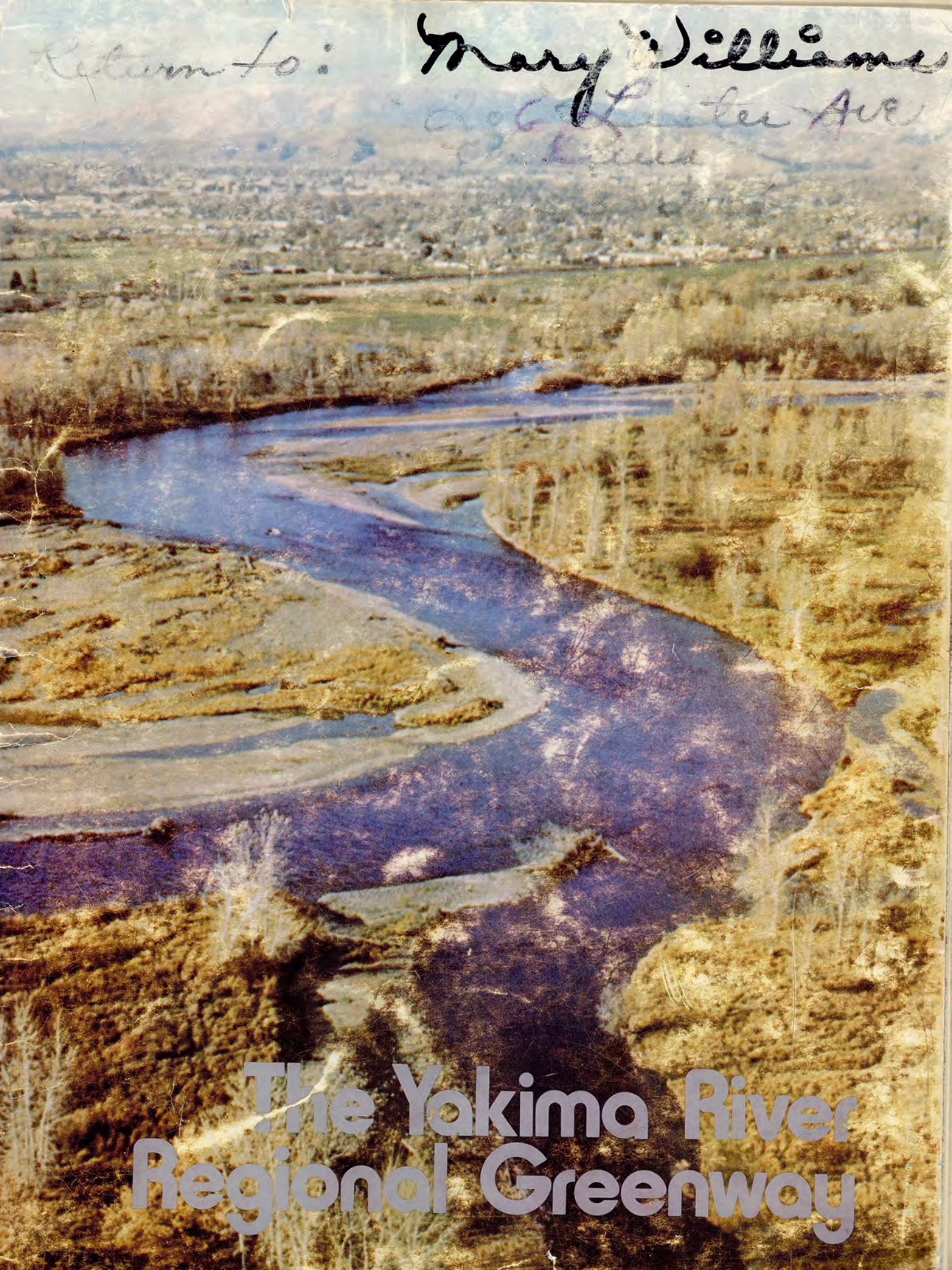


The Yakima River Regional Greenway

#23 Mary Williams

Please return to:

Yakima Greenway Foundation
111 South 18th Street
Yakima, WA 98901-2149

902

105 SOUTH MAIN STREET

JONES
&
JONES

SEATTLE 98104, 624-5702

1 September 1976

Mr. William Hutsinpiller, Director
City of Yakima Dept. of Parks & Recreation
Project Manager, Yakima River Greenway Study
117 North Second Street
Yakima, Washington 98901

Dear Mr. Hutsinpiller:

We are pleased to submit this final report documenting the natural resource and recreational value of the Yakima River corridor from Selah Gap to Union Gap.

This work presents the unique geologic, historic, hydrologic, biologic, and recreational features of the study area; it establishes their importance to the people of the Yakima Valley and Washington State.

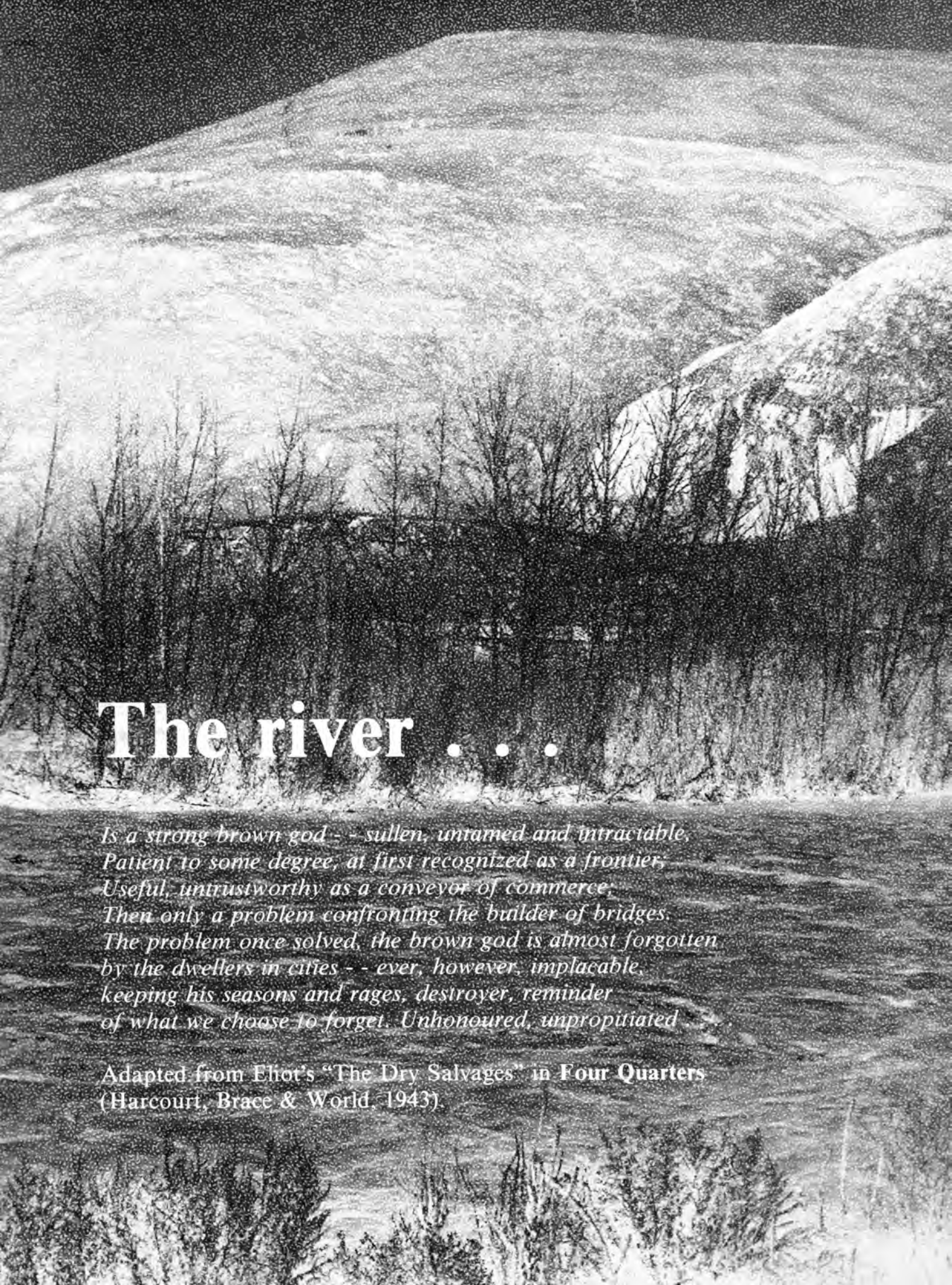
We trust that this report will help to establish the gap-to-gap river reach as both an important site for diverse recreation and as an invaluable natural system deserving care and protection. We believe our work documents the proposed greenway as an outstanding opportunity of civic, regional, and statewide significance.

It has been a genuine pleasure working with you all on this challenging project, and we look forward to presenting our findings to the City and County of Yakima, to the Washington State Parks and Recreation Commission, and to the Washington State Legislature.

Respectfully submitted,

Grant R. Jones

Grant R. Jones, Principal-in-Charge
JONES & JONES



The river . . .

Is a strong brown god - - sullen, untamed and intractable,
Patient to some degree, at first recognized as a frontier;
Useful, untrustworthy as a conveyor of commerce;
Then only a problem confronting the builder of bridges.
The problem once solved, the brown god is almost forgotten
by the dwellers in cities - - ever, however, implacable,
keeping his seasons and rages, destroyer, reminder
of what we choose to forget. Unhonoured, unpropitiated . . .

Adapted from Eliot's "The Dry Salvages" in **Four Quarters** (Harcourt, Brace & World, 1943).

This study is financed by the Washington State Legislature through the Washington State Parks and Recreation Commission. It is administered by the City of Yakima Department of Parks and Recreation in cooperation with the Yakima County Planning Department, Washington State Parks, and the Freeway Park Advisory Committee.

Directing Personnel:

William Hutsinpiller, Director, City of Yakima Department of Parks and Recreation
Warren Sutliff, Director, Yakima County Planning Department
Lynn Martin, Capital Budget Coordinator, Washington State Parks and Recreation Commission
Richard C. Smith, Chairman, Freeway Park Advisory Committee

Project Staff:

Jones & Jones:
- Grant R. Jones, principal-in-charge
- Kenneth Caldwell, project coordination and production
- John Furtado, research and resource analysis
- Rick Kimball, property investigation and analysis
- John Ady, resource analysis
- Diana Sleeth, fiscal management
- Peter Harvard, photo-interpretation
- Johnpaul Jones, architectural concepts

Hydrology and Fluvial Geomorphology:
- Dr. Thomas Dunne
- William Dietrich
- David Nimick
- (Department of Geological Sciences, University of Washington)

Ecology and Habitat Analysis:
- Dr. Dennis Paulson, consulting biologist

Engineering Consultation:
- John Scott (Kramer, Chin and Mayo)

Special Photography:
- Garnie Quitslund
- Thomas Mallard

Gratitude is expressed to all who supplied information or otherwise aided this study.

June, 1976

BACKGROUND AND PURPOSE OF THIS REPORT

There is a long history of attempts to protect the Yakima River as it passes metropolitan Yakima. Since as early as 1959, the Yakima area has formally debated the formation of a Yakima "River Park." In 1964, a schematic plan for a "Yakima Valley Regional Park" was prepared, but was not implemented.

Meanwhile, Interstate Highway 82 was on the boards; with the coming of the Freeway, stronger land-use pressures would soon bear on the river. During this same period, the Yakima Canyon Scenic and Recreational Highway was created (1968); thus the first (and still the only) state-protected portion of the Yakima River was formed.

Again in 1969, the Chamber of Commerce solicited endorsements for the creation of a "Regional Freeway Park" from 82 civic, religious, and fraternal organizations, and local agencies enlisted the Washington State Parks and Recreation Commission to help form a plan of action and seek State funding. In 1970, the Rivers Preservation Act was prepared and submitted to the State Legislature, which approved the concept but denied state funding. No significant action resulted.

With the U. S. Army Corps of Engineers studying the river for flood control, the concept of a "Freeway Park" was presented in the City of Yakima's park plan (May 1974) and later in the County's recreation plan. A "Riverfront Regional Park" and two "Regional Greenway Parks" (middle valley and lower valley) were incorporated into the County Comprehensive Plan in May of 1975. A Freeway Park Advisory Committee was also formed in 1975, and through the efforts of Representatives Ed Seeberger and Jim Whiteside, the State Legislature appropriated funds for a comprehensive master plan study of the area between Selah Gap and Union Gap.* Late in 1975, the firm of Jones & Jones was engaged to perform a thorough analysis of the study area and prepare master plan recommendations. In January of 1976, Jones & Jones made an initial presentation of their early findings. In March of 1976, they presented a progress report containing a brief distillation of findings to date on the study area's physical and man-made systems, park potential, land-use alternatives, and implementation strategies, culminating

* *Not more than $35,000 shall be expended within the* (State Parks) *administrative services program for the purpose of studying the feasibility, desirability, and need for a greenway along the Yakima River from Selah Gap to Union Gap.*

in a preliminary master plan. These findings were then reviewed by the administering agencies, the County Commissioners, and the Freeway Park Advisory Committee.

The purpose of this final report is to provide the administering agencies (and interested private groups) with sufficient detail to allow them to begin implementation of the greenway. For information on the current status of the project, inquiries should be sent to Mr.William Hutsinpiller, Director, City of Yakima Department of Parks and Recreation, 117 North Second Street, Yakima, Washington 98901.

The Yakima river park/greenway concept has been discussed for nearly a generation--over 17 years. As we reflect on the 200th anniversary of this country's foundation, it seems more than appropriate that the greenway should come to fruition, and that mere discussion should come to an end.

FINDINGS

1. A continuous open-space, park, and natural-area corridor between Selah Gap and Union Gap is feasible and desirable, and there is an evident public need for a continuous greenway in that area.

2. The study area contains uniquely valuable wetland areas of unusual size and richness for an arid locale.

3. The study area is being surrounded by the Yakima Urban Area, and is therefore threatened.

4. The study area is part of an important north-south State Trails corridor:
   water trail .... Kittitas Valley to the Columbia
   foot/horse trail.. Kittitas Valley to Yakima
   bicycle trail .... Kittitas Valley to the Columbia.

5. There is potential for connecting this reach to the Yakima Canyon reach to form a continuous conservation and recreation corridor.

6. There is enthusiastic public support for a river-park in the study area.

7. A significant part of the reach is publicly owned (City of Yakima, Washington State, Yakima County); thus there is great opportunity for cementing and expanding public ownership to protect the entire reach.

8. There is an unparalleled opportunity for the social and environmental enhancement of the Yakima Urban Area through the formation of a greenway.

9. The study area is suitable for a wide range of recreational uses (including lake boating, bicycle trails, foot trails, river floating, fishing, picnicking, group camping, field games, and indoor recreation) and conservation programs (including a natural-studies center, interpretive nature trails, viewing platforms, school programs, interpretive signing and displays, and wildlife management).

RECOMMENDATIONS

1. The state, county, and local municipalities should adopt and implement a master plan for the Yakima River Regional Greenway, recognizing the need for a continuous river-related greenway from Selah Gap to Union Gap; appropriate agencies should introduce a bill into the state legislature formally recognizing the greenway as a conservation area of statewide significance.

2. Valuable wetlands should be preserved in their natural state.

3. The greenway should be protected against further incompatible development, new gravel mining, and other adverse actions; public land and/or easement acquisition should take precedence over facility development.

4. A continuous bicycle/foot trail should be developed from the City of Selah to Union Gap.

5. This reach should become part of a recreational trail corridor extending from the Kittitas Valley to the Columbia River.

6. Citizen groups should continue to promote the greenway.

7. Land-managing public agencies should seek to consolidate and connect their holdings, and cooperatively manage them for conservation and recreation purposes. A Yakima River Greenway Commission should be formed to coordinate public-agency actions.

8. The Yakima Urban Area should view the greenway as:
   ... an urban shaping area
   ... a regional and metropolitan park corridor
   ... a regional and urban trail corridor
   ... a pleasing gateway to the Upper Yakima Valley
   ... a close-in natural education area
   ... an enhancement to the riverside communities
   ... a link in a regional open-space system.

9. Appropriate parts of the greenway should be developed for recreational use, as recommended; valuable natural areas should be protected and used for interpretive/educational purposes.

master plan

JONES & JONES

Environmental planners-Landscape architects
105 South Main Street Seattle, Washington

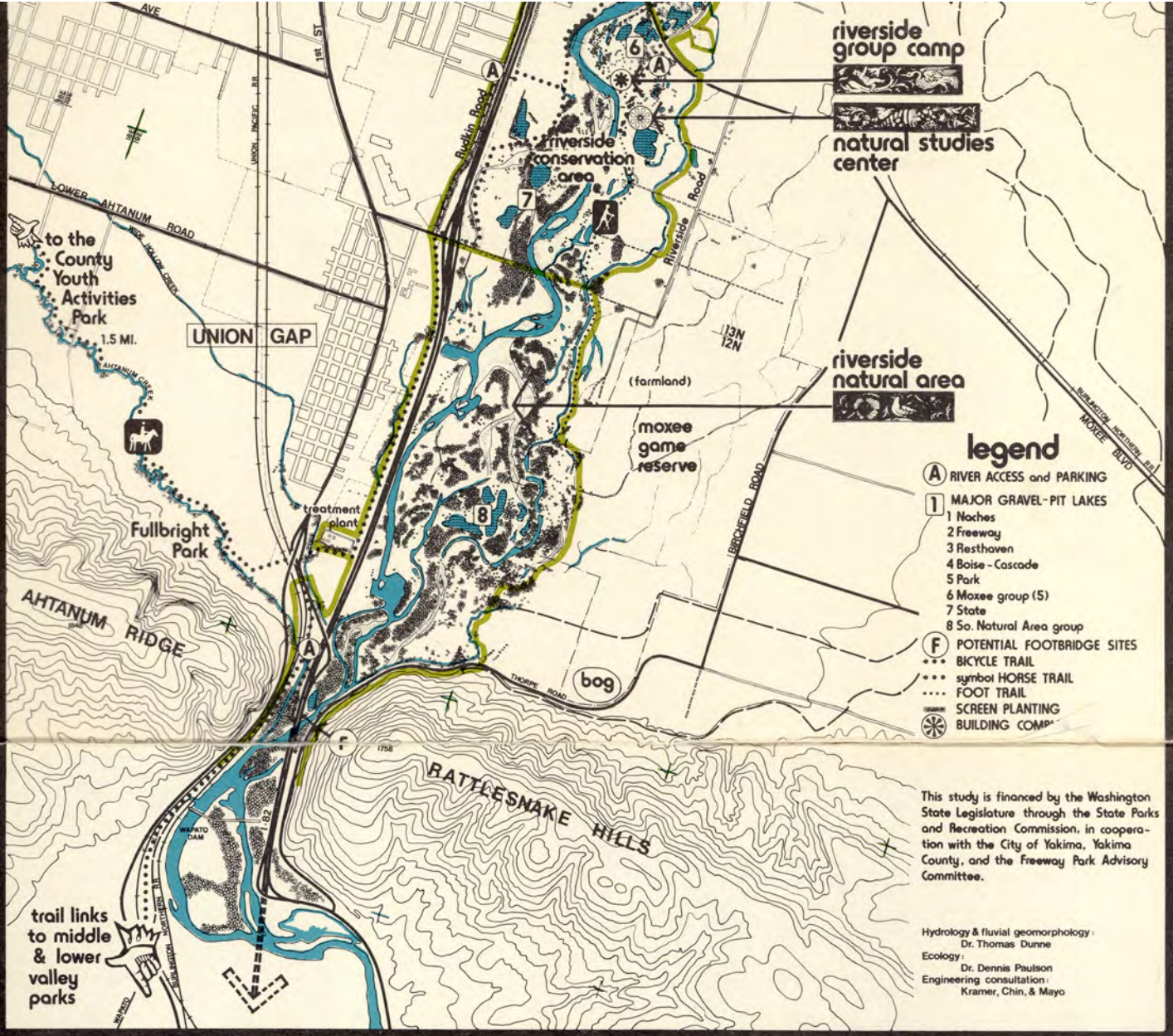
1000 0 1000 2000 3000 4000'

This study is financed by the Washington State Legislature through the State Parks and Recreation Commission, in cooperation with the City of Yakima, Yakima County, and the Freeway Park Advisory Committee.

Hydrology & fluvial geomorphology:
Dr. Thomas Dunne
Ecology:
Dr. Dennis Paulson
Engineering consultation:
Kramer, Chin, & Mayo

legend

- (A) RIVER ACCESS and PARKING
- (1) MAJOR GRAVEL-PIT LAKES
  - 1 Naches
  - 2 Freeway
  - 3 Resthaven
  - 4 Boise-Cascade
  - 5 Park
  - 6 Moxee group (5)
  - 7 State
  - 8 So. Natural Area group
- (F) POTENTIAL FOOTBRIDGE SITES
- BICYCLE TRAIL
- symbol HORSE TRAIL
- FOOT TRAIL
- SCREEN PLANTING
- BUILDING COMP'



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Hydrology & fluvial geomorphology:
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Ecology:
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master plan
The Yakima River Regional Greenway

JONES & JONES
Environmental planners-Landscape architects
105 South Main Street Seattle, Washington

1000 0 1000 2000 3000 4000'

MAPS, TABLES AND PLANS

The Project Map (opposite) is designed to be constantly in view as the report is read.

Section 1
SETTING

SECTION 1. SETTING

PREHISTORY The steppe region of Washington has been inhabited for at least 12,000 years. The earliest tribes were successful hunters, and fossils of large grazing animals occur about the remains of their campfires.

But the large ice age mammals became extinct as the climate warmed, and modern forms of bison and antelope invaded the region from the south as the ice receded. These newer animals did not spread much beyond the warmest, driest parts of the basin, and in post-glacial time they dwindled steadily. In consequence, the ancient peoples came to depend more and more on fishing, so their villages became concentrated along streams where salmon and lampreys could be easily obtained. We know that fishing-based villages were located near both Selah Gap and Union Gap.

Bison became locally extinct about 2,000 years ago. By the 1800's, antelope were very few, and confined to the driest parts of the steppe, to the east. A few deer and wapiti (elk) remained close to the wetland thickets, and a few bighorn sheep lived on the basaltic ledges of the Columbia Valley, south of Grand Coulee. Thus there were few game animals (as compared to the Great Plains).

About 1730 A.D., the tribes acquired horses. This made it practical to make brief excursions eastward across the Bitterroot Mountains into Montana to hunt for bison meat, which was dried and packed home.

Horses had to be herded closely against theft, so there must have been heavy grazing pressure on the vegetation adjacent to the villages that were strung out along the river. This means that an ideal village site was not only at a good fishing location (e.g., near the gaps, where fish were relatively confined and accessible), but also near good grazing land, trees, and wildlife. Thus the broad wet area at the south of the study area was a strong draw to the tribes: it had sub-irrigated soils (the wenas loams) that were lush in high-summer; it had wildlife, food plants, and shelter.

We know in fact that the study area has had at least three large villages: "Pictographs-made-by-small-boy" village at the confluence of the Naches and Yakima rivers; "Spring-of-water" village at the site of Union Gap town (which was the initial site of Yakima); and "Hills-together" village at Union Gap (between Ahtanum Ridge and Rattlesnake Hills, at the site of Wapato Dam).

SETTLEMENT HISTORY Euro-americans began trickling into the Yakima Valley on the heels of Lewis and Clark in the early 1800's. Settlers started coming more thickly in the 1850's, poking into the river valleys looking for good farm land. After 1855, the Yakima Nation was defeated, allotted a reservation, and settlement began in earnest.

Near the Moxee Bog (just north of Union Gap, on the east side) Fielding Mortimer Thorp and nine progeny founded the first recognized valley settlement in 1861. Three years later John Nelson came up from Oregon and eventually settled in the lower Naches Valley in 1864. Much later, in the 1880's, "Yakima City" was founded at the present site of Union Gap.

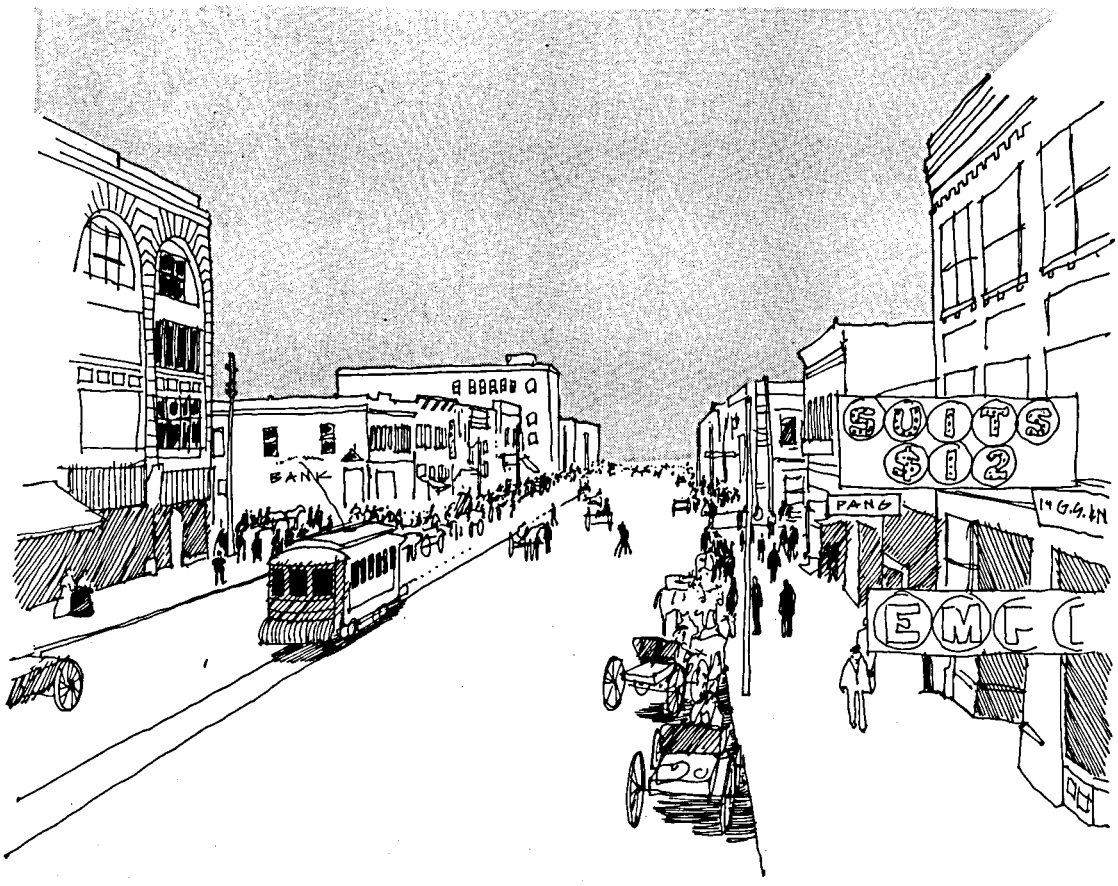
All the early settlers followed the riverside and ridge trails (such as Konewac Pass) made by the native tribes, and they tended to settle in the same kinds of places that had made good village sites. Well into the 1870's the valley settlers were forced to rely on stockades to defend their holdings.

Irrigation revolutionized the valley. Before irrigation, agriculture consisted mainly of alfalfa and other meadow crops grown to feed herds. The Naches Valley reportedly had the first irrigation canal in Washington, and by 1870 about 1,000 acres were being irrigated. In the late 1880's, the railroad came. By 1900 the Yakima Valley still had the largest irrigated acreage in the state. The old Northwest Light and Power Company built a plant on the Naches; now water could be pumped to higher fields.

In 1905, the U.S. Reclamation Service entered the scene, and dams at Tieton Canyon and Bumping Lake insured a steady flow of irrigation water. As a result, the population of Yakima increased eightfold in a single generation (1890 to 1910).

In that golden turn-of-the-century period the City of Yakima grew both in size and in sophistication. It sprouted an extensive electric trolley

system, brick and stone buildings to three stories, commerce, and brick-paved streets. Bicycling was popular. The Cascade Lumber Company ran a busy sawmill starting in 1903, driving logs down the Yakima and Naches rivers, then sluicing them into their millponds. A famous architect (Cass Gilbert) was called in to design the downtown rail depot, from which the newcomer could look beyond the Northern Pacific's 900-foot long cement platform to a grassy park, a fountain, and welcoming trees. And, south of the Terrace Heights Bridge (in the northern part of what is now proposed as "Riverside Park") was a shady river park where the people swam, played baseball, listened to concerts, strolled, or picnicked contentedly.



CONTEMPORARY LAND USE, After the Pre-World-War boom period, the Yakima Valley continued to grow, but at a slower pace. Another boom occurred after the Second World War, after the completion of the Roza Canal and the return of throngs of west-coast soldiers. Yakima County now produces over $125 million in farm products each year. It is the most agriculturally productive county in Washington, and it leads all counties in fruit production. It produces more apples, mint, and hops than any other county in the United States.

The Yakima urban area is the main growth center for both Yakima County and the entire south-central portion of Washington State. It occupies a strategic marketing position with respect to the Puget Sound region. Interstate 82 links it with Interstate 90 to the north, and when I-82 is completed, to the Tri-Cities area on the Columbia.

Looking at the upper valley's settlement pattern, we see it shifting through time. The earliest settlers stayed close to the fertile river wetlands; their irrigation-based descendants moved upland to avoid the river's floods. The railroad became the most dominant focus for Yakima, and it was over 1-1/2 miles from the river. Trolley lines drew settlement up the Naches Valley, away from the river. Wealthy homes clustered in Nob Hill; and the old town, between the railroad and the river, became less important. The main highway (Route 97) closely paralleled the railroad, reinforcing its effects. A strip of industrial and commercial uses ran from north to south; west of that strip lay residential neighborhoods, and east lay the downtown core, the older residential core, and then the river's floodway. The river edge was no longer needed by the city.

When the Interstate Highway came through in the 1960's, its designers found that sparsely-settled band lying between the river and the urban area, and there they chose to site the new highway, where buildings and land were less valuable, and where river gravel was close at hand. The Interstate focused attention on the river as never before.

The riverside lands had been cheap real-estate used for dumps, power-lines, gravel-pits, grazing, and for housing the poor, who suffered the greatest when the floods came. Today, the urban area is surrounding the river. In Yakima County, nearly as many acres are used for residences, industry, and transportation as are used for tree fruits. Terrace Heights, an expanding new community on the east side, (a favored suburban area), will undoubtedly grow rapidly once it is connected to the Yakima sewage system. On the west side, there will be over eight miles of continuous urban area, from the Naches River to Union Gap. Commercial uses will try to cluster around each freeway interchange, and along the two cross-river roads.

The new Interstate caused a startling awareness-shift, bringing all this into view: the lumber mill and its log-storage yards, the gravel

pits, the power lines, the commercial uses. But more importantly, the river itself came into view as never before, and there is still time to determine what that view will be.

THE YAKIMA RIVER,* The Yakima is the longest river lying entirely within the borders of the State of Washington. Its 221-mile mainstream runs from the Cascades to the Columbia, through three counties. The Naches, entering at the northern limit of the study area, drains about 25% of the entire Yakima Basin.

The Yakima is a very ancient river that existed before the Yakima Folds rose, so it cuts through these folds at right angles. In the Yakima Canyon, the river's old meander patterns are frozen into the rock. The Ahtanum-Moxee Valley (the Upper Yakima Valley) is a gravel-filled cradle between the folds.

The Yakima is a mountain river. Its waters come from both surface snowmelt and deep groundwaters moving down under the valleys. Six upstream storage reservoirs regulate the river for irrigation and flood control.

The river runs through various "zones" as it comes down from the mountains. The three great zonations of the Yakima are the Fixed, the Braided, and the Meander. In the mountains or in the Yakima Canyon, the river is fixed (confined) to a narrow, steep valley. As it bursts from that steeply-sloping zone, it drops some of its bed load to form an intricate braidwork of gravel bars and shifting channels. The study area is in this second zone. Further down the valley, the river ceases to braid, and a single channel meanders back and forth across the valley.

The Yakima floods as often as twice a year: first in the winter, when warm maritime air brings rain to the mountains, and later in the spring, when the snowpack melts. Since 1950, the highest floods have occurred in November, December, January, February, May or June. Flood stages have been as high as 15 feet, and have lasted as long as 32 days. The projected Standard Project Flood could bring channel velocities as high as 13 miles per hour (20 feet per second).

From Selah Gap to Union Gap, the river falls about 140 feet. Its range of slope is from 10 to 20 feet per mile.

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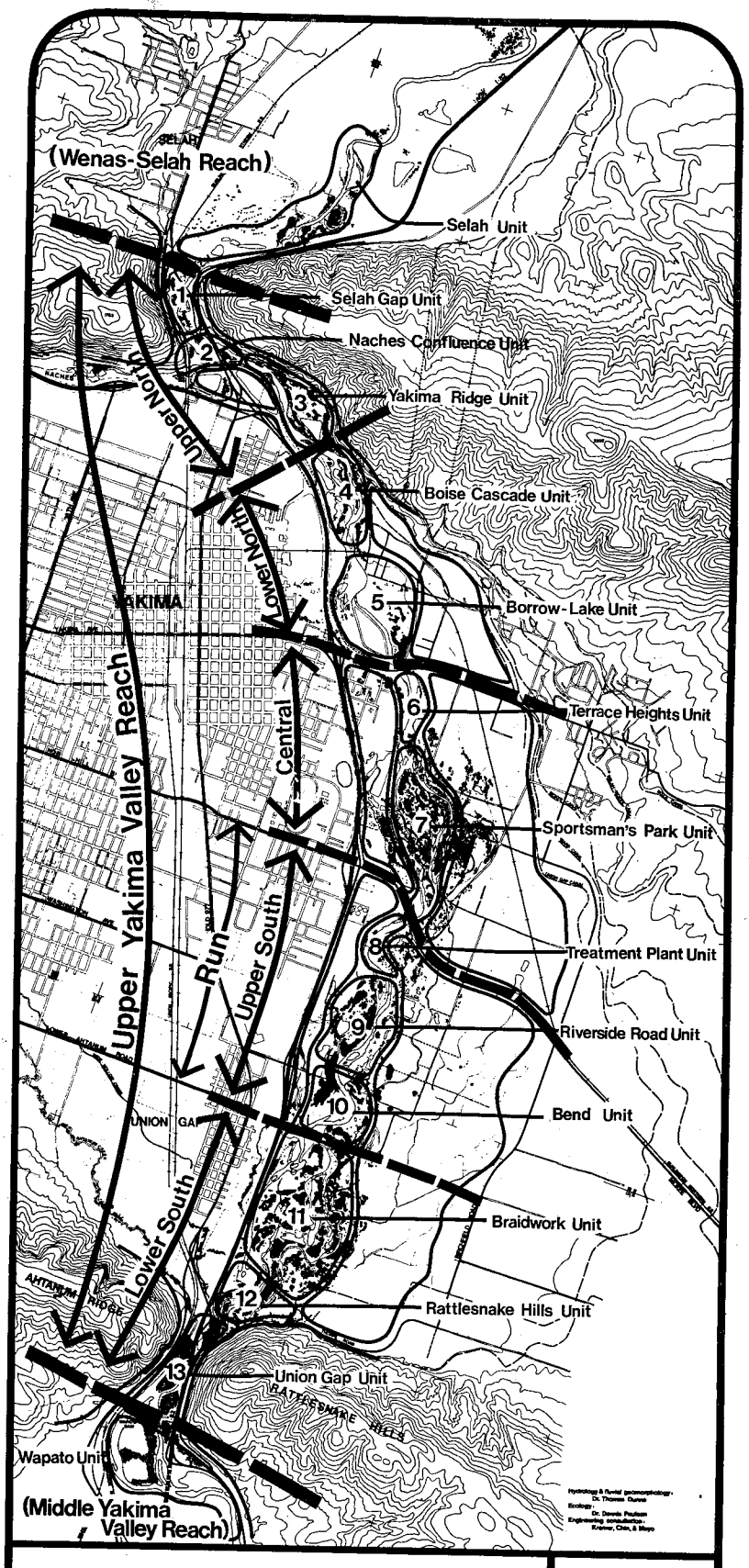
* Interested readers should turn to the Hydrologist's Report (Appendix A at the end of this report) for a complete analysis.

The use of the Yakima River for fishing and water contact sports has been affected both by water quality and water quantity.* The number of salmon has been steadily decreasing, partially due to the effect of irrigation diversions. Bacterial contamination, high nutrient levels and a low dissolved oxygen level may continue to plague the river into the foreseeable future.

In flood, the Yakima is frightening; in mid-summer, it is a docile stream.

* In the summer, flows in the Naches and Yakima are almost entirely storage-releases from upstream reservoirs.



Reach Structure

The Yakima River Regional Greenway

JONES & JONES

Section 2
STUDY APPROACH AND STUDY AREA LANDMARKS

SECTION 2. STUDY APPROACH AND STUDY AREA LANDMARKS

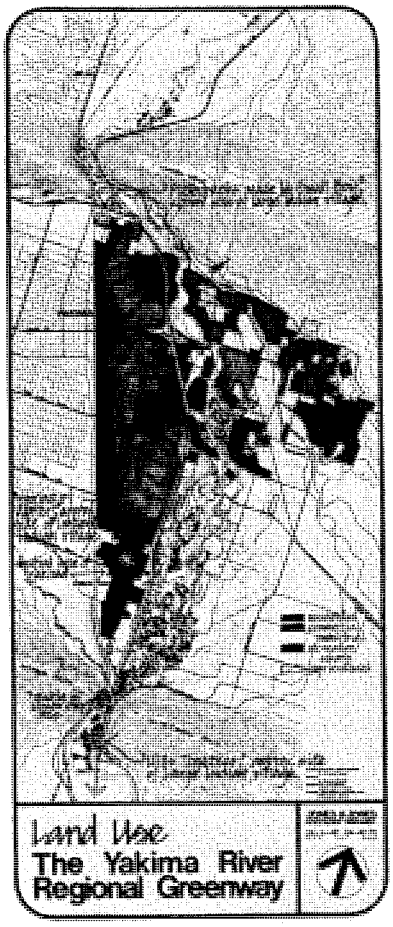
METHODOLOGY

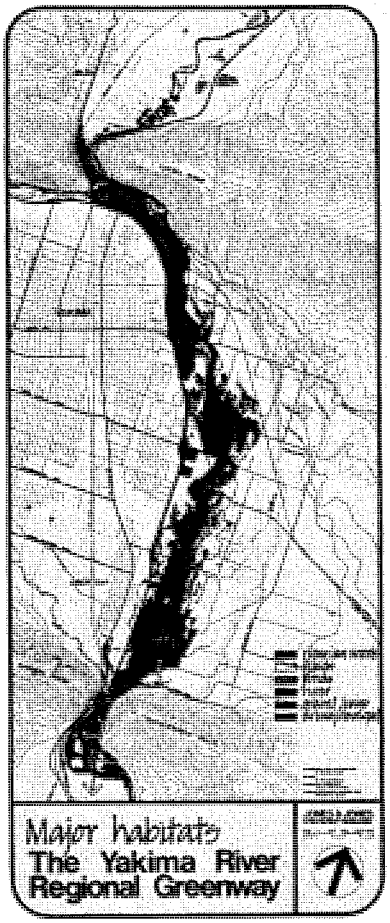
Our study began with a helicopter overflight of the gap-to-gap reach. All available plans, reports, studies, data records, and other references were gathered and reviewed. We enlisted the services of Dr. Thomas Dunne--a fluvial-geomorphologist with the University of Washington--to study the river's past, current and probable future behavior; and Dr. Dennis Paulson, an experienced ecologist, who studied the major river habitats and ecosystems. Garnie Quitslund, a professional photographer, prepared a slide collection. The area was field-researched, a photographic record was made of existing conditions, and analysis was begun. We were also assisted by the local office of the Game Department, the Yakima Valley Audubon Society, Joanna Nashem of the Yakima Valley Museum, Ken Loth of the Yakima Sportsman's State Park, the Nature Conservancy, the Department of Ecology, the Department of Fisheries, the Soil Conservation Service, the Bureau of Reclamation, the Corps of Engineers, the manager of the Central Premix gravel operations (Tim Murphy), the Department of Highways, as well as the municipal and county agencies and Mr. Morris, a local landowner.

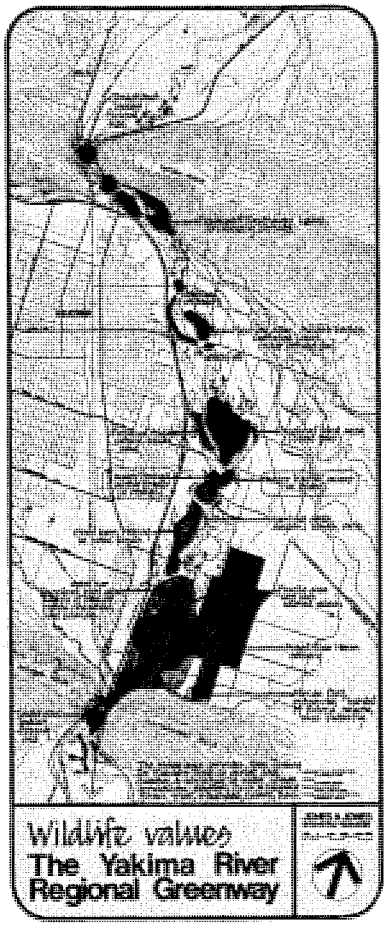
Our initial presentation in Yakima--which featured a lecture by Dr. Dunne--displayed 18 analysis maps, other diagrams and photographs. Analysis maps (at a scale of 1" to 2,000 feet, since the study area is over 9 miles long and over a mile wide) consisted of:

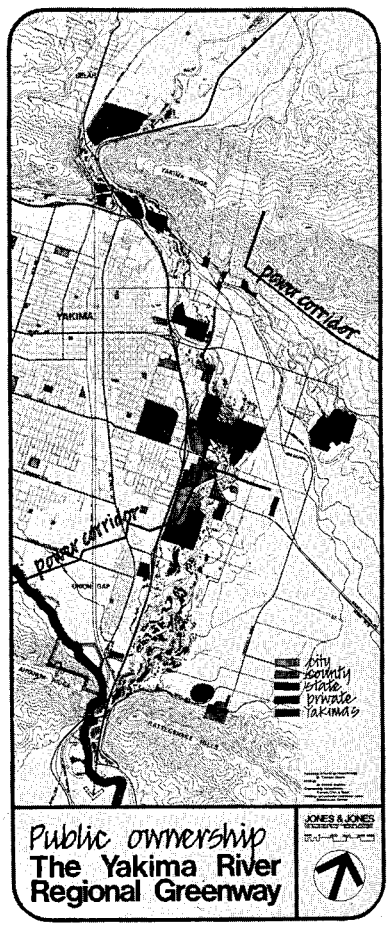
- Regional Setting
- Climate
- Riverscape Runs & Units
- Public Land Ownership
- Land Use
- Floodplains and Diking
- Soils
- Infra-red Imagery
- Major Habitats
- Wildlife Values
- Wildlife Value (by Unit)
- Sewer and Water Systems
- SMA Classes, Wasteways, and Canals
- River Stability
- Channel Changes (1939-Present)
- Political Jurisdictions and Neighborhoods
- Encroachment
- Constraints (Composite)
- Opportunities (Composite).

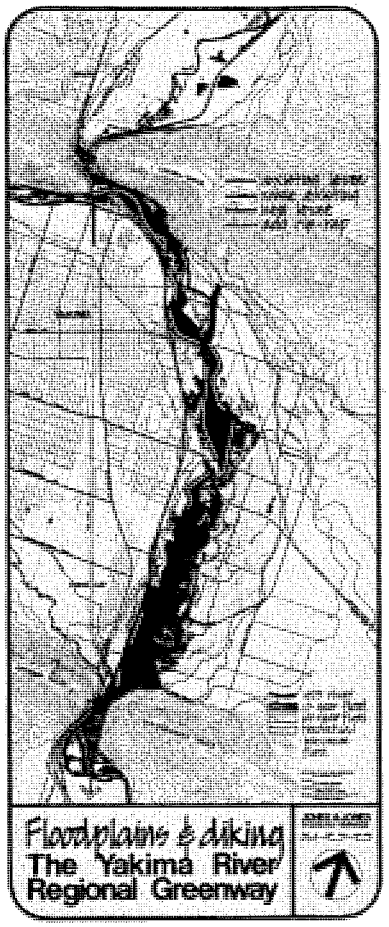
We have examined the ownership and assessed valuation of scores of riverside properties; obtained engineering consultation from the firm of Kramer, Chin, and Mayo (Seattle); reviewed and cataloged the 82 recorded endorsements of the "Freeway Park" concept; and reviewed recently published reports. An implementation-strategy meeting was held

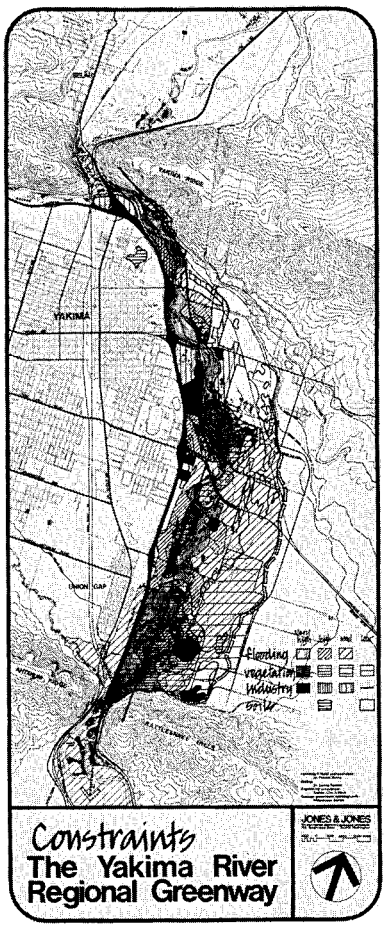












SAMPLE ANALYSIS MAPPING

with representatives of Washington State Parks, the Interagency Committee for Outdoor Recreation, the Department of Highways, the Bureau of Outdoor Recreation, the Yakima County Planning Department, and the City of Yakima Department of Parks and Recreation. We have spoken with the Game Department, the Corps of Engineers, and the Soil Conservation Service, and have contacted the Nature Conservancy and the Trust for Public Land to explore their possible involvement. All potential implementation methods were reviewed.

At our second presentation in Yakima, we distributed 50 copies of a Progress Report and Preliminary Master Plan for review by agencies and interested citizens, as well as copies of sub-reports on the river's hydrology (by Dr. Dunne) and ecology (by Dr. Paulson). Review meetings were then held with the Yakima County Commissioners and the Freeway Park Advisory Committee (with Representative Seeberger in attendance). Comments from several individuals and a local trails advisory group were received and incorporated.

After the publication of this report, pertinent correspondence and reference material will be turned over to the Washington State Parks and and Recreation Commission for future use. We also hope that a public-awareness tool (such as a narrated slide program) can be financed to allow an easy understanding of both the river and these proposals. A scale model (at 1" = 1000') of the greenway has already been produced for public display.

REACHES, RUNS, AND UNITS

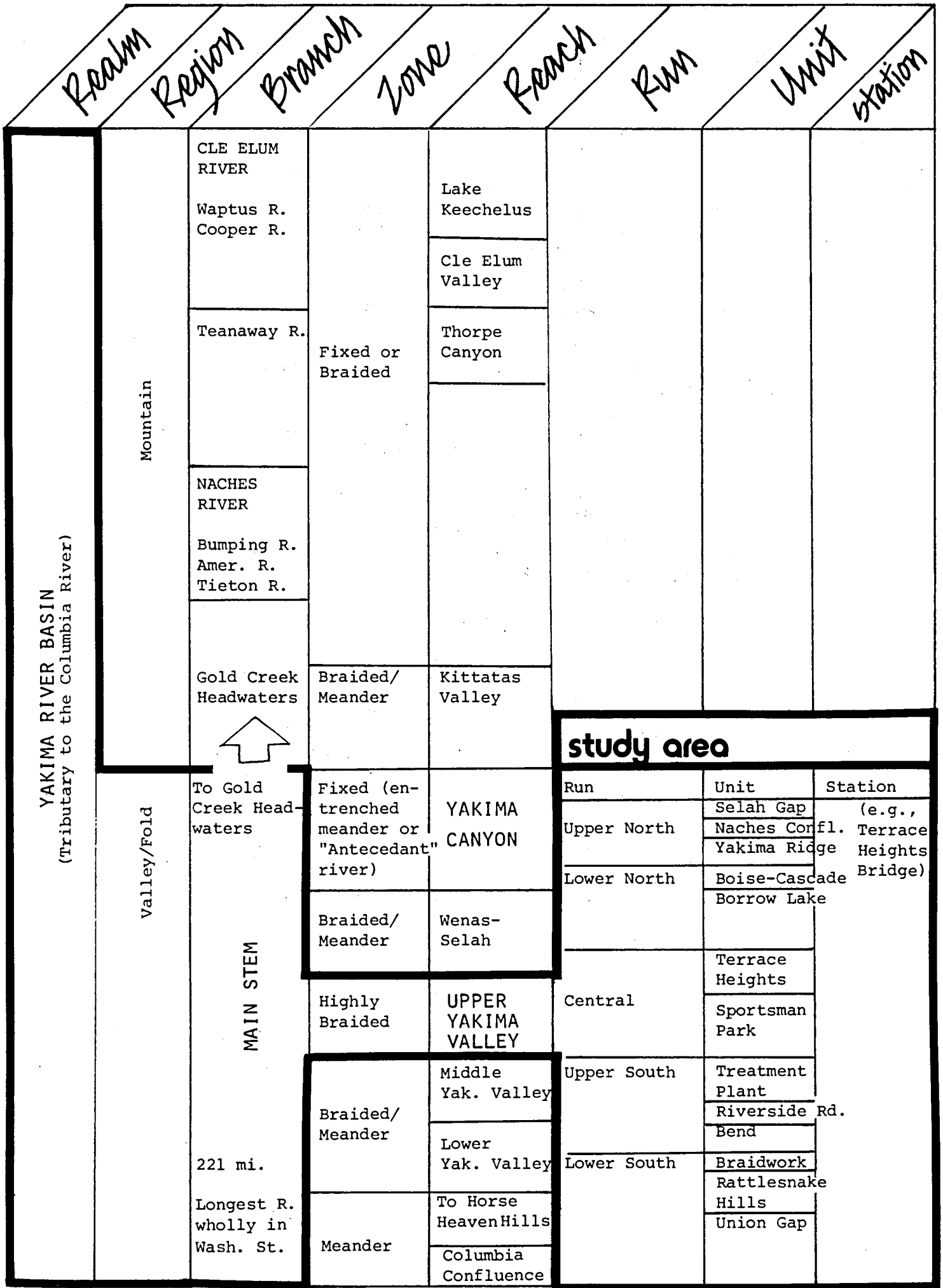
A river has several levels of unity. In order to set the study area in context, we attempted to first divide the entire Yakima Mainstem into reaches.

The Yakima can be perceived as separate segments, each segment (a reach) being a discrete entity based on its visual coherence, its homogeneous landscape, or its physical features.

From the river's headwaters to the Columbia confluence, we identified eleven Reaches:

Kittitas County

1. Lake Keechelus Reach
2. Cle Elum Valley Reach
3. Thorp Canyon Reach
4. Kittitas Valley Reach
5. Yakima Canyon Reach


Realm
Region
Branch
Zone
Reach
Run
Unit
station
YAKIMA RIVER BASIN
(Tributary to the Columbia River)
Mountain
Valley/Fold
MAIN STEM
221 mi.
Longest R. wholly in Wash. St.
CLE ELUM RIVER
Waptus R.
Cooper R.
Teanaway R.
NACHES RIVER
Bumping R.
Amer. R.
Tieton R.
Gold Creek Headwaters
To Gold Creek Headwaters
Fixed or Braided
Braided/ Meander
Fixed (entrenched meander or "Antecedant" river)
Braided/ Meander
Highly Braided
Braided/ Meander
Meander
Lake Keechelus
Cle Elum Valley
Thorpe Canyon
Kittatas Valley
YAKIMA CANYON
Wenas-Selah
UPPER YAKIMA VALLEY
Middle Yak. Valley
Lower Yak. Valley
To Horse Heaven Hills
Columbia Confluence
study area
Run
Unit
Station
Upper North
Lower North
Central
Upper South
Lower South
Selah Gap
Naches Confl.
Yakima Ridge
Boise-Cascade
Borrow Lake
Terrace Heights
Sportsman Park
Treatment Plant
Riverside Rd.
Bend
Braidwork
Rattlesnake Hills
Union Gap
(e.g., Terrace Heights Bridge)

Yakima County	6.	Wenas-Selah Valley Reach
	7.	UPPER YAKIMA VALLEY REACH
	8.	Middle Yakima Valley Reach
	9.	Lower Yakima Valley Reach
Benton County	10.	Horse Heaven Hills Reach
	11.	Columbia Confluence Reach

The study area, Basin Reach #7, is one of the shortest reaches, and is well defined by the ridges at either end.

Each reach can be further divided into Runs based on man-made features and river character. Hence the study area is divided into 5 Runs:

1. Upper North ("Selah Gap" to Resthaven Lake)
2. Lower North (Resthaven Lake to Terrace Heights Bridge)
3. Central (Terrace Heights Bridge to Moxee Bridge)
4. Upper South (Moxee Bridge to the end of Riverside Road)
5. Lower South (Riverside Road-end to "Union Gap").

...and finally, into separate Units based on channel geometry and river character:

1. "Selah Gap" Unit
2. Naches Confluence Unit
3. Yakima Ridge Unit
4. Boise Cascade Unit
5. Borrow Lake Unit
6. Terrace Heights Unit
7. Sportsman's Park Unit
8. Treatment Plant Unit
9. Riverside Road Unit
10. Bend Unit
11. Braidwork Unit
12. Rattlesnake Hills Unit
13. "Union Gap" Unit.

This system may be used in analysis, inventory, and planning. For instance, the project ecologist used the 13 units in his analysis of natural values, assigning the highest values to Units #7, 9, 10, 11, and 12.

STUDY AREA LANDMARKS

It is best to begin by going down the river and pointing out some of the existing features that will be mentioned in this report. "Study Area" usually means the area bounded by "Selah Gap" on the north, "Union Gap" on the south, Interstate 82 on the west, and either Birchfield Road or the Union Gap Canal on the east.

Interstate 82: "the freeway" (all runs)

This comes from the north (it links with the state's primary east-west road, Interstate 90), by-passes the Yakima Canyon, then follows the river as far as "Union Gap." It was also built to act as an emergency flood levee to protect Yakima and Union Gap. At the Naches confluence, another 4-lane, Route 12, takes off up the Naches River. I-82 will soon be extended to the south, eventually reaching the Tri-Cities area.

"Freeway Lake", "Naches Lake" (Gordon Lake, "Lake Polluted"), and "Resthaven Lake" (upper north run). These are borrow-pit lakes at the north end. "Freeway Lake" (about 21 acres) is confined between the freeway and a rip-rapped flood dike. It is stocked by the Department of Game. "Naches Lake" (about 12 acres; once called "Gordon Lake") has warning signs around the lake saying "Lake Polluted, No Trespassing", so we have sometimes referred to it as "Lake Polluted". It is nevertheless a popular swimming hole. It lies between I-82, Route 12, a rail bridge, and a Naches River dike. We have called it "Naches Lake" since it lies at the Naches confluence. "Resthaven Lake" (about 8 acres) is on the east side of the river in a more wooded setting; it too is stocked, but the river is working to invade it, and so the lake should one day be incorporated into a river channel.

"Boise-Cascade Lakes" (upper north run) are small borrow-pit or mill-pond lakes (about 20 acres) named for their owner, lying close to the freeway. Most of this area appears to no longer be needed for industrial purposes. A canal connects these lakes to the main mill-pond, running under the freeway, to the west.

Boise Cascade Mill

A mill has occupied the same location since 1903. In the old days, the river was needed as a transport medium for logs; but now, everything is brought in by truck or rail, and the mill's traditional relationship with the river has ended. The mill is a strong north-end landmark, and is particularly visible from the south-bound freeway lanes.

Rail Bridge

A spur rail line connects the main Burlington Northern line with Moxee, to the east, via a steel-girder rail bridge.

Roza Canal Wasteway

A large return-flow into the river immediately north of the Terrace Heights Bridge.

Terrace Heights Bridge is the first east-west road crossing of the river. It divides the North Runs from the Central Run. This bridge will soon be replaced by a wider bridge sited immediately to the south, and the new bridge will have trail lanes on each side.

City Land-fill Site (central run)

An inactive city disposal site just north of the Premix ponds.

Central Premix (central run)

An unusually large graveling operation on its way to producing a 40- to 50-acre pond complex in its wake. The excavations are very deep--to 80 feet--and might remain active for many years to come.

City Arboretum (central run)

A newly-installed arboretum between the freeway and the river;* also the site of a wet, wooded marsh (with a small pond) where the Audubon Society would like to develop a nature trail.

Yakima Sportsman's State Park (central run)

This 211-acre park (only 40 acres are developed) started out as a private hunting preserve in 1940, was donated to Yakima County in 1946, and in 1950 was re-donated to Washington State Parks. It includes most of Sportsman's Island, a campground, and a picnic area with several small ponds (stocked with water lilies, ducks, and swans). It is currently the only park on the river, and is a popular area for family picnics, group outings, and even an occasional wedding. The 64 campsites are heavily used, filled from June through Labor Day largely with campers from western Washington, California, Oregon, and British Columbia. It therefore serves both regional visitors and the urban area.

Sportsman's Island (central run) is of enormous natural value because it is very inaccessible and has been stable and unintruded for at least 40 years. Most of the 150 acre island is wooded.

Moxee Bridge

The second east-west bridge, leading to Moxee City and points east. This is a relatively new bridge, built concurrently with the freeway. The bridge divides the Central Run from the South Runs.

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* this study recommends that the arboretum be expanded.

Moxee Bridge Ponds (each side of Moxee Blvd., on the river's east side)
Several gravel-pit ponds on each side of the bridge crossing. Collectively they comprise 8 acres. A 7-acre pond lies about 2000 feet to the south.

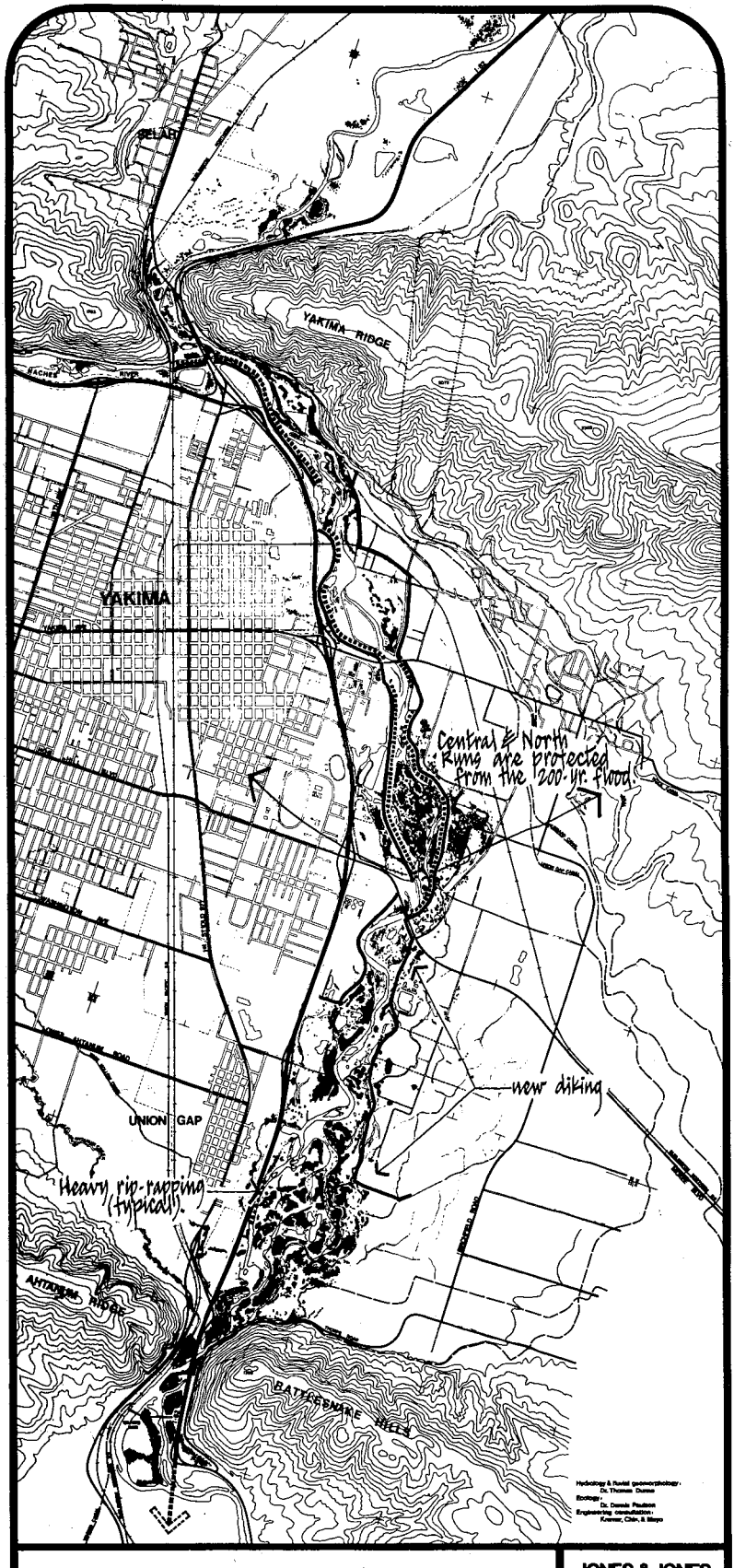
Sewage Plant (upper south run)
A high-rate trickling-filter secondary level plant. A 100-acre spray disposal field is used to process industrial waste (from fruit processing plants). Cattle are grazed in the field, but heavy spraying and excessive grazing have recently caused the pasture to deteriorate to the point of failure. The plant will soon be upgraded and expanded to handle the effluent from the entire urban area, including Terrace Heights and Union Gap.

"State Ponds" (upper south run)
Just south of the spray fields are several small gravel pit ponds totaling about 13 acres. Some are highly naturalized with thick shore vegetation.

Union Gap Interchange (upper south run)
The southernmost freeway exit gives access to the riverlands in the western Upper South Run. A commercial development is proposed between the freeway and Spring Creek (an old river channel).

"Southern Natural Area" (south runs)
The most intact, least disturbed, and most valuable habitat in the study area, it is a rich conglomerate of old gravel-pit ponds, gravel and sand bars, sloughs and river channels. Portions are heavily wooded. Immediately to the east is a 933-acre privately owned State Game Reserve that is used yearly by thousands of waterfowl.

There are several naturalized gravel-pit ponds (totaling about 12 acres) within the lower portion, which is roughly 4000' in width and is fed by subsurface waters.



River dikes after the "Yakima River Levee Project."

The Yakima River Regional Greenway

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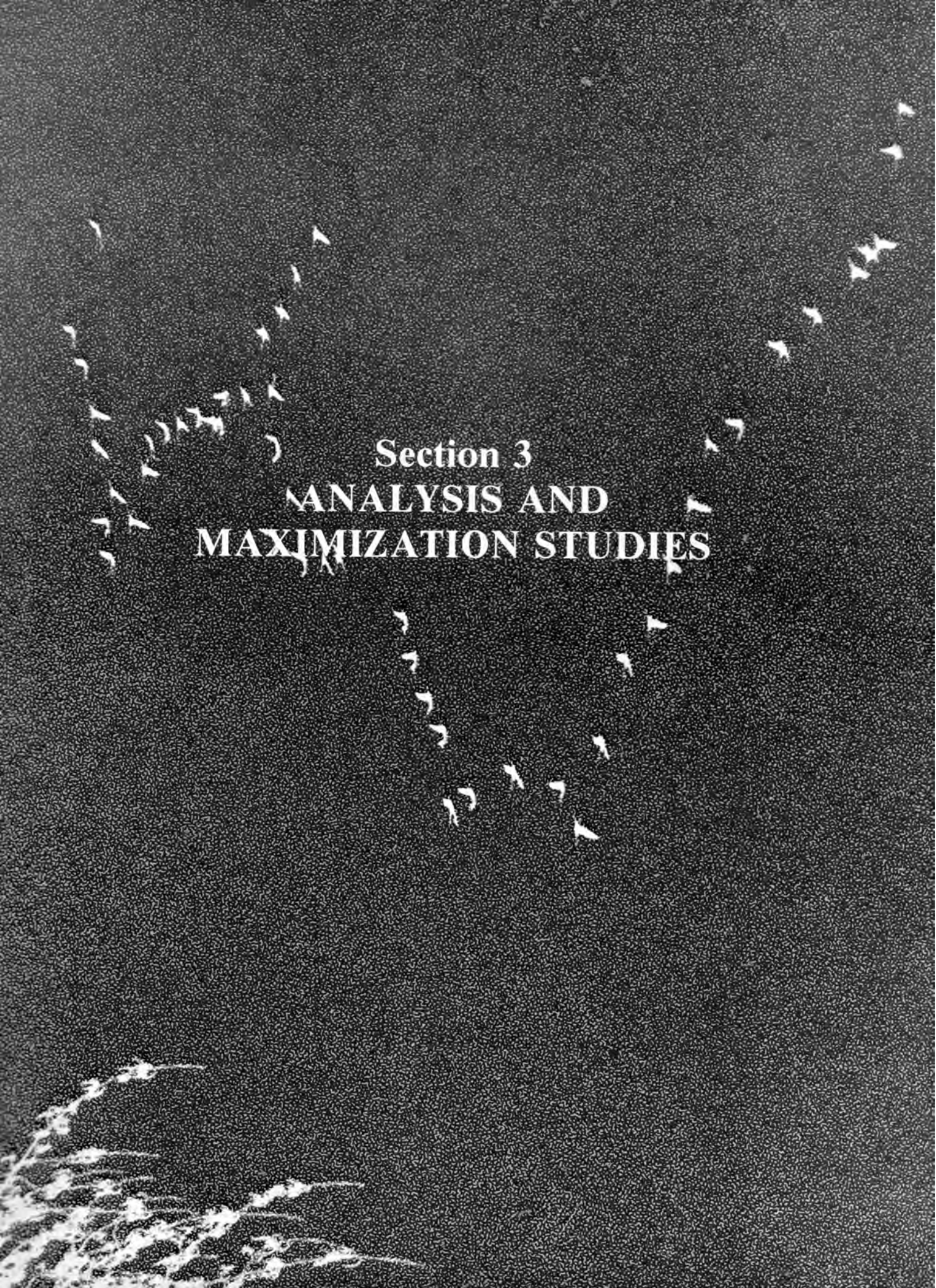

Section 3
ANALYSIS AND MAXIMIZATION STUDIES

SECTION 3. ANALYSIS AND MAXIMIZATION STUDIES

ANALYSIS

RIVER HYDROLOGY.* The Yakima is an extremely powerful, changeable, high-sediment-transport river that drops about 140' from Selah Gap to Union Gap (9.5 river miles). Most unconfined meander bends are migrating at from 20 to 30 feet per year in an ancestral floodplain that is almost uniformly 1-1/2 miles wide (now confined by diking to a strip 1,000 to 4,000 feet wide). The soil--normally water-lain gravels and sands--offers little resistance to the river, and the river can abruptly abandon active channels to create radically new ones. In flood, the Yakima moves as fast as an Olympic runner, and is capable of moving rocks over 20" in diameter. Deep gravel pits in the floodway (or just outside its dikes) help the river to make sweeping changes (or "breakouts").

And, climatic changes may be causing an increase in annual peak discharges (after a low trend from 1935 to 1971). All this points to the likelihood that almost any area in the valley floor might potentially have a channel migrating through it as the river shifts or is diverted.

IMPLICATIONS: SITE DEVELOPMENT SHOULD ONLY TAKE PLACE IN AREAS THAT WE ARE REASONABLY CONFIDENT WILL NOT BE INVADED BY RIVER MEANDERS; ALL STRUCTURES SHOULD BE POLE BUILDINGS OR OTHERWISE RAISED ABOVE EXPECTED FLOOD LEVELS; FUTURE GRAVEL MINING SHOULD BE REGULATED TO SAFEGUARD ADJACENT PROPERTY.

WATER QUALITY. For the foreseeable future, the water quality of the Yakima will not allow for safe swimming or other water-contact sports.

POND HYDROLOGY, Gravel mining is a familiar feature of the Yakima floodplain. When done in the floodway, the river normally invades the ponds (regardless of diking) and fills them. But those ponds that are protected (naturally or by stable dikes) can become naturalized and develop an ecology similar to native ox-bow ponds or warm, highly-mineralized desert ponds. Due to surface and groundwater pollution, ponds receive high-nutrient waters, and thus become infested with algal growth and water plants in the summer. Only ponds with a steady flow through them could avoid such eutrophication.

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* For a full account, see Appendix 'A' of this report.

IMPLICATIONS: PONDS ARE GENERALLY NOT SUITABLE FOR SANCTIONED PUBLIC SWIMMING; THE USE OF A POND SYSTEM FOR BOATING AND FISHING (E.G., THE 40-ACRE CENTRAL PREMIX PONDS) WILL PROBABLY REQUIRE THE CONSTRUCTION OF A RIVER-FED CANAL (OR PIPE) SYSTEM TO GUARANTEE A COMPLETE WATER-EXCHANGE ABOUT EVERY THREE DAYS. GRAVEL-POND EDGES WILL QUICKLY NATURALIZE IF THEY ARE GIVEN A GENTLY-SLOPING FORESHORE AND A STEADY WATER LEVEL; SHORE PLANTINGS WOULD SPEED THE PROCESS.

GROUNDWATER HYDROLOGY. The Ahtanum-Moxee Valley groundwater system is totally enclosed, or "trapped." The Yakima is an antecedent ("pre-existing") river that flowed before the Yakima Folds rose; at the lower fold, Union Gap is a rock threshold which the river must pass over. Groundwater (there are three distinct layers) can escape the valley only by either upwelling near the lower gap, or by pressurized waters working up to higher aquifers. Upwelling helps to produce the lush south end natural area, and its rare bog habitat, the Moxee Floating Bog. The water table rises in the early summer after irrigation begins. Generally, the lower aquifer is purer, while the upper aquifer is contaminated by sewage and irrigation runoff.

IMPLICATIONS: WITH A SEASONALLY HIGH WATER TABLE, SEPTIC-TANK/DRAINFIELD SEWAGE DISPOSAL IS UNSAFE. THE UNIQUE GROUNDWATER UPWELLING AT THE LOWER GAP MAKES THE SOUTHERN NATURAL SYSTEM EVEN MORE ATTRACTIVE AS A HABITAT PRESERVATION AREA.

SOILS. Except for a broad band of fertile Wenas Loam on the east side (Riverside Road to Butterfield Road, extending north in the old river-plain) the study area is dominated by water-borne gravels and sands.

IMPLICATIONS: SOILS OFFER NO CONSTRAINT TO RECREATIONAL FACILITIES, ALTHOUGH GRAVELLY SOILS WOULD REQUIRE HEAVY IRRIGATION TO SUPPORT LAWNS OR PLAYFIELDS. HIGHLY-PERMEABLE SOILS ARE UNSAFE FOR SEPTIC-TANK/DRAINFIELD SEWAGE DISPOSAL. WENAS LOAM IS AGRICULTURALLY VALUABLE AND SHOULD REMAIN IN THAT USE.

RIPARIAN WOODS.* The dominant vegetation is riparian (wetland) trees, especially black cottonwood, with thickets of shrub willow, boxelder, Russian olive, dogwood, and other species. The river is flanked by colorful summer-flowering species such as clematis vines, wild rose, or dogwood. Two areas were identified by Dr. Dennis Paulson as being of a very high value: Sportsman's Island within the State Park, and the "prime natural area" in the south, approximately from the Moxee Bridge to Union Gap. The riparian woods below Resthaven Road are also valuable.

The southern area is one of the more important sites for riparian vegetation in Washington: it is unusually wide due to groundwater-upwelling and a high water table. The Yakima Valley is fairly south in the State and supports a larger number of plants and animals than, say, the Wenatchee or Okanogan basins; and, it is directly adjacent to an expanding urban area. Thus, it is a potential close-in "wilderness" education area.

IMPLICATIONS: THE BROAD, MOIST "PRIME NATURAL AREA" STANDS OUT AS A WETLAND OF REGIONAL AND STATEWIDE VALUE. OBVIOUSLY, ITS PROTECTION (AND INTERPRETATION) WOULD BE AN IMPORTANT GOAL OF ANY GREENWAY PLAN. THE "NORTHERN WOODS" (OFF RESTHAVEN ROAD) ALSO DESERVES PROTECTION.

WILDLIFE VALUES.**The rich gap-to-gap animal community is supported by the river itself, the riverine vegetation, and the floodplain ponds, sloughs, and channels. Numerous raptors (predator birds), songbirds, wetland mammals, and aquatic species inhabit the area. High wildlife value corresponds with the productive vegetation/pond/island areas mentioned previously. The "prime southern area" is adjacent to a 933-acre Game Reserve that harbors thousands of migratory waterfowl, and a 14-acre bog preserve owned by the Nature Conservancy; it also includes a Great Blue Heron rookery, beaver lodges, and valuable insect populations.

The river gives good fishing for rainbow trout and whitefish, with fair populations of eastern brook and german brown trout, steelhead, salmon (in a long-term decline) and bass (only in some ponds).

There is some opportunity for wildlife enhancement through pond reclamation and stocking, water-quality improvement, and habitat protection.

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* Readers interested in natural systems should turn to Appendix B at the end of this report.

** See Appendix 'B' and Appendix B-1.

IMPLICATIONS: PROTECTION AND PRESERVATION ARE IMPLIED. POND FISHING COULD BE GREATLY EXPANDED, BECOMING AN IMPORTANT RECREATIONAL FEATURE. RIVER FISHING ENHANCEMENT DEPENDS ON WATER-QUALITY IMPROVEMENT AND HABITAT PROTECTION.

MAN-MADE FEATURES. This reach (and especially its northern half) has been degraded by borrow-pits, road construction, rip-rap, diking, industrial and commercial uses. By far, the impacts of the Interstate (with its bridges, borrow-pits, protective rip-rapping, noise, and related land-use impacts) has been the most severe. The Interstate's noise-impact zone extends roughly 1,600 feet to either side.* Recent borrow pits have been left in a sterile, steep-sided, diked state instead of being reclaimed into "natural" ponds.

Protective diking has given us potential riverside trails, but the costs are high: reduced wetlands, a less-productive river, aesthetic degradation, an increase in floodplain occupancy, and a false sense of security.

The Yakima area is in the process of implementing a comprehensive wastewater plan that will abandon the Union Gap and Terrace Heights plants, and pipe all effluent to an expanded Yakima sewage plant. The 12" Terrace Heights force main is intended to cross the Moxee Bridge; the 12" Union Gap connector will run on the west side of I-82.

In the traditional way we view rivers, they are seen as "fair game" for power lines, sewage plants, dumps, freeways, borrow pits, and land uses seeking low-cost real estate. The 200-acre State park is the notable historical exception.

IMPLICATIONS: THE DIRECTION HERE IS CLEAR: MOST EXISTING ADVERSE IMPACTS CAN BE MODIFIED (OR NEGATED) BY RECLAMATION, E.G., SCREENING OF OBJECTIONABLE LAND USES, LAND RECLAMATION, FREEWAY PLANTINGS, GRAVEL-POND NATURALIZATION, DIKE PLANTINGS, OR MORE NATURALISTIC DIKE DESIGNS. FREEWAY NOISE IMPLIES THAT QUIET-SEEKING USES ARE IDEALLY SITED ON THE EAST SIDE OF THE RIVER; OR, AS FAR FROM THE FREEWAY AS POSSIBLE. FUTURE IMPACTS CAN ONLY BE PREVENTED BY COUNTY AND STATE LAND-USE REGULATIONS, ACQUISITION OF VALUABLE NATURAL AND RECREATION AREAS, AND THE DEVELOPMENT OF AN ACTIVE, VOCAL COMMITMENT TO THE GREENWAY PROJECT.

* The distance required to reduce the decibel level ("A" scale) from freeway levels (c.90 dB"A") to less than 60 decibels (a "quiet" level roughly equivalent to a window air conditioner).

Special Note: Comprehensive Wastewater Plan

Every effort should be made to coordinate the regional wastewater plan with greenway goals. Points needing immediate attention are:

1. The 12" pipeline crossing proposed at the Moxee Bridge could be relocated to finance (at least partially) a proposed footbridge at the old Moxee Bridge site. Preliminary contact with the project engineers, Gray & Osborne, indicates that the footbridge crossing would save them 1,800 LF of pipe, or about $50,000, in addition to any savings the footbridge installation might have over attaching the pipe under the existing Moxee Bridge. They would prefer the footbridge crossing. The Sewer District could only pay for the portion of the footbridge cost that equaled their savings; the balance (the total cost of the bridge is about $125,000) would need to be financed by the County and/or City of Yakima. They plan to go to contract this fall.

   This opportunity will not come again, and should be pursued with the utmost urgency by both the County and the City. Such a footbridge crossing would connect the growing City park (on the west) to the State park (on the east) with a safe, attractive foot/bicycle crossing. And, with the completion of the New Terrace Heights Bridge--which will have wide pedestrian-bike lanes--a riverside dike-trail "loop" could result.

2. One alternative being considered is the use of river-related land for spray-disposal of effluent, and sludge disposal. Any such action should conform to greenway plans.

3. The abandoned Terrace Heights and Union Gap sewage plants could conceivably be reclaimed for recreational or community uses.

4. The proposed tie between the Union Gap plant and an existing 18" Yakima force main will run on the west side of Interstate 82. If a fee-simple pipeline corridor is acquired, it could readily be developed into a Yakima-Union Gap trail link.

5. The proposed Moxee Bridge pump station should be designed to be in harmony with a park setting (e.g., wood siding, vegetative screening).

MAXIMIZATION STUDIES

To help clarify the issues in the public's mind, we have segregated three "pure" concepts--three thematic approaches--and diagrammed them on Page 3-10. These "maximizations" display what might be done if each goal or "theme" were pursued independently. They are:

Community Image and Tourism Maximization,
Recreation Maximization, and
Stewardship Maximization.

The purpose of this exercise is to highlight the conflicts and compatibilities of these three approaches. You will note that their conflicts are wholly outweighed by their compatibility, meaning that each theme can be pursued without major conflict with the others, for each one "fits" a separate part of the riverscape.

COMMUNITY IMAGE AND TOURISM MAXIMIZATION

Emphasize the river's value as the most important gateway to the greater Yakima urban area; maximize the "parkway" appearance; maximize facilities for tourists, visitors, and travelers; "improve" depressed riverside neighborhoods.

Theme Implications: Highly Visible; Reclamation; Enhancement

a. Easy-access wayside rest-picnicking.

b. Revitalize derelict riverside lands with a visitor center/ museum/restaurant/lodge (run by City, County, Chambers of Commerce, Audubon Society, private concessionaires, the Yakima Valley Museum, etc.).

c. Screening of objectionable views (e.g., industrial storage yards, sewage plant, graveling operations, commercial uses).

d. Freeway visual enhancement (e.g., poplar or ash along the freeway right-of-way).

e. Overall aesthetic enhancement (e.g., flowering trees, shrubs, attractive architecture, "scenic highway" protective covenants against outdoor advertising, screened commercial uses and visual nuisances).

f. Facilities of regional cultural interest: outdoor theater, arboretum, special interpretive center.

g. Attractive visitor complex in a park setting, with: restaurant (indoor/outdoor), park lodge, visitor center displaying local products.

Physical Implications

a. Concentrate efforts on the west side of the river.

b. Concentrate visitor/tourist facilities near freeway exits (namely Terrace Heights Bridge, Nob Hill/Moxee Bridge, Union Gap exit).

c. Maximized reclamation of highly-visible degraded areas (e.g., dumps, gravel pits, storage yards).

d. Indirect benefits (social impact): enhancement of depressed riverside neighborhoods; stimulation of peripheral private recreational developments; overall enhancement of desirability of the Yakima/Terrace Heights/Union Gap community.

RECREATION MAXIMIZATION

Ranging from playfields, indoor facilities, and tennis courts to trails; maximized recreational and sport activity. Includes many items classed as the "Urban Park Group,"
e.g.

- group picnic (with kitchen shelters)
- general picnic
- ball diamonds, playfields
- tennis
- bike trails
- open air theater
- adventure play area
- horseshoe pits, lawn bowling, bocci courts
- day camp
- putting-green area
- indoor recreation center
- archery range
- equestrian area (RE: conflict with County Youth Park)
- horseback tours (horse concession)
- boating (gravel ponds).

Theme Implication : Highly Usable

a. Easy-access (paved roads, parking, near main roads)

b. Active, heavy-use facilities.

c. Regional recreation complex.

d. Regional trail links (water, horse, bike, foot)

e. Widest possible range of facilities.

Physical Implications

a. Level, stable areas on either side of river.

b. Maximum connectivity: good trail linkage, continuity of regional park corridor, connections to other parks.

c. Harmonious detailing, signing, and landscape treatments.

d. User fees a possible form of partial financing, e.g.
   - parking fee (recommended)
   - bicycle-rental concession
   - boat concession (river float; canoes and paddleboats in ponds)
   - charges for team use of playfields
   - general entry fee to highly developed areas (not recommended).

STEWARDSHIP MAXIMIZATION

Maximizing habitat protection and enhancement; reclamation of degraded riverside habitats; developed view trails, viewing platforms and shelters, interpretive signing; interpretive tours; developed natural-education center.

Theme Implications:
Preserve Intact Natural Systems; Reclaim Degraded Systems

a. Perpetuation of valuable habitats, especially:
   - prime south area
   - Sportsman's Island
   - Resthaven natural area.

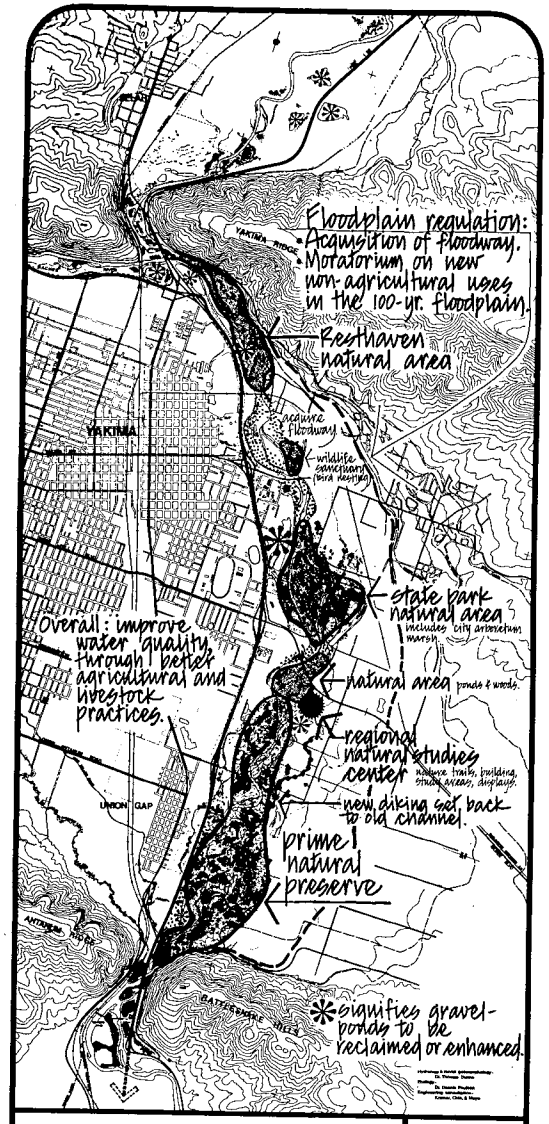
b. Public education in natural systems:
   - geology and climate
   - hydrology/fluvial geomorphology
   - arid and wetland ecology
   - vegetation and soils
   - animal populations:
     - birds (raptors, song birds, waterfowl)
     - fur bearers (mink, beaver, muskrat)
     - insects (butterflies, dragonflies, bees and wasps, etc.).

Physical Implications

a. Limited-access natural-areas, detailed with:
   - "Diamond Gates" (allowing only foot traffic)
   - bird boxes and perches
   - interpretive signs or displays
   - access and circulation controls (e.g., stake fencing)
   - wildlife enhancement techniques.

b. Regional Natural Studies Center
By efforts of the Yakima Valley Museum, local school districts, the Audubon Society, private endowments, and other participating groups; a teaching center, with:
- changing historical/ecological/geological displays (RE: museum)
- nature films (e.g., National Geographic) and slide presentations
- reference library
- school programs
- continuing education programs (e.g., guided walks, weekend classes, field identification of vegetation and animals, children's programs, lectures, other special programs).

This should be located in an easy-access area of moderate natural value, with trails extending into a preserved natural zone.



Stewardship Maximization

The Yakima River Regional Greenway

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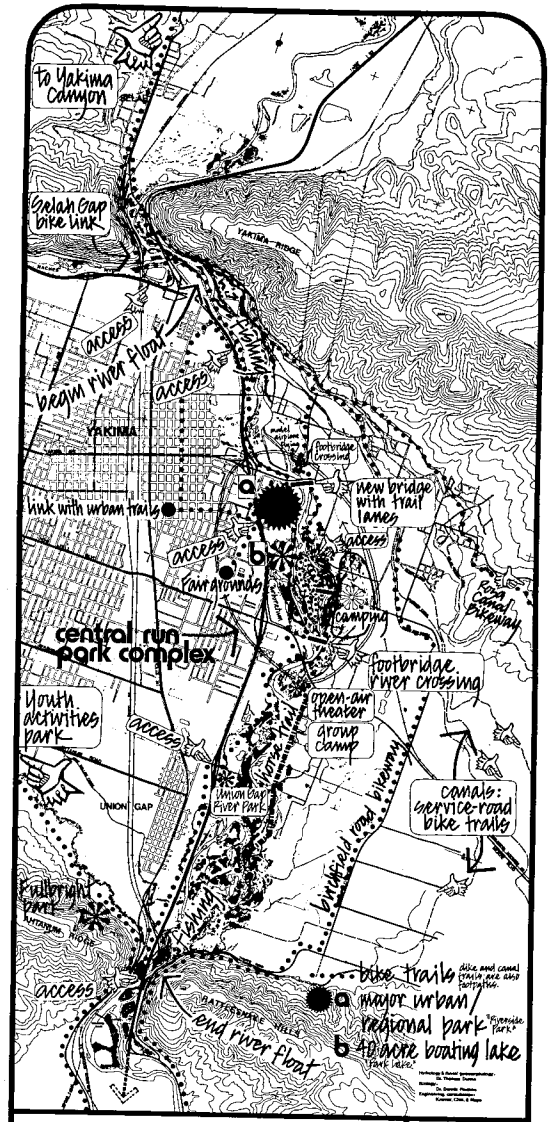
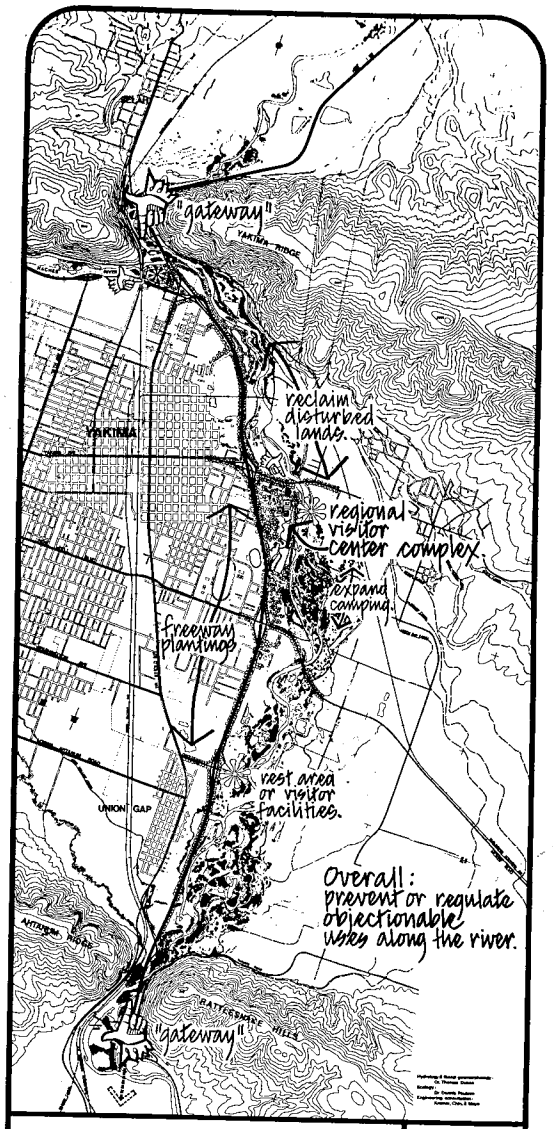


Recreation Maximization

The Yakima River Regional Greenway

JONES & JONES



Community Image & Tourism

The Yakima River Regional Greenway

JONES & JONES

Section 4
RECREATION OVERVIEW

SECTION 4. RECREATION OVERVIEW

The 82 "Freeway Park Endorsements"* cover one of the broadest spectrums of public input seen in any open-space project. From the Altrusa Club to the YMCA, the community appears to wholeheartedly endorse the greenway concept. General and specific recommendations were noticed:

A. General: "facilities for the aged"
"youth facilities"
"City recreation area"
"stopping place for visitors" **
"scenic parkway." **

B. Specific:

group picnic area (organizations)
picnic area (general)
tennis
arboretum
slow-pitch softball diamonds
camping-skills area
primitive group camping
outdoor education area
wildlife preserve
day camp
boating
foot trails and bridges
bicycle trails
horse trails
horse arena
swimming
rifle range
climbing mound
archery range
model airplane flying
amphitheater
ice arena.

Our first effort has been an attempt to group these diverse forms into three categories:

"Natural Area" uses,
"Urban Park" uses, and
"Special Function" uses.

This is shown on the opposite page. Overlaps indicate commonality between groups.***

Each group has its particular requirements, and each section of the river has a certain overall suitability for meeting those requirements. An attempt to assign suitabilities, by run, is shown on Page 4-3.

In an ideal land-use plan, the inherent suitability of the natural systems will dictate the kinds of use they should receive. Our efforts, therefore, were to let the riverplain tell us its capabilities and constraints, allowing a plan to grow from that dialogue.

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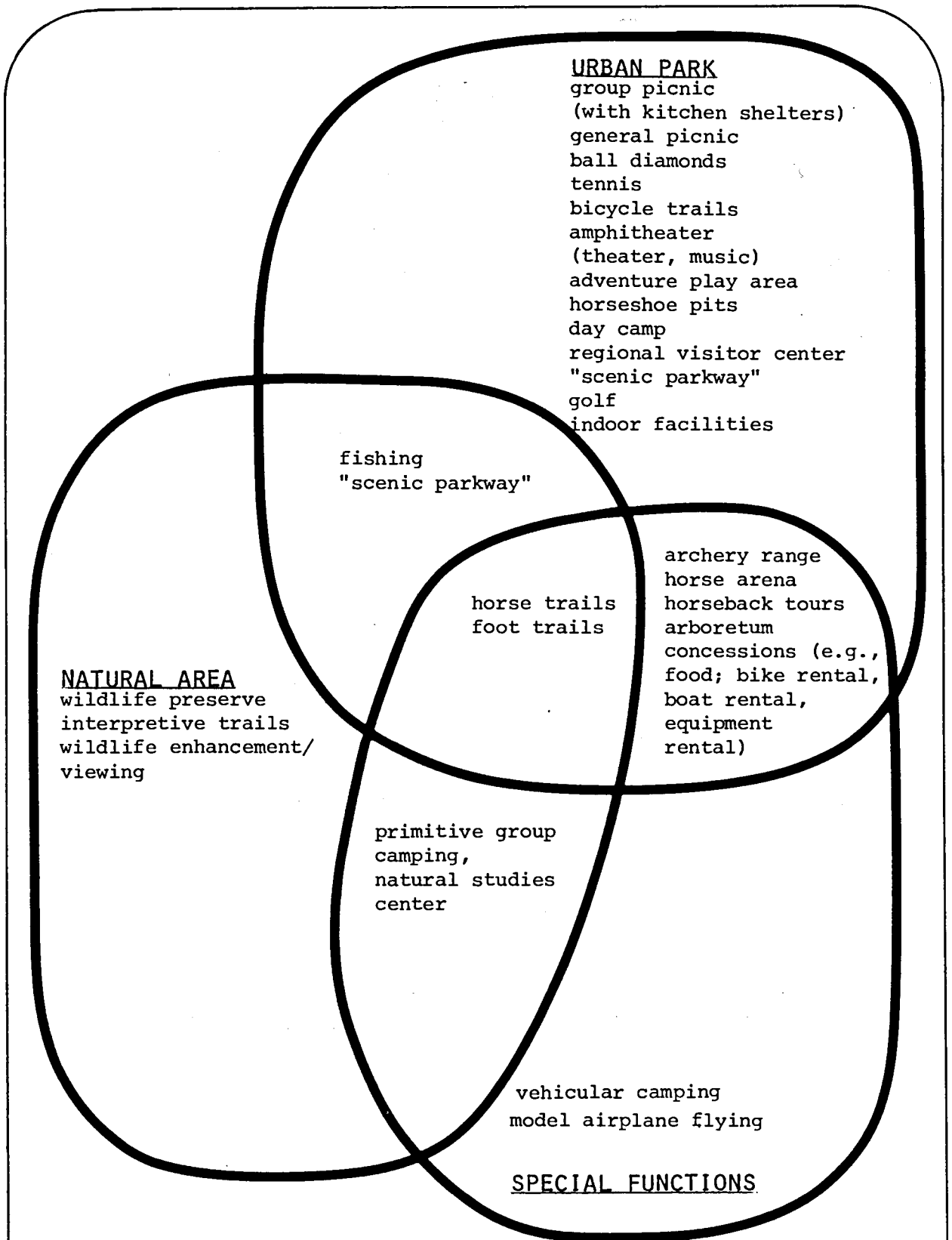
* These are listed in Appendix 'C' of this report.
** Vehicular camping is implied under the "stopping place for visitors" and "scenic parkway" recommendations.
*** This diagram is all-inclusive, and contains activities not recommended in the Endorsements.



YAKIMA REGIONAL GREENWAY,
UPPER YAKIMA VALLEY REACH (BASIN REACH #7)
COMPOSITE COMPATIBILITY DIAGRAM

OVERALL RECREATION SUITABILITY, BY RUN

RUN	SUITABILITY	
UPPER NORTH	West Side	East Side
Units:	SCENIC ENHANCEMENT	NATURAL AREA
Selah Gap	Fishing (lake, river)	Fishing (lake, river)
Naches Confluence	Bike trail (dike)	Bike trail (Resthaven Rd.)
Yakima Ridge	Informal picnicking	Foot trail (natural area)
	River access (boat)	Wildlife enhancement
	Reclamation	Scenic overlook
	Overall theme: Natural (reclaimed)	Overall theme: Natural
LOWER NORTH	West Side	East Side
Units:	SCENIC ENHANCEMENT	CONSERVATION AREA
Boise-Cascade	RECLAMATION	with trails, fishing
Borrow Lake	Fishing (lake, river)	
	Bike trail (dike)	
	Overall theme: Reclamation	Overall theme: open space
CENTRAL	West Side	East Side
Units:	URBAN PARK	CONSERVATION AREA
Terrace Heights	Trails, arboretum	Rural park (trails, camping, amphitheater, etc.)
Sportsman's Park	Natural area (wetlands)	Natural wetlands
	Scenic enhancement	
	Reclamation	
	Overall theme: Urban Park and Reclamation	Overall theme: Rural Park with natural zones
UPPER SOUTH	West Side	East Side
Units:	SCENIC ENHANCEMENT	CONSERVATION AREA
Treatment Plant	Bike trail	Horse trails
Riverside Road	Foot trails	Wildlife enhancement
Bend	Natural area/Recreation area	Foot trails
		Group camp
		Natural studies
	Overall theme: Reclamation, Trail Links Conservation	Overall theme: Natural Area

(Continued)

LOWER SOUTH	West Side	East Side
Units:	NATURAL AREA	NATURAL AREA
Braidwork	Scenic corridor	Wildlife enhancement
Rattlesnake Hills		Natural study area
Union Gap		
	Overall theme:	Overall theme:
	Natural Area	Natural Area

DEMAND AND NEED The formation of an extensive greenway is beyond the scope of traditional "demand and need" calculations; and, most innovative open-space plans are, for they intend to provide a quality of resource that overtops the standard park-acres-per-capita formulae.

However, most facilities (as opposed to pure "open space") may be judged by need requirements.* There are potential conflicts. The master plan for the newly-acquired Youth Activities Park (up Ahtanum Creek) includes many facilities that could potentially be invested in the greenway. (Union Gap's new park may be a similar case.)

It must be borne in mind, then, that the foremost objective of the greenway is the preservation of a river corridor as open space; facility development must be a secondary (though worthwhile) consideration. Certain facilities--such as the Premix gravel-lakes or the potential trail links--are opportunities that could probably be justified by a demand-and-need approach.

UNSUITABLE USES Some types of recreational ingredients are not suitable for inclusion in the greenway. These include:

A. *A rifle range, which poses a severe safety hazard and is better fitted to an isolated location, firing into a south-facing barren ridge.*

B. *A golf course, which not only has huge spatial demands (from 120 acres for an 18-hole "professional" course to 20 acres for a 9-hole regulation par-3 course) but also is best sited in an area with more landform (rolling hills, etc.). Also, a golf course implies a level of investment that would require protective diking and is thus not suited to non-diked or unstable areas. However, a putting green area might be an acceptable ingredient in the "urban park" category.*

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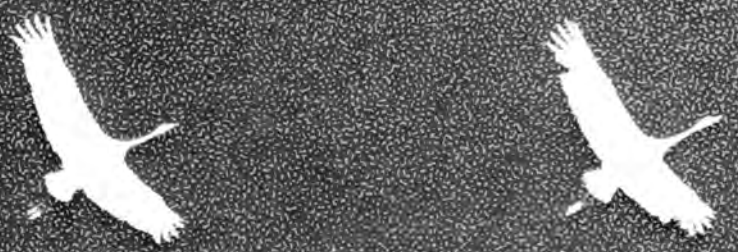
* Additional vehicular camping could be justified on the basis of existing use (at the State Park and the KOA campground) and anticipated demand (resulting from the extension of I-82 to the south, or the creation of a greenway).

C. *Hunting, which (like a rifle range) poses a severe hazard to other greenway users. This may be a touchy issue, but we feel that hunting must ultimately be prohibited in the gap-to-gap reach.*

D. *A horse arena is an accepteble "urban park" ingredient, but would be a duplication of facilities planned for the County Youth Activities Park. The only trail proposed for horse use is the Ahtanum Creek Trail from the County Youth Activities Park to the river. However, horse use could probably continue adjacent to the proposed river-dike bicycle trails. Yakima County may wish to provide more horse trails in the Greenway than are proposed in this study, since Yakima has a high per-capita ownership of horses.*



Section 5
THE RECOMMENDED MASTER PLAN

SECTION 5. THE RECOMMENDED MASTER PLAN

A "master plan" is a general development plan for an area. Master plans show interrelationships and linkages, and a specific type of land use is attached to each part of the planned area.

The following section (Section 6, Plan Details) goes into more design detail, and where appropriate gives graphic concepts. Within the framework of the overall land use plan, detailed proposals for the greenway may change with time, but are shown to stimulate discussion. By example, the proposals for the building complex in Riverside Park will help the City of Yakima to imagine the possible use of that area, and to discuss its implementation.

As much as possible, proposals are the products of factual determinations. Thus we propose the use of pole-buildings throughout the greenway, not for aesthetic reasons, but because of the river's flooding. The Riverside Park Recreation Area was likewise proposed for a variety of functional reasons, including its relation to Yakima, the presence of the Central Premix gravel-pit lakes, its low natural value, its relation to the Sportsman's State Park, and the area's need for reclamation.

Boundary

As far as possible, the greenway boundary was tied to natural features or legally identifiable lines. The west boundary is usually the western edge of the Interstate right-of-way, although public lands touching the freeway (for instance, Kiwanis Park) are also included. The east boundary is more complex. In the north and central runs, roads, canals, or dikes form the edge; in the south runs, a major slough becomes the boundary. (Please refer to the maps in Appendix D for a better picture of these borders.) The boundary shown in Appendix D is a "greenway planning unit", or the "overall conservation area" boundary; not all land inside this boundary will necessarily be acquired.

DEFINITIONS

A natural area has paramount natural value. Recreational use would be incidental to the goals of preservation, enhancement, and reclamation.

A conservation area has a lower natural value, a higher need for reclamation and enhancement, or a greater suitability for recreational use. Conservation areas may contain both natural segments and recreational-use segments.

A recreation area may have naturalistic segments, but its suitability for recreational use outweighs its other aspects.

GENERAL ZONING

The zoning categories are proposed largely for acquisition and management convenience; the zones are made to correspond with the acquisition blocks shown in Appendix D.

LOCATION & ACCESS

NATURAL AREAS:

RESTHAVEN NATURAL AREA
(North Runs; Block 1)
Recreational access:

- Off Resthaven Road;
- Through the "Boise-Cascade underpass";
- Via dike trail (foot/bicycle).

RIVERSIDE NATURAL AREA
(South Runs; Blocks 6 and 7)
Recreational access:

- Trail access (foot only) from the proposed Natural Studies Center and Group Camp;
- Potential trail access (foot only) from Lower Riverside Road;
- Trail access from Ahtanum Creek mouth and Old Town Road (limited extent);
- Foot access along proposed dike.

CONSERVATION AREAS:

ROZA CONSERVATION AREA
(North Runs; Block 2)
Recreational access:

- Via dike trails (foot/bicycle);
- Road access via Hartford Road, "G" Street, etc.

RIVERSIDE CONSERVATION AREA
(South Runs; Block 5)
Recreational access:

- Via eastside dike trail (foot only);
- Foot-trail access from trail-head parking at the Natural Studies Center:
- Via west-side dike trail (foot/bicycle);
- Via Old Town Road.

SPORTSMAN'S CONSERVATION AREA
(Central Run; Block 4)
Recreational access:

- Via dike trail (foot/bicycle);
- Via footbridge to Sportsman's Island (foot only);
- Road access to trail-head parking in the State Park, and off Keyes Road (county lands south of Cavanaugh Road).

RECREATION AREAS:

RIVERSIDE RECREATION AREA
(Central Run; Block 3)
Recreational access:

- Principal auto access off the Terrace Heights Road;
- Secondary auto access via the Beech Street underpass;
- Primary bus access via the Beech Street underpass;
- Primary bicycle/foot access from Yakima & Fairgrounds via Beech Street underpass;
- Via dike trail (foot/bicycle);
- From Sportsman's C.A. via proposed cross-river footbridge.

OTHER "RECREATION AREAS"

- Potential "Union Gap Recreation Area" off Old Town Road (private development);
- Potential "Naches Confluence Recreation Area" at "Lake Polluted": possible stop on the Interurban Trolley; potential swimming area if Naches River water* is circulated through the lake; trail-head parking for the Selah Gap bike link, and dike trails.

* The Naches has better water quality than the Yakima; the lake is the only potential public swimming area identified in the study area. This requires further study.

The recommended master plan can best be understood by noting its ingredients: community image and tourism, recreation, and stewardship. The maximization studies* have shown that each can be pursued without detriment to the others, for each has a certain "fit" with the riverscape: each function "belongs" in a certain place dictated by natural systems, access, stability, or man-made features.

Below, major proposals for each run are listed in terms of Community Image and Tourism, Recreation, and Stewardship. The list generally runs from North to South.

RUN		COMMUNITY IMAGE AND TOURISM	RECREATION	STEWARDSHIP
UPPER NORTH	EAST	.Gateway" Signing on Interstate 82	.Resthaven Road Bikeway .Resthaven foot trails .Resthaven access area (parking)	.Resthaven Natural Area
	WEST	.Freeway plantings, esp. to screen Boise Cascade storage yards .Visual enhancement of "Polluted Lake" borrow pit .Screen Objectionable Uses (e.g., trailer park) .Potential stop on the Yakima Interurban Trolley Line (Yakima to Selah)	.Selah Gap Bike Trail Link .Riverdike Bike/ Foot Trail .North Ponds managed for sport fish production .River floating embarkation pt. .Develop "Polluted Lake" for swimming: potential "Naches Confluence Recreation Area"	.Naturalize "Polluted Lake"; establish in-flow from Naches River .Habitat plantings around Freeway Lake
LOWER NORTH	EAST	(no action indicated)	.Footbridge Crossing at the mouth of the Roza Return Canal .Roza Canal Dike Trail (part of a regional trail system)	.Resthaven Natural Area .Roza Conservation Area

* Refer to Page 3-6

RUN		COMMUNITY IMAGE AND TOURISM	RECREATION	STEWARDSHIP
LOWER NORTH (continued)	WEST	.Freeway plantings .Directional signing to Riverside Park, etc.	.Boise-Cascade* Ponds managed for sport-fish production (if feasible) .Riverdike Bike/ Foot Trail (part of a regional trail system)	.Naturalize Boise-Cascade ponds and surrounding disturbed land

* Boise-Cascade might trade its riverside land for county or state forest land. This could be investigated.

CENTRAL	EAST	.Expand overnight facilities at Sportsman's State Park	.Riverdike Bike/ Foot Trail .Expanded Sportsman State Park* .Footbridge to Sportsman Island .Footbridge River Crossing at Old Moxee Bridge Site	.Sportsman's Island Preserve .Interpretive Trail on Sportsman Is. .Preserve ponds north of Moxee Bridge
	WEST	.Freeway plantings .Directional signing to parks, etc. .Riverside Park Visitor Facilities	."Park Lake" boating .Riverdike Bike/ Foot Trail .Riverside Park Recreation Area (active recreational uses) .Other trail links	.Yakima Valley Arboretum and Audubon Marsh Trail .Reclaim and naturalize "Park Lake"

* It was not possible to recommend a size for this expansion. It appears that the park could now sustain a moderate expansion in camping facilities; however, the demand for campsites could dramatically increase after the Greenway's implementation and after the extension of Interstate 82 to the south.

RUN	COMMUNITY IMAGE AND TOURISM	RECREATION	STEWARDSHIP
UPPER SOUTH	.Prohibition of incompatible uses from Riverside Lands. Regional Natural Studies Center with visitor facilities. .Visual Enhancement of Sewage Plant & Spray Fields .Freeway Plantings. Signing for Riverside Park, Sportsman State Park, & Yakima Regional Natural Studies Center	.Riverside Group Camp .Pond Fishing .Hiking trails .River-dike bike/foot trail (Moxee Bridge to Old Town Road) .Potential limited private recreational development off Old Town Road (potential "Union Gap Recreation Area")	.Regional Natural Studies Center (off Moxee Boulevard) .Riverside Conservation area (part)
LOWER SOUTH	."Gateway" signing on Interstate 82	.Potential limited-access nature trails .Ahtanum Creek-to-Old Town Road Trail Link (new sewer main R.O.W.) .Ahtanum Creek-Mouth Access Area (parking) .Ahtanum Creek Trail (lower portion) .River-Floating debarkation point	.Riverside Natural Area (prime area)

The following tables give a more detailed explanation of the individual "features" proposed for this reach, giving their location and elements, and indicating actions required for their realization.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
SIGNING	All runs overall	Unify and identify the Greenway with harmonious signing.	Road Signing (directional and informative); trail signing, interpretive signing, architectural signing; instructional signing.	The coordinating body (Regional Greenway Commission) should harmonize all recreational detailing.	See Section 6,
DETAILING	All runs overall	Unify the Greenway; detailing will reflect the character (formality) of each sub-area.	Benches, fencing, gates, waste receptacles, parking, trails, bridges, architecture, etc.	(Same)	(Same)
TRAIL LINKS TO YAKIMA CANYON	Wenas-Selah Reach, Yakima Valley Reach (outside of study area)	Regional trail connections.	Preliminary planning.	Studies by Yakima County, Kittitas County, State Parks, and Highways.	Part of a State Trails Corridor from the Kittitas Valley (Ellensburg) to Yakima, thence to the Columbia.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
NORTH RIVER TRAIL LINKS (EAST SIDE)	Upper & Lower North Runs Selah Gap to Terrace Heights Road; along Resthaven Road.	Bike trail link.	On-road bikeway; dike trails; signing; primitive rest facilities; connect with Terrace Heights bike paths; connect to south-bound trails.	Designate Resthaven Road a County bikeway; improve dike-trail for bicycle use; obtain easements if necessary.	County project, in cooperation with diking district and U.S.B.R. (Roza Canal).
NEW TERRACE HEIGHTS BRIDGE	(on-going plans for a new bridge)			Public Works Dept. should establish trail connections, road crossings, and trail-head parking.*	County project.

*It has been suggested that the County should determine the feasibility of having a dike-trail underpass at each end of the new bridge.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
SELAH GAP BIKE LINK	Upper North run, West side of I-82 "Old Stage Road", and on highway bridges.	Link Selah to north end of Yakima.	Trail improvements; bike bridge, signing.	Bike lanes built onto existing highway bridge; other trail connections via Old Stage Road.	County/Highway Dept. Project.
NORTH RIVER TRAIL LINKS (WEST SIDE)	Upper & Lower North Runs a. Under I-82 b. Across Boise Cascade lands c. Across Terrace Hts. Rd.*	Link above bikeway with River Trail system.	Dike trail improvements; links under I-82. Safe crossing over Terrace Hts. Rd.; signing.	a. Action by Dept. of Highways w/ trails money. b. Purchase trail easements (or by donation) c. By County, Dept of Highways, and railroad company. d. Coordinate with Corps of Engineers dike improvements e. Design Terrace Hts. bridge to accommodate trail use.*	a. Danger of dike washout, near Freeway Lake. b. Coordinate with new Terrace Hts. Bridge construction.

*When the new bridge approaches are being designed, the County should establish safe river-dike trail crossings.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
NORTH BORROW-PIT LAKES: RECLAMATION AND ENHANCE-MENT; ACQUISITION	Upper North Run West side, near Naches con-fluence.	Enhance pit-lakes for re-creation, trails, possibly swimm-ing.	Screen-planting near I-82; trail development; re-vegetation; water quality enhance-ment; acquire Boise-Cascade lakes; reclama-tion of all lakes.	"Polluted Lake": establish inflow from Naches River. Naturalize with plantings. Free-way Lake: screen plantings & park development; acquire Boise-Cascade Lakes, (undiked).	State action: Dept. of Game, Dept. of Highways. Also possible Federal aid: B.O.R., U.S.B.S.F. & W., C. of E.
RESTHAVEN NATURAL AREA	Upper & Lower North Runs Woods and marsh adjacent to Rest-haven Road; extends across river to include Boise-Cascade Lakes.	Preserve and enhance existing natural area.	Trail-access and parking improve-ments; signing; primitive visitor facilities.	Add signing, parking; expand and improve trails; prevent hunting; develop fishing access; consolidate landholdings. Prevent gravel mining.	County and State action. (Continued waterfowl hunting will be a threat to expanded public use.)

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
RIVERSIDE PARK (RECREATION COMPLEX)	Central Run West side of the river.	Multi-use "urban park" and recreation grounds.	Building complex: (visitor center, lodging, restau rants, shops) playfields, boat/ bike rental, gen-eral "atmospheric" landscape develop-ment.	City of Yakima, private conces-sionaires.	Potentially one of the most interesting park complexes in the State. Can be connected to Sports-man's Park via foot-bridge.
"PARK LAKE"	Central Run Part of River-side Park; expanded Premix lakes, up to 50 acres.	Reclaimed gravel-pit lakes; non-motorized boat-ing and water-related park uses.	Regrading, revegetation, expansion, enhancement, stabilization.	Negotiations with property owner and Central Premix, allowing for future city acquisition and facilitating future park use.	Danger of dike wash-out. The Lake is the central feature of Riverside Park. Use will require dike monitoring, water circulation, lake management.
YAKIMA VALLEY ARBORETUM	Central Run Part of River-side Park. South of "Park Lake"; west side of river	Regional arbore-tum (partially existing)	Study collections ornamental dis-plays, home gar-dening center, special shows and programs; park nursery; audubon trails, signing.	City of Yakima and local horti-cultural society.	The Yakima Valley climate can support an unusual variety of plants.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
SPORTSMAN'S STATE PARK, (SPORTSMAN'S CONSERVATION AREA)	Central Run East side of river.	Existing State Park proposed for expansion. Facilities for travelers, tourists.	Long-range expansion of tent and R.V. camping; developed dike trail; amphithe-ater; footbridge to Sportsman's Island; signing.	W.S.P. & R.C. actions.	Expanded camping is proposed only at the State Park. The exist-ing private campground (north of the Moxee Bridge, on the east side) is a compatible use, and should remain.
FOOTBRIDGE CROSSING	Central Run Old Moxee Bridge site, above Moxee Bridge.	Link Riverside Park and Sports-man's area. Provide a bike/ foot trail "loop" and link in the regional trail system.	Glue-lam wood arch bridge*, trail connec-tions, signing.	City and County of Yakima. See comments.	Could carry proposed 12" force-main sewer line under bridge. Potential cooperative development, with partial sewer-project funding*.

*Alternate: Possible construction of a suspension bridge by the U.S. Army Reserves, by special arrangement.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
REGIONAL NATURAL STUDIES CENTER	"South Unit," east side, area below Moxee Blvd.	Regional study center; public programs, school studies, film & slide programs, educational tours of the riverside.	Pole-building with meeting rooms, auditorium, library, exhibits; parking, trails; outdoor study area (includes ponds); wildlife enhancement.	City and County of Yakima; local interest groups; local school districts; possible State or Federal assistance.	Would deal with geology, geomorphology, hydrology, botany, zoology, etomology, microbiology, etc. Its implementation would brighten Yakima's cultural horizon.
RIVERSIDE GROUP CAMP	(Same)	Regional group camp and retreat.	Pole-building; primitive camping area with "Adirondack" shelters. Primarily meant for youth organizations and visiting groups.	County/City action.	The community has expressed a need for this facility.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
SOUTH END RIVER TRAIL LINKS	Opposite Town of Union Gap; west side. Upper & Lower South Runs	Link west-side river trails to Ahtanum Creek Trail (thence to the County's Youth Activities Park), and to points south.	Trail following Spring Creek, parallel with I-82 on the west side. River access and trailhead parking at the mouth of Ahtanum Creek.	Purchase or negotiate easements. Cooperative Union Gap and County action. Coordinate with Dept. of Highways. Purchase Ahtanum Creek Mouth. (See note below)	Possible trail within highway R.O.W. or on proposed sewer-main R.O.W. Trail easement through private property. This trail links with the river-dike trail via Old Town Road underpass or via Rudkin Road (thence under the freeway and across the spray-disposal fields).
RIVERSIDE NATURAL AREA	Upper and Lower South Runs Wooded areas in the South Runs, mostly on the east side.	Protect and preserve a valuable, unique riparian zone bordering the Moxee Game Preserve.	Acquisition; limited development of interpretive trails;	State and possibly County actions to purchase valuable wetlands. Involvement of Corps of Engineers, U.S.B.R., U.S.B.S.F. & W.	One of the most crucial acquisition areas. Conservation easements may be used for farmland preservation.

Note: When the Union Gap treatment plant is abandoned, it could be converted to a trail-head facility with parking and restrooms.

FEATURE	LOCATION	PURPOSE	ELEMENTS	ACTIONS	COMMENT
MIDDLE VALLEY LINKS TRAIL	South of Union Gap; west side. Middle Valley Reach (outside the study area)	Extend bike trail system (within Yakima "State Trail Corridor") to the Columbia.	Preliminary planning.	Studies by the Dept. of Highways in connection with their planned extension of I-82. Guarantee trail access after I-82 construction; incorporate trail links into highway design. Negotiations with railroads to explore use of their ROW for trail purposes.	Advanced trail-planning by the DOH will prevent access and trail problems in the middle and lower Yakima Valleys. Primarily a County action.

Section 6
PLAN DETAILS

SECTION 6. PLAN DETAILS

This Section gives conceptual detailing for: Riverside Park, the Natural Studies Center, the Group Camp, Natural Areas, Sportsman's Conservation Area, and other features.

RIVERSIDE PARK RECREATION AREA

The west-side area between the two river bridges (Block 3; Central Run) is proposed as a single city park with "large urban park" functions. It could be connected to the State Park (the Sportsmen's Conservation Area) by a footbridge and by trail lanes on the new Terrace Heights bridge (as currently proposed).

Philosophy

The northern part of Riverside Park is proposed as a high-use area containing a broad range of active recreational features. The central part is Park Lake, a 40 to 50 acre boating lake (non-motorized); if the region's water quality improves, it could also become a swimming lake. The southern part is seen as a naturalistic area containing an arboretum and interpretive trails.

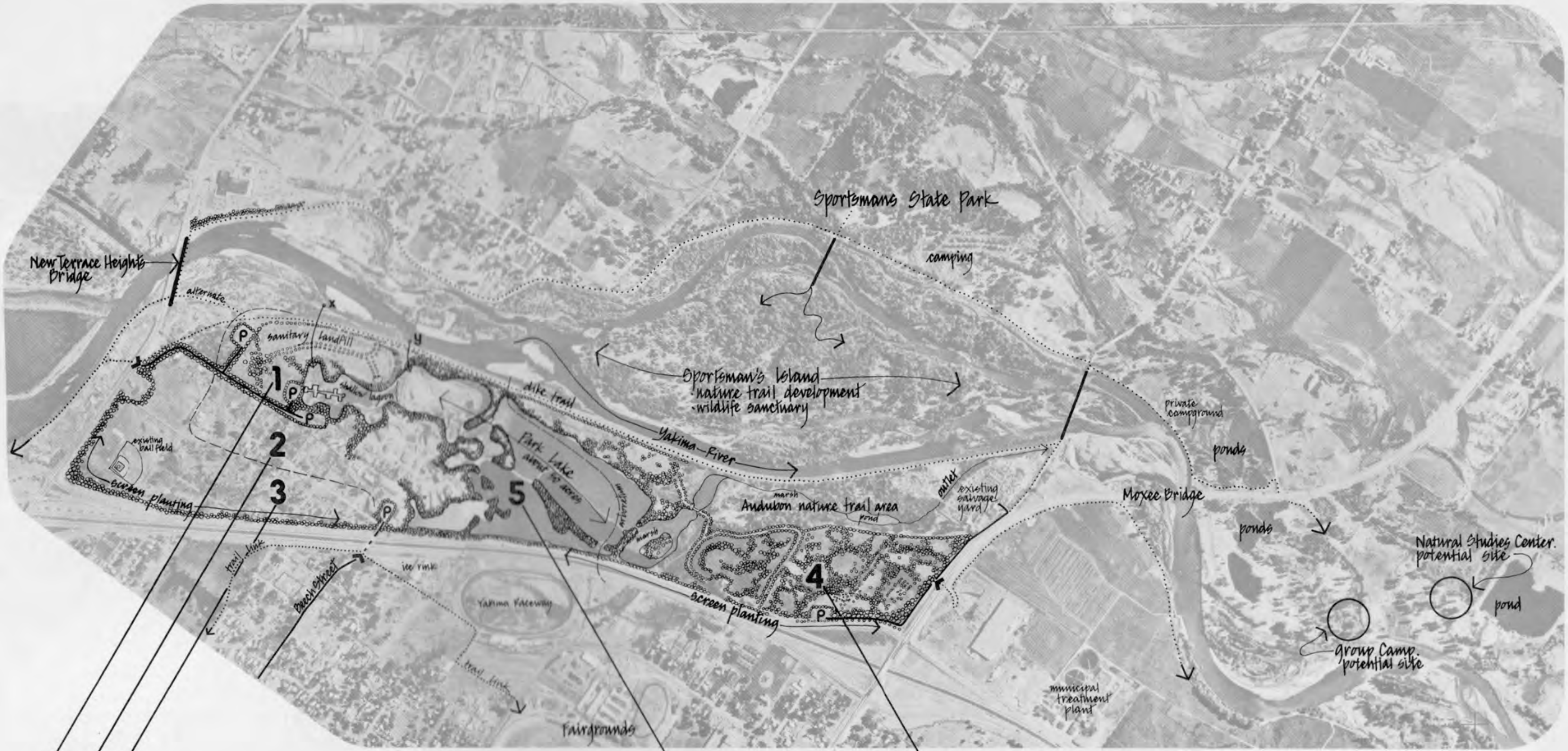
Riverside Park is one of the few areas that is directly accessible to Yakima cyclists and pedestrians (via the Beech Street freeway underpass).

Scope and Content

The schematic map on the next page shows a conceptual layout for the park. Its components are:

1. The North-end active-use area, possibly containing:
   - Road access (off the Terrace Heights Road) and parking.
   - Playing fields and play areas (softball, soccer, etc.).
   - Indoor sports
   - Small park-setting putting green area (concession operated).
   - Lake-related picnicking and boating.
   - Picnic-related small-scale games (horseshoes, bocci ball, fitness course).
   - A bicycle-rental and boat-rental concession.

2. A water-related building complex, built on piers above a northern arm of Park Lake (and also above potential flood levels), as far as possible from the freeway, containing:
   - An indoor/outdoor restaurant.
   - A boat-rental concession (rowboats, paddle boats, canoes, and small sail boats).
   - Lodging, in interconnected lodge buildings, operated by concession.
   - A regional visitor center, focusing on the Naches, Ahtanum, and Moxee Valleys (optional).



SPORTS: 40 acres maximum. Might include soccer (1), softball (3), tennis (6), putting greens, jogging/fitness course, bicycle tracks..... separated by shade & shelter plantings

PARK: Parking, group picnicking (kitchen shelters), picnicking, meadows, wooded areas, park walks, bicycle paths, playgrounds, games.

BUILDINGS: Over-water building complex might include: restaurant, open-air cafe, shops, loading units, boat rental. Other indoor facilities might be sited nearby: indoor sports, visitor center, cultural center, indoor pool.

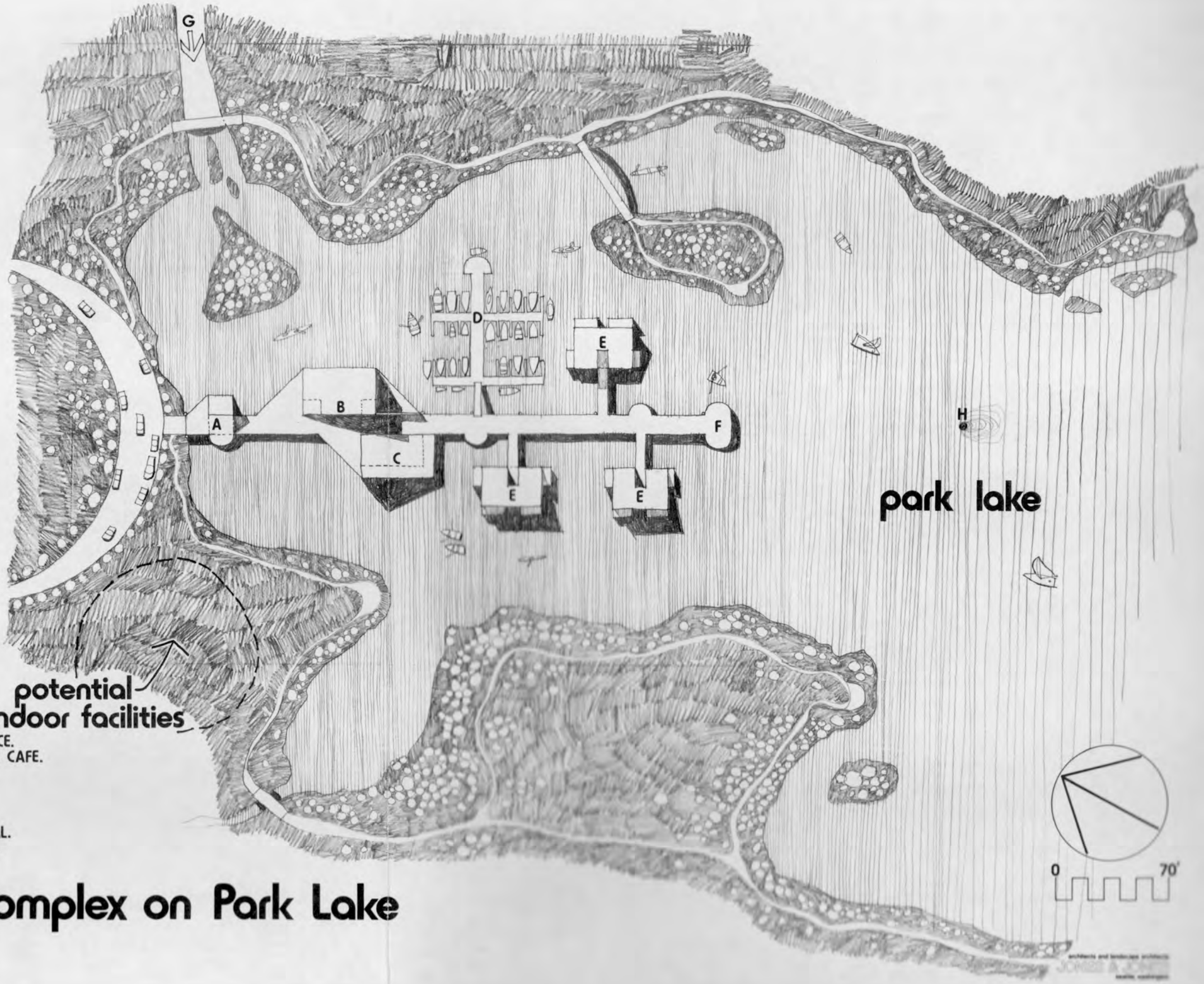
ARBORETUM: Collections of native and exotic ornamentals; steppe vegetation, tree fruits, teaching collections, park nursery, vine arbors, allées, herb garden, garden architecture.

PARK LAKE: A reclaimed gravel-pit lake: the lake's final configuration will depend on future negotiations with the gravel company. The northern lagoon could be shallow (3'-4'). River water may be fed into the lake at "X" or "Y". The "X" route may be infeasible due to the intervening sanitary landfill. If this is the case, the building complex might be sited to the south, off the main body of park lake; or, with the inlet at "Y", natural convection currents might keep the lagoon clean enough for boating if it were a deep excavation (over 20 feet).

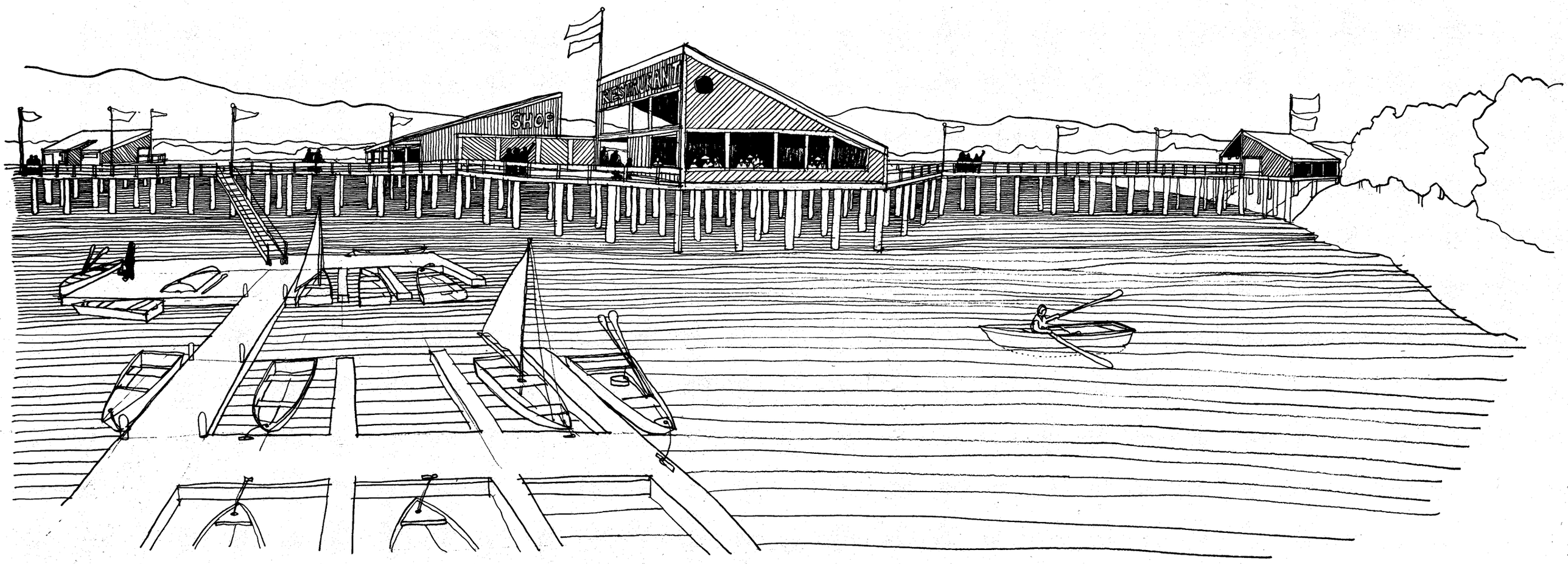
landscape architects
JONES & JONES
seattle, washington

0 1000'

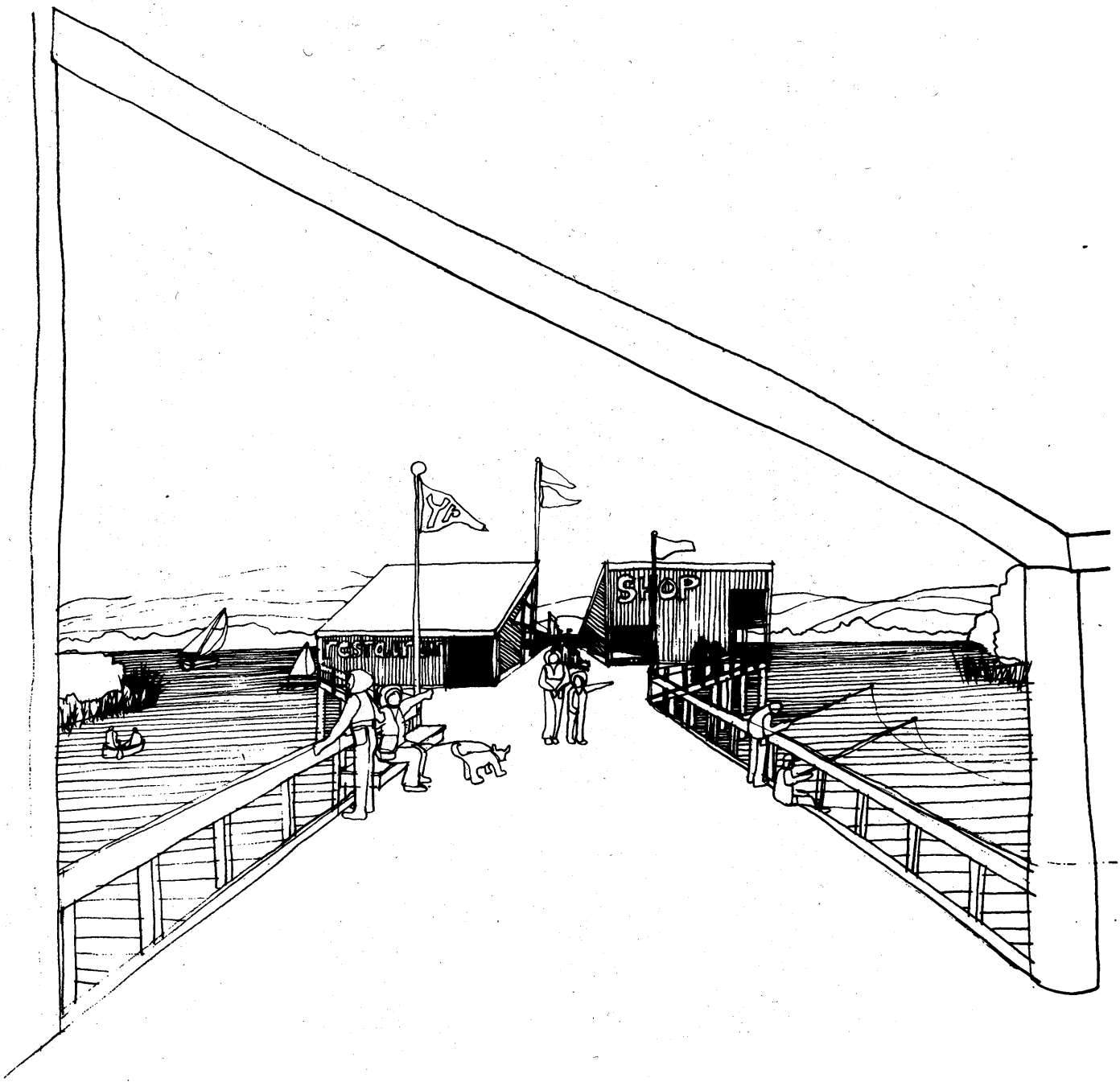
RIVERSIDE PARK schematic development plan



Building complex on Park Lake



View of the Park Lake building complex, from the east.



Entrance to the Park Lake building complex.

3. Park Lake is to become a 40 to 50 acre reclaimed gravel-pit lake, up to 80 feet deep, surrounded by shore-plantings, with habitat enhancement (RE: Section 7 this report), trails, picnicking areas, and small fishing piers. It is proposed that the northern end be extended: a) to form a lagoon for the building complex; and b) to carry river water from a north-end inlet structure (See Appendix F, Engineering Guidelines) into the main body of the Lake.

If Park Lake is to meet its full recreational potential, negotiations must soon begin with the Central Premix graveling operation. The content of that negotiation could be:

a. To insure that most of the lake's foreshore and backshore will be left in a gently-sloping condition.

b. To insure that the lake's final shape will be compatible with future use. (State Parks has had very similar negotiations near Wilson Creek, just north of Yakima Canyon. They negotiated with a gravel extractor to leave a pit-lake in a shape suitable for future park use.)

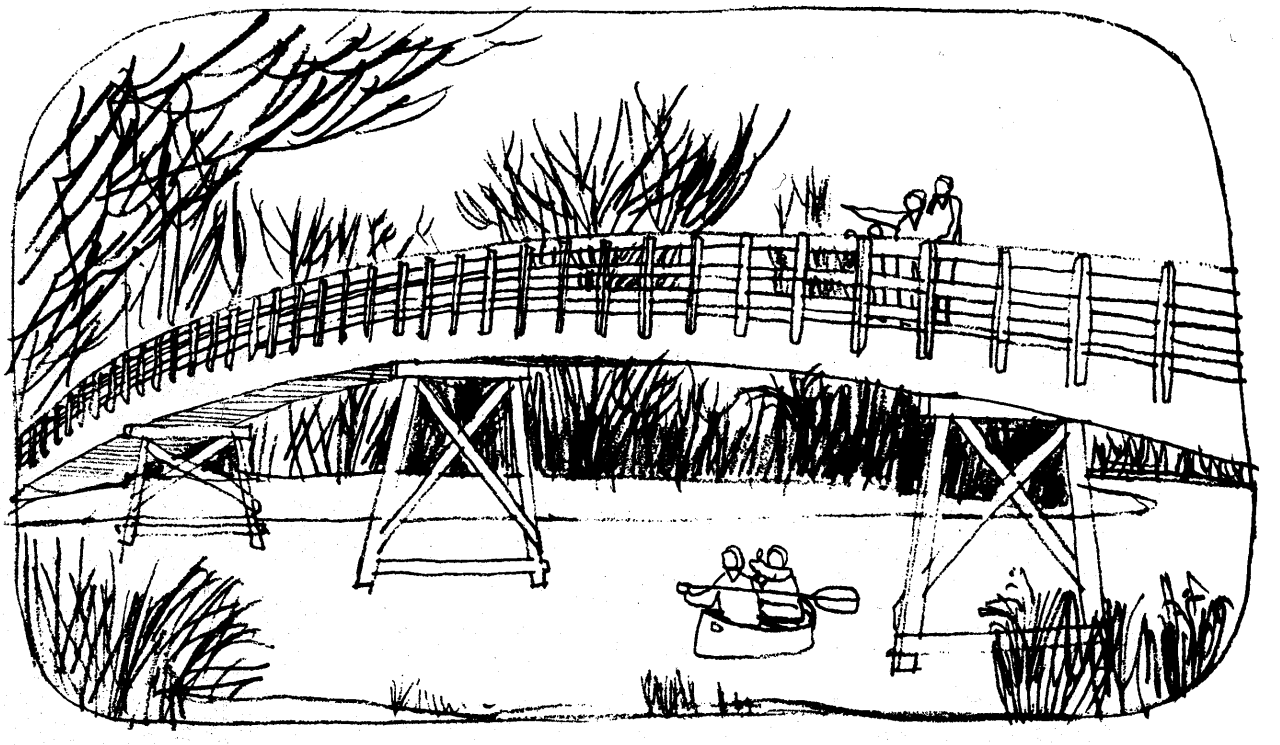
c. If the city acquires the necessary land to the north, it could be excavated (to form a lagoon) while Central Premix's heavy equipment and gravel plant are still in operation.

IT MUST BE BORNE IN MIND THAT THE DANGER OF THE RIVER-DIKE FAILURE OPPOSITE PARK LAKE (FOLLOWED BY INVASION OF THE RIVER'S MAIN CHANNEL) IS VERY REAL. IN CASE OF DIKE FAILURE, LANDS TO THE SOUTH OF THE LAKE COULD BE HEAVILY SCOURED BY THE RIVER.

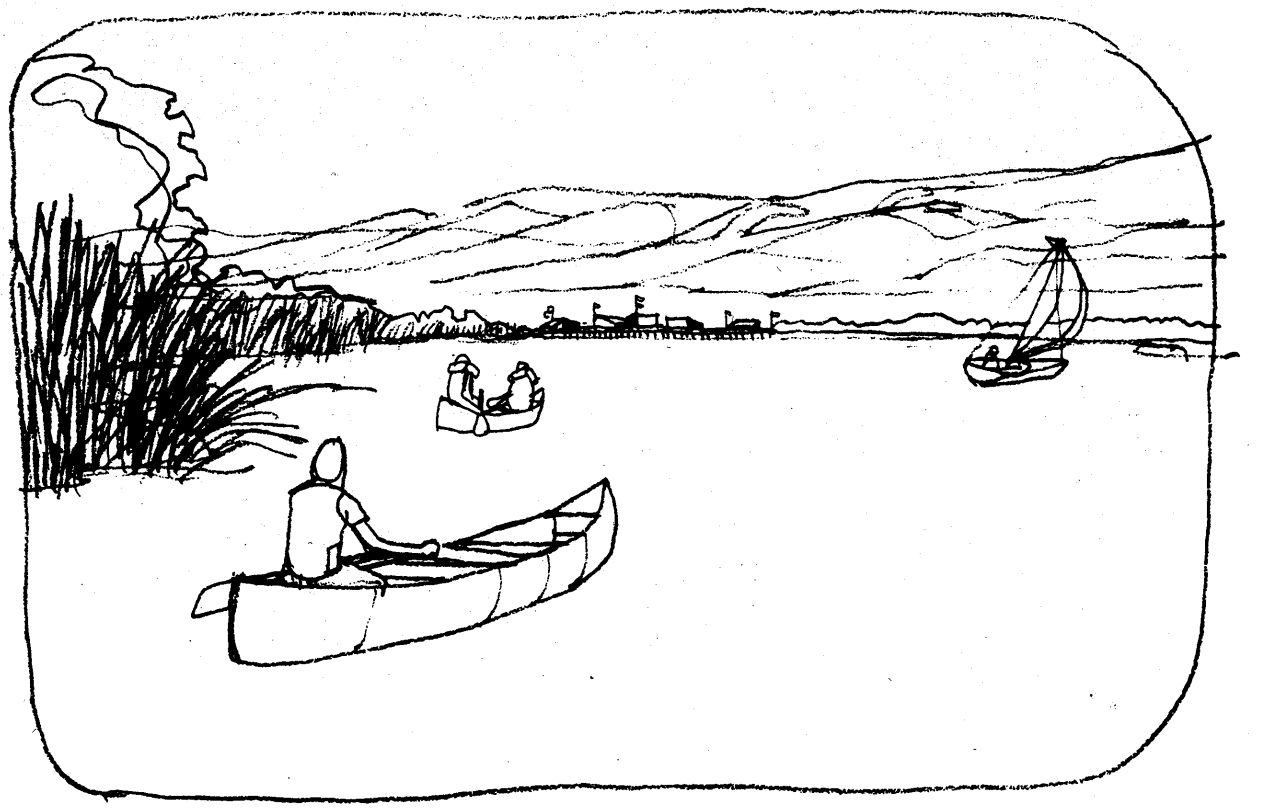
4. The Yakima Valley Arboretum, extending south from Park Lake, could be a fascinating ingredient of the greenway. It would compliment and offset the intensive-use area to the north. And, the proposed foot-bridge crossing (at the old Moxee bridge site) could connect it to the east side of the river.

The valley's growing conditions are ideal; an extensive collection of ornamentals, fruits, and native steppe plants could be grown.

5. Trail links through Riverside Park:
   - A continuous dike trail (foot and bicycle) from the Terrace Heights bridge to Moxee Boulevard, part of a regional trail system.
   - In-park trails through the park and arboretum, including an interpretive nature trail in the arboretum marsh.



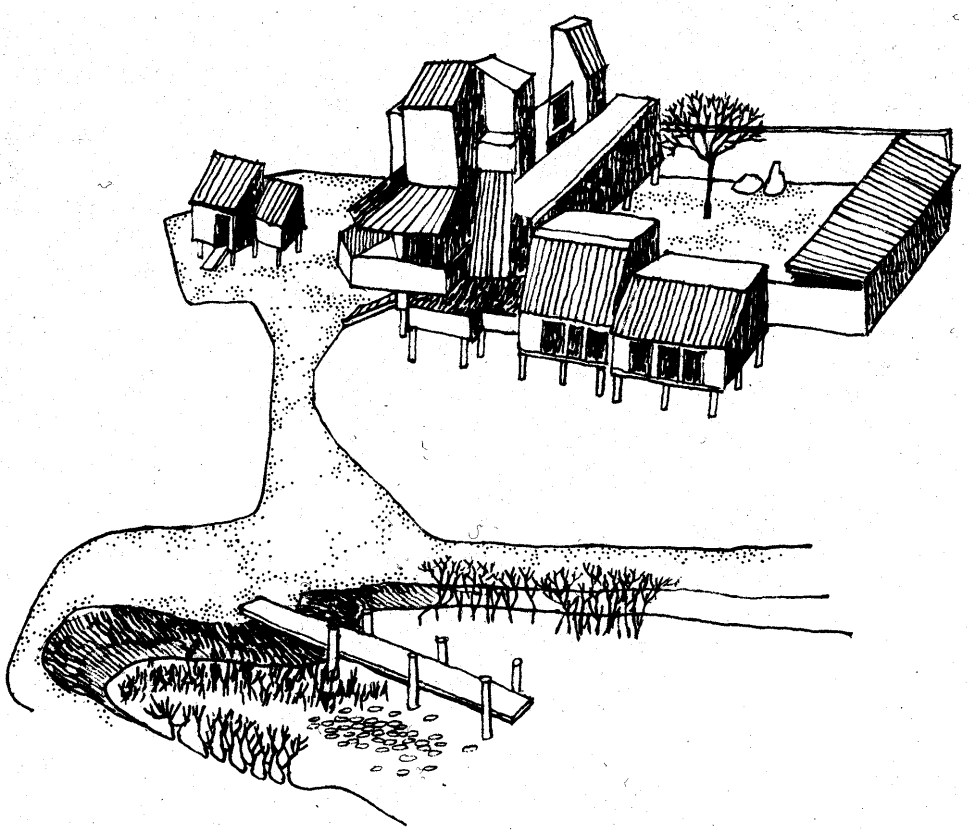
Proposed footbridge crossing between Riverside Park and Sportsman's Conservation Area, at the site of the Old Moxee Bridge.



Boating on Park Lake, with the building complex in the distance.

. A trail link to the State Park via the proposed cross-river footbridge.
. Trail links from the Beech Street underpass to the Central Washington State Fairgrounds and to Kiwanis Park.
. A trail link across the new Terrace Heights bridge.

THE NATURAL STUDIES CENTER



The proposed Regional Natural Studies Center (Block 5; Riverside Conservation Area) is based on the nature-center concept of the National Audubon Society, who will provide a free consultation service for groups or agencies planning nature centers. For further Audubon guidance, contact:

Nature Center Planning Division
National Audubon Society
950 Third Avenue
New York, New York 10022.

(continued)

Conceptual boardwalk along a pond or slough, near the Natural Studies Center.

Philosophy

Conservation can be an attitude, a belief, or a way of life. All people interact with the natural environment, yet few have a clear understanding of natural processes, relationships, and the life-style alternatives that will face them in the future. A natural studies center can be designed to help the community pursue programs of scientific and cultural value: to increase the understanding of the systems upon which they all depend.

Scope

The studies center could cover the widest range of fields:

- geomorphology (the form of the land and how it came to be).
- botany (plants).
- zoology (animals: mammals, insects, reptiles, birds).
- ecology (the relationships among animals, plants, and their environments: the study of interaction).
- hydrology (the workings of surface and sub-surface waters; especially the region's rivers).
- meteorology (the study of the weather).
- agronomy (the workings and effects of agriculture and orcharding).
- history (how the present settlement pattern and life-style came to be).
- anthropology (the comparative study of human cultures and their development).

Moreover, the center would be an enjoyable place to visit, offering trails, picnicking, public programs, talks, and film shows.

Learning

Close cooperation between the center and schools is recommended. All levels of education (from pre-school through college) could be enhanced by the center. Visitors to the region (as well as valley residents) could utilize the center.

Central Building

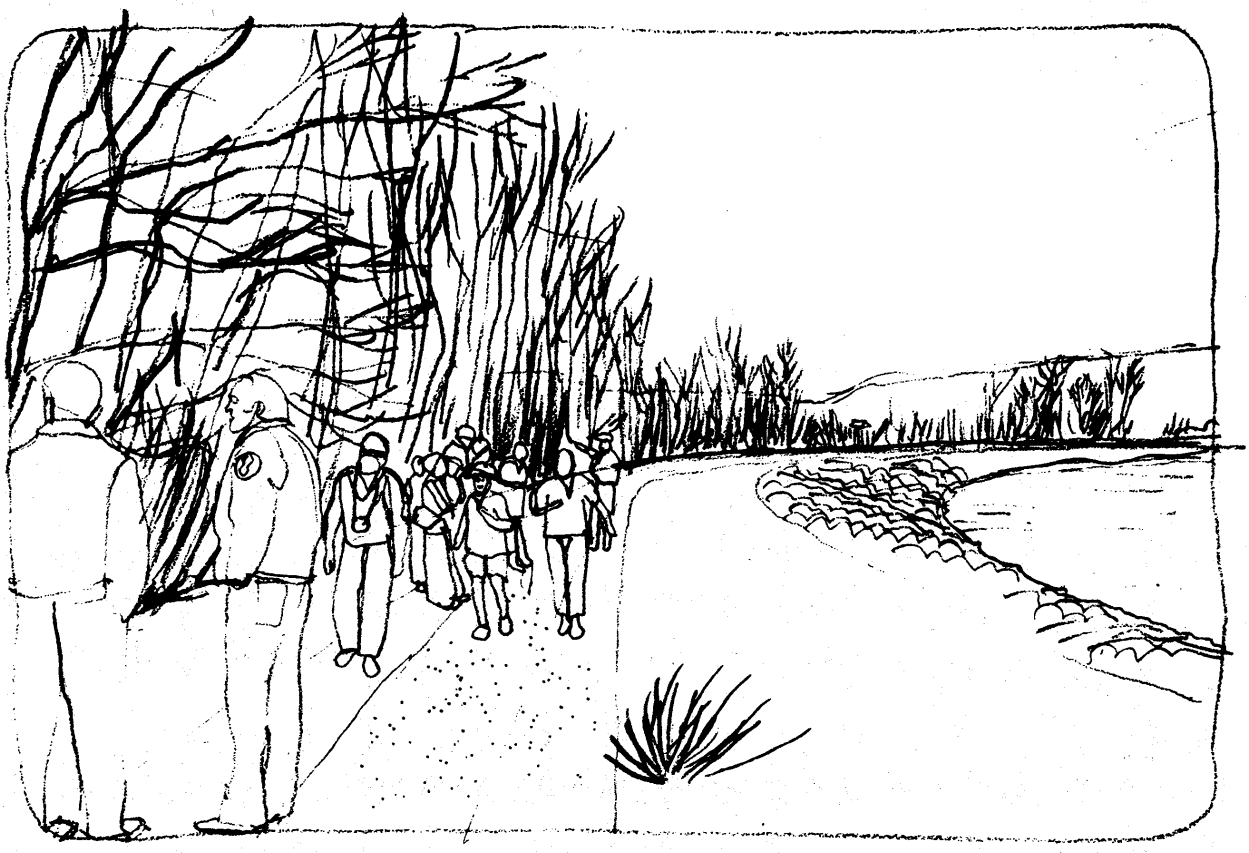
The studies center would focus on a building (which is recommended as a pole-building, beyond the reach of floodwaters) containing a meeting room, auditorium, simple laboratory facilities (e.g., equipped work tables), a large display area, administration room, and storage areas. The size is not yet determined. The building could be exemplary in the use of native, natural materials, and in energy conservation, waste disposal, etc.

Site Development

Beyond the building, the site (which could be about 100 acres) would be developed to provide:

- habitat enhancement (see Section 7 of this report).
- reclaimed gravel-pit ponds.
- photography blinds.
- viewing platforms and towers.

(continued)



A guided interpretive/educational river walk.

- elevated walkways (in wetlands).
- regulated foot access to the Riverside Natural Area.
- interpretive signing.
- self-guiding hiking loops.
- amphitheater or fire-circle.
- picknicking, and parking.

Acquisition and management should be by local groups and agencies, perhaps a cooperative city/county/Audubon effort.*

RIVERSIDE GROUP CAMP

Several "Freeway Park" endorsers (See Appendix C) mention the need for a nearby group camping area for the area's youth groups. It is proposed that this group camp be sited near the Natural Studies Center in the Riverside Conservation Area (Block 5).

Philosophy

The group camp should be a carefully developed, primitive area serving as a summertime retreat. Much of it could be built using the available volunteer labor of youth groups and civic organizations.

Scope and Content

The group camp could provide:

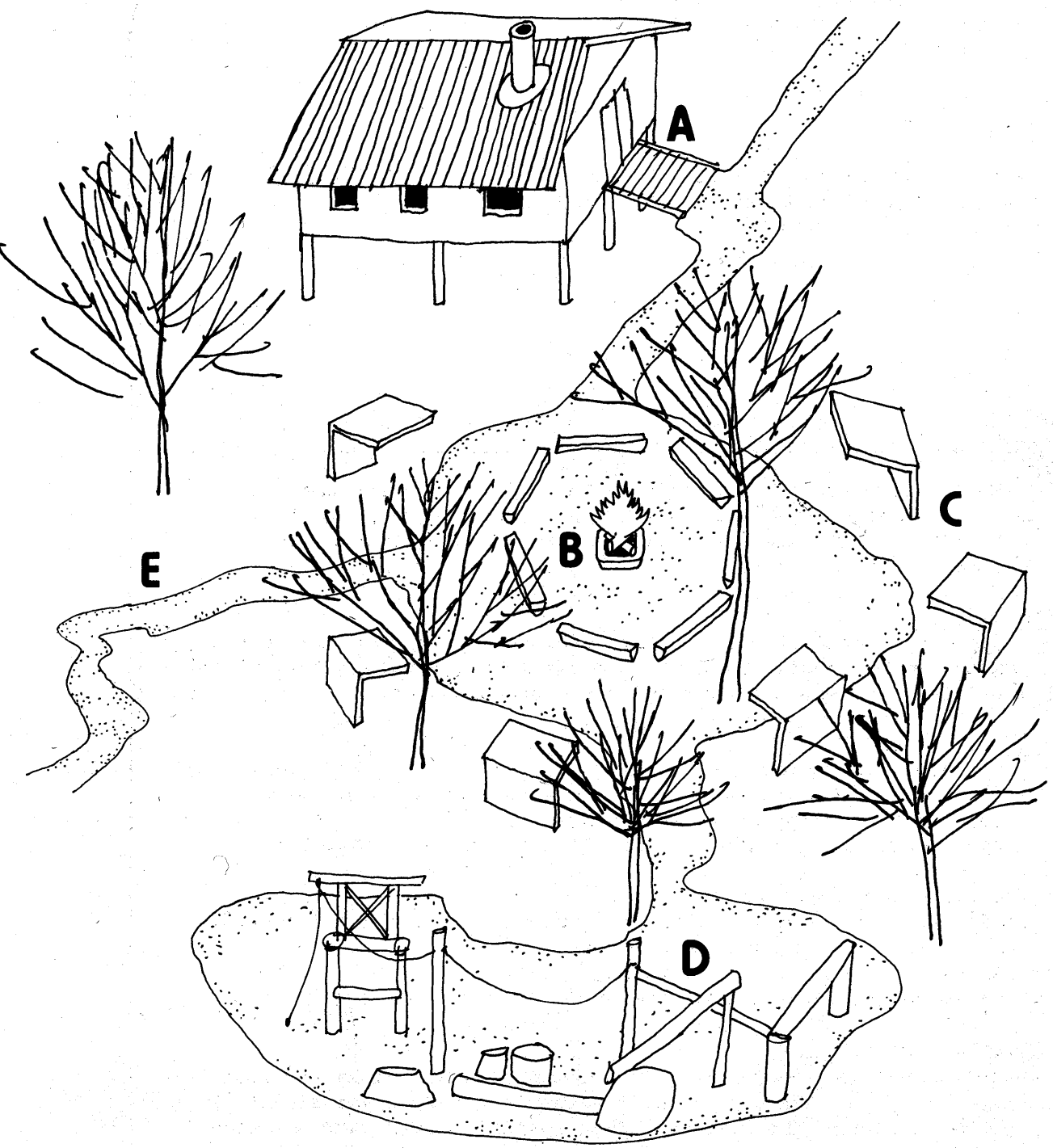
- An all-weather multi-purpose Lodge with a wood stove (pole building, above potential flooding).
- Restrooms; the use of a re-circulating waterless toilet is recommended.
- A fire-circle meeting area.
- "Adirondack" camping shelters (which provide shade and shelter, and help to define the camping area).
- A "natural" play area: climbing ropes, balancing logs, timber climbing structures, and rope bridges. (See also: page 6-22).

Acquisition and Management

The entire Riverside Conservation Area could be acquired by the State Parks and Recreation Commission as an extension of Sportsmans State Park, and State Parks (which is experienced in resident youth camp operation) could develop the Group Camp.

However, the Natural Studies Center -- sharing the Riverside Conservation Area with the Group Camp -- should be a locally-run facility. Therefore, a site for the Studies Center will need to be delineated and held in local ownership. This matter should be one of the first issues resolved by the proposed Greenway Commission (see page 8-9).

* Other groups that might support the project are: the School Districts, Yakima Valley College, Boy Scouts, Girl Scouts, YMCA, and other youth groups.



GROUP-CAMP COMPONENTS

a. Multi-purpose lodge, with restrooms.
b. Fire circle.
c. Adirondack shelters (any number).
d. "Natural-play" area.
e. Hiking trail.

NATURAL AREAS

There are two natural areas proposed for the greenway: The Resthaven Natural Area at the north, and the Riverside Natural Area to the south. Structurally, the greenway looks like this:

	Riverside Natural Area	Riverside Conservation Area	Riverside Park Recreation Area Sportsman's Conservation Area	Roza Conservation Area	Resthaven Natural Area	
(South)	..	..	..	..	..	(North)
	(South Runs)		(Central Run)		(North Runs)	

A third undesignated "natural area" is Sportsman's Island, part of the Sportsman's Conservation Area.

Philosophy

Speaking of the Riverside Natural Area, Game Biologist Gaylin Woodard notes that:

"Having an area so rich in cover and food and available water and supporting such a high and varied population of wildlife in such close proximity to the Yakima metropolitan area is a great natural asset to not only people in the local communities but also those who travel distances to see such a unique area. It would indeed be not only a serious loss but also a poor reflection upon the people of the state if this area were altered in any way that would cause the loss of any of the wildlife established thereon."

As explained under "General Zoning" (Section 5 of this report), the zone labels are somewhat flexible: they represent an over-all management approach. Just as there are "natural areas" in the Yakima Valley Arboretum and the Sportsman's Conservation Area, so likewise there may be limited recreation within the natural areas.

However, the over-all themes of the Natural Areas are (in order of importance):

- Conservation and preservation of the natural communities.
- Relcamation of disturbed environments.
- Enhancement of wildlife diversity.
- Incidental recreation, such as hiking or natural-interpretation trails. (See also page 7-6).

(continued)

Scope and Content

Reclamation, enhancement, and conservation are fairly well understood. "Incidental recreation" needs a fuller explanation, and the suggested elements are listed below:

a. Vehicular access points (primarily applicable to the Resthaven area), consisting of defined parking areas (with wood curbing), signing, litter barrels, and simple sanitary facilities.

b. Access trails: foot trails developed for fishing access and hiking. The use of "diamond gates" could exclude non-pedestrian access.

c. Interpretive or nature trails (especially in the Riverside area): foottrails, where the user is guided by a brochure or by signs. Since interpretive systems are commonly vandalized, the trail-head should have either some kind of control (e.g., begin a trail at the Natural Studies Center), or be regularly patrolled by park personnel.

SPORTSMAN'S CONSERVATION AREA (YAKIMA SPORTSMAN'S STATE PARK)

The existing 211-acre State Park could be expanded by about 153 acres. This expansion would extend the State's ownership to the Terrace Heights Road (in the north) and to Moxee Boulevard (in the south), and would fill in ownership along Keyes Road.

In concert with Riverside Park Recreation Area, this means that the entire Central Run would be publicly owned; thus the central-run is the most diverse recreation complex proposed for the study area.

Philosophy

The Sportsman's area will have features unique to the greenway. It could compliment the Riverside Park Recreation Area by providing a rural-park atmosphere. Valuable natural areas should be protected and interpreted; both day-use and overnight functions can be expanded. *The state park should remain as the only public provider of vehicular camping in the greenway*.*

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* Note the nearby private (K.O.A.) campground, which is a compatible use.

Content

The Sportsman's area could contain:

a. A continuous bike-trail from the Terrace Heights bridge to Moxee Boulevard, part of a regional trail system.

b. A footbridge link to Riverside Park Recreation Area. (This may be a cooperative City/County/State effort.)

c. A footbridge link to Sportsman's Island.

d. An interpretive trail-loop around Sportsman's Island.

e. Expanded day-use functions (picnicking, group-picnicking, kitchen shelters, play area).

f. Expanded camping. The park now has 64 units. This could be expanded to at least double that figure by extending camping to the east (toward Keyes Road) and to the north (to and beyond Keyes Road). Park attendance figures justify this expansion; and when I-82 connects to the Columbia, overnight demand could dramatically rise.

F. CONCEPTUAL DETAILING

It is important that the greenway be unified by common detailing. Each element should also fit its surroundings: natural areas would have naturalistic detailing, while recreation areas could be more formally detailed. The following pages give some conceptual details for:

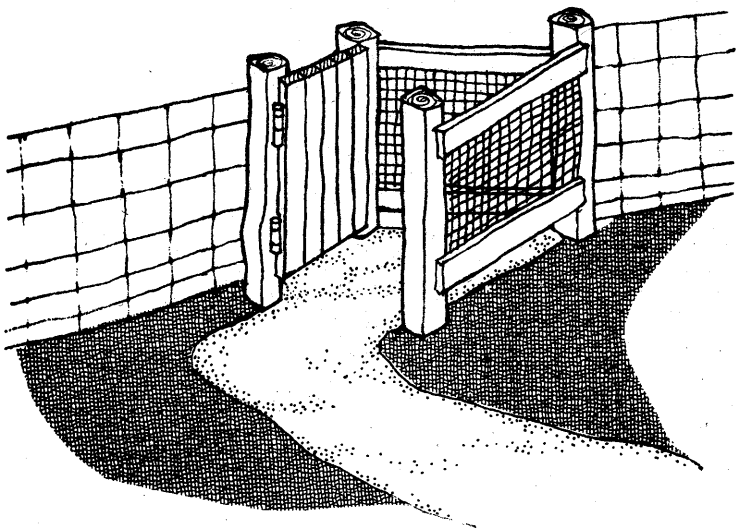
Access Control
Paths & Trails
Benches
Play Areas
Trash Receptacles
Dike Overbuilding
Signing.

Some points relative to access control are:

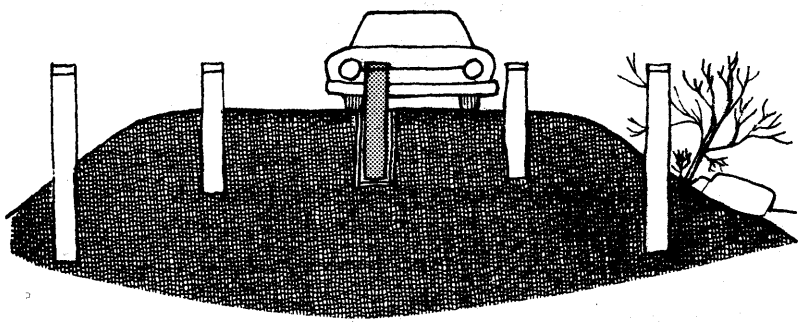
1. All dike trails should be protected from auto entry by bollards. The center bollard would be a locking, removable unit; all agencies needing access could be supplied with keys.

2. The "diamond gate" is recommended where bicycle and motorcycle access is undesirable (e.g., all natural areas), and where paths must run through grazing areas.

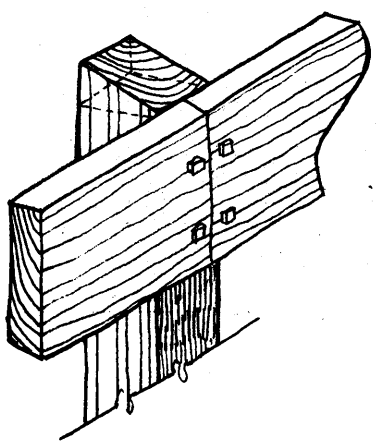
ACCESS CONTROL



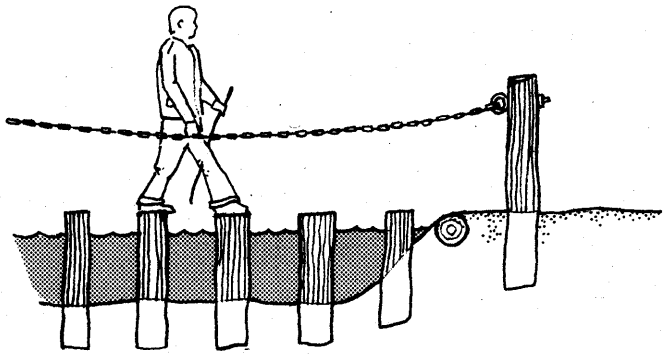
Diamond Gate: This simple design permits only foot access; bicycles, motorcycles, and horses are excluded. It is recommended for access-control in natural areas and for foot access through grazing areas.



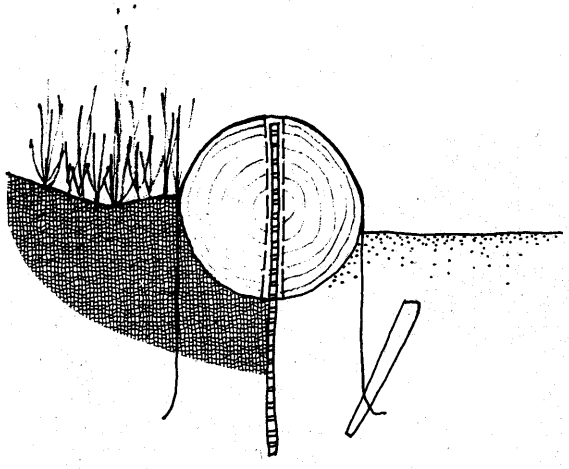
Bollards: Concrete bollards are unobtrusive and extremely long lasting. The center bollard is a removeable, locking steel bollard; when removed, it gives access to maintenance vehicles. Bicycle access is unimpaired.



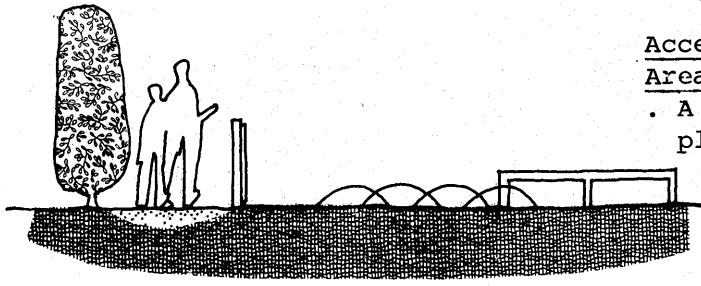
Guard Rails: Heavy or light timber railings may be used around parking areas or to totally prevent auto and motorcycle access.



Stepping Logs:
- Treated timber posts
- Used where a shallow slough or stream is a natural barrier
- Allows only pedestrian access
- An interesting feature for a nature-trail

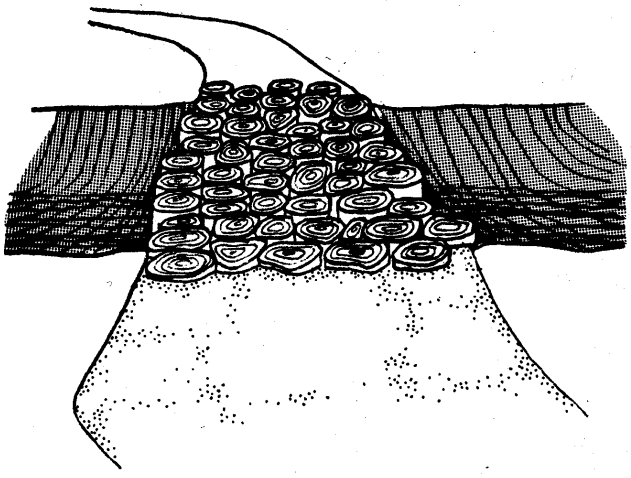


Log Curbing:
- Treated logs
- Fasten to ground with wire anchors or a driven drift-pin
- Recommended for parking area (10" to 18" diameter) and possibly along bicycle paths (8" to 12" diameter).

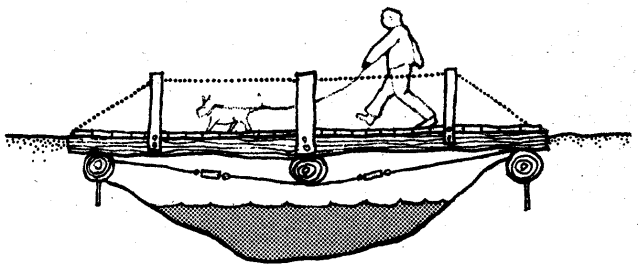


Access-Control in Developed Areas:
- A wide variety of fencing or planting treatments can be used to control, guide, or enhance pedestrian and bicycle traffic.

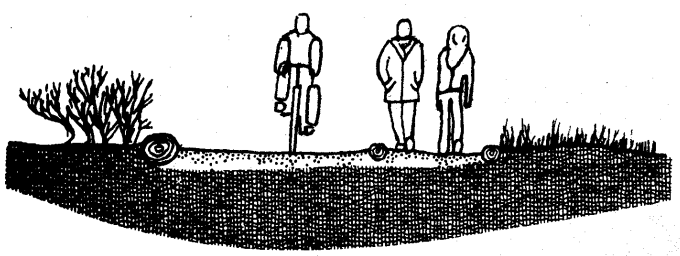
PATHS AND TRAILS



Wood-pile Causeway: An interesting feature for crossing small sloughs. This is suitable for a nature trail.

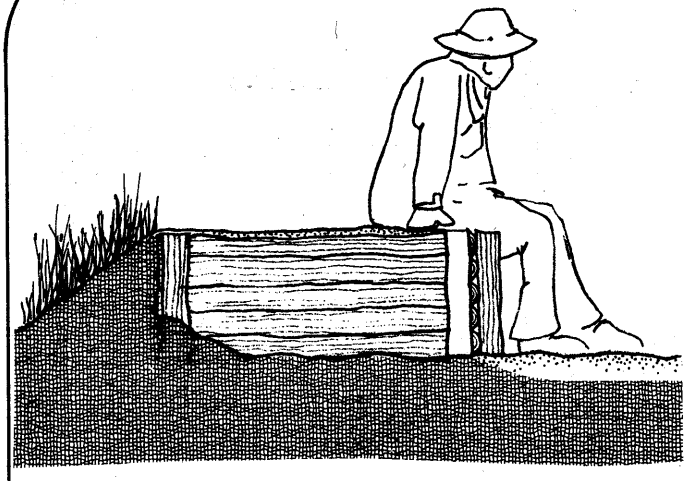


Trail Bridge: A wide variety of designs are available using timber, cable, and wood decking.

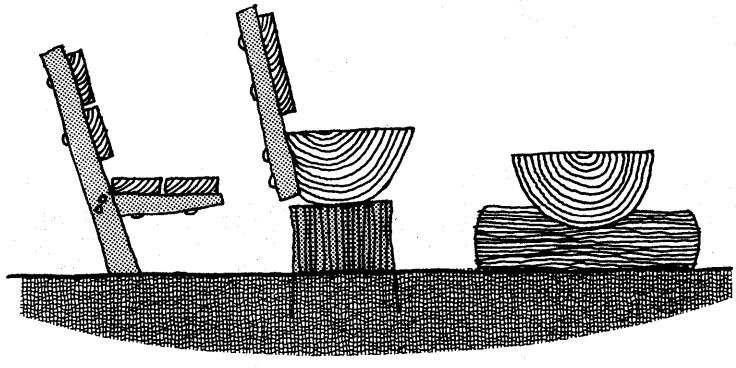


Divided Bike/Foot Trail: In areas of heavy bicycle use, a 6' or 8' bicycle path may be built adjacent to a 4' footpath. Log curbing is used to define the edges.

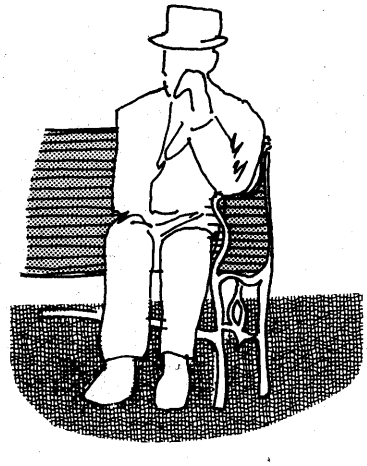
BENCHES



Natural Areas and Footpaths: A wood retaining structure filled with earth. No maintenance is normally required, and it can be built with unskilled labor and available materials.

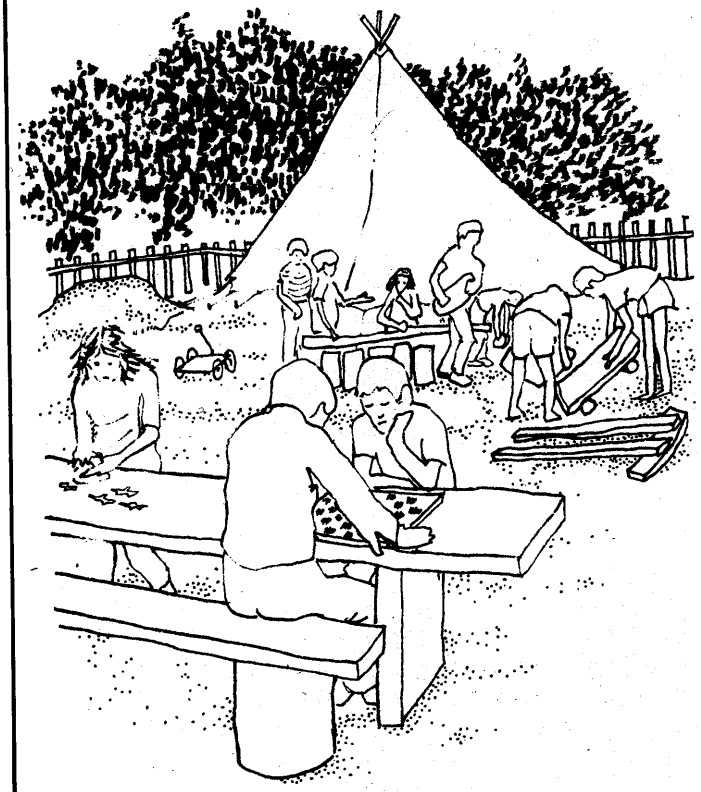


Conservation and Natural Areas: Trail bench of hewn logs or wood timbers. Extremely robust. (Recommended for use in the Group Camp).

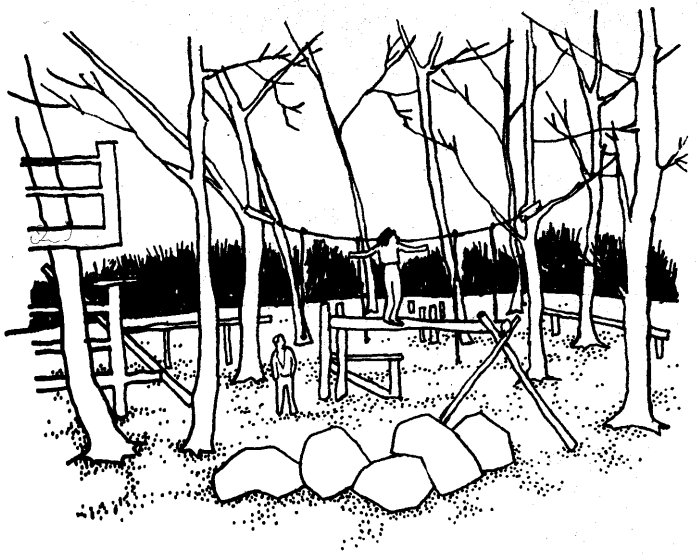


Recreation Areas: Wood slat bench with a curving seat and back. Shown is a traditional design of Alaska cedar or hemlock slats and cast-iron supports. It is robust and vandal resistant, and is very comfortable.

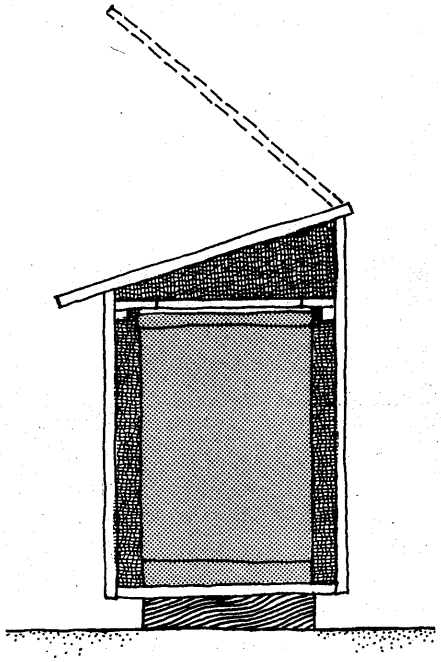
PLAY AREAS



Adventure Playground: Normally a supervised area where children may build, dig, play games, and have group activities. Riverside Park could include such a playground. It is usually fenced or screened, and may be from 1/2 to 1 acre in size.

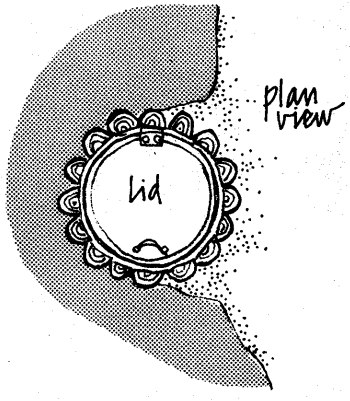


"Natural Play" Area: Intended to duplicate natural play experiences such as climbing, balancing, swinging, and jumping. These areas are easily built with volunteer labor and available materials.

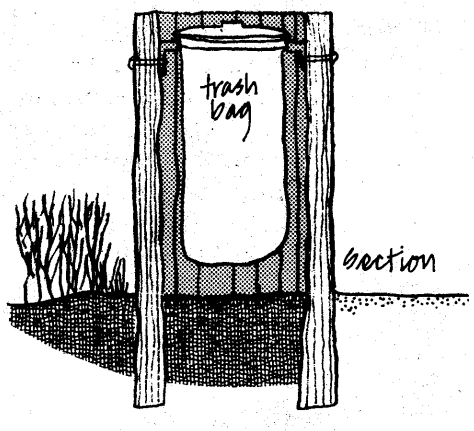


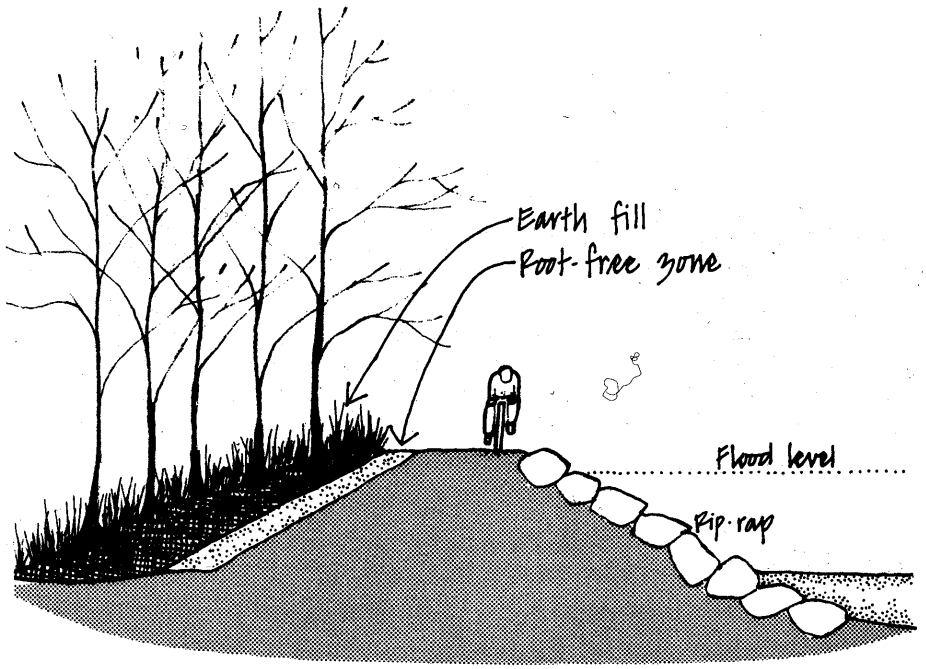
TRASH RECEPTACLES

Recreation Areas: A wood enclosure surrounds a standard 30-gallon trash barrel. The wood lid is hinged. This design is inexpensive, easily maintained, and attractive.



Natural Areas: A rustic design made of split timber stakes fastened around two interior steel hoops. The container can be a cloth or plastic bag or a standard trash barrel.





Dike Over-Building:
Concurrent with the proposed raising of the river dikes, the Corps of Engineers would overbuild on either side, permitting vegetation to soften the dike's appearance. (The "root-free zone" is a gravel layer which protects the dike's interior from root penetration).

SIGNING

Signing should be similar throughout the greenway. The following pages show examples of an integrated sign system using: a) a greenway logo on all signs, b) a standardized lettering style.

Considering maintenance, the routed-wood sign* is still the most durable and vandal-resistant type. A stained wood sign with white reflectorized routed lettering is recommenced as the standard throughout the greenway; concrete or steel supports are also recommended.

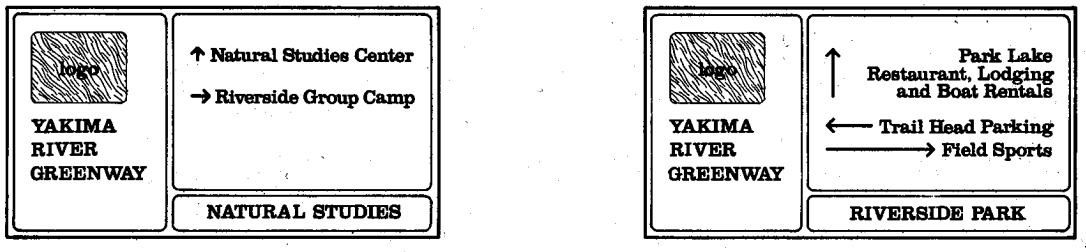
TYPES OF SIGNS

Type	Location	Comment
Standard State Highway recreational signing. (vehicular)	Interstate 82 and the Moxee Highway.	Standard brown metal signs for high-speed viewing. (not sketched)
Entry signs to various greenway sub-areas. (vehicular)	For instance, at the entrance to Riverside Park, the State Park, at trail-head parking areas, or the Natural Studies Center.	Easily read; serve as gateways to each sub-area. Main access roads (e.g., Keyes Road, Terrace Heights Road, Moxee Blvd, or Beech Street).
Interior directional signs. (vehicular)	Decision points.	For instance, to direct vehicles to parking areas, picnic areas, etc.
Trail signs, directional signs, architectural graphics. (pedestrian and bicycle)	Along paths and trails; on park buildings.	Normally small, simple signing identifying allowable trail uses, or directing people to park buildings and park features.
Interpretive signing. (pedestrian and bicycle)	Normally on trails or paths.	Large or small signs interpreting natural processes or special features.

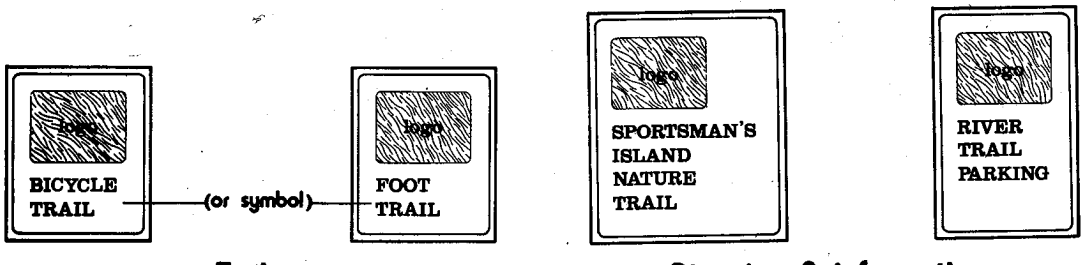
* High-relief wood signs are produced by sandblasting, using rubber-resist lettering patterns, to produce 3/8" high lettering on a sunken background. However, incised lettering is more vandal-resistant.

Suitable subjects for interpretation include:

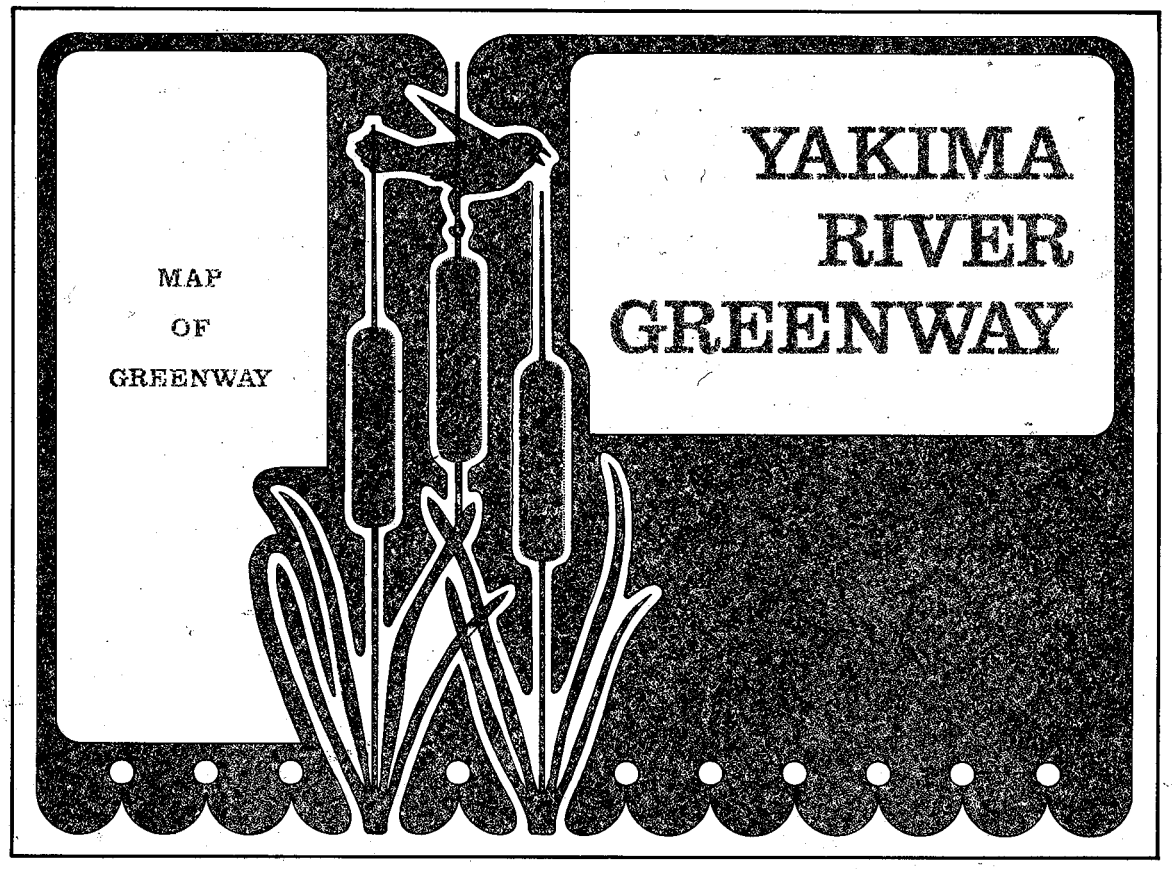
. The Yakima River	(size, extent, origin, flooding, dynamics)
. Wildlife	(bird-boards, signs identifying aquatic mammals or fish, explanations of wetland ecology)
. Local Geology	(the Yakima Folds and valleys)
. Vegetation	(signs identifying vegetation associations)
. Gravel Mining	(signs explaining how the gravel-pit ponds came to be)
. Cultural Features	(agriculture and orcharding in the Yakima Valley; historical notes)



Area entrance signs



Trails **Direction & information**



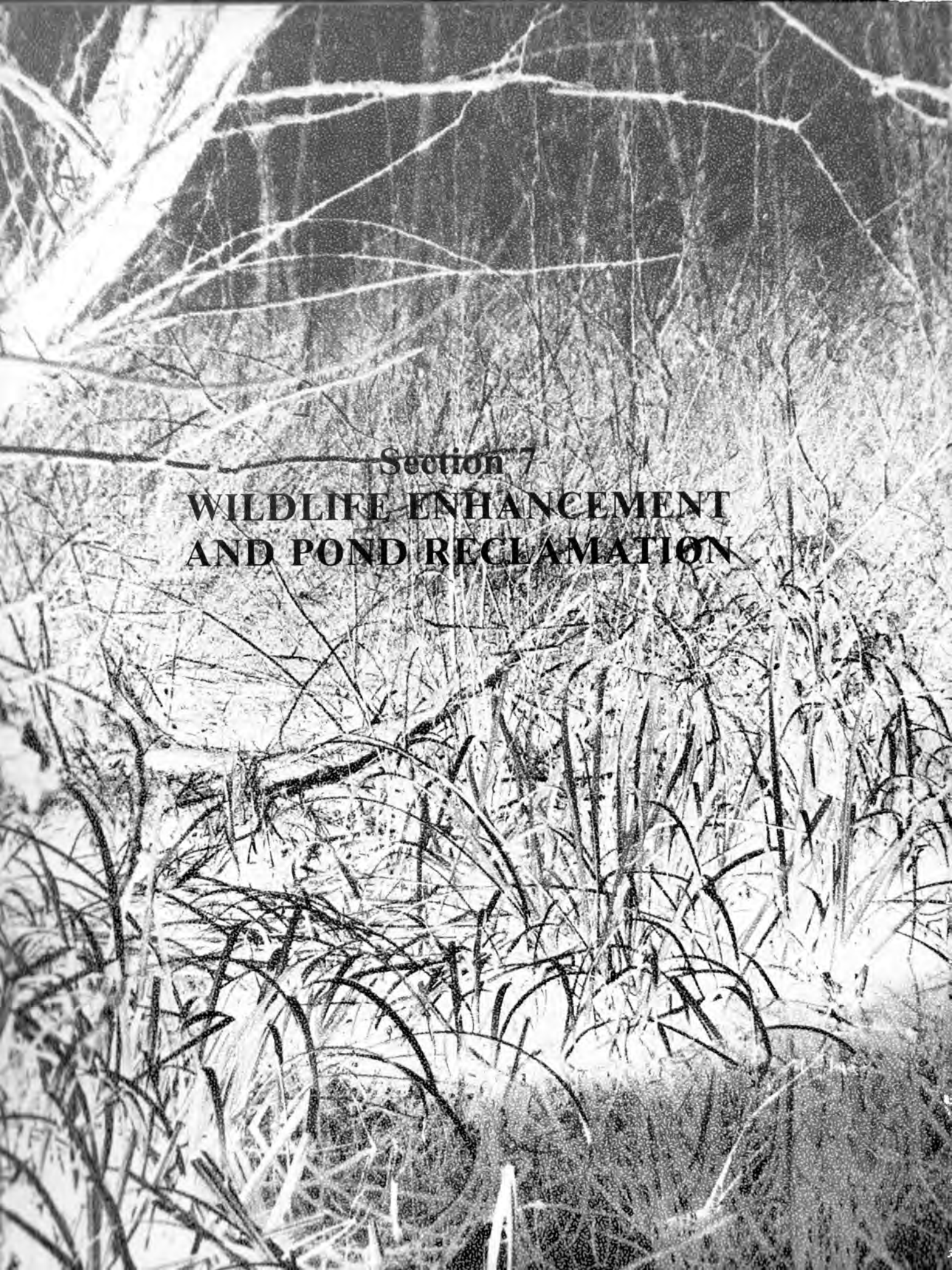
(above) An example of a possible Greenway logo on a main orientation sign.

Alternate typography:

Clarendon Medium — bh E
Horatio Bold — cs Tr
Helvetica Medium — ah B

Alternate logo concepts:

a. Cattails and redwing blackbird (shown)
b. An abstraction of the river flowing through a gap.
c. An abstract plan view of a braided portion of the river.



Section 7
WILDLIFE ENHANCEMENT AND POND RECLAMATION

SECTION 7. WILDLIFE ENHANCEMENT & POND RECLAMATION

The purpose of wildlife enhancement would be to improve and diversify the natural habitats ("place of abode: habitation") throughout the greenway. In the healthy wetland areas, few human improvements are necessary.

Disturbed parts of the greenway can be reclaimed for fishing, wildlife viewing, or for general aesthetics. Re-naturalization of all gravel pit ponds is especially needed. Agricultural lands adjacent to the greenway could be managed to enhance wildlife diversity.

We must keep in mind that the river's lands were once much different than they are today. They were once more productive: the wetlands were far wider, and they weren't drained or farmed. Giant wild ryegrass grew over 6 feet high; dense, ungrazed brush thickets flanked the wetlands. Otter, mink, porcupine, racoon, and beaver were abundant. Hordes of salmon once came upstream. Therefore, what is proposed is a small reinstatement of what once was.

SUMMARY OF WILDLIFE HABITAT IMPROVEMENTS FOR YAKIMA COUNTY

FARMLAND (AND OTHER OPEN AREAS)

Edge:	Develop as much "edge" as possible, because wildlife diversity is a product of the places where two (or more) habitats meet.
Food:	Plant small food patches or strips containing yellow corn, rye, vetch, millet, or buckwheat.
Cover:	Fence off small ungrazed areas in the river's woodlands. Leave piles of brush for protection and nesting sites.
Crops:	Leave small scattered patches of edible field crops unharvested for wildlife.
Burning:	Don't burn fence rows or canal margins in the spring, when birds are nesting and young animals seek cover.
Hedges:	Plant food and cover plants along fencelines to make hedgerows. Good plants are: Russian Olive, Russian Mulberry, Tatarian Honeysuckle, Wayfaring Tree Viburnum, Hawthorn, or Wild Rose. Hedges are protected travel lanes for small game.
Trees:	Save clumps of tall trees; they are used by eagles, hawks, and herons, which prey on rodents and small game. Save old or dead trees for woodpeckers, squirrels, or raccoons. Plant evergreens as well as hardwoods. Plant avenues of cottonwood, white alder, or pine along farm lands.
Wetlands:	Try to leave a buffer strip of vegetation along sloughs, ponds, and wasteways. This provides shade, insect food for fish, and dens for aquatic mammals.
Variety:	Try to plant many different types of cover (hedge, tree, or shrub). The more varied the cover, the more wildlife.
Animal Control:	Exercise restraint in limiting beaver, muskrat, or deer populations.

Pesticides: Carefully spray only the crops; avoid spraying adjacent woodlands, sloughs, or marshes. Use pesticides only as a last resort, and get professional advice in finding the safest formula.

Gravel Ponds: Promote the growth of vegetation around ponds; manage ponds for bass, trout, and catfish production; require gravel excavators to leave a "natural" shoreline. Encourage cattail, sedge, and reeds in marshes and sloughs.

PUBLICLY-OWNED GREENWAY LAND (INCLUDING PARKS)

In addition to the above ...

Ponds: Regrade gravel pond shorelines to a "natural" state; plant the shoreline: introduce bulrush cattails, and trees; fence off some parts of the shore to prevent human access; provide floating platforms or nesting islands for waterfowl; try to establish a flow through ponds to prevent stagnation.

Plantings: Introduce trees, hedges, and shrubs that give food and cover to wildlife. Include food species in all planting plans.

Diversity: Alternate lawns, tall grass, wooded areas, and brush to give maximum habitat diversity.

Human Use: Carefully direct human circulation; use low fencing to discourage "sheet-traffic" across vegetated areas; limit access to sensitive wildlife areas.

Enhancement: Build nesting boxes for wood-ducks and squirrels; provide nesting poles for waterfowl; leave brush-piles; plant duckweed, water lilies, duck potatoe, etc., in ponds.

Revegetation:** (in non-irrigated areas) Plant small quantities first to determine local adaptability:

Trees

*Tree-of-Heaven (Ailanthus altissima). One of the few trees that will vigorously grow on barren, hostile sites.
Blue Ash (Fraxinus excelsior "Kimberly Blue").
Black Hawthorn (Crataegus douglasii).

** This is not an exhaustive list. Expert advice is available through the regional offices of SCS (Union Gap), Game (Yakima), or State Parks (E. Wenatchee).

*Green Ash (Fraxinus pennsylvania lanceolata).
Northern Black Cottonwood (Populus trichocarpa).
*Russian-Olive (Elaeagnus angustifolia).
*Osage-Orange (Maclura pomifera).
Hybrid Poplar (Populus spp.)
*Honey Locust (Gleditsia triacanthos).
*Hackberry (Celtis occidentalis or douglasii).
*Black Locust (Robinia pseudoacacia).
White Alder (Alnus rhombifolia).

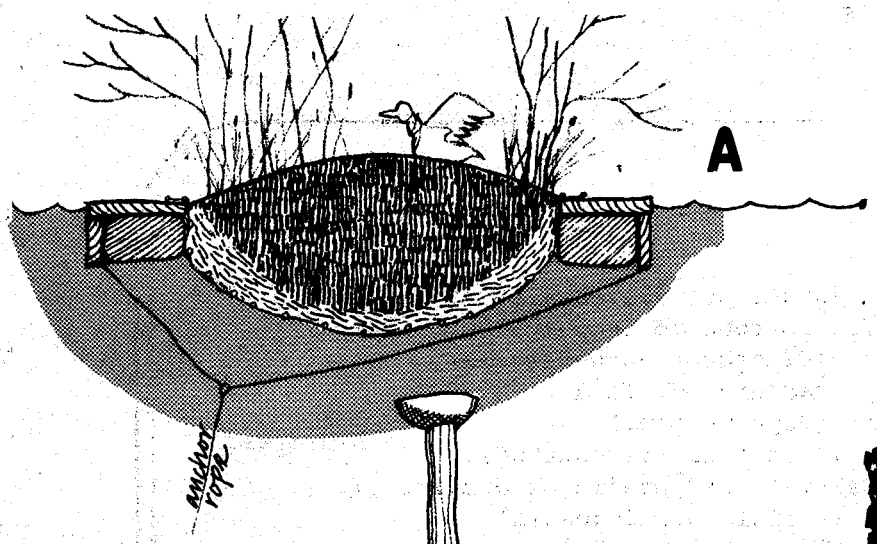
(* = for arid areas.)

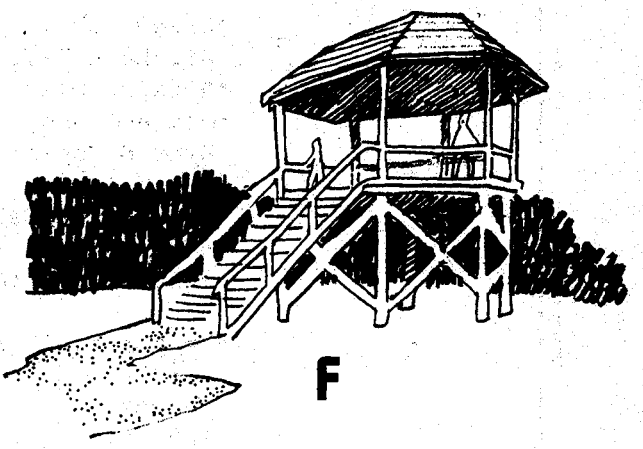
Shrubs
Red-Osier Dogwood (Cornus stolonifera).
*Wild Rose (Rosa nutkana).
*Rugosa Rose (Rosa rugosa).
*Russian Mulberry (Morus alba tatarica). Very beneficial to birdlife.
*Tatarian Honeysuckle (Lonicera tatarica).
Wayfaring-Tree Viburnum (Viburnum lantana).
*Staghorn Sumac (Rhus typhina).

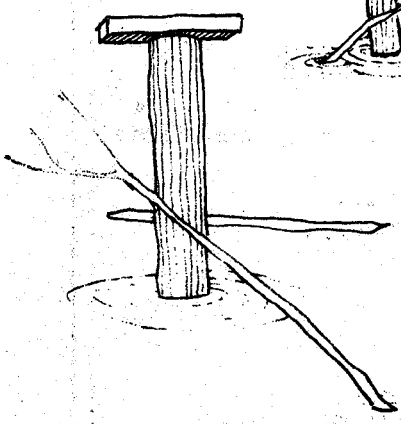
(* = for arid areas.)

Grasses
Streambank Wheatgrass (Agropyron riparium).
(Other wheatgrasses).
(Bluegrass).

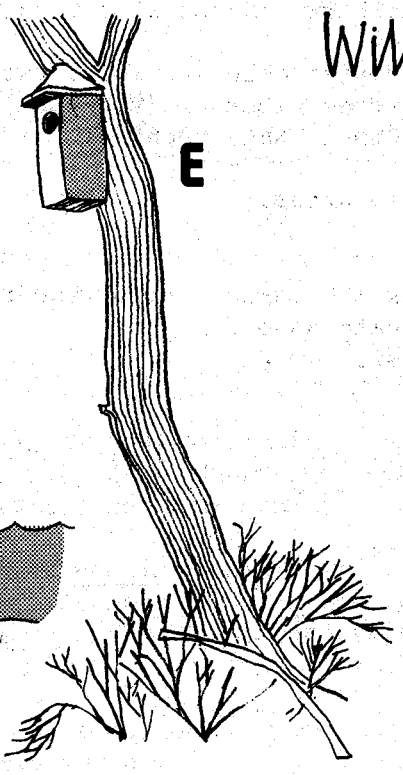
Foods
Vetch
Millet
Buckwheat
Yellow Corn
Rye.

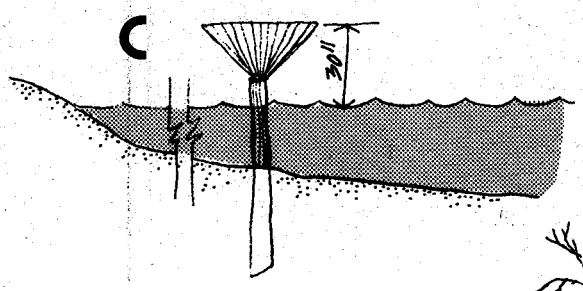


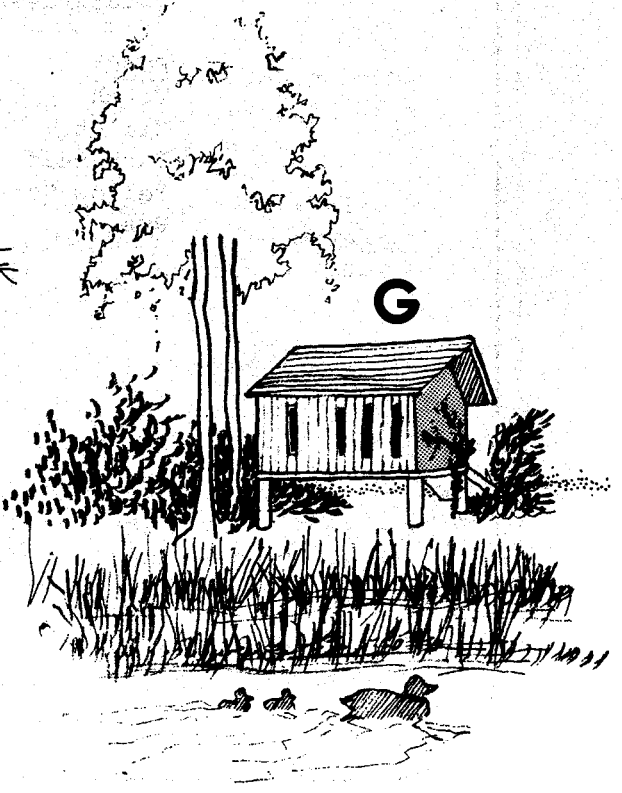


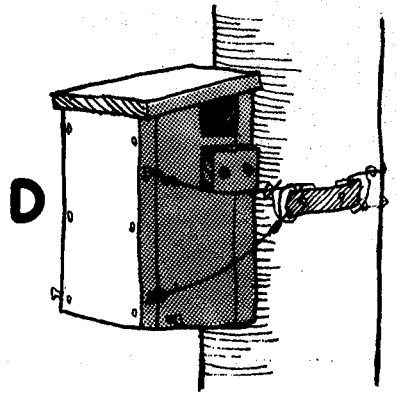


Wildlife enhancement and viewing









DETAILS FOR WILDLIFE ENHANCEMENT AND VIEWING

A. **FLOATING PEAT ISLAND**
Constructed of styrofoam slabs under a wood frame. Nylon cargo-netting is hung inside the frame and covered first with twigs and brush, then filled with peatmoss. Willow twigs are used to start vegetation. The island is held in place by nylon rope tied to a concrete anchor.

B. **WATERFOWL PERCHES**
Logs or dead trees are planted in shallow water; board perches or baskets are mounted at the top.

C. **NESTING BASKET**
Similar to above, fence-posts are planted in shallow water and topped with a wire basket.

D. **SQUIRREL BOX**
A wood box with hinged bottom (for cleaning) for nesting squirrels.

E. **BIRD BOX**
A nest for wood ducks or other birds; mounted near water.

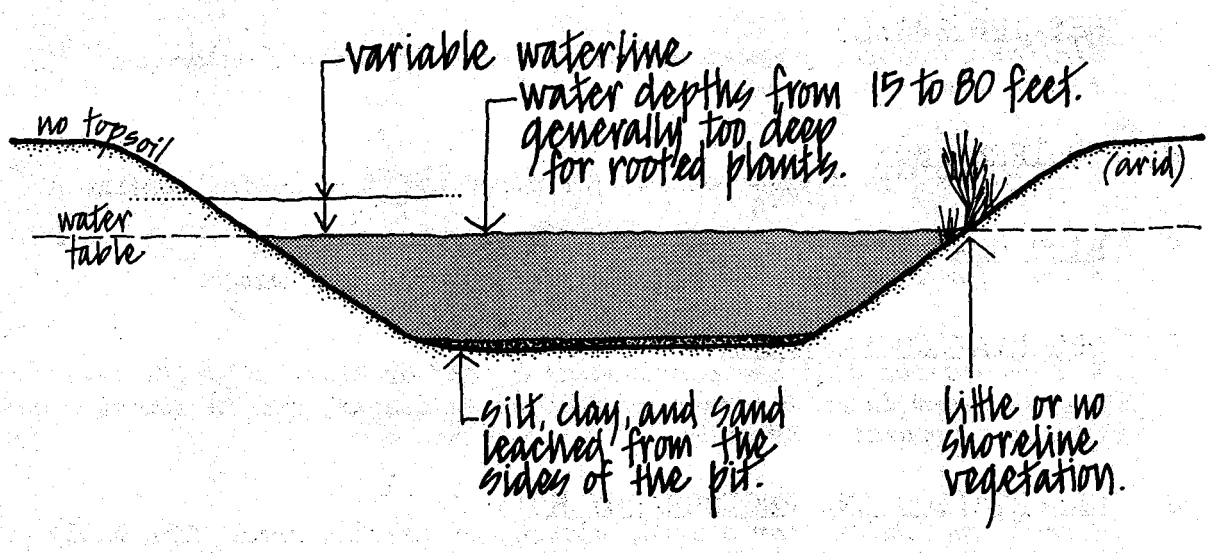
F. **OBSERVATION PLATFORM**
A high covered platform overlooking a pond or other wildlife area. The platform is an interesting feature in itself, and is almost always a popular attraction.

G. **OBSERVATION AND PHOTOGRAPHY HUT**
A small hut built near a pond, slough, or nesting area. The wall has vertical openings for viewing and photography.

POND RECLAMATION

The Lentic environment (*Lenis, calm: Lakes, ponds, sloughs, swamps, bogs*) is very biologically productive. These habitats occupy a very small portion of the earth's surface; and, in an arid setting (such as the Yakima Valley) their rarity and value is intensified. Standing water has great aesthetic and recreational value as well as wildlife value.

When a typical Yakima Valley graveling operation closes down, they leave behind ponds similar to this:



UN-RECLAIMED GRAVEL-PIT POND

There are numerous reasons why this first type of pond is less than ideal:

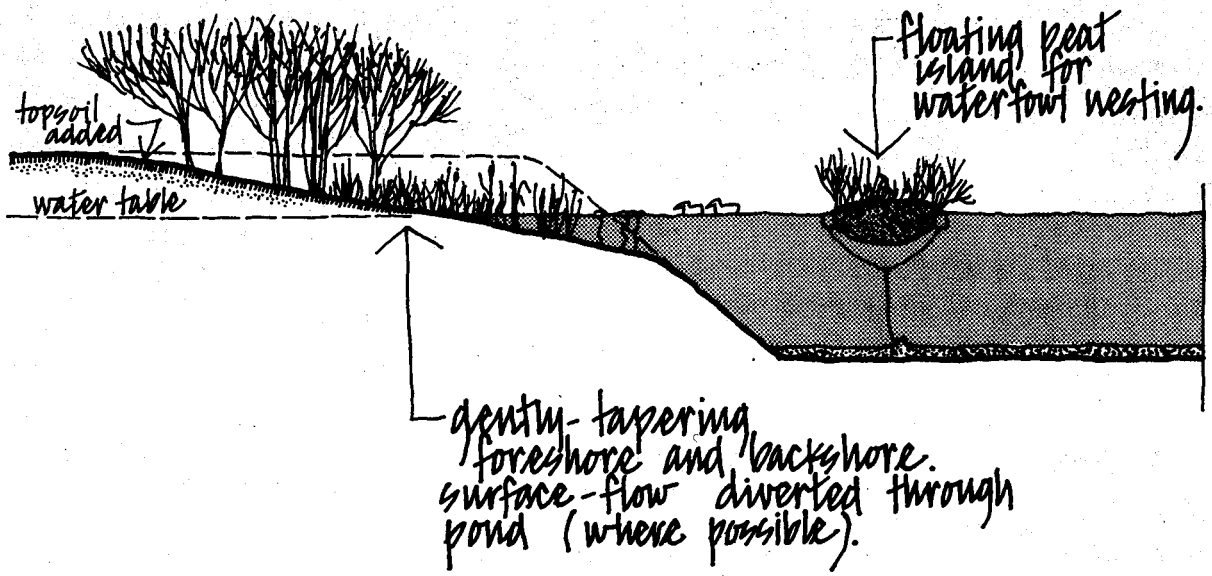
a. *The Littoral zone (shallow-water region occupied by rooted plants) is very narrow. Since shoreline vegetation is of great value to both aquatic and land species, the pond is thus unproductive, or "sterile."*

b. *The backshore (the area upland from the shoreline) is too high above the water; therefore, the pond has little chance of being surrounded by vegetation.*

c. *Without any flow of water through the pond, it will become clogged with floating plants during the summer months.*

d. *The water surface usually corresponds to the area's water table; the pond's water surface rises and falls according to shifts in the valley's watertable. This tends to create a sterile, "reservoir-like" shoreline.*

How can a gravel-pond be reclaimed into a "natural" attractive pond? The sketch below shows a pond that has been naturalized:



RECLAIMED GRAVEL-PIT POND SHORELINE

This second pond has been modified as follows:

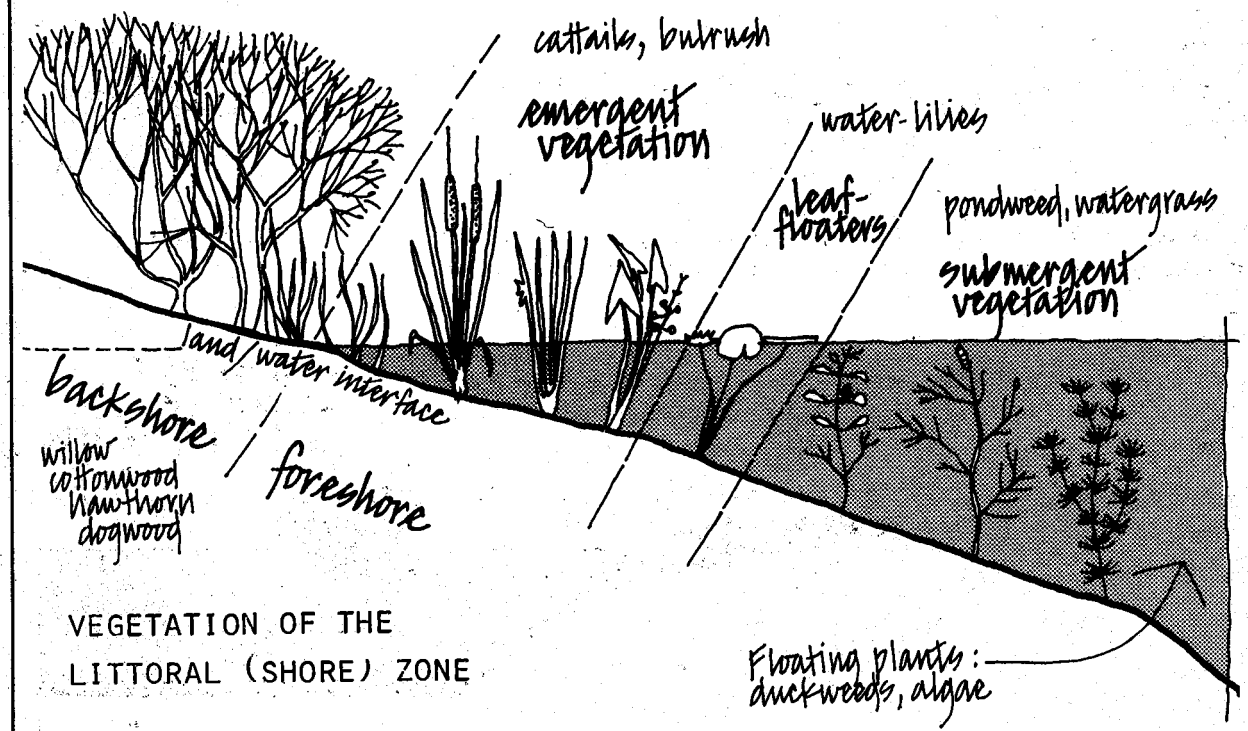
1. *Most importantly, the pond's backshore and foreshore (Littoral zone) have been gently graded out to form:*

   a. *a shallow-water area in the foreshore; and*

   b. *a backshore close to the water-table.*

2. *The water level has been stabilized by diverting a surface-flow through the pond.*

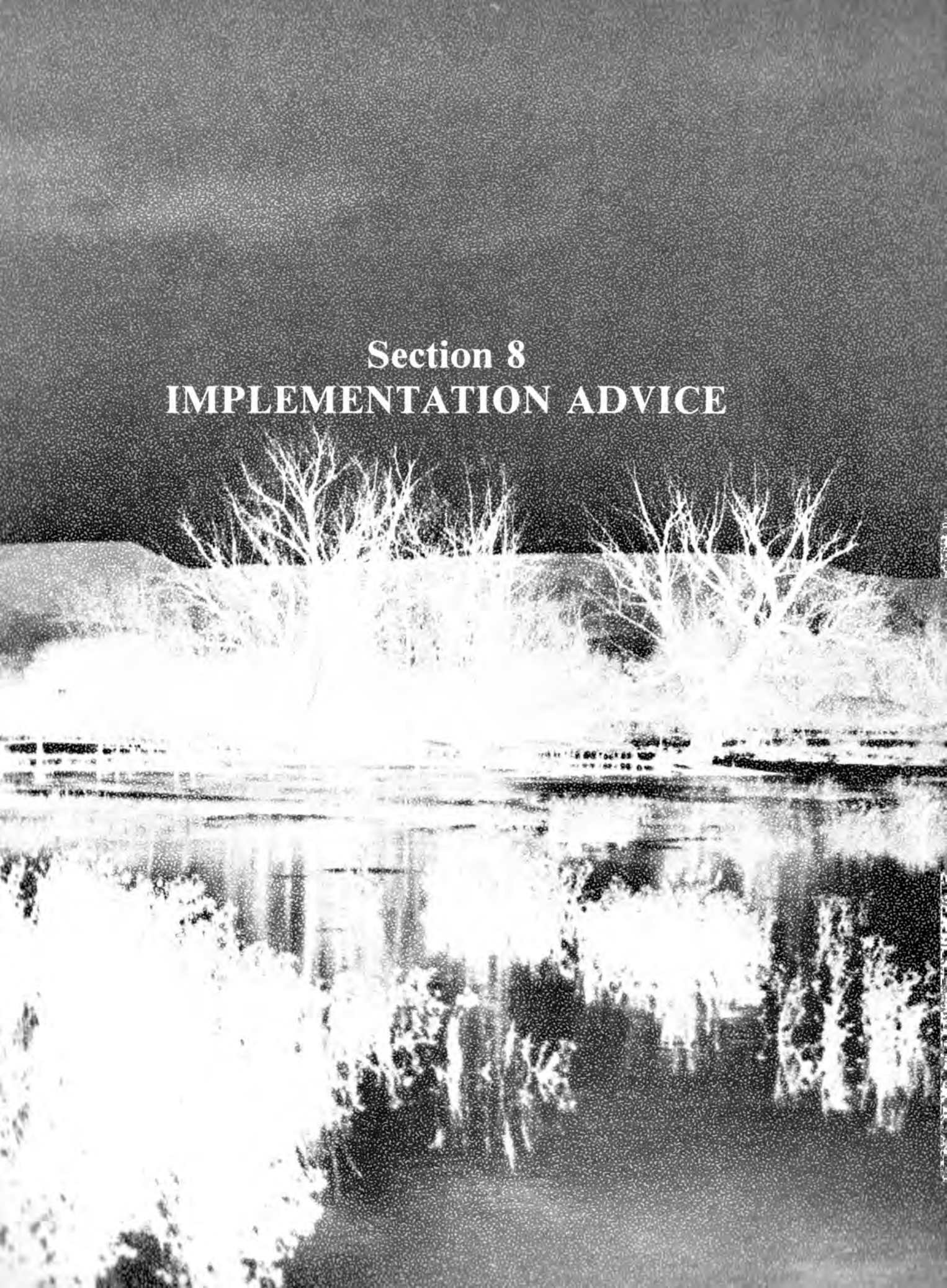
The second pond now has a shoreline that allows the following natural vegetation-types to become established:



VEGETATION OF THE
LITTORAL (SHORE) ZONE

The "emergent plants", together with those on the moist backshore, form a link between the water and land environments. They are used for food and shelter by amphibious animals; they are a safe and convenient means of entry and exit into the water. And, the pond is less hazardous to children, since it now has shallow water around its edge.

Most ponds in the greenway are suitable for stocking with bass and trout.



Section 8
IMPLEMENTATION ADVICE

SECTION 8. IMPLEMENTATION ADVICE

This section deals with possible legislative and public-agency actions in creating the Greenway. It is divided into 4 parts:

A. Establishment
B. Acquisition
C. Development
D. Management.

A. ESTABLISHMENT

Public agencies will first need to recognize the Greenway. This will entail:

1. City of Yakima, City of Union Gap, and Yakima County. a) Official adoption of the master-plan; b) notification to the Corps of Engineers stating this adoption and giving the agencies' intentions regarding the Greenway; c) cooperation with civic groups in the furtherance of public awareness (see Section 9). Both the City and County could formally adopt declarations similar to the suggested State format (see No. 3, below).

2. State Land-managing Agencies. a) Official adoption of the master-plan by the Parks & Recreation Commission and the Game Commission; b) a "statement of intent" sent to the Corps of Engineers.

3. Recognition by the State Legislature. Most important of all is official State recognition of the Yakima Greenway as a conservation area of statewide significance.

Similar to the action that established the Green River Gorge Conservation Area, the following draft legislation is suggested:

Yakima River Regional Greenway

RCW . INTENT. It is the intent of this section to establish and recognize the Yakima River corridor from Selah Gap (Yakima Ridge) to Union Gap (Rattlesnake Hills) as a uniquely valuable recreation, conservation, and scenic resource in the State of Washington.

RCW DECLARATION. The Yakima River corridor from Selah Gap (Yakima Ridge) to Union Gap (Rattlesnake Hills) is a nine mile river reach running adjacent to the Yakima Urban Area in the Ahtanum-Moxee Valley, Yakima County. The Yakima Urban Area is the main growth center for Yakima County as well as for the entire south-central portion of Washington state. This reach is

part of a designated regional State Trail Corridor for foot, horse, water, and bicycle, connecting to the Yakima Canyon six miles to the north. The reach is the most threatened, urbanized part of the Yakima River; it is bordered by an expanding urban area of 50,000, and is bordered by an interstate highway. Major portions of the reach are a rich matrix of ponds, sloughs, braided river channels, and wetland woods, from 1,000 to 4,000 feet in width. The preservation and recreational use of the area has been proposed for over a generation, and was recently endorsed by 82 community organizations. Its preservation would serve an unparalleled range of civic, regional, and statewide goals, functioning as an urban shaping area, a link in a regional trail and open-space system, a close-in natural preserve and study area, a regional recreational resource, and a regional wetland preserve in an arid setting.

RCW . YAKIMA RIVER REGIONAL GREENWAY CONSERVATION AREA CREATED. There is hereby created an area to be known as the "Yakima River Regional Greenway conservation area." This area designation may be used as a common reference by all state and local agencies, municipalities, and federal agencies.

RCW . ACQUISITION OF REAL PROPERTY, EASEMENTS OR RIGHTS AUTHORIZED. In addition to all other powers and duties prescribed by law, public park, conservation, and resource-managing agencies are authorized to acquire such real property, easements, or rights in river-related lands in the Yakima River Regional Greenway in Yakima County, together with such real property, easements, and rights as is necessary for such conservation and park purposes in any manner authorized by law for the acquisition of lands for conservation, park, and parkway purposes. Except for such real property as is necessary or suitable for the development of recreational areas and their related facilities, it is the intent of this section that such property shall be acquired to preserve, as much as possible, the river wetlands in their natural state.

RCW . RIGHTS OF AGENCIES NOT TO BE INFRINGED UPON. Nothing herein shall be construed as authorizing or directing any agency to acquire any real property, easements, or rights in the Yakima River Regional Greenway in Yakima County which are now held by any other agency without the approval of that agency.

B. ACQUISITION *

A strong, on-going acquisition program is essential, and acquisition must always take precedence over development in any funding scheme. By 1990, the Upper Yakima Valley should have about 85,000 inhabitants; by the year 2000, perhaps 90,000. Acquisition will guarantee that the river's landscape will be available to those future populations.

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* **See Appendix FF for a listing of current Federal grants-in-aid programs**

The burden will fall principally on the City of Yakima, Yakima County, and two State agencies--the Parks Commission and the Game Department. We also hope that the Nature Conservancy and the Trust for Public Lands can act as intermediaries in the acquisition of valuable park and natural areas,* and we hope that the Audubon Society, the Chamber of Commerce, the Lions Club, etc. will help in whatever way they can.

It is still recommended that the City of Yakima and Yakima County should eventually merge their park departments into a metropolitan park board (see D, Management), but this is not essential in the acquisition phase.

Appendix "D" gives recommended acquisitions.

STATE ACQUISITIONS normally involve either direct legislative appropriation (in their biennial budget) or grants from the Interagency Committee for Outdoor Recreation (which in turn seeks funds from the Federal Bureau of Outdoor Recreation, etc.). HERE WE SEE THE IMPORTANCE OF STATE LEGISLATIVE RECOGNITION OF THE GREENWAY. BOTH LEGISLATIVE APPROPRIATION AND I.A.C. GRANTS ARE MUCH EASIER TO OBTAIN IF THE STATE LEGISLATURE HAS FORMALLY ENDORSED THE PROJECT'S VALUE. Also, the presence of an acquiring intermediary (e.g., the Nature Conservancy, the Trust for Public Land, or other private trusts) usually speeds public acquisition. (Private acquirers are discussed in Section 9, "Making it Happen".)

In the case of the Yakima Greenway, we are fortunate that B.O.R. and I.A.C. funding criteria favor the acquisition of shorelands close to population centers, and acquisitions that form links in a regional open-space system.

I.A.C. funding criteria rest heavily on the project's conformance to the Statewide Comprehensive Outdoor Recreation and Open Space Plan (SCORP). The Yakima Valley (Yakima and Kittitas Counties; District #8) section of SCORP comments on the area's recreational needs:

> "Needs for the acquisition of regional recreation areas and freshwater shorelands has been identified."
> "Development needs are greatest for freshwater shorelands."
> "The state should acquire and develop critical resource areas, freshwater shorelands, regional recreation areas, trails ...."

SCORP therefore seems to endorse the intent of the Yakima Greenway.

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* A record of the consultant's contact with these two groups will be given to the Washington State Parks and Recreation Commission.

INITIATIVE 215, the "Marine Recreation Land" Act, provides money to "create, add to, or make more usable, bodies of water, waterways, or land, for recreational use by watercraft." SINCE "PARK LAKE" IS A PROPOSED MAJOR BOATING LAKE (NON-MOTORIZED), INITIATIVE 215 MONEY COULD BE SOUGHT (BY EITHER THE STATE OR LOCAL AGENCIES) TO FINANCE PART OR ALL OF THE LAKE'S ACQUISITION AND RECLAMATION.

LOCAL ACQUISITIONS normally rely on I.A.C. grants-in-aid too. The I.A.C. in turn processes all applications to the B.O.R. (and other federal agencies) for matching monies. There are two problems in local acquisition: 1. raising the matching monies; and 2. competing with other projects for I.A.C./B.O.R. funding. These are discussed below.

1. Raising Matching Money. The value of donations may be used as matching money in I.A.C and B.O.R. applications. (This is an important point, and is discussed in Section 9.) The I.A.C./B.O.R. matching scheme can cover 75% of acquisition costs; therefore, a little donation goes a long way. For instance, a willing seller could donate part of his/her land to enable the local agency to buy the rest. A sale would include life-tennancy stipulations which would allow the seller to live on the land for the rest of his/her life, tax free.* (Again, refer to Section 9.)

But for a large-scale, on-going acquisition program (for instance, the acquisition of the "Riverside Park" lands), the local body will probably need to think in terms of special financing. There are several common approaches:

General Obligation Bonds

General obligation bonds are retired by tax dollars from general levies. Normally they are used to finance non-revenue producing provisions such as schools or parks.

There are legal limitations on the amount of indebtedness which a taxing body can incur. Luckily, the City of Yakima and Yakima County are not

* Generally, proposed greenway acquisitions are not inhabited.

close to meeting their general-indebtedness limit.*

City of Yakima current debt = 1.1% of assessed value
City of Union Gap current debt = 0.765% of assessed value
Yakima County current debt = 0.047% of assessed value.

Municipalities can incur up to a 2.5% debt (with a 60% vote of the people). The City of Yakima, given enough public support, could probably pass a general-obligation bond issue to cover the acquisition of the "Riverside Park" area, the construction of a footbridge across the river, and certain trail links. The public could be made aware of the long-term civic enhancement that Riverside Park would produce (RE: use of a public-awareness campaign. See Section 9.) Likewise, the City of Union Gap could similarly have a smaller bond issue to finance easements and/or acquisitions opposite that town.

Yakima County is a more difficult case, for the county as a whole is not overly enthusiastic about public parks. Again, a public-awareness campaign might succeed in proving the long-term advantages of the proposed acquisitions, especially the acquisition of the "Natural Studies Center"/Riverside Group Camp Site, and acquisition of the river floodway itself (which would carry a very low per-acre price tag).

A county-wide bond issue for parkland acquisition could be used to acquire not only the Upper Valley greenway, but also the Middle and Lower Valley "greenway parks" proposed in the county's Park Recreation and Open Space Plan. This would broaden the bond issue's base of public support.

Or, an initial bond issue could finance a package including the acquisition of the Natural Studies Center/Riverside Group Camp Site, trail easements, and initial trail development.

Special Levies

General-obligation bonds are easy to sell to the public because they appear to be "free." Actually, the bonds cost the citizens much more than they realize, for like a home mortgage loan, interest charges are comulatively enormous.

On the other hand, a special levy is much more efficient: the money you receive is free and clear. Also, a one-shot special levy for a good purpose can be easy to promote.**

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* Yakima Wastewater Facilities Planning Study, Vol. 3, E.I.S., R. W. Beck & Associates, 1975.

** The public grows weary of repeated "special" levies, such as regular school levies.

Similar to a bond issue, it appears that the local bodies could be successful in selling a special recreational levy to the public. They could use whatever approach seems most likely to succeed: a) special levies to support specific projects (like the purchase of the "Park Lake" area, or the purchase of the Natural Studies Center/Riverside Group Camp Site); b) a special levy only on inhabitants of the Ahtanum-Moxee Valley (Upper Yakima Valley) to acquire greenway lands; or c) a special levy to form a matching-money fund for general acquisition.

Revenue Bonds

There is one instance where revenue bonds might be used: to purchase and/or develop the park core area of "Riverside Park." The core area is proposed as a City owned, concession-operated building complex offering boat rental, bicycle rental, a restaurant (on a lagoon off Park Lake), possibly lodging and shops, with the option for related indoor facilities. The B.O.R. and I.A.C. will probably decline to finance this core area because it is primarily an indoor facility.

The City could use revenue-bonds (which are retired by income received, and thus have no true public cost) to acquire and develop parts of this core, retiring the bonds from concession fees and the leasing of buildings or floor space. Before this could take place, the City would need to find a willing developer who would adhere to the design guidelines proposed for the core buildings.

There are, again, several options: a) the City could finance the whole project, including all the buildings, and then lease floor space to concessionaires; b) the City could acquire the land, provide site development and utilities, then allow a private development group to build and operate the buildings; c) a combination of a) and b); or d) purchase only the development-rights to the area, and wait until the "Riverside Park" lands are consolidated into public ownership before considering the core's development.

IT MUST BE STRESSED THAT THE NORTHERN PART OF RIVERSIDE PARK (OFF THE TERRACE HEIGHTS ROAD) IS RIPE FOR COMMERCIAL DEVELOPMENT, AND SHOULD BE ACQUIRED BY THE CITY AS SOON AS POSSIBLE TO PREVENT INCOMPATIBLE MOTELS, GAS STATIONS, OR OTHER COMMERCIAL USES FROM NEGATING THE WHOLE RIVERSIDE PARK CONCEPT.

New-Construction Surcharge

Yakima County could consider financing parks and recreation via a surcharge on the new housing construction*

* This method is used by the City of Kirkland, where anyone building a new single-family home is charged a $200 parks fee.

2. Competing with Other Projects for I.A.C./B.O.R. Funding. All agencies should stress the Greenway's value:

a. As a prerequisite, use all available means to encourage the state legislature to endorse the greenway: public petitions, letters of support, testimony by conservation groups, etc.

b. Fully document the greenway's conformance to SCORP recommendations.

c. Document the greenway's conformance to municipal and county recreation plans.

d. Document the greenway's incredibly broad-based public support. Try to have the Freeway Park endorsers re-endorse the proposed master-plan.

e. Stress the project's value in meeting a full spectrum of civic, county, regional, and statewide goals for conservation, recreation, and open space.

f. Stress the greenway's function as a link in an important open space and trail corridor, and as an integrated chain of connected recreational features.

g. Stress the development pressure on the river-side lands resulting from the freeway, the new Yakima urban area wastewater plan, and the projected growth of the Yakima urban area.

C. DEVELOPMENT

The issue of development is similar to that of acquisition, and many of the same techniques may be used. (Proposed developments are detailed in Section 6, "Plan Details.") Instead of duplicating the format of the preceding discussion on Acquisition, important development-funding points are listed as follows:

1. Donations of labor and materials may be used as matching-funds for grants-in-aid. They are valued according to market value, e.g., equivalent worth of the service or material.

This means that the Boy Scouts, the Community College, the Jaycees, the Lions, local businesses, etc., could help the developing agency to meet its matching monies by donating unskilled labor (e.g., youth and civic groups), skilled labor (such as equipment operators, carpenters, masons), and materials (such as wood products from Boise Cascade, lumber from lumber yards, brick and mortar, stone, gravel from Central Premix, asphalt, etc.).

2. Interagency development should be investigated. As a case history, the Tolt River Park, in King County, was sponsored by the King County Department of Planning and Community Development, the King County Department of Public Safety (emergency services division), the Boy Scouts of America, and the 409th Engineering Company of the U. S. Army Reserves.

The Tolt Park is especially intriguing, for the Reserves are providing manpower for the construction of a 500-foot pedestrian suspension bridge over the flood-prone Tolt River. Considering the nearness of the Yakima Army Reserve Camp (and the possibility that Boise Cascade might donate materials), this could be an opportune way to span the Yakima River. This same 409th Engineering Company (part of Fort Lewis, but stationed in Everett) has, in the past, spent its summer reserve time at the Yakima Firing Range, several miles north of the greenway. They are a reserve float-bridge unit supporting the 81st Brigade, which likewise normally summers at the Firing Range.

The City and the County could cooperatively investigate this possibility, initially by speaking to the King County personnel who were involved in the Tolt River project, or by direct contact with the 409th in Everett.

The Boy Scouts, in a regional effort, are providing 75,000 hours of work in the development of the park facilities at Tolt.

3. It will be easier to initially justify simple, necessary improvements. Development-types are listed below, ordered by ease-of-implementation:

- Trail-links, trail improvements, signing, public-access improvements.
- Projects using volunteer labor, such as Group Camp facilities, benches, shelters, plantings, or picnic facilities.
- "Health and safety" improvements such as water supply, toilet facilities, improved road crossings, gates, or fencing.
- Water-related recreation development, such as boating facilities, parking areas, docks, or pond rehabilitation.
- Interpretive/educational facilities, such as the Natural Studies Center or interpretive signing in natural areas.
- Civic-enhancement projects, such as tree planting along roads.
- Special projects with direct funding, such as the "Core" area of Riverside Park, State Park improvements, or the Riverside Park visitor center.
- General "urban park" development, such as playing-fields, paths, irrigated lawns, playgrounds, pavillions, or sport facilities.

4. The State, County and the City of Yakima should be sure to follow the progress of the Corps of Engineers diking project. If all concerned agencies file intent and endorsement letters, the C.O.E. could justify the post-authorization inclusion of peripheral recreational elements. Also, their landscaping budget could be substantially increased. If the City, State, or County can become a sponsor, they might receive 50/50 cost sharing for bicycle paths, etc. A post-authorization change is feasible, and could re-define recreation as a "project purpose" if the local agencies can stress the recreational value of the reach.

5. Trails: The Department of Highways.* In 1971 the State Legislature established, within limits, the responsibilities of the D.O.H. (and of cities and counties) to design road rights-of-way for trail use. Urban arterial trust funds are now also available for bicycle route construction. The Federal Highway Act of 1973 provides up to $2 million per year per state for the construction of independent bicycle and pedestrian facilities.

There are several trail links that could depend upon the cooperation of the D.O.H. These are: the Selah Gap bike link, the Old Town Road-to-Ahtanum Creek trail link, and the Kiwanis Park to Beech Street link.

D. MANAGEMENT

The greenway could possibly have as many as five managing agencies: City of Yakima, City of Union Gap, Yakima County, State Parks, and the Game Department.

This appears to be a difficult situation. The workings of the greenway should be guided by a less-complicated authority, and there are several options that deserve consideration:

1. Establish a Yakima River Authority as a managing body. A special "park authority" could be chartered by the State to manage and control all publicly-owned greenway lands, and potentially to extend its control over all publicly-owned riverside lands in the Yakima Basin. At the present time, we see no way to implement this; thus it is not recommended.

2. Establish a Yakima Greenway Commission. Articles of association could be drawn up to co-mingle all involved agencies and groups into an advisory/regulatory commission. Draft association terms are included in Appendix E. The commission would have the power to coordinate cooperative studies and cooperative acquisition programs, develop design guidelines, solicit donations, and gain public support. Most importantly, the commission would have the power to lobby for or against proposed acquisitions and land developments, and to comment on impact statements and

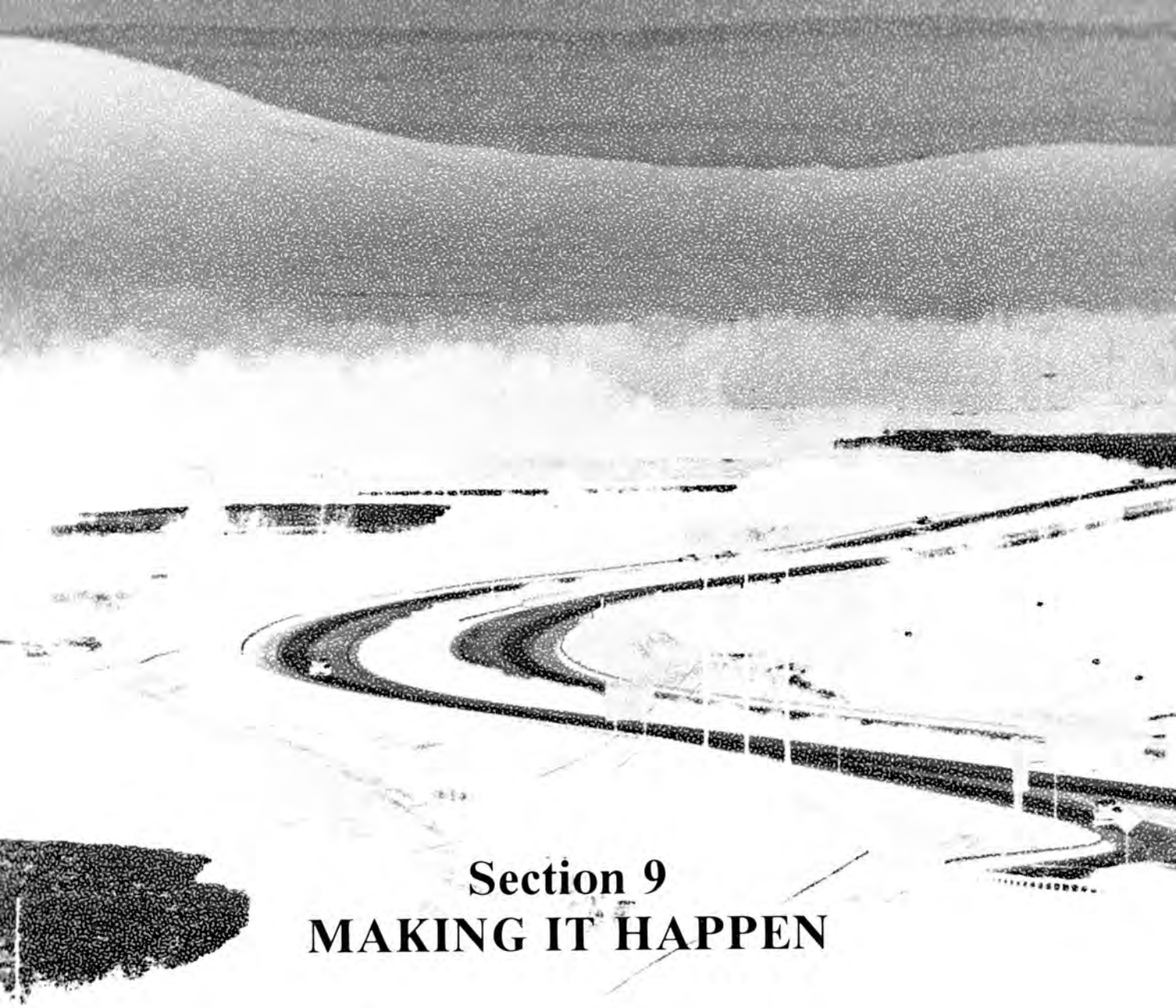
* "Trails Along Highways," LeRoy D. Anderson, from the 1974 First Symposium on Recreation Trails, Wenatchee, Washington.

SMA permit applications for all river-related proposals (both private and public). This option is strongly recommended.

3. Establish a Metropolitan Park Board. If the legalities could be worked out, a metropolitan park board could be instituted to manage all park lands in the Ahtanum-Moxee Valley (Upper Yakima Valley).

The M.P.B. would cover the Yakima Urban Area (Yakima, Union Gap, Terrace Heights and its other unincorporated suburbs; County Park Planning Areas #2, West Valley; #3, Yakima; and #4, East Valley).

The institution of an Upper Valley Metropolitan Park Board is highly recommended; in the interim, coordination of management policies could be handled through the Yakima River Regional Greenway Commission.



Section 9
MAKING IT HAPPEN

SECTION 9. MAKING IT HAPPEN

1. Citizen interest and the role of civic groups.

2. Public-awareness tools.

3. Private actions.

CITIZEN INTEREST AND THE ROLE OF CIVIC GROUPS

This report owes its existence to the efforts of citizen groups. The numerous endorsers of a river-park concept (they are listed in Appendix C, "Freeway Park" endorsers) represent a level of political pressure that was responsible for the funding of this study. If this pressure can be sustained, the Greenway will one day be a reality.

Even a single, resourceful individual or group could--through a steady lobbying campaign--be effective in pushing both public agencies and private interests to full implementation of one of the most challenging conservation efforts in Washington State.

PUBLIC-AWARENESS TOOLS

This report is a lengthy, detailed document that is not easily digested by the public. Even interested groups and public bodies would benefit from a more evocative, terse presentation.

"Public-awareness tool" means something that will quickly and painlessly bring out the need for the Yakima Greenway, and explain its public benefits. A scale model of the Greenway is being produced as part of this master-plan study; however, something else seems necessary. Three alternatives are suggested:

A. A FILM DOCUMENTARY on the Greenway would be a vivid, easily understood means of showing the area's problems, beauty, and possibilities. A 10-minute full-color short (using both slides, maps, and live footage) might cost about $10,000, which means its production would require either a large commercial or industrial sponsor, or a foundation grant.

B. A NARRATED SLIDE SHOW. A narrated slide show could be made using 35 mm color slides, a Kodak carrousel projector with automatic focus, and a Wollensak (3M) cassette-recorder unit. A slide-dissolve unit is optional. The cassette "sound track" has inaudible slide-change commands to synchronize the slides with the narrative. The tape-slide show is thus fully automatic. The cost of the basic equipment is as follows:

Wollensak #2551 ... about $325.
(Optional dissolve unit ... about $330)
(Assume Kodak projector can be borrowed.)

The cost of production, using existing photography, is estimated to be roughly $960 production time plus $60 in slide duplication. This means the total package is about $1,350 (without dissolve unit).*

If we assume that some public agency could finance the purchase of the Wollensak, then the production would need to be supported by Yakima area business groups, civic organizations, or by a foundation grant. Commercial sponsors could be credited at the end of the program.

C. A POSTER OR BROCHURE. Some sort of poster (22" x 34") or color brochure could be produced and distributed to valley residents, public agencies, and the State Legislature. The content would include color and black-and-white photography, a narrative text, and a map of the proposed greenway.

Costs are difficult to calculate. A large poster, or a multiple-page brochure, issued in at least 1,000 copies, might cost about $4,000. However, if a Yakima area printing firm were to donate layout and press costs, it might be considerably less. Local businesses could sponsor the poster/brochure and be credited.

SUMMARY

FILM DOCUMENTARY:
Costs: About $10,000.
Sponsorship: Large commercial/industrial; a consortium of private groups; a foundation grant.
Advantages: High-impact; captures movement and change.
Limitations: Requires professional production; requires a skilled operator; costly.
Recommendation: Recommended as a long-range goal after greenway implementation begins.

NARRATED SLIDE SHOW:
Cost: About $1,350.*
Sponsorship: Public agencies; private groups; foundation grant.
Advantages: Easily transported and shown; fully automatic; can go into considerable detail; relatively cheap.
Limitations: Requires a staff presentation to audiences.
Recommendation: Highly recommended as an initial public-awareness tool.

* The tape-slide show could cost much less if it were produced using graduate students at the University of Washington's College of Forest Resources; or, through Washington State Parks & Recreation Commission.

POSTER OR BROCHURE:

Cost: Up to $4,000.
Sponsorship: Local printer; local businesses; private groups.
Advantages: Easily disseminated; may be mailed to agencies, legislators, potential donors, etc.
Limitations: Limited story-line; of limited educational value.
Recommendation: Should be considered in conjunction with the narrated slide show; depends on local business sponsors and local printing firms.

PRIVATE ACTIONS

Land Trust. A local group could set up a non-profit trust to solicit and accept donated land, estates, and conservation easements. This could eventually become a function of the Greenway Commission, or could continue as a private trust foundation.

Land Exchange. Land owners could trade riverside lands to public agencies in exchange for equally-valued land elsewhere. For instance, Boise Cascade might trade their unused riverside land for forest land held by the D.N.R., the Game Department, State Parks, or Yakima County.

Funding Drives. A consortium of concerned groups could carry out a series of fund-drives for land acquisition. The fund would best be donated to a public body so it could be used as matching money for grants-in-aid. The land trust can act as a fund manager.

Conservation Groups. Groups such as the Audubon Society, the Sierra Club, or Friends of the Earth may be able to obtain grants or donations from their regional or national organizations, as well as run local funding drives. The national Audubon Society offers a Nature Center planning service that can be used to help implement the Regional Natural Studies Center. Publicity in national magazines (e.g., Audubon, Sierra Club Bulletin, Parks and Recreation) would help to add credence and weight to the Greenway proposal.

Private Land-trust Foundations. In the course of this study, the consultants have been in contact with both The Nature Conservancy and The Trust for Public Land. Correspondence will be turned over to the Washington State Parks and Recreation Commission.

The Trust for Public Land's objective is "to facilitate the efficient transfer of private held lands to public ownership by combining the incentives of its tax-exempt status (which can provide property owners

with potential income, estate and property tax benefits) with professional negotiating skills and sound management practices." They mainly seek to preserve open space to serve the needs of metropolitan area residents.

The Nature Conservancy is less park and metropolitan oriented, and more interested in preserving valuable and/or endangered natural areas. By example, the Conservancy was the activating force behind the 2,000 acre Skagit River Bald Eagle Sanctuary, where they acted as a pre-acquiring agency for the Department of Game (which in turn was funded by the B.O.R.). Again, on the Little Spokane River, they are pre-acquiring conservation easements and fee ownership for eventual transfer to Spokane County Parks. B.O.R. is likewise providing matching monies. B.O.R. involvement is crucial.

A "Letter of Intent" is required from the sponsoring public agency, stating that they intend to acquire the property. Sponsoring bodies would likely be the Game Department, Yakima County, the City of Yakima or State Parks (all with I.A.C. and B.O.R. subsidy).

Conservation easements are restrictions that an owner voluntarily writes into his deed, limiting the future use of the land. The owner does this by selling (or giving) some of the ownership rights to a local body or private conservation organization. The owner retains control; the property is open to public use only if he consents; he is free to sell or mortgage the property. However, his valuation (hence his taxes) will be reduced, as well any inheritance tax.

The easements are typically negotiated by a public agency. (Some sensitive landowners may be more open to the approach of a private group rather than "the government.") If a land trust or Greenway Commission were set up, easements might be arranged through them.

Fortunately, the State Legislature has recently passed legislation making conservation easements legally enforceable.*

Voluntary Improvements. Greenway landowners can be urged to voluntarily improve the appearance of their properties. Specifically:

- Screen objectionable industrial uses from roadway or riverside view. For instance, Boise-Cascade could vegetatively screen their log-storage yards from Interstate 82 to improve the appearance of the northern "gateway." Other commercial uses could add additional screening and landscaping (e.g., the K-Mart near the Moxee Bridge or the heavy-equipment sales yard near the Terrace Heights Bridge).

- Agricultural landowners could use riverside lands for wildlife enhancement by using food and forage plantings, hedgerow plantings, and limiting grazing adjacent to the river.

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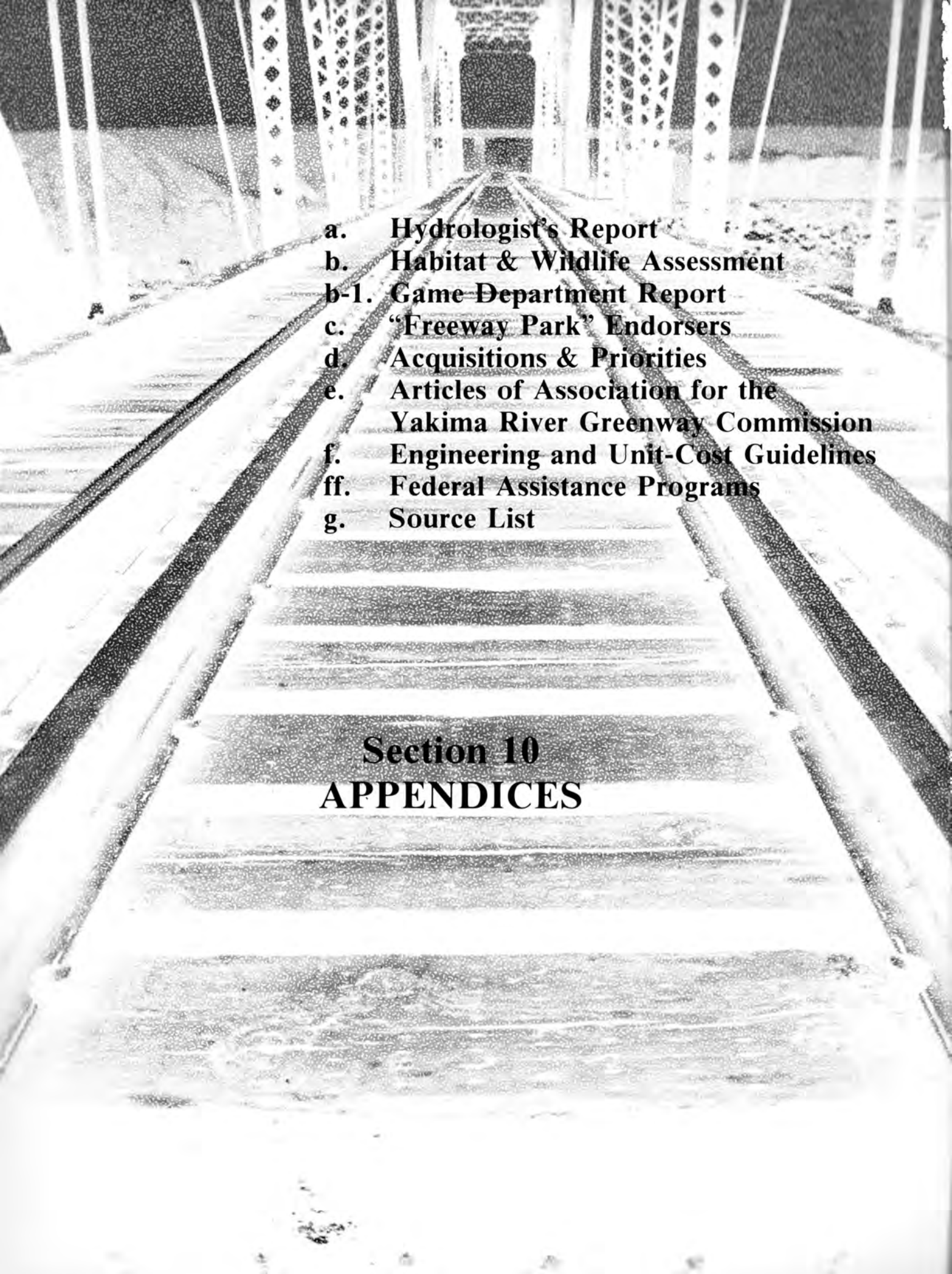
* SB 2660, passed by both houses in February 1976.

Civic groups and youth organizations could hold periodic river cleanup programs to remove litter and junk from the river margin. They could also help make riverside commercial uses aware of the need for planting and screening.

Yakima Greenway Citizens Committee. As a transformation of the "Freeway Park Adivisory Committee," this group could advise all local agencies (and the Greenway Commission). It could also solicit donations, help fund an awareness tool, and lobby for the greenway's implementation.

Volunteer Services. If local groups are interested in this project, civic, religious, business, fraternal, and conservation organizations could bond together to offer substantial donations of labor and/or materials to develop acquired greenway lands. Youth groups might take an interest in the development of trails, the Natural Studies Center, the Group Camp, and in wildlife enhancement work.



a. Hydrologist's Report
b. Habitat & Wildlife Assessment
b-1. Game Department Report
c. "Freeway Park" Endorsers
d. Acquisitions & Priorities
e. Articles of Association for the Yakima River Greenway Commission
f. Engineering and Unit-Cost Guidelines
ff. Federal Assistance Programs
g. Source List

Section 10
APPENDICES

The Yakima River Regional Greenway

hydrology

dr. thomas dunne

JONES & JONES
Environmental planners·Landscape architects
105 South Main Street Seattle, Washington

APPENDIX A

THE YAKIMA RIVER BETWEEN THE SELAH AND UNION GAPS

By: Thomas Dunne, William E. Dietrich, David Nimick
Department of Geological Sciences
University of Washington

GEOLOGIC STRUCTURE AND HISTORY OF THE VALLEY

During the Pliocene epoch (2-12 million years ago) an ancestral Yakima River flowed from the Cascade Mountains across flat-lying basalt lavas which had originated from great fissures in the earth's surface during the Miocene epoch (12-26 million years ago). In the vicinity of Yakima, mountain-building forces began to fold the lavas into a series of parallel ridges and downwarps, shown in Figures 1 and 2. As the lava beds were pushed up the river cut down through the ridges in a series of narrow gaps. Downcutting kept pace with uplift. The Yakima Ridge at the northern end of the proposed greenway park appears from Figure 2 to have risen more quickly than its southern neighbor.

At the same time, large andesitic volcanoes in the mountains to the west were undergoing explosive eruptions and vast quantities of ash and volcanic agglomerates were fed into the Yakima Basin and carried downstream by the river. The sediments were deposited as thick layers in the downwarps between the rising basalt ridges. Erosion of the gaps also contributed coarse basaltic gravels to the accumulating deposits. These sediments are now called the Ellensburg formation and in the Moxee Valley are as much as 1500 feet deep.

During the Pleistocene epoch (2 million to 10 thousand years ago) the activity described above continued and glaciers advanced from the high Cascades down the Yakima Valley as far as CleElum. The Yakima River was swollen many times with glacial meltwater and large quantities of coarse gravelly sediment from the Naches and Upper Yakima basins. This Pleistocene sediment now covers the surface of the Moxee Valley in the vicinity of Yakima and consists of gravels derived from the basalt ridges together with a minor amount of granitic rocks from the Cascades.

Since the retreat of the Cascade glaciers, the river has cut down about 10 feet into its Pleistocene sediments leaving a terrace of sand and gravel covered by windblown silt along both sides of the valley. This terrace now defines a natural corridor within which floodwaters are confined. The gradient of the terrace is steeper than that of the present valley floor of the river. After considering a range of possible reasons for the difference, it seems that the most plausible explanation is recent tilting of the land surface. The overall gradient of the river terrace from the Selah Gap down to the Union Gap is now 0.0036; that of the present floodplain is 0.0030. Such a difference would result from the northerly ridge continuing to rise more rapidly than the southerly ridge, as described previously. We have also compared the gradient of the well-preserved eastern terrace with that of

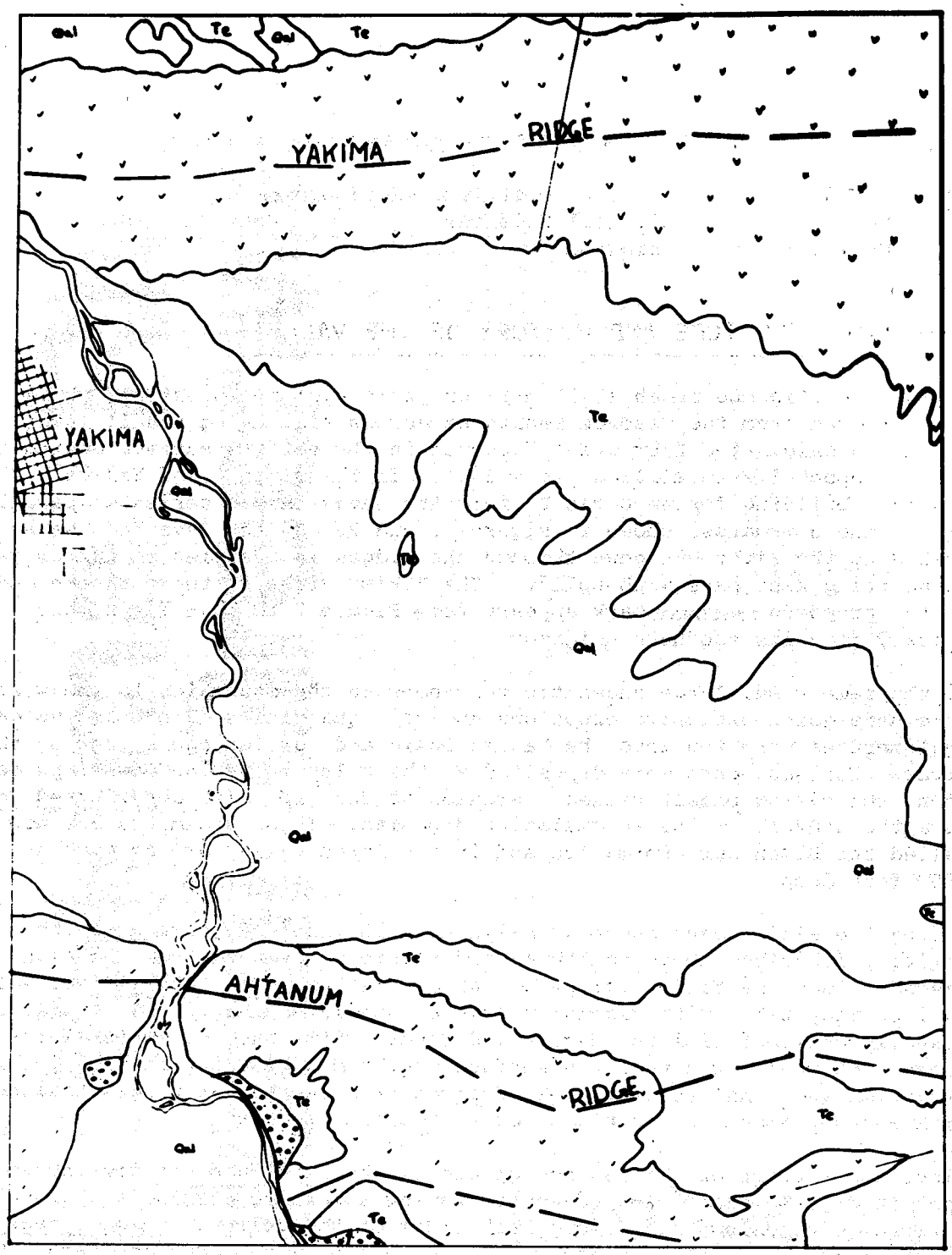


FIG. 1: GEOLOGIC MAP OF THE MOXEE VALLEY NEAR YAKIMA.
SOURCE: U.S. GEOLOGICAL SURVEY

the present floodplain above and below the Moxee Bridge. Our results are shown schematically in Figure 3. They confirm the suggestion that both of the gaps continue to rise but that the northern uplift is occurring at a slightly faster rate than the southern one, causing the Moxee Valley itself to be warped. Another piece of evidence that earth movements are continuing in the region comes from railroad lines which show slight offset and warping in some parts of the area.

If the valley is being tilted in this way, the channel should be cutting down into its valley floor at the northern end faster than at the southern end. One might even expect deposition of sediment at the lower end as the river works to maintain its original gradient across the differentially uplifted land. Examination of aerial photographs of the valley suggest that this hypothesis is probably correct. The upper part of the reach has a simpler, more confined channel in a relatively narrow floodplain confined between high terraces. In the southern Moxee Valley, the channel is more complicated and shows signs of more recent lateral shifting, abandonment of channels and deposition of sediment within its floodplain. The valley floor is much wider to the north and is confined between lower terraces. The transition from the more stable, rising zone to the zone of most rapid channel shifting and deposition seems to lie in the vicinity of the Moxee Bridge.

The present river floodplain lies between the terraces and has an average width of about 1.5 miles. It is intricately laced with active and abandoned river channels which reflect the vigor with which the river has been migrating across its floodplain during the last few thousand years. This activity continues today, and shows no signs of abating, because the movement is a response to the hydrologic and geologic conditions in the Yakima Basin. Any plans to use or modify the floodplain should take this activity into account, and should be based upon an appreciation of why the river looks and acts as it does.

A river channel adjusts its size, shape and pattern* to the size and character of water and sediment discharges which are supplied by the drainage basin. For this reason it is necessary to describe the hydrology and sediment discharges of the Yakima River before considering the morphology of the channel.

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* The pattern of a river channel refers to the aerial view which one sees on a map or air photo.

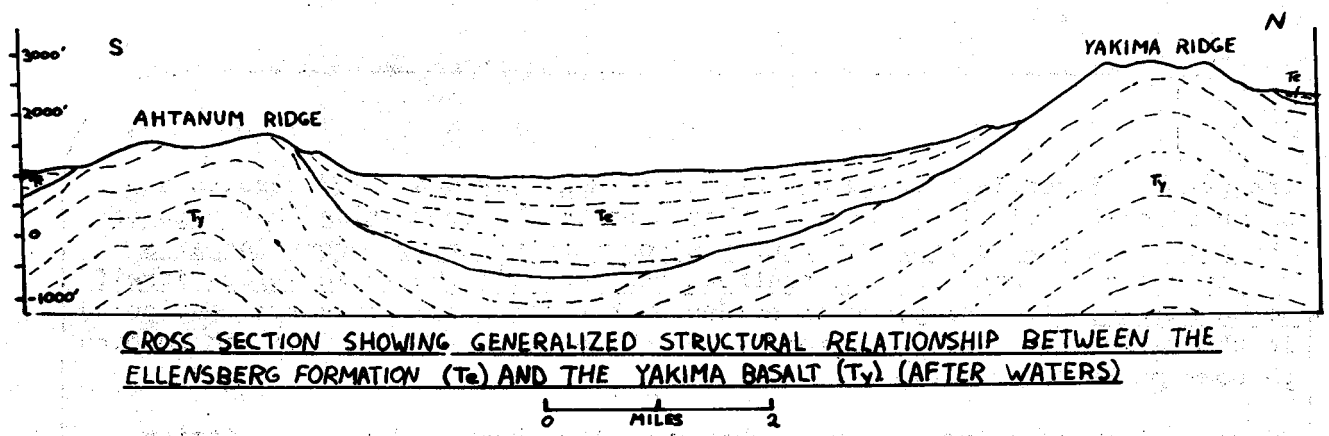

FIG. 2: GEOLOGIC CROSS-SECTION OF THE MOXEE VALLEY NEAR YAKIMA. SOURCE: U.S. GEOLOGICAL SURVEY.

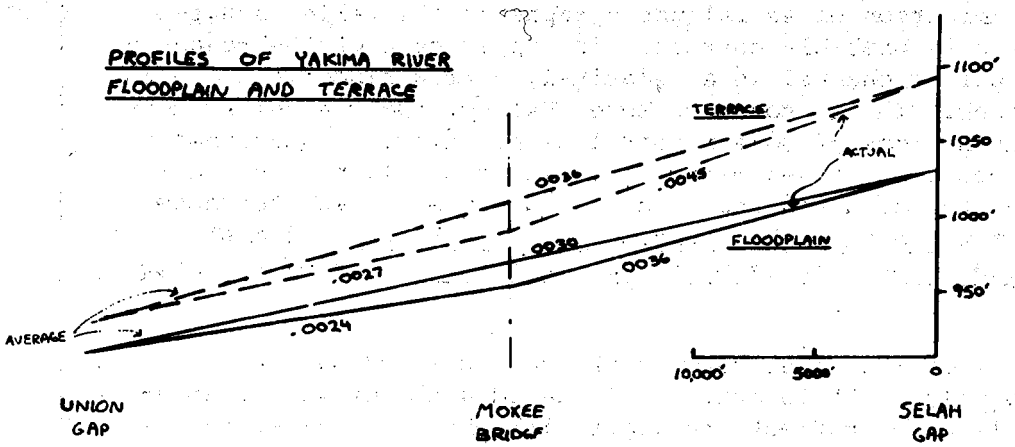

FIG 3: PROFILES OF THE EASTERN PLEISTOCENE TERRACE (DASHED LINES) AND THE PRESENT VALLEY FLOOR (SOLID LINES) OF THE YAKIMA RIVER BETWEEN SELAH AND UNION GAPS. THE NUMBER ACCOMPANYING EACH LINE IS A GRADIENT (IN FEET PER FOOT).

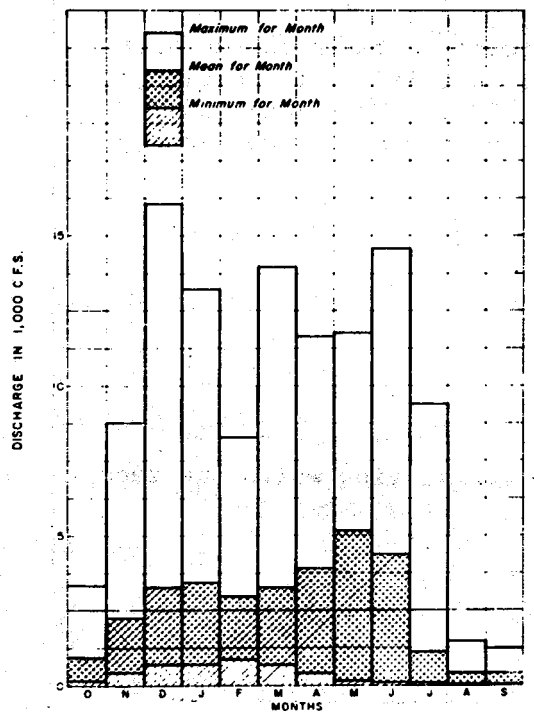

FIG. 4:
MONTHLY DISCHARGE SUMMARY FOR THE YAKIMA RIVER AT PARKER, 1908-65. SOURCE: U.S. ARMY CORPS OF ENGINEERS.

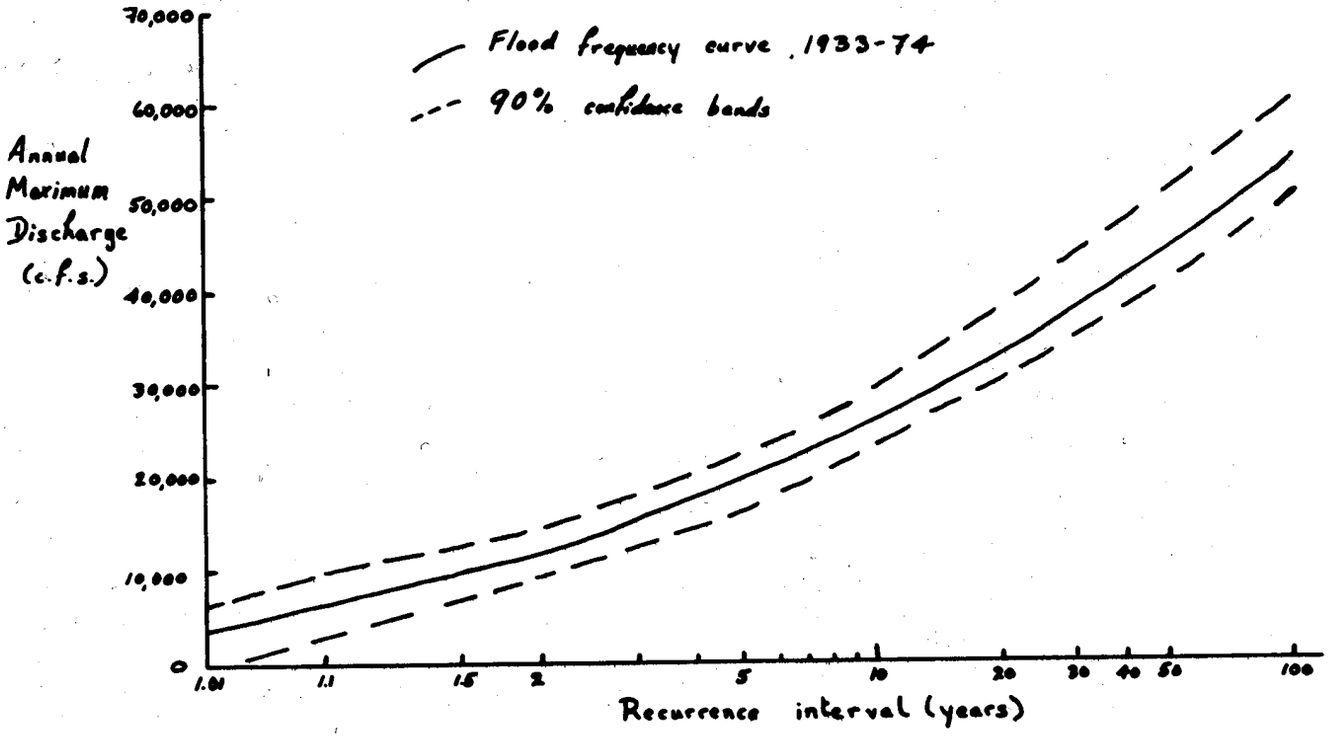

FIG. 5: FLOOD FREQUENCY CURVE FOR THE YAKIMA RIVER AT PARKER FOR THE PERIOD 1908-76.

HYDROLOGY OF THE YAKIMA RIVER

The flow of the Yakima River is derived from snowmelt and rainfall on the western slope of the Cascade Mountain range. A representative graph of the seasonal trend of the river discharge is presented in Figure 4. Monthly discharges are usually highest during the period April-June, reflecting snowmelt runoff. The largest daily and monthly flows of record, however, occurred in December. These large floods are usually associated with large rainstorms on a melting snowpack.

The U.S. Bureau of Reclamation maintains several reservoirs upstream from Yakima which modify the river discharges by storing some water at times of high flow and releasing it for irrigation during spring and summer. The result of this management is to reduce flood peaks and to increase low flows during summer.

The morphology and activity of the channel are controlled by flood discharges. Figure 5 shows the magnitude of floods that have occurred at the gauging station operated by the Bureau of Reclamation at Parker. The graph also shows the expected frequency of floods over the long term. It is based upon data from 1976 back to 1933 (the year after the closing of the last dam on the river). The dashed lines on either side of the solid curve indicate the degree of uncertainty inherent in estimating any flood. Figure 5 shows, for example, that the best estimate that we can make of the 100-year flood is 54,000 c.f.s.. But in fact, we can only be 90 percent confident that the 100-year flood actually lies somewhere between 50,000 and 59,000 c.f.s..

In Figure 6 we have plotted the largest discharge of each year for the period 1897-1976 during which flow records have been kept at the U.S. Bureau of Reclamation gauge near Parker.* There is great variability from year to year but also a suggestion that the years before 1934 experienced generally higher flood peaks than those of the last 35 years. The trend becomes more obvious when the annual peaks from 1908 to 1976 are displayed as shown in Figure 7. On this diagram we have plotted the cumulative deviation of each year's flood peak from the long-term mean annual flood peak for the period 1908-1976. This long-term average is 16,238 cubic feet per second. A rising section of the curve indicates a run of years with above-average floods, while a descending section signifies a period of floods whose size was below the long-term average. The diagram shows, therefore, the trends referred to above. From 1908 to 1933 floods were generally higher than average, although the few peak discharges estimated for the 1890's suggest that during the earlier period floods may have been even higher than during the 1908-1933 period (see Figure 6). Since 1933

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* Only a few estimates of peak discharges are available for the 1890's.

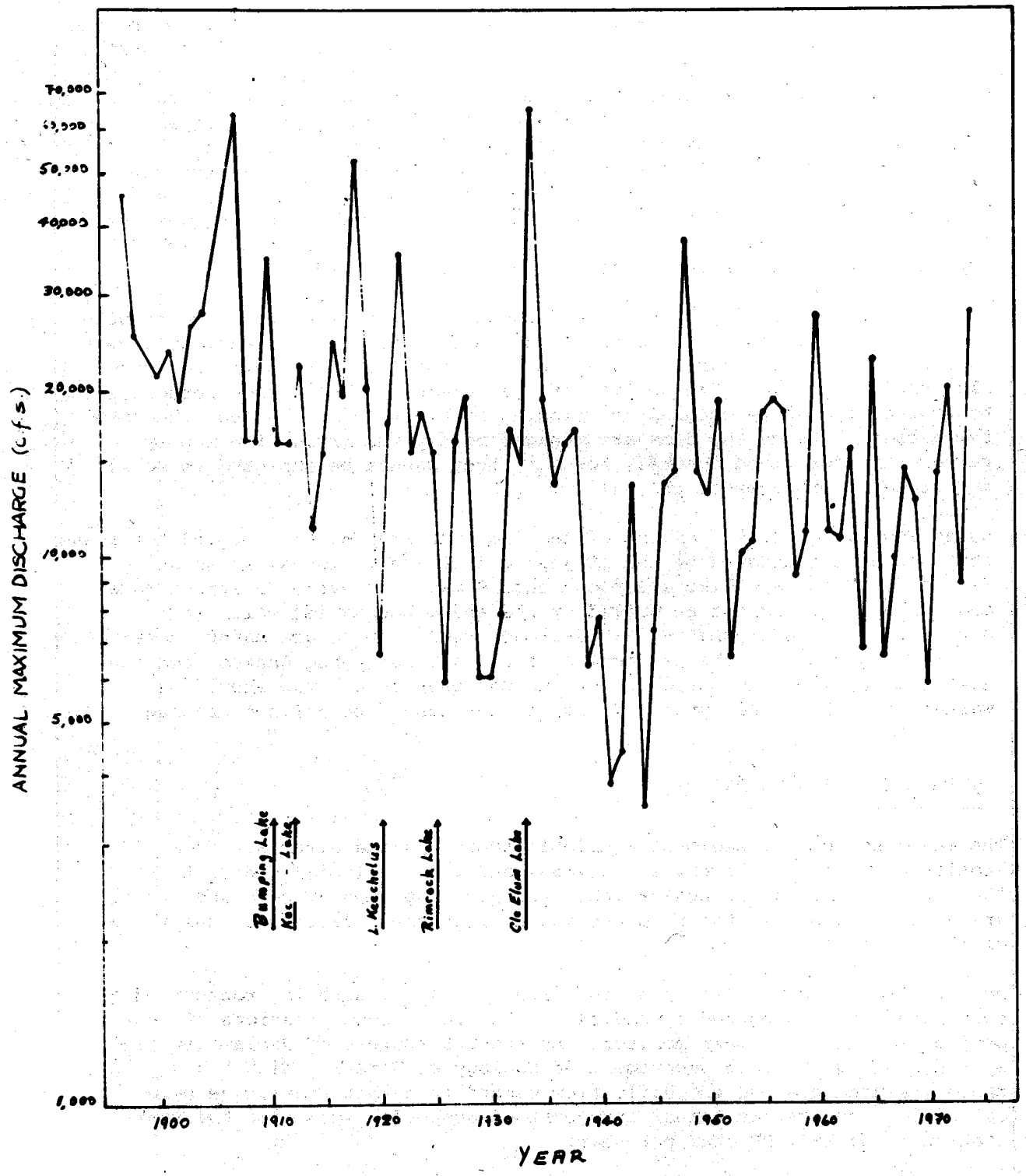


FIG. 6: LARGEST FLOW OF EACH YEAR FOR THE PERIOD 1897-1976 FOR THE YAKIMA RIVER AT PARKER.

floods have generally been below the long-term average, as indicated by the descending curve in Figure 7. This trend is presumably due to the construction of several reservoirs which are noted on Figure 6. It is difficult to estimate their precise effect upon the flood hydrology of the river, however, and it is possible that the run of lower flood peaks was at least partly the result of a minor climatic fluctuation. It will be interesting and useful to examine the peak discharges for the next few years to see whether the slight reversal of trend during the last few years continues. At this time there is simply no way to predict whether the Yakima floods will remain relatively small or whether the valley will experience a run of larger floods during the next decade.

Settlement has encroached upon the floodplain during the run of years with below-average floods. If the flood-hazard increases to its earlier levels during the next few years, it could cause considerable hardship for these floodplain dwellers. The ability of the Bureau of Reclamation personnel to control floods by opening and closing dams has increased over the past few decades. Since the dams are managed mainly for irrigation supply rather than for flood control, however, they cannot be expected to solve the flooding problems of the valley.

As an indication of the extent of the flood hazard, we have mapped the areas that would be inundated by the 10-year and 100-year floods, as shown in Figure 8. This map, like all flood hazard maps, however, is approximate, and the user should not be misled by the sharp boundaries which we or others might draw around the flood-prone areas. There are major uncertainties inherent in the prediction of flood sizes, frequencies, and the area that will be inundated. Everyone who uses such a map should be warned that the boundary of the hazard zone cannot be defined precisely.

SEDIMENT TRANSPORT

The major sources of sediment available to the Yakima River are from erosion of mountain slopes, and glacial and fluvio-glacial sediments in the Upper Yakima and Naches basins. Abundant supplies of sand and gravel are also available in the Pliocene and Pleistocene sediments on the floor of the valley itself.

Most of the sediment carried by the river is sand, which is transported as suspended load, supported by eddies in the flow. Concentrations of suspended sediment have been monitored by the U.S. Bureau of Reclamation and by the Washington State Department of Ecology at Parker. With the aid of these measurements and the daily flow record from that station we have calculated the average annual transport of suspended load past the Parker station to be 183,000 tons per year.

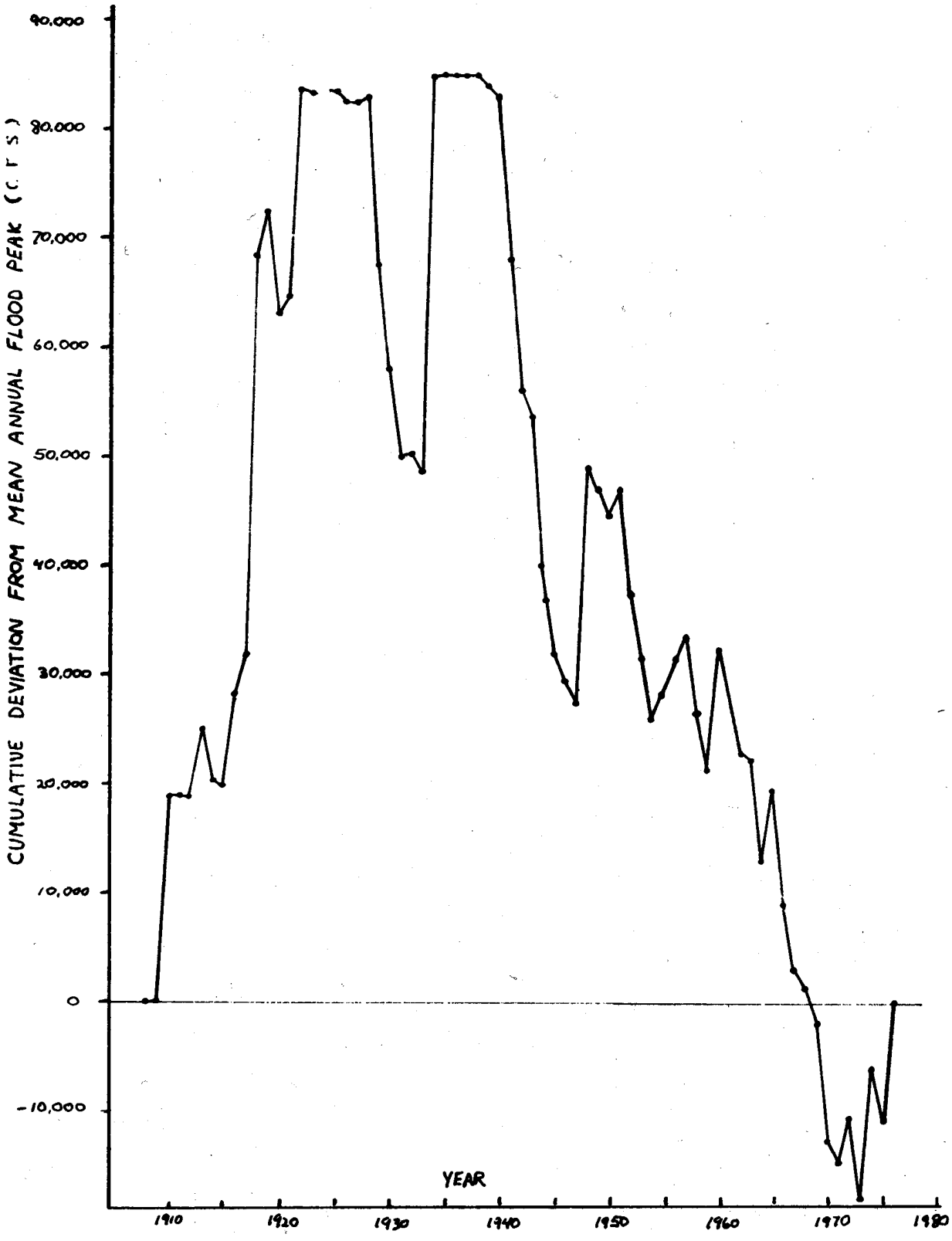


FIG. 7: CUMULATIVE DEVIATION OF ANNUAL MAXIMUM DISCHARGES FROM THE LONG-TERM AVERAGE ANNUAL MAXIMUM FOR THE PERIOD 1908-76.

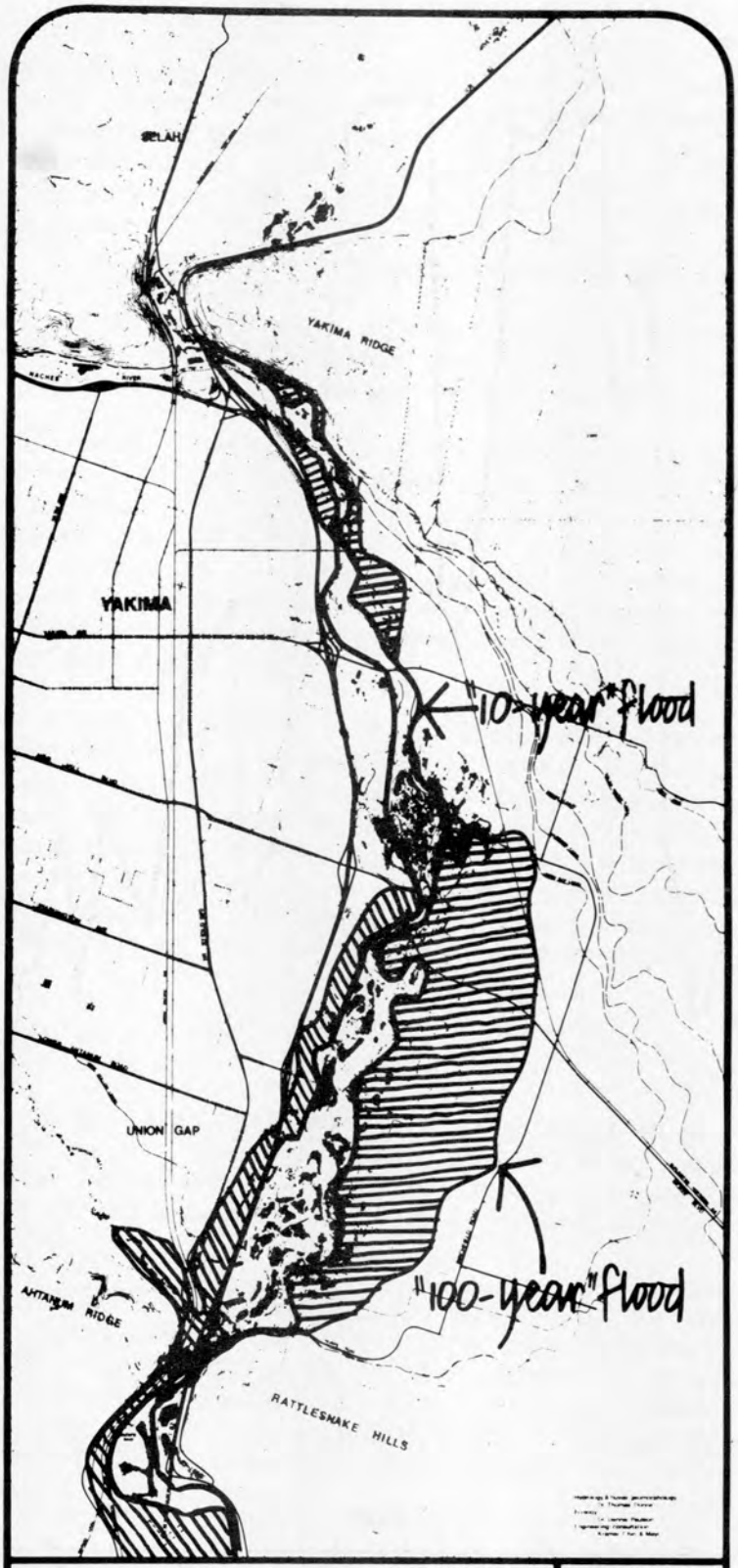


Figure 8.
The Yakima River Regional Greenway

Coarse sand and gravel are also moved by the river, but they travel by sliding, rolling and jumping along the bed of the channel as bedload. Using a technique developed by the U.S. Geological Survey, we have estimated that the rate of transport of bedload through the reach is approximately 57,000 tons per year. Figure 9 shows how the rate of sediment transport varies with the river discharge. By far the largest proportion of all sediment transport occurs during the few days of highest flow each year.

The total sediment load of approximately one quarter of a million tons per year is not high for a river of this size. Nevertheless, it is important that the transport processes are not interfered with by any kind of engineering works. If the flow were obstructed so that it dropped part of its sediment load, rapid filling and diversion of the channel would result. We will show later that the quantity of sediment in motion is important in the evolution of the river channel when it is diverted as a result of human action.

We also attempted to identify the size of the largest rocks which could be moved by the river. Three different techniques using the depth, slope, and velocity of the flow gave us answers between 200 mm and 1000 mm (approximately 8 inches and 40 inches) for the intermediate diameter of the largest rocks that could be moved by the very large floods on this river. Immediately after the December 1975 floods (a moderate-sized flood with a recurrence interval of 8-10 years), we searched the river channel for the largest particle that had been moved by the flow. We found one rock with a diameter of 500-600 mm (20-24 inches). This confirms our earlier estimate that large rare floods should be able to carry occasional rocks with intermediate diameters in the 2-3 foot range. Such estimates are important for considering the stability of dikes and riprapping.

GEOMORPHOLOGY OF THE RIVER CHANNEL

The size, shape, and pattern of a river channel are controlled by the flood discharges and sediment load supplied by the watershed, and by the nature of the sediments through which the channel is carved. Most rivers are confined in a single, meandering channel with fairly regular loops which shift slowly backwards and forwards across the valley floor over hundreds or thousands of years. Other rivers, however, are divided into several channels which divide and unite around large bars or vegetated islands. Such rivers are knows as braided streams and they are generally associated with one or more of the following geologic and hydrologic conditions:

1. They are subject to high, and often rapidly fluctuating, discharges.
2. They have high rates of sediment transport, particularly of bedload.
3. They have steep gradients.
4. They have non-cohesive, easily eroded, sandy and gravelly banks.

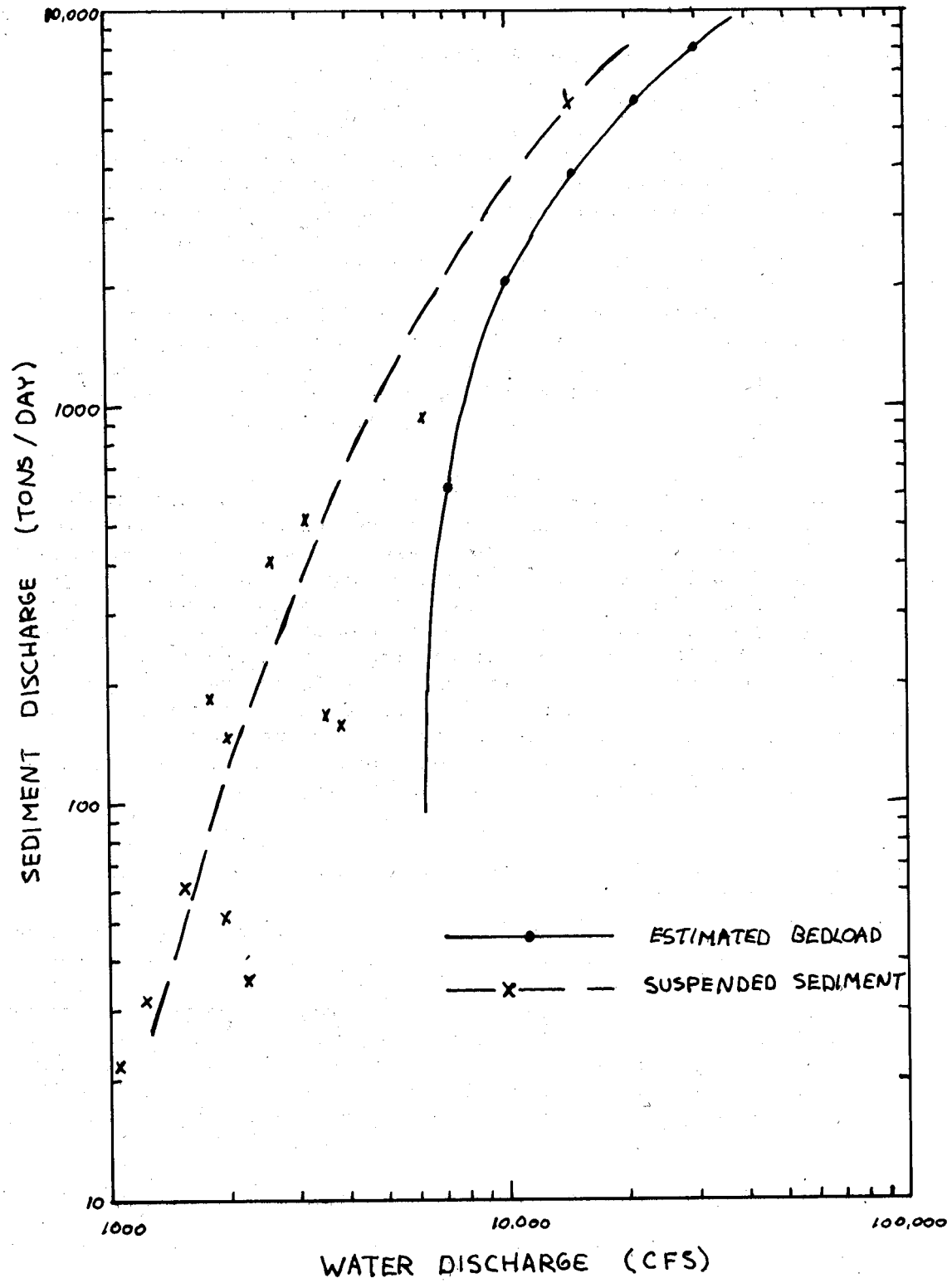


FIGURE 9: RATING CURVES OF SUSPENDED SEDIMENT AND BEDLOAD TRANSPORT AT PARKER.

The Yakima River in the Moxee Valley fits at least three of the criteria listed above and these are the reasons for its braided channel pattern.

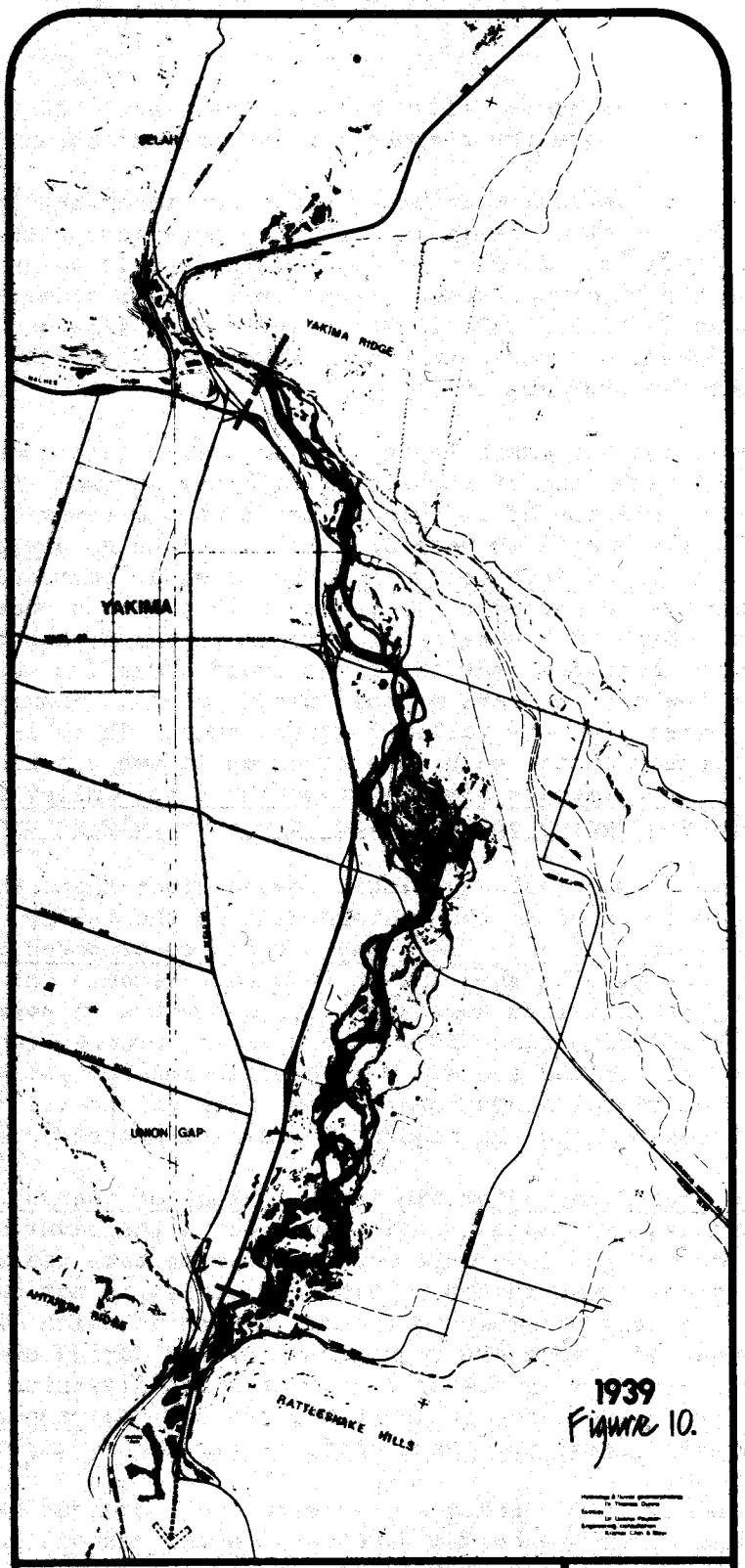
Braided streams have several attributes which are important for the planned park. The first of these is that they move across the floodplain almost constantly. In Figures 10, 11, 12, and 13 we have mapped the position of the major channels of the Yakima River from aerial photographs taken in 1939, 1952, 1959 and 1973. The maps show large differences of position. For comparison, Figure 16 shows the coverage of the river between 1939 and 1973.

Two types of movement are exhibited by the channel: (a) gradual lateral shifting, and (b) diversion of the flow into a new course. By measuring the difference in position of individual bends of the river on aerial photographs of various ages we were able to calculate an average rate of lateral shifing of 30 feet per year. The rates at particular locations varied from zero over a period of 34 years to 75 feet per year during four successive years. These rates are extremely rapid, and the average speed of movement indicates that the river could cross its entire floodplain in an average of 250 years by this method alone. Examination of the aerial photographs of the valley confirms this. There is ample evidence of old channels abandoned by the river as it swept across the floodplain. Many settlements now occupy parts of the valley floor which the river formerly occupied and to which it will surely return.

There seems to be no particular geologic reason other than chance for the channel to be confined to the western side of the valley. It could begin to move eastward at any time. Any structures proposed for the park should be located with this threat in mind. Because the rate of channel shifting has remained approximately constant when averaged over periods of about a decade since 1939, the shifting process can be estimated roughly, as indicated above. More precise information on the rate of shifting of individual bends towards some site of special interest can be obtained by re-examining the sequence of aerial photographs.

Far more dangerous and unpredictable is the threat of channel diversion. Because this process can cause a radical change in the river's course, it can accomplish in one flood what would otherwise take years to achieve by gradual shifting of the channel. Since diversion is not as regular as shifting, it is only possible to examine places at which diversion has recently occurred, trace the sequence of events during and since diversion, and indicate a sample of places at which diversion could conceivably occur in the near future (next ten years). We cannot locate all such potential diversions; the process is simply too unpredictable.

In Figure 15, we have illustrated a diversion that occurred between 1969 and 1973 when the river breached a dike between the channel and an abandoned gravel pit. Arrows indicate the former course of the river and the darker area is the new diversion. After breaching the dike the river left its former channel and flowed out of the downstream end



The Yakima River Regional Greenway

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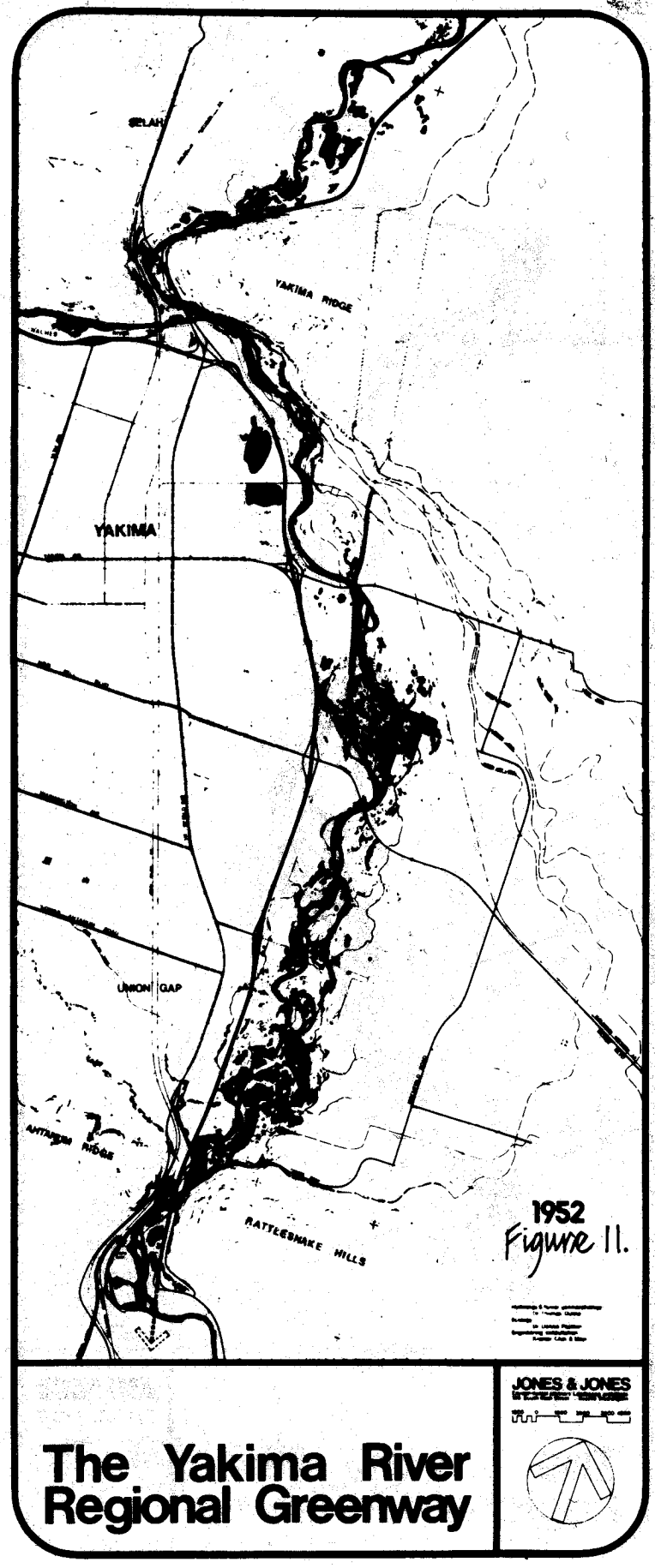
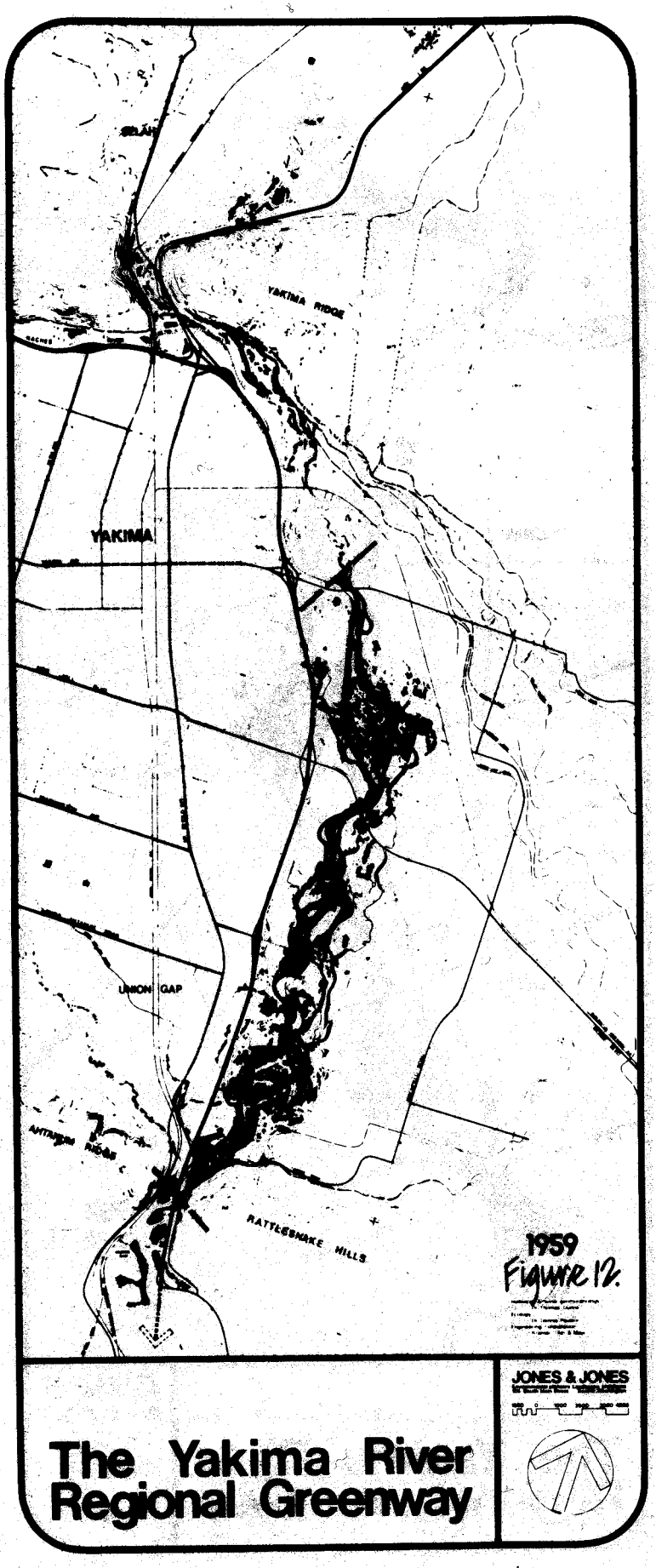
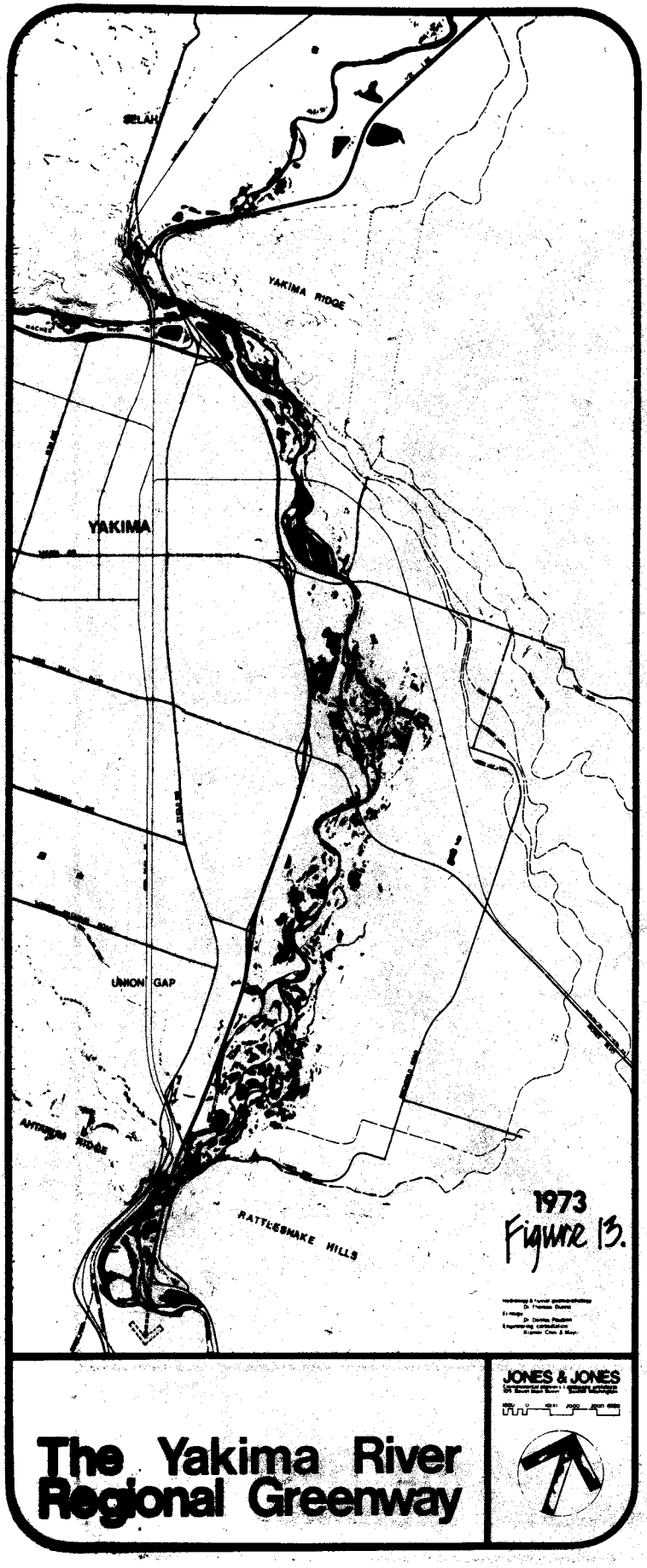

SELAH
YAKIMA RIDGE
YAKIMA
UNION GAP
RATTLESNAKE HILLS
1952
Figure 11.
JONES & JONES
The Yakima River
Regional Greenway


YAKIMA RIDGE
YAKIMA
UNION GAP
RATTLESNAKE HILLS
1959
Figure 12.
JONES & JONES
The Yakima River
Regional Greenway


SELAH
YAKIMA RIDGE
YAKIMA
UNION GAP
RATTLESNAKE HILLS
1973
Figure 13.
JONES & JONES
The Yakima River
Regional Greenway

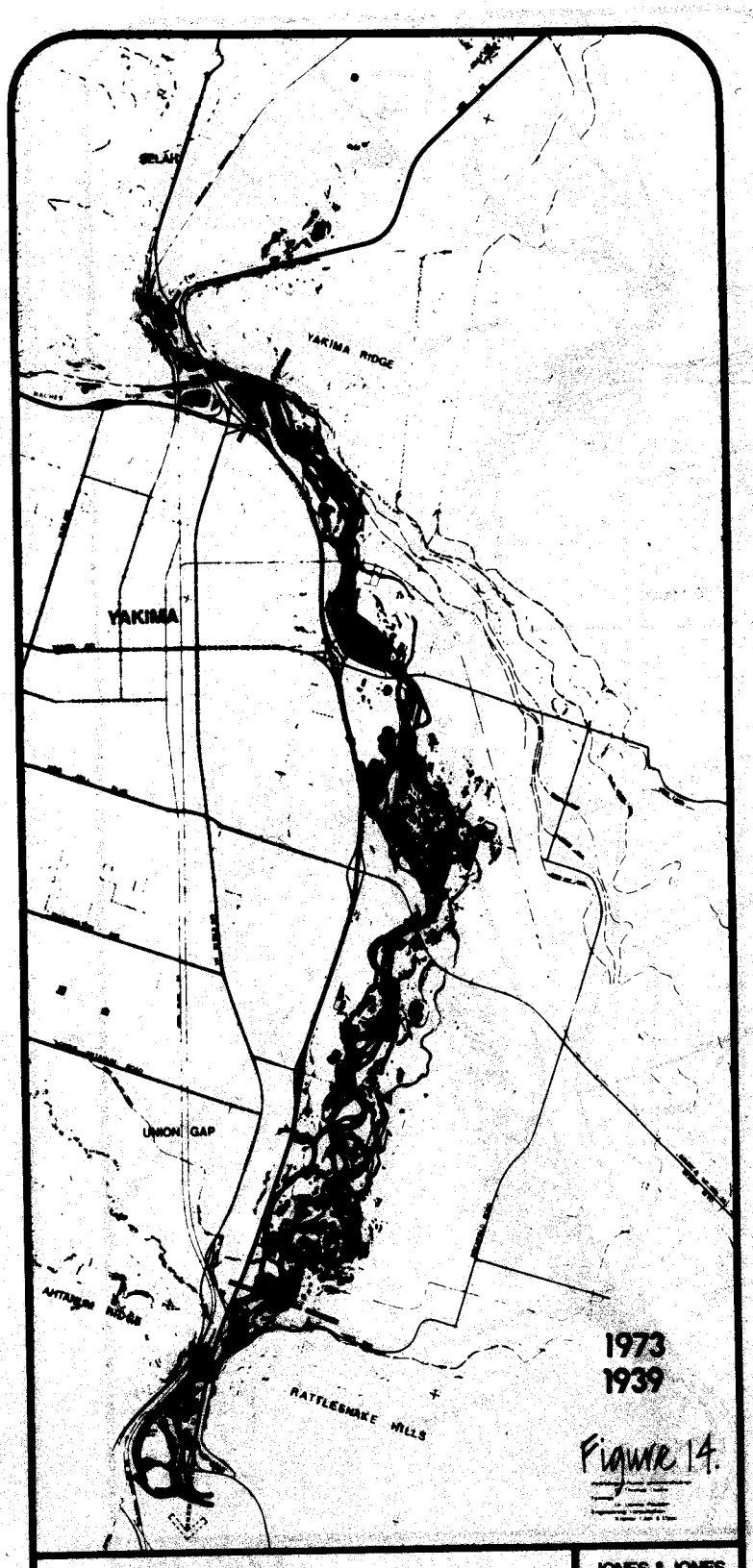


Figure 14.

The Yakima River Regional Greenway

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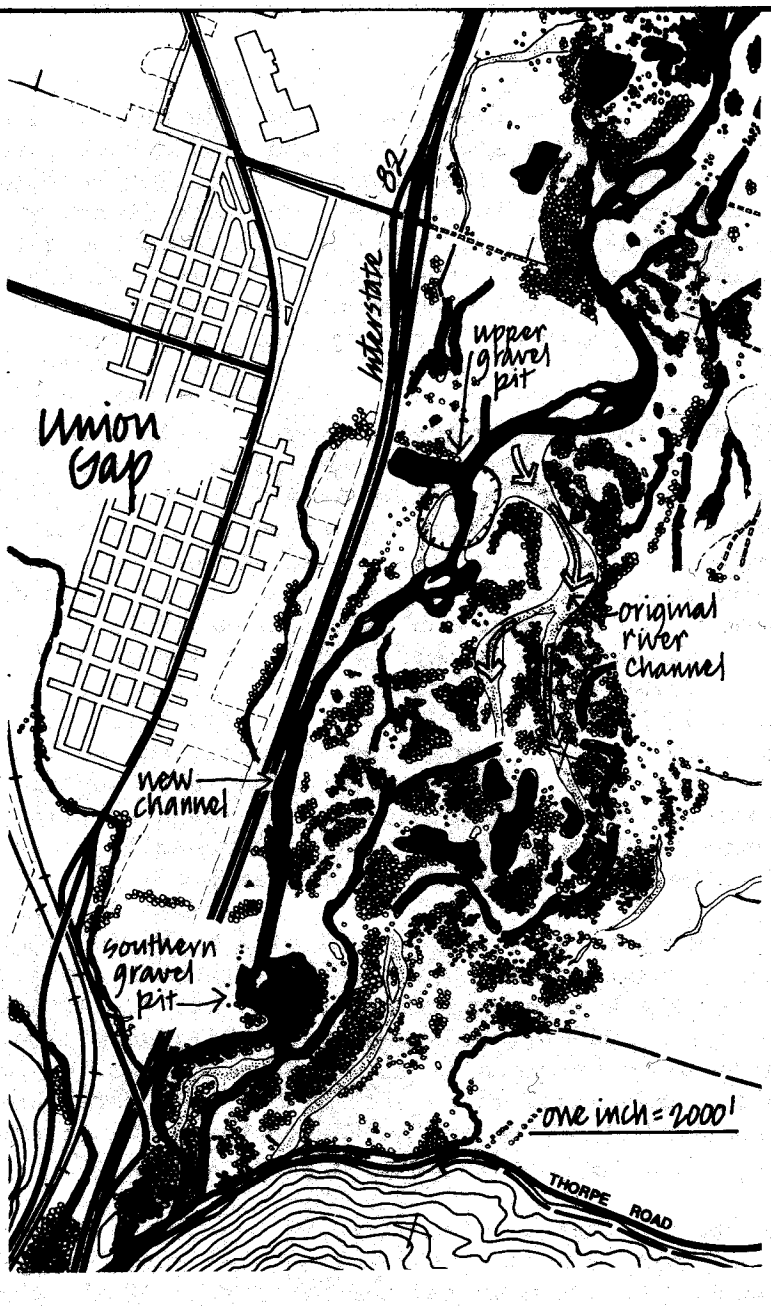


FIGURE 15: MAP OF A CHANNEL DIVERSION THAT OCCURRED IN 1971. THE RIVER ABANDONED THE CHANNEL SHOWN BY THE ARROWS, BREACHED A DIKE, FLOWED INTO THE UPPER GRAVEL PIT AND OUT OF THE SOUTHERN ONE BACK INTO THE MAIN CHANNEL. THE DIVERSION THREATENS TO UNDERMINE THE EMBANKMENT OF INTERSTATE 82.

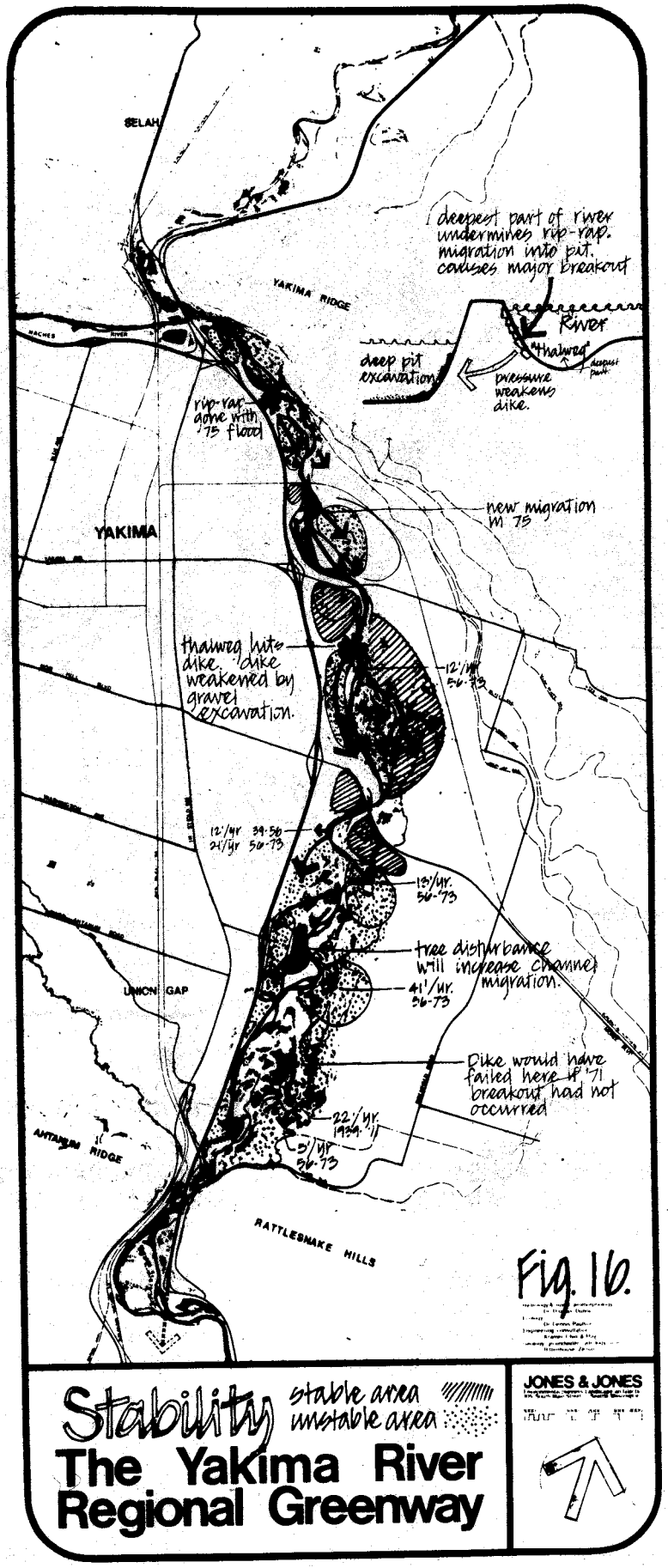
of the gravel pit, across the floodplain into a second pit 4000 feet downstream. Thence it breached a second dike and flowed back into the main channel. This diversion moved the channel 100 to 1000 feet laterally in a single event and brought it into a position where it now threatens to undermine the embankment of Interstate 82. Figure 16 shows the location of other important diversions of the channel, as well as the recent directions of gradual shifting. These movements pose a constant threat to any structures in the floodplain and should be carefully considered in the park plan.

The presence of many abandoned gravel pits in the floodplain increases the chances of future diversion because the river is capable of breaching any of the dikes surrounding the pits. It is possible to predict the course of events after a pit has been breached by examining sequences of aerial photographs of earlier diversions. After the river pours through the breached dike into the slack water of the flooded pit, it drops its sediment load. The sediment builds a causeway across the floor of the pit and the river flows in a channel lined by levees across the top of this embankment. Eventually the causeway will extend to the downstream side of the pit and after that time the river will carry its sediment load through the new channel built across the pit, leaving two lakes outside the levees. From that time onwards a continuous new channel extends from the original upstream breach to the downstream re-entry point. In future floods, the natural levees across the pits could easily be overtopped and breached and the river could be diverted anew.

We were asked to predict where the channel will be by the year 2000 A.D.. In the foregoing account we have stressed that there are major uncertainties in predicting the future movements of this river. Although the gradual shifts may be roughly predicted over a 25-year period, the chance of anticipating major diversions is slim. Nevertheless, we have tried to show in Figure 17 those areas which will probably be threatened by channel encroachment before the end of the century. We stress the uncertainty, however. This map should be used with caution.

Throughout the changes that have occurred in the position of the river channel during the period 1939 to 1973, its total length has remained approximately constant. We measured the sinuousity of the channel by dividing the length of the main channel by the length of the valley. Throughout the past 34 years this ratio has remained constant at 1.2. The river must maintain a channel with this sinuousity in order to expend its energy without damaging its banks any more than it does already. Any plans to divert or confine the river should take account of this requirement.

As an indication of what might happen, we examined the reach of the river which is presently confined by dikes. We considered sites of probable diversion during the next decade or so and drew a map of the new channel if all of these diversions occurred. The sinuousity of the channel after the changes would be only 1.1. The river would be shorter and steeper


SELAH
YAKIMA RIDGE
deepest part of river undermines rip-rap. migration into pit. causes major breakout
River
"thalweg"
deep pit excavation
pressure weakens dike.
rip-rap gone with '75 flood
YAKIMA
new migration in 75
thalweg into dike. dike weakened by gravel excavation.
12'/yr 56-73
12'/yr 39-56
21'/yr 56-73
13'/yr. 56-73
tree disturbance will increase channel migration.
41'/yr. 56-73
UNION GAP
Dike would have failed here if '71 breakout had not occurred
22'/yr. 1939-
5'/yr 56-73
ANTANUM RIDGE
RATTLESNAKE HILLS
Fig. 16.
Stability
stable area
unstable area
The Yakima River Regional Greenway
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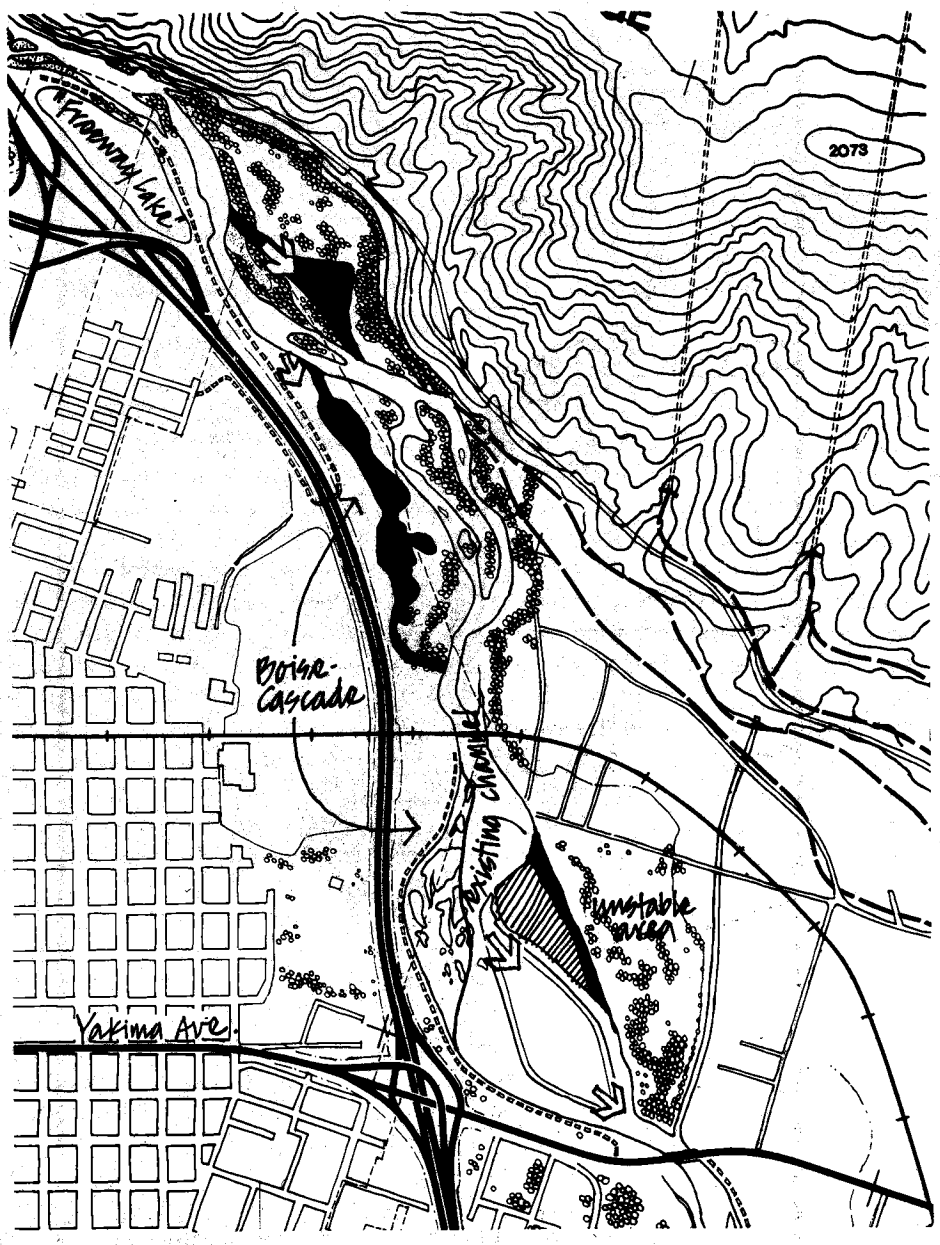

FIGURE 17A - UPPER & LOWER NORTH RUNS

FIGURES 17A, 17B, 17C:
AREAS OF THE VALLEY FLOOR WHICH WILL PROBABLY BE THREATENED BY CHANNEL ENCROACHMENT BEFORE THE END OF THE CENTURY (25 YEARS).

Black areas are potential new channel paths (usually following historical channel alignments).
Shaded areas are threatened by river migration.
Arrows indicate potential "breakouts" or rapid channel advances.

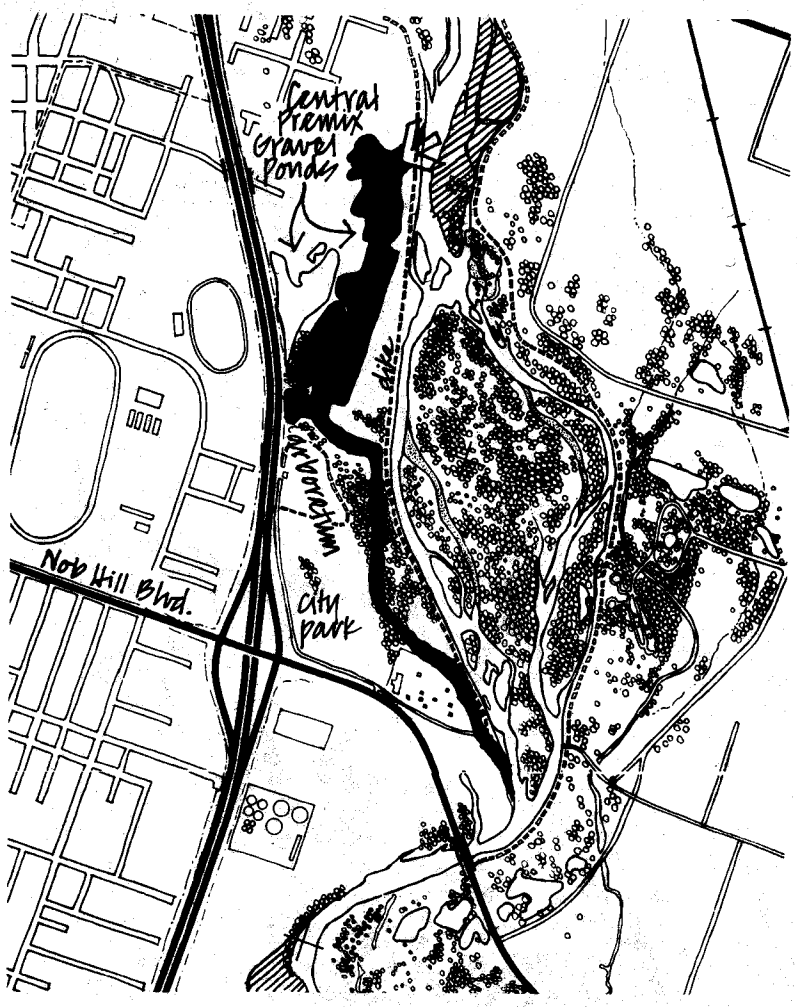

FIGURE 17B - CENTRAL RUN

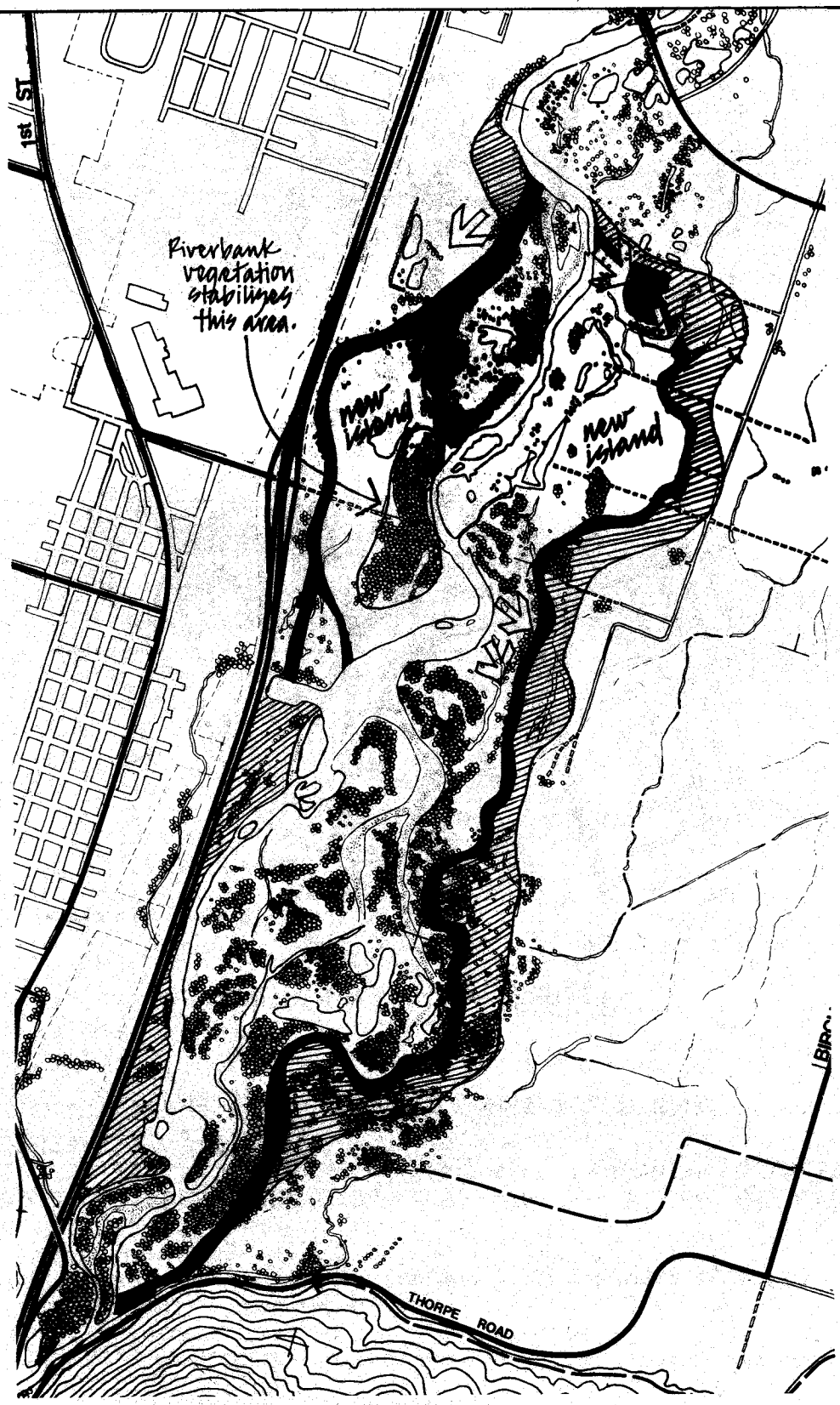

FIGURE 17c - UPPER & LOWER SOUTH RUNS

than at present, and this would cause it to lengthen itself and re-establish its present gradient and sinuousity. If this happens, the dikes will be further endangered as the river increases its rate of lateral shifting in an attempt to develop some curves in its channel. The greater the degree of confinement by dikes, the greater will be the intensity of this attack.

We have already shown that the river is capable of transporting rocks with intermediate diameters larger than 500 mm (20 inches) even in modest floods. The danger of dike failure would seem to be greatest in the southern part of the valley where the lateral activity of the river is greatest. The present dikes are in the north of the valley where, as we described earlier, the river appears to be cutting downwards rather than moving backwards and forwards across the floodplain. Great care should therefore be given to the location of any extensions of the dikes, and their probable effect upon the overall activity of the river should be considered before they are installed.

In Figure 16 we have indicated areas of relative stability and instability along the valley floor. The word "relative" should be stressed here, because all areas close to such a vigorous river with such weak bank materials could be threatened in a large flood.

Continued mining of gravel will reduce the area of relative stability unless the abandoned pits are protected adequately. In the past, this has not always been the case and the aerial photographs show several instances of major diversions of the channel when dikes around these pits have failed. The example shown in Figure 15 is the most recent and most serious. A similar large and potentially serious diversion is threatened at the site of the Central Pre-mix gravel pit north of the Moxee Bridge. The 80+ ft. deep pit is separated from the river channel by only a narrow dike and both the inside and outside faces of this embankment show signs of recent disturbance. The main current of the river heads straight towards this weakness in the dike. If a diversion were to occur at this site, the river could be drawn out of its present channel into a broad westerly loop whose effects could be damaging. This is only one example of a gravel pit which is threatened by invasion. Another one, 2000 feet south of the Moxee Bridge, is in the path of a rapidly migrating bend of the river. If the channel invades this pit, it will probably leave to the south and flow across agricultural land for several thousand feet before re-entering its present course. We have indicated the places where we see imminent danger of such diversions on Figures 17.

The Yakima River Regional Greenway

habitat & wildlife assessment

dr. dennis paulson

JONES & JONES
Environmental planners-Landscape architects
105 South Main Street Seattle, Washington

APPENDIX B

YAKIMA RIVER REGIONAL GREENWAY

HABITAT AND WILDLIFE ASSESSMENT

Dr. Dennis Paulson

HABITAT TYPES

In the proposed park region there are basically six habitat types--riparian woodland, fields, ponds, river, gravel bars and urban. These habitats grade into one another varyingly and in addition vary within themselves, but they are workable units nevertheless and are important divisions from the standpoint of wildlife.

Riparian Woodland

This habitat is extensive along the river and is characterized by stands of black cottonwood (Populus trichocarpa). It occurs on the more elevated sections that are not flooded by rain and only rarely and for short duration by the river itself. In mature stands the trees form a fairly complete canopy and reach 20 meters in height, and around the edges of these stands grow somewhat smaller and more scattered trees. In most parts of this woodland there is a lower story of smaller trees--willow (Salix amygdaloides), black locust* (Robinia pseudoacacia), box-elder* (Acer negundo) and Russian olive * (Eleagnus angustifolia) in addition to the small cottonwoods. Below these may be dense stands of shrubs--red-osier dogwood (Cornus stolonifera), hawthorn (Crataegus sp.), serviceberry (Amelanchier alnifolia), wild rose (Rosa woodsii) and snowberry (Symphoricarpus albus), many of them covered by clematis (Clematis ligusticifolia) vines. At the edges of the woodland many weedy herbs occur, including wormwood (Artemisia douglasiana), thistle* (Cirsium arvense) and mullein* (Verbascum thapsus). Doubtless a much greater diversity of herbaceous plants would be detected in a spring or summer visit.

This habitat is the most mature successional stage present in the area and should remain stable in spite of the somewhat transitory nature of the river banks; only prolonged flooding would kill the trees and shrubs.

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* non-native

Fields

Scattered among the patches of woodland and extending laterally away from the river are fields and pastures varying from very wet (flooded through the winter and spring) to dry (never flooded). Grazing occurs on most of them, as it does on the edge of the riparian woodland, and grasses and weedy forbs predominate, with considerable variation depending upon degree of inundation. This is an early-succession habitat, likely to remain in the same state because of grazing pressure. With the removal of grazing from the area succession would carry those fields with an adequate water supply through a shrub stage eventually to riparian woodland.

Ponds

Because of the past shifting of the channel of the Yakima River, a variety of oxbows are present in the composite stream channel, varying greatly in age and successional stage. In addition, ponds of varying extent and depth have been dug all along the river in this area for gravel or other purposes, and these will follow the same pattern of succession. The deeper and steeper-sided ponds support a relatively low diversity of plant and animal life but are capable of moderate productivity of a few aquatic species in short food chains. In contrast the shallower ponds support, actually or potentially, a much more diverse flora and fauna and should be capable of extremely high productivity that may occur in desert ponds, with highly mineralized soils and high summer temperatures. Both algae and higher plants may be abundant in ponds of these sorts, furnishing food and shelter for many types of aquatic invertebrates which are in turn eaten by fish and aquatic birds.

River

The river itself, where flowing strongly, has a coarse gravel bottom that furnishes shelter for populations of invertebrates that in turn are eaten by a variety of fishes. In more sheltered areas where silt and detritus can settle on the bottom other kinds of invertebrates live, and other types of fish can feed in these places. Most of the productivity of the river is based on plants, animals and detritus that fall into it rather than its own plant growth.

Gravel Bars

The shore of the river is largely gravel, as is characteristic of rivers with moderate to high gradients. Because the river has changed

course and fluctuates greatly in level over its annual cycle, some of the gravel bars are quite extensive and represent a potential habitat of greater extent than the usual river shore. After a major change in the river's course, gravel bars left behind are subject to succession, although this may proceed slowly because of the relatively poor substrate for plant growth that the gravel provides.

Urban

All of the habitats here are "disturbed" because of the nature of a river course, but those that are under direct and constant human influence are included in this category. The City of Yakima itself extends to the freeway, and a variety of types of human influence border the river itself, including roads, a dump, a sewage-treatment plant, a state park, a private campground, a store, a series of gravel pits, a dam and suburban homes. These are varyingly integrated into the natural habitats, the state park, for example, being largely riparian woodland and the gravel-pit area ecologically equivalent to the gravel bars of the river.

UNIQUENESS OF AREA

The Yakima River valley is one of the more important sites for riparian vegetation in Washington for several reasons. Almost anywhere along streams and rivers a characteristic riparian vegetation develops, but only in dry country, e.g., the Columbia basin in eastern Washington, is it of special significance as an island of high productivity and lushness in surroundings that are arid and comparatively unproductive. Even within the Columbia basin there is considerable variation in the extent of riparian woodland on different rivers. The flatter valleys, as that of the Yakima, are liable to develop more extensive stands of woodland because the river's water influences the soil to a greater distance from its course in a situation of lower relief. Steep-sided canyons, as characterize many of the tributaries of the Yakima coming out of the Cascades, may support no more than a thin fringe of vegetation along their streams. Even in flat areas, because of geological characteristics, rivers may erode their beds well below the surrounding land, thus steepening their immediate banks, lowering the ground water under the land adjacent to them, and precluding the growth of trees. This is the case on the Yakima River west of Richland, for example.

The bed of the Yakima southeast of the City of Yakima is similar to the area under discussion here, but relatively few other rivers in the state are. Many of them have one or more of the limitations mentioned above,

some of the smaller ones do not provide enough water to support very wide stands of woodland, and still others have been adversely affected by damming programs. The Yakima valley is of special significance from a biogeographic standpoint, in addition, as it is fairly far south in the state and supports therefore many plants and animals that are characteristic of the regions farther south. For example, a number of insects, reptiles, birds and mammals occur along the Yakima that do not extend as far north as the Wenatchee or Okanogan Rivers, both of which have stands of riparian woodland.

One of the most important contributions to the uniqueness of this area is its proximity to a sizable urban area, the City of Yakima. There is no doubt that a park setting becomes increasingly valuable with increased proximity to population centers, as its potential use goes up in direct proportion to this proximity. As Yakima itself lies in a desert setting (although made green by plantings), the lushness of the riparian situation is even more inviting, and easy accessibility to at least parts of it will encourage use by Yakima and Yakima County residents, as well as visitors from more distant points that seek it as an oasis. Similarly, the maintenance of extensive land in a natural state enhances the potential of a wilderness experience adjacent to the city.

WILDLIFE

Insects

While no survey of this group has been carried out in the area, the butterfly fauna of the Yakima River valley is well-known and interesting. Forty-two species of butterflies and skippers are thought to occur in the area, with another 17 species possible. These two categories totalled comprise a list of about half the butterflies and skippers that occur in Washington, a substantial list for a small area. As this group becomes more diverse with progression southward, it is not surprising that a site with southern affinities supports a diverse assemblage of species.

Of particular interest is the fritillary Boloria selene, found in Moxee Bog. The larvae of this species feed on the violet Viola nephrophylla, which occurs locally in wet places in Washington, but the butterfly is much scarcer than its host plant, being known from only a single additional locality in the state, near Oroville. As such it is noteworthy and in need of complete protection. This area provides excellent habitat for two additional species of butterflies that are generally rary in Washington and of interest to biologists--the monarch (Danaus plexippus) and its

mimic the viceroy (Limenitis archippus), the larvae of which feed on milkweed and willow respectively.

The clematis vines that are so abundant here produce nectar-rich flowers in the summer that are visited by an amazingly diverse and abundant assemblange of bees and wasps, and this is the most interesting part of the state from the standpoint of these groups of insects.

The diversity of fresh water life in the area is indicated by the fact that more species of dragonflies, typical fresh-water insects, have been found in Yakima County than in any other Washington county.

Fishes*

The river and ponds support a moderately diverse fish fauna, from small minnows and sculpins to the game species: steelhead, rainbow trout and whitefish. Less common introduced game species include brook trout, brown trout and bass, the latter especially numerous in the ponds. Freeway and Resthaven Lakes and a small pond near the Arboretum have been stocked; otherwise, fish populations are regulated naturally.

Amphibians

This group, more diverse in wet regions, is represented by few species in this area, perhaps only the long-toed salamander, Pacific treefrog and spotted frog, all of which are widespread in the state and all of which breed in ponds.

Reptiles

Reptiles increase in diversity with decreased latitude; thus southern portions of Washington support more diverse populations of reptiles, and the Yakima area is fairly rich in species. The painted turtle is common in areas of quiet water; western skinks, southern alligator lizards, rubber boas, ringneck snakes, racers, gopher snakes, two species of garter snakes and western rattlesnakes inhabit the river bottomland, some of them also the desert; and additional species of lizards and snakes can be found in the surrounding desert. The southern alligator lizard and ringneck snake reach their northern limit in Yakima County and are local in distribution; therefore they are special features of the area.

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* Game fauna of the Yakima River includes 28 native species and 10 exotic species (Patten et al, 1970)(Game Dept. comment).

Birds

The area supports a diverse avifauna, over 130 species having been recorded here by the Yakima Valley Audubon Society through 1975. With additional study more species will certainly be recorded. The bird list is a good cross-section of the species to be expected as residents or migrants in this habitat east of the Cascades, including a diversity of birds of prey, waterfowl and songbirds. Two songbirds are of particular interest--the bushtit and Bewick's wren. Both of these species are common throughout western Washington but are represented east of the Cascades by small, isolated populations in the Yakima area. They are characteristic of the riparian woodland and are very patchily distributed even in Yakima County. Waterfowl are abundant in the winter, and several species--Canada goose, mallard and wood duck--remain in small numbers to breed. A small great blue heron nesting colony is of special interest.

Mammals

The most important game mammal present in the area is the mule deer, common in parts of the riparian woodland. Fur-bearers include beaver, muskrat, mink, otter and raccoon, and a variety of medium-sized and small mammals occurs, including long-tail weasel, striped skunk, coyote, bobcat, Townsend ground squirrel, yellow pine chipmunk, porcupine, black-tailed jackrabbit and mountain cottontail. The shrew, bat and rodent fauna is largely unsampled but should be diverse.

VALUE TO WILDLIFE

The ponds and riparian woodland are of special value for wildlife, as is usually the case in a desert or semi-desert situation in which both the water and extensive shelter are vital to the survival of many species. Not only are there species typical of and exclusive to the woodland and ponds, characteristic of wetter regions, but the desert species visit the waterside as well.

The ponds, flooded fields and old river channels furnish excellent waterfowl habitat, which has been recognized in the setting aside of the Moxee Game Reserve. This 933-acre reserve, encompassing much but not all of the important waterfowl habitat in the area, holds up to 40,000 ducks during migration and winter, some of which roam into other parts of the Yakima valley where they are accessible to hunters. Some of the fields remain flooded throughout the year and provide nesting areas for waterfowl as well as permanent habitat for a wide variety of marsh plants

and animals. In those ponds that dry up annually a special assemblage of plants and invertebrates flourishes, one that is attractive as food to many visiting animals. Even the river and the larger, less productive ponds serve as resting sites for migratory waterfowl and water sources for any animal that includes them in its home range. Certain fish-eating birds--herons, mergansers and kingfishers--also get food from these bodies of water. And of course the river is of special importance to sportsmen because of its game fish.

An observer is struck by the abundance and diversity of life upon entering a riparian situation from the surrounding desert, and the first impression is correct. The deep, rich soil and ground water along the watercourse together with the high summer temperatures furnish an environment very favorable for plant growth, and this high productivity is expressed up the food chain through insects and small vertebrates to large vertebrates. The abundance of both food and shelter in the Yakima River bottomlands guarantees this abundance of wildlife as long as the patches of habitat are extensive enough to support populations of larger animals, which, with their large home ranges, need large stands of favorable habitat. The larger cottonwood trees provide nesting sites for large birds of prey and herons, and standing dead trees are utilized by a great variety of hole-nesting birds.

The fields that are not flooded are used by a variety of open-country birds, some of which occur only in this habitat in the area, and therefore they are not inconsequential in contributing to the diversity of the area, but they are much less significant than the woodland and wet areas. Likewise, the gravel bars*furnish nesting habitat for a few species of shorebirds, also typical of river banks, and additional species can be found in the more disturbed situations. Thus the mosaic of different habitats supports the greatest diversity of wildlife, as long as the patches of each habitat are large enough to support its characteristic species.

RELATIVE VALUE OF DIFFERENT RIVER UNITS

The thirteen river units can be distinguished on the basis of their value to wildlife. I have designated the value of each unit depending on the relative proportions of the habitat types and the amount of human-caused disturbance in each. The habitats are ranked as high, medium or low depending on the relative proportions of riparian woodland and ponds (most important), fields and river (less so), and gravel bars and urban (least important). The disturbance levels are ranked as high, medium or low on the basis of physical alterations to the landscape and intensity of human use.

* "Washington has found that gravel bars have significant importance to a wide variety of wildlife as brood feeding and resting areas for waterfowl. Spring flooding annually causes large numbers of seeds to be trapped and deposited on gravel bars, making these high areas for fledgling doves and other species" (Game Dept. comment).

TABLE 1

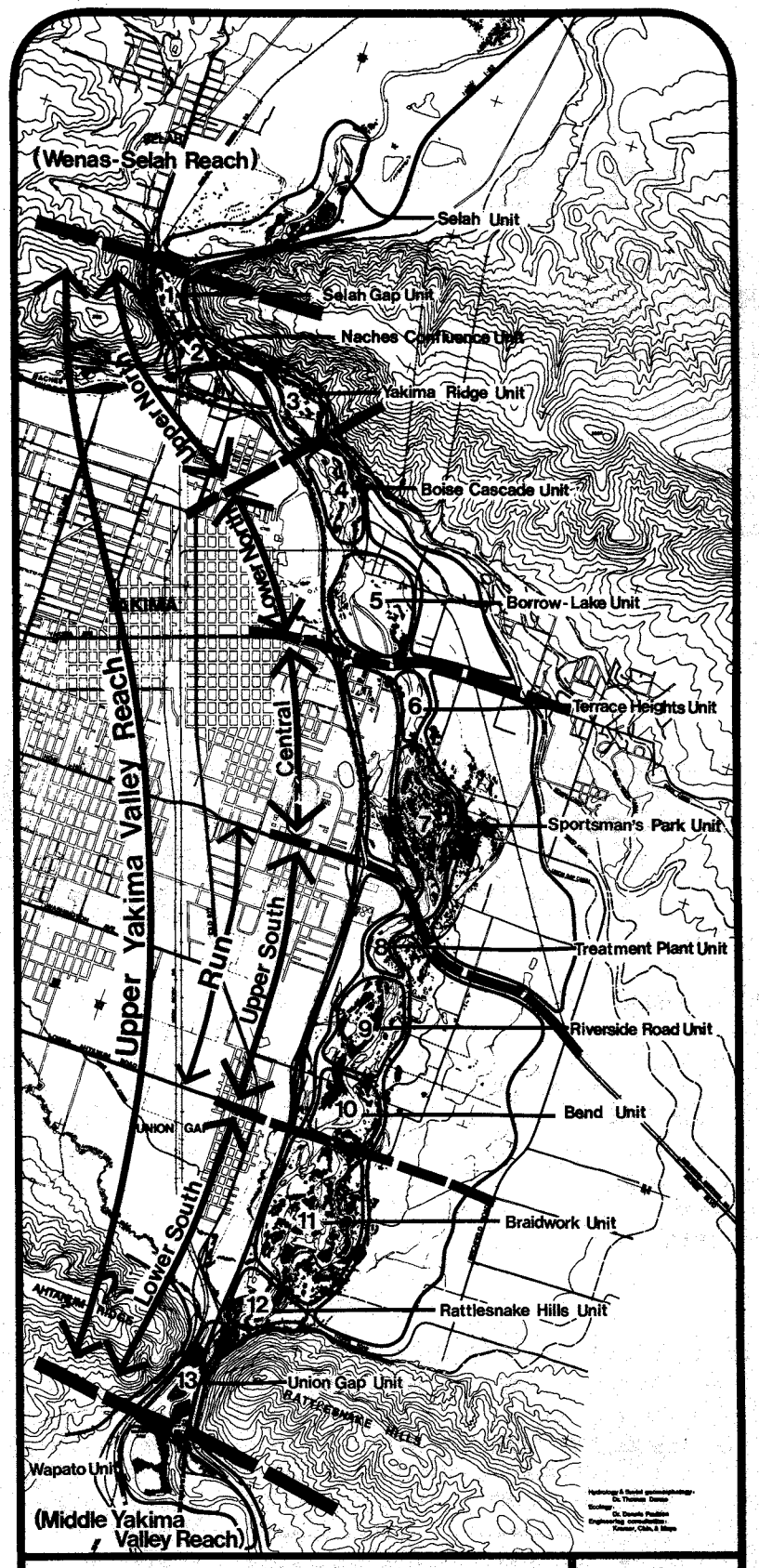
VALUE FOR WILDLIFE OF RIVER-REACH UNITS

Unit No.	Name	Value	Habitat Value	Level of Disturbance	
1	Selah Gap	L	M	H	(roads)
2	Naches Confluence	L	M	H	(roads, fishing)
3	Yakima Ridge	M	M	M	(lake, fishing)
4	Boise-Cascade	M	M	L	
5	Borrow Lake	L	L	M	(gravel pits, fishing)
6	Terrace Heights	L	L	M	(gravel pits, fishing)
7	Sportsman's Park	(VH)	H	L	
8	Treatment Plant	M	M	M	(treatment plan, campground)
9	Riverside Road	(VH)	H	L	
10	Bend	(VH)	H	L	
11	Braidwork	(VH)	H	L	
12	Rattlesnake Hills	(VH)	H	L	
13	Union Gap	M	H	H	(roads, fishing)

KEY: (VH) - very high
H - high
M - medium
L - low
VL - very low

Disturbance	Habitat H	Habitat M	Habitat L
L	VH	M	L
M	H	M	L
H	M	L	VL

Table for Determining Overall Value.



Reach Structure

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TABLE 2

RELATIONSHIP OF RIVER-REACH SECTIONS TO LAND ADJACENT TO THEM

West Boundary	Unit No./Overall Value		East Boundary
desert	((1	L))	desert
desert, freeway	((2	L))	desert
desert, freeway	((3	M))	desert
desert, freeway	((4	M)	desert, farmland
desert, freeway	((5	L***	farmland
concrete plant	((6	L*	suburban housing
gravel pits, arboretum	(7	VH*	state park
sewage treatment plant	*8	M***	woodland
farmland	***9	VH***	farmland
freeway	((10	VH***	farmland, marsh
freeway	((11	VH***	farmland, marsh
freeway	((12	VH***	farmland, marsh
desert	((13	M))	desert

KEY: ((- unfavorable
(- part favorable, part unfavorable (ambivalent)
* - semi-favorable
*** - favorable

Wildlife Value: L - low
M - moderate
VH - very high

It can be seen that there is some clumping of units along the river into more or less valuable regions. Clearly units 9-12 constitute a focal area for considerations about wildlife as a special resource, and unit 7 is also highly significant. Units 9-12 are not only each intrinsically valuable, but their proximity allows larger birds and mammals, which by virtue of their large home ranges need larger patches of habitat, to exist. If the woodland/pond areas were fragmented into smaller patches, some of the animals that now live in the area could not persist, as they do not do so in some of the upriver units that are much less extensive and continuous.

In addition, the parts of the valley adjacent to these units were examined with regards to their value and how it affects the importance of the units themselves. Although these areas are assessed independently of the river units, it can be seen that there is fortunate coincidence of high-value river units and high-value bordering environments. Most units are bounded by the freeway and/or desert on their west sides (and those that are not immediately so bounded are not very far from the freeway and the city itself), but units 5-12, which include all the high-value units along the river, have favorable or semi-favorable habitat adjacent to their eastern boundaries.

RECOMMENDATIONS

1. The area most valuable to wildlife, units 9-12 and the valley adjacent to them, should be assigned the status of a natural reserve, with all habitats and wildlife protected. Parts of this area are adjacent to the Moxee Game Reserve, which will effectively increase the extent of continuous wildlife habitat. The emphasis on these four contiguous units will be adequate to preserve a large enough patch of habitat for even the largest animals that use the area. This area should be one of minimum development*, as parts of it are now fairly readily accessible to those who want a nature experience, and all of it is accessible to serious hikers willing to walk through brush and wade shallow ponds and streams.

2. Unit 7, adjacent to Yakima Sportsman State Park, is equally valuable to wildlife and should be preserved in the same way. As it is adjacent to a fairly high-use area, it should be further developed as a nature-interpretation area, with marked trails and viewpoints within the woodland. Increased use of the island will lower its value for larger animals but not for smaller ones, and the area south of Moxee Boulevard should be adequate for the larger species.

* Any significant increase in human use could be detrimental to the natural concept (Game Dept. comment).

3. Development of any sort for active recreation should be restricted to the area north of Moxee Boulevard, where much of the more valuable wildlife habitat is lacking or disturbed, and strong consideration should be given to limiting it to the units north of unit 7.

4. Any development incompatible with a park (industry, commercial, housing) should be prohibited, and attempts should be made to exclude such areas that already exist between the river and the freeway.

5. Hunting or disturbing of wildlife and plants should be prohibited within the river units, even those developed for active recreation, as these disturbances are incompatible with a park concept, and shooting of course is incompatible with high-intensity human use.*

6. As the shifting of the river bed is of great interest from the standpoint of hydrological/ecological studies, no attempt should be made to control or channelize the river unless it directly threatens human lives, livestock or property by potential changes. A sound system of levees should be adequate for control, and they should be distant enough from the river so that the riparian woodland and park facilities are not flooded too deeply by their containment of flood waters.

7. Two places of special biological value, the Moxee Bog Nature Conservancy site and the heronry, should remain undisturbed and unpublicized, as they are both fragile and liable to irreversible disturbance by too many human visitors.

8. Whenever possible dead trees should be left standing, in order to provide nest sites for a variety of birds.

9. For the most part there should be no necessity of wildlife management, but the effects of beaver populations on the riparian woodland should be monitored and the populations reduced only if there is conclusive evidence that the beavers are destroying the woodland at a rate faster than its regeneration.

10. Enhancement of habitats for wildlife should likewise be unnecessary, as the bottomland is so productive, but special projects may be justified, as for example the provision of nest boxes for wood ducks or other hole-nesters or platforms for marsh-nesting birds.

* This should be a management decision made by the managing agency (Game Dept. comment).

APPENDIX B-1. GAME DEPARTMENT REPORT

The following is a transcript of a letter submitted to the Environmental Resources Section of the Army Corps of Engineers in August, 1973. It outlines the natural value of the area from Moxee Bridge to Union Gap which includes the Riverside Conservation Area (Block 5) and the Riverside Natural Area (Blocks 6 and 7).

IMPORTANCE OF THIS AREA TO WILDLIFE

The deep, rich soil found along the Yakima River bottom between the Moxee bridge and Union Gap and other bottomland watercourses produces shrubs, grasses, seeds and insects in greater abundance and nutrition than anywhere else. These alluvial lands are life-producing for young and life-sustaining for adult birds. The range of upland birds is keyed to a water supply but the watercourse provides something more than drinking water for here are produced the large cottonwoods that provide nesting habitat for Great Blue Heron rookeries and hollows for wood ducks and here, also, are produced the willows, dogwood, serviceberry, clemantis, hawthorn and current utilized by countless species of wildlife for food and cover.

As the extent of bottomland gets smaller it assumes a greater relative importance. The popular concept is that of a continuous upland bird range but, in fact, there are many islands or voids within the range that do not support birds, however, there is rarely an undisturbed streambank area in Washington that does not sustain upland bird life. Any disturbance in that area that would affect the marshes and swamps or alter the flows of the ditches and channels would have a resultant proportional affect on the wildlife and the food chain that supports it.

In any key ecological area, the relationship between nature and the land that supports it lies in a very delicate balance. Young Mallard ducklings are very dependent upon mosquito larvae for their food source during their first few weeks. Therefore, alterations that affects mosquito propagation directly affects the local mallard population. Also adjacent to the reserve is a small patch of vegetation which attracts a certain rare butterfly. This area has been established as a nature site for perpetual observation by outdoor enthusiasts. Should the relationship between that insect and its environment be altered, however slightly, the value of that area may be lost forever.

The natural fertility of the alluvial flood plain of the Yakima River provides the essential base of algae, mosses, lichens, grasses, herbs,

shrubs and trees upon which over 180 species of birds, mammals, reptiles and amphibians are highly dependent.

WATERFOWL, UPLAND AND MIGRATORY BIRDS

The riparian habitat along this stretch of the river is heavily utilized by many species of birds, as a nesting, brooding or wintering area. This habitat provides important cover and food in addition to the availability of water. Mallard, Wood Duck and the Greater Canadian Goose hatch and rear their young in this area. Other waterfowl using the area are Bluewing, Greenwing and Cinnamon Teal, Gadwall, Pintail, Widgeon, Shoveler, Coot, Mergansers and Whistling Swan. The Pied-billed Grebe and Great Blue Heron are frequent and common users of the shorelines in the area. In fact, a large heron rookery is located in the cottonwood trees growing in the bottom along the side channels. As many as 40 herons have been observed at one time at the rookery.

The area also supports a very high population of Chinese Pheasant, Valley Quail and the migratory Mourning Dove and Wilson Snipe. In addition to the above birds, Sore Rails, Phalarope, Avocet, Curlew, Kingfishers and Yellow-headed blackbirds have been observed in the area. Redtail, Marsh, Coopers and Sparrow hawks include the area within their territory for both hunting and nesting. Chukar inhabit the lower, rocky slopes above the valley but depend upon the brushy watercourse for insects and water source in summer and protective cover and food during extreme winters. The dependency of wildlife on river edge-riparian habitat has been well documented in Washington (Wendell Oliver, Wells Dam Project Studies).

The 933 acre Moxee Reserve is situated along the river bottom in Union Gap. This reserve, established in 1952, holds up to 40,000 ducks and is effective in holding populations that provide flights of ducks into the Moxee, Wenas and Ahtanum areas during hunting seasons.

There are, of course, many non-game species of birds (more than 133 species identified) dependent upon the habitat along the river for their existence in that area, all of which are gaining increasing importance to those interested in conserving our wildlife resource.

Waterfowl feel upon a variety of aquatic vegetation such as the fronds, stems and roots of smartweed, pond weed, duck week, and bulrushes and animal matter such as insects, mollusks, crustacians and small fish. Pheasants feed on cereal grains, weed seeds and grasses while quail, which prefer the thick brushy areas along streambanks, are especially

fond of wild rose hips. Chukar prefer grasses and insects while Snipe are worm and insect eaters. Herons wade the shallows along the river and its side channels looking for small fish and other aquatic organisms.

FURBEARERS

Most of the major species of furbearers of the state are found in the area between the Moxee bridge and Union Gap along the Yakima River and its side channels. These include beaver, muskrat, mink, raccoon, nutria and otter. Food includes leaves and bark of willow and poplar, roots and steams of pond lily, pond weeds, cattail and fish and crustacians.

BIG GAME

Riparian habitat is a rich source of food and cover for deer which are commonly observed along the river bottom in the Union Gap area. They eat a large variety of grasses, herbs, shrubs and deciduous trees, including aspen, willow, Red Osier Dogwood, and serviceberry. Again, there are many smaller mammals that find streambank habitat essential for food, cover or water. High populations of coyote, cottontail, rabbits, weasel and skunk exist in the area along with lesser populations of fox, bobcat, porcupine, chipmunk and ground squirrels.

REPTILES AND AMPHIBIANS

Western Painted Turtles are quite common in the area. Others associated with wet areas are Northern Alligator Lizard, Western Skink, Rubber Boa, Ringneck snake, sharptail snake, Garter snake, Long-toed Salamander, Pacific Giant Salamander, Rough-skinned Newt, Spotted frog, Bullfrog, Pacific tree frog, tailed frog and Northwestern toad.

RARE AND ENDANGERED SPECIES

The Bald Eagle and Osprey, both of which feed upon fish, are rare and endangered species that include the area within their range.

Having an area so rich in cover and food and available water and supporting such a high and varied population of wildlife in such close proximity to the Yakima metropolitan area is a great natural asset to not only people in the local communities but also those who travel great distances to see such a unique area. It would indeed be not only a serious loss but also a poor reflection upon the people of the state if this area were altered in any way that would cause the loss of any of the wildlife established thereon.

Gaylin Woodard, Game Biologist
Washington State Game Department

APPENDIX C. FREEWAY PARK ENDORSERS

In late 1969, the Greater Yakima Chamber of Commerce successfully solicited over 80 endorsements for a "Regional Freeway Park, extending from Selah Gap to Union Gap. The endorsers are listed below, alphabetically, and are keyed as follows:

1 General Support
With Special Use Interest:
1a Recreational Use Facilities
1b Natural Area Preservation
1c Aesthetic Concern
1d Funding Source Concern
1e Safety Concern

2 No Endorsement Policy

* 1975 Endorsements

** 1975 and 1970 Endorsements

(All others are endorsements from early 1970).

Special comments of the respondents are also included.

In connection with these endorsements, the Greater Yakima Chamber of Commerce proposed the following resolution which stresses touristic value:

> *The Board of Directors of the Greater Yakima Chamber of Commerce request that Yakima County and the City of Yakima join together for the purpose of proposing an acquisition and development program with the State of Washington for the creation of a Regional Freeway Park.*
>
> *This development would be an asset, not only to the residents locally, but to tourists, as well.*
>
> *The location of this Park will be extremely important as it lies adjacent to the Freeway which carries traffic from both Chinook Pass and White Pass, as well as North and South bound travelers through the State on the East side of the Cascades.*
>
> *(September, 1969)*

It was not until five years later, under the workings of the "Freeway Park Advisory Committee", that a large, gap-to-gap park was proposed to the Yakima City Council and the Yakima County Commissioners (in July of 1975):

> *The area included in this recommendation includes land on both sides of the Yakima River from Selah Gap to Union Gap and encompasses all of the land between the freeway and the Yakima River and some land east thereof. It will cover approximately 2,500 acres of land.*

1 Altrusa Club of Yakima
1 American Association of Retired Persons, Inc.
1 *American Association of University Women
1 American Legion Auxiliary - Logan Wheeler Unit #36 (recreation area for city).
1c Auxiliary to Veterans of World War I, Barracks #157
1 Association of Northwest Steelheaders
1 Beta Sigma Phi - Preceptor Zeta Chapter ("...an asset to local residents as well as tourists...").
1 Big Sisters of Yakima (convenient stopping place for visitors).
1a Boy Scouts of America (in-town group camping)("a 500-acre park... is becoming not a desire, but a necessity for our community).
1 Central Area Square Dance Council
1 Central Washington State College
1d Chinook Business and Professional Women's Club
1 Christian Women's Fellowship of First Christian Church
1 Daughters of the Pioneers of Washington
1 Demosthenes Toastmasters Club 972
1a,c Ellensburg-Yakima Interstate 82 Association (recreation view park).
1 Eight and Forty
1 Fruitvale Grange #348
Garden Dept. of the Women's Century Club ("greatly improve the impression of those traveling through our city").
1c Gyro Club of Yakima ("...definite asset for the community...").
Isabella Rebakah Lodge No. 23, IOOF
1 Jeeping Nomads
1 **Junior Aid of Yakima
1 *Kiwanis Club
1a,d *Kiwanis Club of West Valley (no new taxes)(picnic areas; all ages) (a Safeguard against undesirable private development).
1a Larson Park Tennis Club (tennis).
1 Veterans of Foreign Wars (enhancing further growth and health of Yakima's economy).
1b,c *League of Women Voters of Yakima ("beautify an area grossly subjected to neglect and man-made blight").
1 Office of the Mayor - City of Yakima
2 P.E.O. Sisterhood
1 Phi Sigma Alpha

1 Rosalma Garden Club
1 Selah Heights Grange Auxiliary
1 Soroptimist Club
1 Sorosis Juniors Federated Women's Club
1c Terrace Heights Garden Club
1 Terrace Heights Lions Club
1 Terrace Heights Women's Club
The Woman's Century Club
1 Washington State Nurses Association, District #6
1 Washington State Parks & Recreation Commission
1 Washington State Senate
1 Washington State House of Representatives
1a West Valley Lions (facility for the aged).
1e White Iris Garden Club
1 William Wharton Post No. 379 - Veterans of Foreign Wars
1 Women's Auxiliary to the Typographical Union #614
1c *Women's Century Club Juniors
1a *Yakima Area Arboretum (support for arboretum).
1 Yakima Chamber of Commerce ("...preservation of areas like these is of the highest priority").
1 Yakima Chapter of the Northwest Steelheaders
1 Yakima Council of Churches
1 Yakima County - Board of County Commissioners
1 Yakima County Democratic Central
1 Yakima County Men's Republican Club
1a Yakima District Licensed Practical Nurse's Association ("We feel this would serve a dual purpose of a recreational area for our residents, neighbors, friends, and tourists, and also help to beautify the approach to the city").
1 Yakima Democratic Club
1 Yakima Democratic Women's Club
1c Yakima Education Association
1 Yakima Engineers Club
1 Yakima Garden Club
1a,c Yakima Horseshoe Club
1 Yakima Jaycees
1a,c Yakima Junior Programs
1 Yakima Lions Club
1 Yakima Lodge No. 318 (Elks)
1 Yakima Men's Garden Club (pledge of support).
1 Yakima Valley Mountaineers
1 Yakima Pine Products ("a failure to protect this area while we still can would be tragic").
1 Yakima Ridgerunners (improve appearance to passers-by; summer/winter recreation).
1a Yakima Rotary Club (youth development facilities).
1a Yakima Softball Assn. (4-diamond slow-pitch softball)
1b Yakima Valley Audubon Society
1a,b** Yakima Valley Council of Camp Fire Girls, Inc. (camping skills area, outdoor education, day camp)(Nature study).

1 Yakima Valley Growers-Shippers Association (value to tourists).
1 Yakima Valley Kennel Club, Inc.
1 *Yakima Valley Life Underwriters
1a,e Yakima Valley Museum & Historical Association (Picnic areas, *boating areas, *preservation, protect from undesirable commercial uses)).
1c Yakima Women's Club ("give tourists a favorable impression").
2 YMCA
1 *Young Ladies Institute - Yakima Institute #96
1a YWCA (will work on trails, bridges, picnic areas)(similar to Camp Fire Girls)

APPENDIX D. ACQUISITIONS AND PRIORITIES

NEED FOR FURTHER INVESTIGATION

The directing agencies have been given a detailed breakdown of proposed Greenway acquisitions. However, due to unclearness in the County Assessor's maps, and our inability to relate property lines to natural features, we suggest that the County and City Planning Departments cooperate to produce clear air-photo-based ownership maps for future reference.

If land owners have questions about the Greenway proposals, they should contact either Mr. William Hutsinpiller (Director, Parks and Recreation Department) or Mr. Warren Sutliff (Director of the County Planning Department) for further information.

LAND VALUE

The block values shown are based on assessed valuation, not actual sale price. These values are therefore very questionable, though they do serve to give a first-pass indication of land cost. Also, it must be borne in mind that fee-simple acquisition will not always be necessary.

The value of most Greenway land ranges from $100/acre to $500/acre. Commercially-valuable properties (especially those near the freeway interchanges and cross-river roads) are much more costly, as are developed properties.

ACQUISITION OF RESIDENCES AND FARMLAND

Riverside lands are generally unsettled or sparsely settled. We suggest that willing sellers be approached first, and that occupied residences not be sought unless they are crucial to recreational use (the upper Riverside Park area is the largest "settled" area purposed for acquisition). Conservation easements should be purchased for developed lands not acquired, and for farmland.

> *Actively farmed land should not be withdrawn from agricultural use. Conservation easements are often the best approach to farmland, where the object is to guarantee perpetual agricultural use, preventing residential/commercial development.*

LANDS RECOMMENDED FOR CONSERVATION EASEMENTS OR FEE-SIMPLE PURCHASE

BLOCK 1. "RESTHAVEN NATURAL AREA"

(lands north of the Moxee Branch rail crossing)

Location of Land	Acres	Value*	Comments
Section 12, T13N R18E	3.5	$ 1,300	
Section 7, T13N R19E	70.2	$17,370	Roughly 50% Boise-Cascade lands.
	30±	(?)	"Unowned" river bed.
Section 18(part), T13N R14E	63.7	$40,220	50% Boise-Cascade lands.
Section 17(part), T13N R19E	14.5	$ 8,630	
Subtotal, "Resthaven Natural Area"(Block 1)	181.9	$67,620	

* * * * * * * * * * * *

BLOCK 2, "ROZA CONSERVATION AREA"

(land between the Terrace Heights Road and the Moxee Branch rail crossing)

Section 18(part), T13N R19E	25.3	$25,300	Boise-Cascade land. Value assumed.
Section 17, T13N R19E	102.5	$76,230	Includes un-diked sub-divided land (15th St.. 16th St., H St., etc.).
Section 20(part), T13N R19E	22.6	$90,365	Includes high-value "commercial" lands, as above.
Subtotal, "Roza Conservation Area" (Block 2)	150.4	$191,895	Of this, about 25% is the cost of the subdivided property in Section 17.

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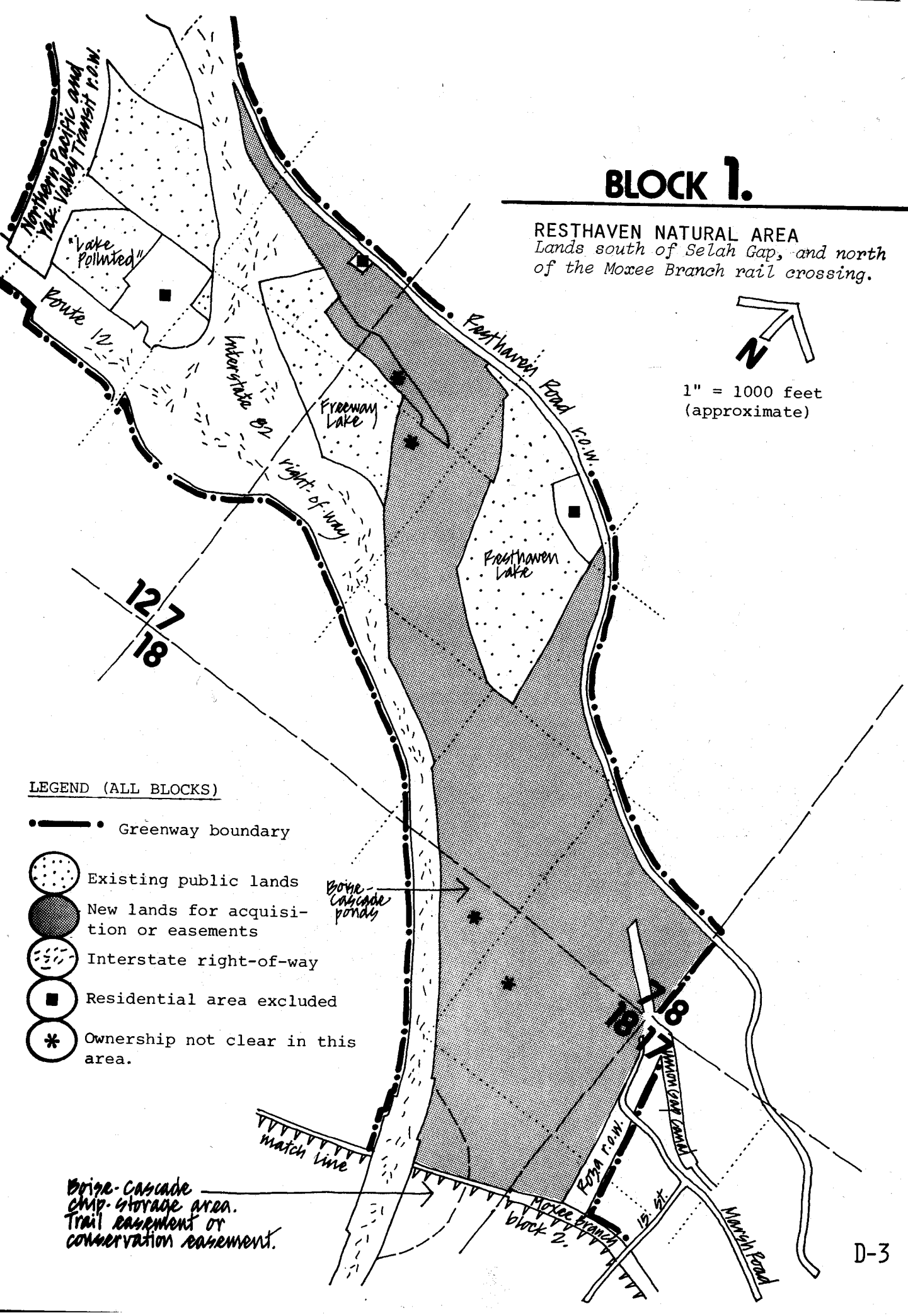
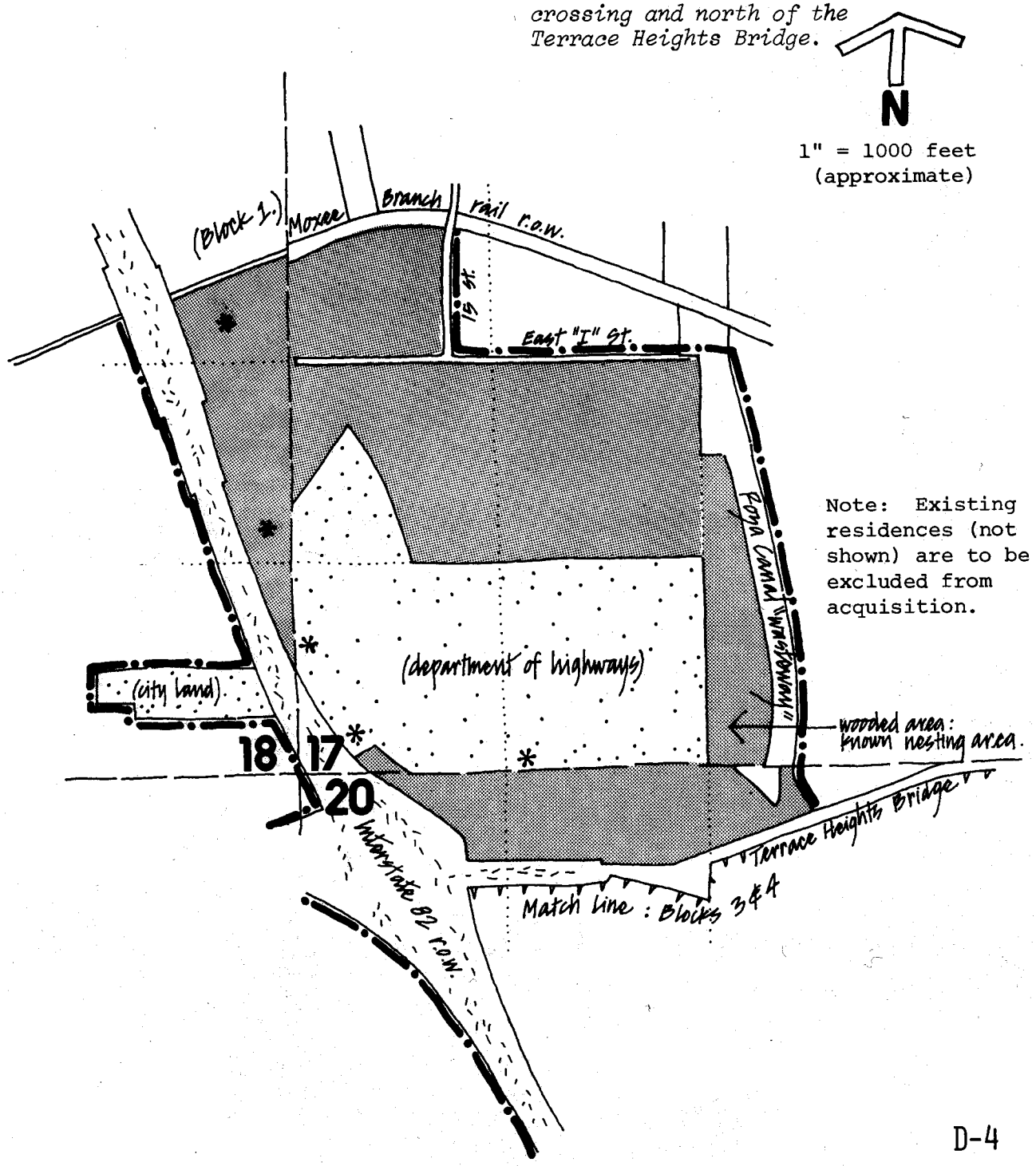
* See preceding explanation of cost and value.


BLOCK 1.
RESTHAVEN NATURAL AREA
Lands south of Selah Gap, and north of the Moxee Branch rail crossing.
N
1" = 1000 feet (approximate)
Northern Pacific and Yak. Valley Transit r.o.w.
"Lake Polluted"
Route 12
Interstate 82
right-of-way
Freeway Lake
Resthaven Road r.o.w.
Resthaven Lake
12
7
18
LEGEND (ALL BLOCKS)
Greenway boundary
Existing public lands
New lands for acquisition or easements
Interstate right-of-way
Residential area excluded
Ownership not clear in this area.
Boise-Cascade ponds
match line
Boise-Cascade chip-storage area. Trail easement or conservation easement.
block 2.
Moxee branch
Rosa r.o.w.
15th st.
Union Gap Canal
Marsh Road
18
17
D-3

BLOCK 2.

ROZA CONSERVATION AREA
Lands south of the Moxee Branch rail crossing and north of the Terrace Heights Bridge.



Yakima River Regional Greenway
June 1976 ... Source: Yakima County land records.

BLOCK 3, "RIVERSIDE PARK"

(land between the two bridges, on the west side of the river)

Location of Land	Acres	Value*	Comments
Section 20, T13N R19E			
a. River-margin properties	137.3	$ 89,630	Includes the 68 acre "Park Lake" property.
b. Parcels off the Terrace Heights road.	18.1	$195,180	Includes some extremely costly commercial property (eg. Standard Oil ownership).
c. Large interior parcels	22.5	$ 29,600	
d. Small interior parcels	19.0	$ 58,450	These require further in-depth investigation.
Section 29, T13N R19E	7.1	$ 3,560	(Part of the "Park Lake" Land)
Subtotal, "Riverside Park" lands (Block 3)	204.0	$376,420	Over half this cost is represented by the high-value Terrace Heights road properties.

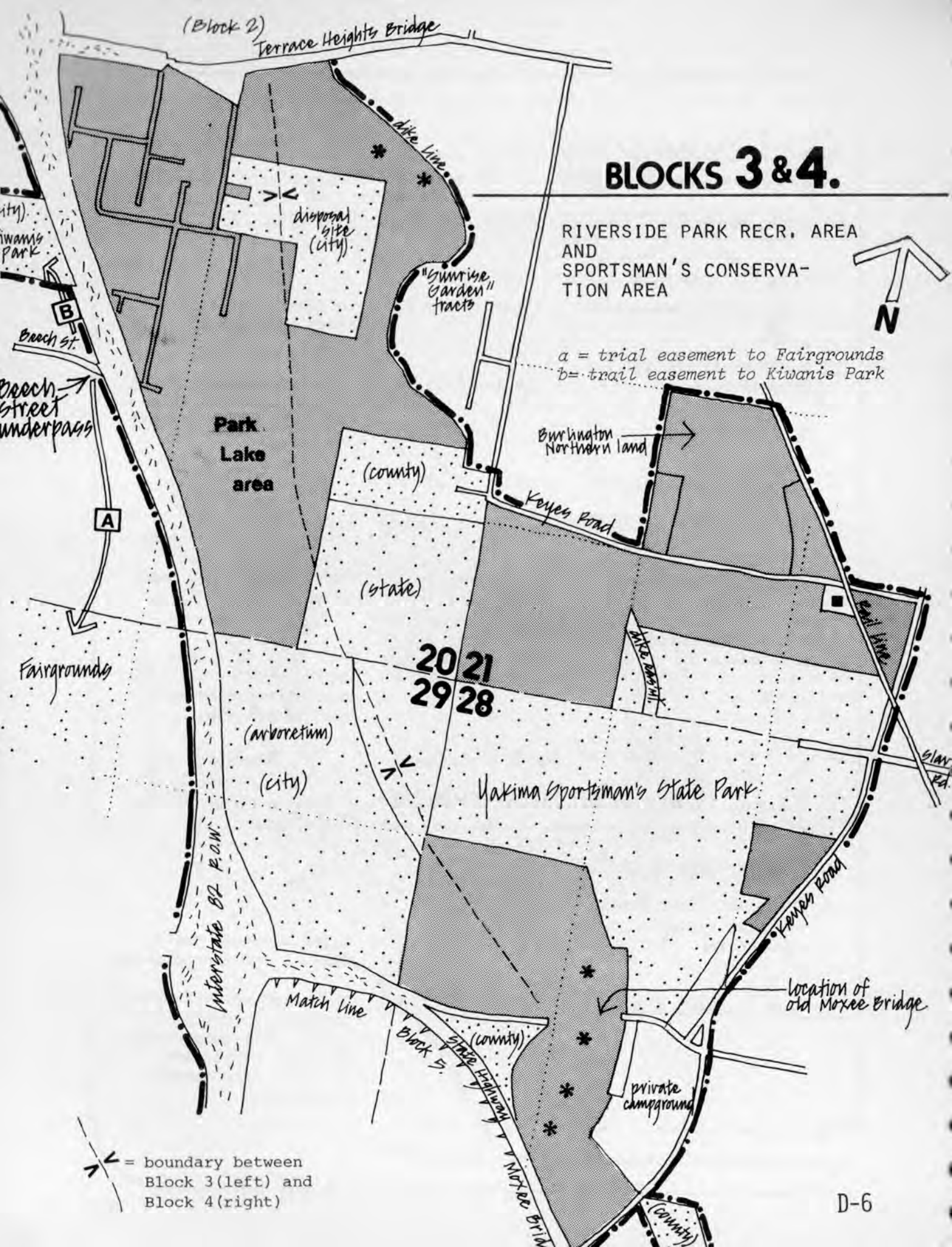
* * * * * * * * * * * * * * * * * *

BLOCK 4, "SPORTSMAN'S CONSERVATION AREA"

(land between the two bridges, on the east side of the river)

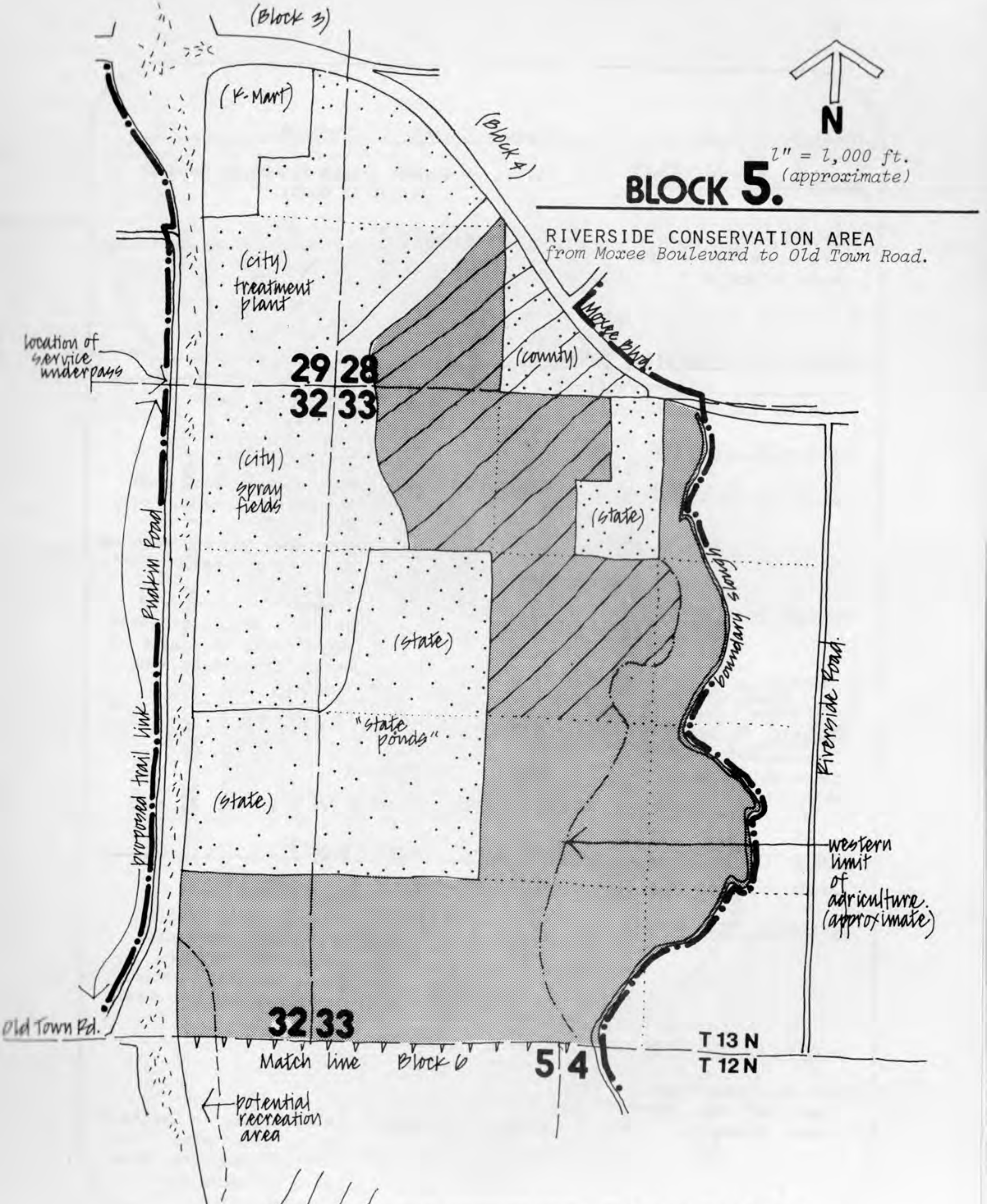
Section 20, T13N R19E			
a. "Sunrise Garden Tracts", portions westward of the river dike	25.0	$ 12,500	Value assumed. Their land is not developable.
Section 21, T13N R19E	110.3	$ 85,010	This area needs further in-depth investigation, values vary considerably. Includes Burlington Northern land north of State Park.

*See preceding explanation of cost and value.


(Block 2)
Terrace Heights Bridge
dike line
disposal site (city)
"Sunrise Garden" tracts
Park Lake area
Beech St.
Beech Street underpass
A
B
Fairgrounds
(county)
(state)
Burlington Northern land
Keyes Road
20 21
29 28
(arboretum)
(city)
Yakima Sportsman's State Park
Interstate 82 R.O.W.
Match Line
Block 5
State Highway
(county)
location of old Moxee Bridge
private campground
Moxee Brid
(county)
BLOCKS 3 & 4.
RIVERSIDE PARK RECR. AREA AND SPORTSMAN'S CONSERVATION AREA
N
a = trial easement to Fairgrounds
b = trail easement to Kiwanis Park
= boundary between Block 3(left) and Block 4(right)

BLOCK 5.

RIVERSIDE CONSERVATION AREA
from Moxee Boulevard to Old Town Road.



= area proposed for Natural Studies Center and Group Camp.

Location of Land	Acres	Value*	Comments
Section 38, T13N R19E	17.7	$ 26,240	Some flood-way land is in doubt.
Subtotal, "Sportsman's Park Conservation Area" lands (Block 4)	153.0	$123,750	

* * * * * * * * * * * * * * * * * *

BLOCK 5, "RIVERSIDE CONSERVATION AREA"

(lands south of the Moxee Bridge and north of "Old Town Road"). (Includes sites for the "Natural Studies Center" and "Riverside Group Camp").

Section 28, T13N R19E	11.0	$ 550	
Section 33, T13N R19E	250.7	$139,010	Much of this land need not be acquired in Fee-simple. Conservation easements are recommended for actively farmed land.
Section 32, T13N R19E	33.0	$131,000	"Commercial" property proposed for development. Flood-prone land east of Spring Creek should be acquired.
Subtotal, "Riverside Conservation Area" lands (Block 5)	294.7	$270,560	

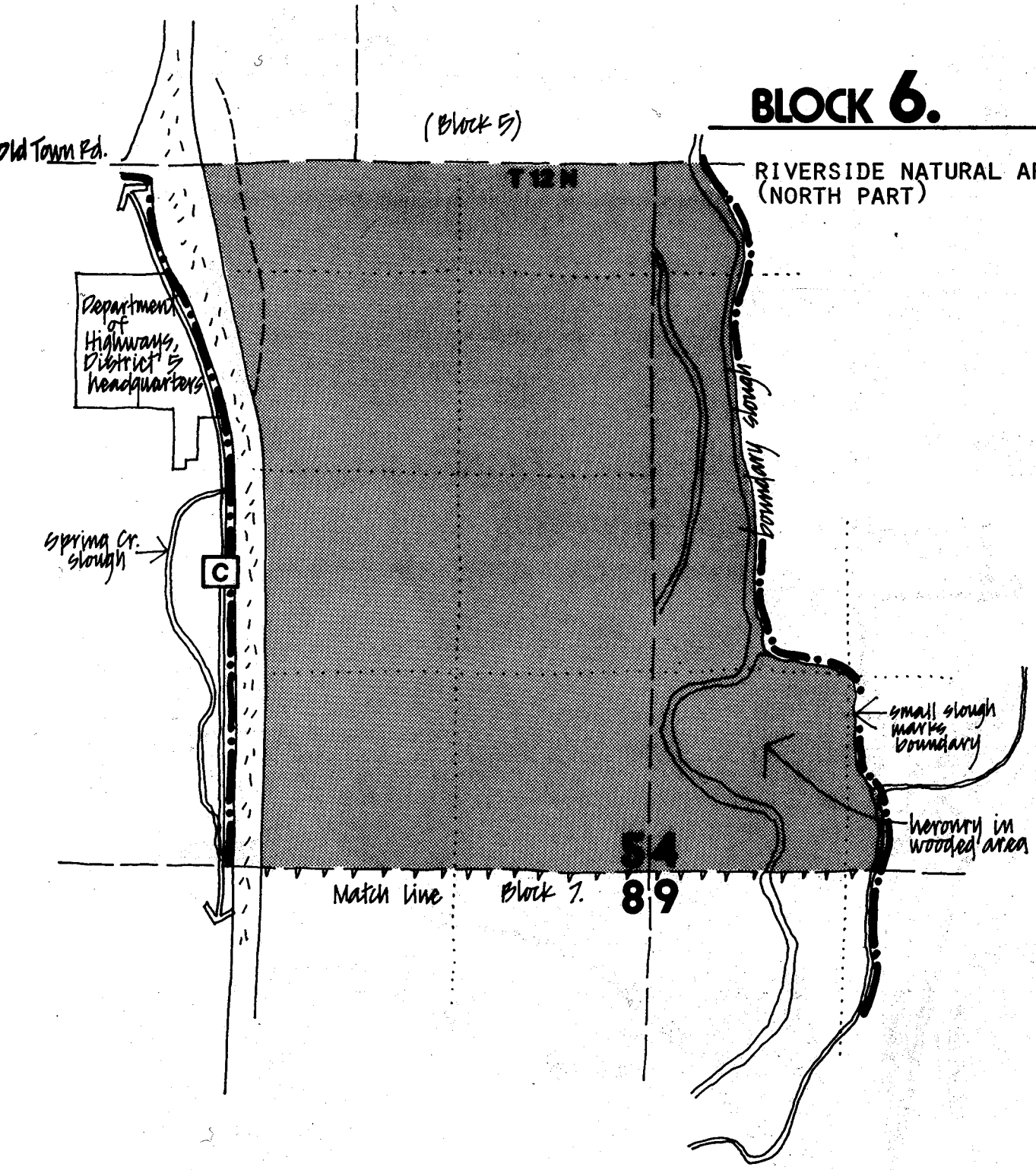
* * * * * * * * * * * * * * * * * *

BLOCK 6, "RIVERSIDE NATURAL AREA" (NORTH PART)

(lands south of "Old Town Road" in Sections 4 and 5, T12N R19E)

Section 5, T12N R19E	288.6	$214,370	This includes several high-value commercial properties near the Union Gap interchange; easements are indicated.
Section 4, T12N R19E	86.2	$ 21,550	
Subtotal, Riverside Natural Area", North Part (Block 6)	374.8	$235,920	Value figure is inflated due to high-value "commercial" property. Low-value flooding land predominates.

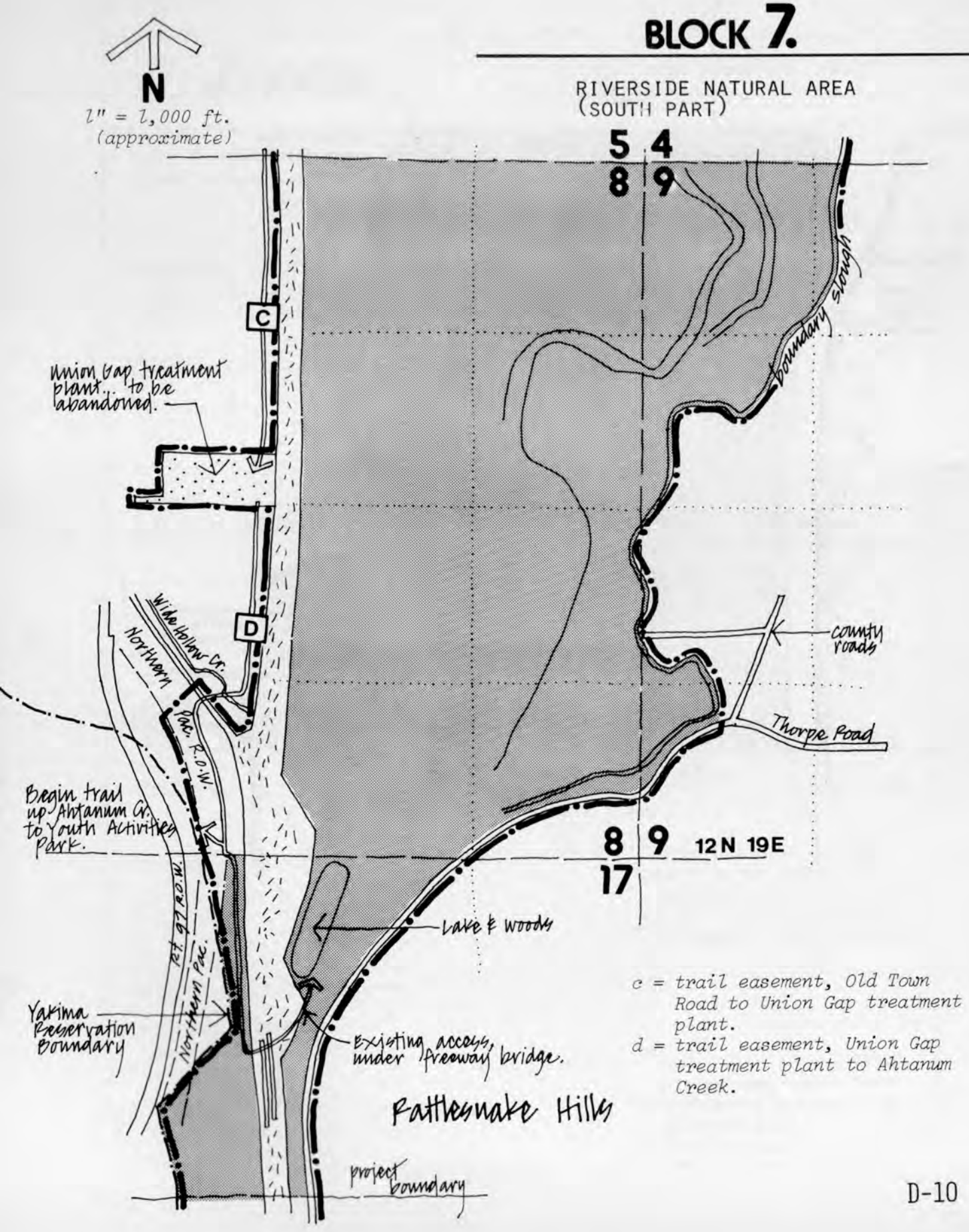
BLOCK 6.



c = trail easement, Old Town Road to Union Gap treatment plant.

1" = 1,000 ft. (approximate)

BLOCK 7.



c = trail easement, Old Town Road to Union Gap treatment plant.

d = trail easement, Union Gap treatment plant to Ahtanum Creek.

BLOCK 7. "RIVERSIDE NATURAL AREA" (SOUTH PART)

(lands north of Union Gap)

Location of Land	Acres	Value*	Comments
Section 8, T12N R19E	313.6	$ 51,565	This contains many acres of low-value floodway land. Conservation easements should be acquired for agricultural lands.
Section 9, T12N R19E	74.7	$ 21,630	Includes agricultural land.
Section 17, T12N R19E	30.6	$ 5,300	
Subtotal, "Riverside Natural Area", South Part (Block 7)	418.9	$ 78,495	

* * * * * * * * * * * * * * *

SUMMARY: LAND TO BE ACQUIRED OR PROTECTED BY CONSERVATION EASEMENTS

Block 1 (Resthaven Natural Area)	181.9 acres	$67,620 value
Block 2 (Roza Conservation Area)	150.4 acres	$191,895 value
Block 3 (Riverside Park)	204.0 acres	$376,420 value
Block 4 (Sportsman's Conservation Area)	153.0 acres	$123,750 value
Block 5 (Riverside Conservation Area)	294.7 acres	$270,560 value
Block 6 (Riverside Natural Area, North Part)	374.8 acres	$235,920 value
Block 7 (Riverside Natural Area, South Part)	418.7 acres	$78,495 value

Total new land: 1,777.5 acres
Total land within greenway boundary (see Block maps): about 3,600 acres
Total assessed value, 1976: $1,344,660*

Average Assessed Value Per Acre (in 1976 dollars)

Block 1.....	$ 372
2	$1,275
3	$1,845
4	$ 809
5	$ 918
6	$ 629
7	$ 187

Average Value, All Lands ..... $756 per acre

* Note that the assessed value in no way represents the potential sale value or the cost of conservation easements.

AGENCY ROLES

The preceding acquisitions are a "shopping list" from which the acquiring agencies can draw according to their finances. They may buy land outright, or they may buy only conservation easements limiting future development. Agencies and private groups may try to persuade willing sellers to donate part of their land, or to voluntarily write conservation deed-restrictions on their land.

VARIOUS AGENCIES

It seems crucial that the "Greenway Commission" be set up at the earliest moment to coordinate land-purchase roles, for several agencies will probably be involved:

Yakima County
City of Yakima (and possibly Union Gap)
Washington State Parks
Department of Game

Each agency must decide on how it will integrate with the other agencies, and what kinds of land it will seek. *The important point is: agencies should not "checkerboard" their holdings; therefore, each agency must decide to focus on a given area (or areas).*

Although final agency roles must be decided through mutual negotiation, the following agency guidelines are suggested:

Yakima County

General Recommendations: Yakima County should seek to acquire the Roza Conservation Area and a site for the Natural Studies Center in the Riverside Conservation Area. The county, city, and local interest groups should be responsible for the development of the Regional Natural Studies Center. The county should also bear the responsibility for establishing riverside trails and regional trail links.

City of Yakima

General Recommendations: The City of Yakima should consolidate its holdings in the Riverside Park area, purchasing all west-side land between the Terrace Heights and Moxee bridges. The Arboretum would therefore be a city project. They should also seek trail easements connecting the Beech Street underpass with Kiwanis Park and with the Central Washington State Fairgrounds. Union Gap could participate in the trail link on the west side of I-82, from Old Town Road to Ahtanum Creek.

The implementation of the Regional Natural Studies Center could be a joint city/county/private group goal.

Washington State Parks

General Recommendations: The State Parks Commission should focus on the consolidation of all east-side land between the two bridges: the "Sportsman's Conservation Area" (which includes Sportsman's State Park). The State Parks Commission could likewise extend their control to the south by acquiring the Riverside Conservation Area (where they could develop the Group Camp). State Parks should also participate in regional trail links.

Washington State Game Department

General Recommendations: The Game Department, through IAC and BOR funding, should play the greatest part in acquiring the two "natural areas": Resthaven Natural Area and Riverside Natural Area. They would also have the greatest role in wildlife protection and enhancement, fishing access, and natural-area trails.

The respective roles of Parks, Game, County, and City will need to be worked out collectively through the proposed Greenway Commission.

PRIORITIES

The assignment of priorities is an extremely debatable task: for instance, should land with high natural value be of a higher priority than less valuable "endangered" land being threatened with development?

We must leave the ultimate decision up to the acquiring agencies; however, we are supplying prioritization directions based on threat of development (endangerment), natural value, and recreational value and reclamation need, followed by an overall priority listing.

a. PRIORITIES BASED ON ENDANGERMENT

Class 1 (Highest):

- Land adjacent to the Terrace Heights Road (Blocks 2 and 3) (part of "Riverside Park" and the "Roza Conservation Area").
- Land adjacent to Highway 24 (Moxee Boulevard) (Blocks 3 and 4).
- "Riverside Park" lands north of Beech Street (Block 3).

Class 2 (High):

- Land off the Union Gap Interchange (Old Town Road) (Blocks 5 and 6).
- Land adjacent to Keyes Road.
- Land adjacent to Resthaven Road.

b. PRIORITIES BASED ON NATURAL VALUE

Class 1 (Highest):

- Land in the lower Riverside Natural Area (Block 7), especially on the east side.
- Land in the upper Riverside Natural Area (Block 6), especially on the east side.
- Land in Resthaven Natural Area, especially areas with ponds (e.g., Boise-Cascade ponds), wetlands, and mature tree clumps (Block 1).

Class 2 (High):

- Areas with ponds, throughout the study area (especially Blocks 3, 4, and 5).
- Riverside Conservation Area (Block 5), especially the east side.
- Roza Conservation Area (Block 2), especially the wooded portions near the Roza Wasteway.
- Wetlands, woods, and ponds in Riverside Park (Block 3).

c. PRIORITIES BASED ON RECREATIONAL VALUE

Class 1 (Highest):
- "Riverside Park", especially "Park Lake" land (Block 3).
- Sportsman's Conservation Area, especially riverside land (Block 4).
- Riverside Conservation Area, especially the Natural Studies Center and Group Camp sites (Block 5).

Class 2 (High):
- West-side land between Freeway Lake and the Terrace Heights Bridge (Blocks 1 and 2).
- East-side land between Resthaven Lake and the Terrace Heights Bridge (Blocks 1 and 2).

d. PRIORITIES BASED ON NEED FOR RECLAMATION

Class 1 (Highest):
- Resthaven Natural Area (Block 1); the west side, Freeway Lake to the Moxee Branch rail line.
- Riverside Park, north of Beech Street.

Class 2 (High):
- Roza Conservation Area.
- Riverside Conservation Area (east side).

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e. COMPOSITE PRIORITIES

Riverside Park rates very highly in Endangerment, Recreation Value and Reclamation, and should therefore be of a very high priority. The acquisition of the "Park Lake" area should have an extremely high priority.

Riverside Natural Area rates the highest in Natural Value (along with Sportsman's Island, which is already publicly owned), and could be the highest priority for natural preservation action.

Resthaven Natural Area rates highly in Natural Value, and the west side has a high Reclamation Need and Recreational Value.

Riverside Conservation Area rates highly in Recreational Value (Natural Studies Center and Riverside Group Camp), Natural Value, and has a high Reclamation Need.

APPENDIX E

ARTICLES OF ASSOCIATION FOR THE PROPOSED YAKIMA RIVER REGIONAL GREENWAY COMMISSION

In order to coordinate and facilitate the development of the greenway, it is proposed that the Washington State Parks & Recreation Commission, the Washington State Department of Game, Yakima County, and the City of Yakima should form a "Greenway Commission."

After this establishment, those four members would draft by-laws and invite other agencies or groups to participate either as full members or as advisors. The Cities of Selah and Union Gap might likely be involved, as would a citizens' advisory committee. Other state agencies concerned with resource management or community development might similarly be invited.

The full name of this commission would be the Yakima River Regional Greenway Commission. It would serve to advocate the implementation of the greenway and to protect the area against adverse proposals. The commission would be funded by contributions from member agencies (and/or groups) in an agreed manner.

The following is a suggested format for the commission's articles of association:

Pursuant to ... (enabling Legislation) ..., be it resolved that the City of Yakima, the County of Yakima, the Washington State Parks and Recreation Commission, the Washington State Department of Game, and other groups, organizations, or legislated bodies as specified in its by-laws, do hereby organize and establish a regional agency, hereinafter referred to as a Commission.

Article I

Name

The name of the Commission so organized and established shall be the Yakima River Regional Greenway Commission.

Article II

Purpose

It shall be the purpose of this Commission to: (a) urge and enlist citizen involvement; (b) coordinate acquisition, development, and manage-

ment of the Yakima River Regional Greenway; (c) coordinate and formulate recommendations for public agency conservation or park actions in the Yakima River Basin; (d) formulate recommendations for review and action by the member agencies' controlling bodies; (e) develop an ongoing cooperative planning and management program; (f) comment and develop advocacy positions on all proposed actions affecting the Greenway; (g) other duties as specified in the Commission's by-laws.

Article III

Membership

The Commission may include all groups, agencies, or municipal corporations which are actively involved in the preservation and recreational use of the Yakima River corridor between Selah Gap(Yakima Ridge) and Union Gap (Rattlesnake Hills) and its related floodplain lands, by reason of their ownership of lands, their special interests or expertise, or a history of past involvement, as will be specified in its by-laws.

Article IV

Officers, Executive Board, and Internal Organization

The City of Yakima, Yakima County, the Washington State Parks and Recreation Commission, and the Washington State Department of Game will meet in an ad hoc by-laws committee to consider and adopt by-laws delineating and regulating the Commission's membership, executive organization, staffing, representation, voting procedures, and all other internal functions, as adopted.

Article V

Meetings

Meetings of the Commission shall be held at such times and places as the Commission shall determine and specify in its by-laws.

Article VI

Allocation of Costs

All agencies, groups, government bodies, and other bodies holding membership in the Commission shall contribute to the expense of such

Commission pursuant to the budgetary laws set forth in the Revised Code of Washington, applicable resolutions and/or ordinances of the members, and such by-laws as may be adopted by the Commission; provided, however, that services and facilities may be provided by members in lieu of assessment.

Article VII

Director and Consultants

The Commission may employ a Director and any consultants it will deem convenient to carry out the purposes and functions of the Commission, as will be determined and specified in its by-laws.

Article VIII

Contracts and Contractual Services

The Commission may contract generally and enter into any contract or legal agreement with the federal government, the state, any municipal corporation and/or other governmental agency, for the purpose of cooperative planning and/or conducting studies of regional problems of mutual concern, and may receive grants and gifts in furtherance of such programs.

Article IX

By-Laws

The Commission shall formulate and adopt by-laws to carry out the purposes and objectives set forth in these Articles.

Article X

Amendment

These Articles of Association may be amended in whatever manner the Commission shall determine and specify in its by-laws.

APPENDIX F. ENGINEERING AND UNIT-COST GUIDELINES

Engineering and cost data was supplied by Kramer, Chin, and Mayo, Inc., Seattle, Washington.

NOTE: IT IS NOT POSSIBLE TO PROPOSE AN ESTIMATED OVERALL DEVELOPMENT COST FOR THE YAKIMA RIVER REGIONAL GREENWAY AT THIS TIME. DEVELOPMENT COSTS MUST BE DERIVED FROM SUBSEQUENT COMPREHENSIVE DESIGNS FOR EACH PUBLIC-USE AREA.

THIS SECTION PROVIDES GENERAL COST GUIDELINES FOR AGENCY REFERENCE; IT DOES NOT CONTAIN PROJECT DEVELOPMENT COSTS.

Section Contents:

1. DESIGN GUIDELINES

Bridge Crossing

A long span pedestrian bridge was designed using pressure-treated laminated wood beams and concrete piers. The cost for a 600 ft. bridge is $125,000 or $210 per foot.

Site Overview

Water, sewer, power, natural gas and telephone are available at the two sites west of the freeway. However, only power, natural gas and telephone are available at the sites east of the freeway.

Water mains for restroom facilities will have to be extended from the Terrace Heights water district or from Yakima. Neither water system can probably supply enough water for irrigation, so this report contains the estimated cost for irrigation wells.

Water mains are sized to supply 500 GPM to a small fire hydrant at each restroom facility.

PVC pipe is not allowed for water mains in Yakima County.

Most of the potential restroom sites are too low to construct gravity sewers to either the Terrace Heights Sewer District or the Yakima Sewer System. Therefore, sewage lift stations will be required. Septic tank and drain fields are not recommended because of the high water table and the possibility of flooding. A chemical, recirculating system as described in this Section could be an alternative to the pressure sewer mains. The estimated cost of this unit is $20,000 per rest area. (Use in the Natural Studies Center or Group Camp may be feasible.)

Utility Problems in Flood Areas
The following are guidelines for construction in areas that will flood occasionally.

Roads and Paths: Use free-draining material for sub-base. This will help control frost heaving also. Construct the rest of the road as usual.

Gravity Sewers: Use water-tight manhole covers. Sewer lines may require ballast to keep from floating.

Water Mains: Protect blow-off from flood damage.

Electrical: Keep transformers and connection boxes above flood level. This implies that all such electrical gear should be sited in park buildings, which will be above potential flood levels.

Sewerless, Waterless Restrooms
There are several manufactured units. One is described below:

Manufacturer: Monogram Industries, Los Angeles.

Functions: Appears and works exactly like a standard toilet, except for a Teflon coating on the bowl. It uses a clear, odorless, non-reactive fluid (similar to a mineral oil). The liquid and waste flows to a vault, where the carrier fluid floats on top of the sewage and is reclaimed by a fluid pickup float, filtered, coalesced, and recycled. The sewage is regularly pumped out and trucked to a treatment plant.

Operation: Operation requires electrical supply. Each 1000-gallon separation tank serves four toilets (thus malfunctions and vandalism can be localized). Each tank stores 15,000 usages prior to pump-out, equaling about a 30-day capacity under normal use. The flush fluid remains in the separation tank indefinitely, and is not pumped out.

This type of toilet is operational (or being installed) in national parks, forests, military installations, factories, mines, and recreation sites in at least seven states.

Potential Greenway Uses

- Riverside Group Camp
- Natural Studies Center
- Remote toilets serving natural-area access points
- Areas where the recirculating toilet would be cheaper than sewage lift stations and sewer mains.

2. COST GUIDELINES (SPECIFIC TO THE YAKIMA AREA).

ITEM	COST (1976 DOLLARS)
Bridge Crossing:	
Laminated wood beam bridge	$ 210.00/LF
Pavements (for flood areas):**	
6' bicycle path gravel	1.50/LF
6' bicycle path BST	3.00/LF
22' roadway BST	15.00/LF
Parking lot BST	190.00/Stall
Free draining fill for sub-base	5.00/CY
Lighting:	
Stepdown transformer	$ 1,000.00 each
Timer clock	220.00 each
Wire	2.00/LF
30' luminaire	3,200.00 each
50' luminaire	4,800.00 each
Use six 30' luminaires for 100 car parking lot (if needed).	
Water Mains:	
6" ductile iron in place	$ 12.00/LF
8" ductile iron in place	14.00/LF
Fire hydrants and valving	2,000.00 each
3" or 4" water line (PVC allowed)	6.00/LF
(Street rehabilitation	5.00/LF)
Sewer Mains:	
8" PCP gravity pipe including manholes	$ 15.00/LF
12" PCP gravity pipe including manhole	19.00/LF
(Add $2.00 for ballast and pressure type manhole in flooded areas.)	
4" ductile iron pressure in place	10.00/LF
6" ductile iron pressure in place	12.00/LF
6000 gpd lift station	10,000.00 each
36,000 gpd lift station*	14,000.00 each
(Street rehabilitation	5.00/LF)

* Serving 6 restrooms @ 6000 gpd/restroom; rr = 6 stalls each side.

** Concerning the use of dikes as bicycle trails, the most feasible design appears to be a 6" crushed rock base under a 2" bituminous surface, costed at $3/LF for a 6' pathway. Soil cement appears to be infeasible.

Irrigation:

Cost per acre for pipes and sprinklers	$10,000.00/acre
72" diameter shallow well - 300 gpm*	20,850.00 each
Inflow structure to feed river water to the north end of "Park Lake"	$32,750.00 each

3. SEWER DESIGN GUIDELINES

Each park area will have a restroom with six stalls per sex.

For women	6 WC	@ 36 gph =	216 gal/hr
	3 sink	@ 15 gph =	45 gal/hr
For men	3 WC	@ 36 gph =	108 gal/hr
	3 urinal	@ 10 gph =	30 gal/hr
	3 sink	@ 15 gph =	45 gal/hr
			444 gal/hr

444 gal/hr x 10 hrs x 1.5 = 6,600 gal/day.

4. WATER SYSTEM GUIDELINES

Peak flow for restrooms 50 gpm

Irrigation requires about 100 gpm/acre.

5. COST OF SERVICING SAMPLE GREENWAY SITES**

a. Near 4th and R Street (Upper North Run; Block 1)

Existing Utilities:
- Water available at 4th and Erickson Lane.
- Sewer available at 4th and Erickson Lane.
- Power - 7.2 KV 1Ø

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* Supply from the river is an alternate; water rights could be at issue.

** Note that sewerless restrooms may be feasible in light of the high cost of sewer-main extension.

Potential Utilities:

1500 LF 6" water main @ 12/LF	$18,000
1500 LF 4" pressure sewer main @ 10/LF	15,000
1 only sewage lift station	14,000
1 LS fire hydrant and valves	2,000
	$49,000

b. SE of Yakima Avenue & I-82 Interchange
(North "Riverside Park"; Central Run; Block 3)

Existing Utilities:
Water and sewer at Chestnut and Fair Avenue.
Power (3Ø) along Terrace Heights Road.
(7.2 KV 1Ø south of Terrace Heights Road.

Potential Utilities:

2000 LF 6" water main @ 12/LF	$24,000
2000 LF 4" pressure sewer main @ 10/LF	20,000
1 only freeway crossing	30,000
1 only sewage lift station	10,000
1 LS fire hydrant and valves	2,000
	$86,000

c. Utility Cost Estimate to Bring Water and Sewer to "Riverside Park" Core Area through the Beech Street Underpass

Existing Utilities:
Sewer at Beech Street and Fair Avenue.
Water at Beech Street and South 13th Street.

Proposed Utilities:

2500 LF 6" water main	$30,000
3000 LF 4" pre-sure sewer main	30,000
1 only sewage lift station	10,000
1 each fire hydrants and valves	2,000
	$72,000

d. Near Keyes Road, South of Terrace Heights Road

Existing Utilities:
Natural gas, telephone and 12.5 KV 3Ø for 3/4 mile on Keyes Road.

Potential Utilities:

4000 LF 6" water main @ 12/LF	48,000
4000 LF 8" gravity sewer @ 15/LF	60,000
3 only fire hydrants and valves @ 2,000	6,000
	$114,000

e. S. of SR24, near Treatment Plant

Existing Utilities:

Water, sewer and power are available at treatment plant.

Potential Utilities:

1000 LF 6" water main @ 12/LF	$12,000
1000 LF 8" gravity sewer @ 15/LF	15,000
1 only fire hydrant and valve	2,000
	$29,000

f. N. of SR24, on Riverside Road

Existing Utilities:

12.5 KV 3Ø along Keyes Road.

Potential Utilities:

6000 LF 6" water main @ 12/LF	$ 72,000
6000 LF 4" pressure sewer main @ 10/LF	60,000
1 only fire hydrant and valves	2,000
1 only sewage lift station	14,000
	$148,000

g. Near Riverside Road and Postma Road

Existing Utilities:

None.

Potential Utilities:

8000 LF 6" water main @ 12/LF	$ 96,000
8000 LF 4" pressure sewer main @ 10/LF	80,000
1 only fire hydrant and valves	2,000
1 only sewage lift station	14,000
	$192,000

Water and sewer from Terrace Heights Road and Keyes Road to the Terrace Heights Sewer District Lift Station #1.

3000 LF 6" pressure sewer.
3000 LF 8" water main.
1 only sewage lift station.

h. Near Butterfield Road, North of Terrace Heights Road

Existing Utilities:

Natural gas, telephone and 12.5 KV 3Ø on Butterfield Road.
No water and sewer.

Potential Utilities to Terrace Heights Road and Keyes Road:

4800 LF 6" water main @ 12/LF	$ 57,600
4800 LF 8" gravity sewer main @ 15/LF	38,400
3 only fire hydrant and valves @ 2,000	6,000
	$102,000

6. PARK LAKE INFLOW

Determine:

Flow required to keep a 40 acre pond (Park Lake) clean (free of stagnation, eutrophication).

Data:

KCM estimates that the lake can only take a dentention of 2 to 3 days.

Solution:

Volume = 40 acres x 50' = 2,000 acres/ft. = 87,120,000 CF.

Note:

For KCM to do an accurate study, they would require 2 days time and the water temperature, nitrate and phosphate levels, suspended solids, biological O_2 demand, etc.

Design:

Freshwater intake for 40 acre lake.

Data:

From COE map, existing water surface is at 1010 ft.
From COE profile, the river bottom at Sec. 226 is 1011 ft. and at Sec. 227 is at 1008 ft.

NOTE: Due to the difficulty of excavating through the City's Sanitary Landfill Site, an alternate site to the south may be more feasible. This would require less pipe or canal construction.

Solution:

72" pipe (surface channel is an alternative) dropping 3' into the north end of the lake. Existing outflow appears adequate.

Cost Estimate:

Inlet Str. (WSDH standard plan)	13 CY concrete @ 300	$ 3,900
	1 only 72" sluice gate	5,000
	Str. exc.	1,000
		$9,900
Str. Exc.	16 x 200 x 8' = 950 CY 950 @ 3.50	2,850
72" RCP	200 @ $100	20,000
Total Cost Inlet Str.		$32,750

APPENDIX FF

FEDERAL ASSISTANCE PROGRAMS - GRANTS-IN-AID PROGRAMS APPLICABLE TO THE YAKIMA GREENWAY

Anadromous Fish Conservation

To provide grants-in-aid of up to 50 percent of project costs to States and other non-Federal interests for cooperative projects to enhance anadromous fish.

Administering agency: Bureau of Sport Fisheries and Wildlife (BSFW); National Marine Fisheries Service

Applied for by: State (Fisheries)

Apply to: Regional Office, BSFW

Cooperative Tree Planting

For the production, purchase, and distribution of tree planting stock for forest, windbarrier, and watershed plantings.

Administering agency: Forest Service (FS)

Applied for by: States; Private Enterprises; Individuals

Apply to: Local Office, FS

Cropland Adjustment: Aid to Farmers

To provide for long-term diversion of land from production of surplus crops to protective conservation uses, including the expansion of recreation resources and wildlife habitat, increasing reforestation, preserving open space and natural beauty, and preventing air and water pollution for periods of not less than 5 years nor more than 10 years.

Administering agency: Agricultural Stabilization and Conservation Service (ASCS)

Applied for by: Private Enterprises; Individuals

Apply to: ASCS, Washington, D.C. 20250

Cropland Adjustment: Grants to Governmental Agencies (Greenspan)

For taking farm land out of agricultural production. Uses to which the land can be converted include open space, public recreation, wildlife habitat, natural beauty, or other uses that control air and water pollution.

Administering agency: Agricultural Stabilization and Conservation Service (ASCS)

Applied for by: States; Local Governments

Apply to: Local Office, ASCS

Cropland Conversion Agreements

To design and test new methods of improving family farm income by converting land regularly used for production of crops to other economic uses, one of which is outdoor recreation.

Administering agency: Agricultural Stabilization and Conservation Service (ASCS)

Applied for by: Private Enterprises; Individuals

Apply to: Local Offices, ASCS

Fish Restoration Federal Aid

To provide grants (of up to 75 percent of cost of a project sponsored by State Game and Fish Departments) to the States.

Administering agency: Bureau of Sport Fisheries and Wildlife (BSFW)

Applied for by: States

Apply to: Regional Office, BSFW

Game Fish Distribution

To establish self-perpetuating fish populations in farm ponds and lakes and to provide recreational fishing opportunities through distribution of hatchery-reared game fish without cost.

Administering agency: Bureau of Sport Fisheries and Wildlife (BSFW)

Applied for by: Federal and Interstate Agencies; States; Local Governments; Non-profit Organizations; Individuals

Apply to: Regional Office, BSFW

Land and Water Conservation Fund Grants

For planning, acquisition and development of public outdoor recreation areas and facilities. Prime importance is attached to projects near large population centers.

Administering agency: Bureau of Outdoor Recreation (BOR)

Applied for by: States; Local Governments; Educational Institutions

Apply to: Regional Office, BOR

Open Space Land Program

Consolidates activities previously implemented through the Open Space Land Program, Urban Beautification Program, and the Historic Preservation Program, and provides matching grants to States and local public bodies of up to 50 percent of project costs.

Administering agency: Community Development Administration; US Department of Housing and Urban Development (HUD)

Applied for by: States; Local Governments

Apply to: Regional Office, HUD

Public Employment Program (PEP)

To provide public service employment for unemployed and underemployed persons, and assist States and local communities in furnishing needed public services, including parks and recreation, during periods of high unemployment.

Administering agency: Manpower Administration

Applied for by: States; Local Governments; Individuals

Apply to: Agency, Washington, D.C. 20210

Public Works and Development Facilities Grants

To provide grant funds for public works, and development facilities in areas which suffer substantial unemployment, low family income or both.

Administering agency: Economic Development Administration (EDA)

Applied for by: Federal and Interstate Agencies; States; Local Governments; Non-profit Organizations

Apply to: Regional Office, EDA

Small Reclamation Projects

To non-Federal organizations for water resource development projects in the 17 western-most contiguous States and Hawaii.

Administering agency: Bureau of Reclamation

Applied for by: Federal and Interstate Agencies; States; Local Governments

Apply to: Regional Office, Bureau of Reclamation

Small Watershed Projects

To provide a coordinated approach to land and water resource conservation, flood prevention, and water use, and to assist and cooperate with watershed project sponsors to protect, manage, improve, and develop watershed land and water resources, including recreation, fish, and wildlife resources.

Administering agency: Soil Conservation Service

Applied for by: States; Local Governments

Apply to: Local Office, SCS

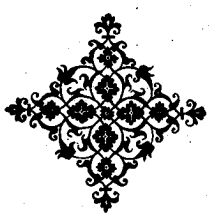
Wildlife Restoration Federal Aid

To provide cost-sharing grants (of up to 75 percent of cost of approved projects initiated by State Game and Fish Departments) to the States.

Administering agency: Bureau of Sport Fisheries and Wildlife (BSFW)

Applied for by: States

Apply to: Regional Office, BSFW



APPENDIX G. SOURCE LIST

SURFACE WATER, GROUNDWATER, SOILS, VEGETATION

Cearlock, Cole, Foote, Wallace (Battelle Northwest Laboratories), Mathematical Ground-water Model of the Ahtanum-Moxee Subbasins, Yakima County, Washington, for the State of Washington, Department of Ecology, 1975.

Pacific Northwest River Basins Commission, Columbia-North Pacific Region Comprehensive Framework Study of Water and Related Lands, June 1971. (Appendix II, The Region; Appendix IV, Land and Mineral Resources; Appendix VIII, Recreation).

JARA - Sasaki, Walker, Roberts, Inc., Environmental Assessment of Ellensburg Valley in the Wilson Creek Watershed, Washington, Planning Document and Technical Appendix, March 1975.

Department of the Army, Seattle District, Corps of Engineers, Floodplain Information Yakima River, City of Selah and Vicinity, Washington, June 1973.

Yakima County Conference of Governments, Yakima, Yakima County Water and Sewer Study, Part I, Narrative Report, 1969.

Beck, R.W. & Associates, Yakima Wastewater Facilities Planning Study, Volume 3, Environmental Impact Assessment, 1975.

Yakima County Planning Department, Yakima County Shoreline Master Program, June 1974, 1974.

USDI, Bureau of Reclamation and USDA, Soil Conservation Service, Inventory of Yakima River Basin, Washington, Diversions and Return Flows, 1973-1974.

Mann, Roy, Rivers in the City, Praeger, New York, 1973.

Department of the Army, Seattle District, Corps of Engineers, Floodplain Information - Yakima and Naches Rivers (Yakima-Union Gap), Washington, May 1970.

Yakima County Shorelines Citizen Advisory Committee and Yakima County Planning Department, Yakima County Shoreline Master Program, June 1974.

Milhous, Robert T., Status of the Water Resources Planning Program in the Yakima Basin, Water Resources Analysis and Information Section, Office Report #24, Department of Ecology, 1975.

Whitworth, Jan, Current Water Related Studies in the Yakima River Basin, Water Resources Information System, State of Washington, Department of Ecology, June 1975.

USDA, Soil Conservation Service, Yakima County Soil Survey, Series 1942, No. 15 (updated information is available from the SCS field office in Union Gap).

USDA, Soil Conservation Service and USDI, Bureau of Indian Affairs, Soil Survey of the Yakima Indian Reservation Irrigated Area, Washington, 1976.

Daubenmire, R., Steppe Vegetation of Washington, Washington Agricultural Experiment Station, Washington State University, Technical Bulletin #62, 1970.

"Boloria selene (Nymphalidae) ambushed by a true bug (Heteroptera)", in Journal of the Lepidopterists' Society, Vol. 27, No. 4, November 30, 1973 (in reference to the Moxee Bog Reserve).

WILDLIFE ENHANCEMENT AND LAND RECLAMATION

Giles, Robert H. Jr., Ed., Wildlife Management Techniques, The Wildlife Society, Washington, D.C., 1969.

Leopold, Aldo, Game Management, Charles Scribner's Sons, New York, 1961.

National Audubon Society, Wildlife Habitat Improvement, Nature Center Planning Division, 950 Third Avenue, New York, N.Y. 10022.

National Audubon Society, A Nature Center for your Community, Nature Center Planning Division, 950 Third Avenue, New York, N.Y. 10022.

USDA, USFS, Wildlife Habitat Improvement Handbook, 1969.

University of Newcastle upon Tyne Research Team, Landscape Reclamation: A Report into Problems of Derelict Land, Vol.1, IPC Science and Technology Press, Ltd., 1971.

Johnson, Craig, Practical Operating Procedures for Progressive Rehabilitation of Sand and Gravel Sites, National Sand and Gravel Association, 1966.

RECREATION PLANS AND RECREATION PLANNING

Yakima County Youth Activities Park, (Master Plan Report), Yakima County, 1975.

ORB, Comprehensive Park and Recreation System Plan for the Yakima Park Planning Area, May 1974.

Dunham and Finn, Small-Craft Harbors: Design, Construction, and Operation, Department of the Army, Corps of Engineers, 1974 (sections dealing with diking and embayments adjacent to rivers).

USDI, Digest, Federal Outdoor Recreation Programs and Recreation-Related Environmental Programs, 1975.

A Comprehensive Recreation and Park Plan for the City of Selah, City of Selah Department of Recreation and Parks (undated).

Trails for Tommorrow: Washington's First Symposium on Recreational Trails; Cooperative Extension Service, W.S.U., Pullman, Washington, 1974.

The Yakima Canyon Scenic and Recreational Highway, State of Washington, 1968.

Municipal and Regional Planning in Washington State, Bureau of Governmental Research and Services, University of Washington, 1969.

Freeway Park Endorsements, The Recreation Committee of the Greater Yakima Chamber of Commerce, 1969 through 1975.

Jones & Jones, The Nooksack Plan, Seattle, 1973 (prepared for the Whatcom County Board of Commissioners and the Whatcom County Park Board).

Jackson, J.B., Landscapes, University of Massachusetts Press, 1970.

Carothers, Richard Associates, Yakima County Park, Recreation and Open Space Plan, for the Board of Yakima County Commissioners, 1975.

Wurman, Levy, Katz, The Nature of Recreation: A Handbook in Honor of Frederick Law Olmsted, Using Examples of His Work, MIT Press, Cambridge, 1972.

Technical Report II. Standards (Recreational), Washington State Planning and Community Affairs Agency, 1969.

Levin, Rose, Slavet, New Approaches to State Land-Use Policies, Lexington Books, Lexington, Massachusetts, 1974.

Guide to New Approaches to Financing Parks and Recreation, N.R.P.A., Acropolis Books, Washington, D.C., 1970.

LAND USE

McCormick, Henry A., An X-Ray on the Naches Valley, 1911.

As the Valley Was, Yakima Valley Society for the Preservation of Early Western Americana, 1968.

Yakima Urban Area Study, Yakima County Planning Department, July 1975.