

FIGURE 6: WATER QUALITY RATING -
 PERCENTAGE OF TOTAL WATER SHED

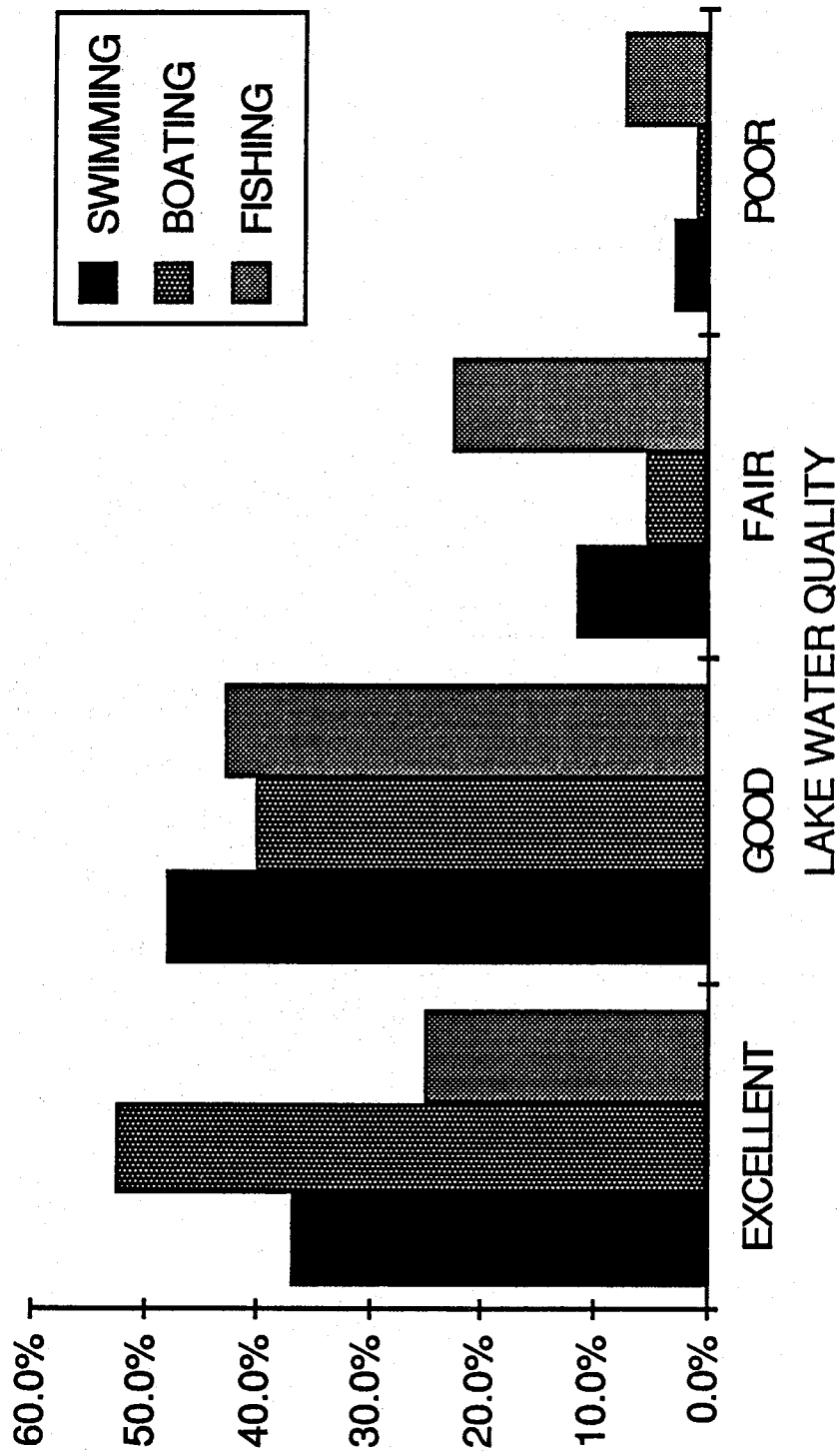


FIGURE 7: DETERIORATION IN LAKE
WATER QUALITY - PERCENTAGE OF
TOTAL WATERSHED

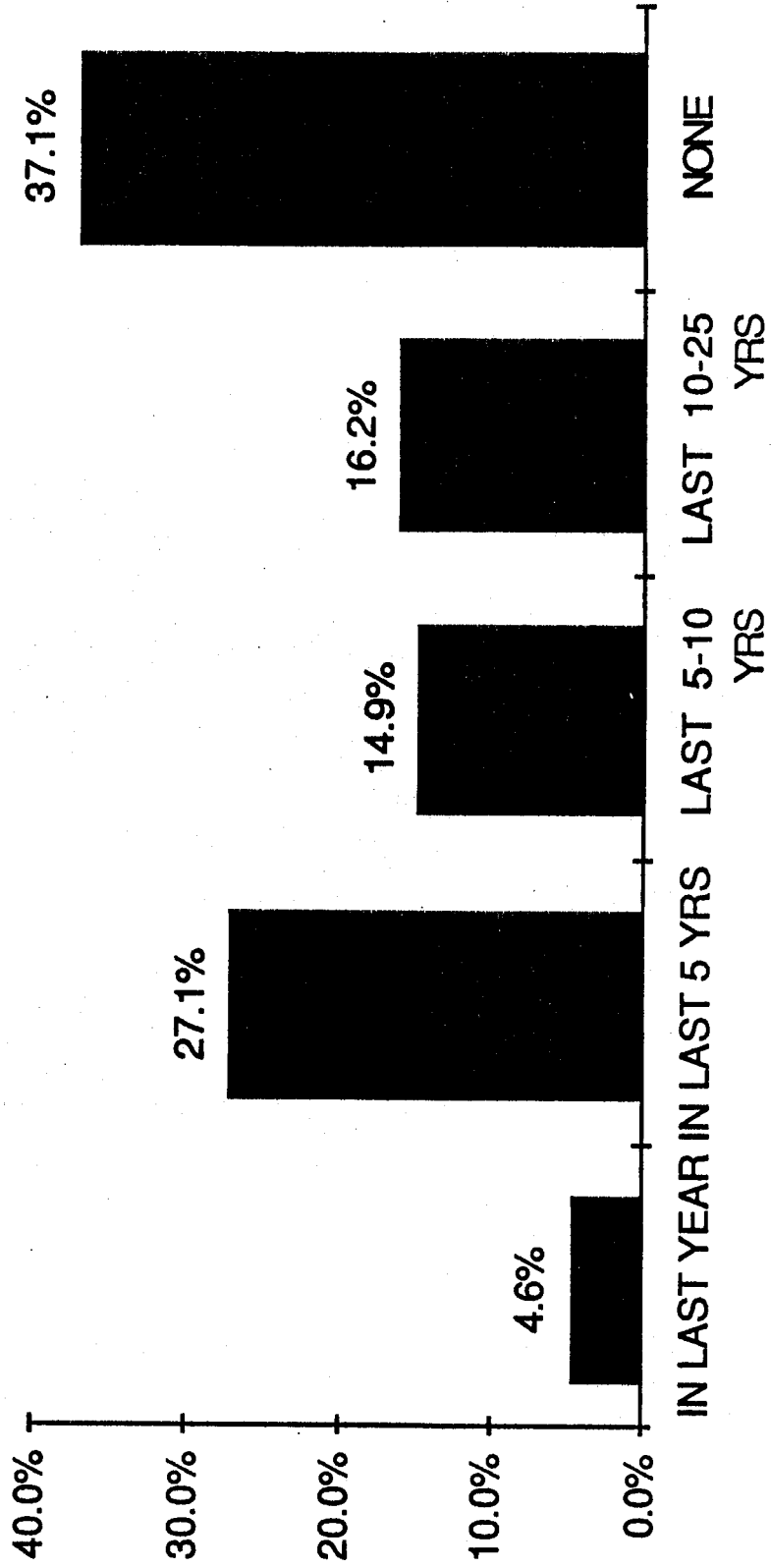


FIGURE 8: BELIEF THAT A WEED PROBLEM EXISTS IN THE LAKE - PERCENTAGE OF TOTAL WATERSHED

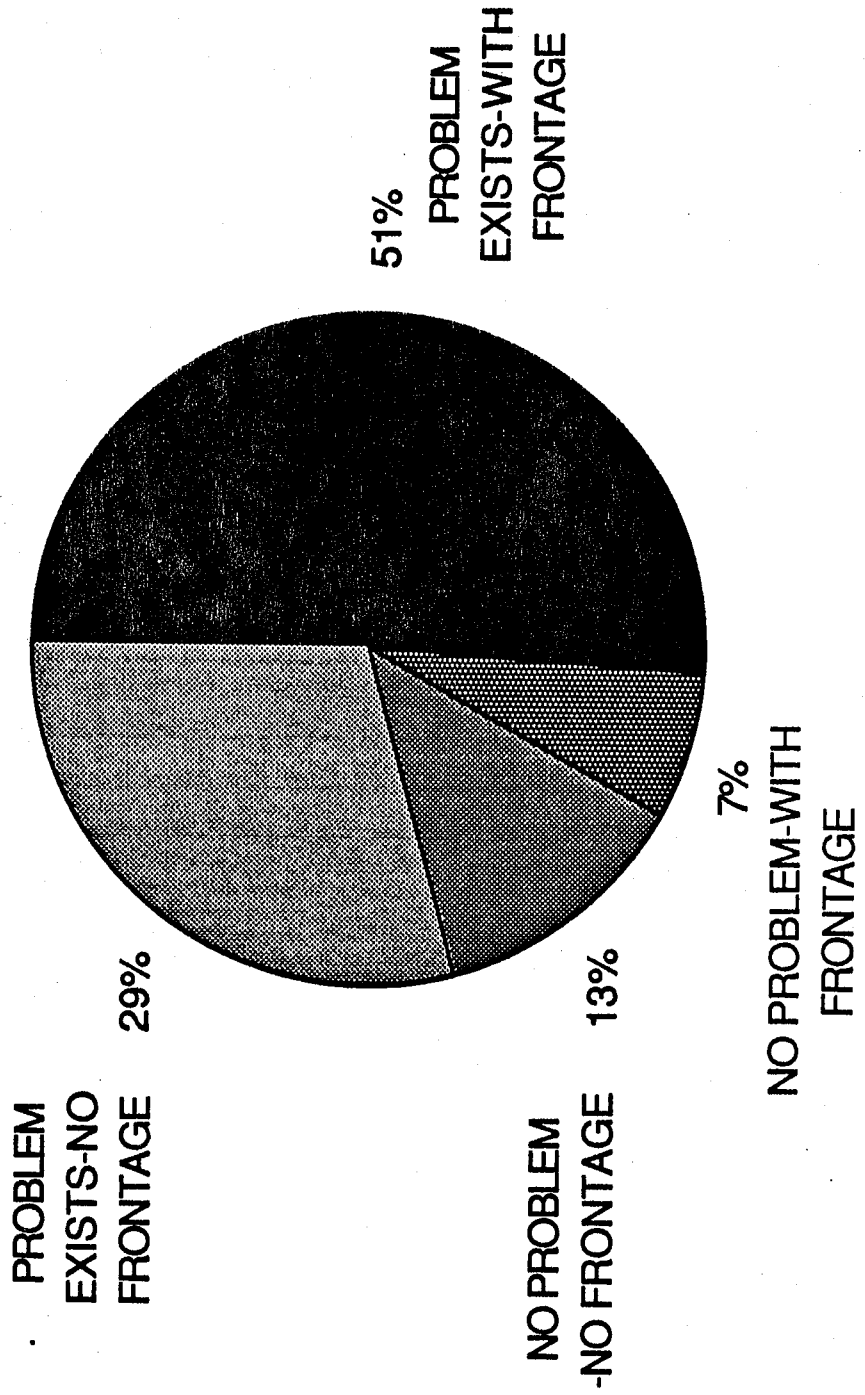
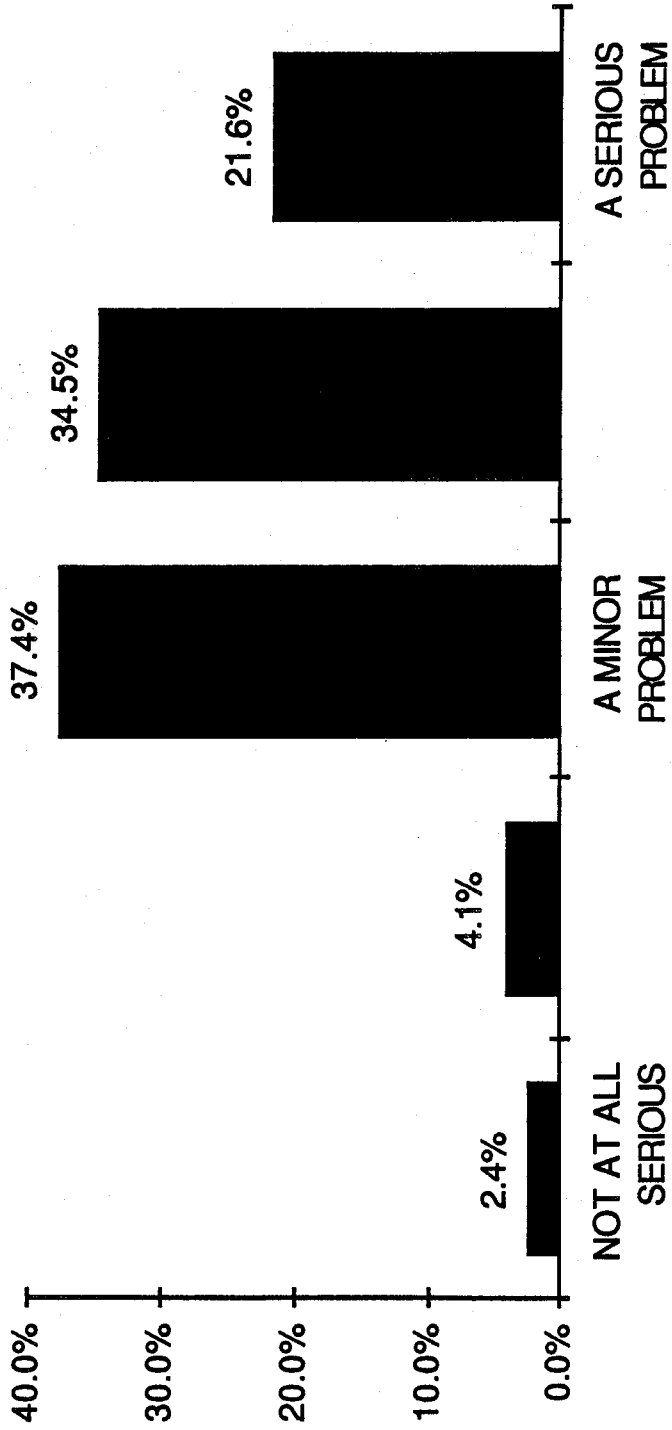


FIGURE 9: PERCEIVED SERIOUSNESS OF WEED PROBLEM -
PERCENTAGE OF TOTAL WATERSHED



**FIGURE 10: PERCEIVED DETERIORATION IN LAKE WATER QUALITY
BY GROUPS WITH AND WITHOUT LAKE FRONTAGE**

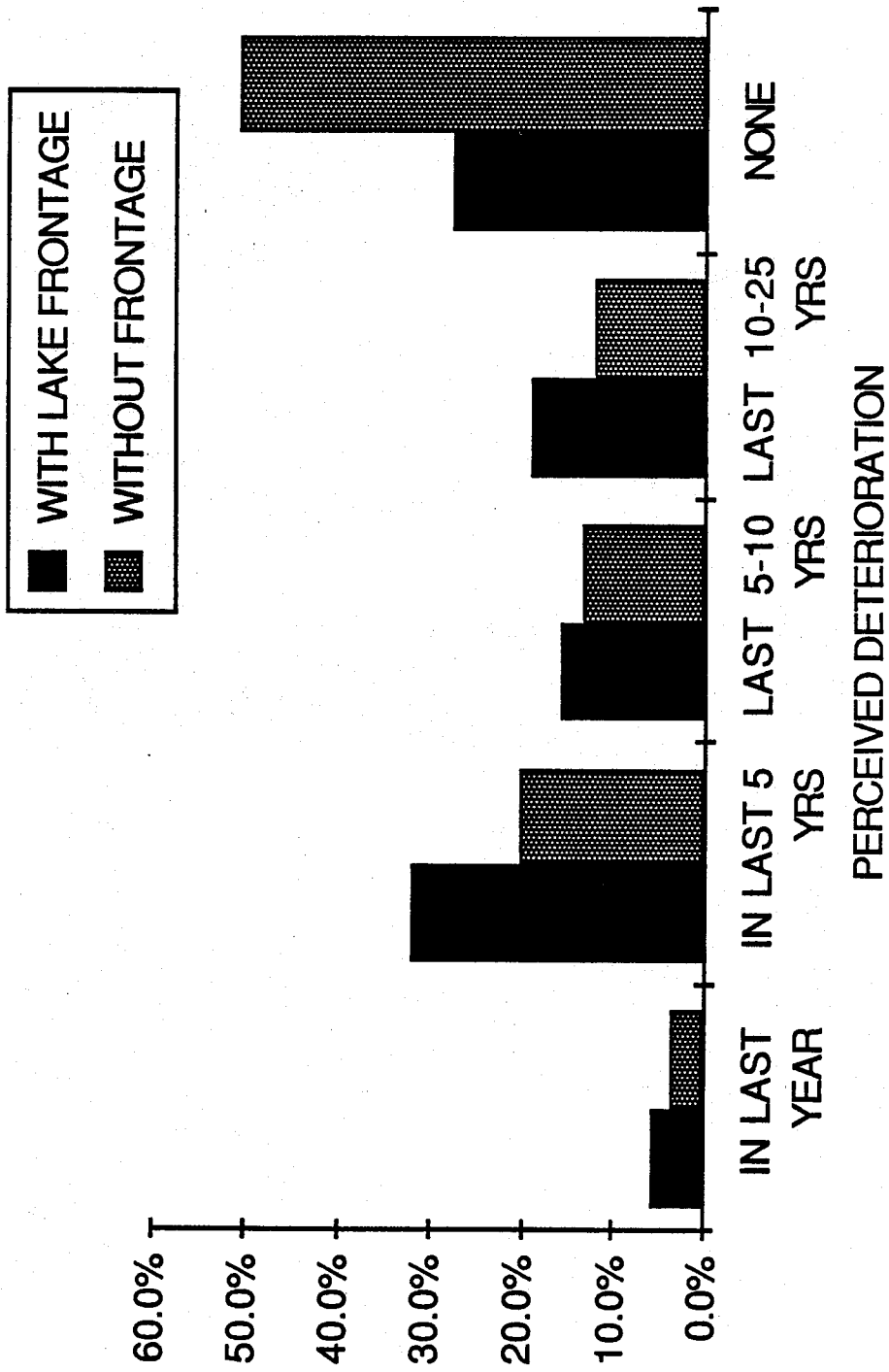


FIGURE 11: PERCEIVED SERIOUSNESS OF WEED PROBLEM - GROUPS
WITH AND WITHOUT LAKE FRONTAGE

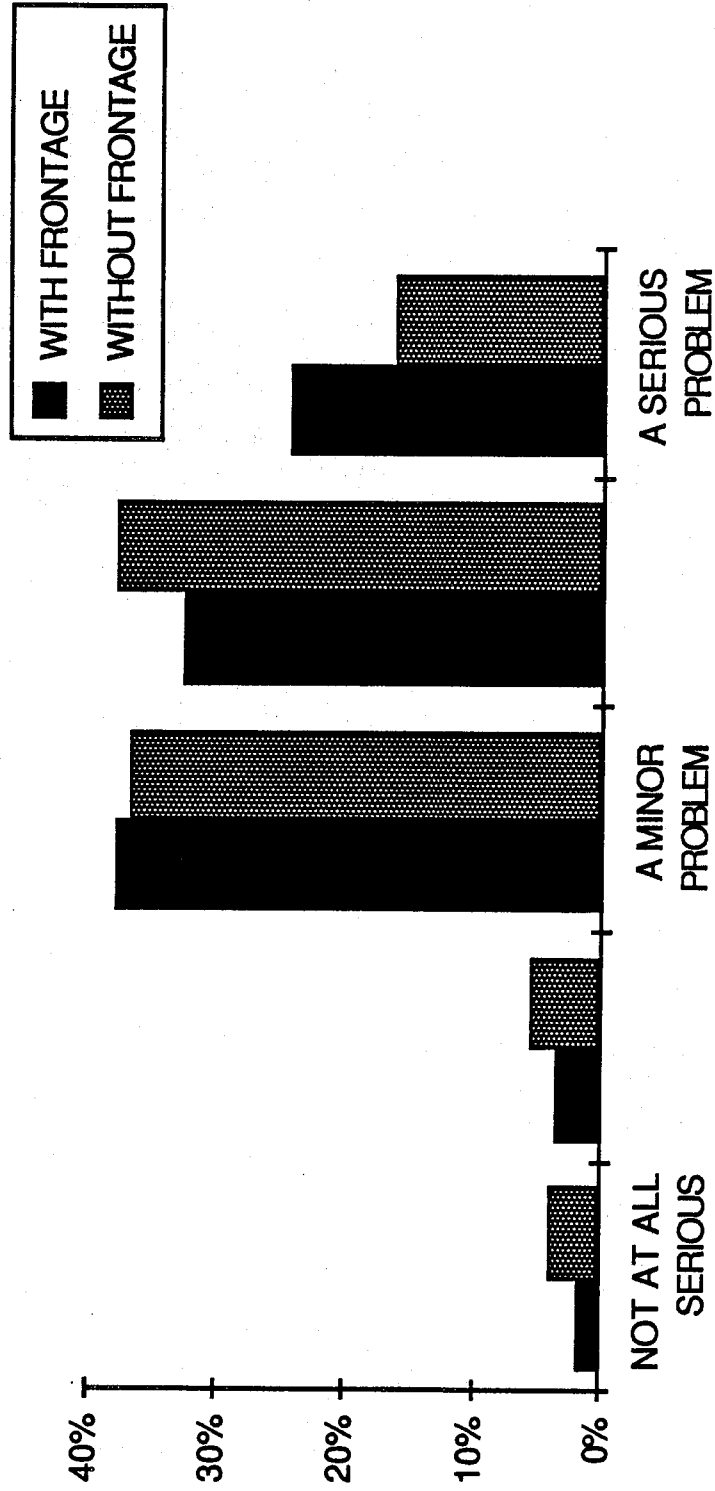


FIGURE 12: ATTITUDE TO SPECIFIC REGULATIONS FOR HOUSEHOLDS TO CONTROL NUTRIENT LOADING TO THE LAKE - PERCENT OF TOTAL WATERSHED

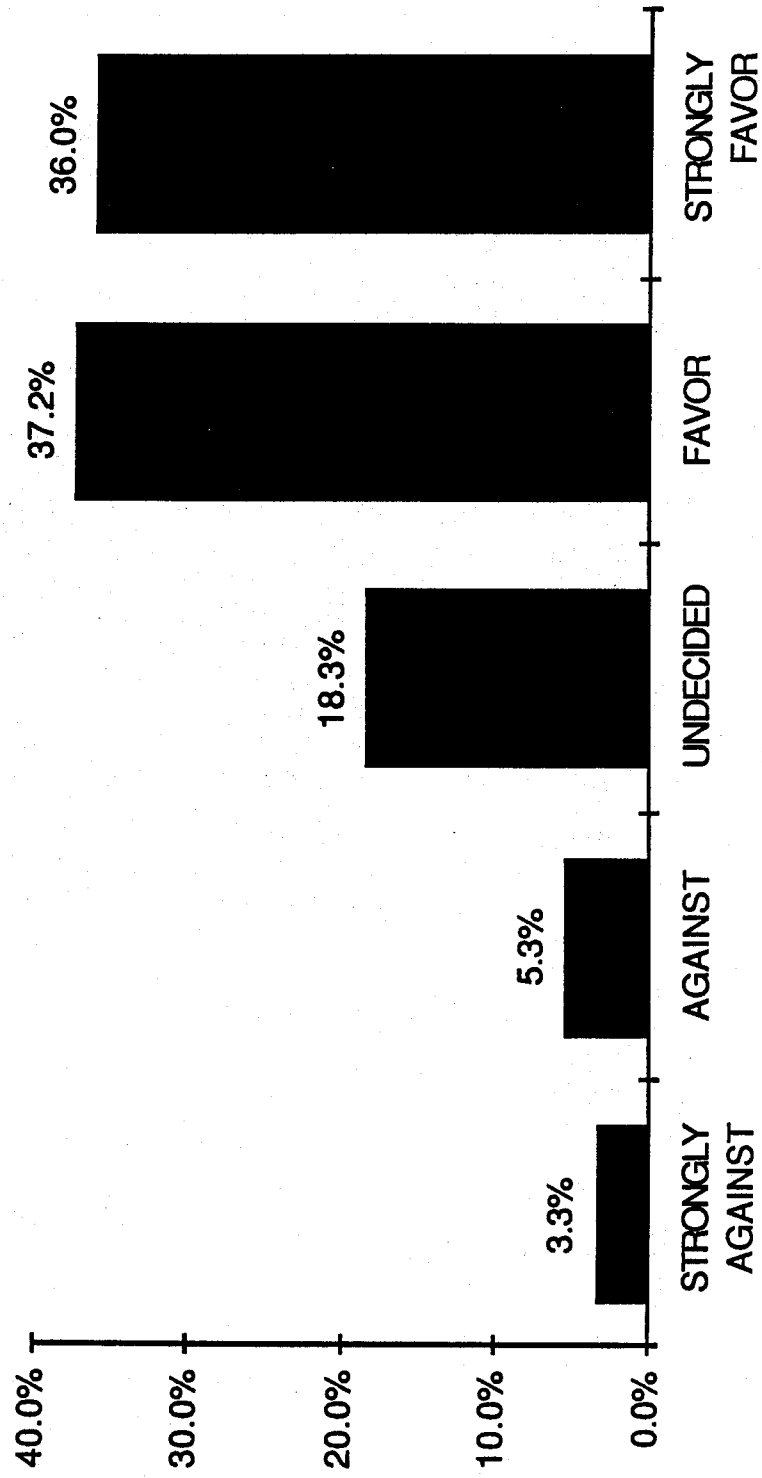


FIGURE 13: ATTITUDE TO PRESENT REGULATIONS FOR PROTECTING LAKE WATER QUALITY - PERCENT OF TOTAL WATERSHED

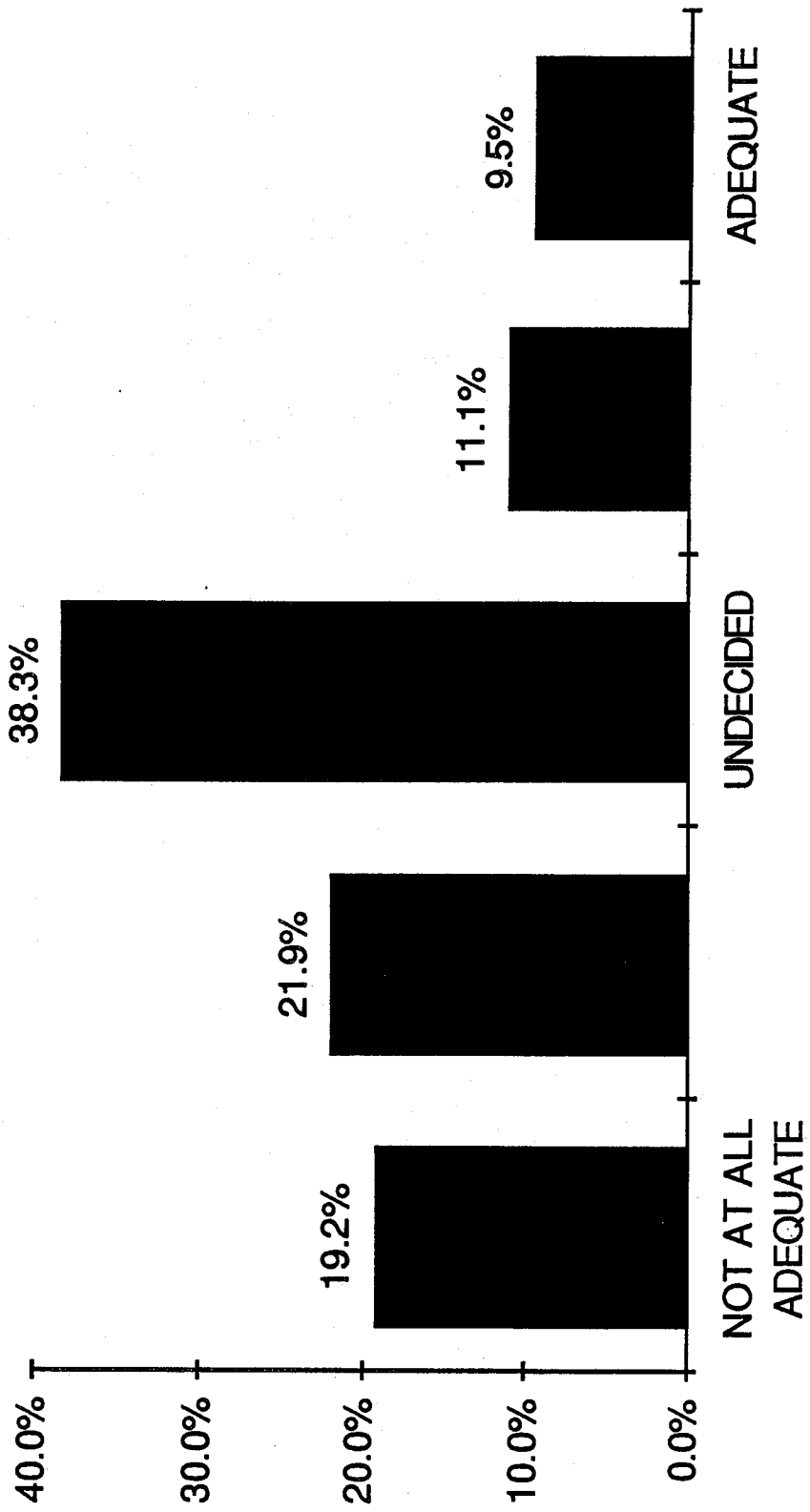


FIGURE 14: ATTITUDE TO SPECIFIC REGULATIONS FOR HOUSEHOLDS TO CONTROL NUTRIENT LOADING TO THE LAKE

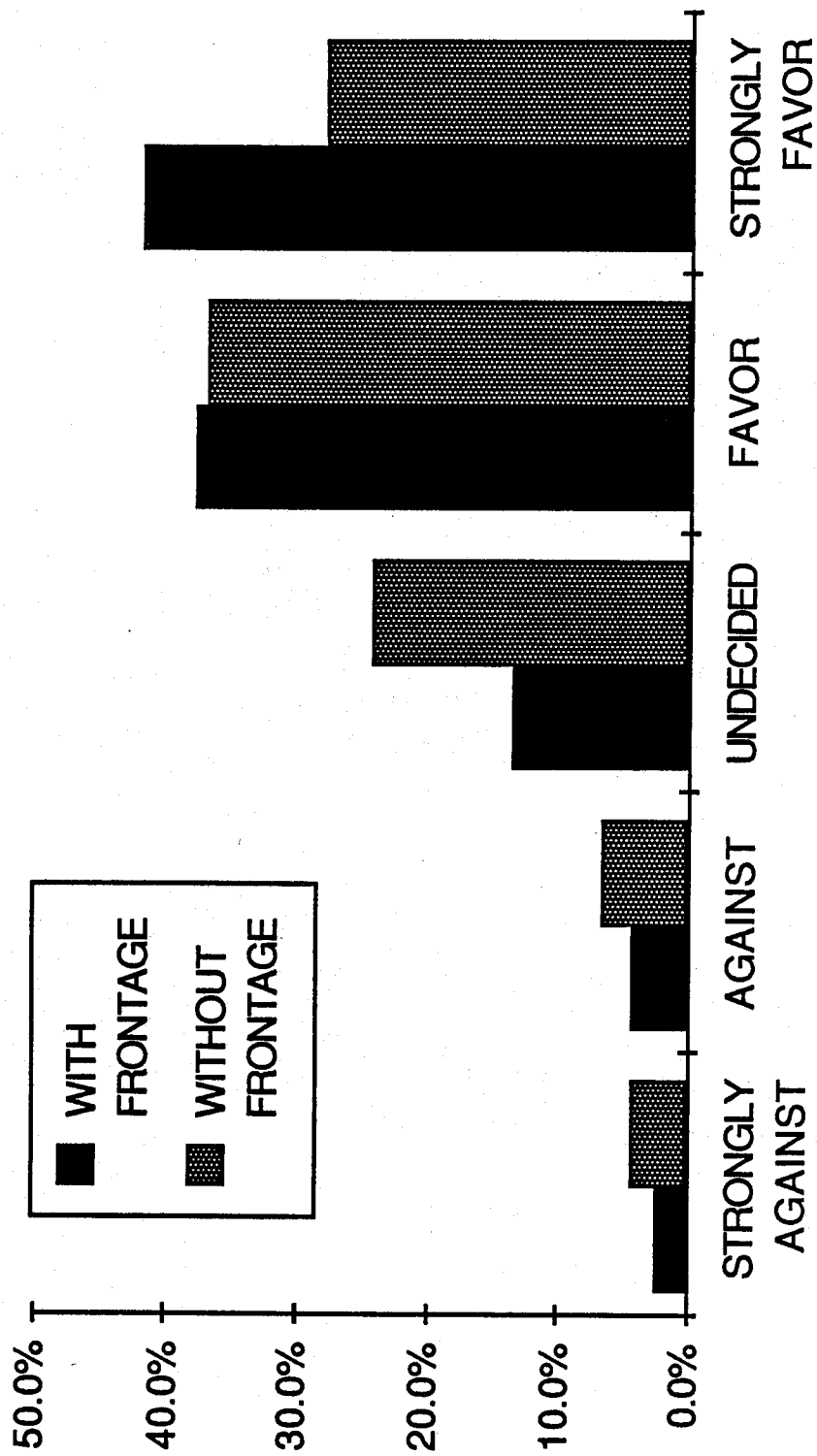


FIGURE 15: ATTITUDE TO PRESENT REGULATIONS FOR PROTECTING LAKE WATER QUALITY - GROUPS WITH AND WITHOUT LAKE FRONTAGE

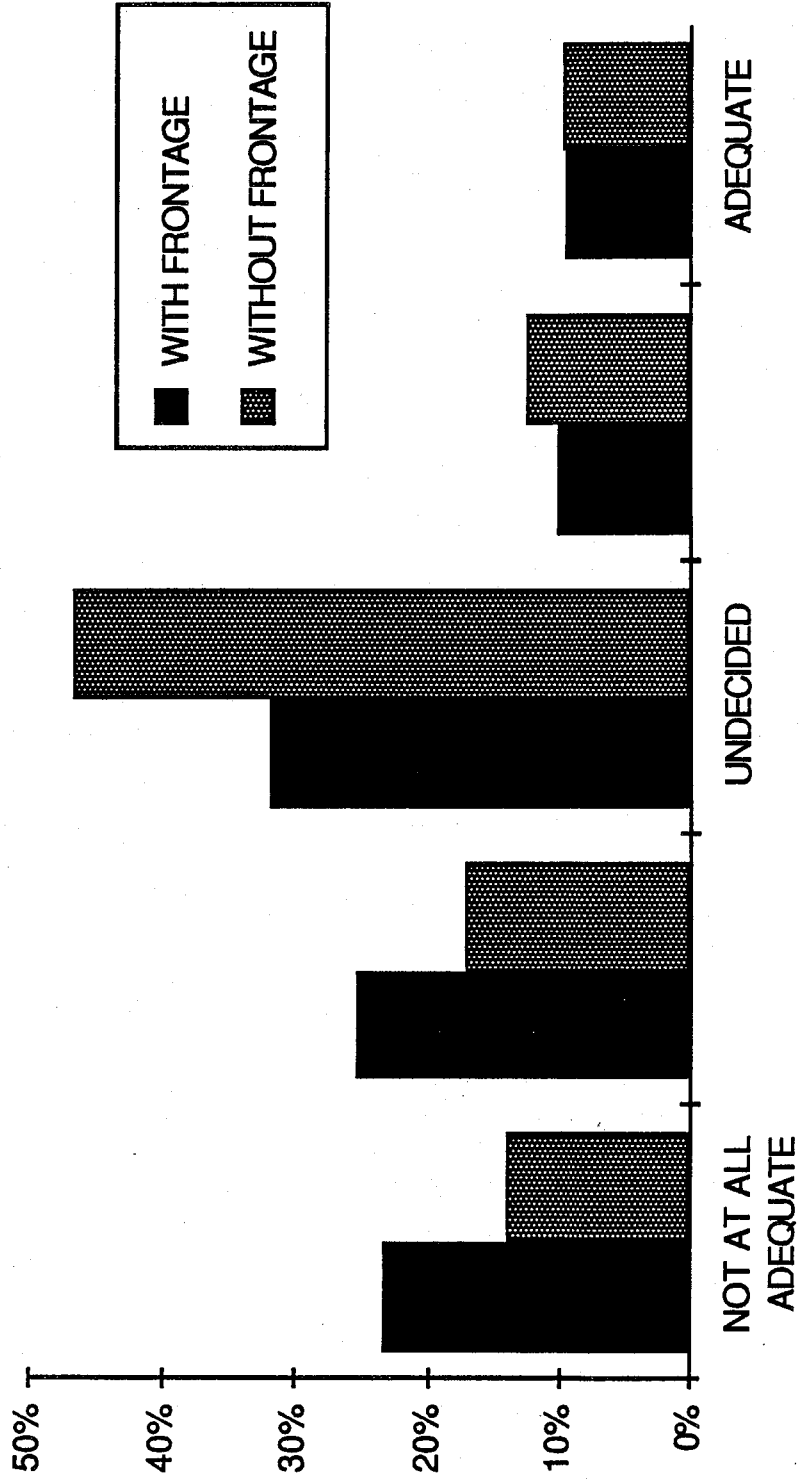
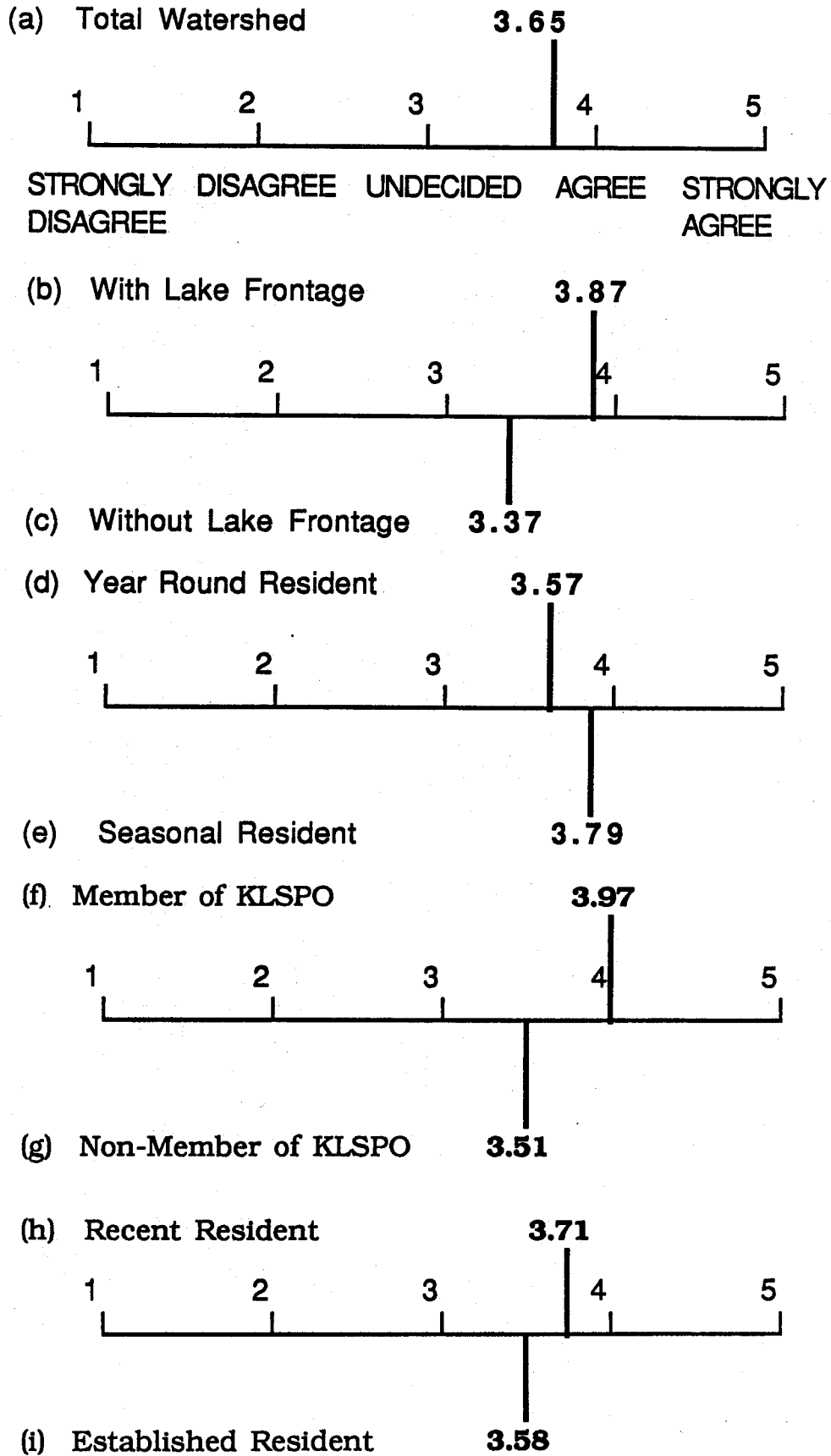
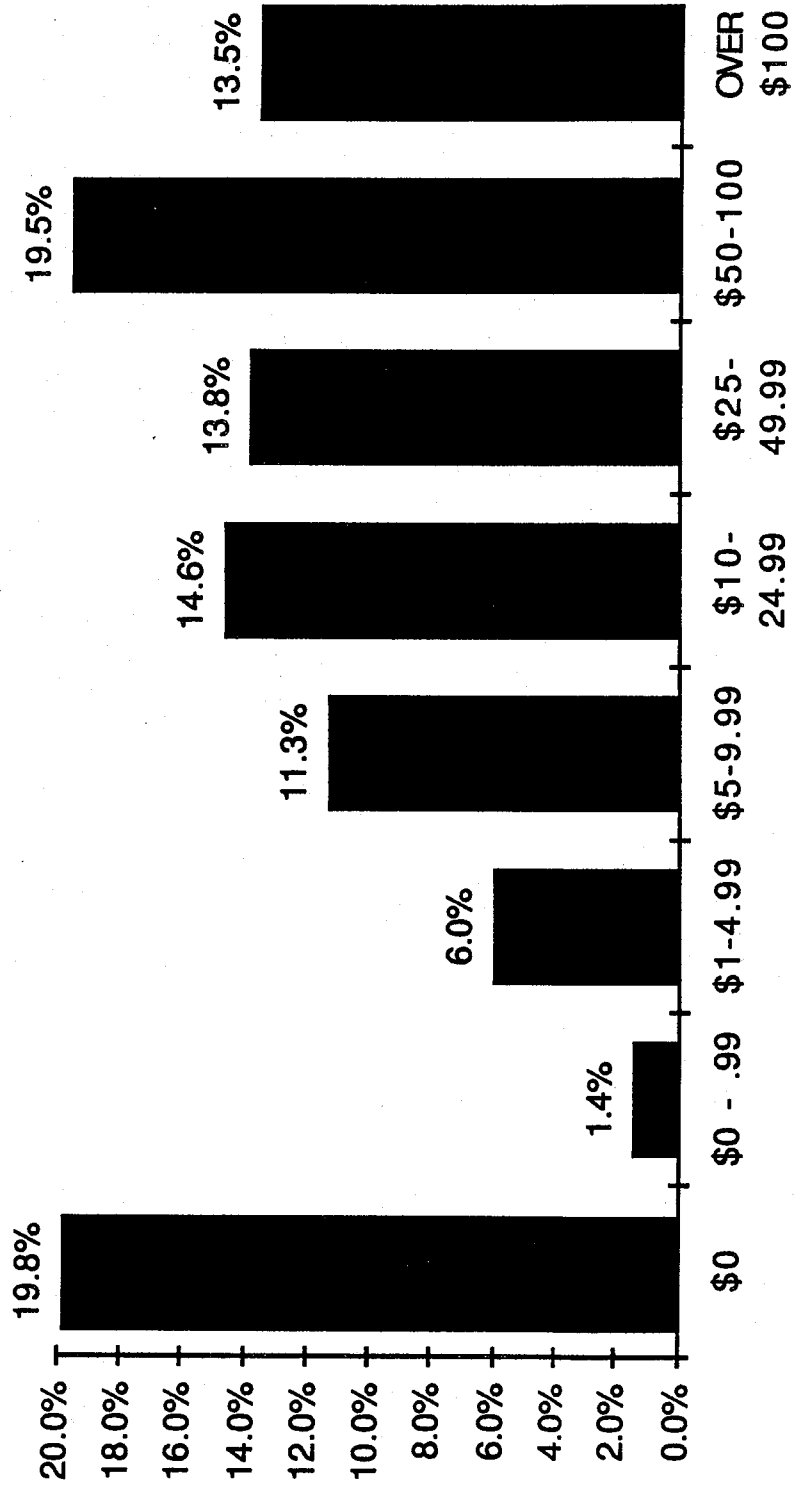


FIGURE 16: ATTITUDE TO LAND USE REGULATIONS FOR PROTECTING WATER QUALITY IN KEUKA LAKE - MEAN SCORES FROM THE LIKERT SCALE



**FIGURE 17: WILLINGNESS-TO-PAY TO KEEP THE LAKE CLEAN. ANNUAL
PAYMENT PER HOUSEHOLD - TOTAL WATERSHED FIGURES**



**FIGURE 18: EFFECT OF WATER QUALITY ON PROPERTY VALUE
NEAR THE LAKE - TOTAL WATERSHED FIGURES**

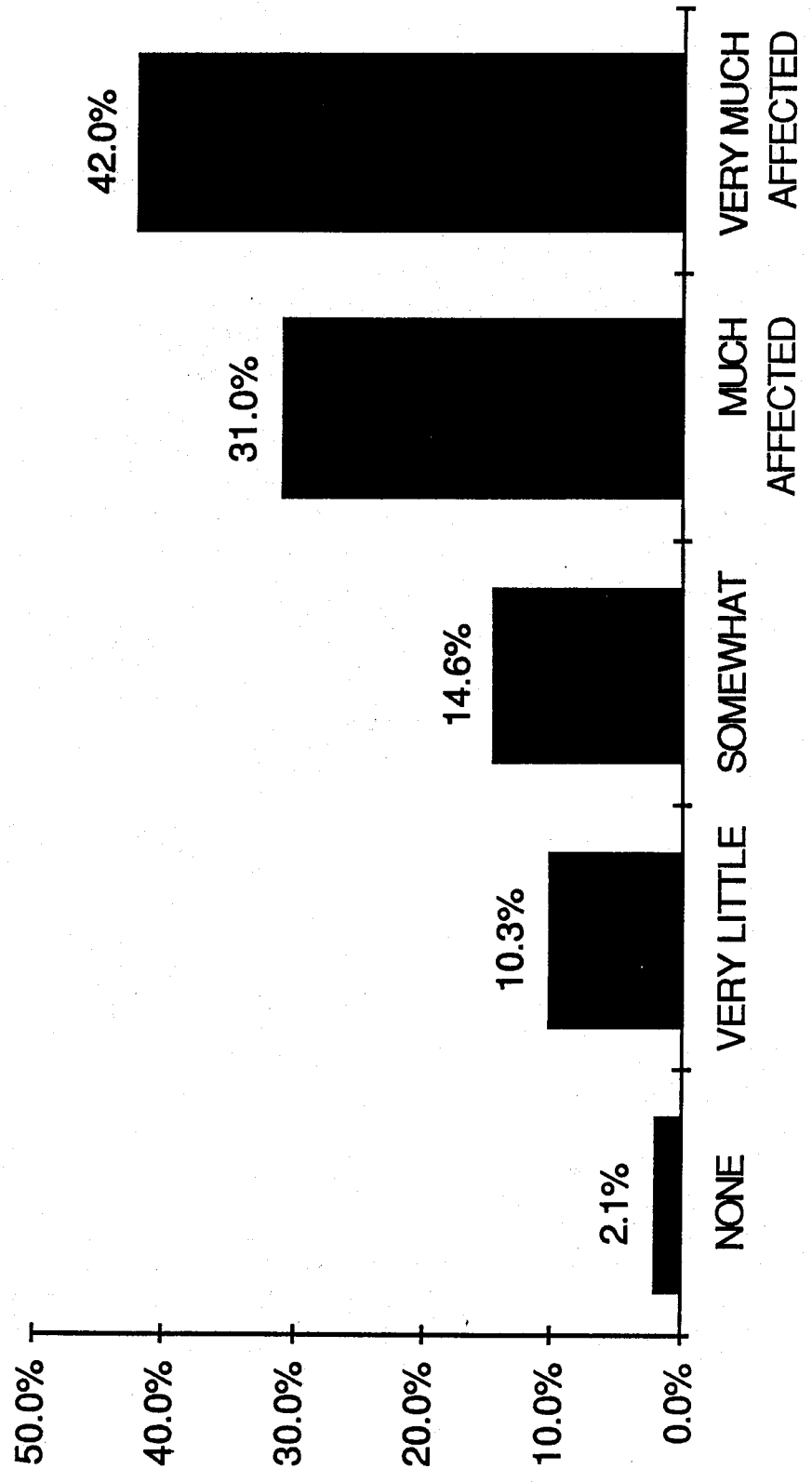
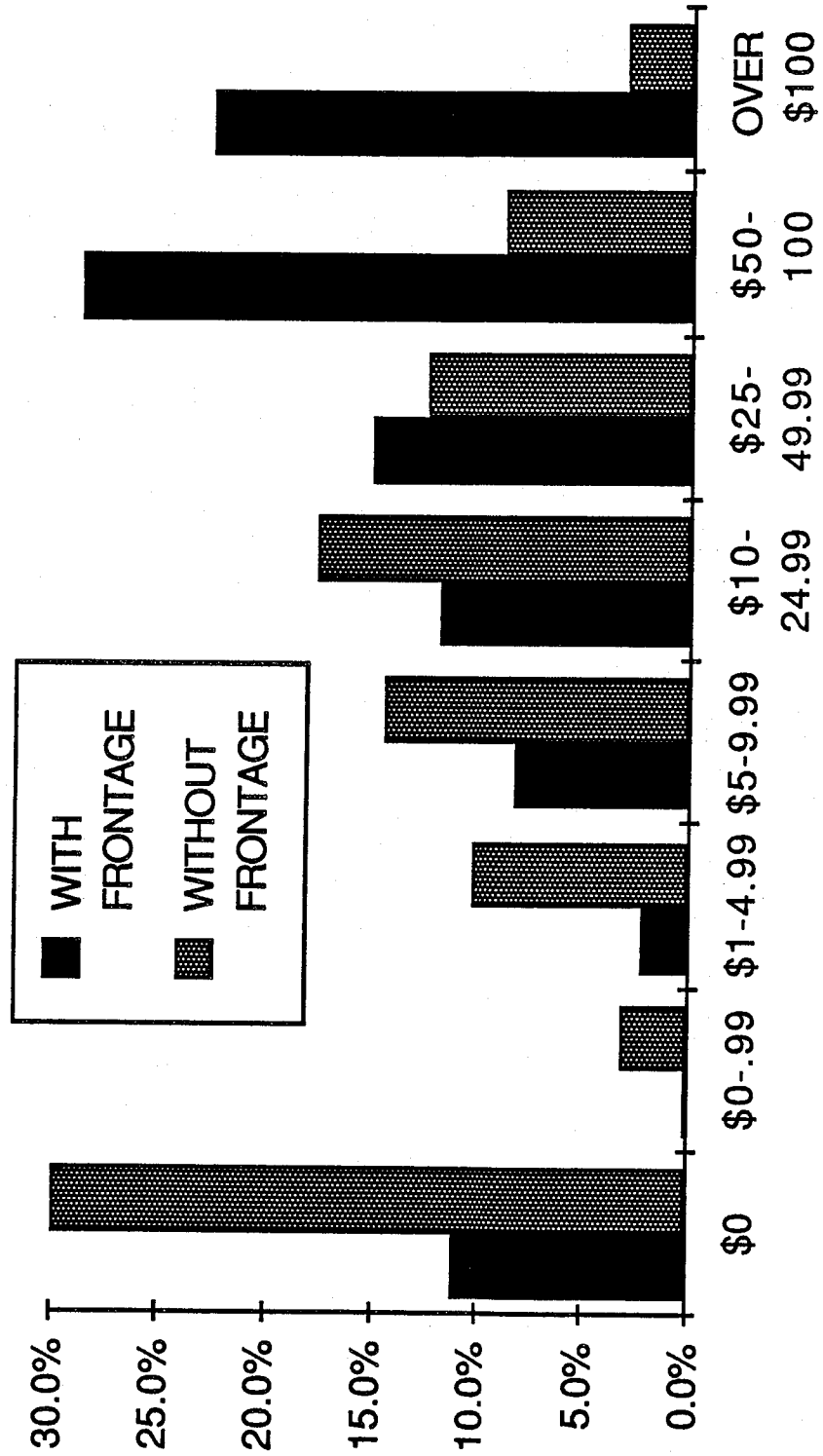
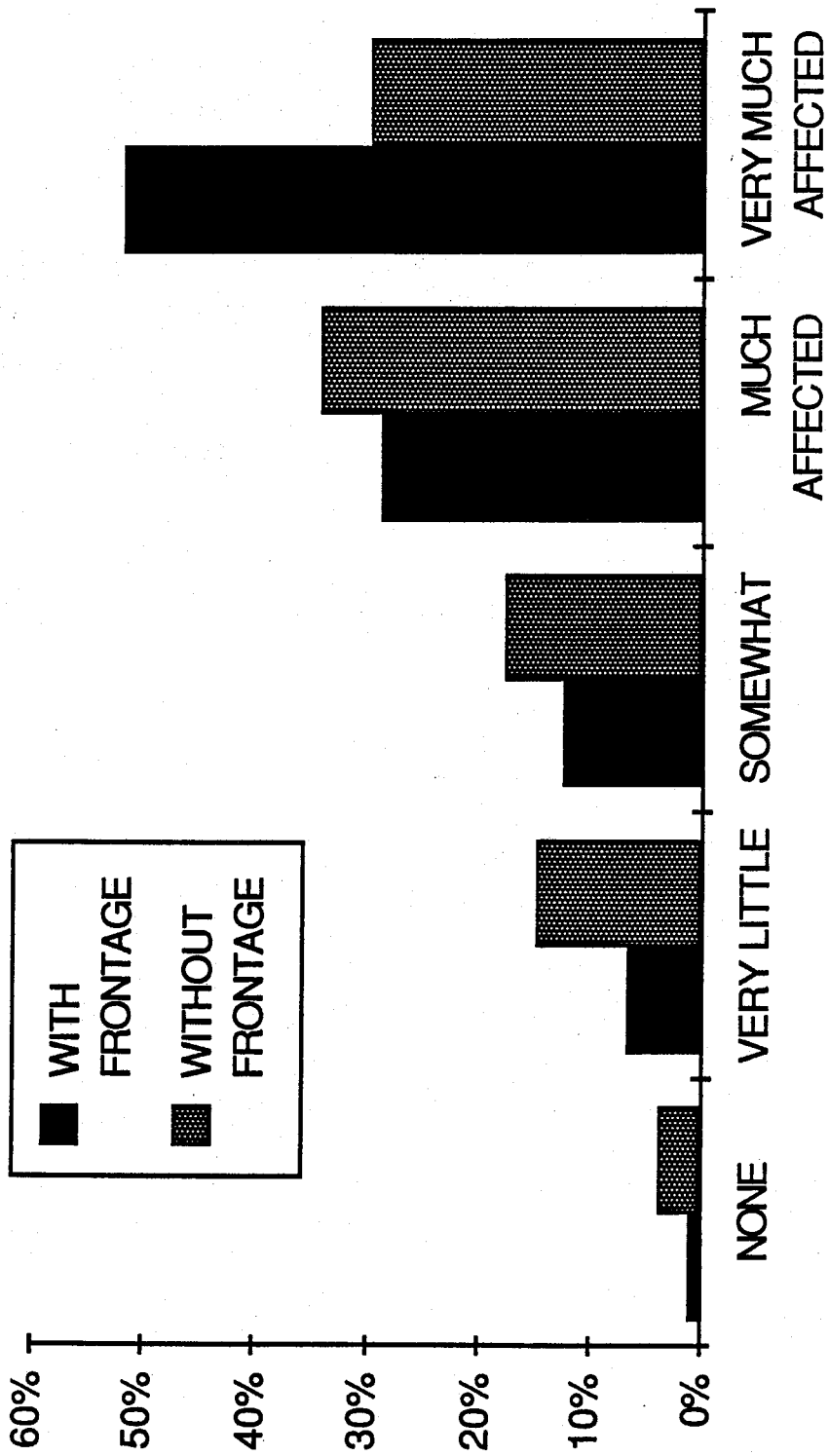


FIGURE 19: WILLINGNESS-TO-PAY TO KEEP THE LAKE CLEAN.
 ANNUAL PAYMENT PER HOUSEHOLD - GROUPS WITH AND
 WITHOUT LAKE FRONTAGE



**FIGURE 20: EFFECT OF WATER QUALITY ON PROPERTY VALUE NEAR THE LAKE
- GROUPS WITH AND WITHOUT LAKE FRONTAGE**



**TABLE 1: LAKE WATER QUALITY RATINGS FOR THREE ACTIVITIES -
PERCENTAGE OF THE TOTAL WATERSHED**

| | EXCELLENT | GOOD | FAIR | POOR | NOT APPLICABLE |
|-----------------|------------------|--------------|--------------|-------------|---------------------------|
| SWIMMING | 36.8% | 48.0% | 11.5% | 2.9% | 0.8% |
| BOATING | 52.4% | 40.0% | 5.4% | 1.1% | 1.3% |
| FISHING | 25.1% | 42.9% | 22.5% | 7.2% | 2.3% |

TABLE 2: AVERAGED LAKE WATER QUALITY RATINGS FOR SUB-GROUPS
IN THE WATERSHED

| RESPONDENT GROUP | SWIMMING | BOATING | FISHING |
|---------------------|----------|---------|---------|
| TOTAL WATERSHED | 3.2 | 3.5 | 2.9 |
| WITH LAKE FRONT | 3.3 | 3.5 | 2.9 |
| WITHOUT LAKE FRONT | 3.2 | 3.5 | 3.0 |
| YEAR ROUND RESID. | 3.2 | 3.4 | 3.0 |
| SEASONAL RESIDENT | 3.2 | 3.5 | 2.9 |
| MEMBER KLSPO | 3.3* | 3.5 | 3.0 |
| NON-MEMBER KLSPO | 3.2* | 3.5 | 2.9 |
| RECENT RESIDENT | 3.2 | 3.5* | 3.0* |
| ESTABLISHED RES. | 3.2 | 3.4* | 2.9* |

* Significant difference between sub-groups at $\alpha = .05$

NOTE:

Values in the table are mean scores derived from a scale where:

- 1 = POOR
- 2 = FAIR
- 3 = GOOD
- 4 = EXCELLENT

TOTAL WATERSHED is the average of all sample respondents.

KLSPO is the Keuka Lakeshore Property Owners Association.

RECENT RESIDENT are residents who have been in the area for 15 years or less.

ESTABLISHED RES. are residents who have been in the area for more than 15 years.

TABLE 3: AVERAGE SCORES FOR PREFERRED METHODS OF CONTROLLING EXCESSIVE NUTRIENT LOADING TO THE LAKE

| RESPONDENT GROUP | METHOD | | | | | | | |
|------------------|--------|------|------|------|------|------|------|------|
| | a | b | c | d | e | f | g | h |
| TOTAL W'SHED | 3.5 | 1.7 | 4.2 | 3.2 | 3.7 | 3.3 | 2.1 | 3.9 |
| WITH LAKE F | 3.4 | 1.7 | 4.1* | 2.6* | 4.1* | 3.6* | 2.0* | 4.1* |
| WITHOUT L.F | 3.6 | 1.6 | 4.3* | 3.7* | 3.6* | 2.9* | 2.2* | 3.8* |
| YR ROUND RES | 3.6 | 1.7 | 4.3* | 3.3* | 3.7* | 3.1* | 2.1 | 4.0 |
| SEASONAL RES | 3.5 | 1.7 | 4.2* | 3.0* | 4.0* | 3.6* | 2.1 | 4.0 |
| MEMBER KLSPO | 3.4 | 1.8* | 4.3 | 2.6* | 4.1* | 3.7* | 2.1 | 4.2* |
| NON-MEMBER | 3.5 | 1.6* | 4.2 | 3.4* | 3.7* | 3.2* | 2.1 | 3.8* |
| RECENT RESID. | 3.6 | 1.7 | 4.3 | 3.4* | 3.9 | 3.4 | 2.0 | 3.9 |
| ESTAB. RESID. | 3.4 | 1.7 | 4.2 | 2.9* | 3.8 | 3.2 | 2.1 | 4.0 |

* Significant difference at $\alpha = .05$

NOTE: Values in the table are mean scores derived from a scale where:

- 1 = LEAST PREFERRED
- 5 = MOST PREFERRED

KEY:

- a Mechanical harvesting of weeds
- b Use weed killing chemicals
- c Increased regulation of lakeshore property septic tank systems
- d Require all lakeshore properties to have holding tanks for waste water
- e Require all farmers in the watershed to use soil conservation methods
- f Restrict use of fertilizers in the watershed
- g Place limit on number of year round residences on the lakeshore
- h Place stricter controls on development near the lake

TABLE 4: MEAN SCORES FOR TYPE OF GOVERNMENT MOST SUITED TO CONTROLLING LAND USE IN THE KEUKA LAKE WATERSHED

| RESPONDENT GROUP | TYPE OF GOVERNMENT | | | | |
|------------------|--------------------|--------|-------|--------------------|-------------------|
| | LOCAL | COUNTY | STATE | WATERSHED DISTRICT | REGIONAL DISTRICT |
| TOTAL WATERSHED | 2.7 | 2.9 | 3.2 | 3.9 | 3.3 |
| WITH LAKE FRONT | 2.6* | 2.9 | 3.2 | 4.1* | 3.5* |
| WITHOUT L.FRONT | 2.9* | 3.0 | 3.2 | 3.7* | 3.2* |
| YEAR ROUND RES. | 2.8* | 3.0 | 3.2 | 3.9* | 3.3 |
| SEASONAL RES. | 2.6* | 2.9 | 3.3 | 4.1* | 3.4 |
| MEMBER KLSPO | 2.5* | 2.8 | 3.2 | 4.2* | 3.5* |
| NON-MEMBER | 2.8* | 3.0 | 3.3 | 3.8* | 3.3* |
| RECENT RES. | 2.6 | 2.9 | 3.2 | 3.9 | 3.3 |
| ESTABLISHED RES. | 2.8 | 3.0 | 3.3 | 3.9 | 3.4 |

* Significant difference between sub-groups at $\alpha = .05$

NOTE:

Values in the table are mean scores derived from a scale where:

- 1 = NOT AT ALL SUITABLE
- 2 = POORLY SUITED
- 3 = UNDECIDED
- 4 = SUITABLE
- 5 = MOST SUITABLE

TABLE 5: MEAN SCORES FOR WHO SHOULD PAY TO KEEP THE LAKE CLEAN

| RESP. GROUP | FED-ERAL | STAT | LOC | LAKE ASS. | LAKE USER | PROP OWN. | ALL | POLL-UTERS | FARM |
|-------------|----------|------|------|-----------|-----------|-----------|------|------------|------|
| W'SHED | 2.6 | 3.1 | 2.8 | 2.3 | 2.9 | 2.9 | 2.6 | 3.9 | 2.6 |
| WITH LF | 2.6 | 3.2* | 2.9* | 2.1* | 2.9 | 2.7* | 2.9* | 3.9 | 2.8* |
| W'OUT LF | 2.6 | 3.0* | 2.7* | 2.6* | 2.9 | 3.0* | 2.3* | 3.9 | 2.3* |
| Y ROUND | 2.6 | 3.1 | 2.8 | 2.4* | 2.9 | 2.9* | 2.5* | 3.8 | 2.4* |
| SEASONAL | 2.6 | 3.2 | 2.9 | 2.2* | 2.8 | 2.8* | 2.8* | 3.9 | 2.8* |
| MEMBER | 2.4* | 3.1 | 3.0* | 2.2* | 3.0 | 2.8 | 3.0* | 3.9 | 2.9* |
| NON-MEM | 2.6* | 3.1 | 2.8* | 2.4* | 2.9 | 2.9 | 2.5* | 3.8 | 2.5* |
| RECENT | 2.6 | 3.1 | 2.9 | 2.3 | 2.9 | 2.9 | 2.6 | 3.9 | 2.6 |
| ESTAB. | 2.5 | 3.1 | 2.8 | 2.3 | 2.9 | 2.8 | 2.6 | 3.8 | 2.6 |

* Significant difference at $\alpha = .05$

NOTE: Values in the table are mean scores derived from a scale where:

- 1 = SHOULD PAY NONE
- 3 = SHOULD PAY SOME
- 5 = SHOULD PAY ALL

KEY:

| | |
|-----------|---|
| FEDERAL | Federal Government |
| STAT | State Government |
| LOC | Local Government |
| LAKE ASS | Keuka Lakeshore Property Owners Association |
| USER | Lake Users |
| PROP OWN. | Lakeshore Property owners |
| ALL | Everyone in the watershed |
| POLLUTERS | Those who cause the pollution |
| FARM | Farmers in the watershed |

APPENDIX A

RESULTS FROM THE WATERSHED SURVEY - ALL RESPONDENTS

KEUKA LAKE WATERSHED SURVEY.

1. Does your property have lake frontage?

YES 53.7%
NO 46.3%

If 'NO' then give approximate distance of your house from the lake:

| DISTANCE (MILES) | PERCENT | Mean = 0.99 mile |
|---------------------|---------|------------------|
| 0 | 60.0 | |
| <2 | 18.7 | |
| 2-3.99 | 9.0 | |
| 4-5.99 | 6.3 | |
| 6-7.99 | 1.6 | |
| >8 | 1.3 | |

2. What is your average length of residence per year in the Keuka Lake watershed (check one):

| | | |
|-------------------------------------|-------|--------------------|
| WEEKENDS ONLY..... | 6.5% | |
| PART OF SUMMER ONLY..... | 5.4% | |
| PART OF SUMMER PLUS SOME WEEKENDS.. | 14.9% | SEASONAL = 46.7% |
| WHOLE SUMMER..... | 6.6% | |
| WHOLE SUMMER PLUS SOME WEEKENDS.... | 13.4% | |
| YEAR AROUND..... | 53.3% | YEAR ROUND = 53.3% |

3. What is the average number of people in residence?:

| NO. OF PEOPLE | PERCENT | Mean = 3.02 |
|---------------|---------|-------------|
| 0 | 1.8 | |
| 1 | 8.0 | |
| 2 | 39.0 | |
| 3 | 16.3 | |
| 4 | 22.2 | |
| 5 | 7.1 | |
| 6 | 3.2 | |
| >6 | 2.5 | |
| Missing | 7.5 | |

4. Are you a member of the Keuka Lakeshore Property Owners Association?

YES 29.9%
NO 70.1%

5. How would you rate the water quality in Keuka Lake for:

| | EXCELLENT | GOOD | FAIR | POOR | NOT APPLICABLE |
|----------|-----------|------|------|------|-------------------|
| SWIMMING | 36.8 | 48.0 | 11.5 | 2.9 | 0.8 |
| BOATING | 52.4 | 40.0 | 5.3 | 1.0 | 1.3 |
| FISHING | 25.1 | 42.9 | 22.5 | 7.2 | 2.3 |

6. Have you noticed any deterioration in lake water quality (check one or more):

SINCE LAST YEAR..... 4.6%
IN THE LAST 5 YEARS.....27.1%
IN THE LAST 5 - 10 YEARS.....14.9%
IN THE LAST 10 - 25 YEARS.....16.2%
NONE WHATSOEVER.....37.1%

7. Please describe any recent changes in lake water quality that have affected your use of the lake?

45.5% of respondents made a comment

43.3% Mentioned weeds in their comments

6.6% Said the lake was not as clean as it used to be

5.9% Mentioned increased sedimentation as a problem

5.5% Said algae was a problem

4.3% Said there was an oil/gas film on the surface

Other commonly mentioned problems were Trash, Crowding from both boats and people, Cloudy water, odour, septic tanks and coliform bacteria, and 4.8% said they never use the lake. A more complete breakdown of these comments can be found in Appendix C.

8. There has been some concern expressed over the existence of an aquatic weed problem in Keuka Lake. Do you believe that there is an aquatic weed problem in the lake?

YES 80.6%

NO 19.4%

If you answered NO, go on to question 9.

If you answered YES, how serious would you rate the aquatic weed problem (Please circle one number):

| | | | | |
|--------------------|------|-----------------|-----------------|-------------------|
| 2.4% | 4.1% | 37.4% | 34.5% | 21.6% |
| 1 | 2 | 3 | 4 | 5 |
| NOT AT ALL SERIOUS | | A MINOR PROBLEM | <u>Mean=3.7</u> | A SERIOUS PROBLEM |

9. Would you be in favor of specific regulations (such as increased septic system inspections, restrictions on fertiliser use, regular septic tank pumping) for households in the watershed to control the nutrient loading to Keuka Lake(circle one number):

| | | | | |
|------------------|---------|------------------|-------|----------------|
| 3.3% | 5.3% | 18.3% | 37.2% | 36% |
| 1 | 2 | 3 | 4 | 5 |
| STRONGLY AGAINST | AGAINST | UNDECIDED | FAVOR | STRONGLY FAVOR |
| | | <u>Mean=3.97</u> | | |

10. If an excessive loading of nutrients to the lake from a variety of sources were discovered, what do you feel would be the best way to deal with the problem. Circle one number for each alternative:

| | b | g | d | f | a | e | h | c |
|--|-----------------|-----|---|---|-----|-----|---|----------------|
| | 1 | 2 | 3 | 4 | 5 | | | |
| | LEAST PREFERRED | | | | | | | MOST PREFERRED |
| a. MECHANICAL HARVESTING OF WEEDS..... | 1 | | | 2 | 3 | 3.5 | 4 | 5 |
| b. USE WEED KILLING CHEMICALS..... | 1 | 1.7 | 2 | 3 | 4 | 5 | | |
| c. INCREASED REGULATION OF LAKESHORE PROPERTY SEPTIC SYSTEMS..... | 1 | | 2 | 3 | 4 | 4.2 | 5 | |
| d. REQUIRE ALL LAKESHORE PROPERTIES TO HAVE HOLDING TANKS FOR WASTE WATER..... | 1 | | 2 | 3 | 3.2 | 4 | 5 | |
| e. REQUIRE ALL FARMERS IN THE WATERSHED TO USE SOIL CONSERVATION METHODS..... | 1 | | 2 | 3 | 3.7 | 4 | 5 | |

| | | | | | | |
|---|---|---|-----|-----|---|---|
| f. RESTRICT USE OF FERTILIZERS IN THE WATERSHED..... | 1 | 2 | 3 | 3.3 | 4 | 5 |
| g. PLACE LIMIT ON NUMBER OF YEAR ROUND RESIDENCES ON THE LAKESHORE..... | 1 | 2 | 2.1 | 3 | 4 | 5 |
| h. PLACE STRICTER CONTROLS ON DEVELOPMENT NEAR THE LAKE..... | 1 | 2 | 3 | 3.9 | 4 | 5 |

11. Do you feel that present land use regulations are adequate to protect water quality in the lake? (circle one number)

| | | | | |
|---------------------|-------|-----------|-------|----------|
| 19.2% | 21.9% | 38.3% | 11.1% | 9.5% |
| 1 | 2 | 3 | 4 | 5 |
| NOT AT ALL ADEQUATE | | UNDECIDED | | ADEQUATE |
| <u>MEAN=2.7</u> | | | | |

12. This question is designed to measure your attitude to land use regulations for protecting water quality in Keuka Lake. Indicate your attitude to the following statements by scoring them according to the scale indicated below.

| | | | | |
|-------------------|----------|-----------|-------|----------------|
| <u>Mean=3.65</u> | | | | |
| 1 | 2 | 3 | 4 | 5 |
| STRONGLY DISAGREE | DISAGREE | UNDECIDED | AGREE | STRONGLY AGREE |

| <u>ITEM</u> | <u>SCORE</u> |
|--|--------------|
| b. If there are too many regulations controlling land use, it will not be worth living here..... | _____ |
| c. Rural areas such as this do not need strict land use laws..... | _____ |
| e. Land use regulations destroy property rights..... | _____ |