

**VEGETATION OF
LOWER & MIDDLE
COTTONWOOD ISLANDS
RESEARCH NATURAL AREA/
AREA OF CRITICAL
ENVIRONMENTAL CONCERN**



by

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prepared for
Coeur d'Alene District, Bureau of Land Management

**Vegetation of Lower and Middle Cottonwood Islands
Research Natural Area/Area of Critical Environmental Concern and
Establishment of Photopoints for Long-term Monitoring**

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November 1992

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**Cooperative Challenge Cost-share Project:
Bureau of Land Management
Idaho Department of Fish and Game**

Purchase Order No. D060 P20046



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Introduction

Lower and Middle Cottonwood Islands have been designated a Research Natural Area (RNA) and Area of Critical Environmental Concern (ACEC) by the Bureau of Land Management (BLM) because of their suitability as ecological reference areas and their value for educational and research uses (USDI-BLM 1989). A thorough vegetation inventory of the islands was conducted to determine what habitats, plant communities and plant species are represented by the RNA/ACEC. As a reference area, the RNA/ACEC can be used to observe long-term changes in vegetation. This report describes plant communities found on the two islands and documents the present physiognomy of each with photographs taken from permanently established photopoints.

Very little information is available on plant communities that occupy islands and shorelines of Columbia River tributaries, considering how much of this habitat has been lost or altered by dams and reservoirs. In a study of the Snake River below Hell's Canyon dam, Huschle (1975) describes several community types similar in composition to those of the Cottonwood Islands. Asherin and Orme (1978), in their inventory of riparian habitats along the lower Clearwater River, defined two community types found on the Cottonwood Islands—*Pinus ponderosa*/*Agropyron spicatum* and *Salix exigua*-gravel bar—but the others described here are probably too limited in extent to have been included in their sampling.

Site

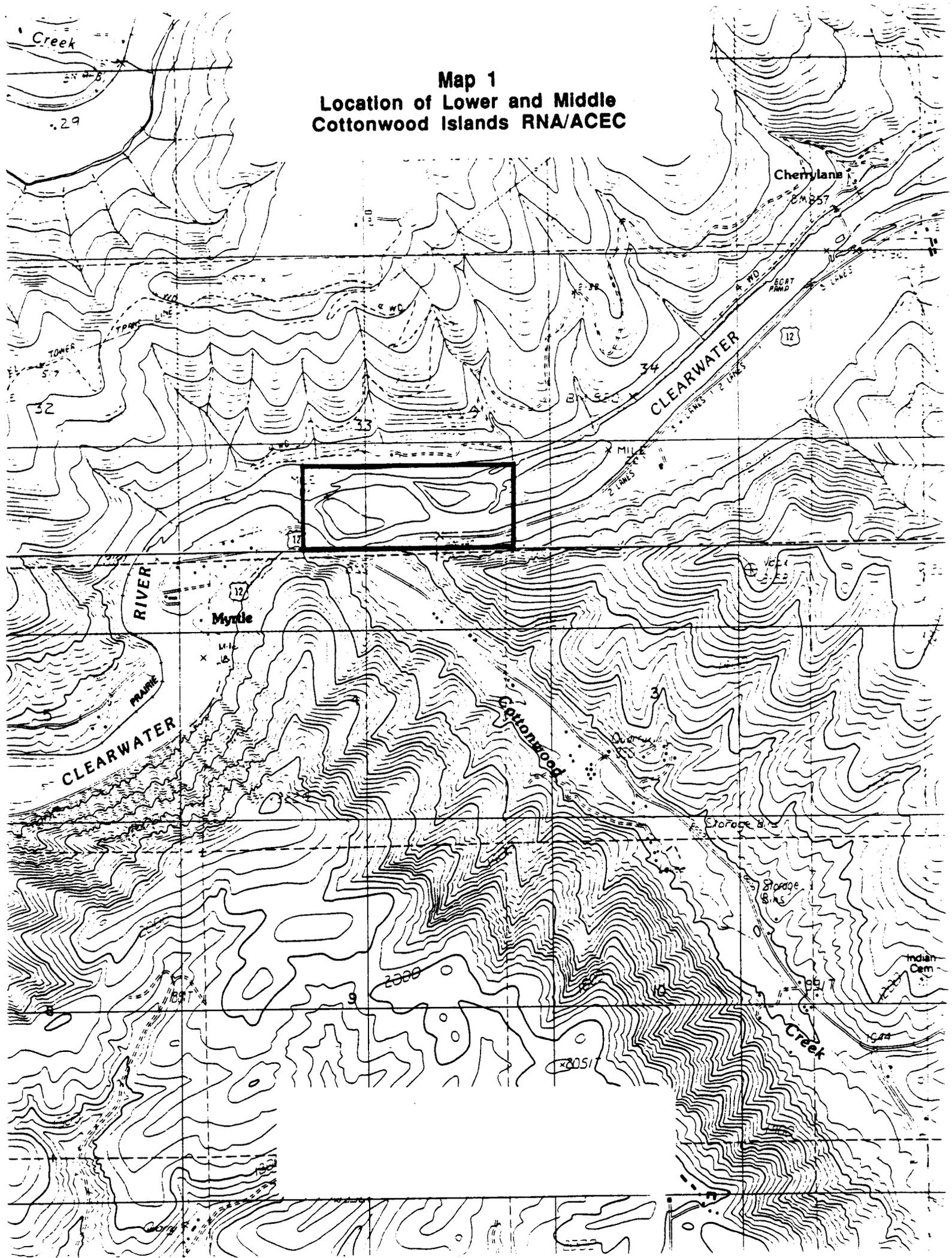
Lower and Middle Cottonwood Islands ACEC encompasses the lower two of three islands in the channel of the Clearwater River, located 19 air miles east-northeast of Lewiston, Idaho, and 1.3 mi downstream from Cherry Lane bridge, at an elevation of 900 ft (T37N, R3W, Sec 33; Map 1). The lower two islands represent a land area of about 14 acres. The area lies within the easternmost extension of the Columbia basin geographic province (Franklin and Dyrness 1973). Once part of a perennial bunchgrass steppe, vegetation of the area is now dominated by introduced annual grasses and forbs.

Flow in this portion of the river is affected by a single dam on the North Fork of the Clearwater River, 25 miles upstream. The North Fork drains roughly 30% of the Clearwater basin upriver of the study area. Because most of the flow within the basin is uncontrolled, "normal" spring flooding still occurs to some degree on the lower Clearwater River.

The BLM has developed a Habitat Management Plan for the area and cooperatively manages the islands with the Idaho Department of Fish and Game (USDI-BLM 1981). The islands are managed primarily for ecological values and waterfowl production. There is a high density of Canada geese nesting boxes on both islands. The islands are not assessable except by water.

The islands taper gradually to river level on their upstream ends and drop abruptly at their downstream ends, forming steep rock banks. The upstream ends of each island are gently sloping cobble bars, making up a much smaller portion of the middle island than of the lower. Much of this cobble bar is covered by water for a period of time during spring runoff. Sand is deposited in spaces within the cobble

Map 1
Location of Lower and Middle
Cottonwood Islands RNA/ACEC



substrate as water recedes and is eroded again during high flow. In small depositional sites deeper sand deposits cover the rock and support a distinct but restricted plant community.

The most elevated portions of the islands have been built up of alternating layers of cobble, gravel and sand and the relatively level surface is covered with a weakly developed sandy soil of variable depth. Plant communities are aligned along an elevational gradient related to frequency and duration of flooding. They are described below in order of increasing elevation above low water.

Descriptions of plant communities

Salix exigua (coyote willow) community

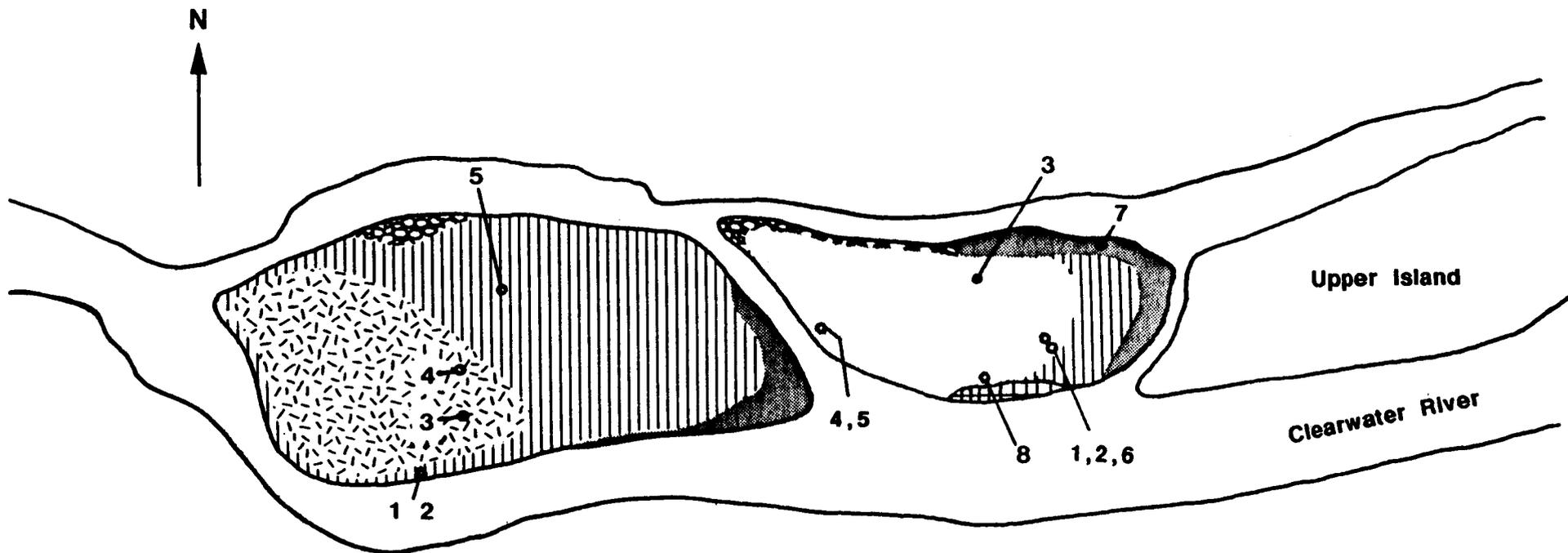
The extensive cobble bars dominating the upstream sides of both islands are usually covered during spring high water. At their lowest extent these bars are characterized by a willow thicket community that is most well developed on the middle island in a narrow zone along the north and east margins (Map 2). *Salix exigua* is the single dominant species forming a dense to open shrub layer 4-6 ft tall.

This zone experiences the highest frequency and longest duration of flooding. In addition, it is exposed to the strongest current, resulting in a bare cobble substrate. The *Salix* community is flooded on and off throughout the summer due to fluctuations caused by Dworshak dam. Most of this zone was inundated on 20 May 1992 during a particularly dry spring. Debris caught in branches of the willows indicates they are totally submerged at times.

The only other species with any significant cover in the *Salix* community is *Populus trichocarpa* (black cottonwood) which tends to take on a shrubby habit due to breakage of stems in strong currents. Species from the *Chrysopsis villosa* community immediately above are scarce in this zone. The forb/grass layer is very sparse but very diverse, including many incidental species. This is the only community where we found *Rhus radicans* (poison ivy), *Rumex acetosella* (sourweed), *Juncus* sp., *Agrostis scabra* (rough hairgrass), *Convolvulus arvensis* (morning glory), *Helianthus annuus* (annual sunflower), *Verbascum blattaria* (smooth mullein), *Solidago* sp. (goldenrod), and *Portulaca oleracea* (common purslane; Table 1). The incidental woody species *Cornus stolonifera* (red-osier dogwood), *Ailanthus altissima* (tree-of-heaven), *Morus alba* (mulberry), *Acer negundo* (box elder) and *Rubus* sp. (black raspberry) were represented by only one or a few individuals and none were larger than small trees.

Chrysopsis villosa (hairy goldaster) community

Above the *Salix* zone, on both islands, cobble bars are dominated by *Chrysopsis villosa*, a low-growing, caespitose perennial. This community is characterized by a continuous low forb layer dominated by *Chrysopsis*. *Salix exigua* is present as a minor element. This zone forms a very distinct band related to elevation above low



Plant Communities

-  *Salix exigua*
-  *Chrysopsis villosa*
-  *Artemisia ludoviciana*
-  *Populus trichocarpa / Festuca Idahoensis*
-  *Pinus ponderosa / Agropyron spicatum*
-  Bare cobble



**Map 2. Plant communities of Lower and Middle Cottonwood Islands
RNA/ACEC and locations of permanent photopoints.**

Table 1. Species list and estimated cover classes, by community type, for Middle and Lower Cottonwood Islands.

Plant communities:	Cover classes:
1 = <i>Salix exigua</i>	+ = present
2 = <i>Chrysopsis villosa</i>	1 = <1%
3 = <i>Populus trichocarpa</i> / <i>Festuca idahoensis</i>	3 = 1-5%
4 = <i>Artemisia ludoviciana</i>	10 = 5-15%
5 = <i>Pinus ponderosa</i> / <i>Agropyron spicatum</i>	20 = 15-30% etc.

* = species not native to region

	Common name	Community								
		Middle Is.				Lower Is.				
		1	2	3	4	1	2	5		
Trees										
	<i>Acer negundo</i>	+								
*	<i>Ailanthus altissima</i>	+								
	<i>Celtis reticulata</i>									+
*	<i>Malus sp.</i>			+						
*	<i>Morus alba</i>	+								
	<i>Pinus ponderosa</i>									20
	<i>Populus trichocarpa</i>	10	1	10		3	3			3
*	<i>Robinia pseudo-acacia</i>	+		3						
*	<i>Ulmus pumila</i>	+		+						+
Shrubs										
	<i>Amelanchier alnifolia</i>			+						
	<i>Chrysothamnus viscid.</i>									
	<i>Cornus stolonifera</i>	+								
	<i>Rhamnus purshiana</i>					+				
	<i>Rhus glabra</i>			+						+
	<i>Ribes aureum</i>			+						
*	<i>Rosa eglanteria</i>	+		+						
*	<i>Rubus sp.</i>	+		+						
	<i>Salix exigua</i>	30	3	1	+	10	1			
Graminoids										
	<i>Agropyron spicatum</i>									20
	<i>Agrostis scabra</i>	+								
	<i>Aristida longiseta</i>			+						10
*	<i>Bromus japonicus</i>			+				+		
*	<i>Bromus tectorum</i>			1				1		3
	<i>Carex parryana</i>	+								
	<i>Festuca idahoensis</i>	+	+	10				3		1
	<i>Festuca myuros</i>		+	+						+
	<i>Juncus sp.</i>	+								
	<i>Panicum capillare</i>							+	+	+
*	<i>Poa compressa</i>	+	+	+				+	+	
	<i>Sitanion hystrix</i>			+						
	<i>Sporobolus cryptandrus</i>			+						3
Forbs										
	<i>Achillea millefolium</i>			+					+	+
*	<i>Agrostemma githago</i>		+	+						

--continued--

Table 1 cont.

		Middle ls.				Lower ls.		
		1	2	3	4	1	2	5
* <i>Alyssum alyssoides</i>	alyssum						+	
* <i>Ambrosia artemisifolia</i>	ragweed					+		+
<i>Artemisia ludoviciana</i>	Louisiana sagewort	1	1	+	10			
<i>Asclepias speciosa</i>	showy milkweed							+
<i>Aster hesperius</i>	willow aster	+	+	+	3			
<i>Balsamorhiza saggitata</i>	arrow-leaf balsamroot							+
* <i>Centaurea maculosa</i>	spotted knapweed		3	10			3	3
* <i>C. solstitialis</i>	yellow starthistle	+	+	+				+
<i>Chrysopsis villosa</i>	hairy goldaster	1	20	3		1	20	3
<i>Collomia linearis</i>	narrow-leaf collomia							
* <i>Convolvulus arvensis</i>	morning glory	+				+		
<i>Epilobium paniculatum</i>	annual willowherb	+	1	1		1	1	+
<i>Erigeron compositus</i>	cut-leaf daisy			+				
<i>Eriogonum heracleoides</i>	Wyeth buckwheat			+				+
<i>E. strictum</i>	strict buckwheat							1
<i>Gaura coccinea</i>	scarlet gaura						+	
* <i>Geranium carolinianum</i>	Carolina geranium					+	+	
<i>Helianthus annuus</i>	annual sunflower	+				+		
* <i>Hypericum perforatum</i>	St. Johnswort	+	+	+			+	
<i>Lactuca sp.</i>	prickly lettuce			+				
* <i>Linaria vulgaris</i>	butter and eggs						+	
<i>Lomatium grayi</i>	Gray's lomatium			+				+
<i>Lotus purshiana</i>	Spanish clover							+
<i>Lupinus lepidus</i>	prairie lupine		3	1			3	1
* <i>Lychnis alba</i>	white campion						+	
<i>Matricaria maritima</i>	May-weed			+			1	+
<i>Mollugo verticillata</i>	carpetweed	+	+					
<i>Oenothera hookeri</i>	evening primrose						+	
<i>Orobanche ludoviciana</i>	broomrape			+				
<i>Penstemon lyallii</i>	Lyall's beardtongue		+			+		
<i>Phacelia heterophylla</i>	phacelia						+	+
<i>Plantago patagonica</i>	Indian wheat						+	+
<i>Polygonum aviculare</i>	prostrate knotweed							+
<i>P. majus</i>	Palouse knotweed			+		+	+	+
* <i>Portulaca oleracea</i>	common purslane					+		
* <i>Potentilla recta</i>	erect cinquefoil			+				+
<i>Rhus radicans</i>	poison ivy	+				+		
* <i>Rumex acetosella</i>	sourweed			+				+
<i>Rumex sp.</i>	dock	+						
* <i>Saponaria officinalis</i>	bouncing Bet			+				1
<i>Sedum lanceolatum</i>	sedum							
<i>Sisymbrium altissimum</i>	tumble mustard						+	
<i>Solanum triflorum</i>	annual nightshade					+		
* <i>Tribulus terrestris</i>	puncturevine					+		+
* <i>Trifolium arvense</i>	hare's foot			+				
* <i>Verbascum blattaria</i>	mullein					+		

water, its lower boundary apparently determined by either the frequency or duration of inundation. The substrate is cobble with sand in the interstices.

In the upper half of this zone, *Lupinus lepidus* (prairie lupine) comes in abruptly and is co-dominant with *Chrysopsis* even though there is no change in slope or substrate. Although *Lupinus* also forms a distinctive elevational zone, I considered it to be a phase of the *Chrysopsis villosa* community because *Chrysopsis* continues to be abundant throughout. The low, caespitose growth habit of these two forb species gives this community a distinctive appearance easily delineated from those above and below. Grass cover is insignificant and the paucity of weeds is notable. A few mature *Populus trichocarpa* trees occur in this community on both islands.

Artemisia ludoviciana (Louisiana sagewort) community—middle island

This is a restricted community occupying sand deposits below high water. The community is distinctive because of its almost complete dominance by *Artemisia ludoviciana* which is only sparse in adjoining communities. Huschle (1975) described a more inclusive *A. ludoviciana* vegetation type which only occurred along the free-flowing portion of the lower Snake River, also below high water. He described this type as lacking diversity and having a unique species composition, similar to the community described here.

On the west (downstream) and south sides of the islands there is an abrupt drop to the water forming a very narrow band of steep cobble bank. Plants are very sparse with the most obvious being small, shrubby individuals of *Populus trichocarpa*. *Salix exigua* is also present.

Populus trichocarpa/Festuca idahoensis (black cottonwood/Idaho fescue) community—middle island

This plant association occupies most of the middle island on the surface highest above the water. It is likely that this level is only flooded during extreme runoff events. Bare cobble is exposed in some spots. Much of the soil surface is covered by a well-developed cryptogamic crust.

The most distinguishing feature of this zone is the presence of mature deciduous trees, but the vegetation is predominantly a grassland with *Festuca idahoensis* the dominant native species. The noxious weed *Centaurea maculosa* (spotted knapweed) is the highest cover component and is more abundant here than in any other community. Trees occur in small, widely scattered groups or in narrow bands near the perimeter of the island. Most of these trees are *Populus trichocarpa* but there are also several large colonies of the escaped ornamental *Robinia pseudo-acacia* (black locust). This species does very well in the canyon and can be expected to spread.

Neither of the studies referred to earlier mention a *Populus*/grass community type. It is possible that on the mainland these have deteriorated to *Populus/Bromus*

tectorum or *Populus*/forb. Asherin and Orme (1978) recognized a *Populus trichocarpa*/*Rosa woodsii* vegetation type as the prominent deciduous vegetation occurring at mouths of tributaries to the Clearwater. Such sites have been severely disturbed by grazing and were described as having an understory dominated by shrubs, with a weedy forb layer. Neither of the stands they sampled included *Festuca idahoensis*.

Narrow bands of *P. trichocarpa* may indicate depositional cycles that allowed their establishment. The widespread distribution of trees in this community make it difficult to define a deciduous tree community separately from the grassland. However, species diversity of this community is increased by species associated with the stands of trees.

Pinus ponderosa/*Agropyron spicatum* (Ponderosa pine/bluebunch wheatgrass) community—lower island

This plant association occupies the most elevated surface of either island. Most of the surface is covered by a sandy soil with exposed cobble in some places. The community here is an open *Pinus ponderosa* forest of sapling to large trees up to 40 ft tall. Most of the area is also covered by a vigorous bunchgrass understory of *Agropyron spicatum* (bluebunch wheatgrass), *Aristida longiseta* (red three-awn), *Festuca idahoensis* (Idaho fescue) and *Sporobolus cryptandrus* (sand dropseed). This community includes large grass openings with the species listed above along with *Bromus tectorum* (cheatgrass) and large (ca. 0.25 ac) colonies of weeds including *Saponaria officinalis* (bouncing Bet), *Centaurea maculosa* (spotted knapweed), *C. solstitialis* (yellow starthistle), and *Linaria vulgaris* (butter-and-eggs). *C. maculosa* dominates several old flood channels. Young pines on the margin indicate an increase in the size of this zone. No *Robinia pseudo-acacia* was observed on the lower island.

This community is an example of the *Pinus ponderosa*/*Agropyron spicatum* habitat type described by Daubenmire (1970) as the only pine/grass habitat type in the Clearwater Valley. It represents a vegetation type that has been seriously depleted throughout the lower river by livestock grazing. Only small areas remain on very steep upland slopes or in other areas protected from livestock use (Asherin and Orme 1978). This type has largely been replaced by a *P. ponderosa*/*Bromus tectorum* association.

Photopoints

Eleven permanent photopoints were established, six on the middle island and five on the lower (Map 2). Photopoints were located to record representative views of each plant community present. They were located above the high water level, or as near to it as possible. Two or three different views were recorded at several photopoints, resulting in a total of 13 different views (slides included in Appendix).

Each photopoint is marked with a rebar stake 1-3 ft tall and painted red. Attached to each stake is a metal tag with the photopoint number. Landmarks were used to describe the locations (see Appendix).

For each view, we recorded the compass direction in which the camera was pointed (declination set to zero; see Appendix). A focal length of 35 mm was used consistently with the camera mounted on a tripod 4 ft above the ground. The camera was tilted in the vertical plane to compose each shot to best show the plant community. Most views include a 4-ft, red-and-white photostick marked in 1-ft increments.

Summary and Recommendations

Because rivers are natural corridors for the dissemination of plants it is not surprising to find a high percentage of weeds and several exotic shrubs and trees on islands in the Clearwater river. Presently, the most serious weed problem in the ACEC is the abundance of *Centaurea maculosa* (spotted knapweed) on the middle island. Although *C. maculosa* usually invades where there is soil disturbance, it is commonly found on sand bars and it may have invaded the island grassland after a fire or a flooding event. The presence of the annual, *Centaurea solstitialis* (yellow star-thistle) is equally troubling because of its ability to spread rapidly.

The main drawback to chemical control of *C. maculosa* would be the likelihood of harming native forbs and trees. It is possible that *C. solstitialis* could be controlled at this point by a combination of hand-pulling and chemical treatment. An ongoing monitoring and control program would be required to combat continuous invasion and spread. Any attempt at eradication should be followed up with seeding of affected areas with adapted native grasses.

In spite of the weed problems however, the islands offer good examples of several plant communities that have been degraded by cattle grazing elsewhere in the Clearwater valley—*Pinus ponderosa*/*Agropyron spicatum* and *Populus trichocarpa*/*Festuca idahoensis*. Although water level varies sporadically throughout the summer as a result of Dworshak dam, cobble bar communities still seem to represent a natural riparian system and annual flooding keeps them virtually free of noxious weeds.

In light of this botanical survey and the management objectives of the RNA/ACEC, I would make the following recommendations:

- The Habitat Management Plan developed in 1981 should be amended to include RNA/ACEC objectives for the protection and maintenance of botanical values. Planting of non-native species is not compatible with RNA goals.
- Invasion and spread of noxious weeds should be monitored to determine whether weeds are replacing native communities. A program of plant-specific spraying or hand pulling may be required for control. Any form of weed eradication should include seeding of treated areas with adapted native grasses.
- Vegetation monitoring plots should be initiated by the BLM for detailed, long-term monitoring.

References

- Asherin, D.A. and M.L. Orme. 1978. Inventory of Riparian Habitats and Associated Wildlife along the Lower Clearwater River and Dworshak Reservoir. Idaho Cooperative Wildlife Research Unit, College of Forestry, Wildlife and Range Sciences, University of Idaho. 267 pp plus appendices.
- Daubenmire, R. 1970. Steppe Vegetation of Washington. Washington Agricultural Experiment Station Bulletin No. 62. 131 pp.
- Franklin, J.F. and C.T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. USDA Forest Service General Technical Report PNW-8.
- Huschle, G. 1975. Analysis of Vegetation along the Middle and Lower Snake River. MS Thesis. University of Idaho. 271 pp.
- USDI-BLM. 1981. Clearwater River Islands Goose Nesting HMP. Cottonwood Resource Area Headquarters, Bureau of Land Management, Cottonwood, Idaho. 6 pp.
- USDI-BLM. 1989. Plan Amendment for the Emerald Empire and Chief Joseph Management Framework Plans to Designate 12 Areas as Research Natural Areas (RNA) and/or Areas of Critical Environmental Concern (ACEC). Coeur d'Alene District, Bureau of Land Management, Coeur d'Alene, Idaho. 65 pp.

APPENDIX
PHOTOPOINT LOCATIONS AND SLIDES

Photopoint locations

Note: all bearings assume declination set to zero.

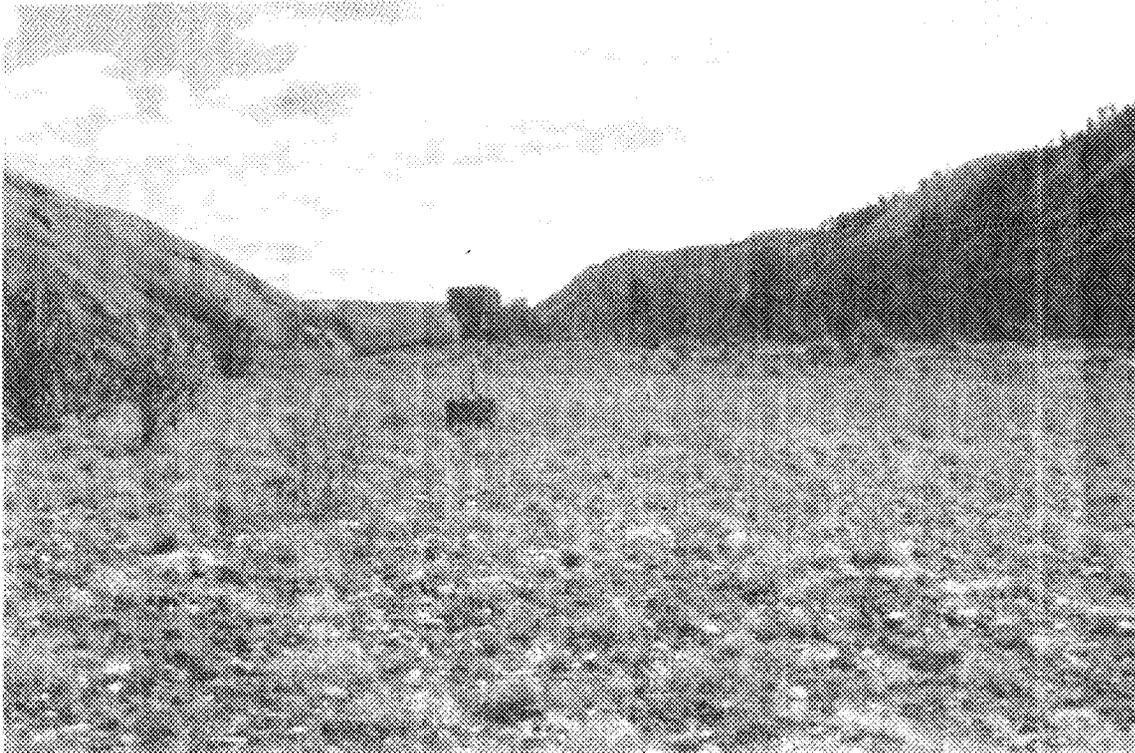
Middle (east) Island

- #1 Largest cottonwood in SE quadrant of island is landmark. Go 8.5 ft from tree at bearing of 30°. Red rebar is 1 ft tall. Take photo at bearing 45°.
- #2 From same tree as photopoint #1, go 20 ft at bearing 360°. Shoot due west. (marked with red rebar)
- #3 In the NE quadrant, well within the POTR/FEID zone, there is a large, 5-stemmed cottonwood surrounded by numerous saplings. Go 30 ft due W. Shoot at bearing 250° (toward locust colony). Nesting box will be out of picture to right. Marked with 2-ft red rebar and metal tag.
- #4 In SW quadrant near nesting box that is above channel separating middle and lower islands. Shoot at 80°
- #5 From same point as #4, shoot at 300°. Large locust in center of photo.
- #6 From #2, Shoot at 45°, toward upper gravel bar. Young POTR on right.
- #7 NE quadrant, within *Salix* zone; go to a mature cottonwood that is the furthest NE. Stand due north exactly 20 ft and shoot at 260° (W). This point will be in water in early summer. NOT MARKED WITH REBAR.
- #8 South side of island at approx. midpoint, 69 ft at 140° from nesting box #5, and just above normal high water. Shoot due east. ARLU-sandbar community.

Lower (west) Island

- #1 South side of island between water and PIPO/AGSP community, 48 ft due south of nesting box (box is in plain site from this side of island). Shoot at 90°.
- #2 From same point as #1, shoot at 50° (CHVI zone upslope from cobble bank).
- #3 Up on highest surface of island in clearing among PIPO, 20-30 ft W of rather large PIPO. Shoot W, looking across sharp drop into gully with *Saponaria* in it. 3 ft red rebar.
- #4 Approx. 80 ft due N of #3 at lower level, but still in PIPO/AGSP. Shoot due east with young pines to right, within photo.
- #5 NW side of the large flood channel that runs through island, near highest elevation on this side (channel has POTR in it). Approximately lined up with 2 nesting boxes. Shoot at 45°.

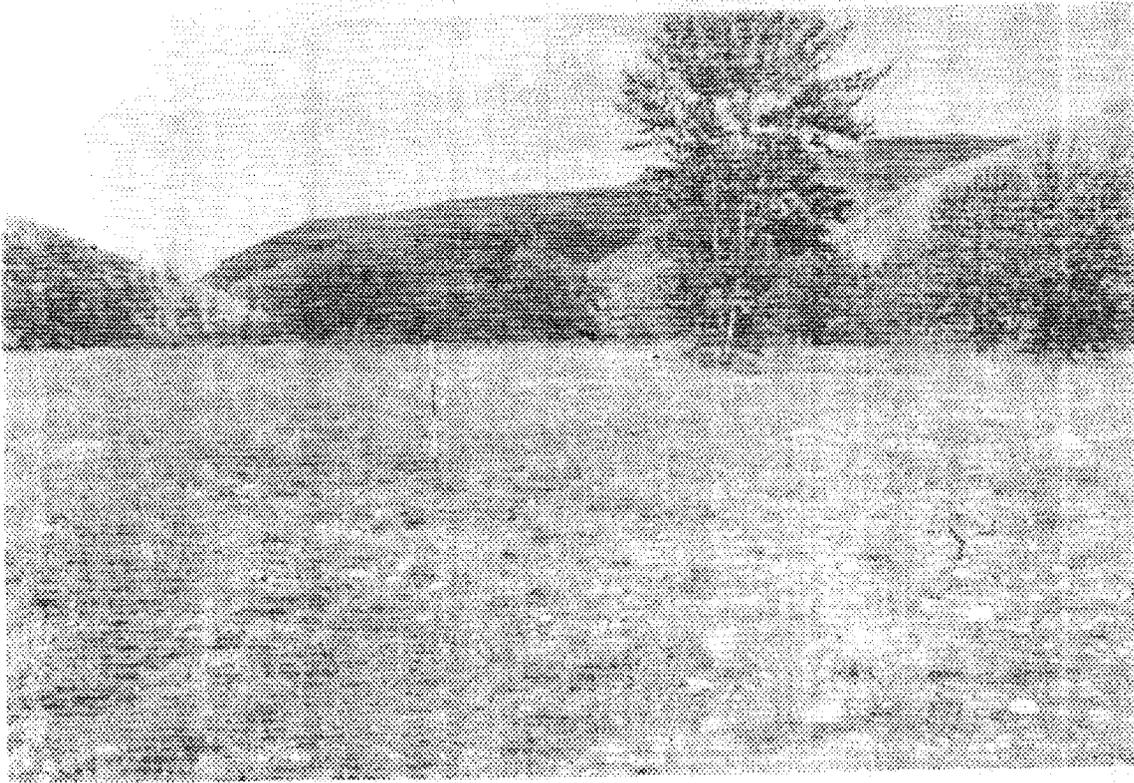
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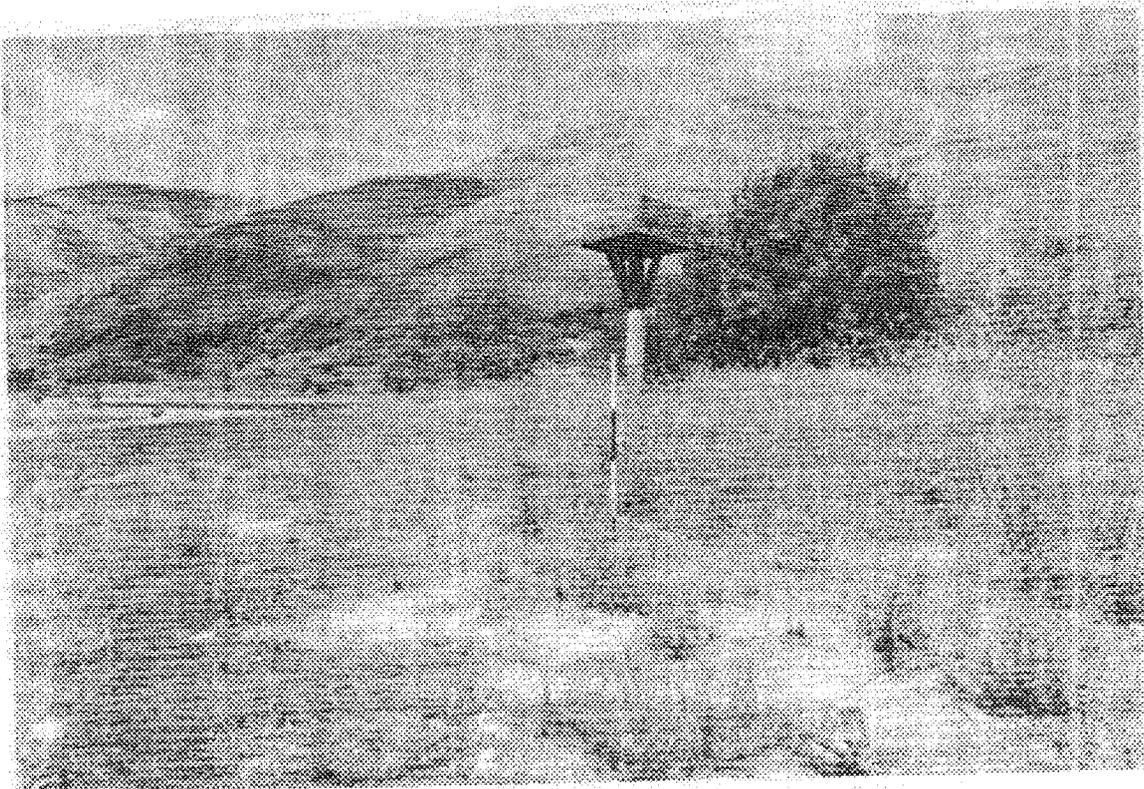
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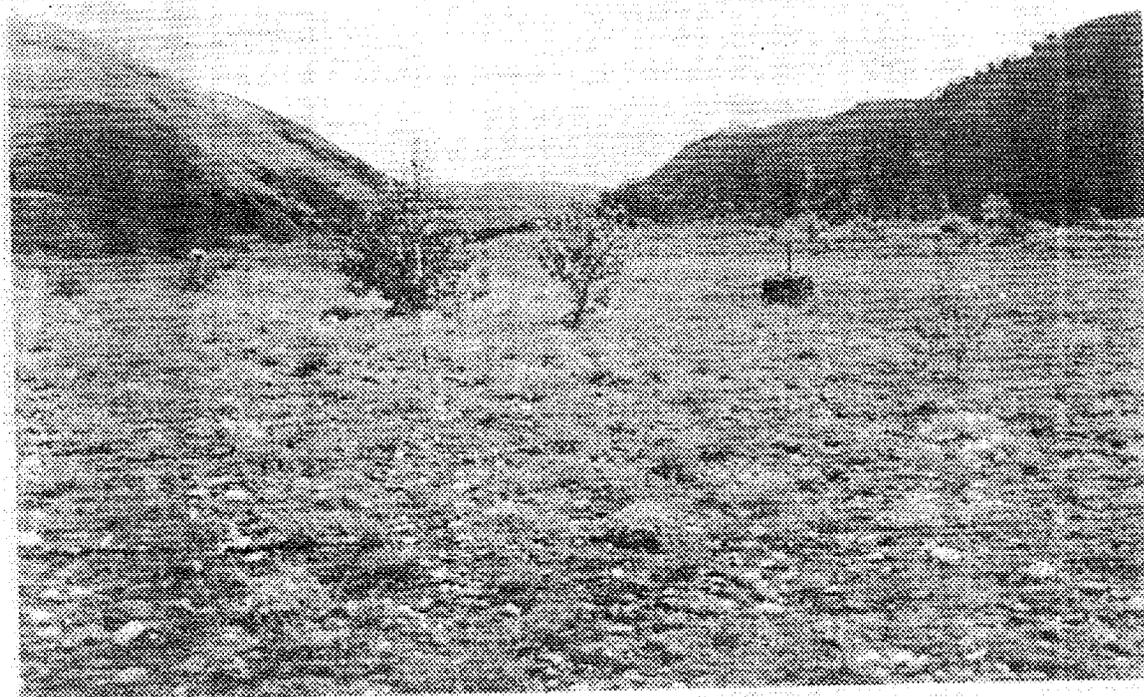
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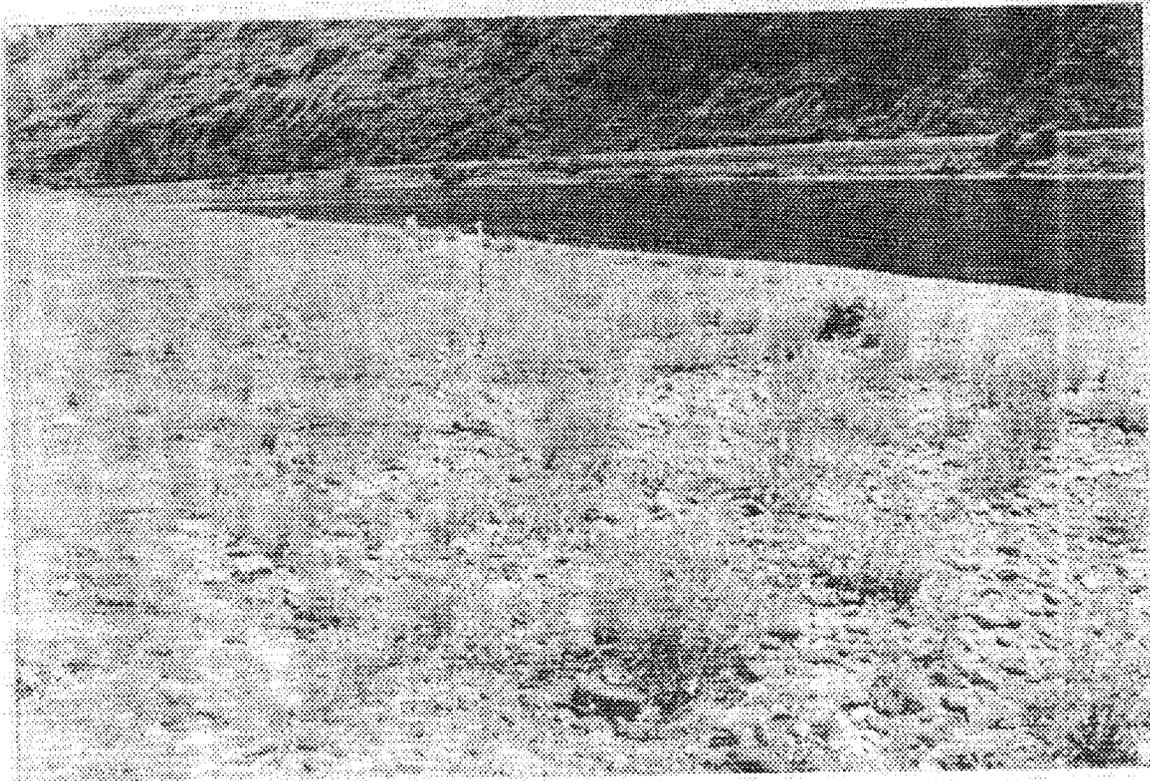
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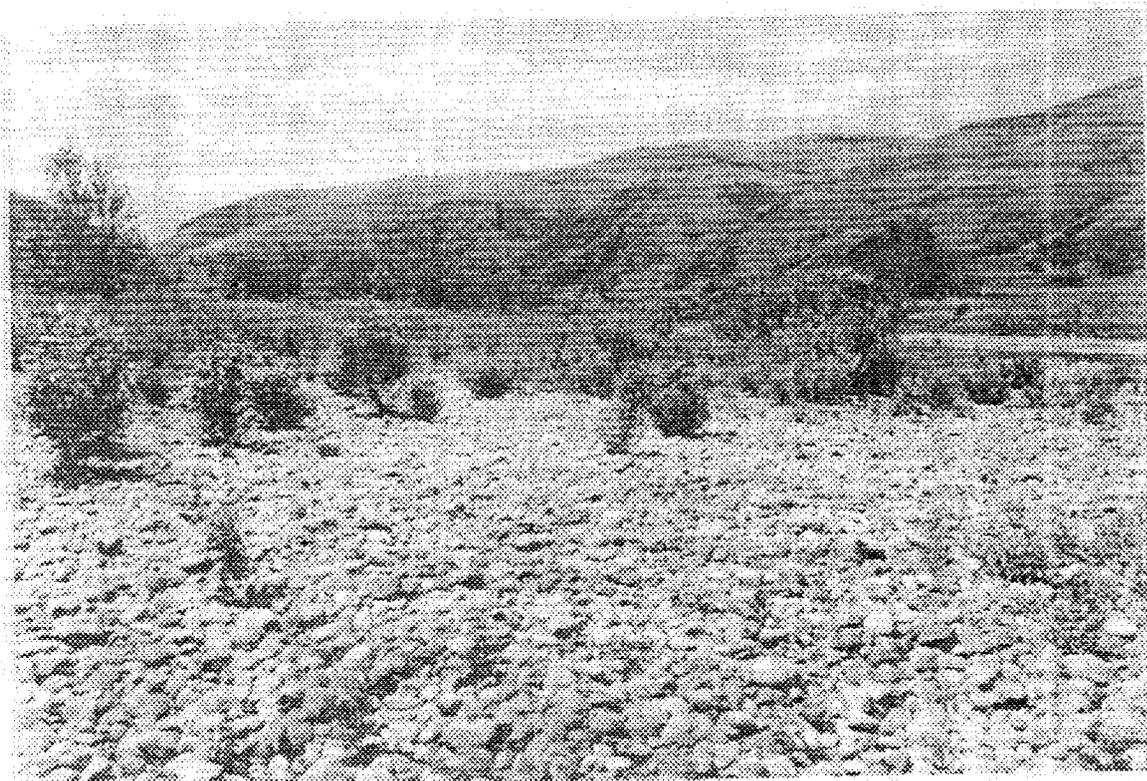
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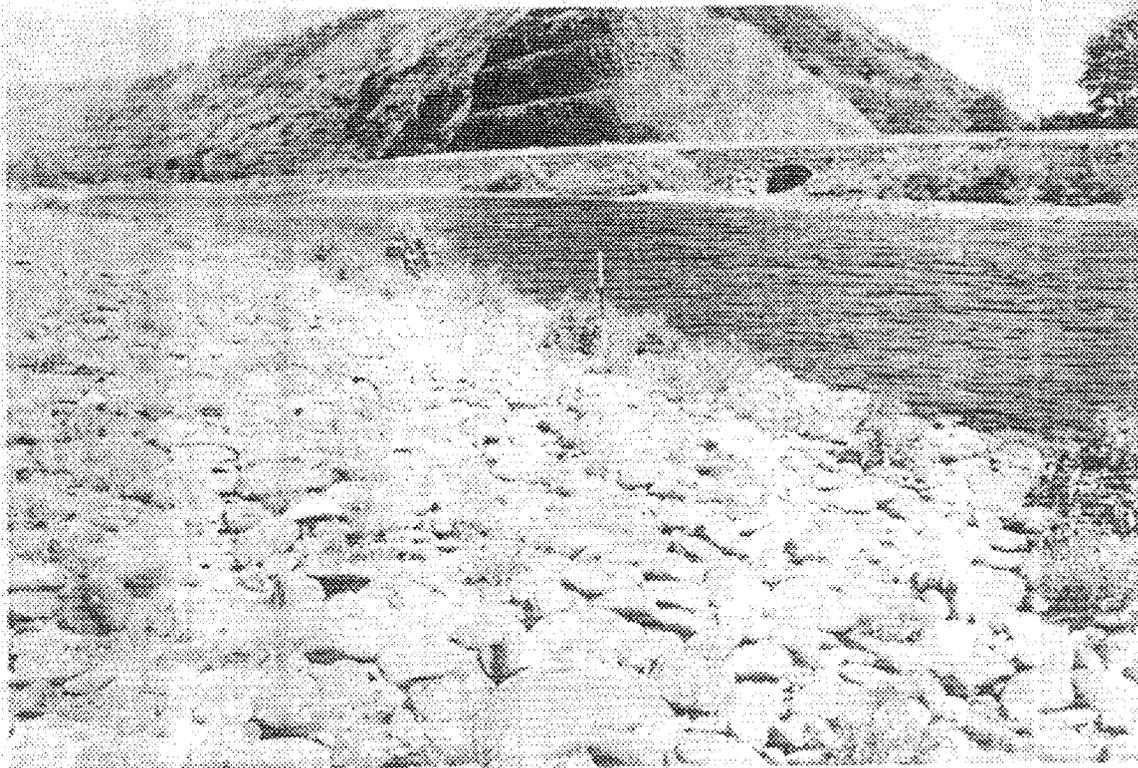


- #7 NE quadrant, within *Salix* zone; go to a mature cottonwood that is the furthest NE. Stand due north exactly 20 ft and shoot at 260° (W). This point will be in water in early summer. NOT MARKED WITH REBAR.

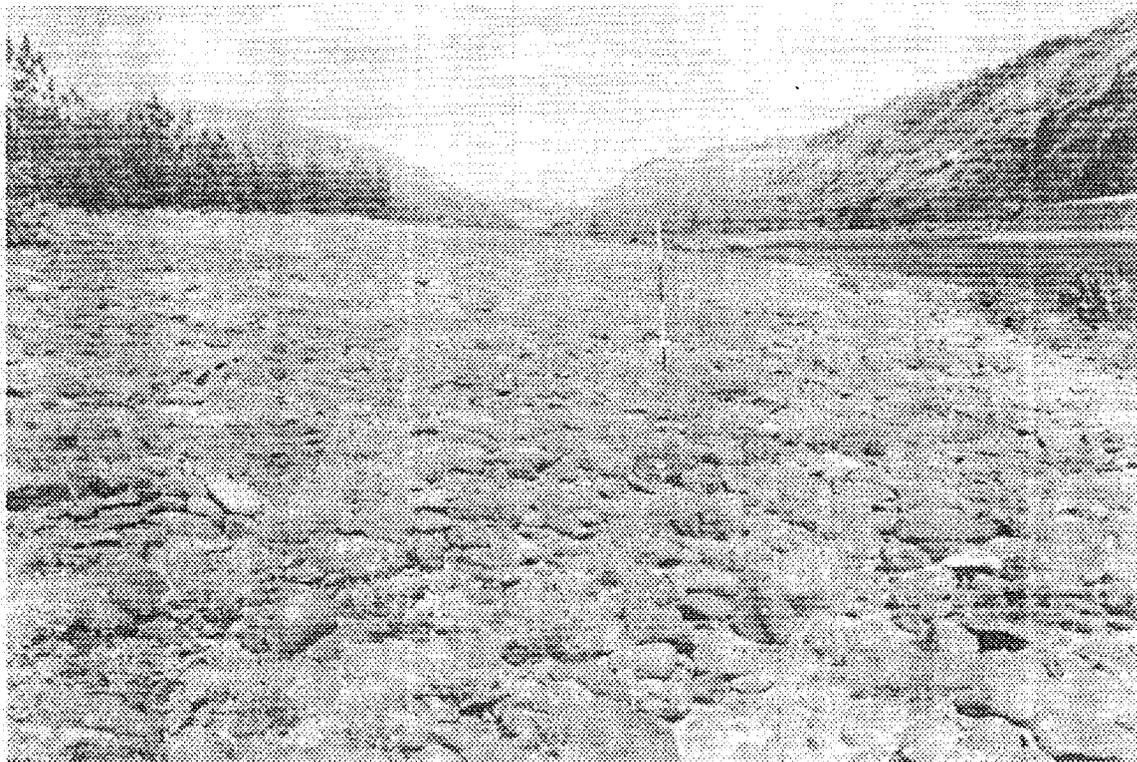


- #8 South side of island at approx. midpoint, 69 ft at 140° from nesting box #5, and just above normal high water. Shoot due east. ARLU-sandbar community.

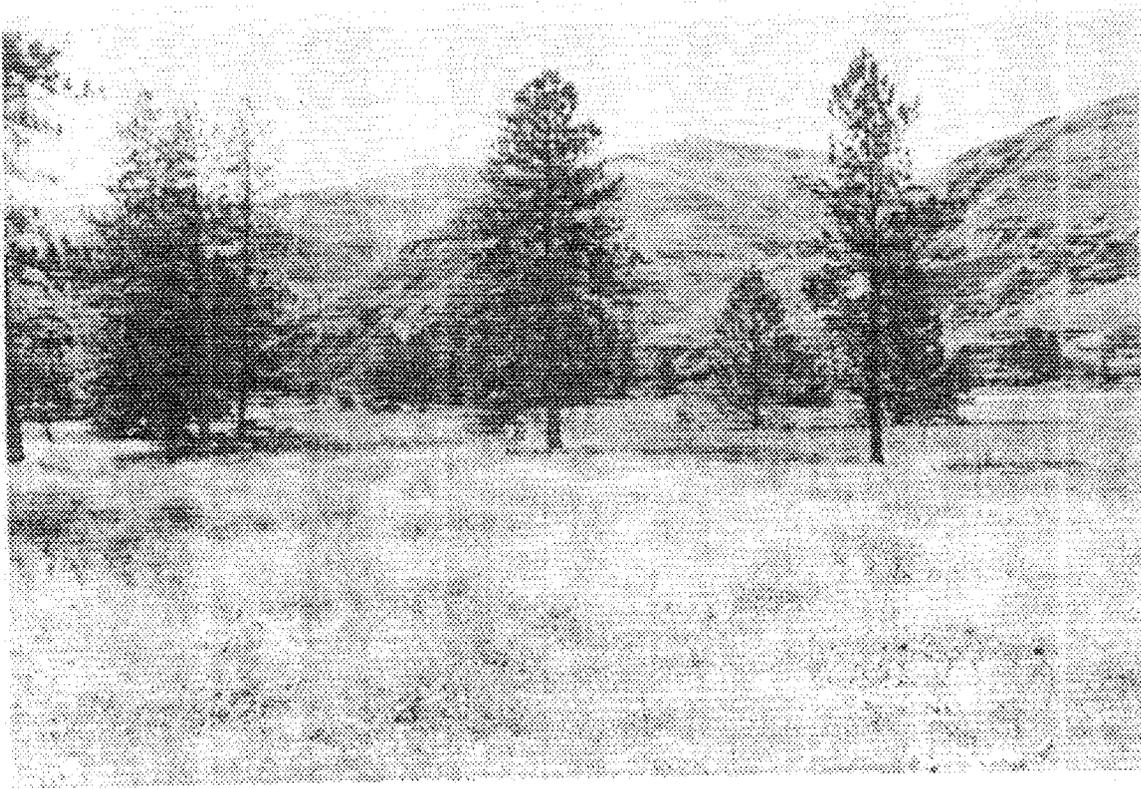
Lower (west) Island



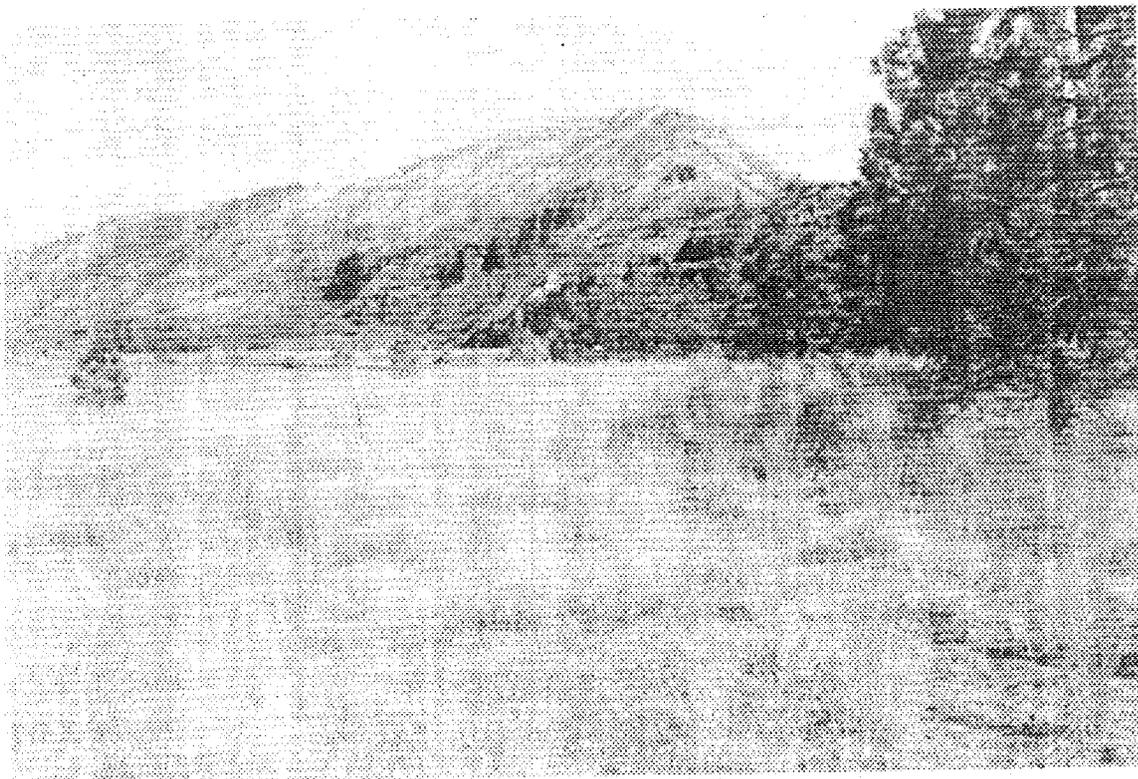
- #1 South side of island between water and PIPO/AGSP community, 48 ft due south of nesting box (box is in plain sight from this side of island). Shoot at 90°.



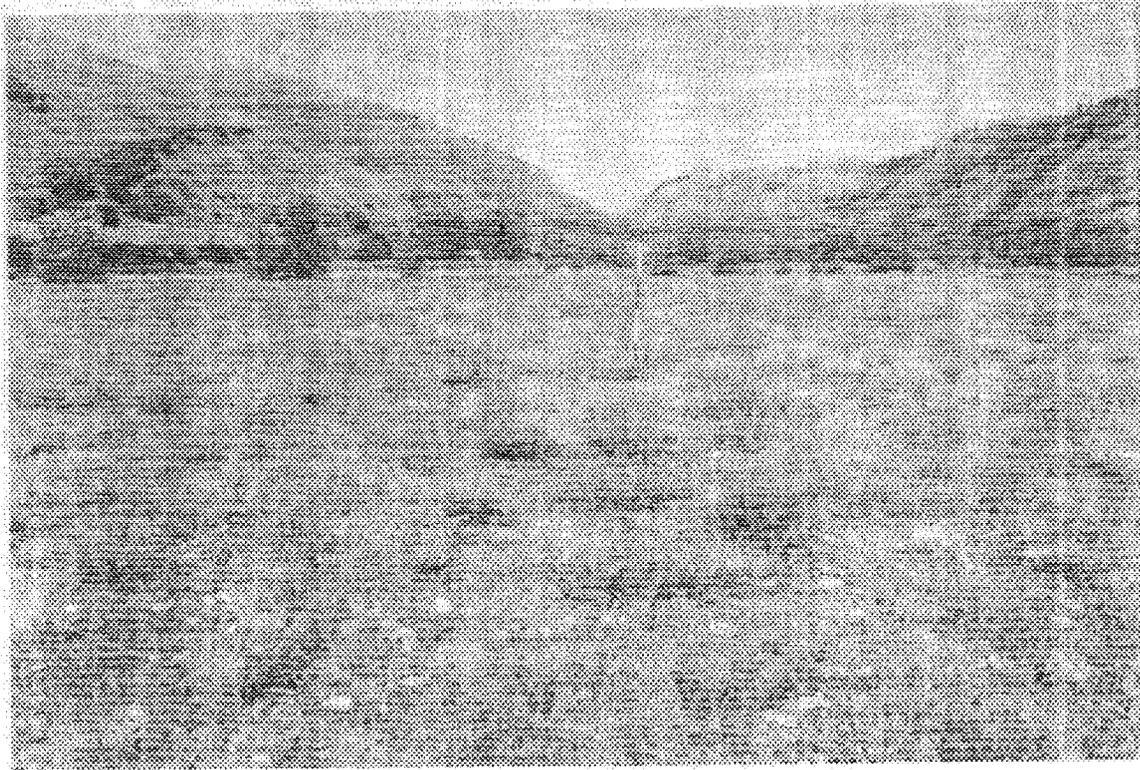
- #2 From same point as #1, shoot at 50° (CHVI zone upslope from cobble bank).



- #3 Up on highest surface of island in clearing among PIPO, 20-30 ft W of rather large PIPO. Shoot W, looking across sharp drop into gully with *Saponaria* in it. 3 ft red rebar.



- #4 Approx. 80 ft due N of #3 at lower level, but still in PIPO/AGSP. Shoot due east with young pines to right, within photo.



#5 NW side of the large flood channel that runs through island, near highest elevation on this side (channel has POTR in it). Approximately lined up with 2 nesting boxes. Shoot at 45°.

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BLM-ID-PT-93-01-4352