge Drive	45	51	48	52	49	53	1	1
Capitol Way South	63	74	67	76	67	76	0	0
Capitol Way North	62	74	66	76	66	76	0	0
Water Street South of Fifth	41	46	41	46	47	50	6	4
Water Street North of Fifth	41	46	41	46	45	48	4	2

a dBA is a noise intensity measurement that includes the sensitivity of the human ear in the determination of loudness. A loudness of 60 dBA corresponds to normal speech; 70 dBA, to a vacuum cleaner; 80 dBA, to a garbage disposal.

b L₅₀ is the noise level exceeded 50 percent of the time during the peak traffic hour.

c L₁₀ is the noise level exceeded 10 percent of the time during the peak traffic hour.

NOTE: These noise estimates are based on the assumption that traffic is and will continue to be the dominant noise source, and are based on estimates of present and future traffic.

Lower Basin

The noise levels along Fourth and Fifth Avenues at a 100-foot distance are calculated to have an L_{10} of about 74 dBA at present. Without the park, this is expected to increase about 3 dBA by 2000 for Fourth Avenue and remain unchanged for Fifth Avenue because of rerouting. On weekends, the predicted noise levels would probably be about 5 dBA lower during peak hours, thus producing weekend noise levels in the adjacent park within the design L_{10} of 70 dBA. The park project does not influence the future average annual traffic flows on those two streets enough to have any noise impact.

The greatest park-related noise level increases in the study area were predicted for Water Street. An increase of about 10 dBA is predicted for this street in the year 2000, but only 4 dBA will be caused by park-related traffic. The noise levels will possibly be higher due to traffic on Fourth and Fifth Avenues, Columbia Street, and Capitol Way. However, the perceivable impact will be slight because the area is not residential and because of noise from the nearby railroad marshalling yard.

The Deschutes Parkway will only generate an L_{10} of about 59 dBA at 100 feet in the year 2000. This noise level would make several areas along the west side of the lower and middle basins suitable for serenity and quiet.¹ A specific area of low noise level will be the park area and bridge separating the lower and middle basins, except when train traffic uses the railroad bridge.

The provision of berms and planting between the marshalling yard and the lake will provide a visual and acoustic barrier for the marshalling yard. The proposed berms could effect about a 15 dBA reduction at 100 feet; the traffic-generated noise of about 50 dBA from Fifth Street across the lake will then become predominant.

Middle Basin

The southwest corner will be subject to the highest noise levels in the park. Berms can effectively reduce the noise levels from the Deschutes Parkway only; the predominant sources are U.S. 101 and I-5. Both of these are elevated too high to be fully shielded by noise barriers. However, a small excess attenuation² can be expected due to tree plantings on the highway embankment. This attenuation is estimated at about 3 dBA per 100 feet, but will vary depending on the forest density and tree type. Without excess attenuation, the 100-foot dBA levels in table 3 will be about 6 dBA lower at 200 feet and about 6 dBA higher at 50 feet.

1 An L_{10} of 60 dBA is considered suitable for serenity and quiet. An L_{10} of 70 dBA is suitable for active sports. (See appendix E)

2 Excess attenuation is the noise reduction in excess of 6 dBA per doubling of distance outdoors with no barrier of any type.

With no effective barriers, the L_{10} for the year 2000 will approach 70 dBA at a distance of 300 feet from I-5. At 150 feet, which is the average point of contact between I-5 and the shoreline trail, the L_{10} would be approximately 72 dBA assuming heavy tree plantings on the freeway embankments. At 1,200 feet west of I-5 and 100 feet from Deschutes Parkway, the L_{10} will be about 65 dBA. The predominant noise source will be I-5 at all points within 800 feet of it. The predicted noise levels are consistent with active sports areas and parks. The noise levels in this area are not likely to be increased by park-related traffic.

Noise from Capitol Way will not be increased due to the project. However, the L_{10} levels at 100 feet will increase by 9 dBA due to nonpark-related traffic. This increase is not likely to impact Capitol Lake because the street is elevated about 150 feet above the park and is several blocks away from the eastern lakeshore. In addition, the rows of residences and buildings along Capitol Way will attenuate noise levels 3 to 5 dBA per row, with a maximum excess attenuation of 10 dBA.

Upper Basin

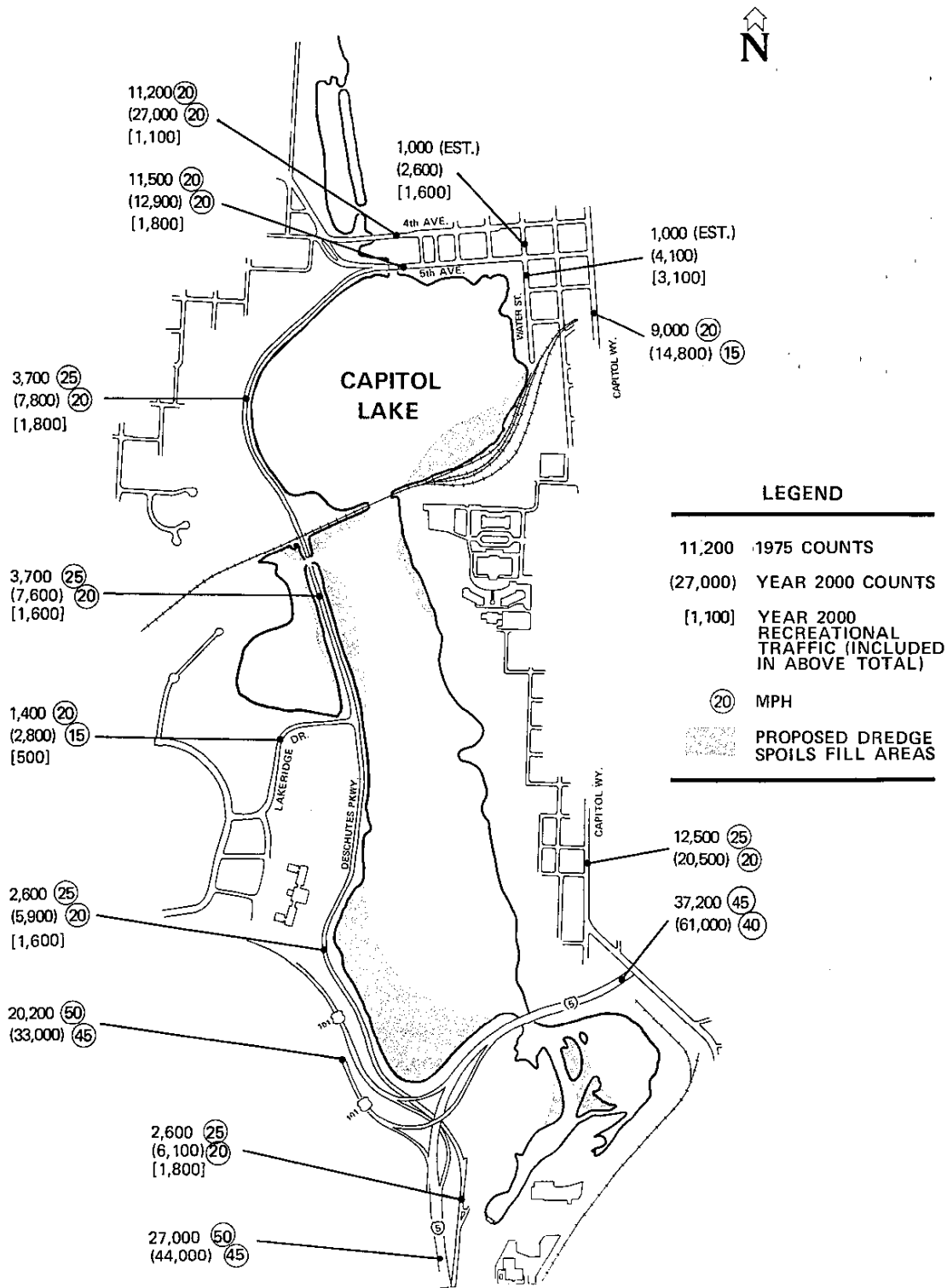
I-5 will continue to be the predominant noise source in the upper basin. Noise levels will approximate those estimated for comparable distances in the southwest corner of the middle basin. These noise levels could increase slightly depending on the results of studies by the Department of Highways on the feasibility of freeway widening in this area.

TRAFFIC

Traffic impacts have been estimated for the year 2000 to coincide with the end of maintenance dredging and the completion of the recreation plan development. The peak-8-hour traffic volumes and average speeds for 1976 and the year 2000 are shown in figure 13. The methodology used in preparing the traffic estimates is described in appendix F.

The primary impact of the vehicular volumes will be at pedestrian and bicycle crossings. The crossing at Fifth Avenue may be hazardous due to the high vehicular volumes and proximity to the intersection with the Deschutes Parkway. Plans would include a pedestrian grade separation if the area north of Fifth Avenue is developed.

Traffic volumes along Deschutes Parkway will be substantially lower than those on Fifth Avenue. The proposed four trail crossings will increase pedestrian/bicycle exposure to traffic. To mitigate the impact on traffic, the proposed



- a. Based on data from the Thurston Regional Planning Council
- b. Based on population estimates obtained by extrapolating planning council population projections through 1990.
- c. Based on population projections and sample telephone survey.

Peak-8-Hour Traffic Estimates 13

crossings should be signed and possibly signal controlled. Landscape barriers should be added to discourage crossing at undesignated locations.

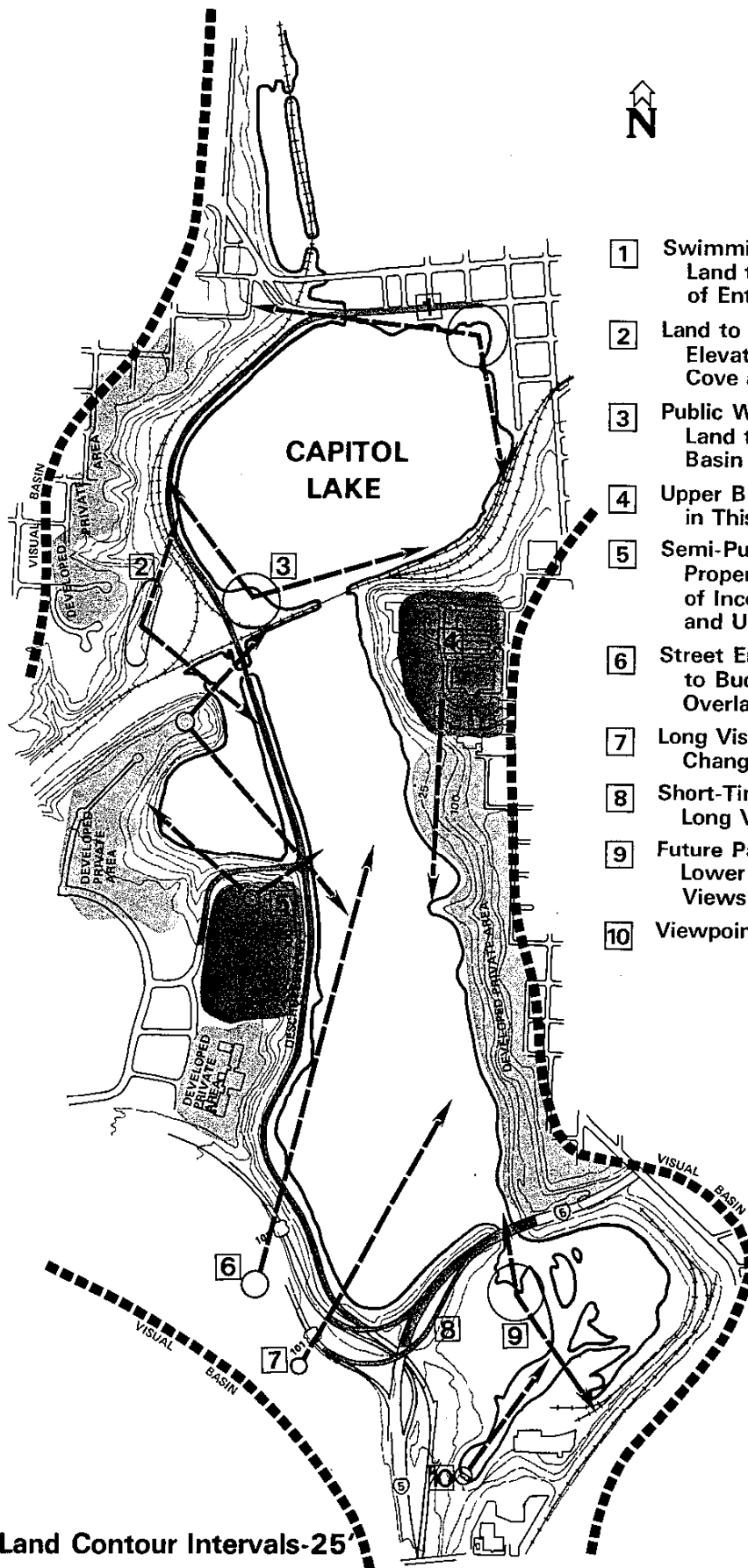
The projected vehicular volumes will probably cause congestion at the northeast corner of the lower basin and the southwest corner of the middle basin. In both cases, a causative factor will be a lack of parking adequate for the probable intensity of beach and swimming activities.

The access to the northeast corner of the lower basin will be restricted by heavy traffic volumes along the Fourth Avenue - Fifth Avenue corridor. Most of the traffic in this arterial corridor will not be lake-related because it is the only route north of the lake for east/west access across town.

VISUAL ANALYSIS

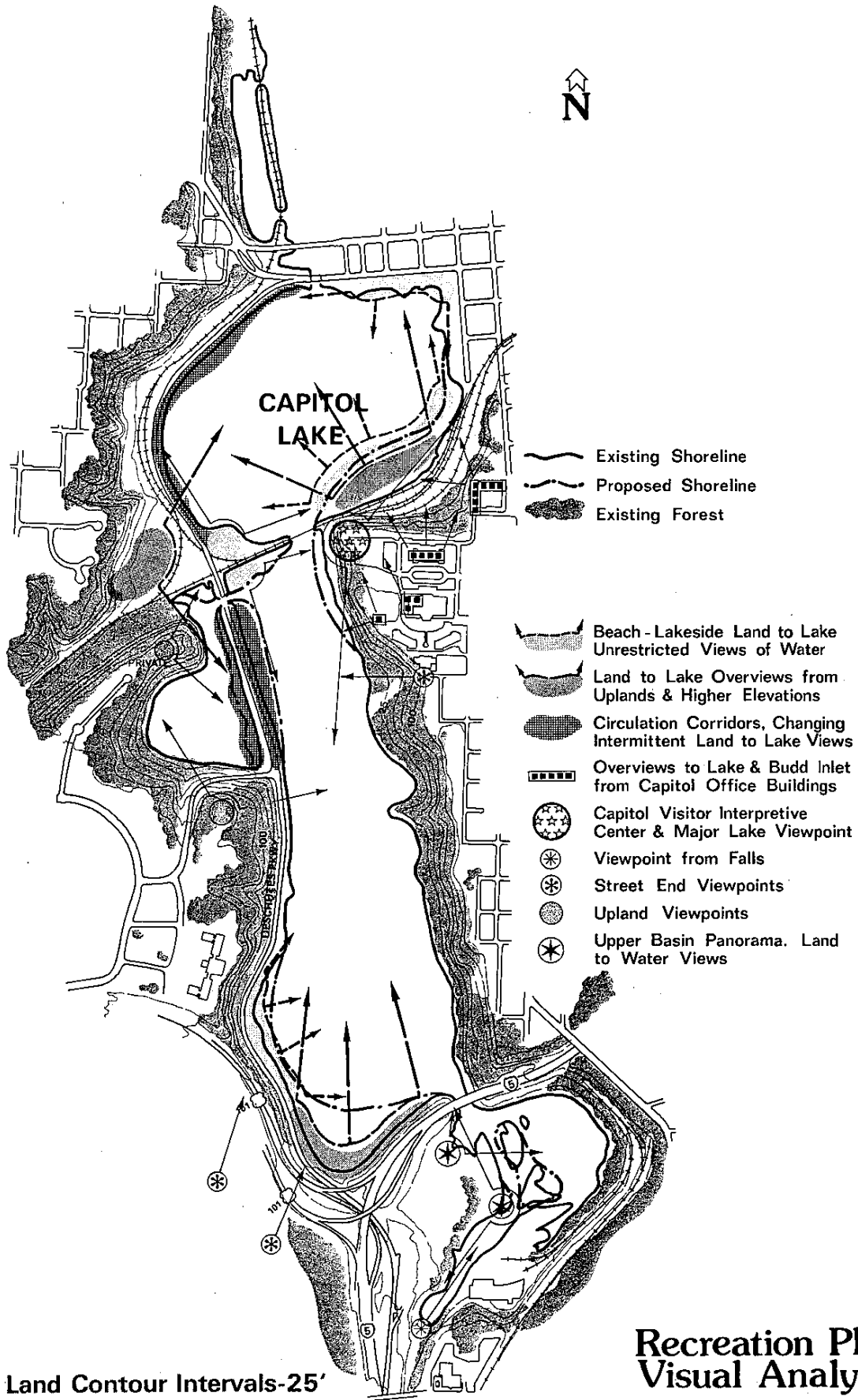
The most striking feature of Capitol Lake is the view of the Capitol and the wooded slopes reflected in the lake surface. The lake provides an aesthetically dramatic setting for the Capitol buildings. This unique panorama can be viewed from street-end view points and scenic overlooks that rise more than 125 feet above the lake. This same view can be seen from I-5 and U.S. 101, portions of the Deschutes Parkway, and Fifth Avenue. All views from the roadways are short time-interval views. Outstanding views of the lake are available from several points along the edge of the Capitol Campus and from many of the buildings on their north and west sides. The proposed county courthouse site also offers magnificent views of Percival Cove and the entire lake basin. The view of the eastern shore with undisturbed forest cover running from water's edge to the crest of the slope is a dynamic contrast, extremely unusual and seldom found in an urban setting.

Unrestricted lower basin views can also be had from the swimming beach and public park at the northeast corner of the lower basin and the public waterfront facility at the southwest end. The middle basin may be viewed from the entire length of the Deschutes Parkway. The upper basin can be seen from a view point at the falls, from the existing boat launch area, and from the site of the proposed Tumwater City Park. These view points are identified on figure 14. Figure 15 shows a visual analysis of the lake basins on completion of the recreation plan development. Of major significance is the increase in areas of beach and lakeshore land-to-water views and upland land-to-lake overviews. Construction of the interpretive center view point would create the key link between the Capitol Campus and Capitol Lake even before completion of the trail system.



- 1 Swimming Beach and Public Park
Land to Lake Unrestricted Views
of Entire Upper Basin Area
- 2 Land to Lake Overviews from Higher
Elevations, Upper Basin, Percival
Cove and Portions of Middle Basin
- 3 Public Waterfront Facility
Land to Lake Views of Entire Upper
Basin to Budd Inlet and Beyond
- 4 Upper Basin Overviews from Buildings
in This Area
- 5 Semi-Public Area, County Owned
Property. Percival Cove Overview
of Incorporated Portions of Middle
and Upper Basins
- 6 Street End Viewpoints. Long Vista
to Budd Inlet, Land to Lake and
Overlake Views. Undeveloped
- 7 Long Vistas of Middle Basin.
Changing Panoramas
- 8 Short-Time Interval Views
Long Vistas Land to Water
- 9 Future Park Site. Panorama of Entire
Lower Basin Area. Land to Water
Views
- 10 Viewpoint from Falls

Land Contour Intervals-25'





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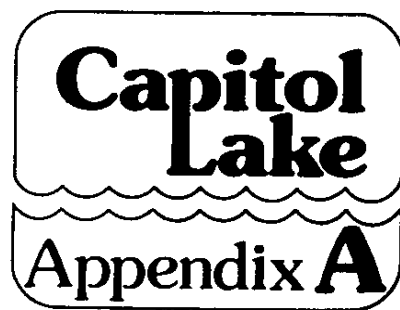
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Recreation
Facilities Inventory

■ ■ Appendix A
 ■ ■ RECREATION FACILITIES INVENTORY

The areas described in this inventory are shown in figure A-1.

NEIGHBORHOODS SURROUNDING CAPITOL LAKE

Southwest

1975 Population	2,720
1990 Population	5,300
1995 Population	6,160

Recreation facilities available: None

1975 needs	6.1 acres
Surplus (+) or deficiency (-)	-6.1 acres
1990 needs	11.9 acres
Surplus (+) or deficiency (-)	-11.9 acres
1995 needs	13.8 acres
Surplus (+) or deficiency (-)	-13.8 acres

Future school sites could be consolidated with recreation facilities to help correct this situation.

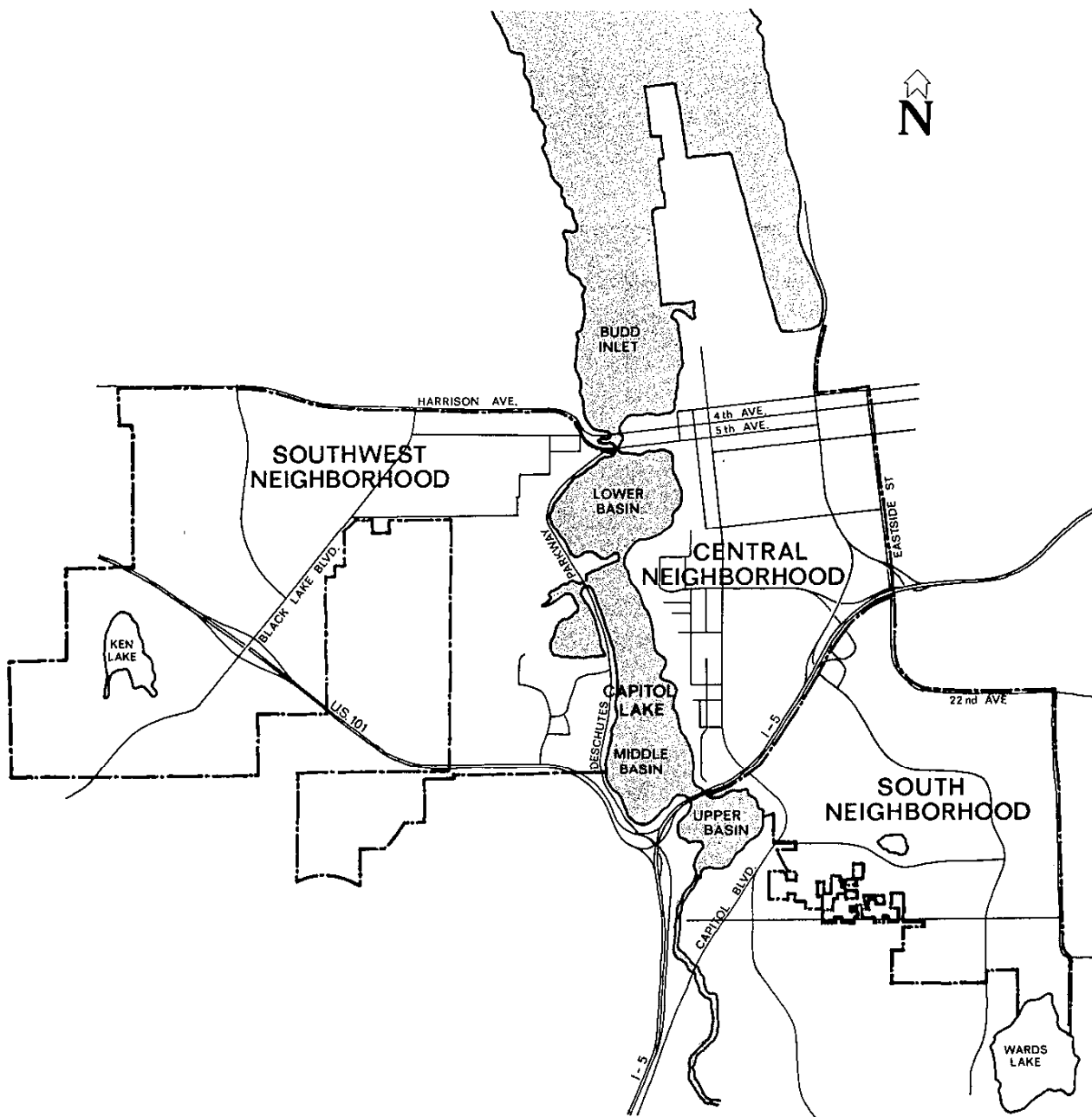
Central

1975 Population	3,600
1990 Population	3,800
1995 Population	3,850

Recreation Facilities Available	
Sylvester Park	1.3 acres
Lincoln Elementary School	1.2 acres
Total	<u>2.5 acres</u>

1975 needs	8.2 acres
Surplus (+) or deficiency (-)	-5.7 acres
1990 needs	8.6 acres
Surplus (+) or deficiency (-)	-6.1 acres
1995 needs	8.7 acres
Surplus (+) or deficiency (-)	-6.2 acres

Although there appears to be a deficiency of recreation facilities in this neighborhood, the City of Olympia Master Plan includes Stevens Field, the State Capitol Campus, Capitol Lake Park, and Capitol Lake itself as contiguous facilities available to residents of this neighborhood; in reality there is no shortage of park and recreation facilities.



Capitol Lake
Neighborhoods **A-1**

South

1975 Population	3,350
1990 Population	3,600
1995 Population	3,680

Recreation Facilities Available	
Pioneer Elementary School	2.0 acres
Total	2.0 acres

1975 needs	7.5 acres
Surplus (+) or deficiency (-)	-5.5 acres
1990 needs	8.1 acres
Surplus (+) or deficiency (-)	-6.1 acres
1995 needs	8.2 acres
Surplus (+) or deficiency (-)	-6.2 acres

Although this neighborhood has adequate recreation facilities at the school sites, there is a need for additional park facilities. The city watershed, currently undeveloped, could fulfill that need. Access to the upper basin of Capitol Lake could be improved with a trail system along the east slope and a crossing at Capitol Boulevard.

COMMUNITIES NOT ADJACENT TO CAPITOL LAKE

West Side Community

1975 Population	6,230
1990 Population	11,000
1995 Population	12,600

Recreational Facilities Available	
Jefferson Junior High School	6.0 acres
Capitol High School	<u>10.8 acres</u>
Total	<u>16.8 acres</u>

1975 needs	12.5 acres
Surplus (+) or deficiency (-)	+4.3 acres
1990 needs	22.0 acres
Surplus (+) or deficiency (-)	-5.2 acres
1995 needs	25.5 acres
Surplus (+) or deficiency (-)	-8.7 acres

Recreation facilities on the community level at the west side are presently adequate, but anticipated rapid growth will generate a need for additional acreage. The schools provide recreation facilities; the community parks provide primarily passive activities. There will be a need for a community park on the southwest side. A developed trail system along Percival Creek would greatly increase the community access to the Capitol Lake basin. Private property enclosing the rim of the lake basin now isolates the lake

recreation areas from access by any means other than private vehicles. Passive recreation areas developed on the shores of Capitol Lake would help provide the passive recreation areas needed before the major portion of the population growth occurs.

Disposal of dredged material in the Percival Cove gravel pit and development of that area into an active recreation area could help relieve some of the burden that now falls on busy Stevens Field.

East Bay/Central/Eastside Community

1975 Population	11,000
1990 Population	12,600
1995 Population	13,150

Recreational Facilities Available

Reeves Junior High School	4.0 acres
Old Washington Junior High School	3.5 acres
Stevens Field	<u>10.0 acres</u>
Total	<u>17.5 acres</u>

1975 needs	22.0 acres
Surplus (+) or deficiency (-)	-4.5 acres
1990 needs	25.2 acres
Surplus (+) or deficiency (-)	-7.7 acres
1995 needs	26.3 acres
Surplus (+) or deficiency (-)	-8.8 acres

Because this area is already densely developed, the acquisition of additional park areas, especially a single large park site, would be difficult. There is a shortage of facilities for court games and tennis, as well as a shortage of passive recreation areas. The eventual development of the area north of the Burlington Northern marshalling yard as a continuation of the open space recreation system around the lower basin will increase the passive recreation area this community needs. The trail link from the Capitol Campus to the lake will help to integrate the Capitol Campus and Capitol gardens more readily into the open space fabric of the community.

South/Southeast/Northeast

1975 Population	8,020
1990 Population	11,700
1995 Population	12,920

Recreation Facilities Available

Miller High School	13.0 acres
Little Baseball Athletic Park	17.0 acres
Washington Junior High School	<u>3.0 acres</u>
Total	<u>33.0 acres</u>

1975 needs	16.0 acres
Surplus (+) or deficiency (-)	+17.0 acres
1990 needs	23.4 acres
Surplus (+) or deficiency (-)	+9.6 acres
1995 needs	25.8 acres
Surplus (+) or deficiency (-)	+7.2 acres

Although there are ample recreation facilities for the present and foreseeable future, there are no community parks in any of these neighborhoods. The potential development of the city watershed area remains a viable objective for the city; another objective would be a connecting link from the upper basin of Capitol Lake to the watershed area.



Detailed
Cost Estimates

Table B-1. UPPER BASIN ISLAND

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost (\$)</u>	<u>Labor Item Total (\$)</u>	<u>Materials Unit Cost (\$)</u>	<u>Materials Item Total (\$)</u>	<u>Item Subtotal (\$)</u>
Rough grading	9,500 cu yd	0.45	4,275	0.05	475	4,750
Fine grading	3.51 ac	867.00	3,040	433.00	1,520	4,560
Topsoil	50 cu yd	5.10	255	3.40	170	425
Hydroseed and fertilize	.51 ac	150.00	75	650.00	330	405
Shrubs	300 ea	6.00	1,800	4.00	1,200	3,000
Trees	40 ea	60.00	2,400	40.00	1,600	4,000
Aquatic plant establishment	3 ac	2,500.00	7,500	1,000.00	3,000	10,500
			<u>19,345</u>		<u>8,295</u>	<u>27,640</u>
Construction contingency (15%)						<u>4,150</u>
TOTAL						31,790

Table B-2. MIDDLE BASIN NORTHWEST CORNER

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost (\$)</u>	<u>Labor Item Total (\$)</u>	<u>Materials Unit Cost (\$)</u>	<u>Materials Item Total (\$)</u>	<u>Item Subtotal (\$)</u>
Rough grading	2,500 cu yd	0.45	1,125	0.05	125	1,250
Fine grading	2.57 ac	867.00	2,230	433.00	1,100	3,340
Hydroseed and fertilize	.7 ac	150.00	105	650.00	455	560
Wooden fishing piers	100 lf	16.25	1,625	8.75	875	2,500
Bicycle/foot trail	5,600 cu ft	0.33	1,848	0.17	952	2,800
Boat launch and access road	500 lf	16.50	8,250	8.50	4,250	12,500
Irrigation	81,600 sq ft	0.10	8,160	0.10	8,160	16,320
Topsoil	1,050 cu yd	5.10	5,355	3.40	3,570	8,925
Seed and fertilize	81,600 sq ft	0.004	326	0.076	6,204	6,530
Trees	50 ea	60.00	3,000	40.00	2,000	5,000
			<u>32,024</u>		<u>27,701</u>	<u>59,725</u>
Construction contingency (15%)						<u>8,960</u>
TOTAL						68,685

Table B-3. POWERHOUSE FILL, EAST SHORE AND HILLSIDE

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost</u> (\$)	<u>Labor Item Total</u> (\$)	<u>Materials Unit Cost</u> (\$)	<u>Materials Item Total</u> (\$)	<u>Item Subtotal</u> (\$)
Clear and grub for arboretum walk	2.93 ac	875.00	2,565	625.00	1,830	4,395
Rough grading	4,800 cu yd	0.45	2,160	0.05	240	2,400
Fine grading	7.8 ac	867.00	6,765	433.00	3,375	10,140
Hydroseed and fertilize	3.02 ac	150.00	455	650.00	1,962	2,415
Aquatic plant establishment	.5 ac	2,500.00	1,250	1,000.00	500	1,750
View point	2 ea	4,000.00	8,000	3,500.00	7,000	15,000
View point/interpretive center with comfort station facilities	1 ea	36,000.00	36,000	24,000.00	24,000	60,000
Topsoil	200 cu yd	5.10	1,020	3.40	680	1,700
Seed and fertilize	87,000 sq ft	0.004	348	0.076	6,612	6,960
Irrigation	127,000 sq ft	0.10	12,700	0.10	12,700	25,400
Bicycle/foot trail	21,600 sq ft	0.33	7,128	0.17	3,672	10,800
Foot trail	25,200 sq ft	0.17	4,284	0.08	2,016	6,300
Shrubs	2,000 ea	12.00	24,000	8.00	16,000	40,000
Trees	100 ea	60.00	6,000	40.00	4,000	10,000
Asphalt removal	2,200 sq yd	0.75	1,650	0.85	1,870	3,520
Asphalt paving (northwest parking lot)	25,300 sq ft	0.37	9,361	0.23	5,819	15,180
Utilities						
Sewer	900 lf	3.50	3,150	2.50	2,250	5,400
Water	900 lf	1.75	1,575	1.25	1,125	2,700
Electricity	900 lf	1.75	1,575	1.25	1,125	2,700
Interpretive center graphics	Lump sum	4,250.00	<u>4,250</u>	750.00	<u>750</u>	<u>5,000</u>
TOTAL			134,234		97,526	231,760

Table B-4. MIDDLE BASIN SOUTHWEST CORNER

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost (\$)</u>	<u>Labor Item Total (\$)</u>	<u>Materials Unit Cost (\$)</u>	<u>Materials Item Total (\$)</u>	<u>Item Subtotal (\$)</u>
Rough grading	19,000 cu yd	0.45	8,550	0.05	950	9,500
Fine grading	17.65 ac	867.00	15,320	433.00	7,640	22,960
Aquatic plant establishment	4.46 ac	2,500.00	11,150	1,000.00	4,460	15,610
Beach (sand in place)	1,900 cu yd	4.50	8,550	2.50	4,750	13,300
Hydroseed and fertilize	3.89 ac	150.00	583	650.00	2,517	3,100
Promenade	8,000 sq ft	2.00	16,000	0.50	4,000	20,000
Boardwalk	300 lf	20.00	6,000	10.00	3,000	9,000
Clear and grub for bicycle/ foot trail	.37 ac	500.00	185	400.00	150	335
Bicycle/foot trail	68,800 sq ft	0.33	22,704	0.17	11,696	34,400
Foot trail	21,000 sq ft	0.17	3,570	0.08	1,680	5,250
Picnic tables on slabs	25 ea	300.00	7,500	300.00	7,500	15,000
Litter baskets	10 ea	100.00	1,000	150.00	1,500	2,500
Benches	20 ea	175.00	3,500	125.00	2,500	6,000
Topsoil	6,000 cu yd	5.10	30,600	3.40	20,400	51,000
Irrigation	442,500 sq ft	0.10	44,250	0.10	44,250	88,500
Seed and fertilize	442,500 sq ft	0.004	1,770	0.076	33,630	35,400
Shrubs	1,000 ea	12.00	12,000	8.00	8,000	20,000
Trees	700 ea	60.00	42,000	40.00	28,000	70,000
Footbridge under I-5	160 lf	125.00	20,000	50.00	8,000	28,000
Comfort station	1 ea	30,000.00	30,000	20,000.00	20,000	50,000
Utilities						
Sewer	2,200 lf	3.50	7,700	2.50	5,500	13,200
Water	2,200 lf	1.75	3,850	1.25	2,750	6,600
Electricity	200 lf	1.75	350	1.25	250	600
Covered picnic tables	3 ea	1,100.00	3,300	700.00	2,100	5,400
			<u>300,432</u>		<u>225,223</u>	<u>525,655</u>
Construction contingency (15%)						<u>78,845</u>
TOTAL						604,500

Table B-5. MIDDLE BASIN SOUTHWEST CORNER EXTENSION

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost (\$)</u>	<u>Labor Item Total (\$)</u>	<u>Materials Unit Cost (\$)</u>	<u>Materials Item Total (\$)</u>	<u>Item Subtotal (\$)</u>
Rough grading	2,000 cu yd	0.45	900	0.05	100	1,000
Fine grading	2.9 ac	867.00	2,515	433.00	1,255	3,770
Aquatic plant establishment	.4 ac	2,500.00	1,000	1,000.00	400	1,400
Beach (sand in place)	370 cu yd	4.50	1,665	2.50	925	2,590
Hydroseed and fertilize	.4 ac	150.00	60	650.00	260	320
Irrigation	94,700 sq ft	0.10	9,470	0.10	9,470	18,940
Seed and fertilize	94,700 sq ft	0.004	380	0.076	7,200	7,580
Shrubs	100 ea	12.00	1,200	8.00	800	2,000
Trees	70 ea	60.00	4,200	40.00	2,800	7,000
Topsoil	800 cu yd	5.10	4,080	3.40	2,720	6,800
Promenade	3,200 sq ft	2.00	6,400	0.50	1,600	8,000
Bicycle/foot trail	8,000 sq ft	0.33	2,640	0.17	1,360	4,000
Picnic tables on slabs	4 ea	300.00	1,200	300.00	1,200	2,400
Litter baskets	2 ea	100.00	200	150.00	300	500
Covered picnic table	1 ea	1,100.00	1,100	700.00	700	1,800
			<u>37,010</u>		<u>31,090</u>	<u>68,100</u>
Construction contingency (15%)						<u>10,215</u>
TOTAL						<u>78,315</u>

Table B-6. MIDDLE BASIN WEST SHORE

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost</u> (\$)	<u>Labor Item Total</u> (\$)	<u>Materials Unit Cost</u> (\$)	<u>Materials Item Total</u> (\$)	<u>Item Subtotal</u> (\$)
Rough grading	7,500 cu yd	0.45	3,375	0.05	375	3,750
Fine grading	4.57 ac	867.00	3,962	433.00	1,978	5,940
Topsoil	1,800 cu yd	5.10	9,180	3.40	6,120	15,300
Hydroseed and fertilize	0.83 ac	150.00	130	650.00	540	670
Irrigation	141,200 sq ft	0.10	14,120	0.10	14,120	28,240
Seed and fertilize	141,200 sq ft	0.004	565	0.076	10,735	11,300
Wooden fishing piers	100 lf	16.25	1,625	8.75	875	2,500
Trees	150 ea	60.00	9,000	40.00	6,000	15,000
Shrubs	200 ea	6.00	1,200	4.00	800	2,000
Bicycle/foot trail	27,200 sq ft	0.33	8,986	0.17	4,624	13,600
Pedestrian bridge	130 lf	75.00	9,750	50.00	6,500	16,250
Benches	10 ea	175.00	1,750	125.00	1,250	3,000
Aquatic plant establishment	0.5 ac	2,500.00	1,250	1,000.00	500	1,750
			<u>64,893</u>		<u>54,407</u>	<u>119,300</u>
Construction contingency (15%)						<u>17,900</u>
TOTAL						137,200

Table B-7. SOUTHEAST LOWER BASIN
BURLINGTON NORTHERN SITE

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost</u> (\$)	<u>Labor Item Total</u> (\$)	<u>Materials Unit Cost</u> (\$)	<u>Materials Item Total</u> (\$)	<u>Item Subtotal</u> (\$)
Rough grading	22,000 cu yd	0.45	9,900	0.05	1,100	11,000
Fine grading	13.68 ac	867.00	11,860	433.00	5,940	17,800
Topsoil	4,900 cu yd	5.10	24,990	3.40	16,660	41,650
Hydroseed and fertilize	2.77 ac	150.00	420	650.00	1,800	2,220
Seed and fertilize	327,600 sq ft	0.004	1,310	0.076	24,900	26,210
Beach (sand in place)	4,700 cu yd	4.50	21,150	2.50	11,750	32,900
Promenade	22,080 sq ft	2.00	44,160	0.50	11,040	55,200
Picnic tables on slabs	25 ea	300.00	7,500	300.00	7,500	15,000
Litter baskets	10 ea	100.00	1,000	150.00	1,500	2,500
Irrigation	327,600 sq ft	0.10	32,760	0.10	32,760	65,520
Bicycle/foot trail	28,000 sq ft	0.33	9,240	0.17	4,760	14,000
Benches	30 ea	175.00	5,250	125.00	3,750	9,000
Shrubs	500 ea	9.00	4,500	6.00	3,000	7,500
Trees	400 ea	60.00	24,000	40.00	16,000	40,000
Pedestrian bridge over railroad	120 lf	90.00	10,800	60.00	7,200	18,000
Security fence at railroad	2,500 lf	2.75	6,875	4.25	10,625	17,500
Comfort station	1 ea	30,000.00	30,000	20,000.00	20,000	50,000
Utilities						
Sewer	1,100 lf	3.50	3,850	2.50	2,750	6,600
Water	1,100 lf	1.75	1,925	1.25	1,375	3,300
Electricity	1,100 lf	1.75	1,925	1.25	1,375	3,300
			<u>253,410</u>		<u>185,790</u>	<u>439,200</u>
Construction contingency (15%)						<u>65,880</u>
TOTAL						505,080

Table B-8. PERCIVAL COVE NORTHEAST CORNER

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost</u> (\$)	<u>Labor Item Total</u> (\$)	<u>Materials Unit Cost</u> (\$)	<u>Materials Item Total</u> (\$)	<u>Item Subtotal</u> (\$)
Rough grading	1,700 cu yd	0.45	765	0.05	85	850
Fine grading	1.58 ac	867.00	1,370	433.00	685	2,055
Hydroseed and fertilize	.17 ac	150.00	25	650.00	110	135
Bicycle/foot trail	12,800 sq ft	0.33	4,224	0.17	2,176	6,400
Topsoil	770 cu yd	5.10	3,927	3.40	2,618	6,545
Seed and fertilize	61,200 sq ft	0.004	249	0.076	4,651	4,900
Irrigation	61,200 sq ft	0.10	6,120	0.10	6,120	12,240
Trees	35 ea	60.00	2,100	40.00	1,400	3,500
Picnic tables on slabs	6 ea	300.00	1,800	300.00	1,800	3,600
Litter baskets	2 ea	100.00	200	150.00	300	500
			<u>20,780</u>		<u>19,945</u>	<u>40,725</u>
Construction contingency (15%)						<u>6,110</u>
TOTAL						46,835

Table B-9. PERCIVAL COVE EAST BANK

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost (\$)</u>	<u>Labor Item Total (\$)</u>	<u>Materials Unit Cost (\$)</u>	<u>Materials Item Total (\$)</u>	<u>Item Subtotal (\$)</u>
Rough grading	7,500 cu yd	0.45	3,375	0.05	375	3,750
Fine grading	5.2 ac	867.00	4,508	433.00	2,252	6,760
Hydroseed and fertilize	1.31 ac	150.00	196	650.00	854	1,050
Topsoil	1,800 cu yd	5.10	9,180	3.40	6,120	15,300
Seed and fertilize	142,800 sq ft	0.004	571	0.076	10,859	11,430
Irrigation	142,800 sq ft	0.10	14,280	0.10	14,280	28,560
Shrubs	600 ea	6.00	3,600	4.00	2,400	6,000
Trees	150 ea	60.00	9,000	40.00	6,000	15,000
Bicycle/foot trail	26,800 sq ft	0.33	8,844	0.17	4,556	13,400
Wooden fishing piers	200 lf	16.25	3,250	8.25	1,650	5,000
			<u>56,904</u>		<u>49,346</u>	<u>106,250</u>
Construction contingency (15%)						<u>15,940</u>
TOTAL						122,190

Table B-10. PERCIVAL COVE GRAVEL PIT

<u>Item</u>	<u>Quantity</u>	<u>Labor Unit Cost</u> (\$)	<u>Labor Item Total</u> (\$)	<u>Materials Unit Cost</u> (\$)	<u>Materials Item Total</u> (\$)	<u>Item Subtotal</u> (\$)
Rough grading	17,500 cu yd	0.45	7,875	0.05	875	8,750
Fine grading	10.6 ac	867.00	9,190	433.00	4,590	13,780
Topsoil	3,200 cu yd	5.10	16,320	3.40	10,880	27,200
Hydroseed and fertilize	3.55 ac	150.00	535	650.00	2,305	2,840
Children's play area	1 ea	18,000.00	18,000	12,000.00	12,000	30,000
Parking lots	38,800 sq ft	0.38	14,744	0.22	8,536	23,280
Irrigation	258,800 sq ft	0.10	25,880	0.10	25,880	51,760
Seed and fertilize	258,800 sq ft	0.004	1,030	0.076	19,670	20,700
Shrubs	500 ea	12.00	6,000	8.00	4,000	10,000
Trees	300 ea	60.00	18,000	40.00	12,000	30,000
Bicycle/foot trail	36,800 sq ft	0.33	12,144	0.17	6,256	18,400
Comfort station	1 ea	30,000.00	30,000	20,000.00	20,000	50,000
Utilities						
Sewer	450 lf	3.50	1,575	2.50	1,125	2,700
Water	1,350 lf	1.75	2,362	1.25	1,688	4,050
Electricity	450 lf	1.75	787	1.25	563	1,350
Picnic shelters	3 ea	15,000.00	45,000	10,000.00	30,000	75,000
			<u>209,442</u>		<u>160,368</u>	<u>369,810</u>
Construction Contingency (15%)						<u>55,470</u>
TOTAL						425,280



Opinion Surveys

TELEPHONE SURVEY

The following is a synopsis of a telephone survey conducted by GMA Research, Inc., regarding the Capital Lake Recreation Plan. For the survey, 384 Olympia area respondents were interviewed telephonically by GMA between 27 April and 1 May 1976. Respondents were all over 18 and selected at random from the Olympia telephone directory. Quotas were maintained to ensure an equal representation of males and females.

Q1. How familiar would you say you are with the Capitol Lake area?

A1. Very familiar	38.8%
Somewhat familiar	44.3%
Not familiar	16.9%
Total	100.0%

(More than eight out of ten surveyed replied that they are familiar with the Capitol Lake area.)

Q2. What do you like most about Capitol Lake?

A2. The top items mentioned were as follows: 134 mentioned the scenic quality of the lake (view of the lake or from the lake), 32 mentioned swimming, 15 mentioned fishing, 13 mentioned convenience to city, and 10 mentioned location.

Q3. What don't you like about the lake?

A3. 118 could not think of anything objectional about the lake; 70 listed water pollution/odor/mud; 53 felt it was too shallow and full of silt.

Q4. Have you ever visited the lake?

A4. More than nine out of ten of those familiar with Capitol Lake have visited the lake at some time.

Q5. During the last 12 months, how many times did you visit Capitol Lake?

A5. Forty-five percent reported 5 visits or less during the year. Visit frequency was evenly distributed among all frequency categories.

Q6a. Do you feel there is or is not adequate access to the water at Capitol Lake?

A6a. A majority of those surveyed feel access to Capitol Lake is adequate.

Q6b. Those who indicated they were familiar with Capitol Lake, had at some time visited the lake, and who felt that access is not adequate were asked: Where do you feel more access should be--in the upper basin closest to Tumwater, in the middle basin between I-5 and the railroad bridge or in the north basin closest to Olympia?

A6b. Twenty-four percent reported that access to the upper basin is most needed, with the middle basin second and access to the north basin least needed.

Q7. During the last 12 months, in which, if any, of the following activities have you participated?

Picnicking	62%	Fish viewing	44%
Swimming	43%	Fishing	40%
Nature study	32%	Bird watching	31%
Hiking	31%	Outdoor ball sports	30%
Motorboating	27%	Non-motorboating	26%
Train watching	16%	Water skiing	11%
		Total	100%

Q8. I am going to read a list of activities and facilities that could be provided in the Capitol Lake area. Would you please tell me if you feel these activities and facilities are very important, important, or not very important to the development of the Capitol Lake Area?

	<u>Very Important</u>	<u>Important</u>	<u>Not Very Important</u>	<u>Don't Know</u>
Swimming	47%	42%	9%	2%
Picnicking	46%	44%	8%	2%
Fishing	33%	49%	16%	3%
Fish viewing	31%	45%	22%	3%
Nature study	30%	48%	18%	3%
Non-motorboating	30%	45%	22%	4%
Hiking	27%	43%	27%	4%
Ball sports	22%	44%	31%	3%
Bird watching	22%	42%	33%	3%
Water skiing	12%	33%	53%	3%
Motorboating	10%	30%	57%	3%
Train watching	5%	27%	65%	4%

Comment: Respondents indicate a preference for quiet, nonobtrusive activities at Capitol Lake--swimming, picnicking, fishing, and the like. Strongest opposition is to high-profile, noisy activities, such as water skiing, motorboating, and train watching.

- Q9. About how long have you lived in the Olympia area?
- A9. Seventy-six percent replied 5 or more years. Compared to other areas, the persons polled tend to be long-term residents.
- Q10. How many people are in your family, including yourself?
- A10.
- | | |
|-------------|----------------|
| One | 10.1% |
| Two | 28.8% |
| Three | 17.9% |
| Four | 22.3% |
| Five | 11.2% |
| Six or more | 9.6% |
| Total | <u>100.00%</u> |

QUESTIONNAIRES

The telephone survey questions were used as the basis for a written questionnaire that was completed by attendees at meetings held throughout the planning period.¹ This questionnaire measured public opinion toward the goals developed by the concerned organizations and elicited more specific responses to the plan design. Results were:

	Yes	No	No Opinion	Number of Responses
Recognition of Capitol Lake as a key part of the capitol campus, and therefore of statewide significance.	84.7%	9.7%	5.6%	72
Preservation of the visual quality, wildlife, active and passive uses, and other environmental characteristics of the lake.	91.5 ^a	5.6	2.8	71
Preservation of the biological processes within the upper (south) basin, except in the area required for desilting operations.	88.6 ^b	7.1	4.3	70
Conservation of the terrestrial vegetation within the entire visual basin of Capitol Lake.	81.7	12.7	5.6	71
Protection of the key fish propagation areas of Capitol Lake, such as Percival Cove.	93.1	5.6	1.4	72

	<u>Yes</u>	<u>No</u>	<u>No Opinion</u>	<u>Number of Responses</u>
Encouragement of land use measures within the Deschutes Basin that will decrease sediment loading.	90.1	2.8	7.0	71

- a Three responses (4.2%) crossed out "active."
b Six responses (8.6%) crossed out last half of sentence.

To the question, "Would you suggest other goals?", the most frequent responses were "Development of only the lower basin," (three responses), and "Expansion of the salmon rearing facilities", (three responses). A total of 99.4 percent of respondents indicated they were somewhat familiar or very familiar with the lake. The lake features most liked were aesthetic beauty, convenient location, solitude in the city, and varied recreational opportunities. The most disliked features were its increasing shallowness (15 responses) and the use of the lake for boat racing (8 responses). All respondents had visited Capitol Lake at some time; the highest frequency of visitation during the past year was 30 or more times (37 percent). The period of greatest use was the weekend (40 percent); next was both weekend and weekday use (32 percent); and least was weekday use (28 percent). The automobile was the most common mode of transportation (60 percent), followed by walking (21 percent), and bicycle (16 percent). Other means of transportation were cited by 3 percent of the respondents; none traveled to the lake by bus.

To the question, "Do you feel there is adequate access to the water at Capitol Lake for these activities," 82 percent said access for viewing was adequate; 61 percent thought access adequate for fishing; 69 percent for swimming or wading, and 43 percent for boating. In response to the question of what type of access is needed, 41 percent wanted more pedestrian access, 28 percent wanted more bicycle access, and 31 percent wanted more boat launching access. Not everyone responded to the question, "Where do you feel more access should be for the following activities?" Responses varied as follows:

Canoeing, rowing					
Upper basin	45.7	32.6	19.6	2.2	46
Middle basin	43.2	47.7	9.1		44
Lower basin	52.1	39.6	8.3		48
Sailing					
Upper basin	23.5	14.7	58.8	2.9	34
Middle basin	33.3	42.9	21.4	2.4	42
Lower basin	58.0	30.0	12.0		50
Fishing	67.4	30.4	2.2		46
Nature study	65.1	27.9	7.0		43
Boat launching	40.9	25.0	34.1		44
Swimming	59.1	34.1	6.8		44
Fish viewing	52.3	43.2	4.5		44
Waterskiing	22.2	11.1	55.6	11.1	36
Bird watching	56.1	29.3	14.6		41
Picnicking					
Family	63.0	23.9	13.0		46
Large group	27.8	16.7	55.6		36
Barbeque pits	24.3	27.0	48.6		37
Horseshoes	21.4	21.4	57.1		42
Jogging	41.3	32.6	26.1		46
Hiking	51.1	34.0	14.9		47
Bicycling	46.7	31.1	22.2		45
Train watching	15.8	21.1	63.2		38
Ball sports	20.0	22.5	57.5		40
Children's playground activities	45.0	35.0	20.0		40

The numbers of persons in the families of the respondents were:

One	5.3%	Four	31.6%
Two	38.6%	Five	8.8%
Three	14.0%	Six or more	1.8%

As with the telephone survey, respondents to the written questionnaire were relatively long-time residents. A total of 83 percent have lived in the Olympia-Lacey-Tumwater area for 5 years or more. Questionnaire respondents tended to live closer to the lake than the telephone survey respondents; 28 percent lived within a mile, 34 percent within 2 to 3 miles, 19 percent within 4 to 5 miles, 9 percent within 6 to 7 miles, 5 percent within 8 to 9 miles, 3 percent within 10 to 15 miles, and only 2 percent over 15 miles.

Age groupings were:

Age		Age	
18 - 24	5.2%	45 - 54	31.0%
25 - 34	15.5%	55 - 64	15.5%
35 - 44	19.0%	65+	13.8%

Ownership of motorboats, canoes, rowboats, and bicycles was:

Motorboat	17 people own 1;	2 people own 5
Canoe	8 people own 1	
Rowboat	8 people own 1;	1 owns 2;
	1 owns 3;	1 owns 4
Bicycle	11 people own 1;	11 own 2; 3 own 3;
	4 own 4;	1 owns 5

THURSTON COUNTY SURVEY

The comprehensive recreation survey recently completed by C. Montgomery Johnson Associates for the Thurston County Parks and Recreation Department indicated the following desired facilities and priorities:

- Nearly two-thirds of the respondents said there was a need for more outdoor recreational facilities, with outdoor facilities favored over indoor.
- The two most needed items are saltwater and freshwater beach access. Respondents indicated by a ratio of nearly 9 to 1 that it is important to acquire these sites.
- The three highest priority items for development are bike lanes on existing roads, park facilities at existing county park sites, and nature trails and an arboretum.
- The great majority of respondents said that funding for parks and recreation programs is too low.
- Fishing, bike riding, and boating were the top three vote-getters in the category of "most important outdoor activity." General use of recreational park areas and waterfront areas for picnicking, playground use, walking, etc., placed sixth in the voting. Tennis was seventh and swimming eighth. Scenic driving and sightseeing tied for 22nd position with "no preference."
- Individual respondents commented on the lack of bike trails, running and jogging trails, nature trails, and hiking trails.

- A desire for beach access without boats was expressed as well as the need for fishing docks, protected waters for canoeing, sailboating, and fresh- and saltwater picnic areas "away from motors, swimming, noise, hustle, and bustle."
- Over 70 percent of the respondents owned a bicycle or had one available for use.



Freeway
Embankment
Plant List

■ ■ Appendix D
 ■ ■ FREEWAY EMBANKMENT PLANT LIST

Based on a 4-year study of vegetation cover for highway rights-of-way conducted by the Washington State Highway Commission,¹ the following plant list has been compiled to indicate average survival percentages for unirrigated freeway embankment plantings. Survival rates for 15 sites within Thurston County make up these averages.² Plants for Capitol Lake freeway embankments will be chosen from this state highway commission report.

Douglas Fir	29%
Shore Pine	64%
Vine Maple	33%
Norway Maple	25%
Amur Maple	64%
Red Maple	24%
Western Red Cedar	13%
Pacific Dogwood	15%
Red Osier Dogwood	96%
Western Hemlock	0%
London Plane	30%
Staghorn Sumac	56%
Smooth Sumac	55%
Leather-leaf Viburnum	20%
Spirea	43%
Oregon Grape	29%
Green Ash	13%
Hazelnut	5%
Deodar Cedar	0%
Photinia	14%
Pacific Madrone	15%
Bolleana Poplar	0%
Ponderosa Pine	30%
Sweet Brier Rose	71%

¹ Rosenthal, Russell N. Washington State Highway Commission. October 1973. Unpublished. *Vegetation Cover for Highway Rights-of-Way Interim Report (1970-1973)*.

² 1975 updated percentages.



Noise Level
Analysis

Appendix E NOISE LEVEL ANALYSIS

This appendix details the criteria and methodology used in assessing the impacts of noise from the proposed recreation plan.

HEALTH EFFECTS OF NOISE¹

There are two basic ways that noise affects people--psychological and physiological. The psychological effects are difficult to measure because they are dependent upon the individual and characteristics of the sound other than intensity. People who are exposed to high noise levels while at work may be less sensitive to community noise intrusion. Also, continuous noise, such as traffic noise, has been found to be less annoying than intermittent noise.

UNITS OF NOISE MEASUREMENT²

Every person reacts differently to sound levels and many attempts have been made to find a simple measure of sound that correlates well with the human response to typical traffic environments.

There are many single units of noise measurement that have been developed to reflect the human perception and reaction to noise. The unit dBA is such a measure of sound intensity and is designed to weight each frequency according to its magnitude relative to varying thresholds of human perception. Since the weighting cannot reflect the response of a variable population, statistical human auditory data were used to construct the weighting factors (L_A) which take into account such characteristics of the human ear as its sensitivity to high frequencies (above 1,000 Hz). It is important to understand that the dBA scale is a logarithmic rather than a linear measure of sound intensity; consequently, a 10-dBA sound level increase denotes a factor of 10 higher in intensity, while a 20-dBA increase denotes a factor of 100.

The dBA was used as the noise descriptor for this impact assessment because it not only correlates well with human perception and response to noise but is also used by many Federal and state agencies for standards and ordinances.

Because the ambient noise level in an urban or suburban area is primarily established by traffic noise that has a random and varying source, a statistical measure of noise denoted L_{10} is used for evaluation. This is the noise level exceeded 10 percent of the time during the peak traffic hour. The L_{10} dBA levels have been found to correlate well with human annoyance and also conform with the approved methods of the Federal Highway Administration (FHWA) in evaluating impacts from highways.

¹ Beranek, Leo L., ed. 1971. *Noise and Vibration Control*. McGraw-Hill.
² Ibid.

The Federal Highway Administration standards require anticipated noise levels to be computed for noise sensitive areas on the basis of the worst situation expected to occur from the traffic generator. The standards also contain design noise levels for different exterior land uses and activities. The design noise levels in the standards should not be exceeded more than 10 percent of the time during the worst hour of the day during a year (L_{10}). This statistical description is needed because of the fluctuation of noise levels with time. For active sports areas and parks, the design noise level is 70 A-weighted decibels (dBA). For serenity and quiet, the design noise level is 60 dBA. This means that where the design noise level is met, the dBA level would be exceeded not more than 6 minutes during the hour when the worst noise conditions exist. For 54 minutes of this hour, the noise would be less than the design noise level.

NOISE PREDICTION METHODOLOGY

Noise levels were predicted using the approved FHWA procedure with a mathematical model programmed for computation by the Michigan Department of State Highways. The computer program predicts L_{10} at selected points. These levels are a result of traffic sources that make up the urban noise environment. Predicted L_A assumes vehicle noise characteristics will remain unchanged in the future.

The following evaluation procedures were used:

- The existing traffic-generated noise levels at 11 locations were calculated based on 1975 traffic counts.
- The traffic noise levels were predicted for the year 2000 from projected normal traffic volumes.
- Traffic noise levels at sites with an increment of traffic volume attributable to the recreation project were predicted for the year 2000.
- The noise levels both with and without the recreation project were compared to determine the traffic noise impact of this project.
- The increases in traffic noise from now to 2000 were evaluated to determine the noise impact of normal traffic volume increases.
- The values of traffic noise levels were compared to design noise levels to measure the relative effects on the park's environment.



Traffic
Analysis

■ ■ Appendix F
■ ■ TRAFFIC ANALYSIS

Estimates of traffic volumes are based on projections for population, travel, and facility usage. The following methodology was used to develop these estimates.

Population projections were derived from existing sources¹ up to the year 1990, and were then extrapolated to the year 2000. Travel projections for these periods indicate that traffic volumes along the northern lake corridor will exceed the capacity of the existing roadways by 1990. There are plans to widen the bridge on Fourth Avenue to four lanes to partially accommodate the projected traffic volumes. No other corridor improvements are currently anticipated by the City of Olympia and Tumwater transportation planners.

To estimate usage of the recreational facilities, sample telephone interviews² were used to gather data including usage of Capitol Lake for the past 12 months and the proximity of the users to the lake. For the year 2000, population estimates combined with the results of the telephone survey indicate that peak usage on a typical August Sunday would approach 11,000 people per day. This usage was apportioned to the various areas around the lake based on the recreational facilities programmed to be available in 2000.

The person-trips were factored by an estimated travel mode distribution and vehicle occupancy ratio peculiar to the recreational activity in each area. The resulting number of vehicle trips per day was compared to the proposed available parking in each area, considering the probable recreational parking turnover rate per day.

The recreational trip total was then assigned to various segments of roadway surrounding the lake based on engineering judgment of the probable avenues of access to the Capitol Lake area. These trips were added to the year 2000 traffic volume forecasts that were estimated by extrapolating current City of Olympia traffic volume counts. Traffic volumes on Fourth and Fifth Avenues were reapportioned to reflect the probable effect of a four-lane bridge on Fourth Avenue.

1 Data from Thurston Regional Planning Council.

2 Presented in GMA Research Corporation, *Capitol Lake Opinion Survey*, May 1976.

