SURFACE WATER RESOURCES of COLUMBIA COUNTY

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SURFACE WATER RESOURCES OF COLUMBIA COUNTY

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INTRODUCTION

Man at leisure commonly looks to natural resources for recreation. The resources with perhaps the most potential for recreation are the lakes and streams. Here he can be angler, boater, water-skiier, swimmer, sailor, duck hunter, or passive observer, as he so chooses. As more people engage in a variety of water uses there becomes less space for each activity and each participant, and conflicting and sometimes dangerous overlaps of use occur.

The high standard of living enjoyed today by Americans has resulted in an increased amount of leisure time available to pursue recreation. This has been accompanied by an expansion in swimming, motorboating, canoeing, water-skiing, fishing, hunting, skin diving, and other water sports. Domestic, agricultural and industrial activities are also demanding more water than ever before due to the population growth.

These various water uses are seldom in harmony. Conflicts arise and often one interest may control the water to the exclusion of other factions. A method of apportioning water use must be sought in order to maintain harmony and assure that the resource is equitably utilized. As a result, the State Legislature, in 1959, directed the Conservation Commission to develop a classification system for lakes and streams according to use. Before an actual classification system can be devised, it is necessary to obtain information regarding number, size, physical and chemical characteristics of lakes and streams as well as the present and potential uses of the water resource. A county waters inventory, such as this one, is our effort to provide this information.

Inventories are prepared on a county basis with emphasis placed on completion of data collection in the areas of greatest use pressure; southeastern Wisconsin, close to population centers; northeastern Wisconsin, the heaviest concentration of lakes; and northwestern Wisconsin, near the Minneapolis-St. Paul complex. Each inventory is designed to present the quantity, quality, and character of the water resource with respect to its use for recreation and its problems of conservation.

This inventory is best described as an extensive survey of surface water resources in Columbia County. Due to the urgency of the demand for these data and the immensity of the task, data collection was carried out without regard for season and and was limited to single visits. It is, therefore, obvious that information such as depth, water analysis, bottom types, transparency and fish species data may not be complete, but it is expected that as time permits, additional facts will be collected. In many instances, it was possible to run only one water analysis or make only a few depth soundings; transparency would vary according to light and water conditions at the time of measurement, and so on. However, here for the first time, is a complete collection of all available data for all surface waters in this county, a set of vital statistics useful in measuring the present condition of the waters and in planning for their future management.

Data for this inventory were gathered from many sources, principally aerial photographs, U.S.G.S. maps, Conservation Department water files, interviews with agency representatives and personal field work. Comprehensive surveys were not possible because of definite time limits. The report is concerned primarily with recreational use of water, so little consideration was given industrial and agricultural

use save where conflicts of interest were paramount. For each body of water General Waters Data Forms were prepared. These gave a physical and chemical picture, resource value and use picture of each lake and stream.

The maps in this publication were abstracted from Highway Commission maps, supplemented by data from U.S.G.S. maps and aerial photographs further corrected by field observations. Nevertheless, readers are cautioned that these maps should not be considered or used from any legal or regulatory standpoint because of natural or man-made changes which may have occurred.

GENERAL SETTING OF THE WATERS OF COLUMBIA COUNTY

Columbia County, in south central Wisconsin, lies within three major watersheds (Figure 1). The Wisconsin River drains the west and central areas; the Rock River system drains the southeast area, and the north central area is drained by the Fox River. The land surface elevations are varied from the high Baraboo quartzite range west of the Wisconsin River (elev. 1200-1400'), to the Wisconsin River at Prairie du Sac (elev. 740'). The divide between Wisconsin and Rock drainage is about 1100 to 1150' above sea level (Weidman and Schultz, 1915).

The county has a complex, still not completely understood, glacial history. Terminal moraines of the Lake Michigan Lobe of the Late Wisconsin Ice Sheet lie beyond the county touching only in the extreme west. Recessional moraines of much less amplitude remain in the center of the county, left by some slight halt in the retreat of the glacier. The majority of the county consists of ground moraine with gentle slopes. The valleys of Neenah Creek and the Fox River below Portage occupy an area of glacial lake deposits characteristically broad and flat. In this area the glacial lake in the Winnebago and Fox River valleys discharged to the Wisconsin River (Alden, 1918).

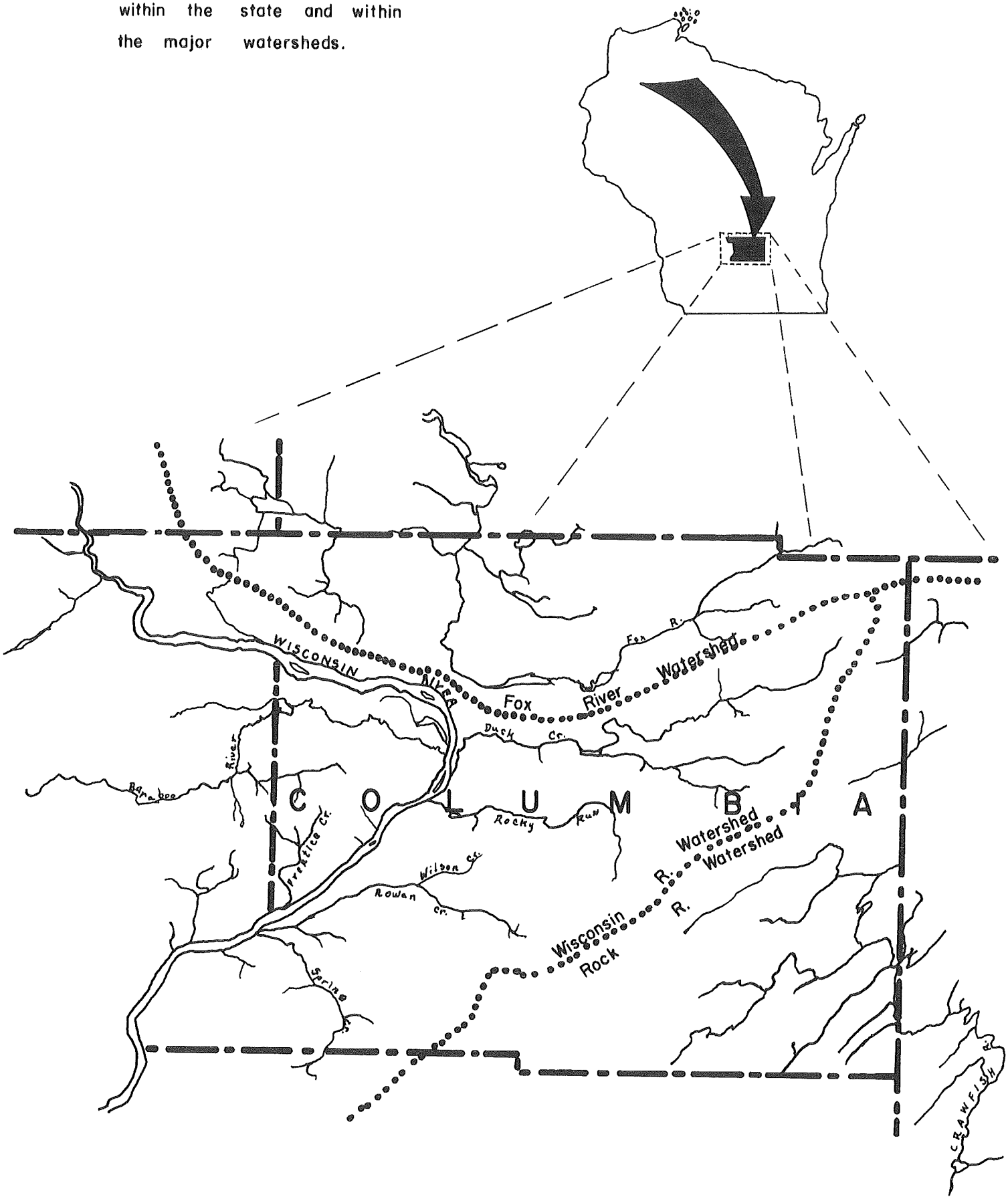
Underlying bedrock strata are perhaps more important to the present relief of Columbia County than were glacial processes alone. The Baraboo Range, for example, is a quartzite monadnock, buried by sandstone and dolomite and partly exhumed, all presumably in preglacial time (Martin, 1932). Upper Cambrian sandstone, stripped of its mantle of dolomite, borders the range and extends over the north and west parts of the county as the principal bedrock. Since it offered little resistance to the erosive glacial forces, the ground moraine on this area is relatively flat, save for scattered end moraine hills.

The drainage divide across the center of the county rests on the escarpment of Prairie du Chien dolomite earlier referred to as the Magnesian Cuesta. The escarpment is very irregular and forms several prominent ridges in eastern and south central Columbia County. On these ridges the drift is thin and lacks morainal topography, whereas, elsewhere the drift is broad and thick. In the town of Westpoint the dolomite is eroded so far that the uplands are high above valleys eroded in the older sandstone.

The soils are varied from rich prairie soils in the south central, bordered by glacial loams, to glacial and fluvial sands and sandy loams in the northwest (Wilde, Wilson, White, 1949). The varied soils are primarily due to mixing of materials of local bedrock origin with materials carried some distance by the glacial ice. Soils in the northwest and north central part of the county are the least productive, while the southern prairie soils are most productive (WCRS, 1958)

Land use is illustrated in the forest inventory of 1958 (WCD, 1958). Commercial forest land comprises 24 percent of the land area. About 2 percent of the area is marsh and muskeg. Oak is the predominant forest type (35 percent of the commercial forest area). Lowland brush is next in area with 29 percent of the commercial forest land. This county has a larger percentage of its area in commercial forest than any other southeastern Wisconsin county.

FIG. 1 Location of Columbia County within the state and within the major watersheds.



Columbia County has an average annual precipitation of about 30 inches, most of which falls as rain from April through September. November is chacteristically a wet month with freezing rains heralding winter. December, January and March have highest snowfall. Table 1 presents characteristic climatic data.

Lakes in this region generally freeze in mid-December and remain so until late March or early April. Deep lakes are markedly stratified from early July through September. Their water is completely mixed in mid-November and mid-April.

Table 1. Climatological data for stations in and near Columbia County.

	Mean Monthly	Temperature Extremes	Precipitation Mean Annual	Precipitation Days with Rain	Precipitation Mean Snow
Montello	45.9°	105°, -45°	29.0"	64	34.8"
Dalton	45.8°	103°, -39°	28.5"	63	39.1"
Burnett	45.7°	112°, -43°	28.1"	59	33.9"
Portage	47.9°	111°, -33°	30.5"	63	41.4"
Reedsburg	46.5°	102°, -42°	31.2"	62	44.1"
Madison	46.6°	102°, -37°	30.1"	114	39.3"

Source: Wisconsin Climatological Data, Wis. Crop. Rptg. Ser., 1961.

ALPHABETICAL LISTING AND DESCRIPTION OF ALL LAKES AND STREAMS

Lakes

Each lake is described briefly in alphabetical order, in terms of its characteristics and resources. Location, area, degree of irregularity (S.D.F), and maximum depth are given in an abbreviated form. Other characteristics are described in detail, including origin, chemical qualities, depth characteristics, problems relating to water quality and resource protection, fish and game resources, and public use opportunities. Most of the descriptive terms are defined in section IV of the appendix. Aids for the geological classification of lakes were provided by publications of Zumberge (1952) and Scott (1921).

Maps are provided illustrating fish resources (Figure 2), wetlands (Figure 4) and public use opportunities and public lands (Figure 5). In addition, physical and chemical data on all lakes have been summarized in tabular form (Appendices I, IA, II, and IIA).

Alder Pond T10N, R7E, Section 34
Surface Acres = 4.2, S.D.F. = 1.39, Maximum Depth = 26 feet

A small landlocked kettle lake in the terminal moraine north of Fish Lake. The pond has light brown, soft water and is bordered by floating bog fringed with alders. Because of the protection afforded its surface by high surrounding hills and the alder shoreline the lake has a very shallow layer of warm oxygenated water in midsummer. Panfish comprise a limited fishery. Public access is not available. Waterfowl nest and rest here.

Becker Lake T13N, R10E, Section 14
Surface Acres = 29.6, S.D.F. = 1.38, Maximum Depth = 8 feet

A shallow landlocked lake in a marshy depression in the ground moraine. The water is light brown and infertile. The bottom is entirely mucky and the water is largely less than three feet deep. In dry years this old lake recedes to a fresh meadow with several shallow marsh pockets. Winterkill, weeds, and fluctuating water levels are therefore obvious problems to management. There are about 57 acres of adjoining wetlands at present. The lake has no public access, no dwellings, and is only lightly used by waterfowl.

Corning Lake T13N, R7E, Section 10
Surface Acres = 27.2, S.D.F. = 1.78, Maximum Depth = 4 feet

A shallow bog lake in a large area of marshy deposits. Hills to the east and west rise in the terminal moraine. The water is dark brown and moderately fertile. Winterkill and weeds are use problems. The lake is connected to the Wisconsin River by a channelized stream and may have panfish fishing at times. Public access is lacking. About 53 acres of wooded swamp adjoin the lake. This could be called a wilderness lake with the exception that a hunting lodge exists near shore. Fair numbers of waterfowl use the lake.

Crystal Lake T12N, R10E, Sections 1, 12
Surface Acres = 27.2, S.D.F. = 1.37, Maximum Depth = 12 feet

A shallow landlocked basin in marshy deposits in the ground moraine. The water is clear and quite fertile. Weeds are a major use problem. The fishery consists of largemouth bass, panfish and northern pike. Panfish predominate. Public access is lacking. About 180 acres of wetland adjoin the lake.

Dates Millpond T13N, R9, 10E, Sections 1, 6
Surface Acres = 96.0, S.D.F. = 3.38, Maximum Depth = 6 feet

A shallow impoundment of French Creek created by a feed mill dam with nine-foot head. The water is clear and fairly fertile. Largemouth bass, panfish and northern pike constitute the fishery; the lake is noted for its fine northern pike fishing. Winterkill and weeds may be use problems. Rough fish are present but do not constitute a problem. Public access is not available, however, boat liveries afford some use opportunities. There are few dwellings on the lake; thus it has a semi-wilderness appearance. About 146 acres of open marshland adjoin the lake. Fair numbers of waterfowl visit the lake and provide good fall shooting.

George Lake T12N, R9E, Section 13
Surface Acres = 33.2, S.D.F. = 1.24, Maximum Depth = 21 feet

A small landlocked lake bordering terminal and ground moraine. The water is clear and quite fertile. A thermocline forms at about 15 feet each summer. Weeds are a use problem. Panfish provide a fishery, augmented by the presence of largemouth bass. The lake is presently without public access, however, commercial facilities provide a degree of use. There are 36 acres of woody wetland contiguous with the lakeshore. This is primarily an important fishing lake.

Goose Lake T10N, R9, 10E, Sections 25, 19
Surface Acres = 72.8, S.D.F. = 1.42, Maximum Depth = 3 feet

A small landlocked lake in a marshy basin in the ground moraine. The lake is presently split by a town road on the north-south section line. The water is generally turbid and "hard" with an exceptionally high conductance. Cannery waste drainage no doubt contributes to the high specific conductance. In midsummer during cannery operations the chloride content of these waters becomes excessively high. The lake suffers from annual winterkill, fluctuating water levels, and possibly pollution. In a recent year, following mild winter conditions, bullheads survived successfully and provided a fishery. Public access is possible from the town road. The lake provides some rare opportunities to observe large numbers of swans and geese in spring.

Lantz Pond T10N, R7E, Section 36
Surface Acres = 4.1, S.D.F. = 1.80, Maximum Depth = 7 feet

A small landlocked pond remnant of an old glacial lake. The pond presently has a bog-cattail marsh center and a narrow belt of water on its circumference. Winterkill and fluctuating water levels are use problems. Bluegills and bullheads have been caught here at times. Public access is not available. Farm buildings are quite near its shores; therefore, waterfowl make little use of it.

Lazy Lake (Fall River Millpond) T11N, R12E, Sections 26, 27
Surface Acres = 174, S.D.F. = 3.25, Maximum Depth = 6 feet

An impoundment of the Crawfish River at the village of Fall River. A village-owned dam of about 10-foot head maintains the water level. The water is clear and quite fertile. Panfish, largemouth bass, and northern pike provide the fishery, with the lake being noted for producing good northern pike and bluegill fishing. Weeds and winterkill may be use problems. The lake was chemically treated to remove rough fish in 1958. A village park and two roads provide access for multiple use, and commercial facilities provide boats. About seven acres of wetland border the lake. Waterfowl make limited use of the area.

Long Lake T12N, R9E, Sections 12, 21
Surface Acres = 39.2, S.D.F. = 5.70, Maximum Depth = 8 feet

An elongate meander lake in marshy deposits seasonally inundated by the Wisconsin River. For most of the year the lake is landlocked with clear, moderately hard, slightly acid water. The basin is generally quite weedy in midsummer as water levels drop. Panfish provide the basic fishery, however, most river species are present at one time or another. Public access is provided by an unimproved road end. Waterfowl visit the area in fall and spring when most cottage dwellers are gone. Some ducks may nest here.

Lost Lake T12N, R8E, Section 34
Surface Acres = 1.6, S.D.F. = 1.13, Maximum Depth = 17 feet

A very small kettle lake in ground moraine deposits overlying the eastern end of the Baraboo Quartzite range. This is a seepage-drainage fed lake with an intermittent outlet that becomes Rowley Creek. The water is light brown and moderately hard. Panfish reportedly provide a fishery. Winterkill may be a major use problem. Public access is not available and the lake is wilderness in character. Since the lake is relatively remote waterfowl make little use of it.

Mud Lake T11N, R10E, Section 22
Other data unavailable

Mud Lake is not really a lake, since it is dry for most of the year or so shallow that only scattered open water areas are found. A land cover survey in 1939 described the area as sedge marsh. The wetlands inventory of 1956 gave a more detailed description, especially with respect to quality. The area was described then as principally drainable shallow marsh and nondrainable deep marsh, with scattered plots of shrub swamp. In spring and fall the open water area is much larger than otherwise, and visiting waterfowl, especially Canada geese and whistling swans are the object of much weekend sightseeing. The lake is described historically in the data summary as a wetland resource.

Mud Lake T12N, R9E, Section 5
Surface Acres = 11.6, S.D.F. = 2.10, Maximum Depth = 1 foot

A small shallow depression in marsh deposits at the base of a terminal moraine within the city of Portage. The lake is drained by wetlands to the Fox River. The water is clear and moderately fertile. Winterkill, weeds and fluctuating water levels are obvious problems, however, they do not detract from its value for waterfowl. Large numbers of ducks and geese frequent the area. City roads provide access. About 440 acres of wetland adjoin the pond.

Park Lake T12N, R10E, Sections 2, 3
Surface Acres = 219, S.D.F. = 2.56, Maximum Depth = 8 feet

A large, quite irregular impoundment of the Fox River in Pardeeville, created by a dam of 17 feet head owned by the village of Pardeeville. The water is quite fertile and often turbid, possibly due to wind action on the large shallow basin. Largemouth bass, northern pike, and panfish constitute the fishery. Public access is provided by a large city park which has 2,640 feet of lake frontage and a county access site north of town on State Hwy. 44. Commercial facilities are also available, and a youth camp uses part of the shoreline. Waterfowl are commonly present, taking advantage of the extensive shallow water.

Ryan Pond T10N, R7E, Section 21
Surface Acres = 7.8, S.D.F. = 1.41, Maximum Depth = 7 feet

A small man-made pond, dug in 1865 for farm purposes. The water is clear and "soft". Algae blooms are a definite recurring problem, coupled with fluctuating water levels and winterkill. At times the pond will support bullheads for several years. Public access is not available, however, a road fill borders the pond and is used on occasion by local anglers.

Silver Lake T12N, R9E, Section 6
Surface Acres = 51.8, S.D.F. = 2.18, Maximum Depth = 41 feet

A small, irregular landlocked kettle lake in the terminal moraine in Portage. The water is clear and moderately fertile. Weeds and stunted panfish are use problems. Largemouth bass, panfish and northern pike provide a fishery which is complemented with the annual stocking of rainbow trout. A city park provides easy access. About five acres of wetland adjoin the lake and provide suitable conditions for limited numbers of migrant and nesting waterfowl.

Spring Lake T12N, R10E, Sections 3, 4
Surface Acres = 17.2, S.D.F. = 1.38, Maximum Depth = 28 feet

A small drainage lake at the base of the terminal moraine in the village of Pardeeville. The lake is drained by the Fox River and has clear, fertile water. Northern pike and panfish constitute the fishery. Adequate public access is not available; the lake is therefore used only lightly for recreation. Waterfowl make limited use of the area for nesting and resting.

Swan Lake T12N, R9, 10E
Surface Acres = 419, S.D.F. = 2.27, Maximum Depth = 82 feet

An elongate deep drainage lake in the valley of the Fox River. The lake is fed and drained by the river and it has no dam structure to maintain its water level. The water is clear and quite fertile. A sharp temperature gradient exists at 25 feet below the surface in midsummer. Largemouth bass, panfish and walleye constitute the fishery. Carp are present but do not constitute a use problem. A town road end provides limited access for fishing and boating. Commercial facilities are not available. Over 300 acres of wetland adjoin the lake and outlet which provide suitable protection for waterfowl and marsh furbearers. Beaver have been active on the outlet in recent years.

Tarrant Lake T12, 13N, R12E, Sections 32, 5
Surface Acres = 18, S.D.F. = 1.68, Maximum Depth = 8 feet

An impoundment of Dutch Creek at Cambria, contained by a dam of 23 foot head owned by the village of Cambria. The pond is quite fertile and generally turbid. Weeds and algae are major summer use problems. Largemouth bass and panfish provide a fishery; bullheads are abundant. Carp, though present, do not constitute a problem. A village park provides access. There are 68 acres of wetland contiguous with the lakeshore. Waterfowl make limited use of the area.

Weeting Lake T13N, R7E, Sections 2, 3
Surface Acres = 34.0, S.D.F. = 1.55, Maximum Depth = 4 feet

A small landlocked swampy lake in lowland bordering the Wisconsin River. The water is light brown and only fairly fertile. The bottom is entirely muck covered. Winterkill, weeds and fluctuating water levels are major use problems. At times following high water conditions on the river, panfish may provide a short term fishery. Public access is not available, and the lake may be classed as wilderness. This is an important waterfowl lake with good nesting.

West Lake T12N, R10E, Sections 4, 5
Surface Acres = 18.8, S.D.F. = 1.07, Maximum Depth = 22 feet

A small landlocked kettle lake in marsh deposits in the ground moraine. The lake has clear moderately fertile water and a fishery for largemouth bass, panfish and northern pike. Abundant weed growth is a problem for fishing and the use of motorboats. Public access is not available. About 60 acres of wetland adjoin the lakeshore and extend to the nearby Fox River. Waterfowl nest and rest here.

(Lake) Wisconsin T10, 11N, R7, 8E
Surface Acres = 9,000, S.D.F. = 4.38, Maximum Depth = 24 feet

A major impoundment of the Wisconsin River in southern Wisconsin created in 1914. The lake is maintained by a dam of 38-foot head owned by the Wisconsin Power and Light Company. The water is brown and moderately fertile. Largemouth bass, panfish and walleye are most common in the fishery. Other species contributing to the catch are muskellunge and northern pike and sturgeon. This lake is the most southerly lake in Wisconsin having a sturgeon population, and one of only a few. Use problems are weeds, algae, carp, and pollution. The shallow bays and backwaters are subject to winterkill during severe winters. This situation amplifies the pollution problem and the surviving fish often have a disagreeable flavor that lasts until the spring thaw. Public access is provided at many sites, and numerous commercial facilities provide additional use opportunities. Unique access and fishing situations are provided by roads which cross arms of the impoundment. Also, it is crossed by one of the few remaining inland ferries. Nearly one thousand acres of lowland marsh adjoin the lake. Waterfowl are numerous, important visitors year-round. In winter one may observe American eagles below the dam at Prairie du Sac.

Wyocena Millpond T12N, R10E, Sections 21, 22
Surface Acres = 90, S.D.F. = 3.08, Maximum Depth = 3 feet

An irregularly shaped impoundment of Duck Creek in the village of Wyocena, maintained by a dam with 8-foot head. The water is clear and quite fertile. Algae and carp present a use problem in that they prohibit more desirable weed growth and restrict the depth to which light can penetrate. A city park, a proposed county park and several roads provide easy access. About 55 acres of largely woody wetland adjoin the inlet area of the pond. Waterfowl nest and rest here and can be considered as important users.

Unnamed Lakes

Those lakes which are unnamed or which have little known names not appearing on maps of the county, are listed in order determined by their location i.e., Town, Range, Section and numerical quarter-quarter section. Each is described in manner similar to that for named lakes. Unnamed lakes are usually small, less than 20 acres, and may commonly have extensive adjoining wetland. They generally experience severe fluctuations in water level which hinders any determination of their physical parameters.

T11N, R10E, Section 2 (2)
Surface Acres = 14.8, S.D.F. = 1.50, Maximum Depth = 8 feet

An impoundment on Rocky Run Creek, west of Rio. The dam washed out in recent years and was replaced by the landowner. About 65 acres of shrub swamp and fresh meadow adjoin the lake, and afford suitable habitat for waterfowl and marsh furbearers. Largemouth bass, bluegills, pumpkinseed, and bullheads sustain a fishery. Access for swimming is presently permitted by the landowner, however, public access as such is not available.

T11N, R10E, Section 26 (3)
Surface Acres = 6.15, S.D.F. = 1.09, Maximum Depth = 4 feet

A shallow landlocked basin completely surrounded by cultivated land and considered as wetland in a recent inventory. The lake has a low alkalinity perhaps reflecting runoff and rainfall as its major sources of water rather than intercept of the ground water table. Winterkill precludes establishment of a fishery. Its close proximity to Mud Lake Wildlife Area accounts for frequent use by waterfowl to escape from that large hunting area. Public access is not available.

T12N, R8E, Section 14 (10)
Surface Acres = 13.72, S.D.F. = 1.43, Maximum Depth = 5 feet

One of several borrow-pit lakes recently created in the process of obtaining sand fill for interstate highway construction. Because of its size this pond is deemed of significant value to be included in the inventory. Shallowness no doubt precludes establishment of a fishery. Public access is not available. Waterfowl make some use of the lake and may possibly nest here once vegetation becomes established along the shore and in the shallows.

T12N, R8E, Section 15 (3)
Surface Acres = 1.42, S.D.F. = 1.20, Maximum Depth = 6 feet

One of two small excavations for highway fill south of the interstate highway near the intersection of highway 33. Since the excavation intersected the ground water table it filled with water and is therefore considered quite similar to a natural lake. Winterkill may preclude fish management, however, the lake has not existed long enough to ascertain dissolved oxygen conditions in water. Public access is not available. Waterfowl values are doubtful since the lake is very close to a heavily traveled highway.

T12N, R8E, Section 15 (14)
Surface Acres = 8.25, S.D.F. = 1.22, Maximum Depth = 11 feet

One of two small excavations for highway fill along the interstate route. Water quality reflects the lake's position in the permeable sands of the Wisconsin River valley. Winterkill may be a problem, however, dissolved oxygen conditions in winter are as yet unknown . Public access is not available. Waterfowl make little use of the lake.

T12N, R9E, Section 5 (9)
Surface Acres = 2.13, S.D.F. = 1.00, Maximum Depth = 7 feet

A small, shallow, landlocked depression within the city of Portage. At one time it was presumably part of the larger Mud Lake separated now by a road grade. Winterkill and fluctuating water levels detract from its fishery value, and the use of shoreline and lake bed as a site for dumping sanitary fill detract from its aesthetic and waterfowl values. Access is possible though difficult from a county trunk highway near the north shore. Presumably all frontage is in public ownership.

T12N, R9E, Section 7 (2)
Surface Acres = 0.71, S.D.F. = 1.00, Maximum Depth = 7 feet

The larger of two small ponds in a 4.4-acre park in the city of Portage, managed as a children's fishing pond. Bluegills and black crappies provide most of the angling opportunity. City wells and runoff are the major water sources. Weeds and winterkill are use problems. The pond is used for ice skating in midwinter

T12N, R9E, Section 7 (5)
Surface Acres = 0.2, S.D.F. = 1.12, Maximum Depth = 5 feet

One of two small, shallow landlocked ponds in a city park in Portage, managed as a children's fishing pond. Bluegills and black crappies constitute the fishery. Winterkill is a use problem, however, the lake is normally restocked each year. The pond is quite small, and is primarily of aesthetic value.

T12N, R9E, Section 20 (12)
Surface Acres = 2.10, S.D.F. = 2.17, Maximum Depth = 1 foot

A shallow remnant of an oxbow lake in the Baraboo River flood plain. At high river stages the stream fills this lake; as the water recedes it drains again to the present river channel leaving a pool only 2-3 feet deep at the most. Therefore, fish may be present part of the year (northern pike, largemouth bass, panfishes) yet are not a perennial population. The oxbow is excellent habitat for wood ducks. Public access is not available.

T12N, R9E, Section 29 (4)
Surface Acres = 0.70, S.D.F. = 1.36, Maximum Depth = 4 feet

An oxbow of the Baraboo River, near its mouth. The larger part of this lake has been somewhat enlarged artificially, and has in recent years been used as a holding pond by a commercial fisherman. A stake fence prevents easy access for river fishes. Public access is not available. Wood ducks along the rivers may find refuge in that part of the oxbow not used as holding pond.

T12N, R9E, Section 29 (13a)
Surface Acres = 0.84, S.D.F. = 5.60, Maximum Depth = 2 feet

A shallow, weedy oxbow of the Baraboo River near its mouth. All adjoining land is wooded; much is in lowland hardwoods. Waterfowl from the Wisconsin and Baraboo Rivers use this and other area oxbow lakes to some extent. Fishery value is negligible since the lake no doubt freezes out each winter. The aesthetic values of such areas are quite high. Public access is not available, the entire area has a wilderness quality.

T10N, R7E, Section 29
Surface Acres = 5.93, S.D.F. = 1.49, Maximum Depth = 5 feet

A small, shallow landlocked lake. Winterkill precludes maintenance of a fishery. Other common problems are fluctuating water levels (may be dry some years) and algae blooms. Public access is not available. In wet years fair numbers of waterfowl may use this and other nearby potholes for nesting and resting sites.

T10N, R8E, Section 11 (6)
Surface Acres = 1.22, S.D.F. = 1.29, Maximum Depth = 3.5 feet

A small shallow, acid soft-water lake, which drains intermittently through fresh meadow to Lake Wisconsin. Winterkill precludes establishment of a fishery. Public access is not available. Aesthetic value is high due to woodlands and other intermittent ponds nearby.

T10N, R8E, Section 19 (7)
Surface Acres = 1.31, S.D.F. = 1.31, Maximum Depth = 5 feet

A small shallow pond in pastured land. The pond is seepage-fed and has no outlet, though a dry ditch does lead down the valley. Live stock water here and fair numbers of waterfowl rest here in fall. There are no fishery values; the pond may disappear in exceptionally dry years. Public access is not available. Marsh vegetation entices waterfowl.

T10N, R8E, Section 20 (6)
Surface Acres = 4.67, S.D.F. = 1.09, Maximum Depth = 10 feet

A small seepage lake in a valley between terminal moraines. An intermittent outlet drains this wet valley to Spring Creek (Lodi) and provides access for northern pike, largemouth bass, and crappies in spring. Marl has been dug here in the past and some marl beds may still be found in the lake bottom. Seepage may be sufficient to prevent winterkill. Public access is not available. The adjoining open marsh of about 245 acres adds value for nesting and resting waterfowl.

T11N, R8E, Section 1 (8)
Surface Acres = 31, S.D.F. = 1.15, Maximum Depth = 5 feet

A shallow, landlocked lake in a drift basin west of the Wisconsin River. The shoreline is pastured and has only a narrow fringe of marsh vegetation. Winterkill precludes establishment of a fishery. Fluctuating water levels and nearness to the interstate highway detract from its value for wildlife. Public access is not available.

T11N, R9E, Section 26 (6)
Surface Acres = 4.91, S.D.F. = 1.03, Maximum Depth = 3 feet

A small shallow impoundment on the headwaters of Hinkson Creek. A dike provides about 5 feet of head. Winterkill is no doubt a major problem, as are weeds, algae, fluctuating water levels, and possibly agricultural runoff, which may cause these problems. Public access is not available. Closeness to a state highway may limit use by waterfowl.

T12N, R9E, Section 32 (9)
Surface Acres = 0.71, S.D.F. = 1.44, Maximum Depth = 3 feet

A small lake which occupies part of a meander scroll of the Wisconsin River. Adjoining lands are open grassy swamp and timbered swamp; therefore wildlife value is high. Waterfowl migrating in the river valley make fair use of this pond, and similar wet swales nearby. The water level is a product of river flooding, hence the pond may be nearly dry at times. Fishery value is negligible. Public access is not available.

T12N, R9E, Section 32 (12)
Surface Acres = 0.96, S.D.F. = 1.38, Maximum Depth = 4 feet

An open water area in a meander scroll along the Wisconsin River. The adjoining bottomlands are entirely wooded, concealing much of the water area from the air. The swale in which the lake lies parallels the river for nearly a mile before becoming a backwater of the river. Forage fishes are present, and it is probable that game fishes from the river may become trapped here following high water. Wood ducks and woodcock are common visitors. Public access is not available. Adjoining lands are owned by the Wisconsin River Power Company (now Wisconsin Power and Light Company) which grants various rights to adjoining landowners.

T12N, R10E, Section 4 (6b)
Surface Acres = 1.39, S.D.F. = 1.94, Maximum Depth = 6 feet

The smaller of two impoundments on the grounds of the Indian Trails Campgrounds. Runoff and seepage are the water sources. The pond is used principally as a swimming pool for campers and picnickers. Fishery values are negligible. Access is available but restricted to patrons of the campgrounds.

T12N, R10E, Section 7 (12)
Surface Acres = 8.23, S.D.F. = 1.00, Maximum Depth = 7 feet

A small shallow lake with intermittent outlet to Duck Creek. Fishery values are negligible since winterkill occurs annually and water level fluctuates considerably. Fair numbers of waterfowl frequent the lake in spring and fall. Public access is not available. Wetlands are limited to a fringe around the shore. The water is fairly turbid and part of the shore appears to have been pastured.

T12N, R10E, Section 16 (4)
Surface Acres = 2.31, S.D.F. = 1.27, Maximum Depth = 4 feet

A small spring-fed natural pond at the base of moraine hills, with a ditched outlet to Duck Creek. Land immediately adjoining the pond is floating bog. Winterkill precludes establishment of a fishery and closeness to busy state highway 22 somewhat detracts from value for waterfowl. However, small numbers of waterfowl visit the pond during spring and summer. Public access is not available. Adjoining wetlands comprise 119 acres.

T12N, R10E, Section 20 (12)
Surface Acres = 33.78, S.D.F. = 1.87, Maximum Depth = 7 feet

A moderately large wildlife impoundment which has inundated several beaver ponds and adjo8ning wetlands. The lake is spring-fed in addition to receiving local runoff. Its shallowness precludes management for sport fishes. Waterfowl production and its value as a resting site are prime values, however, might only remain so if shore lands are maintained in their present state (wooded, lightly pastured, and wild). Public access is not available. Beaver and muskrat gave ample evidence of their presence.

T12N, R10E, Sections 23, 24
Surface Acres = 14.54, S.D.F. = 1.46, Maximum Depth = 6 feet

An impoundment with head of five feet on Duck Creek, referred to locally as Figor's Mill. The head powers a substation providing electricity. It is owned by Mr. J. D. Figor who purchased it from Wisconsin Power and Light Company. Public access is not available, however, the stream is traversible by boat from a bridge a short distance upstream. The fishery is comprised of largemouth bass and bluegills. In 1961 the dam went out and was ordered restored by the Public Service Commission.

T13N, R8E, Section 34 (7)
Surface Acres = 4.99, S.D.F. = 1.05, Maximum Depth = 4 feet

A small, shallow borrow-pit lake near state highway 16 west of Portage. Submergent aquatic weeds choke the pond and shallowness precludes establishment of a sport fishery. Adjoining lands are uncultivated; this plus proximity to the Wisconsin River and extensive marshlands to the north add considerably to its value for waterfowl and other wildlife. Public access is not available.

T13N, R8E, Section 34 (8)
Surface Acres = 2.73, S.D.F. = 1.04, Maximum Depth = 3 feet

A small, shallow borrow-pit lake bordering the state highway west of Portage, near a large lake of similar origin. The pond is weed choked and shallow, yet has high aesthetic value and is frequented by a variety of wildlife. Public access is not available.

T13N, R9E, Section 9
Surface Acres = 5.87, S.D.F. = 1.62, Maximum Depth = 2 feet .

A shallow open-water area in grassy wetlands bordering the Fox River. The marsh at this point is sometimes called the dead river since it constitutes a backwater of the Fox. The pond is relatively inaccessible, sustains fair numbers of waterfowl and has high aesthetic value. Public access is not available. Winterkill prevents establishment of a fishery, however, it is possible that in wet springs northern pike from the Fox River may enter this marsh area to spawn.

T13N, R9E, Section 10
Surface Acres = 655, S.D.F. = 1.90, Maximum Depth = 5 feet (manipulated)

An irregular shaped large impoundment on French Creek near its junction with the Fox River. The lake is entirely within the 1,713-acre French Creek Public Hunting Ground. Northern pike, walleye, largemouth bass, and various panfishes constitute the fishery, having entered from the Fox River. Adequate access to launch, with parking, is provided by a county trunk highway crossing. Water levels are manipulated each spring to benefit waterfowl food plants in the area.

T13N, R9E, Section 14
Surface Acres = 23.24, S.D.F. = 1.69, Maximum Depth = 5 feet

The uppermost of two impoundments within the bounds of a 1,713-acre public hunting ground (French Creek). The lake lies on Spring Creek, a major tributary to French Creek. Water levels are manipulated in spring to benefit waterfowl food plants. The fish population consists of northern pike, and panfishes. Public access with suitable parking is available on the public lands. Waterfowl values are high with geese and several species of ducks frequent visitors.

T13N, R9E, Section 28 (1)
Surface Acres = 2.08, S.D.F. = 2.85, Maximum Depth = 3 feet

A small shallow oxbow lake of the Fox River north of Portage. The lake lies in grass and shrub swamp, and has considerable value for waterfowl. The nearby Fox River no doubt fills the oxbow during spring floods. Fishery value is negligible, and the lake may have been dry at times. Public access is not available. The entire Fox River floodplain is considered as wetland.

T13N, R10E, Section 20 (11)
Surface Acres = 1.78, S.D.F. = 1.34, Maximum Depth = 5 feet

A small pond on Spring Creek and a minor tributary created by a beaver dam. Adjoining land and much of the basin itself is wooded. Brook trout are reportedly present, as are forage fishes. Public access is not available and the lake could be classed as a wilderness pond. Muskrats, beaver and significant numbers of waterfowl, notably wood ducks, are common inhabitants.

T13N, R10E, Section 21 (12)
Surface Acres = 3.28, S.D.F. = 1.30, Maximum Depth = 2 feet

A shallow, wilderness lake in partly wooded wetlands. Aesthetic values are high and waterfowl are common fall residents, even though in dry years very little open water remains. A small ditch provides drainage to Spring Creek when water levels are high. The lake does not sustain a fishery at present, however, fishes moving upstream in spring may enter the lake under more suitable conditions. Public access is not available.

T13N, R10E, Section 35 (9)
Surface Acres = 0.95, S.D.F. = 1.14, Maximum Depth = 1.5 feet

A small, very shallow landlocked pond in pastured land, a short distance from the Fox River. A fish population is not present and the pond may dry in severe summers. A principal value of this pond is as refuge for geese and ducks forced off the river by fall shooting activity. Public access is not available. There are no adjoining wetlands.

T13N, R10E, Section 35 (15)
Surface Acres = 1.24, S.D.F. = 1.03, Maximum Depth = 3 feet

A small, landlocked bog lake near the Fox River. About 5 acres of primarily woody wetland border the lake and lend aesthetic value. Winterkill precludes establishment of desirable game fishes. Public access is not available. Several pairs of waterfowl may nest here since the lake is undisturbed.

Streams

Streams are described in an alphabetical sequence for named streams and by the location of their confluence with another stream or by the point at which they exit the county for unnamed streams. Data given in an abbreviated form describes physical and chemical characteristics, fish and game resources and opportunities for public use. Where public lands border a stream the area and linear miles of stream in public ownership are given. Data for all named streams are presented in tabular form (Appendix III). Pertinent data on small streams without names are presented in Appendix III; there are no descriptive paragraphs for these streams.

Baraboo River T12N, R9E, Section 28
Surface Acres = 151.5, Miles = 13.3, Gradient = 1.88 feet per mile

A major tributary to the Wisconsin River which drains a large watershed west of the river. The stream is generally turbid and causes extensive flooding in spring. Complaints of flood damage brought recent inquiries from the Army Corps of Engineers regarding control needs. The entire stream in this county is traversible by outboard craft. Walleye, northern pike, bass, and panfishes (including catfish) constitute the fishery, however, fishing pressure is quite light. Access is provided by two state highway crossings, by a small road and wayside park, and by navigable water both upstream and downstream. Waterfowl are common along the river, especially wood ducks which utilize the bank trees and large instream snags. About 824 acres of wetland adjoin the stream.

Beaver Creek T12N, R12E, Section 24
Surface Acres = 8.13, Miles = 6.1, Gradient = 2.46 feet per mile

A small, low gradient stream tributary to Beaver Dam Lake in Dodge County. The headwaters tributaries exhibit parallel drainage disciplined by drumlins oriented in a northeast-southwest direction. Since wetland swale drainage is the prime water source fluctuating water levels are an annual problem. Under optimum conditions the stream supports forage species. About five miles of stream have been straightened to speed drainage. Access is possible at four highway crossings. A large 424-acre wetland extends for several miles in the main stream valley.

Big Slough T13N, R8E, Sections 4, 9
Surface Acres = 50.4, Miles = 8.0, Gradient = less than 0.2 feet per mile

A wide slow moving stream tributary to Neenah Creek. During peak runoff periods, the stream floods. Formerly, it connected the Fox and Wisconsin River systems, since all adjoining lands are flat and marshy. Northern pike, largemouth bass, bluegills and black crappies constitute the fishery. Carp are present in problem numbers. One town road provides limited access. Over 1,580 acres of wetland adjoining the stream. It is possible to enter the stream by boat from Neenah Creek.

Crawfish River T10N, R12E, Section 12
Surface Acres = 85.5, Miles = 28.2, Gradient = 4.58 feet per mile

Headquarters of a major stream of the Rock River watershed, this stream flows first northeast, then southeast to drain much of eastern Columbia County. There are two major tributaries, Robbins Creek and North Branch, Crawfish River. Effects of impoundment at Columbus are felt more than a mile upstream. Bullheads, crappies, smallmouth bass, northern pike and walleyes are present; however, the fishery is primarily for northern pike. Buffalo, carp and suckers support an extensive spring dip-net fishery. Carp and pollution are major use problems. Access is possible at several county, town and state highway crossings. About 1,461 acres of wetland adjoin the stream.

Crawfish River, North Branch T11N, R12E, Section 27
Surface Acres = 44.72, Miles = 24.6, Gradient = 3.25 feet per mile

Major tributary to the Crawfish River, flowing northeast then southeast to join the mainstream south of the Fall River Millpond (Lazy Lake). A dam with 14-foot head impounds nearly 2.5 miles of channel at Fall River. Largemouth bass, nothern pike, and several of the panfishes constitute the fishery. Carp are abundant, hence a use problem. Access is possible at numerous road crossings and a launching site exists at the millpond. About 607 acres of wetland adjoin the stream.

Duck Creek T12N, R9E, Section 21
Surface Acres = 58.4, Miles = 11.2, Gradient = 1.8 feet per mile

That portion of stream from the Wyocena Millpond to the Wisconsin River is called Duck Creek. The North Branch and Middle Branch constitute its origin. A delta has formed at its junction with the Wisconsin River which provides good waterfowl hunting. Bass and panfishes afford a limited fishery. Access is possible from a county trunk and a state highway. About 2,960 acres of wetland adjoin the stream.

Duck Creek, Middle Branch T12N, R10E, Section 22
Surface Acres = 31.7, Miles = 15.4, Gradient = 11.04 feet per mile

A stream of moderate gradient which flows to the Wyocena Millpond. A trout stream, Jennings Creek, is its principal spring water source; above this tributary water quality is less desirable. Bass and panfish provide a fishery in the stream, however, forage species are the most common occupants. Several county and town roads provide access. About 321 acres of wetland adjoin the stream.

Duck Creek, North Branch T12N, R10E, Section 15
Surface Acres = 68.1, Miles = 23.4, Gradient = 7.1 feet per mile

A meandering stream which originates above Tarrant Lake at Cambria and receives numerous ditched tributaries along its course to the Wyocena Millpond. Pollution is a continuing problem for this stream. It has reduced the fishery to one of bullheads, carp, suckers and forage species which nearly every year experiences pollution-caused mortalities. Access is possible from several town roads. About 2,427 acres of wetland adjoin the stream.

Fox River T13N, R9E, Section 3
Surface Acres = 297.8, Miles = 40.3, Gradient = 4.52 feet per mile

The major stream of northern Columbia County, it first flows southwest toward Portage, then north, out of the county. After coming within 2 miles of the Wisconsin River it flows on to the Lake Michigan watershed. A dam at Pardeeville with 17-foot head forms Park Lake; the only other structure in Columbia County is at Governor's Bend where navigation locks and a dam were operated in the past. Channel catfish, bullheads and walleyes constitute the fishery. Northern pike, largemouth bass, and yellow bass are also present in some sections. Rough fish and pollution are use problems. Access is possible at Governor's Bend from numerous road crossings, especially upstream from the Portage area. Over 13,900 acres of wetland adjoin the stream, hence waterfowl values are quite high.

French Creek T13N, R9E, Section 3
Surface Acres = 26.17, Miles = 10.8, Gradient = 3.74 feet per mile

A small stream fed largely by wetland drainage, impounded at Dates Millpond, tributary to the Fox River near the Marquette County line. The Conservation Department owns 1,713 acres of adjoining land and operates three impoundments capable of flooding about 700 acres. Water levels are seasonally manipulated in the interests of waterfowl management. In all about 1,600 acres of wetland adjoin the stream. Channel catfish, crappies, and suckers provide a fishery, seasonally augmented by northern pike. Access with boat launching and parking is adequate. The area provides good waterfowl shooting.

Hinkson Creek T11N, R9E, Section 30
Surface Acres = 4.36, Miles = 6.0, Gradient = 4.17 feet per mile

A small marsh-drainage stream north of Poynette, formerly called Wilson Creek, tributary to Rowan Creek. The stream headwaters have been impounded, yet parts of the creek have water quality suitable for trout, and in the past various proposals have been made regarding possible management of the stream. A canning factory pond located near the stream in Poynette has been a source of pollution in the past. The present fishery is limited to brook trout and forage species. Access to fish is limited by the lack of road crossings and angling is enjoyed only through the tolerance of landowners. Recent attempts to survey the stream found many areas impassable due to soft silt bottom and dense bank cover. About 600 acres of marshland adjoin the stream.

Jennings Creek T12N, R11E, Section 20
Surface Acres = 13.24, Miles = 9.1, Gradient = 13.18 feet per mile

A small spring-fed stream tributary to the Middle Branch, Duck Creek. The stream has good water quality but has unfortunately been bracketed by private fish hatchery development. The Conservation Department owns 410 acres with 3.0 miles of stream managed as public hunting and fishing grounds. Brook trout are common and there is a long history of stocking of this species. Nearly all lands adjoining state property are posted against trespass at present. Over 212 acres of wetland adjoin the stream. Waterfowl provide fair shooting and muskrats are present in significant numbers.

Neenah Creek T13N, R9E, Section 9
Surface Acres = 55.15, Miles = 9.1, Gradient = 1.41 feet per mile

A wide sluggish stream which flows through marshlands in northwestern Columbia County to the Fox River. Catfish, walleye, northern pike, carp, dogfish, bass and several species of panfish sustain the fishery. The entire stream in this area is traversible by light boat. Extensive wetlands (219 acres in Columbia County, 2,874 acres in Marquette County) adjoin the stream and afford high waterfowl potential. Access is possible at two county roads and a state highway. High rough fish populations perhaps deter greater use by game species.

Powers Creek (That portion of Rowan Creek from its junction with Hinkson Creek to the Wisconsin River is referred to as Powers Creek)

Prentice Creek T11N, R8E, Section 29
Surface Acres = 5.81, Miles = 8.0, Gradient = 21.87 feet per mile

A high-gradient stream draining from the Baraboo Range to Lake Wisconsin. Trout of all three stream species have been introduced here. Brook trout were first sustained but as stream conditions changed management utilized brown trout to compensate for changing conditions. Fluctuating water levels present a problem in that volume of flow in some years is insufficient to support fishes other than minnows. Access is possible at several town and county road crossings, however, much adjoining land is posted against trespass. There are no adjoining wetlands.

Robbins Creek T10N, R12E, Section 1
Surface Acres = 6.25, Miles = 8.6, Gradient = 6.25 feet per mile

A small low-gradient stream draining a swale southwest of Columbus northeasterly to the Crawfish River. Several artesian wells in the stream valley may be secondary water sources. Common white suckers and a few smallmouth bass constitute the fishery. Fluctuating water levels are a use problem. Access is available at several road crossings. About 244 acres of fresh meadow adjoin the stream.

Rocky Run Creek T11N, R9E, Section 5
Surface Acres = 65.75, Miles = 21.7, Gradient = 6.22 feet per mile

A long low-gradient stream which originates at Mud Lake and flows to the Wisconsin River. The stream is unusual in that it originates in an open marsh and has warm water for several miles before receiving sufficient spring flow and bank cover to make conditions suitable for trout. After several miles the stream again warms and warm water fishes persist downstream to the mouth. The stream is stocked annually with brook and brown trout. Good parking and access is provided by an abandoned portion of a county road ending at the stream. Portions of the stream have been traversed by canoe. About 2,200 acres of wetland adjoin the stream.

Rowan Creek T11N, R9E, Section 30
Surface Acres = 12.84, Miles = 10.6, Gradient = 11.79 feet per mile

A fair gradient spring-fed stream tributary to the Wisconsin River. Brown trout constitute the fishery for about 5.5 miles, below which warm water fishes from Lake Wisconsin inhabit the stream. The stream has perhaps more potential than any in Columbia County for sustaining a cold water fishery. Several state, county and town roads provide access. Over 800 acres of varied marshland adjoin the stream.

Rowley Creek T12N, R8E, Section 31
Surface Acres = 2.67, Miles = 5.5, Gradient = 29.10 feet per mile

A small, high-gradient stream draining from high in the Baraboo Range westward to Sauk County and eventually the Baraboo River. The stream intermittently originates in seepage around Lost Lake and has several springs further downstream which sustain its summer flow. This stream sustains a trout population; however, in recent years ground water conditions have deteriorated. Two town roads provide access.

Sand Spring Creek T13N, R11E, Section 21
Surface Acres = 4.22, Miles = 5.8, Gradient = 15.52 feet per mile

A small stream tributary to the Fox River in the northeast corner of the county. Though the stream has fair gradient and is mostly sand-bottom, the lower half is quite flat and some sections have been straightened. Forage fishes constitute the fishery. Access is possible at one county road and three town road crossings. Over 100 acres of fresh meadow adjoin the stream and offer excellent habitat for upland game birds.

Schneberger Creek T11N, R9E, Section 1
Surface Acres = 0.15, Miles = 0.6, Gradient = 7.00 feet per mile

A small spring-fed creek tributary to Rocky Run Creek. The stream supports a few native brook trout, however, parts are heavily pastured and instream cover is gone. An extensive area of fresh meadow and a small shrub swamp border the stream near its confluence with Rocky Run Creek. Public access is not available. The small size of this stream precludes anything but light fishing pressure, and its principal value is as a spring feeder for the larger stream.

Spring Creek (Lodi) T10N, R8E, Section 17
Surface Acres - 27.20, Miles - 8.0, Gradient - 6.50 feet per mile

A spring-fed stream which originates in a marshy area in Dane County and flows through Lodi to Lake Wisconsin. Private fish hatcheries have capitalized on several of the main feeder-springs downstream from Lodi; however, water quality remains suitable for a good population of brown and rainbow trout. These species are stocked annually to complement the native reproduction of brook trout. The Conservation Department owns over 393 acres in Dane County on this stream, most of which is marshland to be managed for upland game. About 735 acres of nonwooded marshland border the stream in Columbia County.

Spring Creek T13N, R9E, Section 11
Surface Acres = 4.56, Miles = 4.7, Gradient = 10.64 feet per mile

A small, clear spring-fed stream tributary to French Creek. Forage species constitute the fish population. Spring areas near the headwaters have been impounded as farm ponds. Downstream one impoundment of the French Creek Wildlife Area rests on the stream. There is one major feeder stream and several ditches along the stream. Three county trunk highways and 1,731 acres of public land in the French Creek Wildlife Area provide access to the stream. Use by migrating waterfowl is the prime value of this area.

Wisconsin River T10N, R6E, Section 36
Surface Acres = 10,904, Miles = 65.8, Gradient = 0.5 feet per mile

All that portion of the river from Wisconsin Dells to one mile below the Prairie du Sac dam is considered in this report. Lake Wisconsin from the dam to one mile below Dekorra is not included. The river above Prairie du Sac drains over 8,944 square miles through central Wisconsin beginning in Lac Vieux Desert in Vilas County. Two dams provide a combined head of 63 feet in this county (Wisconsin Dells, 25 feet; Prairie du Sac, 38 feet). The water is normally colored reddish-brown and contains industrial by-products and organic materials assumed to cause a taste problem in river fishes. This is most noticeable in late winter and early spring in fishes caught below the dams.

The river has a complex fishery. Walleye, sauger, catfish, both largemouth and smallmouth bass and rock sturgeon are considered the dominant game fishes. An occasional muskellunge is caught below Lake Wisconsin. Bluegills, white bass, and crappies are harvested below the dams in the late spring and early summer. Paddle fish inhabit the river below the Prairie du Sac dam and are protected from capture by law.

The entire stream is navigable and heavily used by canoes and outboard motorboats. An area 3.6 miles long below the Dells Dam and the one mile portions immediately above the dam in these counties is known as the Dells, an important scenic attraction. The shores rise as much as 120 feet vertically in the canyon through Cambrian sandstone. This portion of the river is deep and navigable by large boats. Extensive frontage in this area is controlled by companies capitalizing on the scenic attractions.

Since much of the river shore elsewhere is subject to flooding, cottage development in low areas is not extensive and the river still has high aesthetic value with marsh and wooded lowland banks.

About 0.4 miles of shoreline are in public ownership in local parks and 5.33 miles, mostly within Pine Island Wildlife Area, are in state ownership. Access is possible from Lake Wisconsin sites and from state and local public lands, though launching on state lands is rather difficult. More than 3,000 acres of wetland adjoin the stream affording excellent waterfowl habitat.

SUMMARY OF ALL DATA GATHERED FOR THE INVENTORY

Area and Population

In the 10 years preceding the 1960 census the population of Columbia County gained 7.9 percent. From 1960 to 1963 the population only gained 0.8 percent, thus warranting the conclusion that the rate of increase of population is diminishing. Rural farm population in 10 years diminished by 20.4 percent. Nearly 43 percent of the population lives in a rural nonfarm situation; less than one-third are urban dwellers. County data are compared with those of the state (Table 2).

Of the county land area of about 497,720 acres, 83 percent is in farms. Applied broadly this could mean that over three-quarters of the stream and lake watershed areas are expected to be either grazed, cultivated, or subjected to other agricultural enterprises. About one-fourth the total land area is wooded, but in most cases these are farm woodlots, too small to influence surface water quality.

Table 2. Population and area comparison of Columbia County and the State of Wisconsin[1]

	Area (Sq. Mile)	Population (1960)	Percent Change (1950-1960)	Density (No. per sq. mile)
Columbia County	798	36,170	+7.9	45.3
State of Wisconsin	52,044	3,951,777	+15.1	75.9

[1] Population data from Wisconsin County and Economic Area Data 1950-1960, University of Wisconsin Department of Rural Sociology, 1964

Water Resources

About 4.5 percent of the county's gross area is covered by water. By far the largest portion of this is Lake Wisconsin. There are about 0.64 acres of water per county resident. Excluding Lake Wisconsin and the Wisconsin River reduces the available surface water by 85.7 percent.

Named lakes number only 22 and rank the county 41st in this respect. Named lake acreage ranks it 26th, as there are 10,396 acres. Unnamed lakes number 34 and contribute about 866 acres. Acreages are based on interpretation of aerial photos taken in 1959 and 1962 and are subject to change. Major rivers (the Wisconsin, Baraboo and Fox) contribute 11,560 acres, other named streams about 369 acres, and unnamed tributary waters about 27.6 acres, for a grand total of 23,219 acres of surface water.

Lakes have 124 miles of frontage; rivers have 742 miles. Lake Wisconsin alone has about 58 miles of frontage.

Of the total number of lakes 31 are landlocked, 10 are drained natural lakes (with outlet only), 15 are drainage lakes, and 14 are impoundments. Details on origin and classification of individual lakes are found in the descriptive paragraphs.

Of the 36 streams, seven support desirable "cold water" fisheries, six support desirable "warm water" fisheries, and the remainder sustain forage fishes. About 95 miles of stream may be traversed by boat.

Lake and Stream Morphometry

An unusual feature of glaciation, the drumlin, dictates the pattern of stream drainage in eastern Columbia County. Parallel drainage, with streams frequently reversing their direction of flow by 360° in draining from one valley to the next, is characteristic. This area has few lakes other than small potholes in the wet swales, and small impoundments at points of constriction where drumlins are so close as to permit easy damming of the stream passing between them (Fall River).

In northwestern Columbia County stream patterns are more erratic, with meandering courses following no set pattern. Presumably this is characteristic of streams in old glacial lake beds. Valleys here are extensive and wet, covered usually by grass marsh. Hence lakes, when found are irregular and quite shallow.

Only in southwestern Columbia County, in the area of ground and end moraine do natural lakes exist in fair numbers. Here thay are commonly small round lakes reminiscent of the kettle lakes of the interlobate moraine and pitted outwash in eastern Wisconsin.

Swan Lake, on the Fox River is perhaps unique in its morphometry. It lies on the course of the river yet has a trench-like configuration with a maximum depth of 82 feet. Alden (1918) thought that it lies in what was once a preglacial valley with a stream flowing to the Wisconsin River. Swan Lake may be called an ice-block basin in till, lying in a preglacial valley (Zumberge, 1952). This could be equally as true of West and Spring Lakes, since they occupy the same valley.

Lake shape and irregularity of shoreline reflect the origin, and form the basis for a classification of lakes. A convenient numerical expression of irregularity is the shore development factor (S.D.F.) which generally lies within certain parameters for lakes of particular origin (Hutchinson, 1957). Glacial lakes of Wisconsin, which are usually compound kettle holes, have a S.D.F. ranging from 1.5 to 2.5. Simple kettle lakes frequently have S.D.F. less than 1.25. Impoundments, oxbow lakes, and meander scrolls have much higher S.D.F., commonly 2.5 or more. The following table illustrates the classes of lakes in Columbia County as represented by S.D.F. Mean S.D.F. for all lakes for which this calculation was made is 1.77.

Table 3. Shore development for types of Columbia County Lakes

Lake Type	Range	Mean	Sample Size
Simple Kettle	1.00 - 1.78	1.25	22
Compound Kettle	1.38 - 2.27	1.81	6
Impoundment	1.03 - 4.38	2.22	14
Excavation	1.04 - 1.43	1.18	6
Meander	1.36 - 5.70	2.77	8
	1.00 - 5.70	±1.77	T = 56

Water Quality

In most instances landlocked lakes are lower in total alkalinity than are the drainage lakes. Lakes as well as flowing waters in the area west of the Wisconsin River, Lake Wisconsin, and the Fox River north of Portage are noticeably less alkaline than are the lakes and streams to the east.

To the east water quality reflects the origin of groundwater and flowing surface water in dolomitic bedrock of the Prairie du Chien Group; though the streams flow westerly for some distance over Upper Cambrian sandstones, their origin and their association with alkaline glacial drift dictates water quality. Since nearly all permanent bodies of water in eastern Columbia County are impoundments, they too reflect the chemical characteristics of flowing water.

The western one-third of the county is almost entirely within the immediate watershed of the Wisconsin River. Lakes within the floodplain approximate the river water in their alkalinity, and thereby reveal the high porosity of the floodplain soils. Groundwater flow as well as river flow is from the sand area to the north, hence relatively soft. The numerous small landlocked lakes of this part of the county are glacial in origin, resting in terminal moraine or on ground moraine. Their waters may therefore be of complex origin in sandstone bedrock, alkaline drift, and some acid seepage from marshlands frequently bordering small landlocked ponds.

Excavations in the Wisconsin River floodplain are considered to exhibit characteristics of natural bodies of water since they intercept the ground water table rather than impound flowing water or receive water by other artificial means.

Agricultural industry has at times greatly altered natural water quality. Cannery wastes, lagooned and discharged to an intermittent stream tributary to Goose Lake create exceptionally high chloride concentrations during peak production periods. Several streams (notably Duck Creek) have inadvertently received pollutants which proved deleterious to fish and insects inhabiting their waters.

An analysis of water quality for lakes and streams is presented in Table 4. Data for Goose Lake has been excluded since it is obviously grossly altered by saline influent water. Data for Lake Wisconsin are withheld due to the remote source of this water when compared with other county impoundments.

Table 4. Water quality of lakes and streams in Columbia County

Water	Total Alkalinity (Mean in ppm)	pH (Mean)	Specific Conductance (Mean in Mmhos)
All lakes	159	7.8	338
Simple kettles	124	7.7	276
Compound kettles[1]	154	8.3	365
Impoundments[2]	237	8.2	480
Excavations	70	7.8	211
Oxbows and Meander scrolls	191	7.4	373
All streams	244	7.9	532
Trout streams	253	7.9	511

[1] Excluding total alkalinity (268mg/L) and specific conductance (2,932 Mmhos) of Goose Lake

[2] Excluding total alkalinity (72mg/L) and specific conductance (227 Mmhos) of Lake Wisconsin

Fish Resources

Fisheries are illustrated in color on a resource map (Figure 2) and depicted for named lakes in a frequency histogram (Figure 3). Largemouth bass, bluegills, black crappies, and the species of bullheads (often not distinguished in surveys) provide the most common lake fishery. The lakes in major drainage systems also support northern pike and walleye fisheries. Rainbow trout occur in only one lake (Silver Lake) which receives an annual stocking of several thousand fish, to provide a combination warm water-cold water fishery.

Muskellunge are found in Lake Wisconsin and near the mouths of Rocky Run Creek and Rowan Creek. The presence of muskellunge is attributed to an annual fingerling stocking program.

Only 18 of the 56 lakes inventoried support a fishery every year. Of the remainder eight infrequently provide a fishery through years with mild winters when winterkill does not affect them.

Trout provide an important fishery in seven streams which collectively constitute 28 miles of streams. Brook trout are annually stocked in Hinkson Creek, Rocky Run Creek, and Jennings Creek and its tributaries. Brown trout are annually stocked in Rocky Run Creek, Rowley Creek, Rowan Creek, Prentice Creek, and Spring Creek (Lodi). Spring Creek (Lodi) also receives rainbow trout each year.

Wetland Resources

The Conservation Department prepared an inventory of wetlands as they existed in 1958 as a planning guide for persons engaged in land management (W.C.D. 1960). It is an interpretation of this material plus observations during the lake classification field work that form the basis for evaluating wetlands contiguous with lakes and streams. An explanation of wetland terminology is found in Appendix IV, Definitions.

In 1958 there were 55,181 acres of wetland in Columbia County. The majority of the unnamed lakes are included in this figure as deep marsh pockets or potholes. The map (Figure 4) illustrating wetlands indicates the degree of overlap.

Wetlands are well distributed throughout the county, with the exception of the high prairie land in south central Columbia County. Large blocks of marsh exist along the Fox and Wisconsin Rivers, and in the lowland separating them in north central Columbia County. Perhaps the greatest wetland losses in the last 20 years have been in the Crawfish River watershed, where many areas were drainable and fertile soils warranted drainage to enhance crop production. Low rainfall and a dropping groundwater table have no doubt caused further losses in this watershed. However, at present, there still remains a large number of small units which serve as stable cover patches in the changing agricultural complex, and which continue to sustain wildlife, even harbor spawning fish in spring upstream runs.

There are several large blocks of wetland in Columbia County worthy of special mention, not necessarily because of fish management potential, more because of wildlife values and water retention value. The Wisconsin marshland survey of 1934 evaluated some wetland areas (W.C.D. 1934). The Portage Game Area was described as "A 2,500-acre strip of undrained river bank forest and marshland

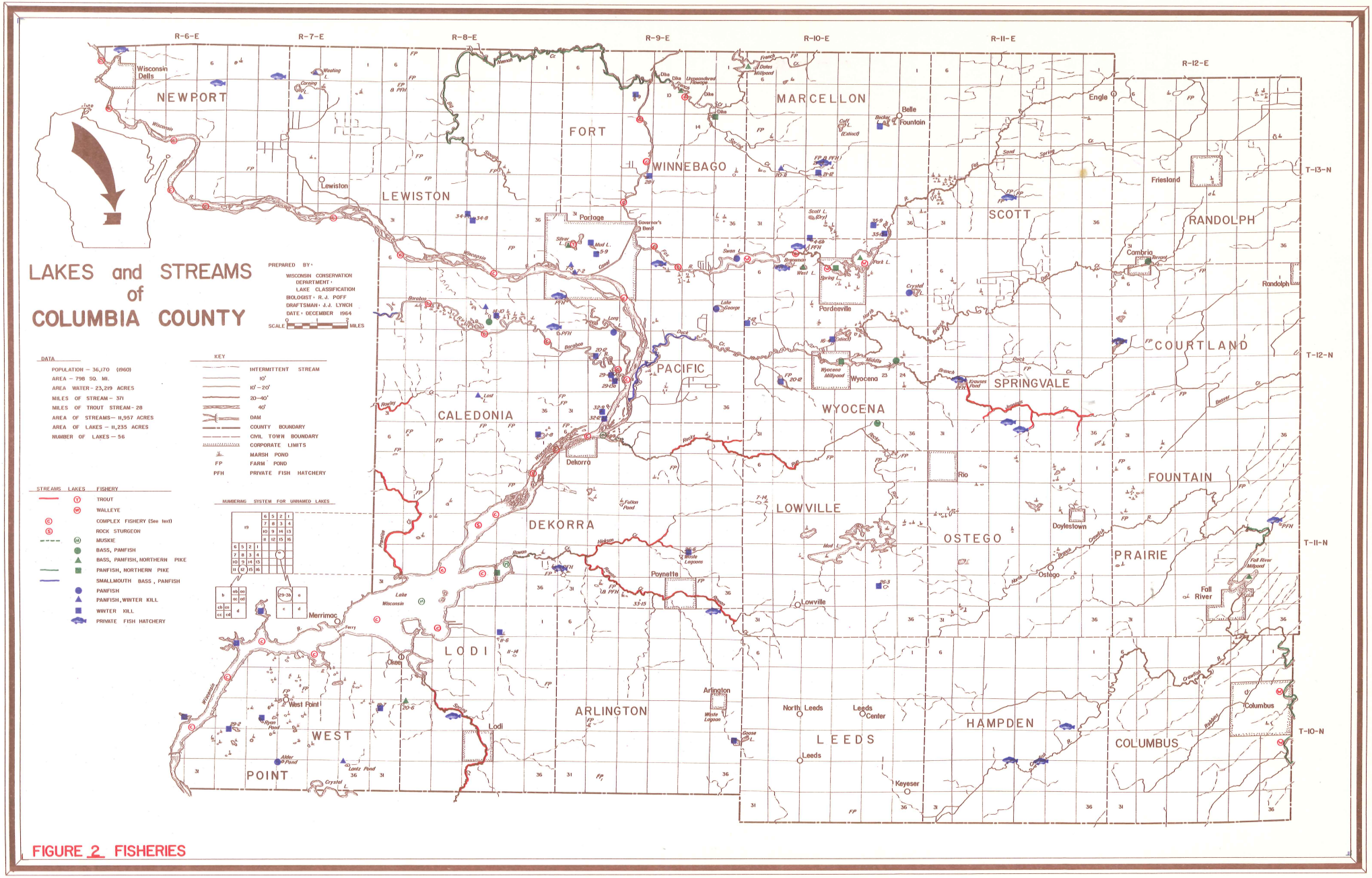


FIGURE 2. FISHERIES

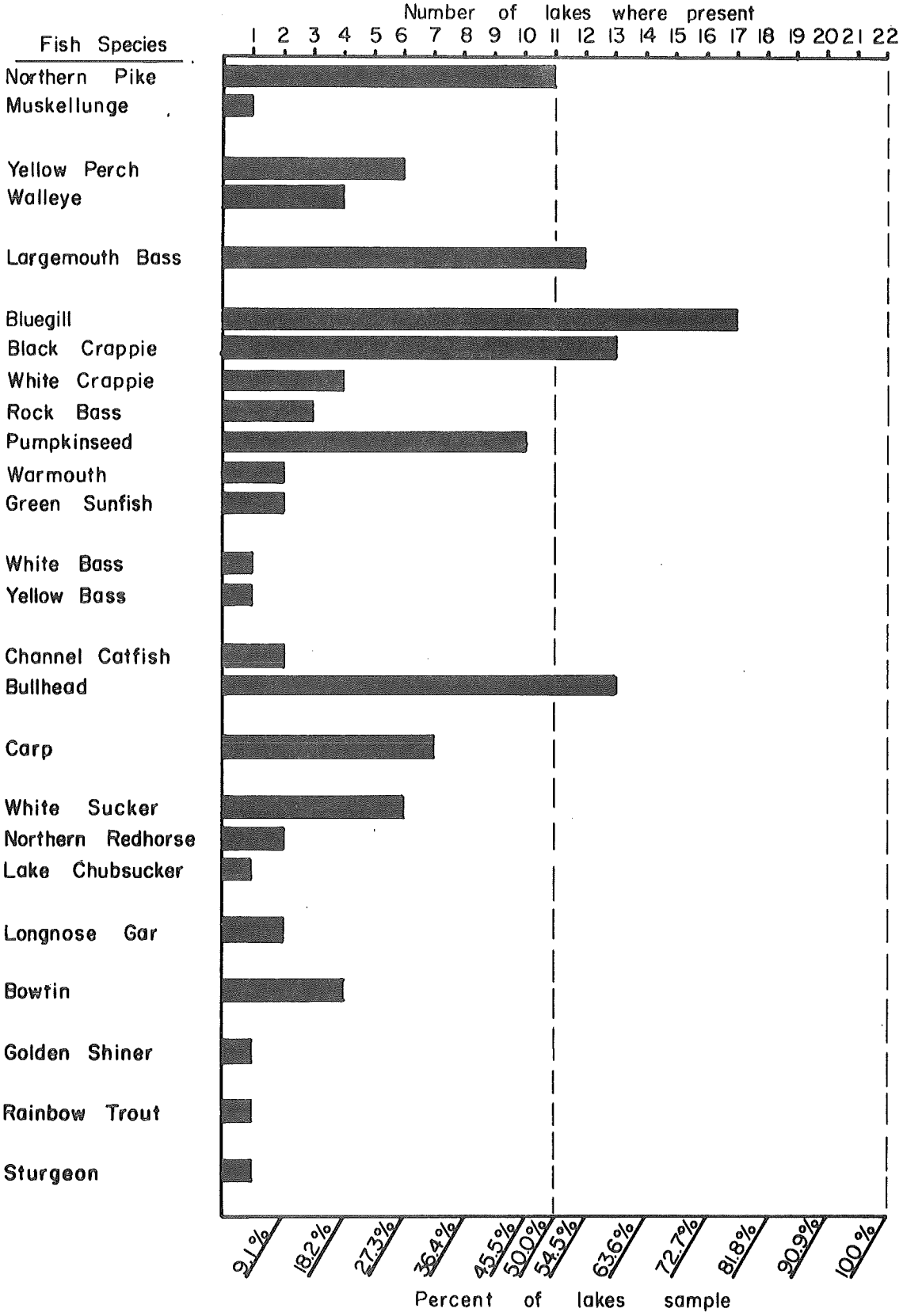


Figure 3 Frequency of occurrence of fishes in Columbia County lakes. (22 lakes sampled)

sandy soil. . .heavily burned in places. Good prospects for a general game refuge, situated at a strategic point on the Winnebago-Wisconsin River migration route". Small low head dams were proposed for this area which would also have enhanced its value for spawning fishes.

The Duck Creek marsh of some 2,000 acres in 1934 was also considered for low head dams.

The Mud Lake area, 700 acres in 1934, was at one time a muskrat farm. The lake had never been dry prior to 1934 as far as the investigators knew. The Conservation Department presently owns 1,528 acres in the Mud Lake area.

The Swan Lake marsh, which covered about 2,800 acres in 1934 was described as ". . .promising looking. . .groves of tamaracks. Snow geese drop in on occasion. Carp abound in the river and must affect the growth and spread of vegetation. Muskrats are present in large numbers". Here too low head damming was suggested as a management tool.

Another area, the Lake "Whiting" (Weeting) marsh in northwestern Columbia County covered 7,000 acres, was described an excellent habitat, including three small lakes. Valuable tamarack on the area made the cost of acquisition prohibitive.

Though public lands exist on only one of these marshlands, smaller wetlands elsewhere have received considerable attention, and the Department presently owns about 9,596 acres of which much is classified as wetland. Table 5 is a detailed listing of the state-owned lands.

Table 5. State-owned public lands in Columbia County

Ownership	Area	Water Frontage	Adjoining Water
Land Commission	80	1.14	(Island) Wisconsin River
"	19	0.63	(Island) Wisconsin River
"	9	0.31	(Island) Wisconsin River
Wisconsin Conservation Department		3.25	Island shoreline, Wisconsin River
Pine Island	3,985[1]	5.25	Wisconsin River
"		0.30	Baraboo River
French Creek	1,713	3.00	French Creek
"		0.48	Spring Creek
Rowan Creek	5	0.13	Rowan Creek
Mud Lake	1,528	0.40	Rocky Run Creek
Jennings Creek	410	6.00	Jennings Creek
Paradise Marsh	426	3.00	Beaver Creek
Grassy Lake	633	--	None
Dekorra	241	--	None
State Game Farm	547	--	None
Total Area	9,596 acres	23.89 miles frontage	

[1] Includes 220 acres purchased by easement only

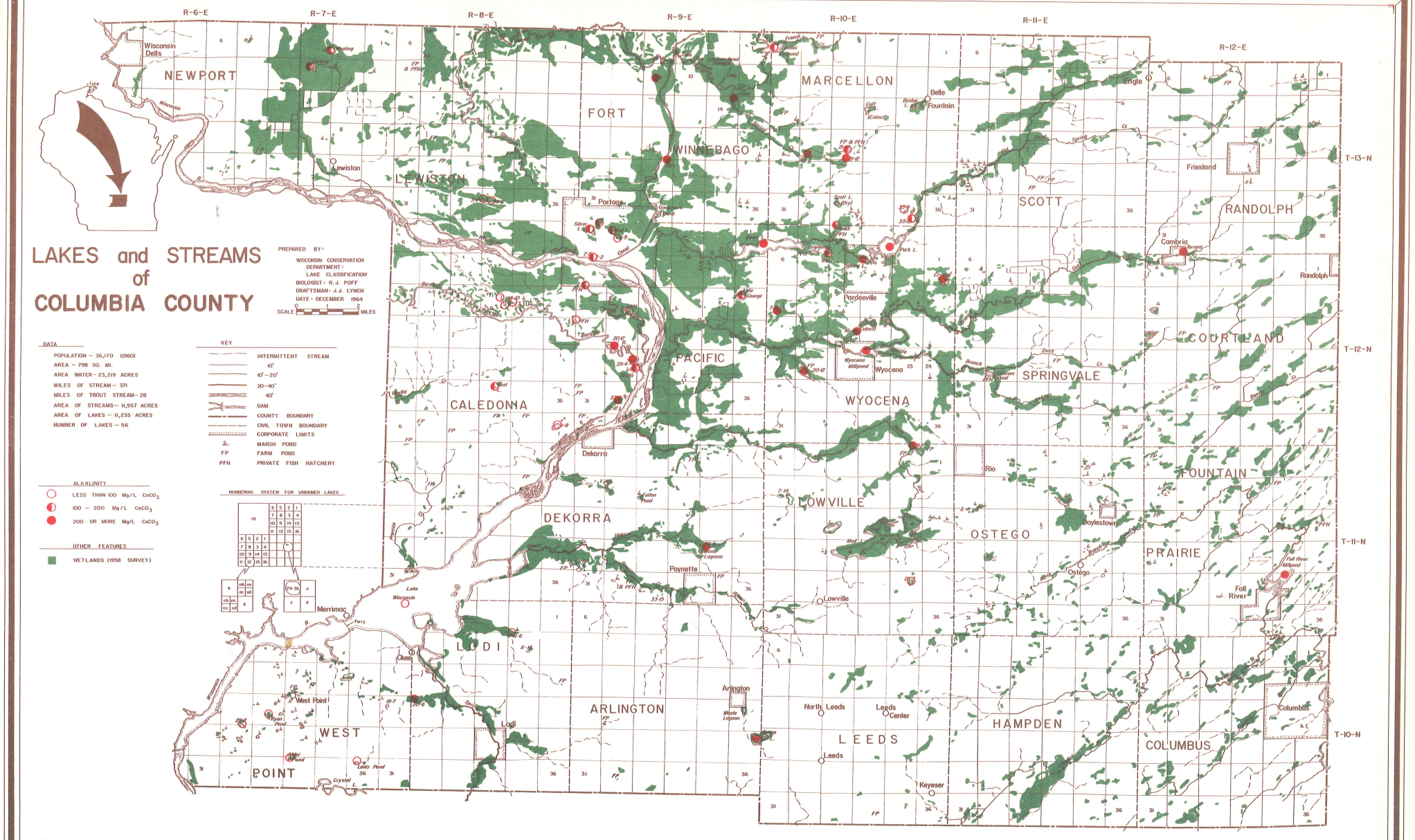


FIGURE 4 ALKALINITY AND WETLANDS

Commercial Fishing

Presently a commercial fisherman is licensed to remove rough fish from the Wisconsin River between the interstate bridge and Wisconsin Dells, and from the lower reaches of the Baraboo River and Duck Creek. The removal operation has been primarily conducted in winter (seining under the ice. On occasion rough fish are held in a barricaded oxbow of the Baraboo River listed as a lake in this report /T12N, R9E, Section 29(4)/. This operation has been largely confined to the Baraboo River. In addition to carp, which are kept, there are commonly numbers of northern pike, walleye, channel catfish, crappies, and white suckers captured, which are returned to the river.

This activity is extremely market oriented, hence fishing is seldom undertaken unless a ready market exists.

Public Use and Access

During field investigations, lakes were categorized by degree of public access. Classes were: access-improved for multiple use (implies launching, picnicking, swimming), access-boat launching only, access-unimproved, and no public access. An access map is provided (Figure 5).

Of 56 lakes investigated only eight had improved access with multiple use facilities (in all cases public parks). There were two lakes with boat launching access only six lakes with unimproved access sites (dedicated but undeveloped; public roads bordering the water), and 37 lakes without public access. Streams traversible by boat provide access to three impoundments otherwise inaccessible.

Cities, villages, and the county provide access to surface waters through 20 parks. Parks are designated on the resource map. In addition community parks and the water frontage they provide are presented in Table 6. About 2.23 miles of stream frontage and 1.49 miles of lakeshore are made available to the public in this this matter.

Farm Ponds - Private Fish Hatcheries

Presently more than 55 farm ponds hold water year-round in Columbia County. These ponds may be from one-tenth of an acre to several acres in size, generally one-fourth to one-half acre. Slightly more than half this number are primarily used for waterfowl nesting and resting. Six ponds are licensed as private fish hatcheries. Many of the remaining pond owners have obtained fish from federal hatcheries.

Private fish hatcheries are maintained under 22 valid licenses at present (including six farm ponds). Over half are licensed to rear trout, and other species. Minnows, various panfishes and largemouth bass constitute the fish population in most other instances.

Hatcheries and farm ponds supplement the recreational use of public waters, provided they do not infringe upon them. When constructed on navigable waters, permits are necessary, and when vital spring areas are involved, public hearings must be held.

Farm ponds and private fish hatcheries are designated on the map illustrating fisheries (Figure 2).

Table 6. Local park lands in Columbia County with water frontage

Name	Area	Water Frontage	Lake or Stream
Governor's Bend	4.39 A.	0.26 miles	Fox River
Camp Rest	0.47 A.	0.06 miles	Lake Wisconsin
Camp Perry	0.35 A.	0.01 miles	Lake Wisconsin
Tipperary[1]	0.33 A.	0.01 miles	Lake Wisconsin
Fall River Park	1.5 A.	0.07 miles	Lazy Lake
Fall River Park	4 A.	0.28 miles	N. Branch, Crawfish River
Park Lake (Hwy. 44)	0.6 A.	0.06 miles	Park Lake
Pardeeville	15 A.	0.48 miles	Park Lake
American Legion	1 A.	0.02 miles	Park Lake
Poynette Parks	15.5 A.	0.48 miles	Rowan Creek
John Muir Park	45 A.	0.25 miles	Rowan Creek
Silver Lake	2 A.	0.06 miles	Silver Lake
Goeres Park	3 A.	0.73 miles	Spring Creek (Lodi)
Lodi Mill Park	0.7 A.	0.08 miles	Spring Creek (Lodi)
Tarrant Park	10 A.	0.23 miles	Tarrant Lake
Dekorra Park	1 A.	0.04 miles	Wisconsin River
Riverside Park	1 A.	0.09 miles	Wisconsin River
Pauquette Park	4.4 A.	0.19 miles	Wisconsin River
St. Lawrence Bluff	0.5 A.	0.08 miles	Wisconsin River
Wyocena	0.3 A.	0.06 miles	Wyocena Millpond
Wyocena (County)	10 A.	0.43 miles	Wyocena Millpond
21 parks	121.04 acres	3.97 miles	11 lakes or streams

[1] Road end near park provides water access

Cottage and Homesite Development

There are about 1,157 cottages and permanent homes on lakeshores. Lake Wisconsin accounts for 822 of these. Streams have only about 475 dwellings with the Wisconsin River again providing most (more than 100). Most stream frontage is not suitable for cottage or homesite development because of flooding and marshlands contiguous with the stream courses. Homes are therefore set back some distance from the banks. In most instances dwellings on smaller streams are farm houses which may at one time have relied on the streams for cooling and drinking water.

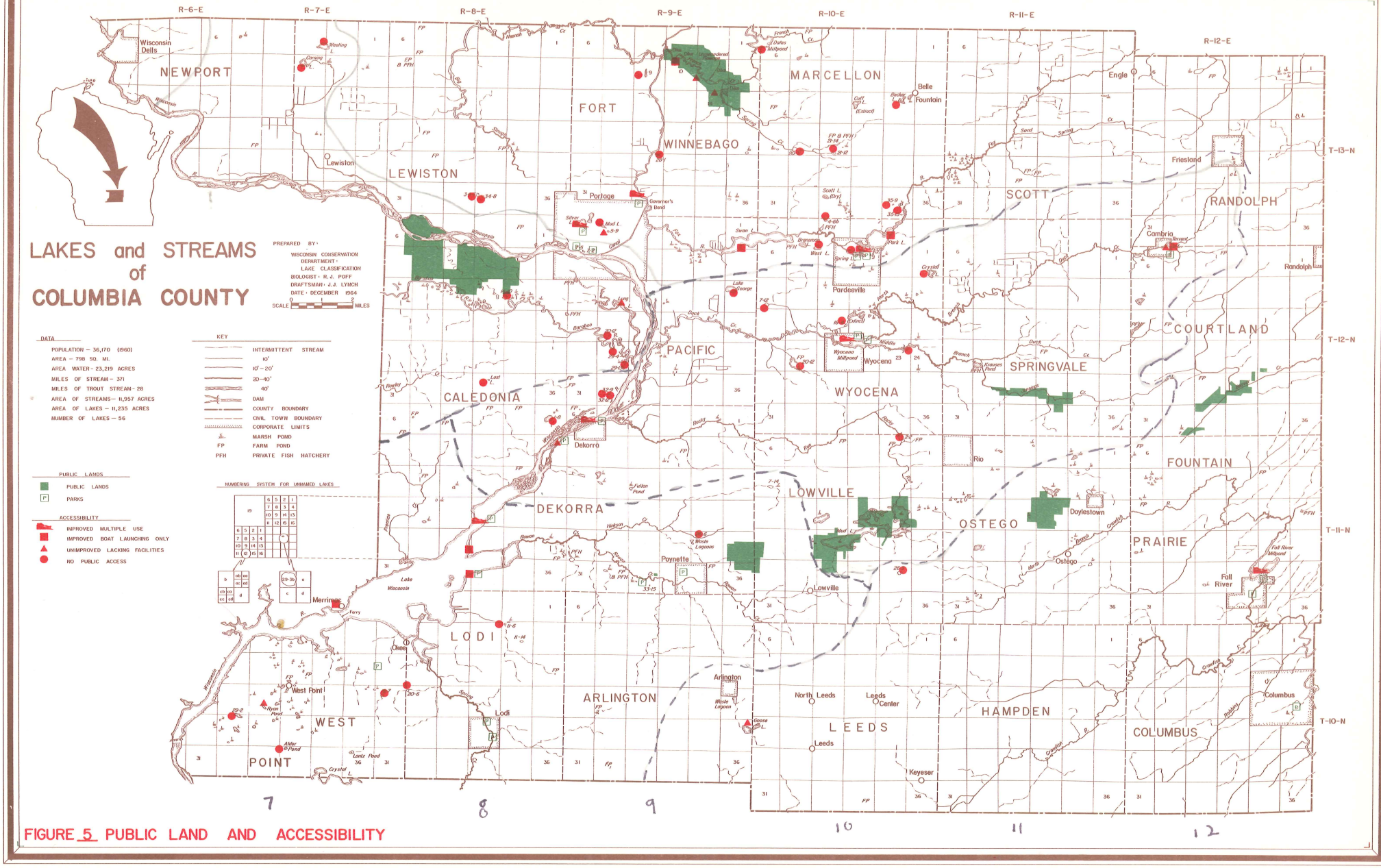


FIGURE 5 PUBLIC LAND AND ACCESSIBILITY

PRESENT AND POTENTIAL USES OF SURFACE WATER

Fishing

Between 9,000 and 10,000 residents and about 9,000 nonresidents purchase a license to fish in Columbia County each year. Lake Wisconsin is the core of the lake resort area. Among residents there appears to be no significant deviation from the trend in license sales set by statewide sales (Figure 6).

National surveys and recent state surveys suggest that one in every three to five persons fishes. The degree of participation in Columbia is higher perhaps than the average. Much of the population is rural or centered in small villages, where outdoor activities are a major form of recreation.

The degree of public access and the existence of commercial facilities determines the extent of use of surface waters. Streams and lakes with public park access are most heavily fished. Village and town parks afford the most desirable access opportunities in Columbia County at present, providing access to 9,553 acres of water in six lakes and to four streams of significance. County parks programmed or presently under development will provide access to another major stream (Fox River) and additional access to one lake with access at present. Commercial facilities providing water access exist on six lakes, three of which have no other means of access.

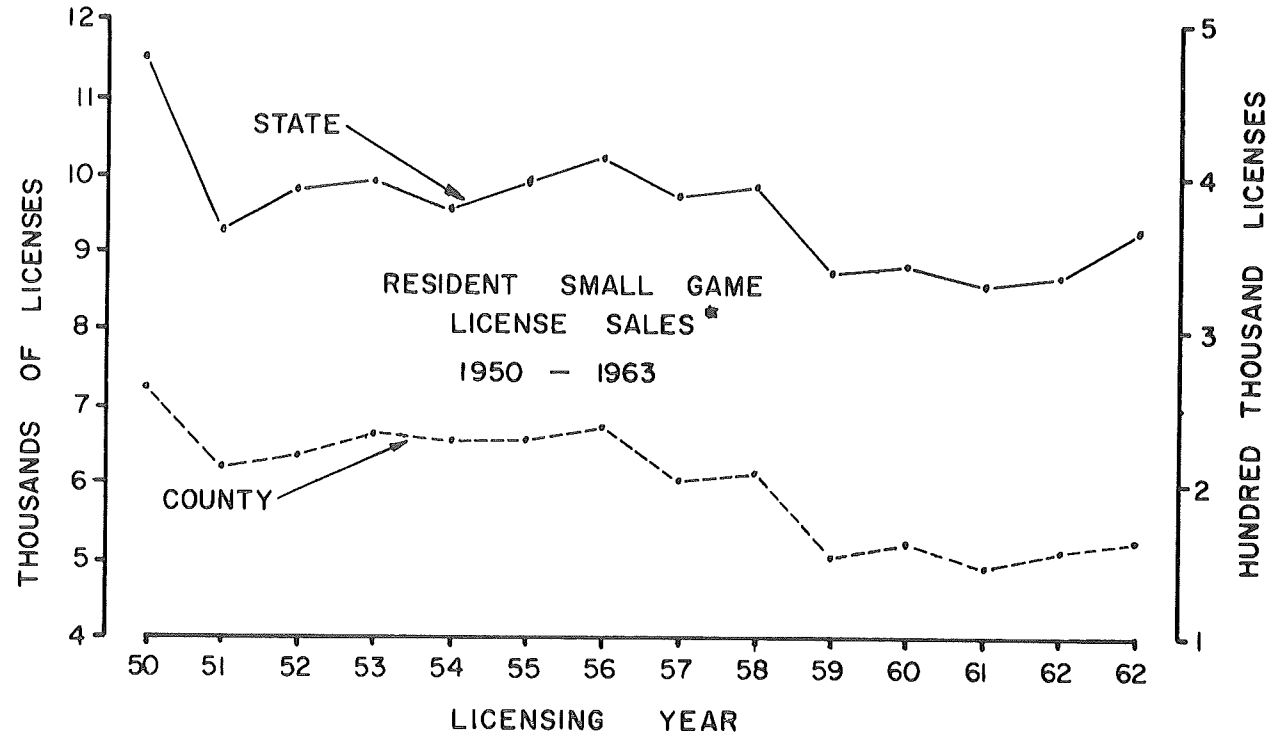
Lake Wisconsin and the Wisconsin River have more potential for providing fishing opportunities than any other bodies of water in Columbia County. There are also fewer restrictions to fishing these waters. There are no closed seasons for hook and line fishing for species other than trout, muskellunge, and sturgeon; however, other regulations (bag limit, size limit) remain in force. Setlines and bank poles are permitted with live bait of minimum size for the taking of catfish below the Prairie du Sac Dam, and above the dam only with catfish bait is permitted. Catfish taken by this method in these waters may be sold. In addition, motor trolling is permitted on the waters of the Wisconsin River, including the lake, downstream to the Prairie du Sac Dam.

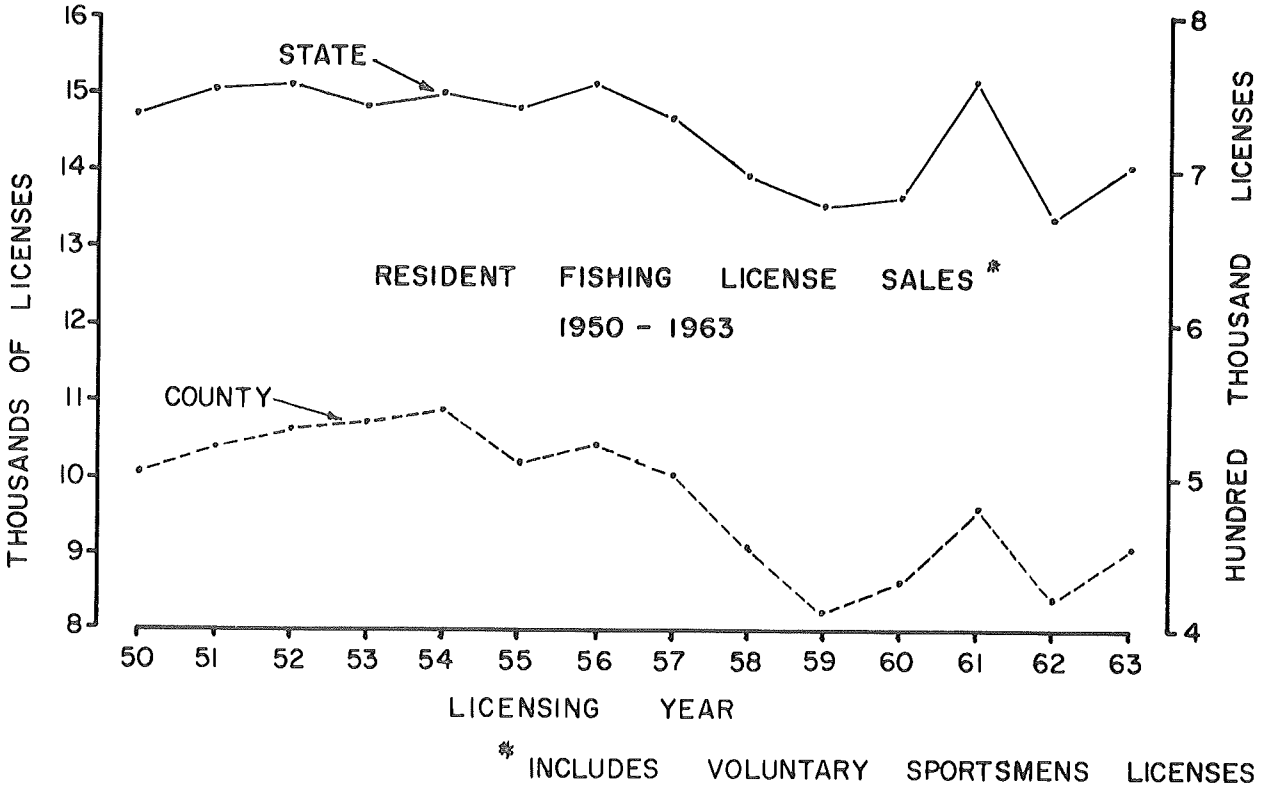
Two-story lake management as a tool for providing greater fishing opportunity was suggested by biologists in 1956 for Silver Lake in Portage. Since then the lake has received several thousand rainbow trout each year. This is presently the only lake supporting trout in the county.

Biological factors limiting potential use of surface waters are winterkill (often attended by fluctuating water levels) and pollution. Winterkill occurs on 38 lakes. Avoiding winterkill calls for a greater water volume from deepening by increasing water levels or dredging. While dredging is a proven means of rehabilitating lakes it is costly. Shallow lakes near population centers may some day have sufficient value for fishing and other recreation to warrant the cost of dredging.

When the fishery in a lake becomes undesirable, either in size of individual fish or in species composition, chemical rehabilitation may be warranted. This was the case in Tarrant Lake in 1952 and in Lazy Lake (Fall River Millpond) in 1958. Both are impoundments on streams with rough fish populations. This fish management tool may be used on other impoundments in the future.

Figure 6 License sales trends — Columbia County





* INCLUDES VOLUNTARY SPORTSMENS LICENSES

Children's fishing ponds provide recreation for this segment of the population in one city, Portage. Opportunities for fishing are so well distributed in the county that such ponds are generally unnecessary. Only on the intensively farmed high prairie lands of south central Columbia may more of such ponds be found necessary.

Boating

Boat registration figures obtained from a Conservation Department report to the U.S. Coast Guard showed that in 1962 there were 2,200 motorboats and 17 sailboats registered in Columbia County. Of these, 1,850 were licenses issued for personal boats and 360 were issued to owners of fleets of boats. The total number of boats registered as of August 1962 was 2,217. In September 1963 there was a total of 1,955 boats registered of which 1,941 were motorboats and 14 were sailboats. Three hundred fifty-six fleet licenses were issued and 1,599 individual boats were registered then.

A general decrease in registration is evident here. Fleet registration did not show as great a decrease as individual registration. The general decrease presumably reflects a laxity in re-registration.

The types of boating activity in which boaters on the major lakes of Columbia County were engaged are summarized in Table 7 along with boat densities for each lake. These data were obtained from Law Enforcement Division reports of lake use activity by aerial surveillance during summer months of 1964. The figures given are reports of boat density noted in a single observation including lowest, medium and highest observation expressed as acres per boat.

Lake Wisconsin, as well as upstream segments of the Wisconsin River, has the largest numbers of boaters; however, Park Lake has the greatest boat density (described as acres per boat engaged in fishing).

Only one boat control ordinance has been filed with the Conservation Department, that of the city of Portage, encompassing the waters of Silver Lake. Unfortunately use observations are not available for this lake. Use regulations are posted at launching sites on Park Lake and are presumably a matter of local agreement.

Table 7. The number of boaters observed from the air on Columbia County waters.

Body of Water	Acres per Boat								
	Fishing			Boating			Skiing		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Lake Wisconsin (9,000 acres)	563	152	70	3,000	581	167	-	2,808	-
Swan Lake (419 acres)	419	294	209	-	-	-	-	-	-
Park Lake (219 acres)	44	15	8	-	219	-	-	-	-
Silver Lake (52 acres)	No observations								
Wisconsin River Lake Wisconsin-Portage (5,043 acres)	2,522	1,552	841	1,681	1,260	560	-	1,681	-
Wisconsin River Portage-Wisconsin Dells (5,619 acres)	562	489	394	2,810	1,248	803	-	-	-

L = low observation M = mean observation H = high observation

Swimming

About one-half the population engages in beach oriented activities. There are only two supervised beaches in the county. (An unsupervised beach is provided on Lake Wisconsin but park size limits the extent to which it is used.) Lack of beaches may be partly explained because more than 75 percent of the frontage on named lakes is muck shore (Appendix IA) not conducive to natural beach development. County plans for a park on Wyocena Millpond may enhance the beach situation, however, the feasibility of beach development here is at present questionable.

Municipal planners suggest that even small communities need at least five acres for an adequate site. Actual beach frontage is seldom the limiting factor, however, room for parking, picnicking, and sanitary facilities may limit development nearly as much as suitable shore bottom type. In larger communities ten acres per 1,000 population suffices.

Hunting

The number of persons hunting small game dropped appreciably in 1959 and has varied but little since (Figure 6). About 5,000 people each year purchase either a small game license or sportsmen's license. This represents one in every seven residents of the county, and can be construed as a fairly high level of participation. The national survey of 1960 suggests that about one in every five men hunts and one in every 69 women hunts (United States Dept. Interior, 1960).

Considerable public land is available for hunting in Columbia County (Table 5). In most project areas small parcels are yet to be purchased within project boundaries. Nearly all Department lands were acquired with waterfowl management in mind and have extensive water frontage. Additional lands are leased in two projects on a yearly basis. In all 23.89 miles of stream bank are in state ownership capable of providing opportunities for jump-shooting primarily. About 7.94 miles of lake frontage are in state ownership capable of providing pass-shooting opportunities primarily. Some impoundments (T13N, R9E, 10; T13N, R9E, 14) are entirely within public lands.

Added shooting opportunities are provided by three licensed shooting preserves which controlled 1,536.46 acres in 1962 (Burger, 1962). None of the 30 licensed game farms in Columbia County provide hunting. Water frontage, or small ponds are presumed to exist on 16 game farms, since this number reported they reared geese or ducks. The amount of frontage on lakes and streams covered in this report which is contained in game farms and shooting preserves could not be ascertained.

Several small groups have purchased water fronting lands or wetlands near lakes or streams for the express purpose of providing hunting opportunities; for example, the Lewiston Outing Club encompasses Corning Lake and part of the shore of Weeting Lake, the Sunnyside Rod and Gun Club has lands on Prentice Creek and Lake Wisconsin, and the Columbia County Sportsmen's League has property adjoining wetlands along Rowan Creek near Poynette.

Aesthetics

Wild shores, a varied landscape, hills as the horizon, and a large, winding river contribute immensely to the beauty of Western Columbia County. The Wisconsin River, in its bend around the Baraboo Range, has aesthetic values equaling any in southern Wisconsin. Lowlands bordering the river are also quite scenic; the beauty of the tamarack swamp surrounding Corning Lake lies in the impression of vastness and impenetrability it purveys. While further east in the county there is little of this beauty, another form takes its place in the sprawling marshland of Mud Lake near Rio, with geese and ducks careening overhead.

The present move to create commercial campgrounds (four such areas now exist in the county, all on water) is partly an expression of local cognizance of the areas.

SURFACE WATER PROBLEMS

Resource Based Problems

Those problems inherent in the resource, independent of man's use of it, are called resource based problems and reflect physical limitations of individual lakes or streams. Winterkill is such a problem; though man may prevent it by dredging, clear-plowing the ice in winter, or by aerating such lakes through the winter, his was not the original fault. As lakes age they experience eutrophication, and, if they are shallow and have little water exchange, their oxygen supply is more rapidly consumed.

Similarly weeds and algae in abundance are considered resource based problems since they become more profuse as lakes age. Man, however, may speed up the natural process and bring about lake problems long before they would occur normally.

User Based Problems

Man desires things a certain way, hence, when his wants are not met he has problems. He desires a specific fishery consisting of large game fishes. Thus stunted or slow growing panfishes, and rough fishes predominating in a lake are considered as problems. There is an economic basis for considering these as problems since they represent poor utilization of the resource.

Man desires clear, pure water in his streams. Thus he considers the colored, fish tainting waters of the Wisconsin River a problem. Yet in this instance he is able to live with his problem and hesitates to demand more from the causative agents. He demands that small streams be sparkling clean and full of fish. Therefore pollution becomes a problem. This has been met with surveillance by competent public health biologists and sanitary engineers with the capability of detecting pollution sources and ordering necessary improvements in treatment facilities. In Columbia County the problem previously posed by canneries and packing plants has been well controlled.

Unfortunately the wastes from community living of human origin are presently disposed of primarily in flowing surface waters where much is demanded of dilution as a purifying agent (Table 10). Droughts affect the impact of pollution because they are felt in reduced stream flow and loss of vital dilution.

Table 10. Sewage disposal facilities in Columbia County[1]
(Current to October, 1962)

Community	Types of Treatment	Waters Receiving Effluent
Arlington	Trickling filter	Lagoon
Cambria	Trickling filter - Imhoff tank	North Branch, Duck Creek
Columbus	Trickling filter	Crawfish River
Lake Delton	Sludge digestion - chlorination	Wisconsin River
Lodi	Trickling filter	Spring Creek
Fall River	Sledge digestion - chlorination	North Branch, Crawfish River
Pardeeville	Trickling filter	Fox River
Portage	Trickling filter	Fox River
Rio	Trickling filter	Rocky Run Creek
Wisconsin Dells	Sludge digestion - chlorination	Wisconsin River
Wisconsin Academy	Trickling filter	Crawfish River

[1] Source: Records of the State Committee on Water Pollution.

Each person using a lake or stream thinks he has a right to experience the feelings accompanying his position on a smooth mirrored lake surface or on a riffle overlooking a trout pool. Another of his kind violating his pool or disturbing his mirrored image is immediately challenged as conflicting with his rights. Here the problems of lack of space arise. The supply of lake and stream space generally falls short of the demand for it. If all waters were available to use, the supply would certainly be closer to the demand. Thus lack of public access to surface waters looms as a problem. While city, town, and county parks provide excellent access on some lakes, others (in Columbia County some 40 lakes with 481 acres) lack adequate access and support few persons other than those with shore ownership. Public access need not mean 100-car parking lots and paved ramps; this is only necessary on large lakes. A simple designated right-of-way, unpaved, even simply grassed, would suffice for smaller lakes.

THE FUTURE

Columbia County is richly endowed with major surface waters some of which historically have been important travel arteries. To protect their quality, to preserve this historical birthright and to provide for use is the task facing citizens of Columbia County. How might this be done? It will require use of such common tools of government as pollution enforcement, zoning and public land acquisition to protect habitat and provide use facilities. Besides these measures, various management measures such as chemical fish control, introductory stocking, water level manipulation and harvest control need to be continuously employed by the professional resource managers, to assure the desirability of the fish and game resource.

The climate for good resource management always has local roots. Significant steps have already been taken in pollution control and fish and game habitat protection and management but more needs to be done and it will depend on local support.

ACKNOWLEDGEMENTS

The assistance of field personnel of the Conservation Department and other agencies is gratefully acknowledged.

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DEFINITIONS

To facilitate data collection and reporting, several technical terms are employed with which some readers may not be familiar. The following definitions should serve to clarify the meaning of these terms:

aesthetics - The scenic qualities of water and its surroundings. Wild shorelines usually have higher scenic values than developed shorelines because they harbor wildlife and a varied plant life. The marshes are often spawning and nesting grounds.

alkalinity - A measure of the carbonates, bicarbonates, and hydroxides present in a sample of water, expressed as parts per million (ppm) calcium carbonate. In this report, alkalinity determined with the acid-base indicator methyl orange is assumed to represent total alkalinity.

direct drainage area - The land area where runoff flows directly into only a particular lake or stream, as differentiated from watershed areas. The direct drainage area for streams is only the area drained within the county; for lakes the drainage area includes the total area that may also drain into the lake from other counties.

glacial features:

drumlins - Smooth, elongated hills of glacial till, with their long axis paralleling the direction of ice movement. They generally occur in clusters rather than singly.

glacial outwash - Deposits made up of the material produced by glaciers and carried, sorted and deposited by water that originated mainly from melting of glacial ice. The deposits now exists as stratified beds of clay, sand or gravel in the form of plains, valley trains and deltas of old glacial lakes. The outwash may extend far beyond the farthest advance of the ice. Outwash was often a calving ground for glaciers and the melting of buried ice blocks produced numerous lakes. Outwash of this kind is known as pitted outwash.

ground moraine - Extended sheets of glacial till deposited irregularly over the path of the glacier. These nearly level areas are also composed of a mixture of sand, gravel, boulders and clay, and occasionally, the bedrock is left exposed. The lakes found in this type of moraine are usually shallow and marshy.

terminal moraine - A ridge of glacial till marking the farthest advance of a particular glacier or lobe of a glacier. Between two such lobes, the Green Bay and Lake Michigan lobes of the Late Wisconsin Ice Sheet, an interlobate morainic deposit of unusual height and irregularity was formed. This is referred to as the Kettle Moraine of Wisconsin, so called because of the deep hollows associated with it.

lake types:

hard water drainage lake - An impoundment or lake whose main water source is stream drainage. Total alkalinity of 50 ppm or more year-round. Usually a pH of 7.0 or higher.

soft water drainage lake - Main water source stream drainage. Total alkalinity less than 50 ppm. pH usually, but not necessarily below 7.0.

hard water seepage lake - Landlocked with water level maintained by groundwater table and basin seal. Total alkalinity 50 ppm or more; pH 7.0 or more.

soft water seepage lake - Landlocked with groundwater source and basin seal. Total alkalinity less than 50 ppm. pH usually, but not necessarily less than 7.0.

pH - The negative logarithm of the hydrogen ion concentation expressed in gram equivalents. A pH of less than 7.0 is acid, a pH of 7 neutral, and more than 7.0 is alkaline. Usually swamp drainage contributes to a low pH.

(S.D.F.) shore development figure - A convenient method of expressing the degree of irregularity of the shoreline of a lake. This is the ratio of the length of the shoreline of a lake to the circumference of a circle having the same area as the lake. The number is therefore never less than 1.00.

(SC) specific conductance - A measure of the ability of a sample of water to conduct an electric current. It is therefore a measure of the total dissolved electrolytes in the water, and has use in determining relative purity of waters. The unit of measurement is reciprocal megohms or micromhos.

wetlands - Any area where the water table is at such a level that raising of a cultivated crop is usually not possible. Wetland definitions follow those used by the U.S. Fish and Wildlife Service for wetlands inventories. Wetland classifications are as follows:

deep marshes - Water from six inches to three feet in depth during growing season. Vegetation of cattails, reeds, bulrushes, spike rushes and pondweed.

shallow marshes - Water present during most of the growing season, at least in parts of the area. Vegetation of cattails, river rush, bulrushes, and spike rushes.

fresh meadows - Soggy ground or seasonally flooded areas which are normally too wet for agricultural practices. Vegetatation of smart-weeds, grasses, sedges, broad-leaved plants or bur reed.

shrub swamp - Waterlogged soil, with occasional standing water. Vegetation of alders, willow, dogwoods, etc.

timber swamps - Waterlogged soil, with occasional standing water. Vegetation of tamarack, black spruce, black ash, balsam, etc.

bogs - Waterlogged soil conditions. Vegetation of leatherleaf, cranberries, and Labrador tea.

Plant species on the preceding page are not intended to be a complete list for each type; they are a guide to groups which serve as indicators for various types.

wilderness lake - A body of water near which there are no buildings or car access to commercial facilities within 200 feet of the shore, but where access is possible by trail or water.

winterkill - A fish mortality resulting from extreme stagnation of water beneath the surface of an ice-bound lake, wherein the dissolved oxygen concentration is lowered to a level incapable of sustaining fish life. Partial winterkill may occur in lakes having shallow bays or areas of shallow water, since these waters may not be circulated during ice-covered periods.

APPENDIX I

Physical and Chemical Characteristics of Columbia County Lakes

Code No.	Name	Location Tn.	Rge.	Sec.	Area (acres)	Length (miles)	Width (miles)	Maximum Depth (feet)	Shoreline (miles)	Shore Development Factor	Public Frontage (miles)	Source of Water	pH	Total Alkalinity (ppm)	Specific Conductance (mmhos 25° C)	Date of Sampling
1	Alder Pond	10	7	34	4.2	0.13	0.09	26	0.40	1.39	--	Seepage	7.3	35	109	Sept. 24, '63
2	Becker L.	13	10	14	29.6	0.31	0.20	8	1.15	1.38	--	Seepage	7.1	20	80	May 14, '61
3	Corning	13	7	10	27.2	0.33	0.24	4	1.30	1.78	--	Seepage	8.2	136	269	Oct. 4, '61
4	Crystal	12	10	1, 12	27.2	0.30	0.28	12	1.00	1.37	--	-	7.5	216	513	Jan 3, '62
-	Cuff	(extinct)														
5	Dates Mill-pond	13	9, 10	1, 6	96.0	0.61	0.38	6	4.10	3.38	--	Drainage	8.5	160	293	May 15, '61
-	Fall River Millpond	(see Lazy Lake)														
6	George	12	9	13	33.2	0.33	0.29	21	1.00	1.24	--	Seepage	8.3	184	370	May 16, '61
7	Goose	10	9,10	25, 19	72.8	0.40	0.15	3	1.70	1.42	0.20	Seepage	8.8	268	2,932	June 7, '61
-	Krause Pond	(private fish hatchery)														
8	Lantz Pond	10	7	36	4.1	0.13	0.09	7	0.51	1.80	--	Seepage	8.2	88	219	June 7, '61
9	Lazy Lake	11	12	26, 27	174.0	1.15	0.40	6	6.00	3.25	0.08	Drainage	9.2	214	373	June 30, '61
-	Loomis	(extinct														
10	Long	12	9	17, 21	39.2	0.95	0.10	8	5.00	5.70	0.01	Drainage	6.3	75	225	Jan. 3, '62
11	Lost	12	8	34	1.6	0.05	0.04	17	0.20	1.13	--	Seepage	7.3	139	213	Oct. 11, '63
12	Mud	12	9	5	11.6	0.40	0.07	1	1.00	2.10	--	Seepage	8.3	112	222	Oct. 4, '61
-	Mud	11	10	22	(extinct)											
13	Park	12	10	2, 3	219.0	1.15	0.60	8	5.30	2.56	0.56	Drainage	8.3	214	464	May 14, '61
14	Ryan	10	7	21	7.8	0.25	0.08	7	0.55	1.41	0.10	Seepage	7.2	68	185	June 7, '61
-	Scott	(extinct)														
15	Silver	12	9	6	51.8	0.55	0.37	41	2.20	2.18	0.16	Seepage	8.5	150	333	May 16, '61
16	Spring	12	10	3, 4	17.2	0.30	0.10	28	0.80	1.38	--	Drainage	8.3	212	595	May 14, '61
17	Swan	12	9,10	1,2,5,6	419.0	2.35	0.47	82	6.50	2.27	0.02	Drainage	7.9	210	454	May 19, '61
18	Tarrant	12,13	12	32,5	18.0	0.40	0.15	8	1.00	1.68	0.24	Drainage	8.5	219	529	May 14, '61
19	Weeting	13	7	23	34.0	0.30	0.20	4	1.27	1.55	--	Seepage	8.0	144	337	May 16, '61
20	West	12	10	4, 5	18.8	0.25	0.18	22	0.65	1.07	--	Seepage	7.8	145	346	May 14, '61
21	Wisconsin	10,11	7,8	-	9,000.0	16.85	2.55	24	58.20	4.38	0.25	Drainage	8.7	72	227	July 15, '64
22	Wyocena Millpond	12	10	21, 22	90.0	1.40	0.24	3	4.1	3.08	0.15	Drainage	8.4	256	556	May 19, '61
22	Named Lakes				10,396.3 acres				103.93 miles	$\bar{x}$ = 2.16	1.77		$\bar{x}$ =8.0	$\bar{x}$ = 152	$\bar{x}$ = 329	
34	Unnamed Lakes				866.26 acres				20.50 miles	$\bar{x}$ = 1.51	8.32		$\bar{x}$ =7.7	$\bar{x}$ = 163	$\bar{x}$ = 344	
56	Lakes				11,262.56 acres				124.43 miles	$\bar{x}$ = 1.77	10.09 miles		$\bar{x}$ =7.8	$\bar{x}$ = 159 ppm	$\bar{x}$ = 338 mmhos	

APPENDIX IA

Columbia County	Adjoining Wetlands (Acres)	Percent Woody	Percent Nonwoody	Depth Percent <3	Depth Percent >20	Watershed Area (Sq. Miles)	Percent Muck Shore	Cottages or Homesites
Alder Pond	5	10	90	<1	15	>1	100	0
Becker Lake	.57	5	95	50	0	2	99	1
Corning Lake	53	99	1	80	0	2	80	1
Crystal Lake	180	67	33	75	0	1	80	1
Dates Millpond	146	1	99	75	0	19	75	3
George Lake	36	93	7	80	0	1	80	4
Goose Lake	5	1	99	95	0	5	99	0
Lantz Pond	44	0	100	40	0	>1	100	0
Lazy Lake	7	33	67	40	0	58	70	14
Long Lake	2	50	50	45	0	5	15	22
Lost Lake	2	50	50	5	0	5	99	0
Mud Lake	440	20	80	95	0	4	99	0
Park Lake	535	10	90	15	0	56	80	120
Ryan Pond	0	0	100	45	0	1	45	1
Silver Lake	55	10	90	10	80	1	45	56
Spring Lake	10	20	80	5	10	57	55	12
Swan Lake	304	16	84	1	80	80	55	69
Tarrant Lake	68	1	99	30	0	17	73	9
Weeting Lake	25	10	90	20	0	6	100	0
West Lake	60	39	61	10	5	1	70	5
Wisconsin Lake	485	46	54	5	10	8,950	40	822
Wyocena Millpond	55	60	40	90	0	84	99	12
TOTAL	2,574							1,152

APPENDIX II

Unnamed Lakes in Columbia County

Location Tn.	Rge.	Sec.	Code No.	Area (acres)	Length (miles)	Width (miles)	Maximum Depth (feet)	Shoreline (miles)	Shore Development Figure	Public Frontage (miles)	pH	Total Alkalinity (ppm)	Specific Conductance (mmhos 25° C)	Date of Sampling
10	7	29(2)	23	5.93	.15	.09	5.0	.51	1.49	--	9.2	42	160	June 7, '61
10	8	11(6)	24	1.22	.09	.03	3.5	.20	1.29	--	6.4	50	130	March 7, '63
10	8	19(7)	25	1.31	.06	.04	5.0	.21	1.31	--	8.7	110	205	Sept. 29, '64
10	8	20(6)	26	4.67	.13	.09	10.0	.33	1.09	--	7.9	280	531	Sept. 29, '64
11	8	1(8)	27	31.0	.3	.2	5.0	.9	1.15	--	8.4	75	208	Oct. 4, '61
11	9	26(6)	28	4.91	.13	.07	3.0	.32	1.03	--	8.1	242	454	Sept. 29, '64
11	9	33(15)		Small pond in public park west of Poynette - nearly dry at visit										Oct. 10, '64
11	10	2(2)	29	14.8	.28	.14	8.0	.81	1.50	--	7.3	229	606	Jan. 3, '62
11	10	26(3)	30	6.15	.13	.09	4.0	.38	1.09	--	8.0	22	105	Oct. 4, '61
12	8	14(10)	31	13.72	.20	.15	5.0	.74	1.43	--	8.4	32	133	May 19, '61
12	8	15(3)	32	1.42	.08	.05	6.0	.20	1.20	--	6.8	60	237	March 7, '63
12	8	15(14)	33	8.25	.12	.08	11.0	.49	1.22	--	6.6	70	305	March 7, '63
12	9	5(9)	34	2.13	.08	.06	7.0	.19	1.00	.19	7.4	67	206	Oct. 5, '64
12	9	7(2)	35	0.71	.05	.03	7.0	.12	1.00	.12	7.4	101	245	Oct. 5, '64
12	9	7(5)	36	0.2	.03	.01	5.0	.07	1.12	.07	7.4	99	248	Oct. 5, '64
12	9	20(12)	37	2.10	.20	.01	1.0	.44	2.17	--	8.2	262	478	Oct. 13, '64
12	9	29(4)	38	0.70	.06	.02	4.0	.16	1.36	--	8.0	201	349	Oct. 13, '64
12	9	29(13a)	39	0.84	.10	.02	2.0	.26	5.60	--	7.2	104	272	Oct. 13, '64
12	9	32(9)	40	0.71	.08	.01	3.0	.17	1.44	--	7.2	257	519	Oct. 13, '64
12	9	32(12)	41	0.96	.08	.02	4.0	.19	1.38	--	7.2	156	306	Oct. 13, '64
12	10	4(66)	42	1.39	.13	.02	6.0	.32	1.94	--	8.1	195	386	Oct. 10, '64
12	10	7(12)	43	8.23	.15	.10	7.0	.40	1.00	--	6.9	214	480	Jan. 3, '62
12	10	16(4)	44	2.31	.10	.06	4.0	.27	1.27	--	7.8	272	500	Oct. 10, '64
12	10	20(12)	45	33.78	.62	.14	7.0	1.50	1.87	--	8.0	248	500	Nov. 3, '64
12	10	23, 24	46	14.54	.31	.10	6.0	.78	1.46	--	8.1	256	526	Nov. 3, '64
13	8	34(7)	47	4.99	.09	.07	4.0	.33	1.05	--	8.7	97	195	Oct. 5, '64
13	8	34(8)	48	2.73	.07	.06	3.0	.24	1.04	--	8.8	92	211	Oct. 5, '64
13	9	9	49	5.87	.26	.06	2.0	.55	1.62	--	7.8	228	412	Oct. 5, '64
13	9	10	50	655.0	2.0	1.0	5.0	6.8	1.90	6.8	7.9	284	524	Oct. 10, '64
13	9	14	51	23.24	.31	.20	5.0	1.14	1.69	1.14	7.9	310	549	Oct. 10, '64
13	9	28(1)	52	2.08	.26	.01	3.0	.58	2.85	--	7.6	242	421	Oct. 10, '64
13	10	20(11)	53	1.78	.03	.10	5.0	.25	1.34	--	7.9	251	476	Oct. 10, '64
13	10	21(12)	54	3.28	.14	.05	2.0	.33	1.30	--	7.2	246	471	Oct. 10, '64
13	10	35(9)	55	0.9	.07	.03	1.5	.16	1.14	--	6.8	9	85	Oct. 10, '64
13	10	35(15)	56	1.24	.07	.03	3.0	.16	1.03	--	7.3	132	258	Oct. 10, '64
				866.26 Acres			$\bar{x}$ = 4.8	20.50	$\bar{x}$ = 1.51	8.32	$\bar{x}$ = 7.7	$\bar{x}$ = 163	$\bar{x}$ = 344	

APPENDIX IIA

Columbia County Unnamed Lakes	Adjoining Wetlands	Percent Woody	Percent Nonwoody	Depth Percent<3	Depth Percent>20	Watershed Area (Sq. Miles)	Percent Muck Shore	Cottages or Homesites
10-7-29	0	0	0	50	0	1	55	0
10-8-11 (6)	3	50	50	95	0	1	100	0
10-8-19 (7)	0	100	0	-	0	1	100	0
10-8-20 (6)	245	0	100	5	0	1	100	0
11-8-1 (8)	1	0	100	-	0	1	-	1
11-9-26 (6)	40	10	90	100	0	1	80	0
11-10-2	65	45	55	30	0	18	80	1
11-10-26 (3)	1	100	0	-	0	1	80	1
12-8-14 (10)	0	0	0	10	0	1	0	1
12-8-15 (3)	0	0	0	5	0	1	20	0
12-8-15 (14)	0	0	0	5	0	1	10	0
12-9-5 (9)	2	1	99	5	0	1	90	0
12-9-7 (2)	0	0	0	15	0	1	0	0
12-9-7 (5)	0	0	0	20	0	1	0	0
12-9-20 (12)	1	100	0	100	0	656	100	0
12-9-29 (4)	0	95	5	45	0	658	5	0
12-9-29 (13a)	0	95	5	99-	0	658	90	0
12-9-32 (9)	20-	30	70	99	0	1	80	0
12-9-32 (12)	5	99	1	80	0	1	80	0
12-10-4 (66)	0	0	0	-	0	1	0	0
12-10-7 (12)	2	50	50	35	0	1	80	0
12-10-16 (4)	119	50	50	10	0	1	100	0
12-10-20 (12)	0	0	0	50	0	1	40	0
12-10-23,24	0	0	0	40	0	37	65	1
13-8-34 (7)	0	0	0	95	0	1	0	0
13-8-34 (8)	0	0	100	100	0	1	0	0
13-9-9	434	0	100	100	0	1	90	0
13-9-10	105	0	100	60	0	40	-	0
13-9-14	617	0	100	80	0	12	80	0
13-9-28 (1)	576	0	100	99	0	1	20	0
13-10-20 (11)	5	50	50	30	0	8	20	0
13-10-21 (12)	62	20	80	99	0	1	100	0
13-10-35 (9)	1	0	0	100	0	1	50	0
13-10-35 (15)	5	80	20	99	0	1	80	0
Unnamed Lakes	2,309 Acres							5
Named Lakes	2,574 Acres							1,152
TOTAL	4,883 Acres							1,157

APPENDIX III

Characteristics of Columbia County Streams

	LOCATION						Watershed Area (Sq. mi.)	Surface Area (Acres)	Length (Mi.)	Width Av. (Ft.)	Gradient (Ft./Mi.)	Public Frontage (Mi.)[2]	pH[3]	Total Alka. (ppm)	Spec. Cond. (Mmhos 25° C)	Date of Sampling	ADJOINING WETLANDS		
	From			To													Area (Acres)	% Woody	% Non-Woody
	T.	R.	S.	T.	R.	S.													
Baraboo River	12N	8E	18	12N	8,9E	28	658	151.52	13.3	94	1.88	0.16	8.4	183	362	June 23, 61	824	1	99
Beaver Creek	12N	12E	32	12N	12E	24	24	8.13	6.1	11	2.46	3.00	7.3	326	782	June 21, 61	424	0	100
Big Slough				13N	8E	4,9	6	50.42	8.0	520	<0.20	0.01	7.9	170	355	Jan. 7, 61	1,584	40	60
Crawfish River	10N	11E	29	10N	12E	12	158	85.45	28.2	25	4.58	0.11	8.2	271	625	May 22, 61	1,461	13	87
Crawfish R., N. Branch	11N	11E	32	11N	12E	27	66	44.72	24.6	15	3.25	0.05	7.8	288	655	June 21, 61	607	13	87
Duck Creek	12N	10E	22	12N	9E	33	111	58.37	11.2	43	1.70	0.03	8.1	247	496	May 24, 61	2,960	20	80
Duck Cr., Middle Branch	12N	12E	17	12N	10E	22	37	31.73	15.4	17	11.04	0.08	7.9	277	570	May 24, 61	321	5	95
Duck Cr., N. Branch	12N	12E	5	12N	10E	15	47	68.06	23.4	24	7.05	0.10	7.9	308	684	May 24, 61	2,427	30	70
Fox River	13N	11E	1	13N	9E	3	337	297.94	40.3	61	4.52	0.44	7.8	209	453	June 23, 61	13.911	37	63
French Creek	13N	10E	4	13N	9E	3	60	25.94	10.7	20	3.74	3.05	7.5	239	458	June 23, 61	1,600	10	90
Hinkson Creek	11N	9E	15	11N	9E	30	18	4.36	6.0	6	4.17	0.03	7.9	246	502	June 7, 61	603	50	50
Jennings Creek	12N	12E	29	12N	11E	20	17	13.24	9.1	12	13.18	6.08	8.3	269	531	May 24, 61	212	44	56
Neenah Creek	13N	8E	27	13N	9E	9	183	55.15	9.1	50	1.41	0.02	7.7	142	318	June 23, 61	219	0	100
Powers Creek	Rowan Creek from its junction with Hinkson Creek to Lake Wisconsin is often considered by this name.																		
Prentice Creek	11N	8E	4	11N	8E	29	10	5.81	8.0	6	21.87	0.03	8.1	198	408	June 26, 61	0	0	0
Robbins Creek	10N	12E	29	10N	12E	1	10	6.25	8.6	6	6.25	0.07	8.0	278	837	May 22, 61	244	5	95
Rocky Run Creek	11N	10E	23	11N	9E	5	54	65.75	21.7	25	6.22	0.45	7.6	227	451	May 24, 61	2,192	27	73
Rowan Creek	11N	10E	31	11N	9E	30	123	12.85	10.6	10	11.79	0.90	7.9	260	536	Jan. 7, 61	820	58	42
Rowley Creek	12N	8E	34	12N	8E	31	11	2.67	5.5	5	29.10	0.01	8.4	203	420	July 15, 64	0	0	0
Sand Spring Creek	13N	12E	18	13N	11E	21	7	4.22	5.8	6	15.52	0.04	7.8	246	537	May 24, 61	100	0	100
Schneberger Creek	12N	10E	31	11N	9E	1	2	0.15	0.6	2	7.00	0.01	7.1	125	313	Feb. 8, 64	27	37	63
Spring Creek (Lodi)	10N	8E	34	10N	8E	17	100	27.15	8.0	28	6.50	0.86	7.7	276	603	June 7, 61	735	11	89
Spring Creek	13N	9E	3	13N	9E	11	14	4.56	4.7	8	10.64	0.51	7.8	244	495	June 7, 61	400	15	85
Wisconsin River[1]							8,944	10,904.00	64.8	1.388	0.50	10.58	7.1	56	121	Composite	3,085	65	35
Named Streams								11,928.7 ac. 336.5 mi.				26.62	$\bar{x}$ = 7.9	$\bar{x}$ = 238 mg/L	$\bar{x}$ = 518 Mmhos				
Unnamed Streams								27.56 ac. 34.5 mi.					$\bar{x}$ = 7.9	$\bar{x}$ = 253 mg/L	$\bar{x}$ = 556 Mmhos				
All Streams								11,956.30 ac. 371.0 mi.					$\bar{x}$ = 7.9	$\bar{x}$ = 244 mg/L	$\bar{x}$ = 532 Mmhos				

1/ Wisconsin River excludes Lake Wisconsin from Prairie du Sac Dam to Dekorra

2/ Public Frontage includes roads crossing the streams; a length of 0.01 miles per crossing has been arbitrarily chosen to represent such frontage

3/ Means for pH, alkalinity, and specific conductance do not include the Wisconsin River

APPENDIX IIIA

Characteristics of Columbia County's Unnamed Streams

Location	Watershed Area	Surface Area	Length (Miles)	Width (Miles)	Gradient (Ft. per Mi.)	Public Frontage (Miles)	Nature of Wetlands Woody %	Non-Woody %	Wetlands Area	pH	Total Alkalinity (ppm)	Specific Conductance	Date of Sampling	Watershed
10N 12E 34 10N 12E 24	4	1.74	3.6	4	28	.04	0	100	18	8.1	302	699	22 My 61	Crawfish
10N 12E 35 10N 12E 25	2	0.41	1.7	2	21	.03	-	100	1	8.2	287	507	22 My 61	Crawfish
11N 8E 7 11N 8E 17	2	0.73	1.5	4	147	.03	-	100	0	8.1	239	325	26 Jn 61	Prentice
11N 11E 26 11N 12E 16	12	3.88	4.0	8	15	.07	-	100	202	8.6	255	485	22 My 61	Crawfish
12N 10E 7 12N 10E 17	3	2.55	1.4	15	4	.01	60	40	368	6.9	214	480	3 Ja 62	Duck
12N 10E 20 12N 10E 19	4	1.20	0.9	11	1	.01	1	99	289	7.5	211	456	3 Ja 62	Duck
13N 12E 30 12N 11E 1	3	0.39	1.6	2	63	.02	0	100	1	8.4	305	604	24 My 61	Duck
12N 12E 5 12N 12E 5	2	0.76	0.9	7	37	.02	0	100	23	8.3	270	658	24 My 61	Duck
12N 12E 13 12N 12E 12	3	0.97	1.6	5	11	.02	1	99	262	7.5	136	340	21 Jn 61	Beaver
12N 12E 10 12N 12E 27	11	6.54	6.0	9	6	.05	0	100	308	7.8	285	754	24 My 61	Beaver
13N 7E 11 13N 7E 36	14	4.51	6.2	6	2	.04	70	30	3,979	8.6	180	245	23 Jn 61	Wisconsin
13N 12E 8 13N 12E 4	5	2.30	3.8	5	15	.04	0	100	102	7.5	289	775	3 Jan 62	Fox
13N 12E 6 13N 12E 6	2	1.58	1.3	10	38	.01	0	100	47	7.5	320	897	3 Jan 62	Fox
		27.56 ac.	34.5 mi.			0.39 mi.				$\bar{x}$ =7.9	$\bar{x}$=253 mg/L	$\bar{x}$=556 Mmhos		

SURFACE WATER RESOURCE PUBLICATIONS

Barron County	1964
Chippewa County	1963
Columbia County	1965
Dane County	1962
Dunn County	1962
Eau Claire County	1964
Green County	1961
Kenosha County	1961
Marquette County	1963
Menominee County	1963
Milwaukee County	1964
Ozaukee County	1964
Polk County	1961
Racine County	1961
St. Croix County	1961
Vilas County	1963
Walworth County	1961
Washington County	1962
Waukesha County	1963