

Manhattan Beach Comprehensive Plan

August 3, 1996

*Based on a Conservative Version of
Sustainable Development*

Comprehensive Plan Participants:

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Manhattan Beach Comprehensive Plan — 1996

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Part I Community History

Manhattan Beach is located in the heart of the lakes area in North Central Minnesota. It is approximately 1-1/2 square miles in size. The city is adjacent to Big Trout Lake, part of the Whitefish Chain in northern Crow Wing County. Manhattan Beach is primarily a residential community and is dependent on tourism, seasonal residents, and jobs outside the community.

To provide liquor licenses for the growing tourism business in the south end of the community, the City of Manhattan Beach was formed from a portion of what was Allen Township. At the time, the population was located along the County Road 6 blacktop roadway, so that population base defined the boundaries of the City. With the exception of Beaver Dam Resort, the land along the north shore of Big Trout Lake was undeveloped, thus of no value to the tax base and voting power of the newly forming city. That undeveloped land remained in Allen Township, and Allen Township later incorporated as the City of Fifty Lakes.

From the 1930's through the '60's Manhattan Beach was a major tourist retreat area. Fishing and the relaxation of resort life drew people to the area. Tourist services included two large complexes, Manhattan Beach Lodge and Resort for lodging, dining, and dancing, and the Manhattan Beach Club.

Through its history, the Club, on the east side of County Road 6 (66) north of the Manhattan Beach Point Road, included a four-lane bowling alley, restaurant, barber shop, grocery store, bar, gas station, motel rooms and a post office. At one time a community skating rink and warming house sat to the south of the Club parking lot, and there was once a riding stable on the north side of the club complex.

Additionally, commercial buildings near the Club housed a puzzle factory and a gift shop at one time. Over time all of the Club area buildings on the east side of CR 6 (66) burned and that property is currently vacant.

Beginning in 1928 The Manhattan Beach Lodge originally included most of the southeast bay of Big Trout Lake offering cabins that stretched into Crosslake, main lodge rooms, dining, and dancing. The Lodge Tennis Courts were lakeside where the Manhattan Villa Condominiums were built in the early 1970's. The cabins were eventually subdivided and sold leaving the main lodge and restaurant which still operates on the shore of Big Trout Lake.

In the northeast corner of Big Trout Lake two small fishing resorts were established: FloraDell developed by the Vargos and Beaver Dam Resort. In later years, both of these properties were subdivided. Today, the original Vargo property is known as Boulder Ridge, and Beaver Dam became part of the first platted lots in the North Gate Lane Plat.

In the north end of the City, the Wannebo family operated an auto repair garage and used car sales business as well as an excavating company. It should be noted that the gravel pit on the south side of County Road 1 was opened by the County in the 1960's prior to the adoption of ordinances.

The balance of the City consisted of small sustenance farms with 5 - 10 animals, and most of the population supplemented their income with part-time jobs such as summer cabin cleaning or working for local manufacturers such as Durkees in Pine River. Many residents were employed seasonally in construction and logging.

Today, 1996, the used car/garage operation is no longer in business. Additional housing occurred in the form of condominiums next to Manhattan Beach Lodge, Boulder Ridge has two houses under construction, and children of the larger property owners have purchased

corners of their parents' land for the use of the next generation of residents. There is a 25 lot development currently being proposed for the northeast corner of the city south of County Road 1.

The lifeblood of this community remains its water resources in the form of Big Trout Lake, and its large rural residential properties, the smallest being about 10 acres.

Part II Planning History

Manhattan Beach has been administering its own ordinances for more than 20 years. The City first adopted its zoning ordinances in 1973. Because of development pressures, the City made a decision to complete a Comprehensive Plan in late 1995. The purpose of this plan is to provide direction to the City Council to assist in making decisions which will impact the City's short and long-term development. This will also become the base for the review and updating of City ordinances.

The City's current ordinances have served the community well over these years. The council and zoning coordinator have done well in its application. The community exists as its residents intend or it would be something different.

The challenge of development and new State regulations dictate that the newly formed Planning Commission should establish a Comprehensive Plan to provide direction in rewriting the City ordinances. The first step, undertaken by the City Council in 1995, was to hire Region 5 to conduct a survey and assist in the evaluation process.

It is the intent of the commission to keep ordinances as simple and user friendly as possible. A recent lawsuit challenging the existing ordinance regarding the City Council's authority to limit the number of animals within the City was won by the City in District and appellate Court upholding the City's authority to place such limitations. To protect the environment, it has been determined that a City can control land use changes.

Throughout the development of this Plan, the Planning Commission studied the plans and ordinances of other communities, reviewed the Comprehensive Plan of Crow Wing County, and met with County zoning officials and County department heads for guidance, advice and trends. A moratorium on land use changes has been implemented to control growth during the planning process.

Part III Community Survey and Region 5 Preliminary Plan

A Preliminary Comprehensive Plan was prepared by the Staff of Region 5 and is included here. This plan represents one form of input and was presented to the Manhattan Beach City Council on July 7, 1995 and presented at a public meeting on October 6, 1995 along with a map reflecting the current land use within the community.

This report includes background on the community, tables/charts of the public survey conducted in the Spring of 1995, a discussion of goals and policies, and a recommended implementation schedule. This survey and report were delivered to and discussed by the City Council at a publicized open meeting. The balances of the services available from Region 5 have been put on hold until the Commission develops its final Comprehensive Plan.

The main elements of the Region 5 Comprehensive Plan are: Population Characteristics; Housing Characteristics; Economy; Transportation; Environment; and Land Use.

INTRODUCTION

Manhattan Beach is located in the heart of the lakes area in North Central Minnesota. The city is adjacent to Big Trout Lake, which is part of the Whitefish Chain of Lakes in northern Crow Wing County. Manhattan Beach is primarily a residential community which is very dependent on tourism.

Manhattan Beach has been administering its own zoning ordinance for over twenty years. The city first adopted its zoning ordinance in 1973. Because of development pressures, the city made the decision to complete a comprehensive plan. The purpose of the plan is to provide direction to the city council in making decisions which will impact the city's short-term and long-term development.

BACKGROUND

Information on population, housing, the economy, transportation, the environment and land use was collected in order to provide a profile of the community as it exists today. Goals and policies were developed after analyzing this data. In addition, a community survey was completed so that citizens could provide input into the planning process. The goals and policies will provide the basis for the implementation of the plan.

Population Characteristics

The population characteristics of a community are very important in identifying changing population patterns.

Growth - There was dramatic growth in the population of Manhattan Beach, with the city showing a 30.4% increase between 1970 and 1980. According to local officials, the 1970 population from the Census is inaccurate. Officials estimate that the population was closer to 60 in 1970. If so, the population of city has been stable since 1960. Crow Wing County, in comparison, has shown substantial growth, with a 19.8% increase in their population. Table 1 shows the population changes for Manhattan Beach and Crow Wing County between 1960 and 1990. Table 2 shows the population projections for 2000 and 2005. Again, Manhattan Beach is shown with little change in its population. The City should examine the reasons why it is not growing while Crow Wing County is showing tremendous growth. Increased population growth would expand Manhattan Beach's tax base.

Manhattan Beach has approximately 1 1/2 square miles of land within its boundaries. Population density has increased from 28.75 persons in 1980 to 40.50 persons per square mile in 1990 (Table 3). The number of households and housing units also increased during this same time.

TABLE 1
POPULATION
CITY OF MANHATTAN BEACH AND CROW WING COUNTY
1960 - 1990

	<u>1960</u>	<u>1970</u>	<u>% OF CHANGE</u>	<u>1980</u>	<u>% OF CHANGE</u>	<u>1990</u>	<u>% OF CHANGE</u>	<u>1993 EST.</u>	<u>% OF CHANGE</u>
Manhattan Beach	62	46	-25.8	60	30.4	61	1.67	61	0
Crow Wing County	32,314	34,826	8.3	41,722	19.8	44,249	6.1	46,512	5.1

SOURCE: Census of Population, 1960 -1990

TABLE 2
POPULATION PROJECTIONS

	<u>1990</u>	<u>AVE. INCREASE EACH 10 YR. PERIOD '60 - '90</u>	<u>2000</u>	<u>2005</u>
Manhattan Beach	61	-0.54%	61	60
Crow Wing County	44,249	11.99%	49,690	55,648

SOURCE: 1990 Census of Population and Crow Wing County Comprehensive Plan

TABLE 3
POPULATION DENSITY
1970 - 1990

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>80-90 CHANGE</u>	<u>1993</u>	<u>90-93 CHANGE</u>
Population	46	60	61	1.67	61	0.00
Land Area (Sq Mi)	1.60	1.43	1.51	5.59	1.51	0.00
Density (Per Sq Mi)	28.75	41.96	40.50	-3.48	40.50	0.00
Housing Counts	41	68	65	-4.41	N/A	N/A
Households	15	26	27	3.85	27	0.00
Persons/Household	3.07	2.31	2.26	2.16	2.26	0.00

SOURCE: Census of Population, 1970 -1990 and 1993 Estimates for Minor Civil Divisions

Age - Population by age group is shown in Table 4. The 60-69 year-old age group makes up the largest percentage with 23.0% of the total population. Manhattan Beach has 19.7% of its population under 20, but the young adult population stands at zero. Manhattan Beach will face a population decline in the future, if the city does not

attract younger families to its community.

Households - Manhattan Beach had a total of 27 households in 1990. During the period between 1970 and 1980, the number of households increased by 73.3% from 15 to 26. Since 1980, the number of households has remained stable. During this same time period, Crow Wing County has shown an increase with 13.4% more households in 1990 and 6.0% estimated in 1993. Table 5 shows the change in number of households for both Manhattan Beach and Crow Wing County.

TABLE 4
NUMBER OF PERSONS BY AGE
1990

<u>AGE</u>	<u>PERSONS</u>	<u>% OF TOTAL</u>	<u>AGE</u>	<u>PERSONS</u>	<u>% OF TOTAL</u>
4 AND UNDER	1	1.64	30 - 39	8	13.11
5 - 9	3	4.92	40 - 49	11	18.03
10 - 14	6	9.84	50 - 59	7	1.48
15 - 19	2	3.28	60 - 69	14	23.00
20 - 24	0	0.00	70 - 79	8	13.11
25 - 29	0	0.00	80 AND OVER	1	1.64
TOTAL POPULATION:	61		TOTAL FEMALE POPULATION:	29	47.5%
			TOTAL MALE POPULATION:	32	52.5%

SOURCE: 1990 Census of Population

TABLE 5
NUMBER OF HOUSEHOLDS
MANHATTAN BEACH AND CROW WING COUNTY

	<u>HOUSEHOLDS</u>				<u>% OF CHANGE</u>			<u>PERSON'S PER HOUSEHOLD</u>			
	1970	1980	1990	1993	70-80	80-90	90-93	70	80	90	93
Manhattan Beach	15	26	27	27	73.3	0.04	0	3.07	2.31	2.26	2.26
Crow Wing	10,974	15,171	17,204	18,232	38.2	13.4	6.0	3.1	2.7	2.6	2.6

SOURCE: Census of Population, 1970 - 1990 and 1993, Estimates for Minor Civil Divisions

The majority of households in Manhattan Beach are married-couple family households. There are very few female headed households within the community. A summary of households by type is shown in Table 6.

TABLE 6
HOUSEHOLDS BY TYPE
MANHATTAN BEACH
1990

TOTAL HOUSEHOLDS	27
Family Households	23
Married - couple family	22
Female head of household	1
NON-FAMILY HOUSEHOLDS	4
Householder living alone	4
65 years and older	2
Female head of household	1

SOURCE: 1990 Census of Population

Housing Characteristics

The characteristics of housing in a community must also be examined, in order to determine the kind of development which should take place in the future.

Type - The owner-occupied housing in Manhattan Beach consists primarily of single-family homes. According to the census information, there is only one renter-occupied housing unit. Vacant or seasonal housing units make up 58.5% of total housing units or the majority of Manhattan Beach housing (See Table 7).

TABLE 7
HOUSING UNITS
1980 - 1990

	<u>1980</u>		<u>1990</u>	
	<u>NUMBER</u>	<u>% OF TOTAL</u>	<u>NUMBER</u>	<u>% OF TOTAL</u>
Owner-Occupied	26	38.2	26	40.0
Renter-Occupied	0	0	1	2.8
Vacant/Seasonal	42	61.8	38	58.5
TOTAL	68	100.0	65	100.0

SOURCE: Census of Population, 1980 - 1990

A study completed by the Environmental Quality Board (EQB) titled Growth Management Study examined the effects of growth on the environment. Manhattan Beach was one of the communities included in the study, which covered the areas along Gull Lake and the Whitefish Chain of Lakes. According to this report much of the housing is new, having been built since 1979. Table 8 shows Manhattan Beach with 21.8% of its housing units built since 1979. Surrounding communities also have fairly new housing.

The study also states that housing values along these two lakes are high. Comparing housing values in the vicinity of Manhattan Beach, one can see that homes in Manhattan Beach have the lowest median value of \$50,000. According to the EQB study, people are moving away from popular lakes, due to high housing costs and overcrowding.

It is expected that some of the seasonal housing units in Manhattan Beach and the surrounding area will be converted to permanent houses in the future, as their owners reach retirement age. Permanent residents may demand higher levels of service. In addition, new housing units may be built in Manhattan Beach.

TABLE 8
HOUSING UNITS
YEAR BUILT AND MEDIAN VALUE

	PERCENT BUILT			
	<u>AFTER</u>	<u>BEFORE</u>	<u>MEDIAN</u>	<u>MEDIAN</u>
	<u>1979</u>	<u>1970</u>	<u>YEAR BUILT</u>	<u>VALUE</u>
Manhattan Beach	21.8	41.0	1972	\$50,000
Crosslake	29.1	47.0	1971	89,500
Fifty Lakes	18.4	56.3	1968	74,300
Timothy Township	18.3	47.0	1971	67,500
Ideal Township	25.1	43.2	1972	95,100

SOURCE: Growth Management Study, EQB, 1994

Economy

Manhattan Beach depends on Crosslake for its goods and services. There is very little commercial development within the City of Manhattan Beach.

Employment - Employment by occupation is shown in Table 9. The majority of residents and land owners are employed as professionals (33.8%). Skilled-craftsman and homemakers ranked second with 14.9% of the total.

Income - Over 50% of the residents and landowners have annual

household incomes of \$40,000 and over (See Table 10). Approximately one-fourth have household incomes over \$70,000 per year. Overall household incomes are substantially higher than Crow Wing County, which has a median household income of \$22,250.

TABLE 9
OCCUPATIONS OF MANHATTAN BEACH RESIDENTS
AND LAND OWNERS

<u>CATEGORY OF OCCUPATION</u>	<u>NUMBER OF PERSONS</u>	<u>% OF TOTAL</u>
Farmer	2	2.7
Skilled-Craftsman	11	14.9
Professional	25	33.8
Retail	4	5.4
Laborer/Manufacturer	1	1.4
Homemaker	11	14.9
Clerical	6	8.1
Service Industry	4	5.4
Government	1	1.4
Other	9	12.2
TOTAL	74	100.0

Source: 1995 Community Survey

TABLE 10
INCOME OF MANHATTAN BEACH RESIDENTS
AND LAND OWNERS

<u>INCOME RANGE</u>	<u>NUMBER OF HOUSEHOLDS</u>	<u>% OF TOTAL</u>
Less than \$10,000	0	0
\$10,000 - \$19,999	2	5.4
\$20,000 - \$29,999	8	21.6
\$30,000 - \$39,999	7	18.9
\$40,000 - \$49,999	5	13.5
\$50,000 - \$59,999	5	13.5
\$60,000 - \$69,999	1	2.7
Over \$70,000	9	24.3
TOTAL	37	100%

Source: 1995 Community Survey

Transportation

The transportation system of a community is vital to the movement of goods and people. Roads also provide access to land. Manhattan Beach's transportation system consists primarily of highways and local roads.

Highways - Major collector highways County State Aid Highway (CSAH) 1 and CSAH 66 intersect within the City of Manhattan Beach. Collectors are highways whose function is to collect traffic from local roads and move it to minor arterial highways. CSAH 1 extends west from Manhattan Beach to Pine River and MN Trunk Highway 371. CSAH 1 extends east to Emily and MN Trunk Highway 6. CSAH 66 begins at CSAH 1 in Manhattan Beach and runs south into Crosslake where it intersects CSAH 3, which extends south to Brainerd.

Local Roads - Local roads include Northgate Lane, Satchel Road, Meyer Lake Road, Goldenstein Road and Old Grade Road.

Intercounty Route System - Manhattan Beach is also part of the Intercounty Route System with Intercounty Route D (CSAH 1) running through town. The Intercounty Route System covers the five counties of Cass, Crow Wing, Morrison, Todd and Wadena. Signs with letters A, B, C, D, E and F designate these routes throughout the five county area.

Environment

Manhattan Beach's natural resources are very important to the city's quality of life. The preservation of these natural resources is a top priority for the City because it relies heavily on tourism.

Water Quality - Surface water resources in Manhattan Beach include Big Trout Lake and Four Acre Lake. Ground water resources are also important to the area because they provide a source of water for residential, commercial and agricultural uses.

Surface water quality data obtained from MPCA indicated that Big Trout Lake at Manhattan Beach has low levels of phosphorus and chlorophyll a. According to the EQB study of lakes in the area, they are very sensitive to nonpoint pollution and nutrient loading. As an example, an average total phosphorus level of 15 micrograms per liter would relate to an average summer transparency of 15 feet. Doubling of the phosphorus level to 30 micrograms per liter would reduce the average transparency to six feet. Most recent data indicates a total phosphorus level of 11 and transparency of approximately 17 feet. Currently the trophic state of the lake is described as Oligotrophic. According to Mississippi's Headwaters Users Guide to Shoreland Property, Oligotrophic means nutrient poor and biologically unproductive. These lakes are clear and deep with very little algae. Typical fish populations include trout and tulibee. Fish and animals in these well-oxygenated

lakes are especially sensitive to loss of oxygen.

There is limited information on groundwater from the County Well Index. According to the EQB study, most wells in the study area, which includes Manhattan Beach, had nitrogen levels of 0.4 to 7.6 milligrams per liter. Levels of nitrate of 2 to 3 milligrams per liter are due to human activity. Levels greater than 10 milligrams per liter is the maximum level allowed for human consumption.

Water quality is affected by the types of land use within the City and surrounding areas. Spring runoff follows a flow corridor through Manhattan Beach emptying into Big Trout Lake. There is an old dump within the City of Fifty Lakes which could have a negative impact on both surface and groundwater quality.

Soils - Manhattan Beach has permeable soils overlying surficial aquifers. The surficial geology is mainly outwash. Outwash soils such as Chetek Onamia and Brainerd Chetek are a mixture of sand and gravel and are highly permeable. High permeability of these soils and the interconnections between the aquifers and surface water makes the groundwater susceptible to contamination. Little filtration of contaminants is provided by these sandy soils.

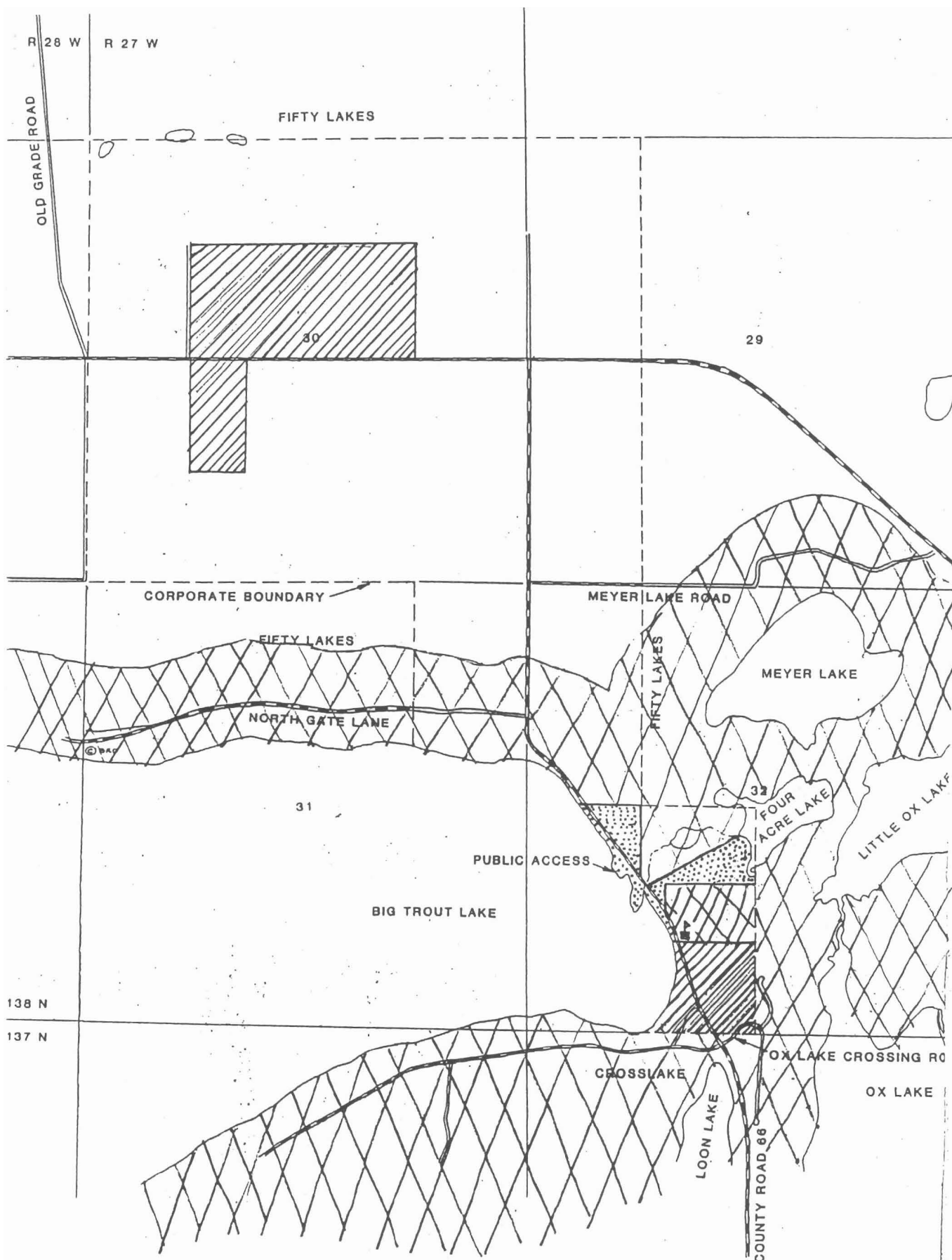
Forests - The entire area was logged at the turn of the century and it is regrown in White Pine. Much of the area is wooded, but development pressures may reduce the area in the city which is wooded in the future.




Land Use

Land use has changed very little over the last ten years, but there may be additional development pressures in the future. Planning for future development is important in order to preserve the quality of life in Manhattan Beach, which is dependent on tourism.

Existing Land Use - The primary types of uses of land are residential and agricultural. Agricultural uses include mainly hobby farms. Residential development is located primarily along the shoreland areas in subdivision plats. Platted subdivisions in Manhattan Beach include Beaver Dam, Boulder Woods, French's Addition, Manhattan Beach Entrance Addition and Manhattan Beach Villas. There are scattered home sites along CSAH 1 and CSAH 66. Very little commercial development exists. Commercial development includes an excavating company located along CSAH 1 and a restaurant and lodge located on CSAH 66 south.

Zoning - The City of Manhattan Beach has had its zoning ordinance since 1973. The City's zoning ordinance was updated in 1994. Manhattan Beach has only two zoning classifications, one for residential uses and one for commercial uses. The majority of land in the city is zoned residential.



-  Commercial
-  Public Access
(Corps of Engineers)
-  1000' shore zone

City of Manhattan Beach
(showing shoreline management zone)

Part IV Physical Resources

To include maps and descriptions of the following:

Snowmobile trails in or near the City; Public Lands including Public Landing and Corps of Engineers Land; Roads; Lakes & Streams; Heavy Forested Areas; Open Area; Topography; Commercial Areas; Shoreline Management Impact Area by zone.

Part V Community Goals

Based on the conservative interpretation of "Sustainable Development" it is the goal of the commission to maintain a rural residential community, to protect the natural resources of the area, and to enhance the quality of life now and for future generations.

The following key result areas from the Region 5 research and plan shall become our overall goals:

1. To encourage moderate growth in residential development.
2. To encourage development of additional residential housing.
3. Encourage tourist type businesses in the southern commercial area of the City.
4. Improve local road conditions as funding allows
5. Preserve surface and groundwater quality.
6. Develop and enforce a plan which provides for compatible land use.

Part VI Comprehensive Plan Goals

Because Manhattan Beach is located in Crow Wing County and it is the shared belief of the participants that the County's Comprehensive Plan will become the umbrella template for all communities in the county, and because they have already accomplished much of the documentation for this process, the County Plan has been blended with the plan submitted by Region 5 to form the basis of the Manhattan Beach Comprehensive Plan.

The following alignments have been made between these plans and the following goals, facts, challenges, and recommendations have flowed from the appropriate positions of both plans.

<u>Manhattan Beach</u>	<u>Crow Wing County</u>
Population	Linked to Residential
Housing	Residential
Economy	Economy
Transportation	Transportation
Environment	Linked to Land Use
Land Use	Commercial Forest, Agriculture, Recreation

1. Residential Development - Goal: *To encourage moderate growth in residential development. Provide for orderly and controlled development so as not to upset the balance of housing values and to make minimal impact on nature which is the base of our community. Not to harm the open space and water resources.*

Facts

- a. All of the lake shore has been developed
- b. Only private septic systems exist

- c. There are a minimum number of City roads that require maintenance
- d. There are no building codes or inspection procedures
- e. There is a stable number of households (about 27)
- f. Most housing is single family on large tracts of land—10 to 200 acres
- g. The median house price is \$50,000 and housing is relatively new
- h. Residents are retired or employed (little unemployment) with a substantial number of household incomes over \$70,000.
- i. The desire of the residents is to maintain the wooded, natural look of the community.

Challenges

- a. Larger tracts of land are available for development
- b. Increased development means more costly services in the future
- c. Controlling taxes as wealthier residents bring increased property values
- d. Control development of new roads that may become public
- e. Environment, protect it, it is our base. Less housing and population density is surest way to protect the natural resources.
- g. Roads and future public services such as sewer, fire protection and the like controlled for cost efficiencies

Recommendations

- a. Develop land classifications
- b. Tier lot sizes (2, 3, and 5 acres) from the lakes and along the roads to ensure a tranquil setting
- c. Maintain residential, rural, hobby farm community by requiring a residence on each parcel of land where animals are maintained.
- d. Create transitional residential zones based on distance from natural water
- e. Maintain current housing standards by establishing a minimum house size requirements according to residential zoning area
- f. Ensure natural screening for developments
- g. Develop and enforce an ordinance to prevent unsightly storage of junk vehicles, trash, etc.

2. Agriculture - Goal: *To maintain the hobby farm history of the community while blending it with new and existing residential development. To discourage intensive animal husbandry in areas more suitable for other land uses.*

Facts

- a. 4-5 Acres is generally allowed for each large animal
- b. City's right to control animal density has been upheld in district and appellate courts.
- c. Hobby Farm profile is 4-10 large animals on 40 acres
- d. 78% of survey respondents want fewer than 10 animals per property, and no change in the current City position.
- e. A majority of residents do not want feed lots
- f. There are only four large properties with large animals in the City as of 3/24/96.

Challenges

- a. Allow minimal changes
- b. Protect surface and groundwater
- c. Allow for suitable growth

Recommendations

- a. Establish land classifications that specify number of animals allowed
- b. Allow for crop and herb growing, including trees.

3. Transportation - Goal: *To preserve and maintain an adequate road system in the City of Manhattan Beach*

Facts

- a. Present road system is adequate at the present time
- b. Surface of existing roads requires more repairs and maintenance
- c. Private roads in residential developments, due to their non-thoroughfare nature, are better classified as private roads.

Challenges

- a. Within the framework of new residential and commercial zoning guidelines, to review set-back standards and restrict access of development along public roads

Recommendations

- a. Provide regular maintenance on existing roads to satisfy needs
- b. Consider major improvements to existing roads as requested by users and abutting property owners with funding to be determined by City Council on a case-by-case basis
- c. Encourage all developers of residential plats to provide private roadways unless roads meet specifications for city standards
- d. Limit direct access to county highways, promote use of private roads

4. Forestry and Woodlands - Goal: *To preserve the natural wooded setting of the community while allowing individual rights to harvest wood products*

Facts

- a. Most residents wish to maintain the woodland environment of the community
- b. Unrestricted growth and development within the community can impact the natural setting most residents prefer
- c. Large and small wood lot owners supply material to the forest product industry as well as for energy use
- d. Heavy logging takes place north of the city limits of Manhattan Beach
- e. Trees are a renewable resource

Challenges

- a. Preserve and maintain the look and feel of the community without infringing on individual rights
- b. Commercial and residential development of forest land for other uses threatens existing wooded areas
- c. Provide for adequate screening and privacy between properties and in public view.
- d. Provide for sound forestry practices on private and public land.

Recommendations

- a. Create land use specifications for wooded areas.
- b. Create larger minimum lot size. Allow higher density in PUD cluster development with open space managed under an approved forest management plan.
- c. Encourage that woodland activities be coordinated with the DNR.

5 Environment/Land Use - Goal: *To create ordinances which allow for conservative community growth while protecting our lakeshore and wooded setting*

Facts

- a. The City exists because of the combination of clear lakes in a wooded setting.
- b. Most lakeshore has been developed to legal limits.
- c. Many lakeshore lots are now substandard in size.
- d. The State has published standards which are available as a regulatory tool.
- e. The wooded land to the north of the City remains ecologically sensitive.
- f. The City currently recognizes only two zoning classifications, commercial and residential.
- g. Summer lake usage is near capacity.

Challenges

- a. To allow for conservative growth while preserving water quality
- b. To manage a reasonable transition between dense shoreland development and uninhabited wilds.
- c. To support the tourism based economy while minimizing the ecological impact.

Recommendations

- a. Develop commercial, residential, and agricultural density standards to ensure the quality of the area's ground and surface waters.
- b. Develop zoning districts as required to complement density standards in each distinct part of the City.
- c. Adopt as part of the ordinance all applicable portions of the "Statewide Standards for 'Management of Shoreland Areas.'"
- d. Support the development of non-summer, non-lakeshore recreational activities to more widely distribute usage without overburdening existing natural resources.

6. Commercial/Economic - Goal: *To accommodate the growth of service and tourism businesses while protecting the scenic beauty of the area.*

Facts

- a. There is a very limited commercial tax base
- b. There are very few local employment opportunities
- c. There is little access to goods, services, and activities within the community, and fair access in nearby communities.
- d. Some of the commercial activity within the city is home-based
- e. An unscreened gravel pit exists within the city

Challenges

- a. To blend the need for additional tax revenue with the residents concern for the environment and natural beauty of the area.
- b. To provide local employment opportunities
- c. To provide residents with goods, services, and activities within the community.
- d. To allow home-based entrepreneurial activities without changing residential character.

Recommendations

- a. Create a small commercial district along CSAH 66 in the existing commercial zone.
- b. Encourage new business ventures which provide resident or tourist related products, services and activities, or office based businesses.
- c. Develop building, sign, and plat design standards for commercial development which will complement the natural environment.
- d. Eliminate the “permitted” category of commercial development within the City Ordinance and require a conditional use permit for all commercial ventures which must adhere to the design standards.
- e. Closely define the ordinance as it relates to home-based business in order to protect the residential feel of the non-commercial area.
- f. Maintain a relationship with, and support agencies that stimulate growth.
- g. Create a second commercial classification for businesses located on CSAH 1.

7. Public Lands/Recreation - Goal: *To protect, maintain, and enhance access to the woods and waters of the area for quality outdoor recreation.*

Facts

- a. The only public lands within the city are the Corps of Engineers maintained public landing and beach on Big Trout Lake which extends back to 4 Acre Lake
- b. No facilities are maintained to provide access to the county and state lands north and east of the city.

Challenges

- a. To maximize the access to public recreational water and land with minimum environmental impact.
- b. To promote inter-governmental cooperation to manage our shared resources.

Recommendations

- a. Work with the Corps of Engineers to maintain, monitor, and enhance the public landing and beach on Big Trout Lake.
- b. Develop a plan to protect and preserve the undeveloped shore of Big Trout Lake south of the public landing.
- c. Encourage and support a public access to the county lands north and east of the city to include winter parking.
- d. Work with Crow Wing County, the City of 50 Lakes, and private entities to develop a network of hiking and cross country ski trails, as well as snowshoe and hunting access to the county and state lands north and east of the city.

8. Waste Management/Pollution - Goal: *To maintain a pure and serene environment while accommodating conservative growth*

Facts

- a. Lake and ground water quality is critical to the City's future.
- b. A water quality concern is leakage from septic systems, animal waste, and lawn and agricultural chemicals.
- c. All waste water disposal in the City is by privately owned sewer systems.
- d. The state establishes sewer standards—the City enforces them.
- e. Significant growth and usage is inevitable.
- f. Garbage and trash removal are handled by residents using private solutions.
- g. There are currently no landfills within the City.
- h. Roadside trash pick-up is currently being accomplished by residents on a voluntary basis.
- i. Noise, visual, air, and light pollution have historically been mediated on an individual basis.

Challenges

- a. To adequately continue to enforce state mandated sewer and pollution standards with increasing demands and limited resources within the City.
- b. To allow for reasonable growth without threatening surface or groundwater quality.
- c. To create acceptable and enforceable standards for trash, noise, visual, air, and light pollution without infringing on individual rights.

Recommendations

- a. Develop strict sewer ordinance enforcement guidelines and request county assistance if required.

- b. Work with MPCA and lake associations to monitor lake and ground water quality and support educational efforts within the community to prevent pollution.
- c. Use other city ordinances as well as community history to model the standards from which a new ordinance can be crafted to limit trash, noise, visual, air, and light pollution.

Part VII Updating The Comprehensive Plan

The City will continue the process of long range planning through the Planning Commission. This group will work closely with the community, Crow Wing County Planning and Zoning, Region 5, and with other appropriate entities to implement the recommendations of this plan.

Recommendations

1. To immediately begin amendment of the zoning map and ordinance under the policies and recommendations established in this Comprehensive Plan.
2. To work with surrounding communities for the collection of information and planning, but without infringement of features which are unique to Manhattan Beach.
3. Conduct at least one public meeting every three years to review this Plan.

APPENDIX A

Manhattan Beach Community Survey

PUBLIC PARTICIPATION

Manhattan Beach Community Survey

A survey was mailed to 68 property owners in Manhattan Beach. Both seasonal and permanent residents were surveyed. Forty-four surveys were returned for a return rate of 65%.

A list of all property owners was obtained from the Crow Wing County Auditors office. The survey included questions on demographics and the future direction of the city.

The purpose of the survey was to 1) provide citizen input on the City's Comprehensive Plan; 2) provide direction to the City Council in administration of its zoning ordinance and; 3) provided future direction for the city.

Question 1

The majority of the survey respondents indicated that persons in their households are in the 65-74 year old age group. Persons 45-54 made up the next largest group. There are very few young adults or children in the survey respondent's households.

TABLE 11
NUMBER OF PERSONS BY AGE
1995

<u>AGE</u>	<u>PERSONS</u>	<u>% OF TOTAL</u>
Under 5		5.7
5-9		1.9
10-14		5.7
15-19		8.5
20-24		6.6
25-34		5.7
35-44		10.4
45-54		16.0
55-64		13.2
65-74		19.8
74-84		5.7
Over 85		<1.0
TOTAL		100.0

SOURCE: 1995 Community Survey

Question 2

The majority of the respondents are permanent residents. Of the survey respondents, 69.0% are permanent residents and 21.4% are seasonal residents. Only 9.5% indicated they are land owners only.

Question 3

Most respondents indicated they owned rather than rented. This reflects the fact that tax records were used as the source for addresses. Even so, there are few renters in Manhattan Beach.

Question 4

Many of the people in Manhattan Beach are long time residents. Of those responding to the survey, 38.1% have lived in Manhattan Beach for over 15 years and 35.7% have lived in the city for 5-15 years.

Question 5

Most respondents live in single-family dwellings. Only 11.9% live in multi-family dwellings. The multi-family dwellings are the Manhattan Beach Villas.

Question 6

Most residences (37.5%) were built between 1970 and 1979. Only 12.5% of residences were built before 1939. Most of the housing is relatively new in Manhattan Beach, as is the case with surrounding communities.

Question 7 & 8

The majority of survey respondents indicated that they had drilled wells (65.1%) which were between 50 and 100 feet deep (62.2%).

Question 9, 10 & 11

Many respondents (68.3%) have had their wells tested. Close to forty percent have had their well tested within the last year. This may be as a result of 1) property transfers; 2) new construction and; 3) concern for their quality of drinking water. According to the survey, no wells were reported to be contaminated.

Question 12

Most respondents use a septic system and drainfield (97.5%). Since much of the housing is fairly new, most have a septic system and drainfield.

Question 13

Most respondents are employed or retired. Very few indicated they were unemployed. Some also indicated they were self-employed.

Question 14

Most respondents indicated their occupation was professional (38.5%) for self and 28.6% for spouse.

Question 15

Respondents were divided evenly between those that planned on retiring in Manhattan Beach, those that would not be retiring in Manhattan Beach, and those that weren't sure of their future plans.

Question 16

Most respondents indicated they had incomes over \$70,000 per year (24.3%). Over one-half had incomes over \$40,000 per year. No respondents indicated incomes of less than \$10,000 per year.

Questions 17 & 18

Most respondents (81.4%) are satisfied with the roads in Manhattan Beach. Of those residents who are not satisfied with the roads in Manhattan Beach (18.6%), quality and maintenance were of concern. Written comments indicated that there is some concern over the condition of Northgate Lane.

Questions 19 & 20

Respondents are generally satisfied with their police protection with 87.5% of the survey respondents indicating satisfaction with services provided by Crow Wing County. Of the residents who were not satisfied (12.5%), 13.6% wanted more frequent patrols.

Questions 21 & 22

All of the respondents answering the survey are satisfied with the fire protection provided by the City of Crosslake. Recently the insurance rating improved and rates have dropped.

Questions 23 & 24

Most survey respondents (70.0%) are not willing to pay for additional services, but almost one-third or 30.0% are willing to pay more for improved or additional services. Roads are the area where most (15.9%) are willing to pay more for improved/additional services. Of major concern is Northgate Lane.

Questions 25 & 26

Fifty percent of the survey respondents are satisfied with the zoning as it is administered and 50% are not. Some survey respondents said that regulations need to be made stricter and need to be clarified. Enforcement of regulations is also needed.

Question 27

The majority of survey respondents (58.3%) believe that agricultural land uses are compatible with residential land uses. Many respondents (41.7%) believe that agricultural uses are not compatible with residential uses.

Question 28

Survey respondents stated that if agricultural uses were allowed in the city they preferred cash crops (41.1%) followed by other (28.6%), dairy farms (16.0%) and; feed lots (14.3%). The other category included hobby farms, vegetable farms, and raising of horses.

Question 29

Most survey respondents said that 1-5 animals should be allowed on a residential property. The size of the property and size of animal would need to be taken into account. The question did not state this, so the results of this question may be inaccurate.

Question 30

According to survey respondents, most would not like to see adult entertainment facilities in Manhattan Beach. If they were an allowed use, most felt that they should be restricted to commercial areas.

Question 32

A vast majority of survey respondents would allow commercial uses of most types within the city, including neighborhood retail (72.7%), gas stations/convenience stores (70.5%), restaurants (77.3%), hotel/motels (72.7%) and miscellaneous service (59.1%).

Question 33

Most survey respondents are in favor of additional residential development (65.9%), followed by additional commercial development (36.4%).

Question 34

Survey respondents were asked to rank the three top priority needs in Manhattan Beach and residential development and commercial development tied for top priority at 15.9%. If residential development and housing are combined for a total of 22.7%, this is Manhattan Beach's top priority. Water quality ranked second with 13.6% followed by housing (6.8%) and fire protection (6.8%).

Question 35

The following is a list of comments regarding the current needs of Manhattan Beach and recommendations on how the city should address these needs.

Manhattan Beach has been primarily a residential community with small family usage by a few residents. In the last 20-25 years we have seen an increase in retirement residential uses, which seems to be an ever increasing occurrence. People tell me they come here for the wooded landscapes with clean water and air. I know that the vast majority of our residents would like to keep it that way.

We need Northgate Lane blacktopped to coincide with Ideal Corners & Fifty Lakes sections of this road. Summer time dust created by traffic is terrible. It is ridiculous for a farm with 160 cows in a residential city.

The City needs more tax base.

Leave Manhattan Beach as it is. We don't need any feed lots.

I think that before projects and petitions are acted upon, government regulations must be looked into.

I think that the City is doing fine. I think that planning for future development should be confined to residential. We are close enough to Crosslake that we don't need a lot of commercial development and sure don't need industrial development. Manhattan Beach Lodge is all we need. Residents should be required to keep their residences up so they look nice.

Many residents are unhappy with Manhattan Beach Lodge, the addition and not informing the residents of the new location of the kitchen exhaust right over our town house complex.

Manhattan Beach should be annexed by Crosslake. There is no reason to keep it a separate city.

Clear and concise laws so that there will be no questions regarding legality or meaning.

A good comprehensive plan to control future developments.

Do not allow feedlot situations.

The City needs better qualified elected officials. Perhaps the best thing would be if the city were annexed by Crosslake, Fifty Lakes or Timothy. I am concerned that this survey will become the basis for the "comp" plan. A comp plan should reflect what resources the community has.

Slow, controlled, manageable growth. We don't want any growth bringing more traffic and more need for services that will raise taxes. To achieve this, we need ordinances that are enforceable and lawsuit-proof.

We have a need for more tax base. We would like to have that through residential development. We would like a five acre requirement for residential building.

To keep development of a lakeshore residential community.

The current council needs to open up to the citizens and treat everyone fairly and evenly.

The city a term used very loosely when the state changed township to city. Manhattan Beach is not a metro area and shouldn't be regulated like one. If people that aren't native to this area, they shouldn't be trying to regulate ag land use for non-existent metro city area. Adapt a uniform building code. Be more concerned about the quality of homes being built, than the setbacks.

Clarify zoning laws.

Manhattan Villa Townhouses 17 units - We would prefer residential areas with good police and fire protection. There is little need for commercial development, as needs are met in Crosslake.

Areas of Manhattan Beach should remain mainly residential south of Westgate land. The City should support services such as first responders, etc.

Personnel watercraft and oversized power boats pose a very serious threat to peace and serenity, lake environment, fish and waterfowl (especially loons). Trout Lake and the WF chain is fast becoming a Lake Minnetonka. Regulate off-shore developments to reduce lake use density. Keep feedlots out. Do everything possible to control insensitive developments.

The City needs to take a strong look at how the elected officials run the Council. Maybe in the best interests of all citizens in Manhattan Beach our City should merge with Crosslake.

Needs more tax base - more residential housing.

Manhattan Beach lives and dies on tourism. We need a nice, clean, woodsy place that city folks like. People need to make their living out of their homes, but we do not need factories or junk yards to pollute. The cattle operation would drive the tourists away and pollute Big Trout Lake. Local farmers should raise herbs, not cattle. We need a bed and breakfast inn, not a hotel. We need more artists' shops, not convenience stores. This town is like a 3 square block neighborhood.

GOALS AND POLICIES

ISSUE	GOAL	POLICY
P O P U L A T I O N		
Lack of population growth	Encourage moderate growth in residential development.	Promote the benefits of living in Manhattan Beach.
H O U S I N G		
Lack of residential development	Encourage the development of additional residential housing.	Provide for flexible regulations for residential development.
E C O N O M Y		
Lack of commercial tax base	Encourage tourist type businesses to locate in the city.	Designate areas which are appropriate for commercial uses.
T R A N S P O R T A T I O N		
Poor road conditions	Improve the condition of local roads.	Develop a long range plan for improving specific roads.
E N V I R O N M E N T		
Potential nonpoint pollution of surface and groundwater	Preserve surface and groundwater quality	Work with county water plan coordinator to identify land uses which could negatively impact water quality and develop groundwater monitoring program.
L A N D U S E		
Conflict of residential and agricultural/commercial uses	Promote the development and enforcement of a land use plan which provides for compatible land uses.	Designate areas which are appropriate for agricultural/commercial uses.

IMPLEMENTATION

Goals and policies have been established in the previous section and are the basis for the development of an "action" plan. The goals and policies were developed with input based on a Manhattan Beach community survey. The Manhattan Beach Comprehensive Plan should provide a guide for future decisions on development within the city.

The following recommendations comprise an action plan that the City should following in carrying out the goals and policies of this plan.

<u>ACTION</u>	<u>TIMELINE</u>
Update and revise zoning ordinance and map.	1996
Gather information on ground water quality with assistance from county water plan coordinator.	1996-97
Develop long range plan for maintenance/improvement of local roads.	1996
Review Comprehensive Plan and update as necessary.	2000

Appendix A Manhattan Beach Community Survey
MANHATTAN BEACH COMMUNITY SURVEY

1. How many persons (including yourself) are in the following age groups?

1. <u>5.7</u>	under 5	7. <u>10.4</u>	35-44
2. <u>1.9</u>	5-9	8. <u>16.0</u>	45-54
3. <u>5.7</u>	10-14	9. <u>13.2</u>	55-64
4. <u>8.5</u>	15-19	10. <u>19.8</u>	65-74
5. <u>6.6</u>	20-24	11. <u>5.7</u>	74-84
6. <u>5.7</u>	25-34	12. <u><1.0</u>	over 85

2. Describe your status as a property owner in Manhattan Beach?

1. 69.0 permanent resident
2. 21.4 seasonal resident
3. 9.5 land owner only

3. Do you own or rent?

1. 95.3 own
2. 4.7 rent

4. How long have you lived in Manhattan Beach?

1. 14.3 less than 5 years
2. 35.7 5-15 years
3. 38.1 over 15 years
4. 11.9 Do not reside here

5. What type(s) of dwelling(s) is on your property?

1. 66.7 single-family
2. 11.9 multiple-family
3. 0 manufactured home
4. 2.4 motor home/travel trailer
5. 7.1 cabin
6. 14.3 other (please specify _____)

6. Approximately what year was your residence built?

- | | |
|-----------------------------|-------------------------------|
| 1. <u>12.5</u> Before 1939 | 5. <u>37.5</u> 1970 to 1979 |
| 2. <u>10.0</u> 1940 to 1949 | 6. <u>10.0</u> 1980 to 1989 |
| 3. <u>12.5</u> 1950 to 1959 | 7. <u>7.5</u> 1990 to present |
| 4. <u>10.0</u> 1960 to 1969 | |

7. How deep is your well?

1. 18.9 0-50 feet
2. 62.2 50-100 feet
3. 18.9 100+ feet

8. What type of well is it?

1. 65.1 drilled
2. 16.3 sandpoint
3. 18.6 don't know

Page Two
Manhattan Beach Community Survey

9. Have you ever had your well tested?

1. 68.3 Yes 2. 31.7 No

10. If yes, when was your well last tested?

1. 39.3 1 year ago or less
2. 35.7 2-4 years ago
3. 17.9 5-10 years ago
4. 7.1 over 10 years ago

11. If you have had your well tested, was it contaminated?

1. 0 Yes 2. 100.0 No

12. What type of sewer system do you currently use?

1. 97.5 Septic System and Drainfield
2. Chemical Toilet
3. 2.5 Septic System and Drywell

13. What is your employment status?

<u>Yourself</u>	<u>Spouse</u>	
1. <u>30.0</u>	5. <u>38.9</u>	employed
2. <u>2.5</u>	6. <u>2.8</u>	unemployed
3. <u>35.0</u>	7. <u>33.3</u>	retired
4. <u>13.0</u>	8. <u>25.0</u>	self-employed

14. Which of the following categories best describe your occupation?

1. <u>2.6</u> farmer	6. <u>2.6</u> homemaker
2. <u>25.6</u> skilled-craftsman	7. <u>7.7</u> clerical
3. <u>38.5</u> professional	8. <u>5.1</u> service industry
4. <u>5.1</u> retail	9. <u>0</u> government
5. <u>0</u> laborer/manufacturer	10. <u>12.8</u> other (please specify) _____

The occupation of your spouse:

1. <u>2.9</u> farmer	6. <u>28.6</u> homemaker
2. <u>2.9</u> skilled-craftsman	7. <u>5.7</u> clerical
3. <u>28.6</u> professional	8. <u>2.9</u> service industry
4. <u>5.7</u> retail	9. <u>2.9</u> government
5. <u>2.9</u> laborer/manufacturer	10. <u>11.4</u> other (please specify) _____

15. Are you planning on retiring in Manhattan Beach between now and 2010?

1. 35.1 Yes 2. 32.4 No 3. 32.4 Don't Know

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Manhattan Beach Community Survey

16. What is your annual gross household income?

1. 0 less than \$10,000
2. 5.4 \$10,000 - \$19,999
3. 21.6 \$20,000 - \$29,999
4. 18.9 \$30,000 - \$39,999
5. 13.5 \$40,000 - \$49,999
6. 13.5 \$50,000 - \$59,999
7. 2.7 \$60,000 - \$69,999
8. 24.3 over \$70,000

17. Are the roads in Manhattan Beach adequate?

1. 81.4 Yes 2. 18.6 No

18. If no, what could be improved?

1. 4.6 maintenance
2. 9.1 quality
3. 0 quantity
4. 0 safety
5. 0 other (please specify) _____

19. Is police protection in Manhattan Beach adequate?

1. 87.5 Yes 2. 12.5 No

20. If no, what could be improved?

1. 6.8 additional staff (i.e. deputies)
2. 13.6 more frequent patrols
3. 0 other (please specify) _____

21. Is fire protection in Manhattan Beach adequate?

1. 100.0 Yes 2. 0 No

22. If no, what could be improved?

1. 0 improved response time
2. 0 additional firemen
3. 0 other (please specify) _____

23. Would you be willing to pay for improved or additional services (i.e. better roads, fire protection, police protection)?

1. 30.0 Yes 2. 70.0 No

24. If yes, which services would you be willing to pay more for if they were improved or additional services were provided?

1. 15.9 roads
2. 0 fire protection
3. 4.6 police protection

Page Four
Manhattan Beach Community Survey

25. Are you satisfied with the land use controls, as regulated by Manhattan Beach (i.e., zoning)?

1. 50.0 Yes 2. 50.0 No

26. If no, specify _____

27. Are agricultural land uses compatible with residential land areas within the city?

1. 58.3 Yes 2. 41.7 No

28. What types of agricultural uses should be allowed in the city?

1. 41.1 cash crops
2. 16.0 dairy farms
3. 14.3 feed lots
4. 28.6 other (please specify) _____

29. How many animals should be allowed on a residential property?

16.7 none 38.9 1-5 22.2 6-10 18.2 over 10

30. Are commercial land uses compatible with residential areas within the city?

1. 80.6 Yes 2. 19.4 No

31. Should adult entertainment facilities be allowed in Manhattan Beach in any of the following land use areas?

	Yes	No
1. Residential	<u>8.3</u>	<u>91.7</u>
2. Commercial	<u>41.0</u>	<u>59.0</u>
3. Open	<u>10.7</u>	<u>89.3</u>

32. What types of commercial uses should be allowed in the city?

1. 72.7 neighborhood retail (i.e. shops)
2. 70.5 gas station/convenience store
3. 77.3 restaurants
4. 72.7 hotels/motels
5. 59.1 miscellaneous service (i.e. laundromats)
6. 20.1 other (please specify) _____

33. Which of the following land uses should be expanded in the city?

- | | | |
|----|-------------|---------------|
| 1. | <u>65.9</u> | residential |
| 2. | <u>36.4</u> | commercial |
| 3. | <u>15.9</u> | industrial |
| 4. | <u>36.4</u> | recreational- |
| 5. | <u>9.1</u> | other |

34. Please rank the top three priority needs in Manhattan Beach. (With 1 indicating the greatest need)

		<u>PRIORITY 1</u>	<u>PRIORITY 2</u>	<u>PRIORITY 3</u>
1.	_____ roads	2.3	2.3	6.8
2.	_____ fire protection	6.8	2.3	2.3
3.	_____ police protection	2.3	11.4	11.4
4.	_____ housing	6.8	2.3	0.0
5.	_____ water quality	13.6	6.8	4.5
6.	_____ solid waste management	4.5	4.5	11.4
7.	_____ residential development	15.9	9.1	6.8
8.	_____ commercial development	15.9	9.1	0.0
9.	_____ industrial development	0.0	6.8	0.0
10.	_____ recreational development	4.5	6.8	11.4
11.	_____ other (please specify)	2.3	2.3	0.0

35. Describe what the current needs of the city are and also how the city should address these needs in the future:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

THANK YOU! PLEASE RETURN PROMPTLY.

APPENDIX B

Water Quality Data

Appendix A. Water Quality and Morphometric Data for Secchi Transparency Trend Lakes. Water quality data represent summer means of available data in STORET for the period from 1985-1992. Legend is at the end of the table.

LID	AREA	DMAX	DMF	TP	NTP	CHL	NC	CHN	NCN	SD	NSD	ALK	SC	TSIP	TSIC	TSIS	REG	LAKE	LOC
01-0033	2513	21	.	33	9	14	9	.	0	1.3	117	53	93	55	56	56	NLF	MINNEWAWA	7 MI NE OF MCGREGOR
01-0102	372	39	.	17	5	5	5	.	0	4.3	68	66	118	45	46	39	NLF	WILKINS	5 MI S OF PALISADE
01-0147	835	31	.	.	0	.	0	.	0	1.1	57	.	.	.	.	58	NLF	ESQUAGAMAH	5 MI W OF WAUKENABO
02-0034	218	22	.	159	1	46	1	.	0	0.9	123	110	240	77	68	62	CHF	MARTIN	5 MI W OF STACY
02-0084	130	20	.	48	2	23	2	.	0	1.1	95	120	315	60	61	59	CHF	CROOKED	1 MI E OF ANOKA
03-0030	401	100	43	12	18	2	18	.	0	4.2	56	155	264	40	38	39	CHF	BOOT	2 MI NW OF TWO INLETS
03-0359	1267	58	17	43	10	18	8	.	0	2.2	10	195	470	59	59	49	CHF	SALLIE	AT SHOREHAM
03-0381-01	.	82	.	27	39	7	32	.	0	2.3	25	183	367	52	49	48	CHF	DETROIT (MAIN BAY)	AT DETROIT LAKES
03-0387	1234	26	.	24	2	4	2	.	0	2.8	149	195	348	50	44	45	CHF	FLOYD	2 MI N OF DETROIT LKS
03-0657	184	73	27	28	8	2	6	.	0	6.4	158	217	383	52	36	33	CHF	TURTLE	4 MI NE OF ROLLAG
04-0030	29775	115	.	.	0	.	0	.	0	3.6	108	.	.	.	.	42	NLF	CASS	AT CASS LAKE
04-0069	2742	28	.	.	0	.	0	.	0	2.4	73	.	.	.	.	48	NLF	BLACKDUCK	1 MI W OF BLACKDUCK
04-0130	6420	76	.	34	27	.	0	.	0	2.4	138	172	344	55	.	47	NLF	BEMIDJI	AT BEMIDJI
06-0152	12610	15	11	.	0	.	0	.	0	1.0	204	.	.	.	.	60	NGP	BIG STONE	AT ORTONVILLE
07-0044	1171	59	13	88	20	75	22	.	0	0.9	44	143	304	69	73	62	WCP	MADISON	AT MADISON LAKE (TOWN)
09-0029	373	16	.	.	0	.	0	.	0	3.1	89	.	.	.	.	44	NLF	PARK	8 MI N OF BARNUM
09-0035	118	70	.	.	0	.	0	.	0	3.0	139	.	.	.	.	44	NLF	LITTLE HANGING HORN	2 MI S OF BARNUM
09-0038	409	90	.	.	0	.	0	.	0	2.3	86	.	.	.	.	48	NLF	HANGING HORN	2 MI S OF BARNUM
10-0002	301	50	21	45	13	.	0	48	13	1.4	73	59	303	59	.	55	CHF	RILEY	2 MI N OF SHAKOPEE
10-0018	105	49	.	.	0	.	0	.	0	1.4	26	.	.	.	.	55	CHF	SCHUTZ	1 MI NE OF VICTORIA
10-0041	162	58	.	52	4	26	4	.	0	1.8	39	100	227	61	63	52	CHF	ZUMBRA-SUNNY	1 MI N OF VICTORIA
10-0044-01	.	84	.	38	13	34	4	20	9	1.8	47	118	262	57	65	51	CHF	AUBURN (WEST BAY)	AT VICTORIA
10-0045	281	40	.	.	0	.	0	.	0	1.5	34	.	.	.	.	54	CHF	STEIGER	AT VICTORIA
10-0059	2607	37	16	39	4	.	0	23	4	1.3	84	160	333	57	.	57	CHF	WACONIA	AT WACONIA
11-0059	1768	.	.	17	12	6	11	.	0	3.5	322	72	133	45	49	42	NLF	WASHBURN	4 MI NW OF OUTING
11-0069	224	55	.	.	0	.	0	.	0	4.3	52	.	.	.	.	39	NLF	BASS	6.5 MI N OF OUTING
11-0171-01	.	50	.	.	0	.	0	.	0	2.4	69	.	.	.	.	47	NLF	WABEDO (NE BAY)	5 MI S OF LONGVILLE
11-0201	4782	60	.	18	10	6	7	.	0	2.8	275	138	230	46	49	45	NLF	WOMAN	4 MI SW OF LONGVILLE
11-0203-04	.	35	.	.	0	.	0	.	0	2.9	87	.	.	.	.	45	NLF	LEECH (SHINGOBBE BAY)	1 MI SE OF WALKER
11-0218	371	54	.	.	0	.	0	.	0	2.9	125	.	.	.	.	44	NLF	UPPER GULL	AT LAKE SHORE (TOWN)
11-0250	975	60	.	17	6	3	4	.	0	4.2	115	95	173	45	43	39	NLF	ADA	4 MI N CHICKAMAW BEACH
11-0263	316	29	.	16	6	8	4	.	0	3.7	129	165	255	44	51	41	NLF	CHILD	7 MI SW OF LONGVILLE
11-0305	9541	70	.	15	17	7	17	.	0	3.2	183	105	200	43	49	43	NLF	GULL	AT NISSWA
11-0351	219	37	.	.	0	.	0	.	0	3.6	97	.	.	.	.	42	NLF	FIVE POINT	11 MI N OF PINE RIVER
11-0383	1038	72	.	15	4	3	4	.	0	4.9	91	110	170	44	43	37	NLF	PLEASANT	1 MI E OF HACKENSACK
11-0412	1283	45	.	15	9	4	9	.	0	3.8	120	99	163	43	45	41	NLF	BIRCH	AT HACKENSACK
11-0413	4640	208	.	16	15	2	13	.	0	5.4	257	120	200	44	38	36	NLF	TEN MILE	1 MI NW OF HACKENSACK
11-0505	490	24	.	33	6	10	6	.	0	2.5	85	147	250	55	53	47	NLF	LITTLE WOLF	2 MI W OF CASS LAKE
16-0139	1325	130	.	.	0	.	0	.	0	9.3	139	.	.	.	.	28	NLF	CLEARWATER	22 MI NW OF GRD MARAIS
16-0228	493	65	.	.	0	.	0	.	0	6.8	131	.	.	.	.	32	NLF	BEARSKIN	20 MI NW OF GRD MARAIS
16-0360	728	30	.	20	6	7	4	.	0	2.2	204	34	66	47	50	49	NLF	CARIBOU	4 MI N OF LUTSEN
16-0632-01	172	.	.	.	0	.	0	.	0	4.2	38	.	.	.	.	39	NLF	GULL (MAIN BASIN)	25 MI N OF LUTSEN
18-0038	917	54	.	12	8	4	8	.	0	3.8	80	110	181	41	45	41	NLF	CLEARWATER	5 MI SE OF CROSBY
18-0041-01	.	36	.	13	4	3	4	.	0	3.4	43	91	155	41	41	42	NLF	CROOKED (SUGAR BAY)	6 MI NW OF GARRISON
18-0041-02	.	72	.	11	10	3	10	.	0	4.5	102	79	130	39	41	38	NLF	CROOKED (MAIN BAY)	6 MI NW OF GARRISON
18-0044	171	40	.	10	4	3	4	.	0	3.4	41	90	161	38	40	43	NLF	HANKS	12.5 MI E OF BRAINERD
18-0096	793	47	.	24	8	17	8	.	0	1.8	57	114	203	50	58	51	NLF	UPPER SOUTH LONG	10 MI W OF GARRISON
18-0136	1380	39	.	24	8	24	7	.	0	1.7	90	110	241	50	62	53	NLF	SOUTH LONG	11 MI W OF GARRISON
18-0183	240	37	.	.	0	.	0	.	0	1.9	118	.	.	.	.	51	NLF	ISLAND	4 MI SE OF EMILY
18-0310	7370	138	.	14	15	4	11	.	0	4.2	262	123	210	42	44	39	NLF	WHITEFISH	AT CROSSLAKE (TOWN OF)
18-0311	891	105	.	11	10	2	10	.	0	4.9	188	119	192	39	38	37	NLF	RUSH	8 MI NE OF JENKINS
18-0315	1418	128	.	11	2	3	1	.	0	5.0	20	92	190	39	41	37	NLF	BIG TROUT	AT MANHATTAN BEACH
18-0352	644	63	.	.	0	.	0	.	0	4.6	199	.	.	.	.	38	NLF	OSSAWINNAMAKEE	AT BREEZY POINT
18-0376	435	40	.	20	2	10	2	.	0	3.1	63	150	220	48	54	44	NLF	UPPER CULLEN	3 MI SE OF PEQUOT LKS
18-0377	382	46	.	13	3	5	3	.	0	3.8	64	123	215	41	46	41	NLF	MIDDLE CULLEN	13 MI N OF BRAINERD
18-0398	271	26	.	.	0	.	0	.	0	2.8	114	.	.	.	.	45	NLF	ROY	1 MI W OF NISSWA

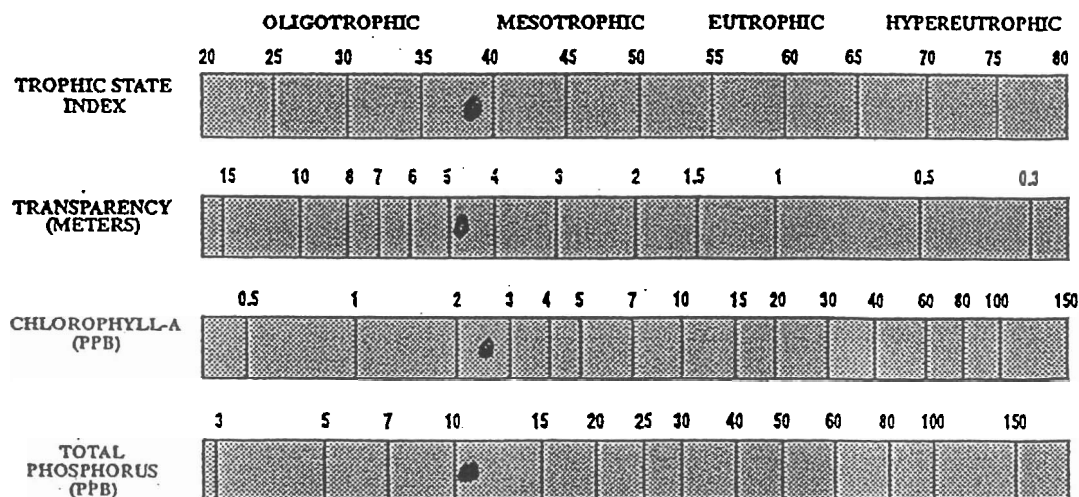
Big Trout Lake

Figure 6. CARLSON'S TROPHIC STATE INDEX VALUES
TSI Relationships based on mean summer data for 1991.

Changes in the Biological Condition of Lakes With Changes in Trophic State

R.E. Carlson

- me where this range
- TSI < 30 Classical oligotrophy: Clear water, oxygen throughout the year in hypolimnion, salmonid fisheries in deep lakes.
 - TSI 30 - 40 Deeper lakes still exhibit classical oligotrophy, but some shallower lakes will become anoxic in the hypolimnion during the summer.
 - TSI 40 - 50 Water moderately clear, but increasing probability of anoxia in hypolimnion during summer..
 - TSI 50 - 60 Lower boundary of classical eutrophy: Decreased transparency, anoxic hypolimnia during the summer, macrophyte problems evident, warm-water fisheries only.
 - TSI 60 - 70 Dominance of blue-green algae, algal scums probable, extensive macrophyte problems.
 - TSI 70 - 80 Heavy algal blooms possible throughout the summer, dense macrophyte beds, but extent limited by light penetration. Often would be classified as hypertrophic..
 - TSI > 80 Algal scums, summerfish kills, few macrophytes, dominance of rough fish.



good to excellent conditions

After Moore, I. and K. Thornton, [Ed.] 1988. Lake and Reservoir Restoration Guidance Manual. USEPA> EPA 440/5-88-002..