SAWYER COUNTY LAKES AND RIVERS CLASSIFICATION PLAN

INTRODUCTION

Local units of government in Wisconsin are charged with regulating land uses to protect the public health, safety and general welfare, and they are encouraged to formulate policies and plans toward that end in advance. In carrying out this responsibility a major emphasis is usually placed on resource protection--fostering the wise use of waters, agricultural and forest lands, minerals and other natural resources. Oftentimes the strength of such resource--based land use programs, particularly when challenged in a court of law, can be traced rather directly to the degree to which the locality has linked its resource policies, plans and regulations to available natural resource data.

The following sketches one way land use programs may be grounded to the statistical information which exists for Wisconsin's water resources at the local level. The same method of regulating according to prior resource classification can be applied using different data sources in the case of other natural resources such as agricultural, forest and mineral-bearing lands. Three general ingredients comprise the method: 1) a rationale, 2) a classification scheme, and 3) a regulatory program.

This plan will focus solely on classifying the surface water resource. Similar detailed data for streams and rivers does exist and can be built into local land use programs in basically the same way.

The regulatory program discussed later will pertain directly to the local zoning power on shorelands. A full-blown carrying-capacity approach could utilize the resource classification scheme for local surface water use regulations as well.

Once the classification system has been devised it can be used for various purposes, zoning and non-zoning (e.g., surface water use regulations) alike. Also, the system can provide a basis for dealing not only with routine and typical development proposals, but with such a typical and non-routine matters as PUDs, conditional uses, rezonings, back-lot developments, resort conversions, etc.

The Rationale.

There are two major reasons for utilizing this approach. First, lakes constitute important environmental and economic (recreation) resources in Wisconsin. And, second, with a reasonable amount of time and effort, it is possible to devise a local program more sensitive to an individual lake resource than is the minimum statewide standard in Wisconsin.

On the first reason, water resource importance, ten counties of northwest Wisconsin house approximately four percent of the state population, but contain almost twenty-five percent (more than 400 square miles) of the states's inland water acreage. This includes nearly 6,000 lakes which are unevenly distributed according to basic indicators such as size, shape and geography. For instance, more than two-thirds of the lakes are small, less than 25 acres in size, and about fifty lakes are 600 or more acres. Similarly, the breakdown for lake shape shows that while about half the lakes are fairly regular("round") and the other half are less regular ("long") more than three hundred fifty lakes are highly irregular ("spider"). And, geographically, although one county has only one hundred fifty lakes, several have close to one thousand and most northern counties have between three and five hundred lakes.

Recent trends in permanent and transient population movement, such as the so-called rural residency turnaround (in-migration) and changing recreational travel patterns, also affect localities throughout the North differently and unevenly. But, in general, these trends have resulted in substantial pressures for lake-related development, and have contributed to the need for more systematic management and growth studies such as this carrying-capacity plan.

A brief look at two simple and fundamental lake characteristics, size and shape, provides an orientation to a problem with Wisconsin's minimum state standard approach for land uses in shorelands. The left diagram shows two lakes of identical shape, but different size, super imposed on each other. Little Round Lake covers 50 water surface acres, while Big Round Lake encompasses 200 acres,. If we were to measure the shoreline length we would discover that, although Big Round has four times the surface water acreage, its shoreline is only twice the length of Little Round. The right diagram on the other hand, shows two lakes of identical size (50 water surface acres, like Little Round), but different shapes--Long Lake and Round Lake. In spite of the fact that they have the same water surface area, Long Lake has sixty percent more shoreline length. It is,therefore, potentially subject to much greater development and recreation user pressure, per water surface acre, than is Round Lake.

Table 1 shows how much the water surface area per developed shoreline lot would vary from lake to lake, if we assume that all the lakes in Map 2 could be fully developed at the state minimum standard of 100 feet per lot at the waterline. To the extent that we can agree that more water surface per lot generally translates into an increased capacity to carry or absorb the "shocks" (pollution, aesthetic degradation, etc.) which development imposes on the lake resource, we can conclude that large, regularly-shaped lakes (Big Round) have a greater absorptive capacity than do small, irregularly shaped lakes (Long Lake). And we can see that the use of a state standard (or any across-the-board standard of any dimension) ignores the existence of such variations. What we are not sure of, however, is precisely whether this is done at the expense of the most sensitive lakes (not protective enough), the least sensitive lakes (overly protective), or all lakes regardless of sensitivity (not protective enough or too protective).

Table 1: Full Development Potential at Wisconsin Minimum Lot Width

Lake Name	Number Lots	WSA/lot
Long Lake (50 acres)	85	.59
Round and Little Round (50 acres)	53	.96
Big Round Lake (200 acres)	106	1.92

The Classification Scheme

Resource classification schemes range from very simple sortings into several groups based on one or two distinctive characteristics to highly complex divisions derived from interrelating many variables. In the case of lake resources, an extremely simple sort is often suggested in the names of the lakes--Clear Lake vs Mud Lake, Bass or Trout Lakes, Big Spider Lake vs Little Spider Lake, etc. Limnologists, on the other hand, spend much of their time studying all facets of inland waters and classifying them into numerous categories based on lake genesis, geography and trophic status. What type of classification scheme gets used in a particular situation generally depends on judgments in four fundamental areas:

1. The nature of the resource. Lakes are complex and dynamic systems with highly individual characteristics. They are also systems that interrelate intensively with other ecosystems such as land, air, wildlife and fisheries, etc. In truth, man's understanding of lakes and their interrelationships falls far short of the ideal and, even within the limits of presently available knowledge, requires such time-consuming and expensive investigation that is possible to establish relatively clear-cut, quantifiable cause and effect linkages only for a selected few demonstration projects. Contrariwise, man's studied observations concerning general lake processes are developed and accurate enough to permit, and even encourage, practical "middle--ground" approaches to management.

2. Data availability. Much information exists and can be utilized in classification schemes ranging from the simple to the complex. In Wisconsin, for instance, at least three valuable sources are readily employable for local projects. One source is the Surface Water Resources report, prepared by the Department of Natural Resources, which exists for each county. It contains statistical tables with more than twenty different types of information on each lake in the jurisdiction. Another source is the even more detailed data which DNR keeps stored on computer tapes. This again exists by individual lake within each jurisdiction. And, another important source is the firsthand experience and perceptions which local lake users can bring to bear through their participation in a classification project.

3. Intended use. This helps assure relevancy and efficiency. It does not make good sense to classify lake resources into eight groupings if only three divisions are to be used in the local land use program. Likewise, it does not really pay to devote a lot of effort to interrelating twenty-four different types of information if an interplay of three or four variables will accomplish almost the same result. And it is senseless to use an overly

simple classification scheme, like lake names, if not all lake resources are named or if the names are misleading and inaccurately based on subjective and non-verifiable criteria. For instance many lakes are not named at all and, of the named lakes, only a handful of the names are descriptive. And, among the descriptive names are lakes such as Bass, Bluegill and Round (shape) may be verifiable, but Red (color) and Snake (shape) may not be. The participants from the jurisdiction, therefore, may play a judgmental role in identifying what is of primary concern to them, what is ultimately desired, and in reviewing alternative classification schemes for solving these problems and meeting their objectives.

4. User friendly schemes. The classification scheme is one, hopefully, which can be understood and accepted by those within the locality who must live by it as well as by those who must apply it. This is particularly important for land use programs. If people cannot follow the basic thrust of what is being done, and why, they will probably challenge and reject it out of hand.

In this classification methodology, the focus is placed on rating lakes according to one basic index, vulnerability. The vulnerability determination amounts to scoring lakes on the basis of their physical parameters such as size, shape, depth and flush potential. In those cases where additional and reliable qualitative data are available, a quality index may be incorporated as well. The quality determination is derived from scoring lakes according to characteristics of interest to the locality (fish and vegetative types, and water quality parameters)

Data Interpretation

The discussion suggests that what is sought is a scheme which allows a locality to separate its highly vulnerable lake resources from those of lesser vulnerability. The locality can then provide maximum land use protection to lakes which could be expected to benefit most from this type of management (the regulatory incentive is high). Lakes which stand to benefit little from land use measures, on the other hand, would receive only minimum protection (the regulatory incentive is low). And lakes which fall in-between can be managed in accordance with a mid-level or moderate regulatory program. An alternative for these in-between lakes could be to scrutinize them further until a clearer decision concerning their sensitivity can be arrived at. This might mean looking at a new set of data variables (public land ownership and access, existing development, type and distribution of soils) which, for one reason or another (not readily available, too complex, etc.) had been omitted in the initial classification scheme.

In this example, local participants decided to proceed with a three-tier--maximum-moderate-minimum-classification system. This procedure allows a locality to reserve new data variables for lakes for which a re-classification is requested, or for use when the regulatory agency is petitioned for a variance or special exception.

Lake Classification System Model

This model classification scheme utilizes a combination of natural resource factors that determine lake vulnerability or sensitivity.

Lake Surface Area

Lake surface area is an important determinant of the ability of a lake to support shoreline development and avoid lake user conflicts. As a general rule, smaller lakes (under 50 acres in size) are more susceptible to environmental degradation and visual impacts resulting from shoreland development and intensive recreational use.

The following scoring factors are used to rank lakes based on their surface area. The lower scores indicate greater lake vulnerability.

Lake Surface Area	**Scoring**
Less than 50 acres	1
50 to 249 acres	2
250 or more acres	3

Maximum Depth

Lake maximum depth is used as a second indicator of vulnerability. Shallower lakes, which do not stratify, have greater circulation of dissolved nutrients that enter the lakes. These lakes tend to have a larger variety of aquatic plant communities that are valuable for a wide range of wildlife and fish. Beds of aquatic plant materials can easily be disturbed by intensive water recreation use and shoreline activities, such as cutting and chemical treatment of aquatic vegetation to create swimming and docking areas.

Shallow lakes are particularly susceptible to nutrient loading and turbidity problems, both of which can be increased by intensive shoreline development and recreational use. In general, shallower lakes are more appropriate for wildlife habitat protection and passive recreation than for motor boating, water skiing, and other more intensive lake uses associated with shoreline development.

The following scoring factors are used to rank lakes based on the maximum depth. The lower scores indicate greater lake vulnerability.

Maximum Lake Depth	**Scoring**
Less than 20 feet	1
20 to 39 feet	2
40 or more feet	3

Lake Type

In Wisconsin, many of the smaller lakes are seepage lakes formed by groundwater seeping into depressions in the glacial outwash plain. Most of these lakes are "landlocked" and have no external drainage. These lakes are the most vulnerable to premature eutrophication and contamination caused by development in the shoreland zone.

Drainage lakes flow into the surface water system of rivers and streams. These lakes, along with man-made impoundments, possess varying degrees of ability to naturally circulate and flush nutrients and other forms of contaminants, but generally these lakes are less vulnerable to environmental damage than the seepage lakes. A third category of lakes is spring lakes that are fed primarily by natural springs. These lakes have intermediate vulnerability.

The following scoring is used to rank lake vulnerability with respect to lake type. The lower scores indicate greater lake vulnerability.

Lake Type	**Scoring**
Seepage Lake (SE)	1
Spring Lake (SP)	1
Drainage Lake (DG)	3

Watershed Area

The natural ability of lakes to flush and circulate water is also a function of watershed size, lake volume, and average rainfall. Lakes with larger watersheds tend to have a higher volume of water circulating through them and may have higher flushing rates.

Lakes with smaller watersheds tend to have a lower nutrient input; however, nutrients accumulate because of longer retention times. Generally lakes with smaller watersheds and long retention times are more vulnerable to nutrient loading from activities that occur in the shoreland zone, which is a larger percentage of the total watershed area.

The following scoring is used to rank lake vulnerability with respect to watershed size. The lower scores indicate greater lake vulnerability.

Watershed Size	**Scoring**
Under 1 square mile	1
1 to 9 square miles	2
10 or more square miles	3

Shoreline Development Factor (SDF)

Shoreline development factor (SDF) is a convenient method of expressing the degree of irregularity of the shoreline of a lake compared to the surface area. The SDF ratio is the length of shoreline versus the circumference of a circle having the same surface area as the lake. A perfectly round lake would have a surface area of 1.00. The SDF can never be less than 1.00.

Lakes with a higher SDF have more shoreline in relation to the surface area and thus are more vulnerable to development pressures per linear foot of shoreline that is developed. These lakes can more easily become overdeveloped and are more susceptible to various types of contamination and runoff resulting shoreline development.

The following scoring is used to rank lake vulnerability with respect to the shoreline development factor (SDF). The lower scores indicate greater lake vulnerability.

Shoreland Development Factor (SDF)	**Scoring**
2.00 or more	1
1.50 to 1.99	2
1.00 to 1.49	3

Development Density

The existing level of residential density around a lake or on a river is an indicator of a water body's development status.

In previous studies such as the Minnesota Classification Scheme and observations of existing conditions on local northern Wisconsin lakes, a development density near 200 feet per structure indicates a high density ratio. This high development density in most cases indicates that the majority of the shoreline is developed and that the potential for additional new single family dwellings is low. A lake with a high development density normally will score high and fall into the category of lakes requiring less development protection measures.

Density (feet per structure)	Scoring
300 and less	3
301 - 600	2
601 and greater	1
no structures within 300' of shoreline	0

Lake Classification Scoring Criteria Summary

Lake Surface Area	**Scoring**
Less than 50 acres	1
50 to 249 acres	2
250 acres or more	3

Maximum Lake Depth	**Scoring**
Less than 20 feet	1
20 to 39 feet	2
40 or more feet	3

Lake Type	**Scoring**
Seepage Lake (SE)	1
Spring Lake (SP	1
Drainage Lake (DG)	3

Watershed Size	**Scoring**
Under 1 square mile	1

1 to 9 square miles	2
10 or more square miles	3

Shoreline Development Factor (SDF)	**Scoring**
2.00 or more	1
1.50 to 1.99	2
1.00 to 1.49	3

Density (feet per structure)	**Scoring**
300 and less	3
301 - 600	2
601 and greater	1
no structures within 300' of shoreline	0

Overall Vulnerability Ranking	**Lake Classification**	**Protection Level**
Total score ___ or over	Class 1	Minimum
Total score ___ to ___	Class 2	Moderate
Total score ___ or less	Class 3	Maximum

The Regulatory Program

After a locality has worked out its classification scheme, its next (and final) step is to attach to it a regulatory program. There are two basic mechanisms that can be used. The locality can vary the density of development around the lake and/or the distance of development from the lake. As illustrated earlier, the former, varying the distance around the lake, has the effect of assigning greater or lesser amounts of water surface area(or water volume) per lot per lake, depending primarily on a judgement of absorptive carrying-capacity of the water. The latter, varying distance from the lake, was not illustrated earlier, but it has the effect of allowing closer or farther development, depending on a judgment which relies primarily on a sense of absorptive carrying-capacity of shoreland adjacent to the lake. In actual fact, the use of either mechanism, or both in combination, affects the carrying-capacity of a lake's total micro-environment, the water and the land.

The following table contrasts the use of these mechanisms in Wisconsin and Minnesota at the state levels. Wisconsin opted to establish a minimum lot width and structural setback that, as was explained earlier, is insensitive to any particulars of a lake's micro-environment. Thus, a high quality-highly vulnerable lake receives a base-level of protection identical to that of a low quality-lowly vulnerable lake. The state of Minnesota, on the other hand,varies both the lot width and structural setback (and, therefore, by extension the density around, and distance from, the lake) depending on whether the lake belongs to a class of lakes judged to have a greater or lesser carrying capacity.

Illustration of How the Two Extreme Classes of Lakes Would be Regulated in Minnesota, Contrasted with Wisconsin

	Lot Width	Structural Setback
Burnett County Minimum Standard		
RR-3 High Vulnerability	300 feet	100 feet
RR-2 Medium Vulnerability	200 feet	75 feet
RR-1 Low Vulnerability	150 feet	75 feet
Minnesota State Standards+		
High Quality/High Vulnerability	200 feet	200 feet
Low Quality/Low Vulnerability	100 feet	75 feet

This is an over-generalized presentation of the Minnesota system which relies on four classes of lakes and three sets of regulatory level, the density around, and distance from, the lake depending on whether the lake belongs to a class of lakes judged to have a greater or lesser carrying capacity.

From the point of view of grounding a land use program to the carrying capacity of adjacent resources like lakes, any across-the-board minimum standard-be it 100 or 400 foot lot widths, is equally insensitive. The latter, of course, does provide a higher level of protection than the former. But it is still not known how much more protection, or around which lakes, there might be regulatory overkill or underkill.

In reality, since lakes are such complex and dynamic systems, no amount of classification-regulatory effort will result in a land use program where one can say with any degree of accuracy how much additional protection one more foot of lot width or setback, or one hundred more feet for that matter, will provide a given lake resource. Users of the method described in this paper should accept that limitation as fundamental. However, a tier of generalized regulatory levels can be established which will assure that a higher degree of protection will be assigned to more sensitive lakes, while a lower degree will go to less sensitive environments. What the levels might actually be may vary from jurisdiction to jurisdiction since, to be most effective, they will be based on judgments combining the following ingredients: 1) the locality's wishes: 2) the experience of others (states and localities) with various protective levels: 3) research guidelines for the parameters receiving emphasis in the program; and 4) professional, "political," and public input and common-sense.

Summary

** Lakes are important resources in Wisconsin and it is important to understand the interrelationships between these resources and land uses that occur along their shores and within their watersheds.

** The relationships are now not well accounted for, or reflected in, most of the minimum standard shoreline regulatory programs in use in Wisconsin.

** The data and methodology to establish a better linkage between water resources and adjacent land uses does exist and is available,

** Local units of government have the power to utilize this data and to establish a planning and regulatory approach that provides a more resource-sensitive shoreland program, beyond the minimum standard

Sawyer County Shoreland Survey

1996

Developed for the Sawyer County Zoning Administration and Sawyer County Zoning Committee

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Introduction

By almost all measures, Wisconsin has experienced significant growth in the past ten years. This growth, and the resulting pressure on resources, has been a major source of concern for citizens and governmental entities alike. Increasing land use, recreational, and other user conflicts have inspired discussion and planning related to land and water use within all reaches of the state.

Sawyer County is located in the northwest region of Wisconsin. The county, in large part due to its 205 lakes, has long been a highly regarded location for tourism and recreational property development. Sawyer County ranks second in the state with 52% of its dwellings being seasonally occupied, and many lakes within the county have a history as resort/recreation destinations.

Some components of Sawyer County's growth include new construction and overall increases in property valuations. In the period between 1985 and 1995 , applications for land use permits more than doubled from around 300 to 650. This same time span saw equalized property valuations within the county increase by 73%.

Some of the larger lakes have experienced per/foot shoreline values in excess of $1,000 during the past year. The dynamics of lake property values combined with the quality and size of new lake homes have caused increased development pressures on Sawyer County's water resources.

These growth factors, and the resulting pressures on resources and public services, have contributed to Sawyer County's decision to undergo a Lake Planning Process. This survey has been developed to identify key issues which may impact the lakes planning process and to gauge public opinion related to lakes issues.

Methodology

Twenty two lakes were identified for representation in this survey and 400 surveys were mailed. Recipients were identified at random based on lists of property owners on each lake. Factored into the sampling methods were the number of properties on a given lake and methods to ensure equal representation from various sizes of lakes. A single mailing was done with no additional follow-up. Two hundred twenty-six surveys were returned for a 57% response rate. Appendix A lists a the number of responses received by lake.

Definitions

Big Lake - Big Round Lake, Lake Chetac, Lac Courte Oreilles, Grindstone, Chippewa Flowage, Sand Lake, Sissabagama Lake, Nelson Lake and Moose Lake. One hundred thirteen responses were received from these lakes.

Non-Resident - Residence established elsewhere. Vacation property or occasional use. Forty-eight responses were received from non-residents.

Permanent Resident- Lives on the property year round and is a resident of Sawyer County. Eighty-one respondents classified themselves as permanent residents.

Seasonal Resident - Lives part of the year in Sawyer County. May list residence within Sawyer County or elsewhere. Eighty-eight responses were received from seasonal residents.

Small Lake - All other responses other than those classified as big lakes. Ninety-nine responses were received from small lakes.

Strength of Response - Respondents were asked whether the felt very strongly, strongly, or not strongly in regards to their response. This rating was used to identify which responses might be viewed as significant issues. A rating of 1.00 to 1.24 was considered "not strongly", a rating of 1.25 to 1.49 was considered "strongly" and a rating of 1.50 or greater was considered "very strongly".

Limitations of the Study

While a 57% response rate from a sample of 400 is relatively strong for a single mailing, a larger sample and response rate would realize better data. Limitations in the selection criteria may have contributed to greater response rates and representation from certain bodies of water. Also, the average age of respondent is much greater than the county as a whole. It is not known if this higher average age is representative of the population living on or near the county's lakes.

Key findings

- Sawyer County lake property owner's support consideration of a lake's capacity for development when making decision related to zoning and development.
- The majority of lake property owner's support increased minimum lot widths.
- Lake property owner's feel present ordinances related to non-conforming structures are adequate.
- Primary land use/user conflicts relate to recreational use and growth and development.
- Respondents felt most strongly about their responses on:
  1. Policies related to size and use of watercraft.
  2. Policies related to maintaining a northwoods character.
  3. Consideration of a lake's capacity for development when making zoning and development decisions.
- Opinions on development issues can vary significantly based on lake size and residency status.

Property Development Issues

Consideration of Capacity for Development

Many factors influence the development capacity of a lake's shoreland. It is the fundamental assumption of a lake classification process to identify characteristics of a lake's susceptibility to development. Sawyer County lake property owners (91%) overwhelmingly supported consideration of a lake's capacity for development when making decisions on how lake front property is zoned and developed. According to a strength of response rating of 1.51, respondents felt very strongly about this issue? The high percentage if respondents in favor of consideration of a lakes capacity was shared almost uniformly by permanent and seasonal residents, as well as those living on "big lakes" and "small lakes".

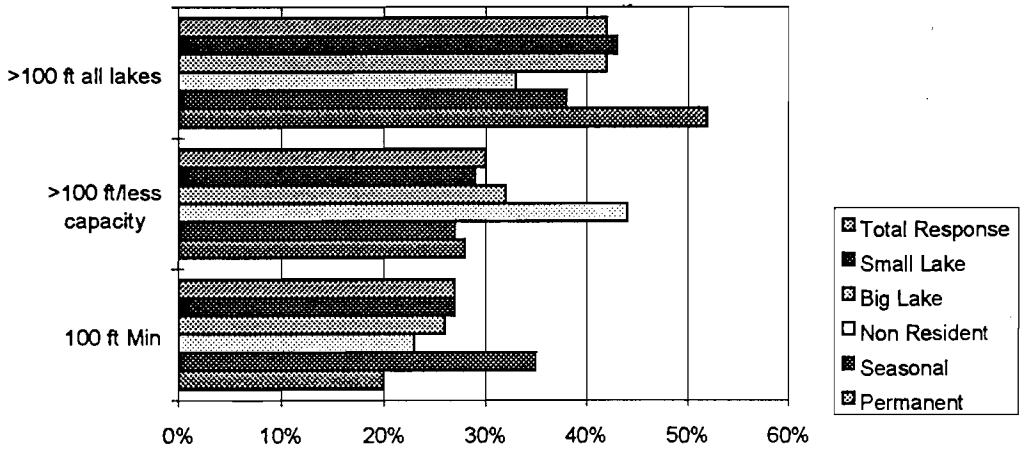
Minimum Lot Widths

Respondents support increased lot widths beyond the current one hundred foot minimum on lakes within the RR-1 and RR-2 Residential Recreational Zoning District. Thirty percent said that minimum lot width should be increased on lakes with a lower capacity for development while 42% said that the minimum lot width should be increased on all lakes. Only 27% favored continuing the current 100 foot minimum lot width. When asked what the minimum lot width should be, 53% of those favoring an increased lot width identified a 150 foot minimum. An increase to 200 ft, the second highest response, was favored by 36% of the respondents. Table 1 identifies the range and number of responses. Respondents felt "strongly" with a 1.39 strength of response rating related to their response.

- ***Table 1, Minimum Lot Width***

Minimum lot width should be:	Number of Responses
100.	1
120.	2
125.	4
130.	1
150.	50
175.	2
200.	34

Figure 1, Minimum Lot Width



While there was majority support for increased minimum lot widths, response to this question varied significantly based on residency status. Figure 1 identifies that a greater percentage of residents classifying themselves as either permanent or non-residents favored increased minimum lot widths than do seasonal residents. Cumulative totals indicate that 80% of permanent residents, 65% of seasonal residents, and 77% of non-residents favor increased minimum lot widths. Lake size does not significantly impact the response to this question.

While minimum lot width on lakes elicited a strong response, minimum lot width on river frontage elicited a much weaker reaction. Strength of response rating for this issue was one of the lowest at 1.05. Since only two respondents identified that they lived on river frontage property it may be inferred that the question does not directly impact respondents, and thus creates a lower level of concern. Sixty percent of respondents were in favor of increasing the minimum lot width beyond the 100 foot lot width for residential zone districts on rivers, while 41% supported increasing the minimum 300 foot lot width for parcels zoned forestry.

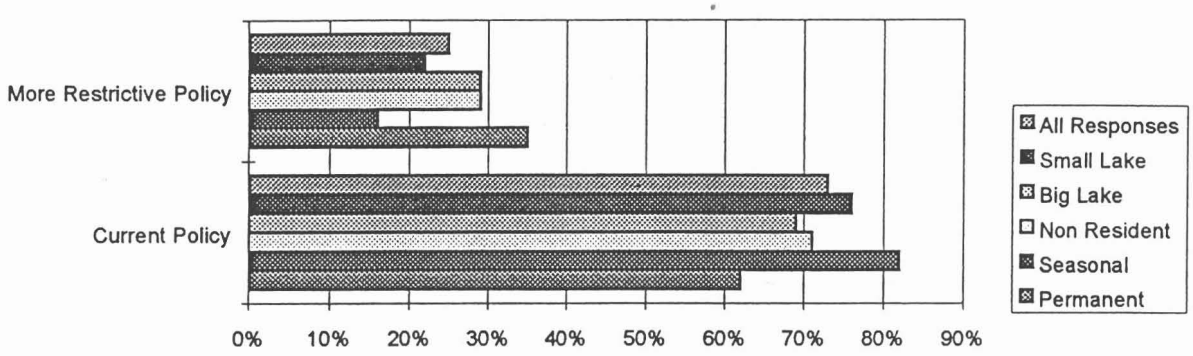
Non Conforming Uses and Structures

The majority of respondents support the County's current policy on non-conforming structures which allows for structural repairs or alterations to non-conforming buildings of not more than 50% of their fair market value during the life of the structure. Seventy-three percent favored retaining the current county policy while 25%

favored adopting a more restrictive ordinance. Respondents felt "strongly" about their response with a strength of response rating of 1.40.

Opinions on this issue vary by residency status. Figure 2 identifies that 62% of permanent residents favor retaining the current policy on non-conforming structures while 82% of seasonal residents and 71% of non-residents favor the current policy.

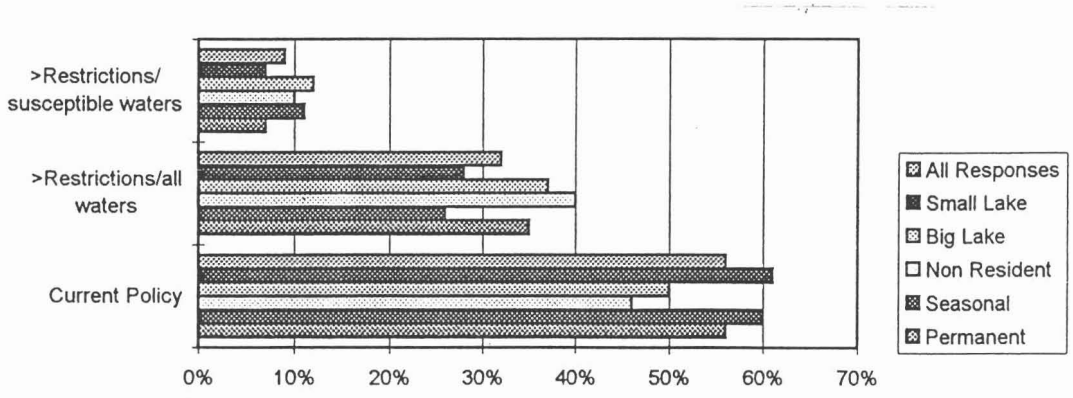
Figure 2, Policies on Non-conforming Use



Differentials can also be found based on the size of lake. Sixty-nine percent of those residing on "Big Lakes" support the current policies on non-conforming structures while 76% of those living on "Small Lakes" support the current county policies.

Shoreline Restoration and Protection

Figure 3, Policy on Removal of Shoreline Vegetation



Current county policy identifies that a maximum of 30% shoreline cover can be removed paralleling 100 feet of lakeshore and extending 35 feet inland. Opinion regarding this policy on shoreline vegetation removal was divided. More than one-half of the respondents (56%) favor keeping current county policies while 41% favor greater restrictions. As a group, non-residents (50%) were most supportive of additional restrictions on removal of shoreline vegetation.

Special shoreline restoration provisions were also supported by a majority of respondents. Sixty-eight percent of survey respondents are in favor of special provisions for a shoreline restoration plan which may include the replanting of trees and shrubs along existing developed shoreline. Seventy-seven percent of non-resident respondents supported special shoreline restoration provisions, the only significant variation from the total sample.

Aesthetics and Northwoods Character

Most respondents (65%) favor policies to protect ecologically or aesthetically significant areas from intrusion, while 30% of respondents were not in favor of these policies. There was no significant difference according to size of lake or residency status. Eighty percent of respondents favored development of policies designed to encourage future development to maintain a "northwoods" appearance and character. Respondents felt "very strongly" in regards to this issue. Strength of response was rated as a 1.56.

Recreational Use and User Conflicts

Policies regarding motorized watercraft were supported by Sawyer County lake property owners, particularly on smaller lakes. Seventy-four percent of survey respondents favor development of policies related to motorized watercraft, personal watercraft, motorboats, and waterskiing. On "big lakes" 69% favored consideration of policies while 83% of those responding from small lakes identified the need for policies related to size and type of watercraft. A very strong strength of response of 1.58 identifies this as an important Lake's issue.

This is supported by open ended responses to the question "What do you see as the primary land use/user conflict on your lake or river?". Recreational use issues were cited as user conflicts by 39% of respondents, the vast majority identified personal water craft and motorized boats as a source of conflict. Other responses can be categorized as development issues, natural resource issues, enforcement/zoning and other. Seven percent of respondents cited no user conflicts related to their lake.

- ***Table 2, User Conflicts***

Topic	# of Responses	Percent
Recreational Use Issues	53	39%
Development Issues	51	38%
Natural Resource Issues	13	10%
No User Conflicts	10	07%
Enforcement/Zoning	07	05%
Other	02	01%

(See appendix B for actual responses.)

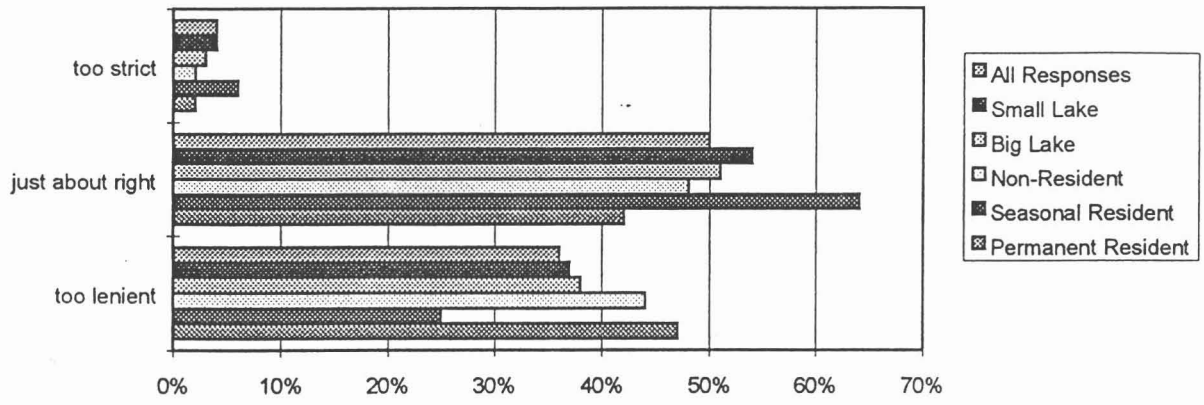
Shoreland Regulations and Enforcement

While viewpoints vary considerably regarding the effectiveness of current county shoreland regulations in the protection of the respondents' lake or river, overall they are seen as effective by the majority of respondents. Table 3 breaks down the responses by various categories.

• ***Table 3, Effectiveness of Shoreland Regulations***

Not effective			Effective				Very effective		
1	2	3	4	5	6	7	8	9	10
	15%			59%				16%	

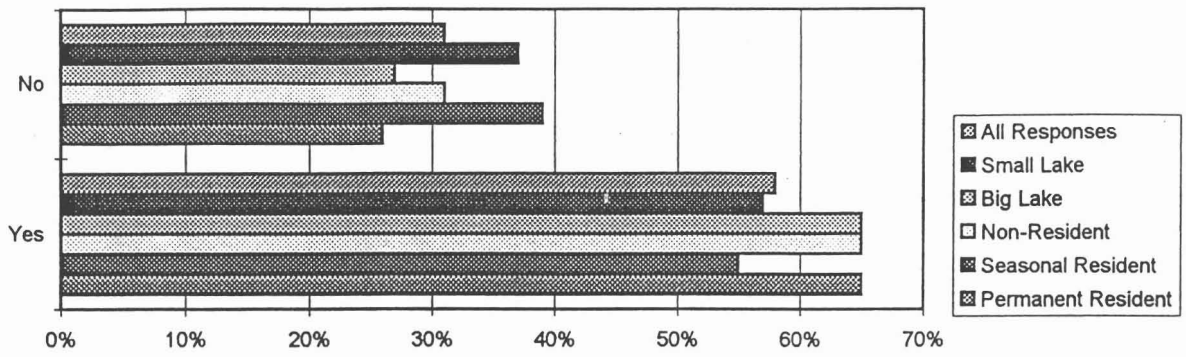
• ***Figure 4, Present County Shoreland Ordinances***



Respondents are somewhat divided as to whether the present shoreland ordinances are just about right, or are too lenient. Fifty percent of survey respondents share the opinion that present shoreland ordinances are just about right. Thirty-six percent categorized present ordinances as too lenient, while only 4% categorized them as too strict. The most significant variances in response can be attributed to residency. Most (64%) seasonal residents found current shoreland ordinances just about right while about one-half (47%) of permanent residents found present county shoreland ordinances too lenient.

Additionally, survey respondents were asked whether they would favor stronger enforcement of ordinances related to shoreland property. Slightly more than one-half (58%) identified that they would be in favor of stronger enforcement of ordinances.

• *Figure 5, In Favor of Stronger Enforcement*



In parallel with the response related to strictness or leniency of ordinances, permanent residents, non-residents, and those living on big lakes, (65%) were in favor of stronger enforcement of ordinances while a lower percentage (55%) of seasonal residents supported stronger enforcement.

Demographic Information

Residency Status:

35%	Year round resident
39%	Seasonal Resident
21%	Non resident
41%	Plan to move to the area on a permanent basis

Age of respondents:

0%	20-29
6%	30-39
21%	40-49
19%	50-59
50%	>60

Employment:

50%	Presently employed
41%	Retired
5%	Other

Household income:

7%	<20,000
16%	20,001 - 40,000
18%	40,001 - 60,000
11%	60,001 - 80,000
10%	80,001 - 100,000
18%	>100,000

DEVELOPMENT DENSITY

The existing level of development on a lake or river should be considered when attempting to evaluate or measure a water body's capacity for development. Densities can be calculated by feet of shoreline per structure, structures per acre of surface water or numbers of structures per mile. To achieve a level of consistency based on existing available structure information in the regional lakes\rivers classification scheme for North Western Wisconsin counties, the feet per structure calculation was used.

In the Sawyer County Program, the lakes that have the highest development densities were in the 200-250 feet of shoreline per structure range. All these waters have an existing minimum frontage requirement of 100 feet. By contrast, the town of Spider Lake in Sawyer County with an adopted minimum of 200 foot frontage had 500-550 feet of shoreline per structure on larger historically developed lakes.

The lakes with a high (± 200 feet per structure) development density in most cases indicate that the majority of the shoreline is developed or built up and that the potential for additional new single family dwellings is low. Also, a lake with a high development density normally will score high and fall into the category of lakes requiring less development protection measures.

Many lakes have undergone substantial development and in some cases where less than 100 feet of minimum frontage exist. For example, condo conversion or subdividing resorts have created pockets of very high housing densities creating significant impacts particularly on smaller lakes. In contrast, some counties and towns have adopted stricter minimum shoreland frontage requirements of 150 or 200 feet.

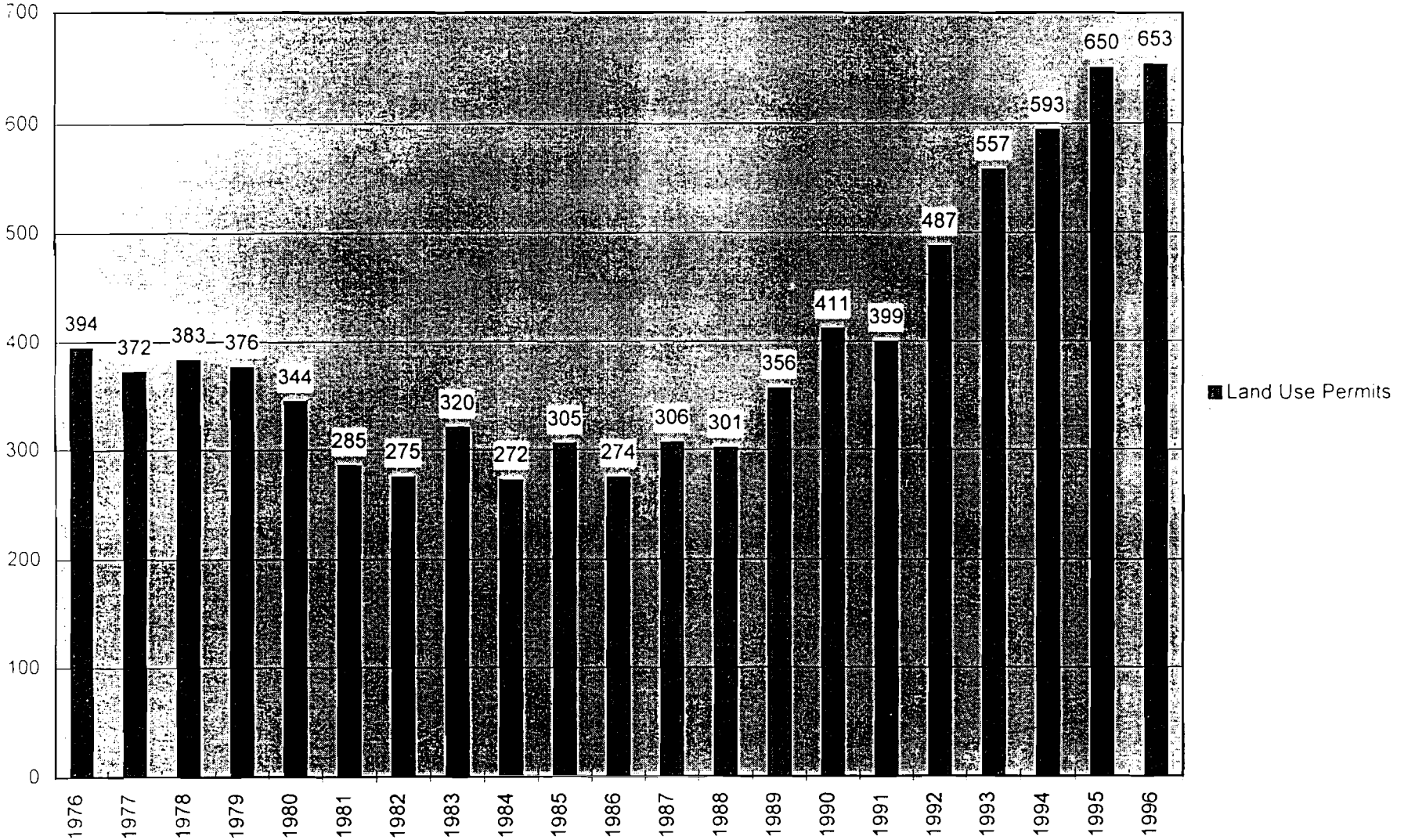
By calculating and comparing existing lake and river development densities, a bench mark can be established within a classification scheme to lobby for more or maximum protection of waters that have not been significantly developed.

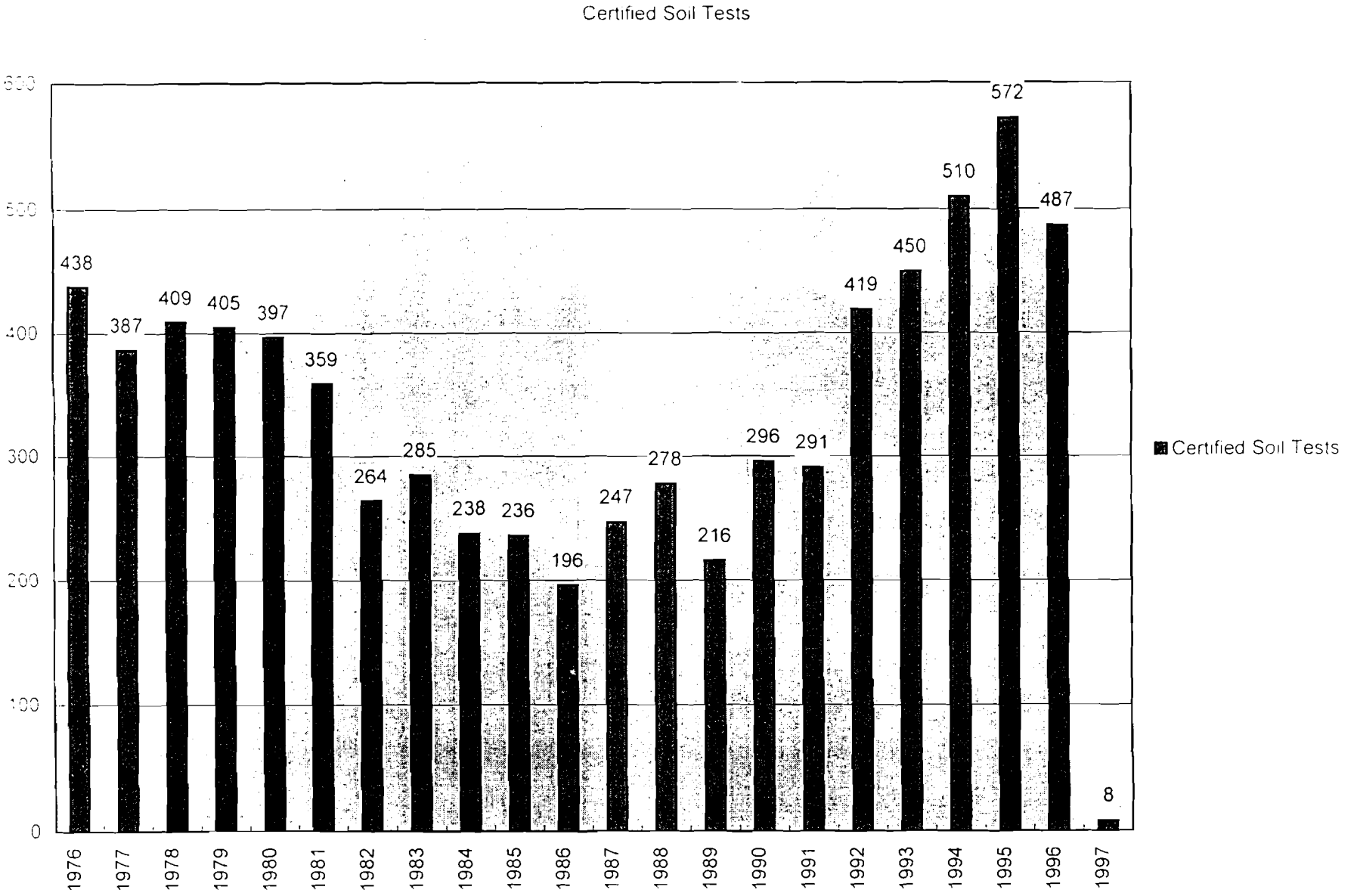
In order to use development density as a scoring factor, relatively current and accurate structure information must be available on lakes and rivers and should be easily retrievable.

Existing structure data can be available in the form of current air photos, real property listers data base, (if geo-coded by water body) and emergency fire numbers or 911 mapping. This information generally is not consistent throughout counties in Northern Wisconsin, but is consistent and easily retrievable within a single county, and can be used to evaluate densities.

The structures or addresses have to be at a scale large enough to count and preferably in a digital format. For example, Burnett, Douglas, and Sawyer Counties have structures with emergency fire numbers that are kept current on a regular basis. Numbering and mapping of addresses is underway in Bayfield and Ashland Counties. Price County was completed in 1992 but never updated.

SAWYER COUNTY YEARLY TOTALS




Certified Soil Tests
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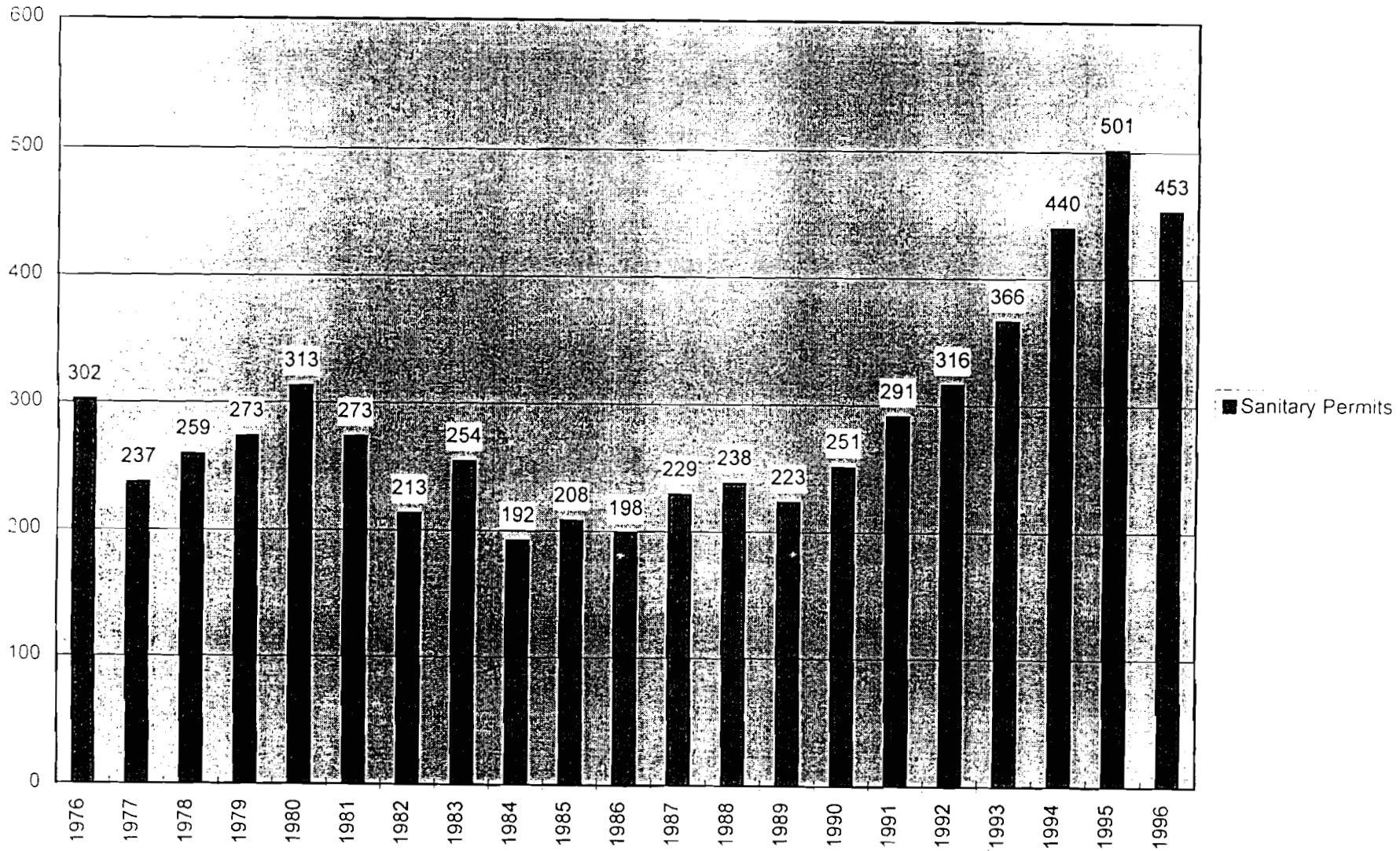
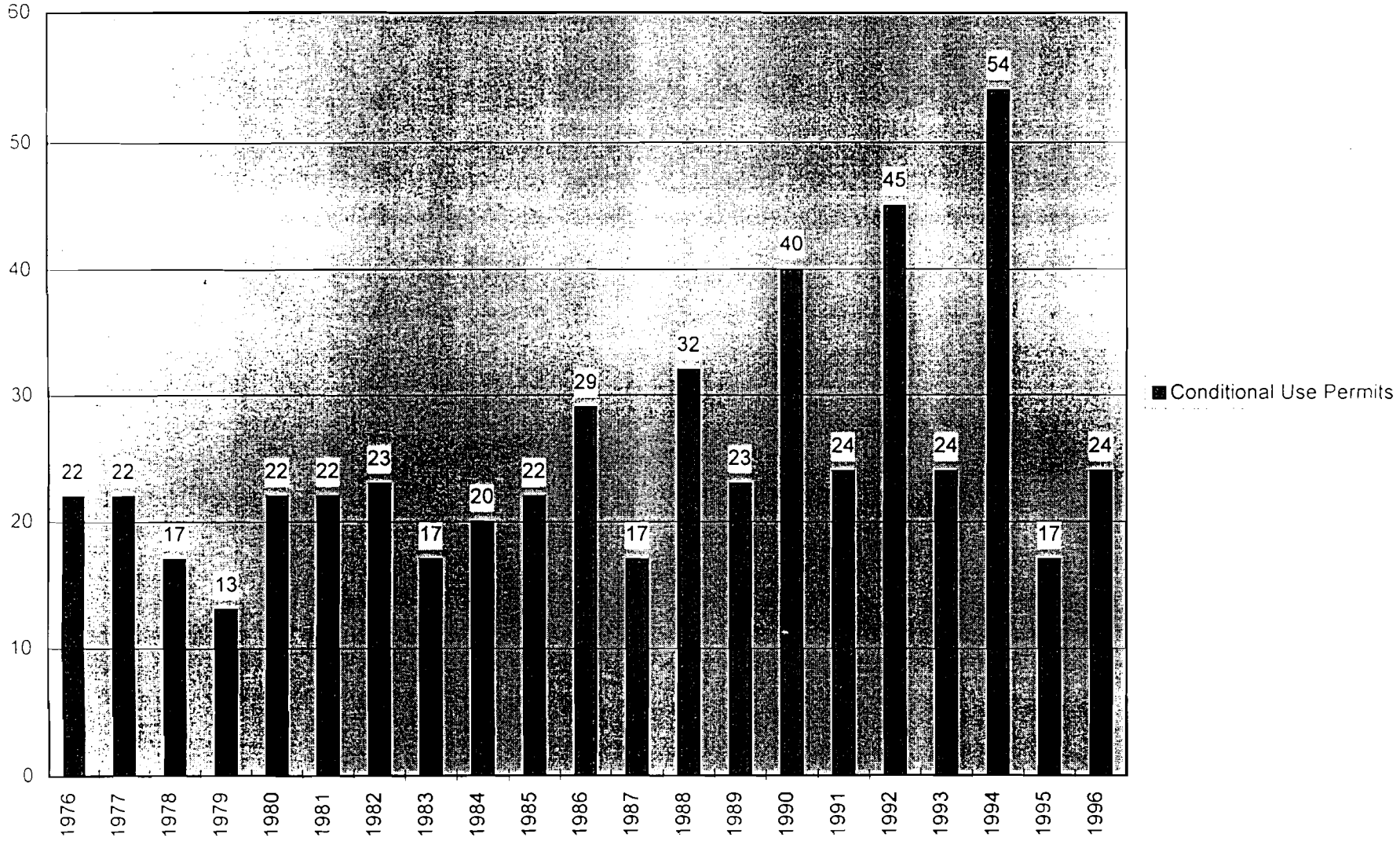
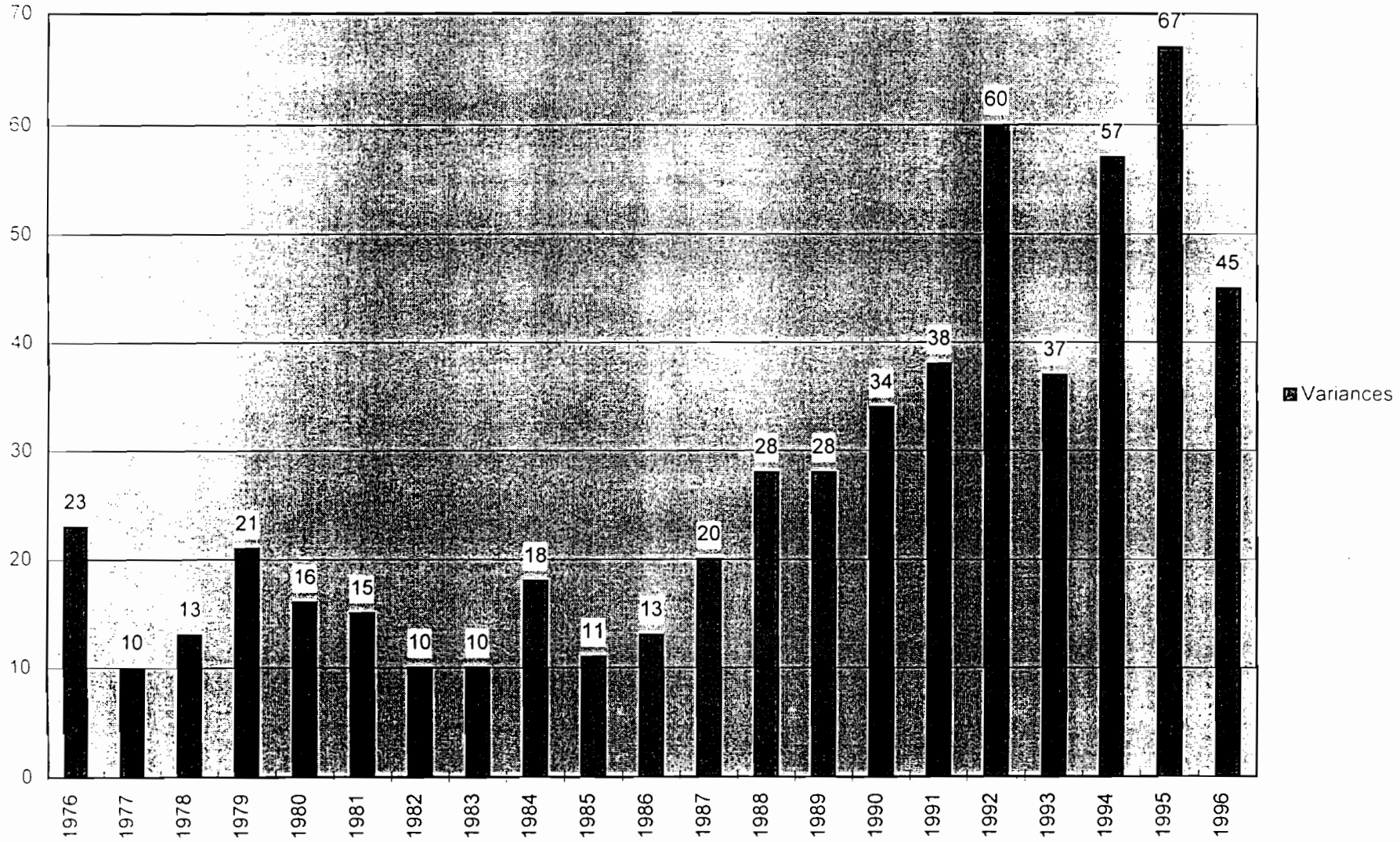
SAWYER COUNTY YEARLY TOTALS



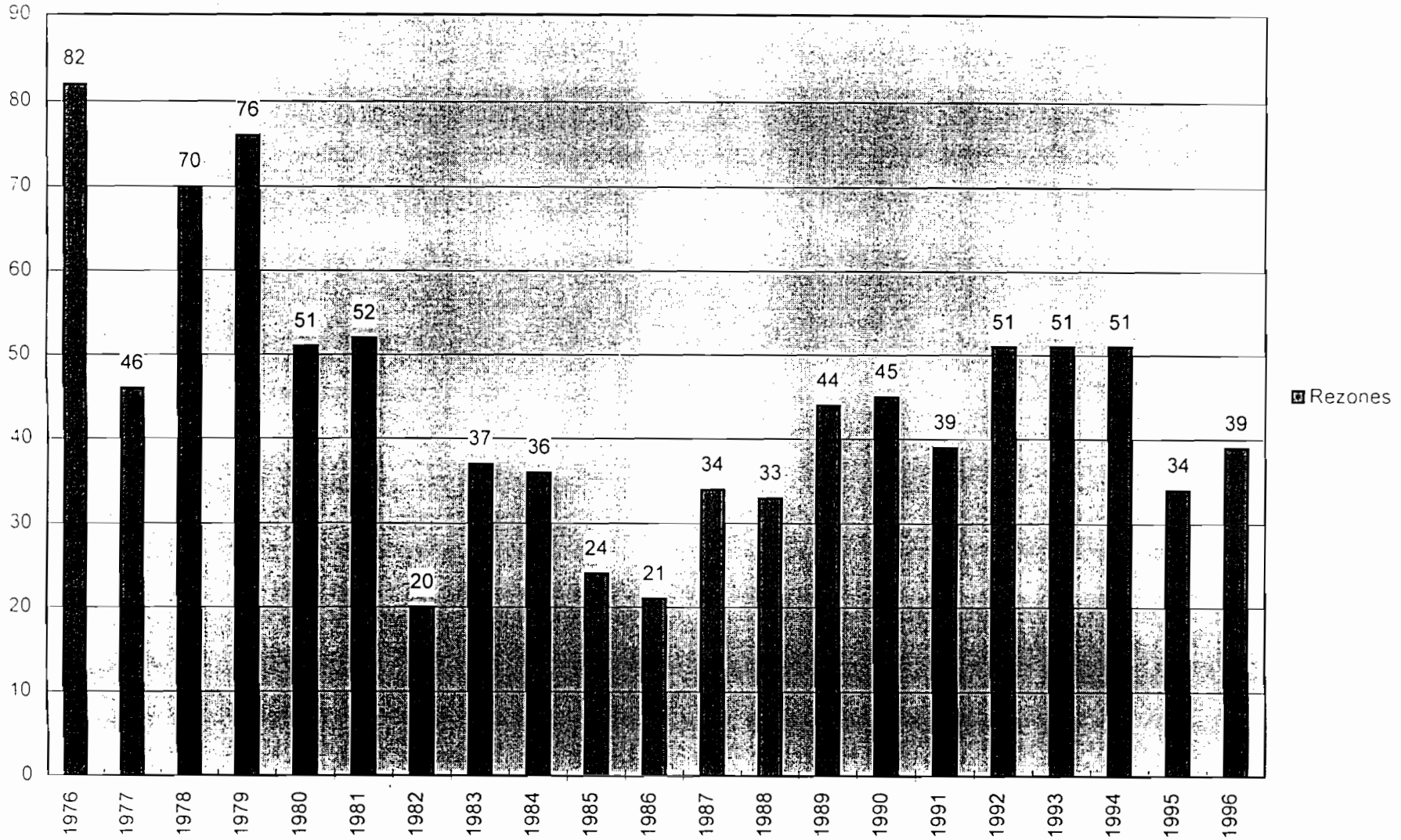
SAWYER COUNTY YEARLY TOTALS



SAWYER COUNTY YEARLY TOTALS



SAWYER COUNTY YEARLY TOTALS



SAWYER COUNTY YEARLY TOTALS