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No. 682 Fall 1995

## Women Who Farm: Wider Attention to a Growing Subgroup

Kimberly A. Zeuli and Richard A. Levins

From 1978 to 1992, the proportion of women farmers in the United States grew from 5.2 percent to 7.5 percent of the total farm population (Figure 1). These small numbers hide a much larger economic fact: almost half of all farmland in Minnesota is leased (see box on page 4), and 40 percent of that leased land is owned by women. Obviously, most women in farming are not doing the farming themselves.

These figures reveal a new trend in American agriculture: an increasing role for women in both the production of our food and the ownership of our farmland.

For the most part, this trend has gone unnoticed. One commentator noted: "There are women connected in some way with most U.S. farms, but the work of these women is even less noticed [than the work of other women], since farming is thought to be done by men."

Last year, we conducted a series of interviews to learn more about women who farm in Minnesota. Both the results of that study and the public reaction to it are worth looking at.

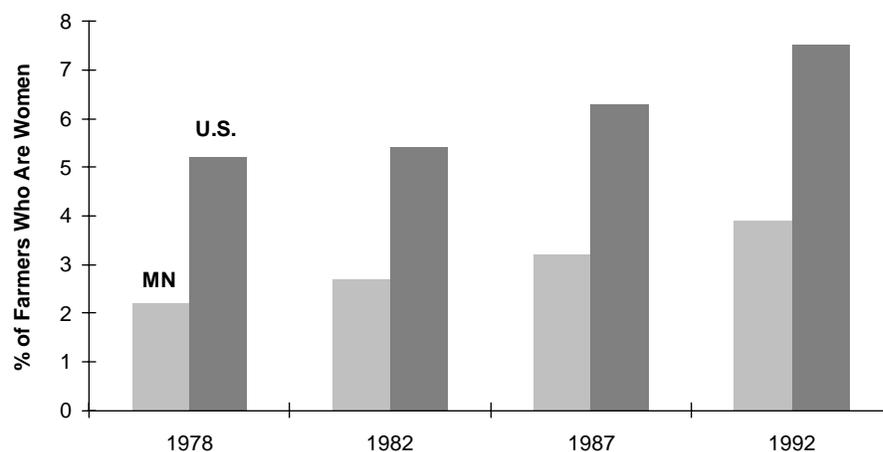
### Women Farmers in Minnesota

Although 2,931 women farmers were reported in the 1992 Minnesota Census, they are not easy to find. We worked with several groups to identify 20 women who met the Census definition of an independent farm

(See *Women* page 2)

*Kimberly A. Zeuli is a research assistant and Richard A. Levins is a professor in the Department of Applied Economics.*

Figure 1. The Proportion of Farmers Who Are Women Is Steadily Rising.



Note: 1978 was the first year that the Census differentiated farmers by gender.  
Source: Census of Agriculture.

## New Walleye Size Rules: How Will Minnesota Anglers Respond?

Jane Ruliffson and Frances Homans

### Introduction

Minnesota highways are jammed on the day before the walleye opener, and boat launches fill up early the next morning with anglers eager to catch the first walleye of the season. The rest of the summer may not be quite as intense as those first few days, but

walleye fever continues to infect Minnesotans throughout the summer and into the ice-fishing season.

But even as anglers try more often and use more sophisticated equipment, they are bringing home smaller and smaller fish. The increasing harvest means that it is harder for a walleye to

(See *Walleye* page 4)

*Jane Ruliffson is a research assistant and Frances Homans is an assistant professor in the Department of Applied Economics.*

*(Women continued from page 1)*

operator, lived in various counties across the state, and represented as many different farm enterprises as possible. Each was asked about herself and her farming operations. From these interviews and from Census statistics we were able to draw several conclusions about women farmers in Minnesota. We summarize these here.

Perhaps the most significant is that men and women farmers really aren't very different when it comes to operating their farms. Most women, like most men, decide what and how to farm based on their resources. For instance, the 1992 Census shows that the majority of both male and female

farmers either operate cash grain farms, livestock farms, or dairy farms, or have field crops (Figures 2 and 3). The one exception is the higher percentage of female farmers running animal specialty operations. This is probably because women farmers operate smaller acreage farms than men, and animal specialty farms (such as goat farms) maximize their resources.

Our study also showed that women farmers use essentially the same methods as men who farm the same size and type of operation. This is true for the organization of farms as well. The Census shows the highest proportion of farms in Minnesota are either individual or family owned (87 percent

of the farms run by women and 88 percent of those run by men). The farms in our study reflect this pattern. Eight of the 20 farmers owned the farm with their spouse, eleven were individual proprietors, and one was in a formal partnership with her brothers.

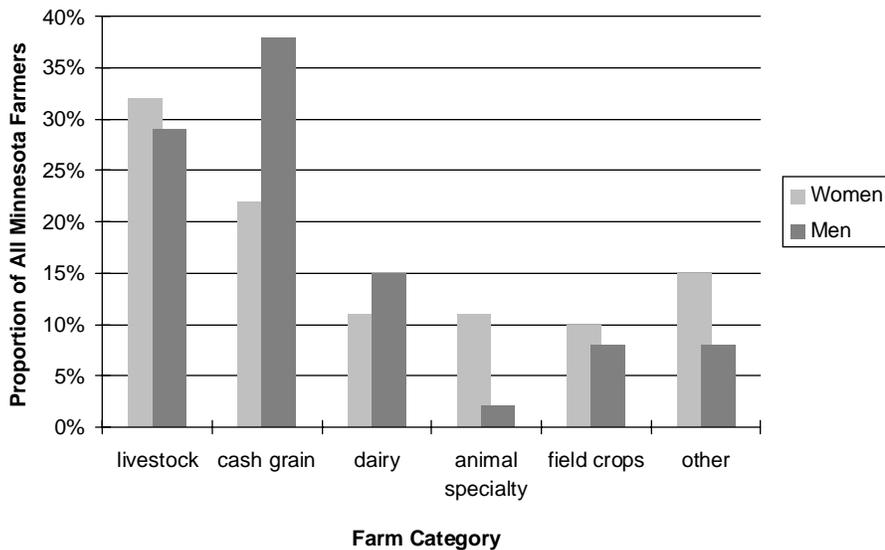
Census numbers probably understate the actual number of women-run farms because the reporting forms force respondents to check one category or the other. If both people run the farm jointly, very often the male category is selected.

The age, marital status, number of children, and level of education among women farmers vary just as among male farmers. Our study's farmers ranged from 23 to 72 years old, with an average age of 49.5 years. Twelve of the women in our study were married; eight of those twelve had children living with them. Four were widows with children at home, two were divorced (one had children at home), and two were not married and had no children at home. All had finished high school and most were college educated; twelve of the women had also received some type of formal agricultural education.

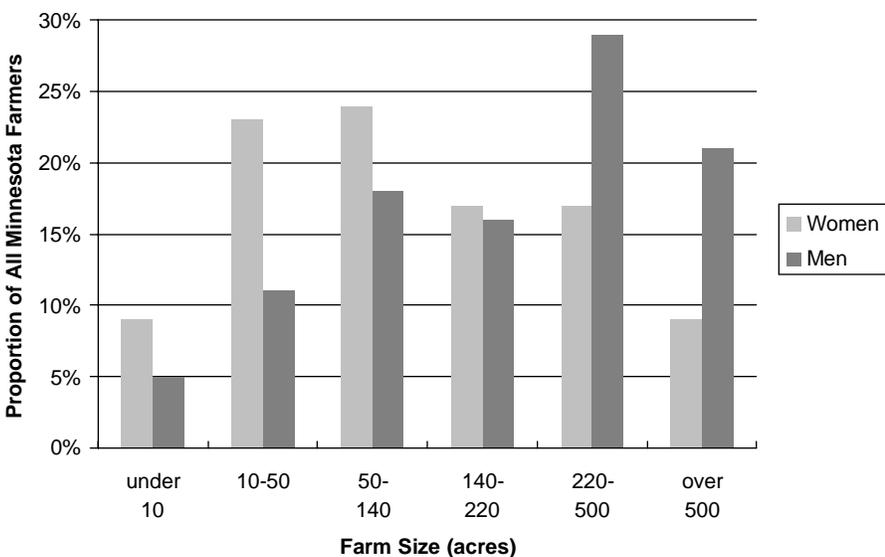
Half of the women in our study had been farming on their own for more than ten years, with the average being 12 years. But they had been on the farm even longer: when you include the years before their husbands died, they averaged more than 17 years. The Census reported "average years on present farm" which was 19 for female operators and 21 for male operators in 1992.

All of the farmers in this study considered themselves full-time farmers, although seven also worked off the farm. For the Census, 56 percent of female operators reported farming as their principal occupation, compared to 68.5 percent of male operators. Again, this may be because women operate smaller farms, both in terms of acreage and gross sales. Another study based on Census statistics found that 62 percent of Minnesota's small-scale farmers reported their primary occupation as farming, compared to 97 percent of mid-sized farmers and the 92 percent of large-scale farmers who so reported. Despite this difference, an almost equal proportion of male and female operators reported no days worked off the farm. Since a higher percentage of women than men operate small farms, but an equal proportion report no days worked off the farm, women farmers are probably less likely to work off the farm than their male counterparts.

**Figure 2. Women Farmers Specialize More Often in Animals...**



**Figure 3. ...But Operate Smaller Operations.**



Source: Census of Agriculture

Only nine of the women interviewed in our study had been raised on a farm, and only five of these got started by taking over their family's farm. Three of the women bought the land from non-relatives, and one married a farmer. Of the eleven women who were not raised on a farm, eight began farming by buying land and the other three married farmers. This lack of estate transfer to women might explain the observations that women farmers operate smaller acreage farms than men.

The women in our study said they farmed for a variety of reasons. A common response was, "I've always wanted to farm." Wanting a better lifestyle for themselves and/or their family was another. In particular, kinship with the land and animals and being outdoors was the most attractive part of farming for many women. "Every day is different. Every day is outside. Every day I get to be in touch with the land, animals, and weather," reported one farmer. These women also considered farming an attractive career option. It was a chance to own their own business, to stay home with the kids, and to face new challenges.

Most of the interviewees said a lack of money and a lack of knowledge about farming were the greatest barriers they had to overcome. The daily and unpredictable troubles that all farmers encounter were also tough. Crop failures, poor weather, and bad equipment are not gender related, but lack of knowledge and limited access to farm credit just may be. In farm families, sons are often given more opportunities to learn about farming than daughters because sons are often considered the future farmers in the family. Why should a farmer teach his daughter how to operate the farm if he believes she will never farm? The daughter may not even ask to be taught since she, too, may not think of farming as a potential career. One woman admits that if one of her brothers had wanted it, she wouldn't have been allowed to take over the family farm. It was only after she took over the farm that her father taught her fully how to farm. For women not raised on a farm, learning how to farm may be even more difficult.

Seven of the farmers volunteered their feeling that they had difficulty in securing credit because they were women. Lacking the financial resources and farming experience to

qualify for loans is a major barrier for a lot of new farmers, regardless of gender. However, other studies have shown that loan approvals depend upon the relationship between the banker and the customer. The banker is most likely to lend money to friends. Women farmers are often considered outsiders in their communities, especially women who have bought their way into farming and the community. This means local male farmers may be more likely to obtain loans from local lending agencies than women farmers since they are more likely to be friends with the lender.

Discrimination was another problem almost all of the women felt they had or still do face. Many felt they were discriminated against until they proved themselves as farmers. According to one, "Men look at me like I don't know anything. I have to prove myself more than a man would. After I prove myself, it's okay." For many of the women, dealing with salesmen and others involved in agriculture meant being overcharged, ignored, or put down.

## The Public Responds

This collection of case studies of 20 farmers is not exactly "cutting edge" work in the eyes of most economists. In fact, we found very little enthusiasm for the study when it was first proposed. But since the study was released, hundreds of individuals and media outlets have requested further information.

Even if one is used to some attention from the farm press, a call from CNN is an entirely different story.

The many responses to our study reveal much about public perceptions of women farmers. They can be grouped into four categories: the curious, the marketers, the feminists, and the farmers.

### The Curious

The first, and largest, group of those who responded to our study was those who were curious and wanted to see an example of a woman who farmed. This group included specialized publications as well as the two largest newspapers in the Twin Cities and two major Twin Cities television stations. The story then went out on the Associated Press wire and we received even broader coverage, including an inquiry from CNN to help with a special story.

Some asked simply to interview a woman who farmed, while others had

something more specific in mind. One wanted to meet a woman with a large crop farm and big tractor. A reporter asked about any who might have "cute animals." Clearly, perceptions of women farmers were varied.

The attention from this group was widespread and welcome. It helped us meet one of our major objectives: to inform the public about women farmers, create awareness, and possibly provide encouragement for women considering farming. But the responses also made it clear to us how invisible women farmers are in our society. Most people clearly had seldom thought about women farmers, and for the most part, did not know where to go about finding such a person.

There were occasional indications of progress, however. Recently a farmer was interviewed on the evening news about crop damage from an early frost. The farmer was a woman, but no special mention was made of that fact. She was interviewed because her crops had been damaged by frost, not because she was "different."

### The Marketers

The second group of people who responded to our study were interested in how they could use it to sell products or services. To them, women farmers represented a new, growing consumer niche. A design engineer from a major farm equipment manufacturer asked if the women in the study had specific complaints or comments about their machinery and did we know of any women who might be interested in testing new equipment designs? A rural health research center wanted to use the study to help tailor its services to fit the needs of farm women. Farm newspapers reported on women farmers in their "women's section" or "women's issue" in an attempt to gain more women readers.

### The Feminists

The response of the marketer group was strangely similar to that of the third group, the feminists. Both viewed women farmers as being different from their male counterparts. The feminists seemed eager to show women successfully competing in a traditionally male-dominated field. However, their stories often portrayed women as "earth mothers," farmers who nurtured and cared for land and animals in a way only a woman could. In this view, women farmers, because they are

women, are more inclined to farm organically or sustainably than men.

There is little in our study to support the agendas of either the marketers or the feminists. We simply did not find much difference in the way men and women farm in similar circumstances. Granted, the marketers might do well to portray women, as well as men, in their farm advertising, but special “ladies” equipment hardly seems necessary. And while the support of feminists for women who are entering farming may prove welcome in what is sure to be a struggle for many, the issue of how the land is farmed is best treated separately from the issue of the gender of those who farm it.

## The Farmers

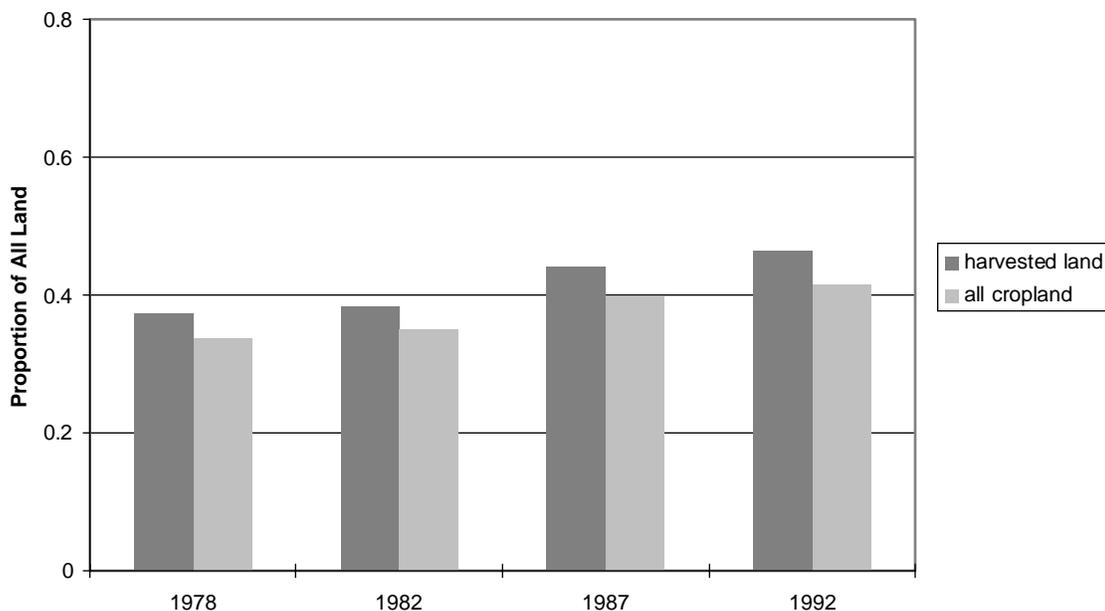
The final group of respondents, women who were farming or thinking about farming, were the ones we most hoped to reach. These farmers praised our attempt to draw attention to the increasing number of women who farm and said these women should be considered “real” farmers. The potential farmers thanked us for letting them know that they were not the only women thinking about farming as a career. Some results of our study indicate that role models and occasional encouragement might be especially important in increasing the number of women farmers.

## Conclusion

We now know a little more than we did about the women who farm in Minnesota, but there is much more to learn. For example, the fact that women are majority landholders but minority farmers is of current interest to us. But more important, why study and encourage women farmers at all?

In our view, the answer is not one of the uniqueness of women and their farming practices. It is one of simple equity and justice. A sector of our economy as large as farming, especially one so heavily subsidized by federal funds, should be under close scrutiny for low female participation. Farming, and our farm programs, could use a closer look.

“Land farmed” and “land owned” are not the same concepts—financially or statistically. Nearly half of Minnesota's cropland is rented from others. This is not a new phenomenon, as the chart clearly shows, but the rent share has been steadily growing since at least the 1970s.



Source: Census of Agriculture. All land operated by tenants is assumed to be rented.

(*Walleye* continued from page 1)

survive long enough to get big. In this article, we report some early results of an economic assessment of some management changes that are being proposed to deal with this decline in the Minnesota walleye fishery.

## The Problem: Overfishing

Fish are what economists call an open access resource: they may be

freely harvested with only modest restrictions. This can and does lead to problems.

Studies of open access resources in commercial settings clearly show a pattern of resource exploitation. Without conservation incentives, resource stocks are driven to low levels. Harvesting pressure increases until net benefits (“rents,” to an economist) are driven to zero, through either increased harvesting costs or decreased value of the harvested commodity. At this point, the resource

may or may not be in danger of collapse, but it will certainly be overharvested from an economic perspective.

Fisheries managers have tried to curb overharvesting through regulations, but open access pressures and dissipation of economic rents will continue, say some researchers, until private property rights are established.

Similar pressures emerge in recreation settings. Individuals are reluctant to conserve because many of the benefits of conservation will go to

someone else. Harvesting pressure increases and net benefits begin to fall, either due to increased angling costs or reduced value of the fishing experience. The experience is devalued by lower catch rates, smaller-sized fish, or the loss of amenities (such as solitude), as more and more anglers fish a lake.

As harvesting increases, regulatory agencies often step in. These agencies typically do not consider private property rights as a solution to overharvesting. Instead, they try to serve anglers by somehow improving fishing quality while still keeping the resource freely accessible to all.

The Minnesota Department of Natural Resources (DNR), charged with maintaining the quality of fish populations, has traditionally relied on stocking. The DNR stocks walleye in many lakes where walleye cannot reproduce naturally, and it supplements walleye stocks in lakes with natural populations. In this way, the numbers of walleye are kept at high levels. Unfortunately, stocking does not stem the decline in average fish size.

So the agency is considering imposing size limits on allowable catch. For example, all walleye smaller than the required minimum size would have to be released. The idea is that these smaller fish could then be caught later, once they have grown to a more satisfactory size.

Fish experts argue that a combination of stocking and size limits would lead to healthy walleye populations with many large fish. Increasing the number of large fish may also improve natural spawning and therefore reduce the need for costly stocking.

The new rules will be only gradually introduced. At first, minimum size restrictions would be experimental on a few selected lakes. If successful, such rules might then be implemented on other lakes across Minnesota.

In essence, the DNR programs focus on the supply of walleye. Stocking programs supplement supplies directly, and size limit regulations would increase the supply of larger walleye indirectly.

Though the biological component or supply side is critical to the success of size limits, an equally important component is the demand side. How will participation change as: (1) the regulation is imposed and (2) the regulation is successful in improving the quality of fishing?

We are assessing the behavioral response of anglers to this proposed

regulation. Will anglers reduce the time spent fishing at a lake where regulation is in force? Or, if the regulation is successful in increasing the average size of walleye, will more anglers fish the lake? Will different segments of the angler population react differently to these changes? Will changes in fishing quality affect consumer welfare and spending patterns?

These questions are important for two reasons. First, walleye populations are affected by total fishing pressure, and this will not remain constant as fishing quality changes. In order to determine how the walleye population will evolve, there must be an assessment of how fishing pressure will change. Second, the level of participation is linked to angler benefits. Though the consumer surplus (a measure of the benefits we enjoy from doing something like fishing—over and above the cost we incur in doing it) generated in an open access setting is not as large as it would be in optimal institutional setting, it is nonetheless still sensitive to fishing quality.

## The Study

The DNR is considering two Minnesota lakes, Osakis (straddling Douglas and Todd counties) and Minnewaska (in Pope county), for minimum size limit regulations. Creel surveys have been used to help managers first decide how stringent the regulations should be. Researchers have surveyed anglers about the type of fish they seek and the type, number, and size of the fish they catch. These data are also used in population assessments. A companion economic survey—which we summarize below—asked anglers about their fishing habits and how those habits might change with a size limit regulation.

The first part of the survey addressed current fishing habits and preferences. Anglers were asked about the frequency and duration of trips to either Lake Osakis or Lake Minnewaska as well as the number of trips they take to other fishing lakes. Anglers were also asked about the elements that make a fishing trip pleasant and successful for them: were they concerned mainly about the fish they caught (number and size) or were components such as weather, crowding, or water quality just as or more important? Anglers were asked about their current keeper, about the average

and the ideal size fish for eating and for trophies, and whether anglers fish mainly to catch a meal or to garner a trophy. Many of these questions were designed to get at the difference between the actual and an ideal fishing experience.

The second part of the survey contained two sets of questions about the experimental regulation and the possibility of catching larger fish. The first set of questions were framed as “contingent valuation” questions. This is a type of economic analysis that tries to get at people’s valuation of hypothetical (contingent) events—like a better fishing experience. How much more would anglers be willing to pay, in addition to what they were already paying for a trip, in return for the opportunity to catch larger fish? The second set of questions were “contingent activity” questions. Would anglers change the number of trips they take to the lake if the regulation was initially established and then successfully increased average fish size? A final set of questions recorded demographic information such as age, income, and education level.

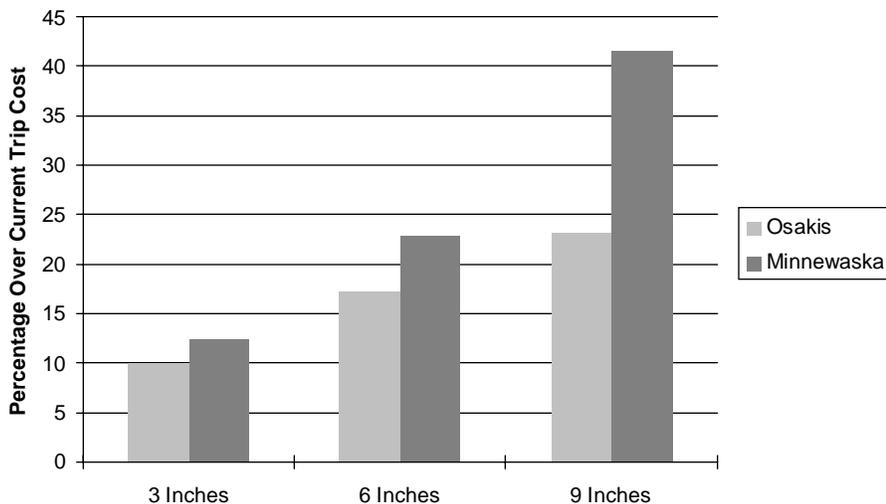
## Overall Results

Our initial impression that walleyes are smaller than anglers might wish is verified by our survey results. The desired size (16.9 inches, on average) is larger than the current average catch (15.8 inches). Anglers tend to keep walleye that are smaller than this average, but they report that they voluntarily release fish that are, on average, smaller than 14.6 inches. This suggests two hypotheses: (1) anglers want larger fish, and (2) that regulations that raise the “keeper” size to the average size caught or higher would cause a dramatic change in fishing behavior.

Survey results suggest that many anglers do, in fact, value larger fish. About half said that they would be willing to pay more for an increase in average size. These respondents said they were willing to increase trip costs, on average, by 11% for a 3-inch increase in average size, 19% for a 6-inch increase, and 28% for a 9-inch increase (see Figure 1). The other half of our respondents were satisfied with current conditions and would not be willing to pay more for larger fish.

Whether or not anglers valued larger fish, would they fish at the lake even with behavior-limiting regulations? Results indicate that some

**Figure 1. Would You Pay More to Get to a Lake With Bigger Fish?**



anglers would reduce the number of fishing trips to the regulated lake. For a minimum size limit that is 3 inches longer than the current average size, 16% of our respondents would cut back on their trips to the lake. As the regulation becomes more stringent, this percentage increases steeply, to 35% for a limit 6 inches longer than average and 39% for a limit 9 inches longer (see Figure 2).

One reason given for this resistance to strict regulations is that 70% of anglers say they fish primarily to catch enough for a meal. Since the respondents' ideal eating size is, on average, 17 inches, stricter regulations would prohibit anglers from keeping walleye they think are good eating.

Because the bulk of anglers won't reduce their trips to the lake, regulations may be possible, and perhaps even desirable. Anglers apparently recognize the pitfalls of open access behavior, and respondents suggested rules that mitigate this behavior. Anglers may wish to conserve, but if they do, they also want to reap the benefits of conservation. This will only happen if others conserve as well, which would be ensured by a minimum size restriction.

If regulation successfully improved the size distribution of walleye, would anglers then increase their number of trips? Though many would not change the number of trips even with striking increases in the average size caught, 21% did say they would change the number of trips with a 3-inch increase in average size, 32% with a 6-inch increase, and 34% with a 9-inch increase (see Figure 3). These results

probably understate the increase in the total number of trips that would follow an improved size distribution, since anglers who are not currently fishing in that lake might start coming in the hopes of catching larger fish.

Overall, our survey results suggest anglers do value size increases, and many will keep fishing in the lake with a minimum size restriction of 3 inches larger than their current average size. This is true even though the current voluntary keeper size is, on average, 14.5 inches. More anglers would increase their number of trips because of an increased size (3 inches) than the number of anglers who would decrease their number of trips because of a minimum size restriction (3 inches longer than their current average size). As the proposed restriction becomes more stringent (minimum sizes of 22 to 25 inches), participation drops off more dramatically. An increase in the number of trips from the resulting improved size distribution would not necessarily compensate for this decrease in participation.

These data help determine the optimal minimum size restriction to balance the loss of surplus from constraints on angler behavior with gains from improved fishing quality.

### Differences Between the Lakes

Preliminary results suggest that the optimal regulation is likely to differ across lakes. Lakes differ from each other both in physical characteristics and in the reasons anglers choose to fish at those lakes. These differences influence the sensitivity to regulations

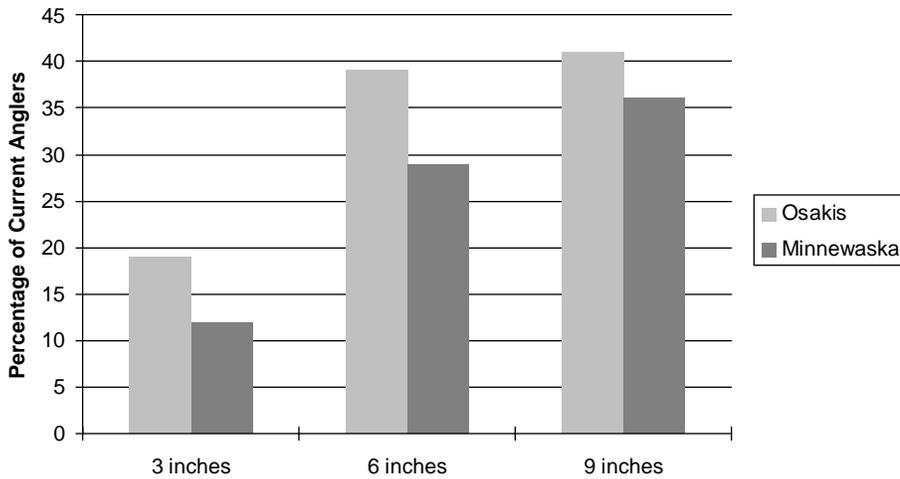
and to changes in fishing quality. Lakes Osakis and Minnewaska illustrate how different characteristics of lakes may affect the choice of a size-improving regulation.

Lake Osakis is widely known and aggressively promoted as a walleye fishing lake. In contrast to Lake Minnewaska, anglers fishing there travel twice as far on average and spend twice as much per trip. At Minnewaska, almost one-third of the anglers are local residents; only 5% travel more than 300 miles to get there. By contrast, only 9% of the anglers at Osakis are local, and almost a fifth of the anglers travel more than 300 miles to the lake (see Figure 4). A much higher percentage of anglers fish for trophy walleye at Osakis than at Minnewaska, and almost twice as many anglers at Lake Osakis said it was important for them to keep the fish they catch.

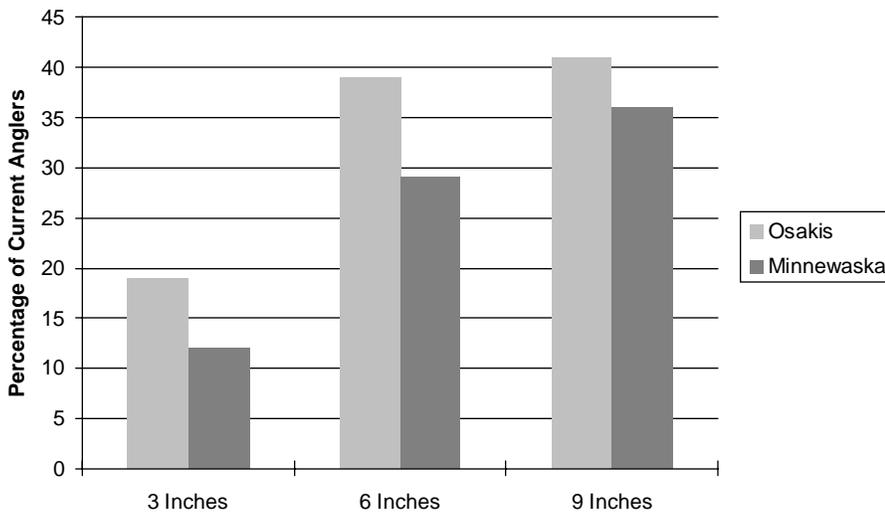
These data suggest that the flexibility of anglers who go to Lake Osakis may make them more sensitive to restrictions on their behavior. Though these anglers prefer larger "trophy" fish (and choose Lake Osakis for that reason), they may be less willing to abide by regulations before the gains in size are realized. Surveys show that Lake Osakis anglers are, in fact, willing to pay more for larger fish. For a 3-inch increase in average size, Lake Osakis anglers are willing to pay an average of \$8 more than Lake Minnewaska anglers. For a 6-inch increase the anglers are willing to pay \$12 more, and for a 9-inch increase the anglers will pay an additional \$6.

Though these figures suggest that the gains from the regulation may be higher at Lake Osakis, the number of fishing trips to the lake may drop more dramatically while the size distribution improves. Survey results verify this conjecture. At Osakis, 19% (vs. 12% at Minnewaska) of anglers said they would change the number of trips to a lake with an enforced minimum size limit of 3 inches over the current average size. For a 6-inch change, these numbers increase to 39% (Osakis) vs. 29% (Minnewaska) and for a 9-inch change, 41% vs. 36%. This may lessen the pressure on walleye in Lake Osakis and make the regulation more successful. It remains to be seen, however, whether long-term gains in benefits from increased average size would compensate for short-term losses from anglers choosing another lake.

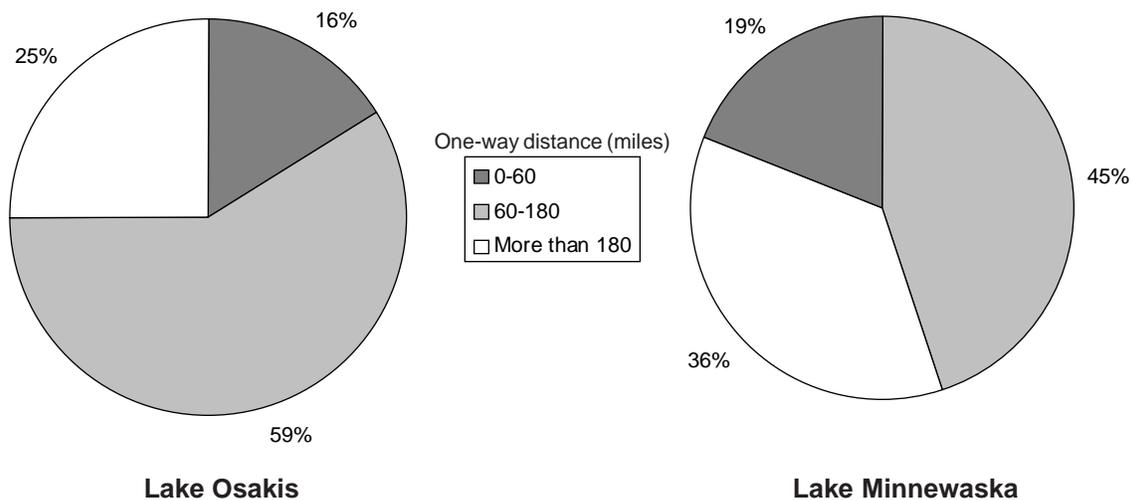
**Figure 2. Would You Take Fewer Trips if the Lake had Minimum Restrictions?**



**Figure 3. Would You Take More Trips if the Fish Were Bigger?**



**Figure 4. How Far Do You Drive to Fish?**



## Conclusion

Walleye angling is one of the great pleasures of a Minnesota summer. Anglers enjoy the challenge of finding and catching walleye, and are further rewarded with a fine meal at the end of the day. With any luck, they might even land a trophy fish. But as fishing has become more popular, the average size of walleye has steadily declined. Lakes are filled with smaller walleye and fewer trophy-sized fish.

To reverse these trends, the Department of Natural Resources is experimenting with restricting the size of fish harvested. If size-specific catch regulations are implemented, biologists will be able to calibrate the link between size limits and resulting improvements in fish size and natural reproduction. This information will be critical in predicting the effect of regulation on participation and benefits.

Our preliminary survey results suggest that minimum size limits would be acceptable to most anglers now fishing Lakes Osakis and Minnewaska, but that different size limits would be appropriate at different lakes. There will be an initial period in which participation will decline at lakes where the regulation is in force. But participation will eventually increase if the regulation is successful in improving the average size of walleye.

The next stage of our research will be to assess potential changes in consumer surplus and link total participation rates to alternative regulations. Different segments of the population may be analyzed to determine differences in responses to the possible regulations.

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