Acknowledgments

Many, many thanks are owed to all the people who have contributed to this project over the years. Besides the people listed on this and the next three pages, there were literally hundreds of teachers and

possible. Unfortunately, space doesn't allow mention of every one of their names. Thank you all!

[redacted]

Curriculum and Instruction
School District of Stevens Point

Treehaven Field Station
College of Natural Resources
University of Wisconsin-Stevens Point

[redacted]

About the Wisconsin Center for Environmental Education

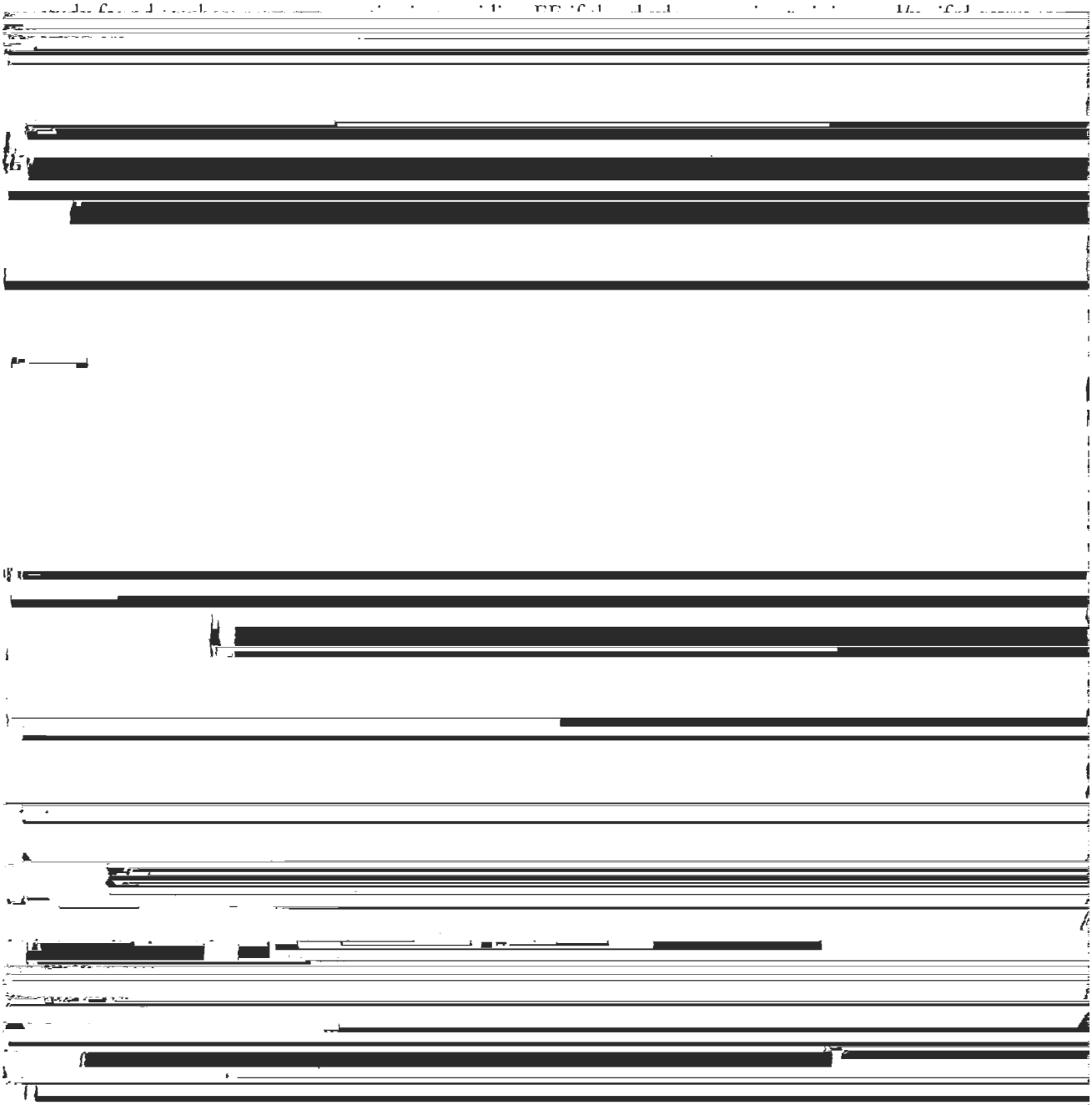
The Wisconsin Center for Environmental Education was established by a 1990 legislative initiative. It was

mission of the WCEE is to "Promote, develop, disseminate, implement and evaluate environmental

Preface: About the Title "Are We Walking the Talk?"

"The Talk" in the rooms and halls of K-12 education in Wisconsin overwhelmingly supports the need to initiate, develop, and improve environmental education (EE) in our schools. This perspective is qualified and quantified by the results of the statewide student, teacher, and administrator assessments reported on in this document. The follow-up question might be, "If this is 'The Talk,' what are our schools doing about it?" or "Are We Walking the Talk?"

Wisconsin teacher education and curriculum mandates relative to EE seem to be effective given that this



Some Key Findings

In general...

...Wisconsin students, teachers, and administrators overwhelmingly believe education about the environment should be an important part of the core educational experience of K-12 students.

Wisconsin Teachers...

....felt it was a "good idea" to mandate EE curriculum plans in the schools.

[redacted]

work in EE.

Wisconsin Students....

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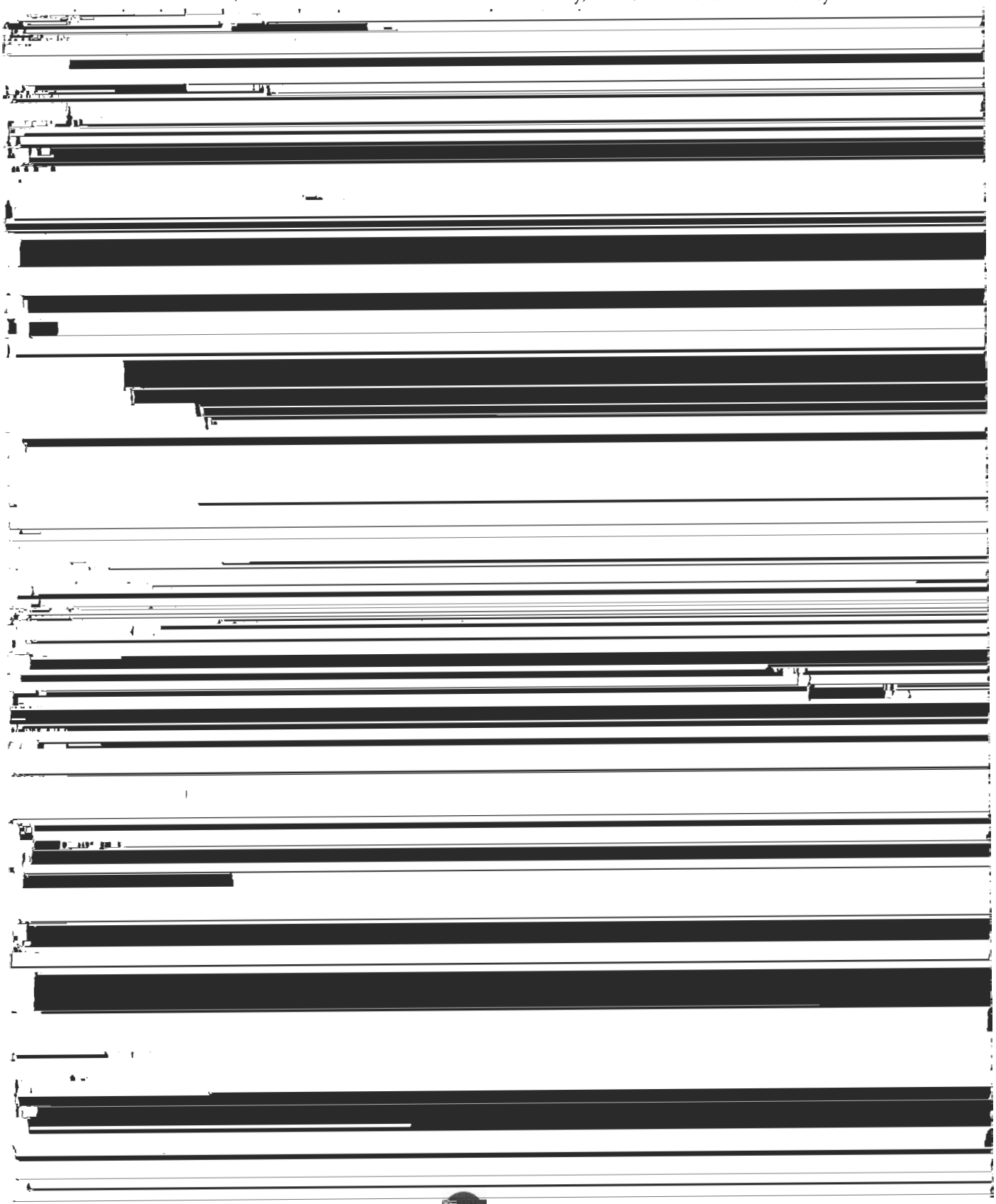
List of Appendices

As science and society strive to gain more insight into how the world works, it is clear that one

over 3,500 fifth grade and high school students. Additionally, over 900 teachers were surveyed to



Introduction and Purpose

environmental literacy assessment, a framework or

outline was developed to guide construction of

questions to be used in the assessment instruments

Development of the Assessments

grade students. Pilots were conducted so that statistical item analysis could be done on each question in the pool (Appendix F).

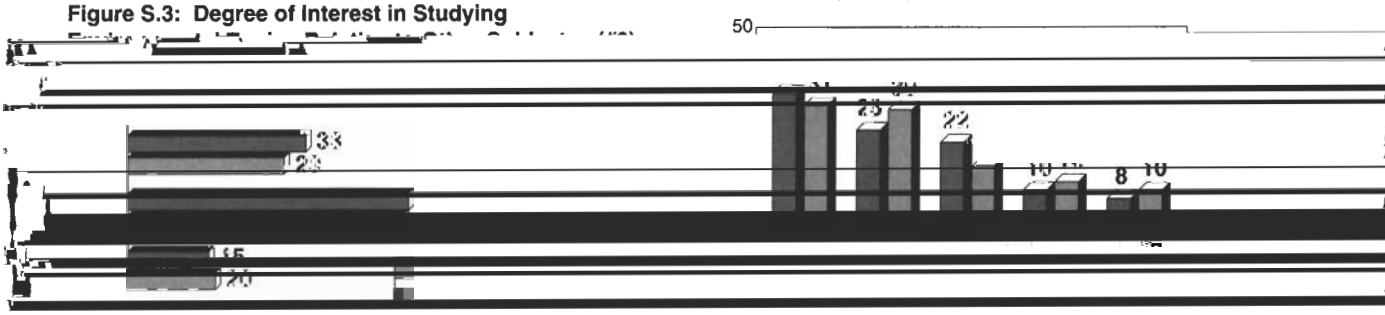
During the 1994 school year, 105 school districts

or as interesting as studying other subjects (Figure S.3).

Figure S.3: Degree of Interest in Studying

Figure S.5: High School Students' Primary Source of Environmental Understanding (#4)

■ Total Pop. (N=1797) ■ Env. Lit. (n=665)



here do stud

most

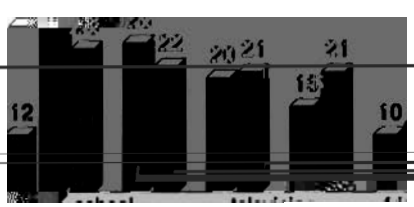


Figure S.6: My school should have more lessons about the environment. (#8)

■ % Fifth Grade Students (N=1852)

Figure S.9: I think most of the concern about environmental problems has been exaggerated. (#10

■ % High School Students (N=1805)

Figure S.12: There are already enough laws to protect the environment. (#17)

■ % High School Students (N=1804)

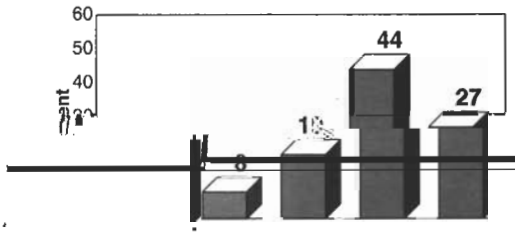
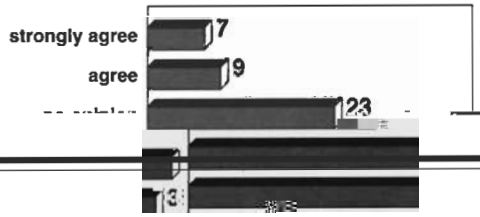
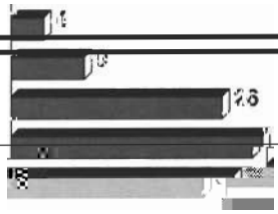


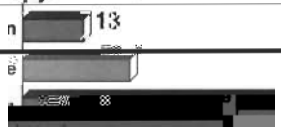
Figure S.14: It is too hard to solve environmental problems. (#24)

■ % Fifth Grade Students (N=1847)



Do students believe environ
can be solv





encouraged others to recycle or to stop activities

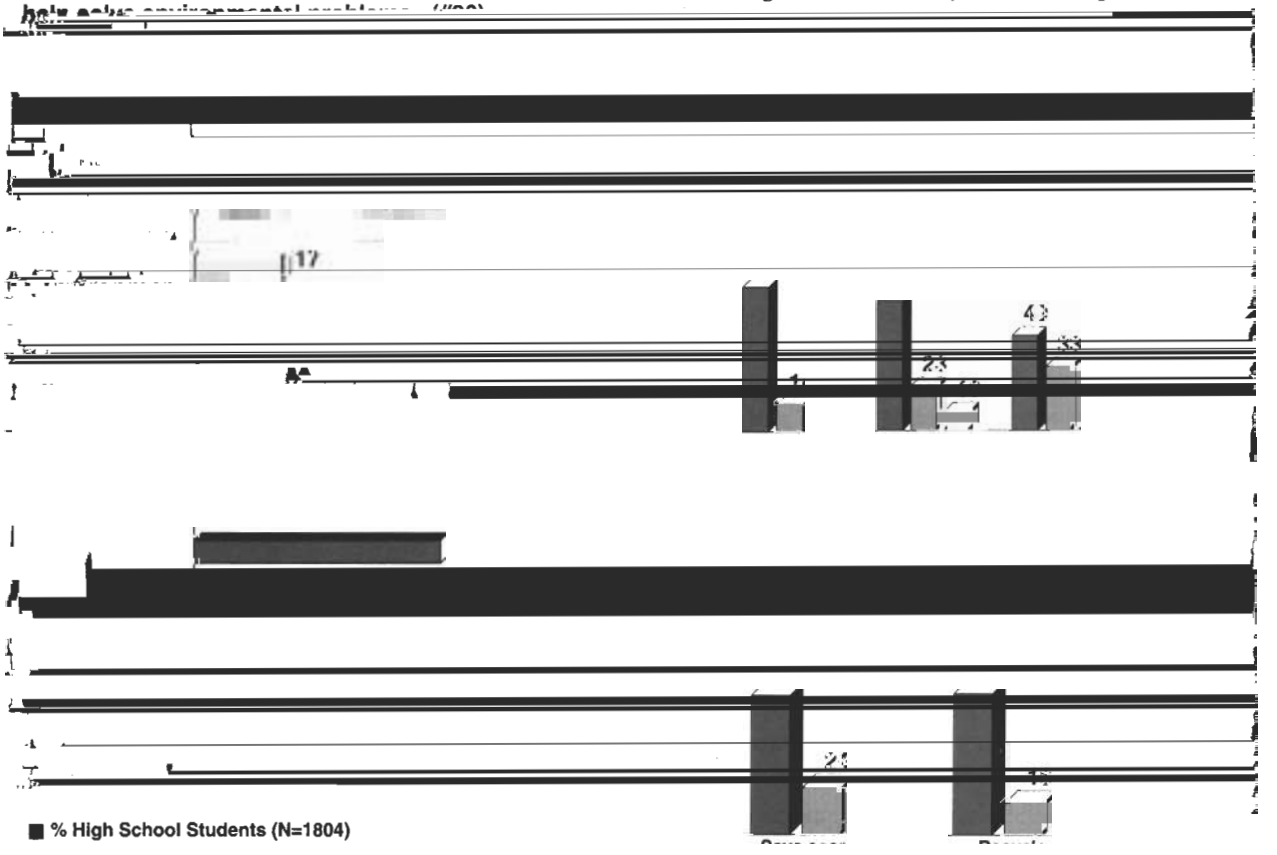


Figure S.17: There is not much I can do that will

Figure S.19: Reported Frequencies of Selected Environmental Actions Taken by Fifth Grade Students
(N = approximately 1,800)

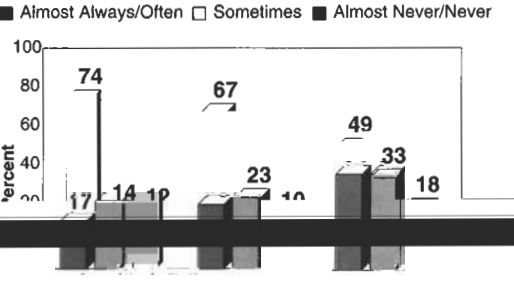
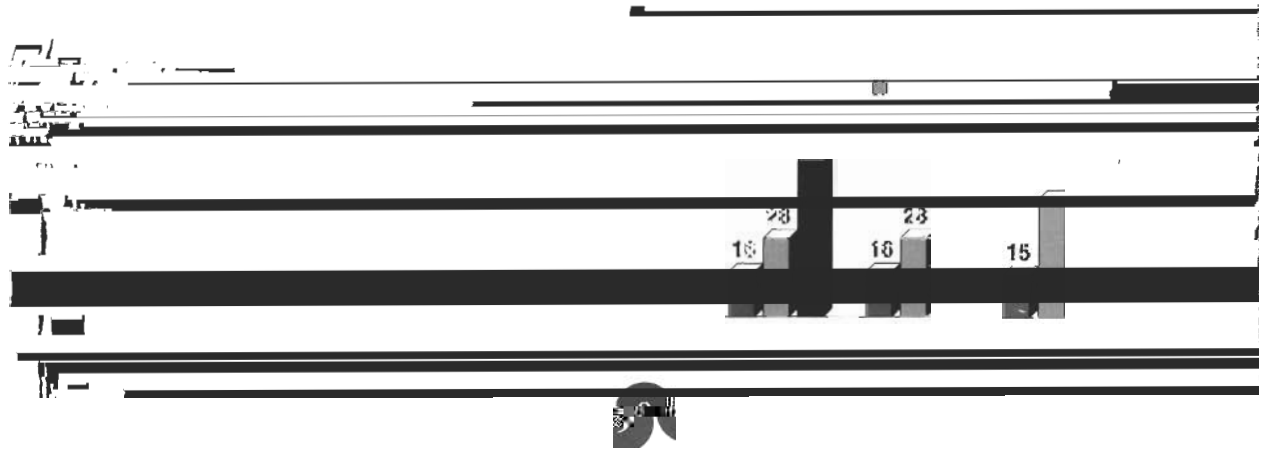
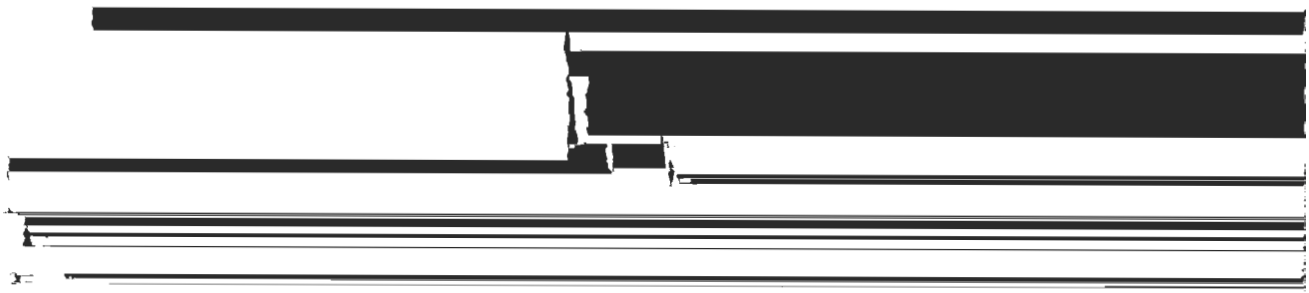


Figure S.18: I believe that I can contribute to the



Similarly, purchasing power was not pursued as an option for environmental action by students. They did not to any great extent see themselves as purchasing or avoiding the purchase of products because of environmental concerns.

significantly higher than those who were not identified (NI). Figure S.23 shows that EL fifth grade students scored 64% and EL high school students scored 63% compared to 55% and 50% respectively for the not identified students. This

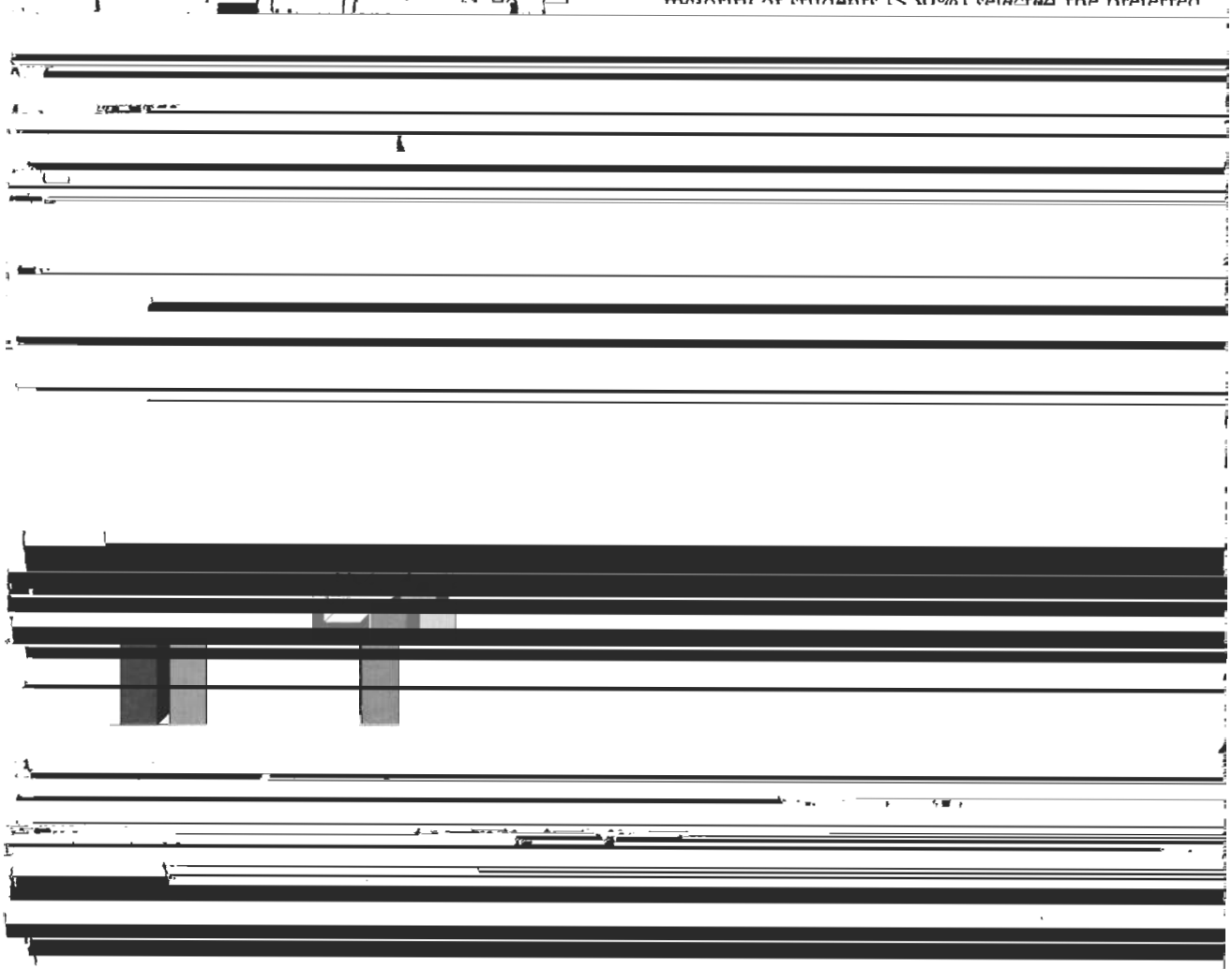


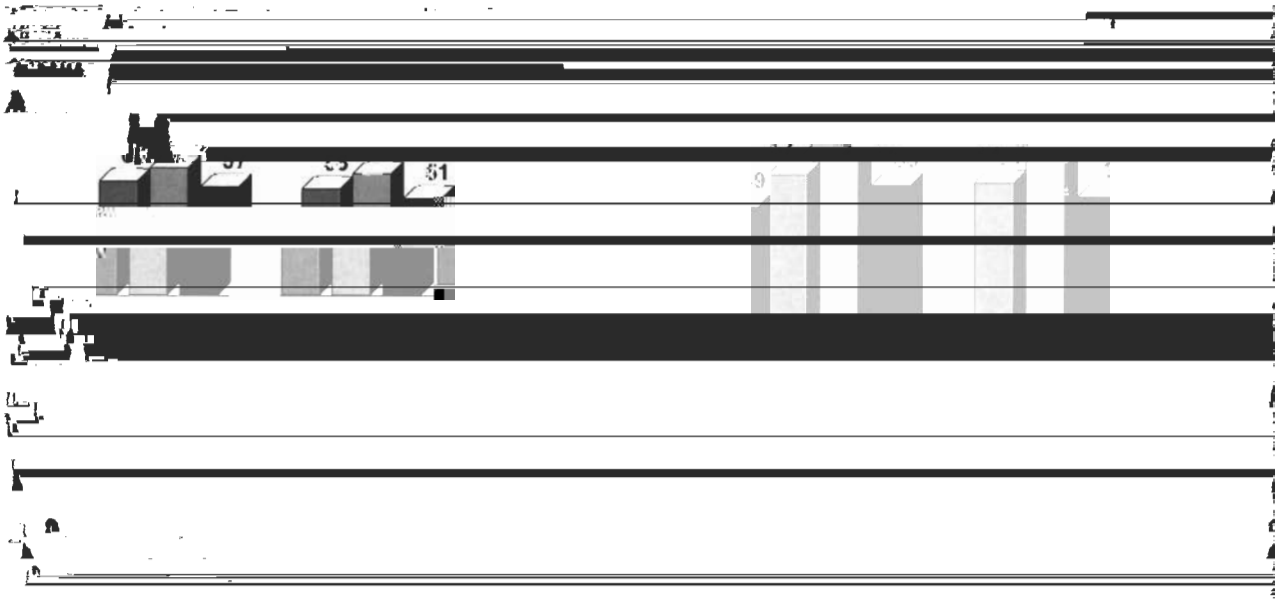
Part Four: Knowledge of Ecological Foundations and Environmental Issues

This part contained objective multiple choice questions that were intended to test student knowledge and awareness about ecology and

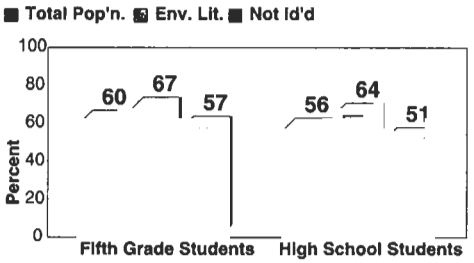
discriminate between levels of achievement. However, the EL scores are still lower than the traditional passing mark of 70%.

A more positive interpretation of the results for both the high school and fifth grade is that a

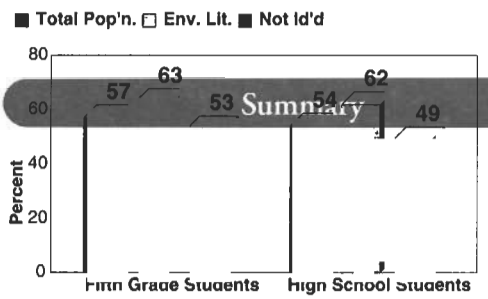




Percent Correct by Group



Percent Correct by Group



The secondary students had a similar response pattern to that of the fifth grade students (Figure

Each test included questions on issues related to

Introduction and Purpose

What do Wisconsin K-12 teachers know, feel, and do relative to teaching about the environment and associated problems or issues? In order to gain insight into this question, the Wisconsin Center for

Based on the above "guiding questions" and as a result of several reviews and pilots, a final assessment instrument was developed (Appendix C). The instrument was designed to be administered by mail and completed in less than an hour.

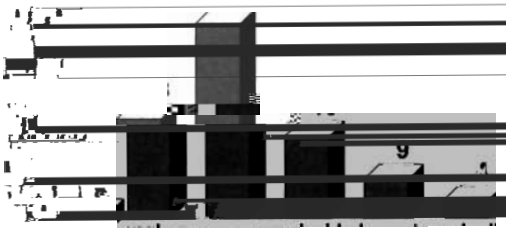
Population and Survey Administration

Development of the Assessment

Results

Table T.1 Response rates and EE infusion of disciplines sampled (N = 906)

Discipline	Total surveys sent	Number of responses	Response rate (%)	Infuse EE(%)
Art	52	41	79	73
Agriculture	9	7	78	100
Science	93	70	75	94
Home Economics	31	21	68	76
Health	28	13	64	62
Elementary	900	517	57	76
Tech Education	42	24	57	58
Social Studies	55	31	56	74
Business	30	15	50	27
Language Arts	120	63	42	51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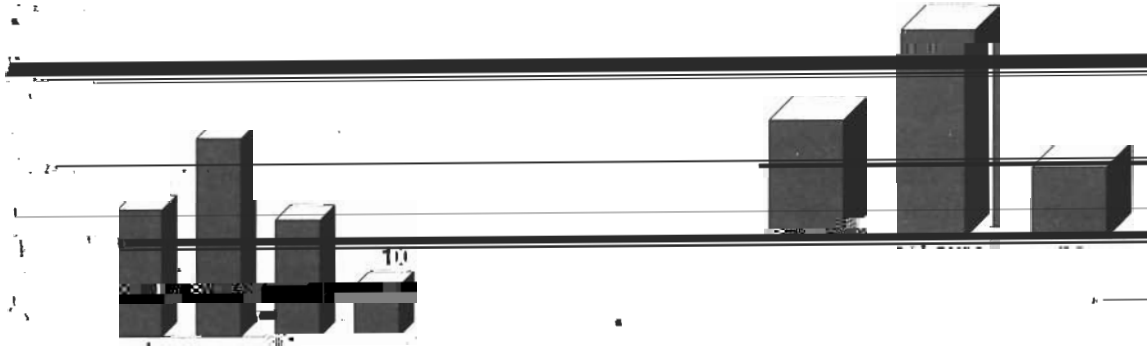
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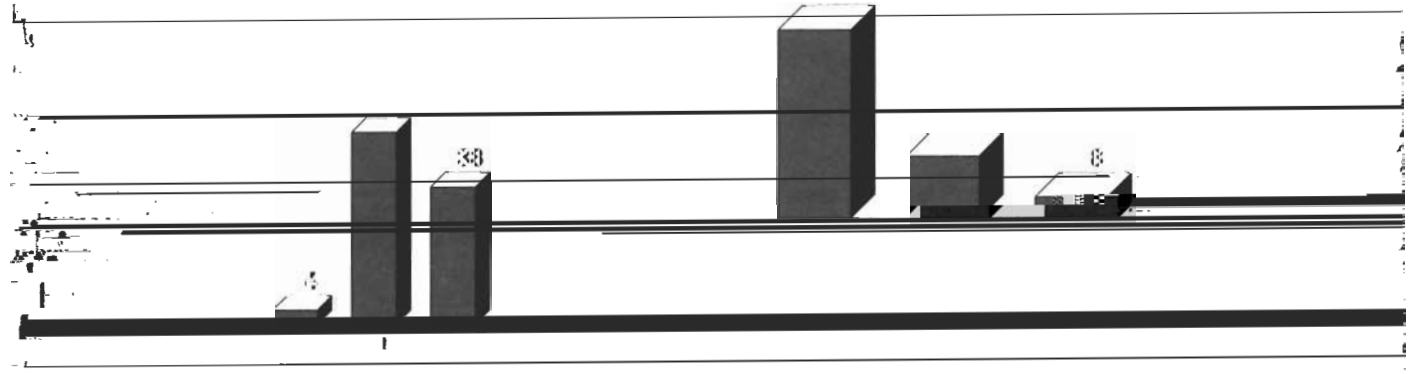
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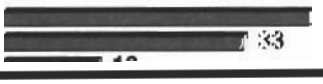
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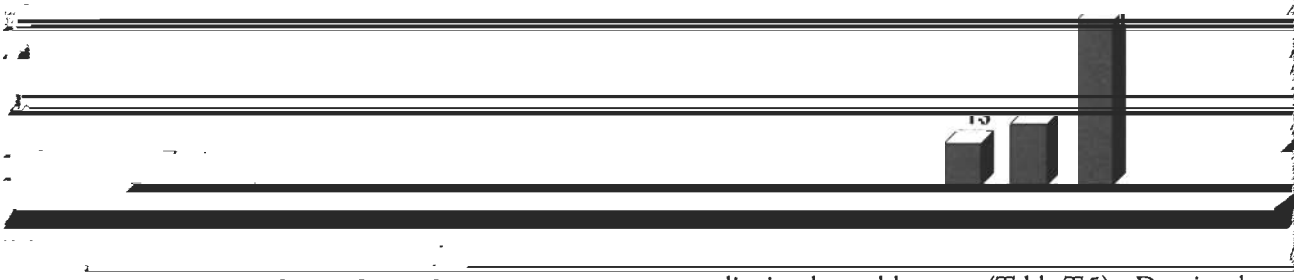
To what extent do teachers feel they are often reported using effectively were observations



competent in teaching about the environment.

Teachers' overall perceived EE competencies were assessed by averaging their mean responses to all the items addressing the components of environmental literacy (cognitive, affective, behavioral) and perceived effectiveness. The responses for the individual items were assigned a value of from 1 (strongly disagree) to 5 (strongly agree). The

audiovisuals, and lectures (Table T.5). Despite the apparent lack of diversity of methods, teachers agreed they were able to help students increase their cognitive understanding (MM = 3.73, Table T.4).

Figure T.8 Number of Cognitive Education Methods Teachers Feel Are Valuable for Teaching About the Environment (n=620)

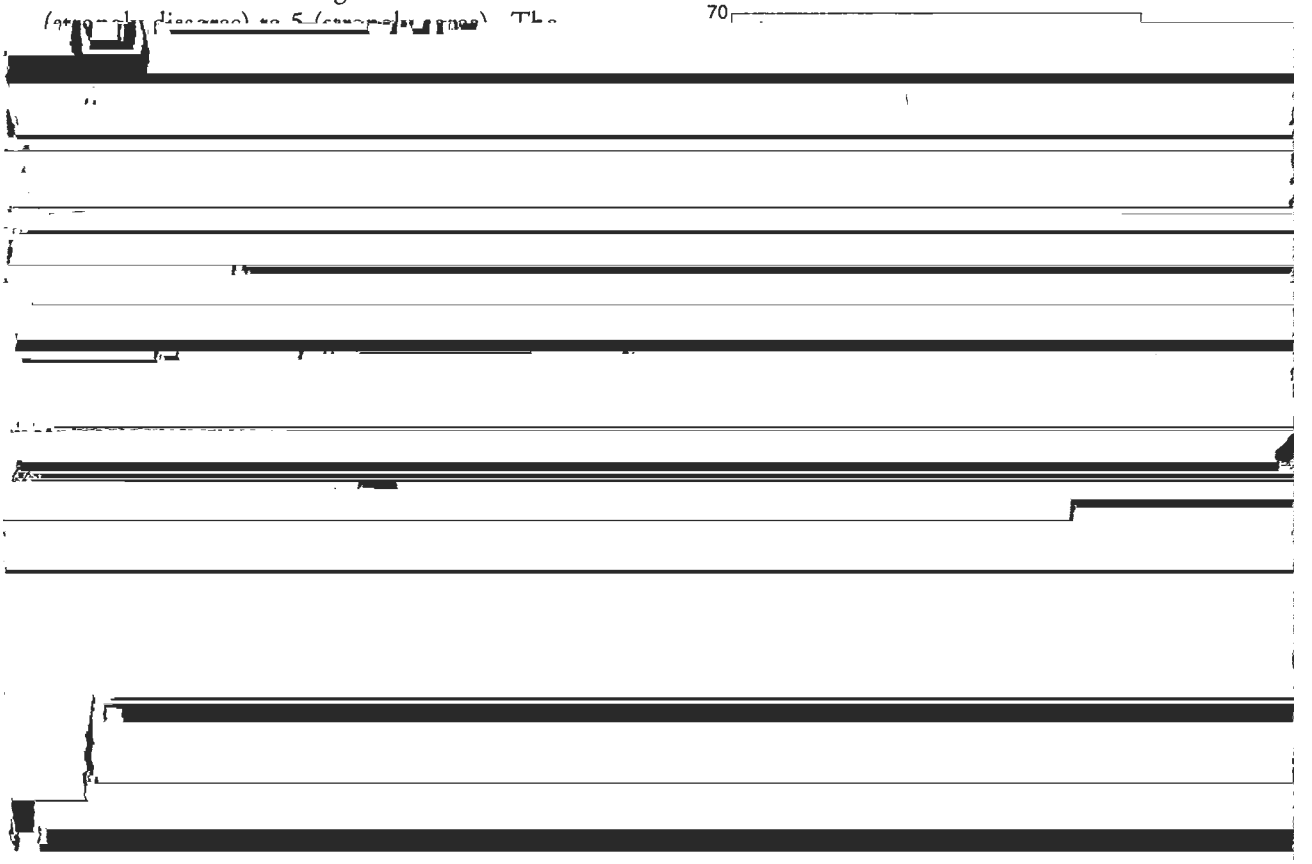
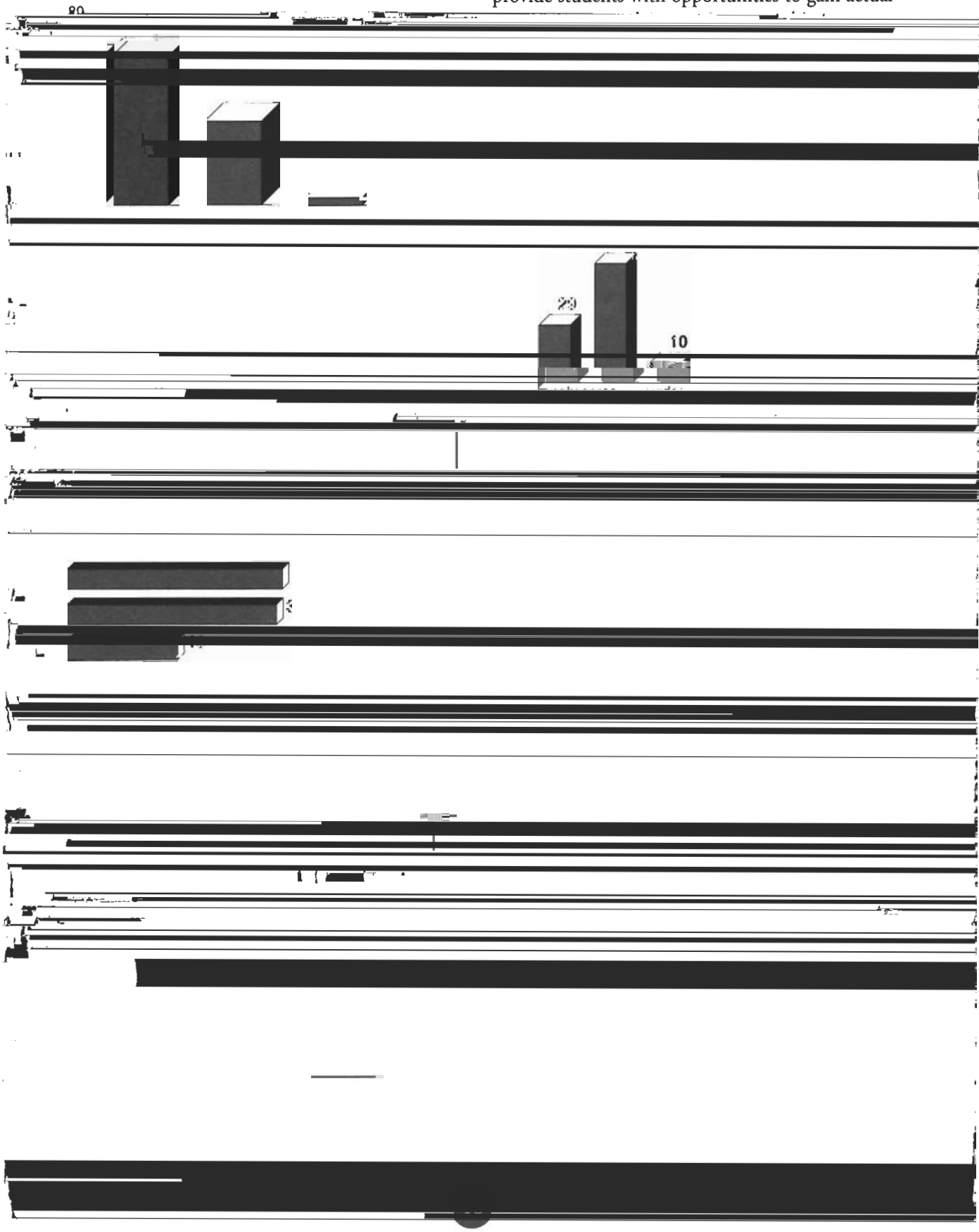


Table T.6 Affective/Values Education Methods Teachers Reported Using Effectively (n=502)

Figure T.12 Have you involved students in environmental action strategies? (n= 589)



Overall, respondents agreed that teachers should provide students with opportunities to gain actual

Table T.9 Main Reason for Not Infusing EE (n=269)		
Reason	**No. of teachers**	**%**
Concepts unrelated to subject	68	25
Do not have background	64	24
Do not have class time	37	14
Not enough prep time	20	7
Other things more important	10	7

education in the classroom.

Summary

The Wisconsin Teacher Assessment of Environmental Education was conducted to determine what the state's teacher population

Introduction and Purpose

What do Wisconsin K-12 school administrators know, feel, and do about supporting environmental

3. To what degree do school administrators provide support for EE in their schools?

4. What do school administrators

Development of the Assessment

Population and Survey Administration

Results

Results of the administrators' assessment are herein presented relative to the "guiding questions"

Figure A.1 Schools should build student awareness and sensitivity to the total (human and natural) environment and its associated problems.

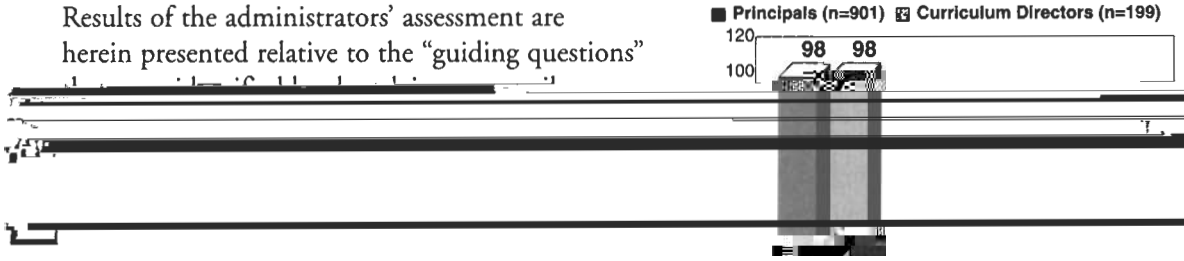


Figure A.5 Schools should provide opportunities for students to gain actual experience in resolving environmental issues

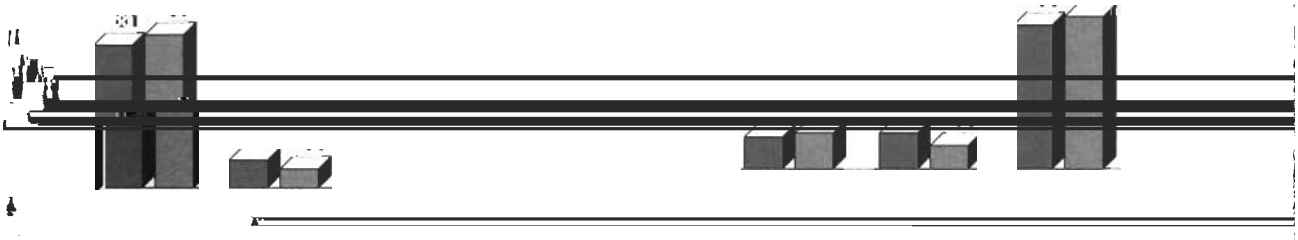
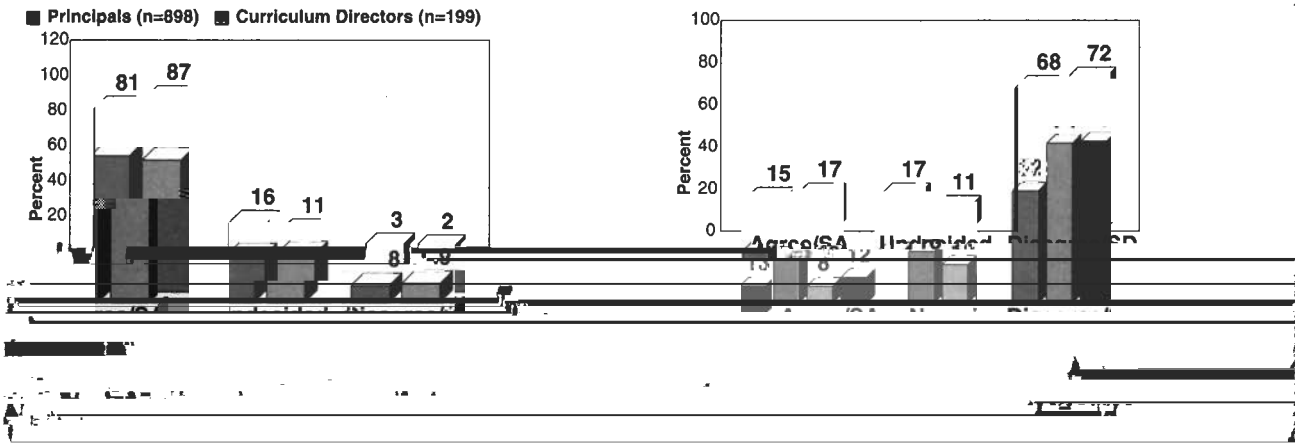


Figure A.9 Education about the environment should be taught as a separate subject in my school.



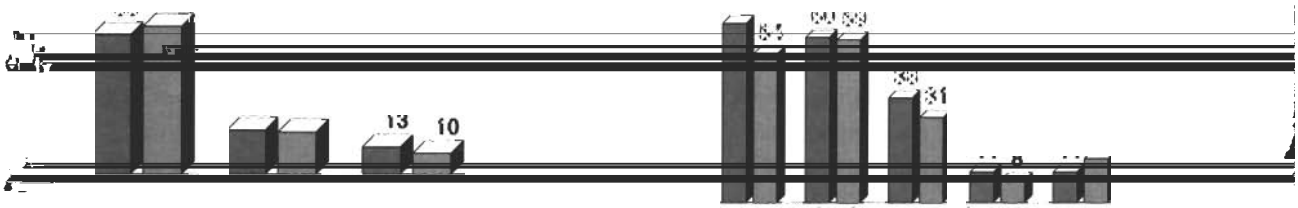
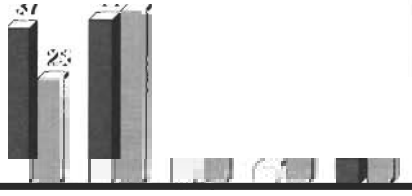


Figure A.6 Environmental education should be

Figure A.10 Education about the environment should be taught as a separate subject in my school (n = 833)

To what degree are school administrators personally knowledgeable about EE and aware of the status of EE in their schools?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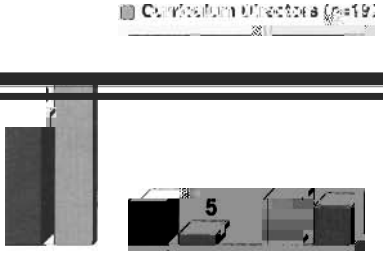
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Figure A.15 Does your school have a person designated as the environmental education specialist, coordinator, or chairperson?

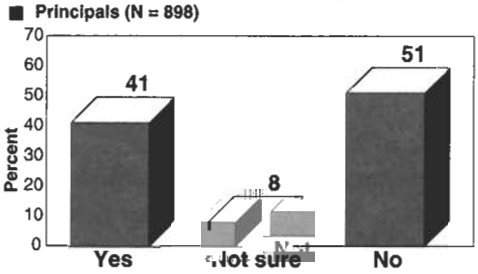


Figure A.18 Does your school/district provide financial support for the environmental education committee to mee

(percent of those reporting having an EE committee)

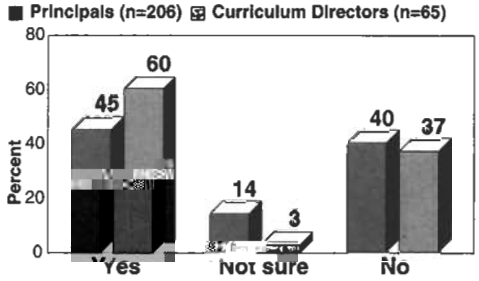
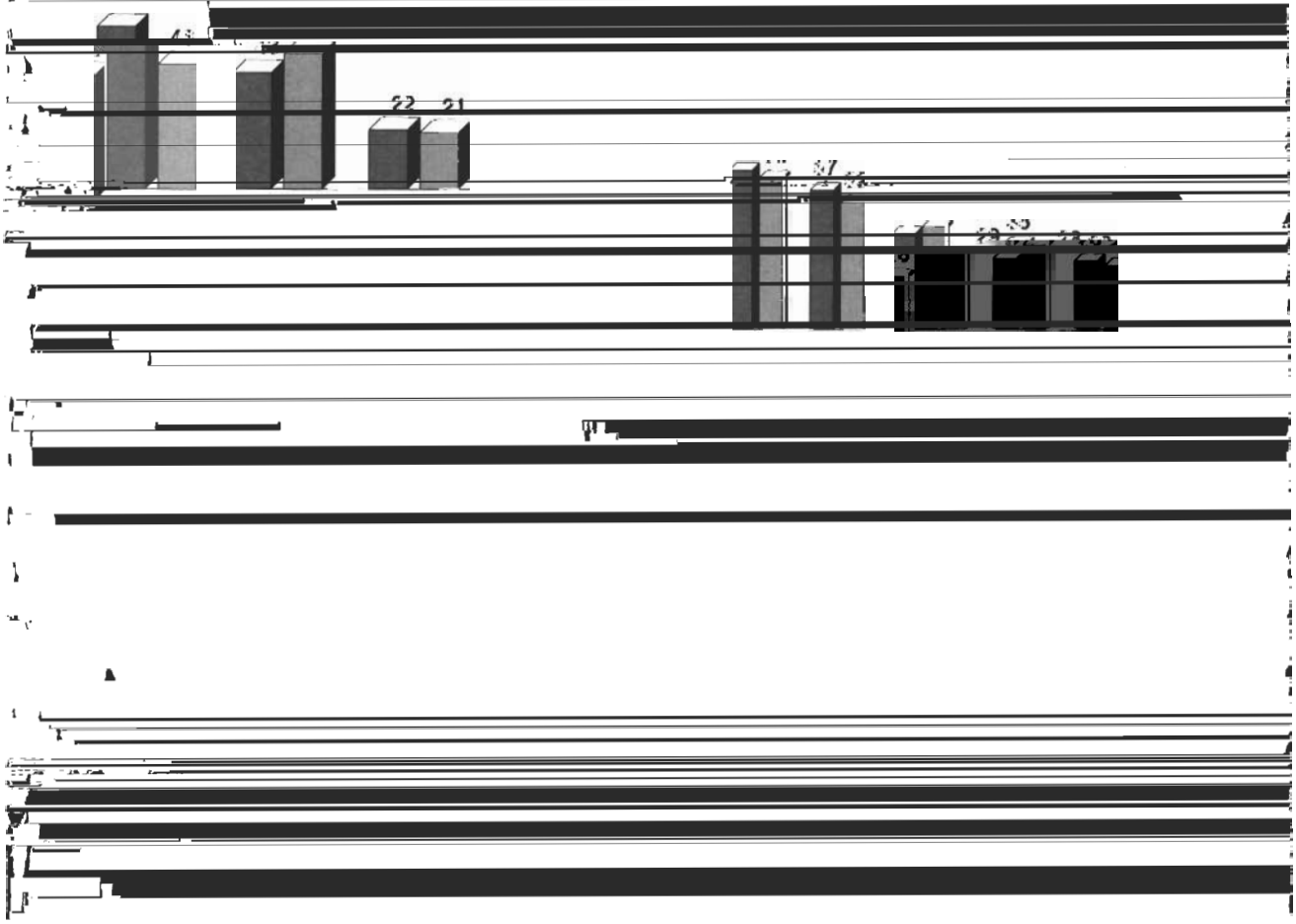


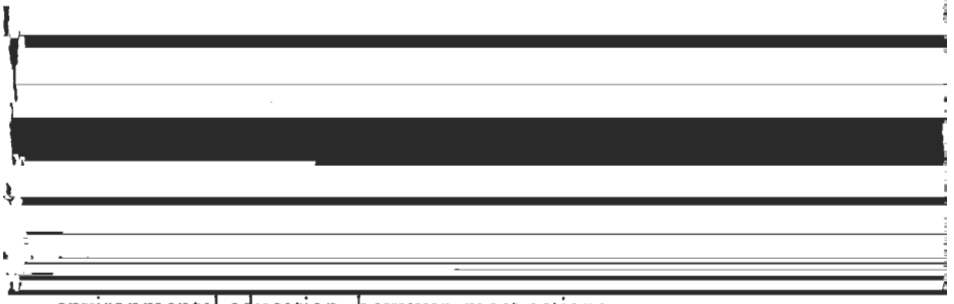
Figure A.16 Does your school/district have an

Figure A.20 District-related barriers to including or indicated more teacher interest in environmental

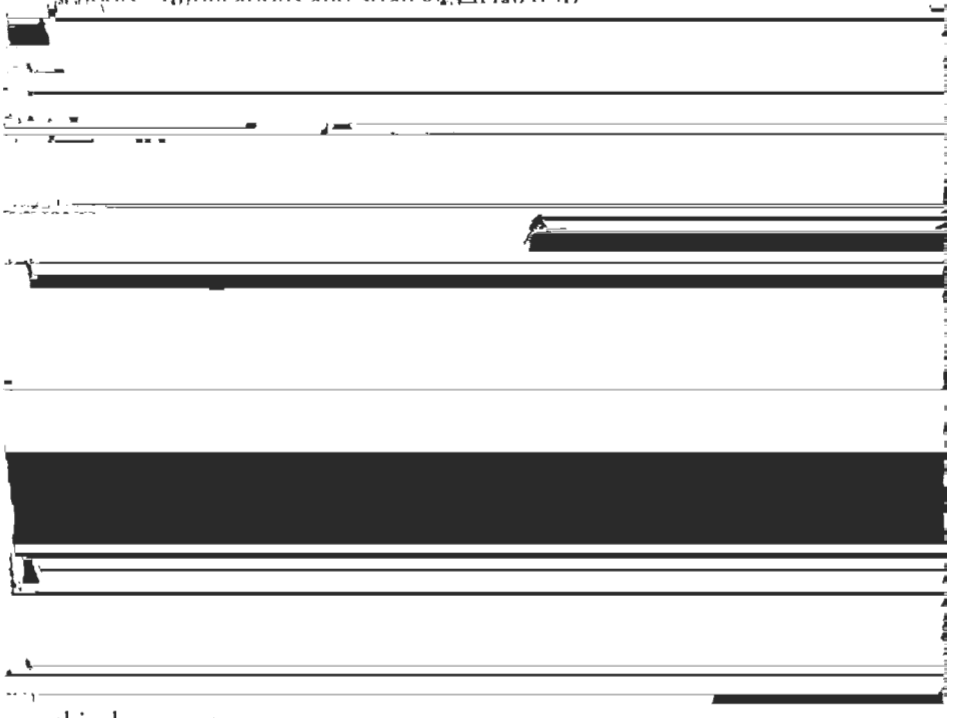


Summary

report they do take actions to support



environmental education, however, most actions were considered relatively passive. That is, administrators provide verbal support to the development of EE, but personnel and financial support were relatively lacking in many schools. Implications and strategies related to



this document.

This section integrates the findings of the student, teacher, and administrator surveys and tests. It provides implications, conclusions, and strategies relative to improving environmental education in the K-12 schools of Wisconsin.

Importance of Environmental Education

Students believe that learning about the environment and associated issues is relatively

<u>Implications</u>: Teacher education institutions in Wisconsin will have to concern themselves with providing quality EE in-service and pre-service programs.

<u>Conclusion</u>: The state of Wisconsin, through its teacher education institutions, should

training in environmental education by ensuring that university pre-service programs offer appropriate environmental education course work. In-service programs in

environmental education should be made

Conclusion: Schools should work to ensure the effectiveness of their environmental education efforts by assessing the degree to which students are achieving the suggested

Student Achievement

awareness/knowledge, attitude/value, and behavior/action skill concepts.

Ecological knowledge and awareness of environmental issues in the average Wisconsin

educational standards. Higher standards are achievable and desirable.

Implications: It is widely agreed that environmental issues will ultimately be prevented or remedied as a result of the general

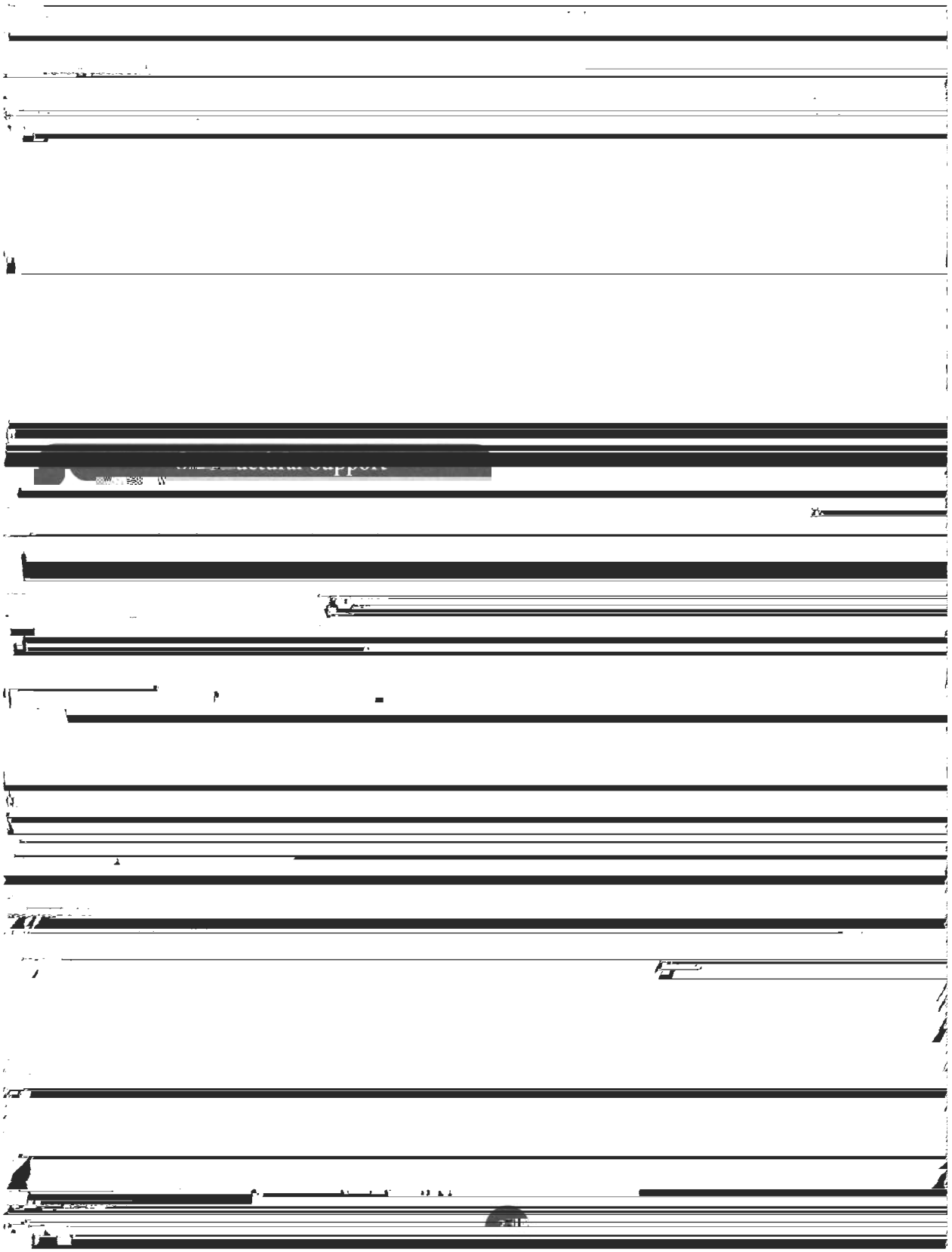
are preventable and solvable. They feel more should be done by government, industry, agriculture, and education. They feel they are personally responsible for contributing to the prevention or solution of

Implications: Students have strong feelings about establishing a societal structure that works toward maintaining environmental quality.

Conclusion: Given that student cognitive scores on this assessment were considered lacking, it's possible that the present student population might be more inclined to make environmental decisions more on how they feel rather than on what they know. Schools should

expect a societal structure that establishes environmentally responsible behavior across all sectors. Additionally, they feel that they are personally responsible for pursuing

time. The establishment of these positions also sends a message to teachers that this is an important curriculum area and deserving of their attention.



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Iozzi, L., Laveault, D., and Marcinkowski, T. (1990). Assessment of Learning Outcomes in Environmental Education. (draft copy) Paris, France: UNESCO.

Lane, J. (1993). An Assessment of Wisconsin Teachers' Perceived Competencies In, Attitudes Toward, and Amount of Class Time Devoted to Teaching About the Environment. Unpublished Master's thesis. Stevens Point: University of Wisconsin.

Summary of Response Frequencies

(Editor note: The questions in Part One were used to develop a student profile.)

Instructions for Part One: Fill in the circle on your answer sheet for the letter of the answer that is most like your answer to each of the following questions.

Key :

N = Total Sample Population

1. What is your gender? (N = 1850, EL = 678, NI = 1172)

(Editor note: The questions in Part Two were used to develop an affective profile. Items 5-18 measured student attitudes towards the environment. Items 19-26 measured student locus of control and degree of assumption of personal responsibility towards the environment.)

Instructions for Part Two: These questions ask what you think. Be honest. There are no right or wrong answers. Read each question carefully. Fill in the circle on your answer sheet that is closest to what you think.

Strongly Agree (SA) Agree (A) No opinion (N) Disagree (D) Strongly Disagree (SD)

[redacted]

5. More money should be spent solving environmental problems.
(N =1850, EL = 679, NI =1171)

	SA	A	N	D	SD
[redacted]					
%EL	38	36	19	3	3

10. I would be willing to change my habits if it helped solve pollution problems. (N=1852, EL = 678, NI = 1174)

	SA	A	N	D	SD
%TP	33	38	23	4	2
%EL	37	38	21	3	2
%NI	31	38	24	5	3

11. If a car makes too much air pollution no one should be allowed to drive it. (N = 1850, EL = 677, NI = 1173)

	SA	A	N	D	SD
%TP	19	18	27	20	15
%EL	18	20	29	18	15
%NI	19	18	26	22	15

12. How I travel to school each day is important because my energy use affects the environment. (N = 1849, EL = 678, NI = 1171)

	SA	A	N	D	SD
%TP	19	30	35	8	8
%EL	22	31	33	7	7
%NI	17	30	36	9	8

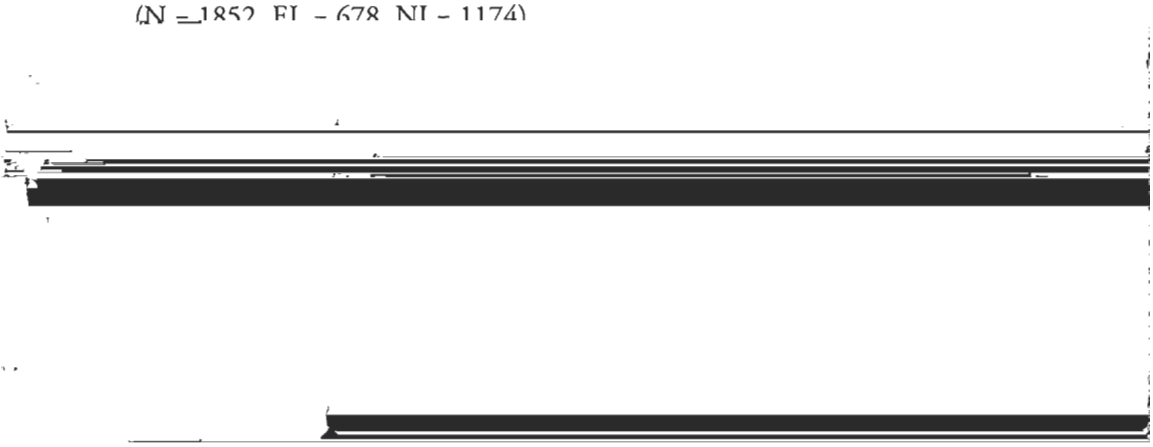
13. It is okay if a little water gets polluted because there is plenty of water. (N = 1839, EL = 675, NI = 1164)

	SA	A	N	D	SD
%TP	3	8	11	30	48
%EL	3	6	7	30	54
%NI	4	9	12	30	45

14. It is okay for our school to make the playground larger, even if it means destroying some endangered plants. (N = 1852, EL = 678, NI = 1174)

	SA	A	N	D	SD
%TP	5	3	9	23	59
%EL	5	2	7	20	66
%NI	5	4	11	25	56

15. The government should encourage people to have cars that are energy efficient. (N = 1852, EL = 678, NI = 1174)



%TP	35	28	28	5	4

17. I am concerned about how large the human population is becoming.
(N = 1844, EL = 676, NI = 1168)

	SA	A	N	D	SD
%EL	22	23	40	9	6
%NI	15	23	45	10	6

18. It bothers me to throw an aluminum can in the trash. (N = 1848, EL = 675, NI = 1173)

	SA	A	N	D	SD
%TP	22	27	30	12	9
%EL	28	27	28	10	8
%NI	19	26	31	14	10

19. It is a waste of time to work to solve environmental problems.
(N = 1832, EL = 674, NI = 1158)

	SA	A	N	D	SD
%TP	4	4	13	23	55
%EL	4	4	16	19	63
%NI	4	5	15	26	51

20. When I have done something that harms the environment there's very little I can do to make it right. (N = 1844, EL = 676, NI = 1168)

	SA	A	N	D	SD
%TP	7	14	25	31	23
%EL	8	11	21	32	29
%NI	7	15	28	30	20

21. Things I do have no effect on the quality of the environment.
(N = 1852, EL = 677, NI = 1175)

	SA	A	N	D	SD
%TP	4	9	26	31	30
%EL	5	7	20	30	38
%NI	4	10	28	32	25

	SA	A	N	D	SD
%TP	7	9	23	32	30
%EL	7	8	19	32	35
%NI	7	9	25	32	26

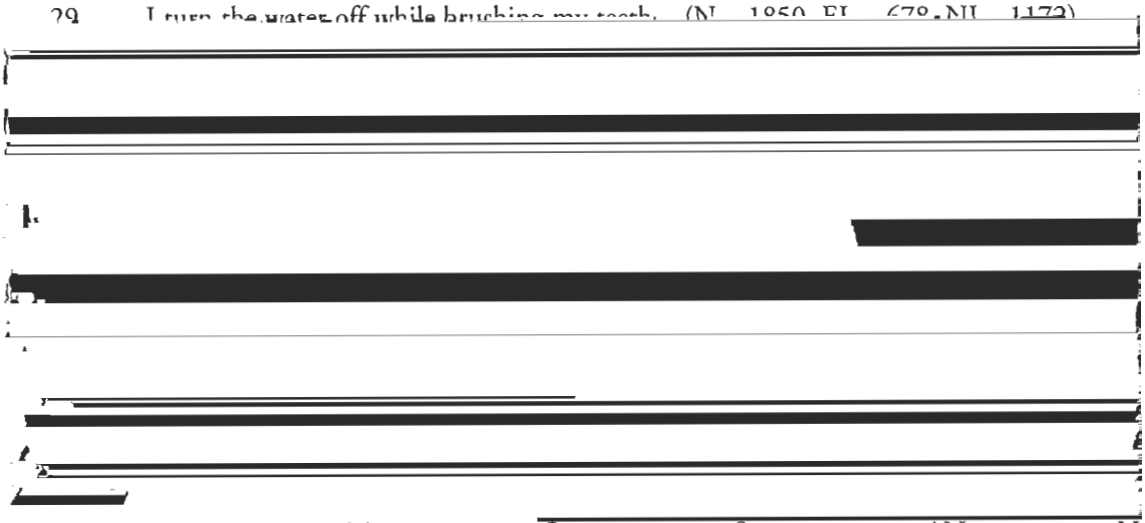
25. As long as other people are driving big cars, my family should be able to drive one too. (N = 1853, EL = 678, NI = 1175)

	SA	A	N	D	SD
%TP	9	11	33	25	22
%EL	8	9	32	25	26
%NI	10	12	34	26	19

26. Environmental problems will only be solved when people like me change the way we live. (N = 1854, EL = 679, NI = 1175)

	SA	A	N	D	SD
%TP	36	26	23	9	6
%EL	41	26	19	7	7
%NI	33	26	25	9	6

29. I turn the water off while brushing my teeth. (N = 1850, EL = 678, NI = 1172)



	AA	O	S	AN	N
%TP	59	15	14	5	7
%EL	66	11	13	4	5
%NI	54	17	14	6	8

30. I try to eat at places that use little packaging. (N = 1850, EL = 678, NI = 1172)

	AA	O	S	AN	N
%TP	9	12	38	20	21
%EL	12	13	36	19	21
%NI	7	12	39	20	22

31. I tell people about using recycled paper. (N = 1850, EL = 677, NI = 1173)

	AA	O	S	AN	N
%TP	10	13	26	20	30
%EL	12	14	27	20	27
%NI	8	12	26	20	33

32. I have written a letter to someone suggesting a solution to an environmental problem. (N = 1849, EL = 678, NI = 1171)

	AA	O	S	AN	N
%TP	4	4	12	10	70
%EL	6	5	14	10	65
%NI	2	3	12	11	72

33. I ask people to recycle. (N = 1848, EL = 677, NI = 1171)

	AA	O	S	AN	N
%TP	15	18	30	17	20
%EL	20	22	28	14	16
%NI	13	16	31	18	22

34. I ask someone not to buy something if I think it harms the environment. (N = 1849, EL = 678, NI = 1171)

	AA	O	S	AN	N
%TP	8	9	24	21	38
%EL	11	11	24	20	34
%NI	5	8	24	22	41

37. I ask other people to do some things because they are good for the environment. (N = 1848, EL = 677, NI = 1171)

[redacted]

%TP	12	22	34	17	16
%EL	16	24	31	14	15
%NI	9	20	36	18	16

38. [redacted]

[redacted]

	AA	O	S	AN	N
%TP	13	16	20	13	37
%EL	17	18	20	12	33
%NI	11	15	21	14	40

39. I pick up litter without being asked. (N = 1852, EL = 678, NI = 1174)

	AA	O	S	AN	N
%TP	25	24	33	10	8
%EL	31	27	27	9	6
%NI	21	23	36	10	10

40. I try to save electricity. (N = 1851, EL = 678, NI = 1173)

	AA	O	S	AN	N
%TP	36	31	23	6	4
%EL	41	30	20	5	4
%NI	33	31	25	6	4

42. A small bird eats a butterfly that had been eating nectar from a flower. Then the bird is eaten by a hawk. This is an example of: (N = 1849, EL = 677, NI = 1172)

%TP	%EL	%NI		
2	2	3	a)	mutualism
92	94	92	b)*	a food chain.
2	2	2	c)	competition.
3	3	3	d)	survival of the fittest.

43. [redacted]

%TP	%EL	%NI		
12	9	14	a)	A flea bites a dog.
70	76	66	b)*	A robin eats a worm.
8	6	9	c)	A caterpillar eats a leaf.
11	9	11	d)	A deer eats grass that has a grasshopper on it.

44. A fox dies. This creates a problem for: (N = 1846, EL = 676 , NI = 1170)

%TP	%EL	%NI		
42	50	37	a)*	the fleas that were drinking the fox's blood.
[redacted]				

47. If there were no decomposers on Earth, what would happen?

(N = 1844, EL = 676, NI = 1168)

%TP	%EL	%NI		
60	66	57	a)*	Dead plants and animals wouldn't become part of the soil.
13	10	13	b)	Many human diseases would disappear.
7	7	7	c)	More meat would be available for humans to eat.
20	17	22	d)	Little would change.

48. A grassland turns into a desert over a short period of time. What will most likely happen to the animals that lived in the grassland? (N = 1850, EL = 677, NI = 1173)

%TP	%EL	%NI		
84	88	82	a)*	Most will leave or die.
3	2	3	b)	They would have more babies to survive.
7	5	8	c)	Those that eat grass would adapt to new food.
6	5	7	d)	Many will pass on traits that will help their young to survive in the desert.

49. Some people started a program in a national forest to protect deer. They started killing wolves. Ten years later there were no wolves in the forest. For a few years after the wolves were gone there were many more deer than there had ever been. Then suddenly

51. A rabbit eats some corn. The energy from the corn goes into the rabbit. The next day a fox eats the rabbit. The fox gets very little of the energy that was in the [illegible]

[redacted]

(N = 1846, EL = 677, NI = 1169)

%TP	%EL	%NI		
4	4	4	a)	A fox can't digest corn.
34	33	35	b)	The rabbit has already digested the corn.
6	4	7	c)	Corn doesn't have much energy.
56	59	54	d)*	Most of the corn's energy was used by the rabbit.

52. [illegible]

[redacted]

56. A pollutant gets into an ecosystem and harms insects. How might this affect the ecosystem? (N = 1831, EL = 672, NI = 1159)

%TP	%EL	%NI		
8	5	9	a)	Plants are not harmed, so it doesn't affect the ecosystem.
55	62	50	b)*	It harms part of the ecosystem, so it may affect other parts of the ecosystem.
20	17	??	c)	It kills insects so other animals in the ecosystem stay healthy.
17	15	18	d)	Most animals eat plants so it doesn't affect the ecosystem much.

61. Which of the following would be most likely to cause soil pollution?

(N = 1847 EL = 676 NI = 1171)

%TP %EL %NI

66. Cutting down forests for lumber or farming often conflicts with:
(N = 1845, EL = 674, NI = 1171)

%TP	%EL	%NI		
8	8	8	a)	creating jobs.
18	16	20	b)	building homes for people.
65	68	63	c)*	the needs of forest plants and animals.
8	8	8	d)	keeping land open for roads.

[redacted]

endangered. This is most likely because: (N = 1845, EL = 676, NI = 1169)

%TP	%EL	%NI		
8	6	9	a)	other animals chased them out or ate them.
8	5	10	b)	the weather changed.
74	81	70	c)*	people made too many changes in the animals' habitat.
11	8	12	d)	the animals or plants they ate died off.

68. If wild animal species need a place to live for the next 300 years it would be best to:
(N = 1845, EL = 673, NI = 1172)

%TP	%EL	%NI		
16	11	19	a)	put them in a zoo where they can be cared for and protected.

(N = 1843, EL = 673, NI = 1170)

%TP	%EL	%NI		
44	52	39	a)*	storing nuclear waste for thousands of years.
20	19	20	b)	finding the materials needed to produce nuclear energy.

76. Countries with small populations may be a part of the world's resource problems if they: (N = 1834, EL = 674, NI = 1160)

%TP	%EL	%NI		
19	17	20	a)	allow more people to leave their country.
18	13	20	b)	produce too much plant waste.

77. In the long term, which of the following is the best way to make the amount of garbage going to landfills smaller? (N = 1827, EL = 669, NI = 1158)

%TP	%EL	%NI		
18	16	18	a)	Recycling [illegible]

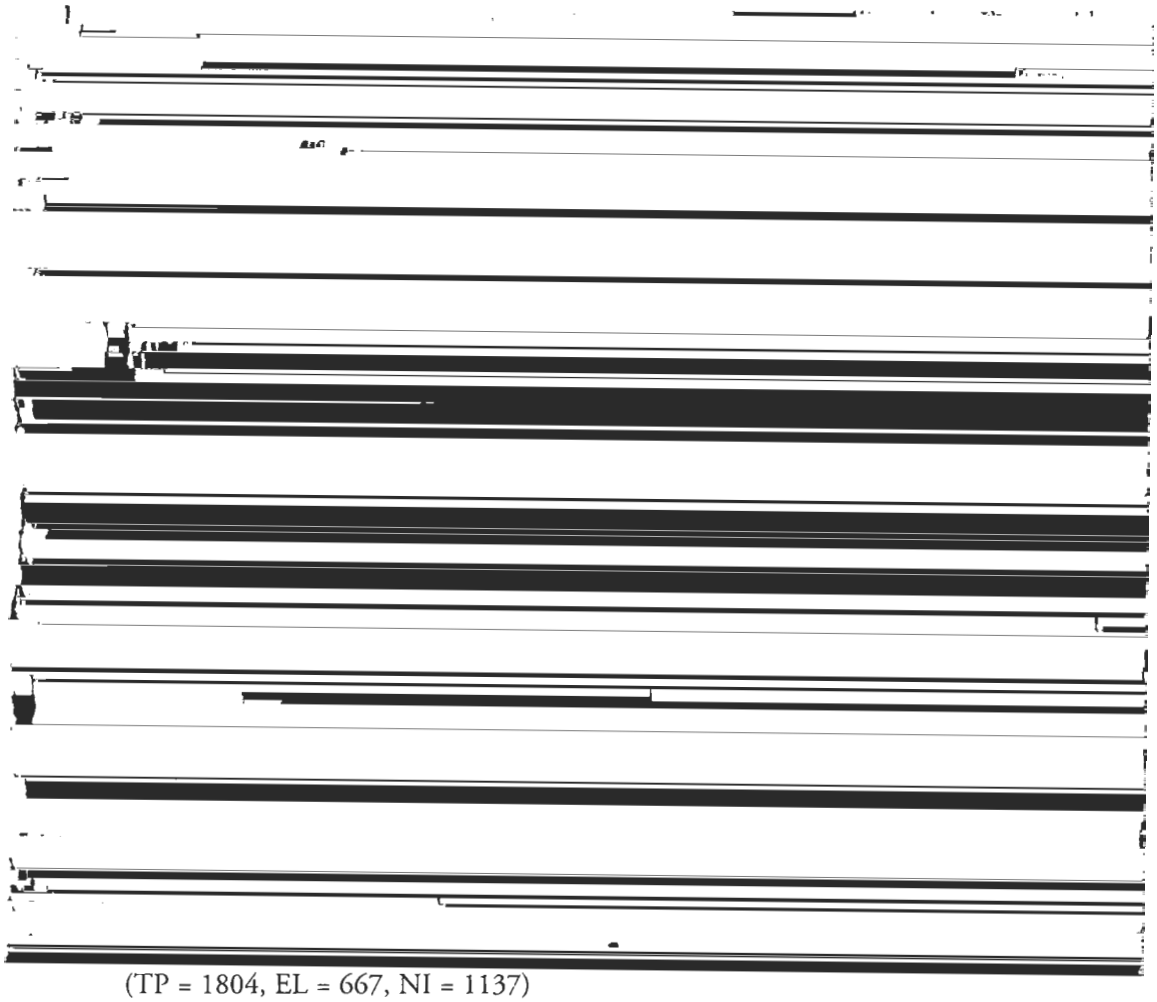
Summary of Response Frequencies
1994 Environmental Survey of Wisconsin High School Students

5. What are your educational plans after high school? (TP = 1805, EL = 660, NI = 1136)

%TP	%EL	%NI	
2	2	3	a) no future educational plans at the present time
20	14	24	b) vocational/technical school
66	76	60	c) college or university
3	3	4	d) military
8	5	10	e) undecided

Part Two

(Editor note: The questions in Part Two were used to develop an affective profile



(TP = 1804, EL = 667, NI = 1137)

	SA	A	N	D	SD
%TP	33	44	15	5	2
%EL	43	41	12	3	2
%NI	28	46	17	6	3

10. I think most of the concern about environmental problems has been exaggerated.
(TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	3	10	21	38	29
%EL	5	9	13	37	36
%NI	2	10	25	38	25

11. Knowing about environmental problems and issues is important to me.
(TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	17	50	26	6	2
%EL	27	51	16	4	2
%NI	11	49	32	7	2

12. A community's pollution regulations should not interfere with industrial growth and

15. More controls should be placed on industry and agriculture to protect the quality of the [redacted]

environment, even if it means that things that I purchase will cost more.
(TP = 1806, EL = 669, NI = 1137)

	[redacted]				
%TP	17	40	28	11	4
%EL	24	43	21	9	3
%NI	13	39	32	11	5

16. I am not concerned about the fact that the world's deserts are increasing in size.
(TP = 1803, EL = 666, NI = 1137)

	SA	A	N	D	SD
%TP	2	10	28	42	17
%EL	2	9	24	43	23
%NI	3	11	31	41	14

17. There are already enough laws to protect the environment.
(TP = 1804, EL = 667, NI = 1137)

	SA	A	N	D	SD
%TP	3	8	19	44	27
%EL	3	6	12	43	36
%NI	2	9	23	44	22

18. I believe that plants and animals exist to be used by humans.
(TP = 1804, EL = 668, NI = 1136)

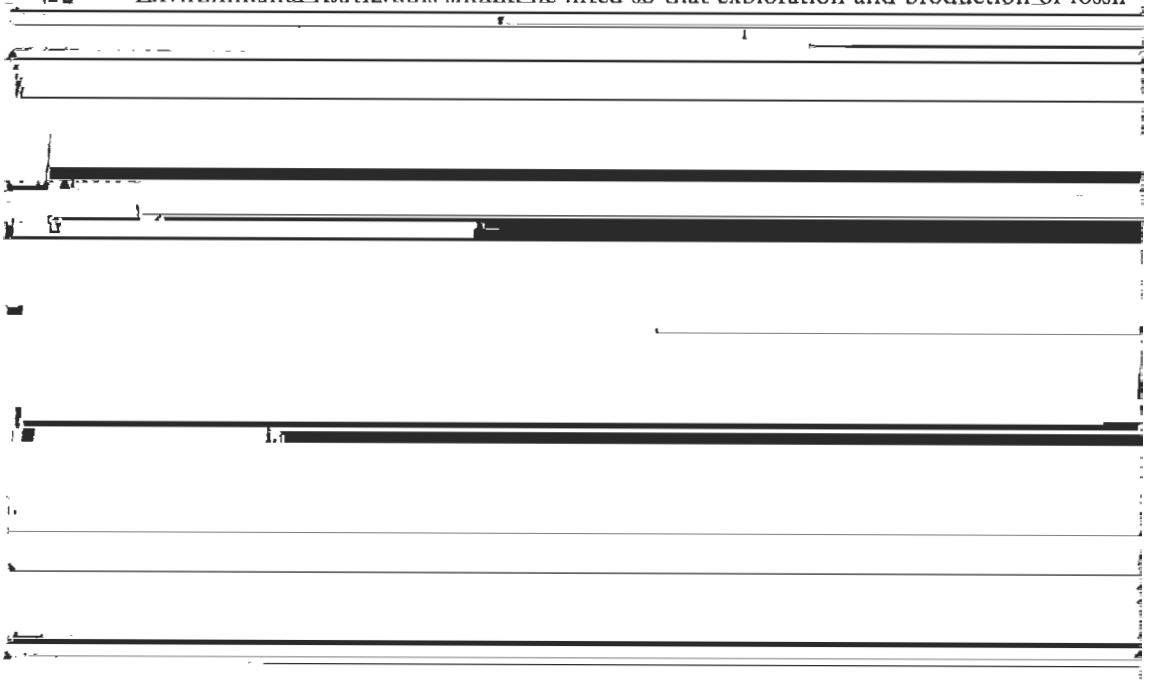
	SA	A	N	D	SD
%TP	8	19	24	27	21
%EL	10	18	21	26	25
%NI	7	20	26	28	19

19. [redacted]

21. More land should be set aside for wildlife habitats. (TP = 1807, EL = 669, NI = 1138)

%TP	38	40	16	4	2
%EL	45	38	12	3	1
%NI	34	41	19	4	2

22. Environmental restrictions should be lifted so that exploration and production of fossil



	SA	A	N	D	SD
%TP	2	9	35	33	21
%EL	3	8	23	35	31
%NI	2	10	42	32	15

23. If a person's car exceeds certain standards for air pollution, he or she should not be allowed to drive it. (TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	20	39	23	12	5
%EL	28	39	18	10	6
%NI	16	40	26	14	5

24. The government should provide financial support for research and development related to renewable energy, even if it means that taxes will be higher.
(TP = 1803, EL = 668, NI = 1135)

	SA	A	N	D	SD

27. I am not concerned about the rate of species extinction in the world. (TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	2	7	12	42	37
%EL	2	5	8	37	48
%NI	2	8	15	44	31

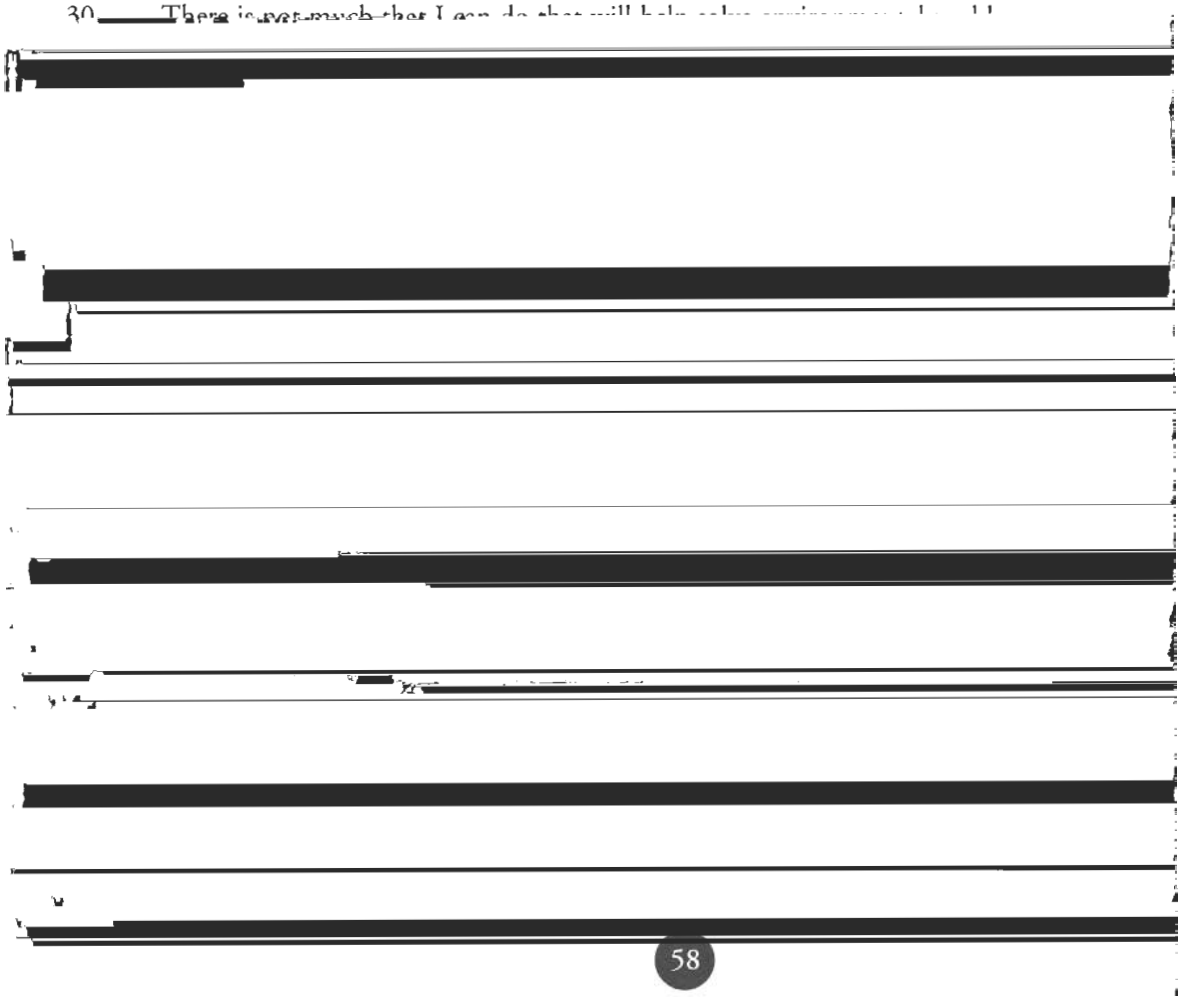
28. I am concerned about environmental health hazards such as those caused by air or water pollution. (TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	31	56	9	3	1
%EL	38	53	6	1	1
%NI	26	57	11	4	1

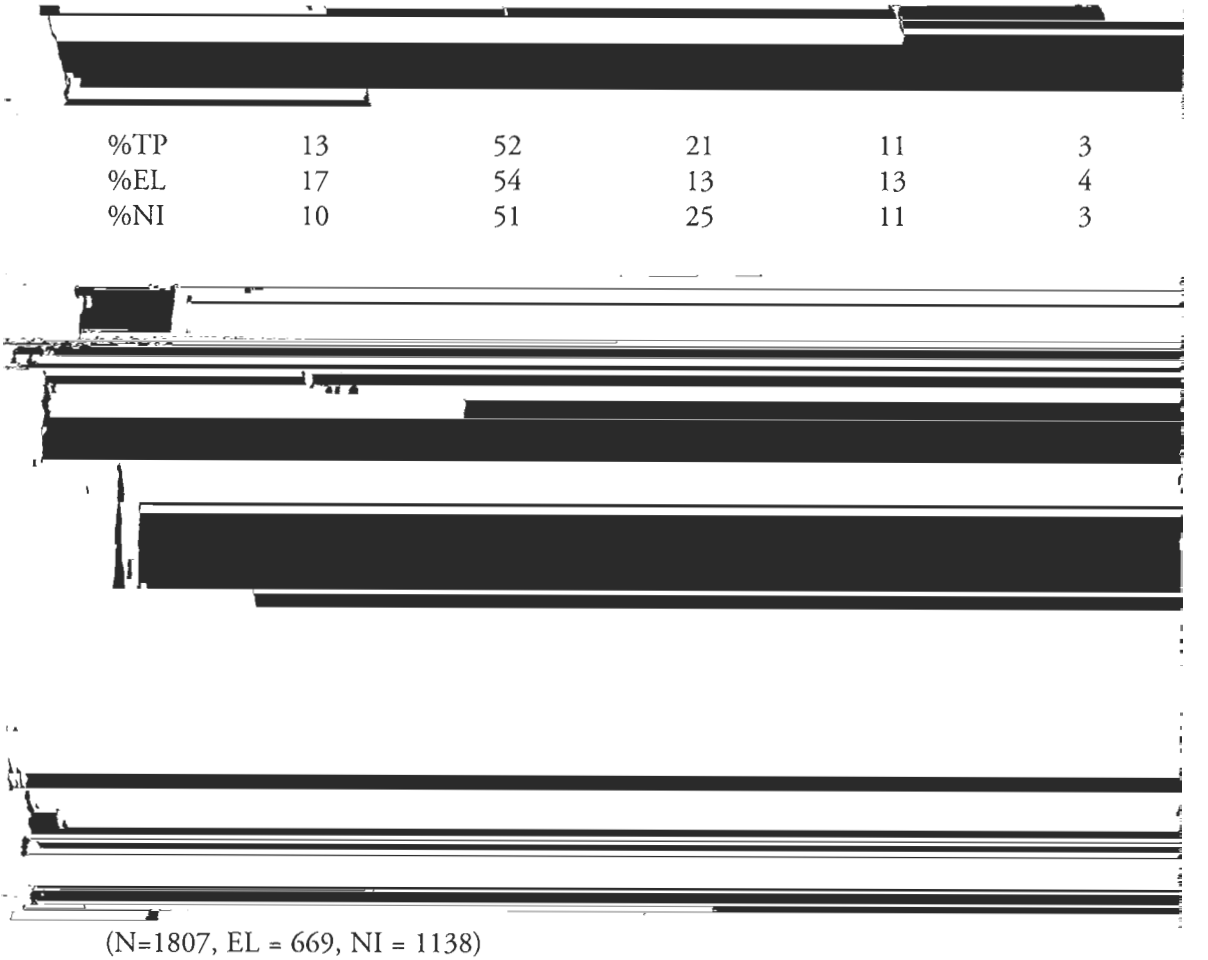
29. I want to help solve environmental problems. (TP = 1804, EL = 668, NI = 1136)

	SA	A	N	D	SD
%TP	19	48	26	5	2
%EL	29	48	18	4	1
%NI	13	48	31	6	2

30. There is very much that I can do that will help solve environmental [illegible]



33. An individual, working on his or her own, can contribute to the solution of environmental problems and issues. (N=1806, EL = 668, NI = 1138)



%TP	13	52	21	11	3
%EL	17	54	13	13	4
%NI	10	51	25	11	3

(N=1807, EL = 669, NI = 1138)

	SA	A	N	D	SD
%TP	3	19	21	45	11
%EL	2	15	15	50	18
%NI	4	22	25	43	7

35. I feel that it is my responsibility to help solve environmental problems. (N=1804, EL = 669, NI = 1135)

	SA	A	N	D	SD
%TP	11	42	33	12	3
%EL	17	46	25	11	1
%NI	8	39	37	13	4

Part Three

(Editor note: The questions in Part Three were used to develop a behavioral profile.)

Instructions for Part Three: For the following group of statements, please indicate how frequently you do each of the actions mentioned. Be honest, there are no right or wrong

37. I avoid purchasing products that are over-packaged. (TP = 1805, EL = 669, NI = 1136)

	AA	O	S	AN	N
%TP	4	11	41	26	17
%EL	6	14	40	28	13
%NI	4	9	42	26	20

38. I talk to people that I notice doing something that harms the environment in an effort to

43. If I see an aluminum can on the ground when I'm out walking, I pick it up and take it with me. (TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	8	15	31	24	22
%EL	12	18	31	23	17
%NI	6	13	31	25	24

44. I recycle paper, glass, and/or metal waste products at home or at school. (TP = 1805, EL = 669, NI = 1136)

	AA	O	S	AN	N
%TP	47	25	16	6	5
%EL	55	24	12	6	4
%NI	43	26	19	6	6

45. I avoid purchasing products that have a negative impact on the environment. (TP = 1804, EL = 668, NI = 1136)

	AA	O	S	AN	N
%TP	11	20	39	20	10
%EL	15	25	37	14	9
%NI	8	17	41	23	12

46. I talk to my family and friends about what they can do to help solve environmental problems. (N=1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	5	11	28	30	26
%EL	7	15	30	30	18
%NI	3	8	27	31	31

47. I write or call politicians to express my views about environmental issues. (TP = 1805, EL = 667, NI = 1138)

	AA	O	S	AN	N
%TP	1	3	8	15	72
%EL	1	3	10	18	68
%NI	1	3	7	14	75

48. I make a point of reading newspaper and magazine articles about the environment. (TP = 1806, EL = 668, NI = 1138)

	AA	O	S	AN	N
%TP	8	18	37	22	16
%EL	12	25	35	16	12
%NI	5	14	38	25	19

49. I purchase one product over another product because it is packaged in reusable, returnable, or recyclable containers or packages. (TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	9	20	36	20	16

[redacted]

(TP = 1806, EL = 669, NI = 1137)

	AA	O	S	AN	N
%TP	1	2	7	16	74
%EL	-	2	8	21	70
%NI	1	2	6	14	76

[redacted]

54. Having sharp thorns can help a plant by keeping animals from eating it. This is an example of (TP = 1798, EL = 668, NI = 1130)

%TP	%EL	%NI		
8	4	10	a)	mutualism.
70	80	63	b)*	adaptation.
6	4	7	c)	competition.
17	11	20	d)	commensalism.

55. All of the individual organisms that live on the ground in a particular forest share the same

11	12	10	a)	niche.
[illegible]	[illegible]	[illegible]	b)*	habitat.
7	4	9	c)	life-style.
5	3	7	d)	food source.

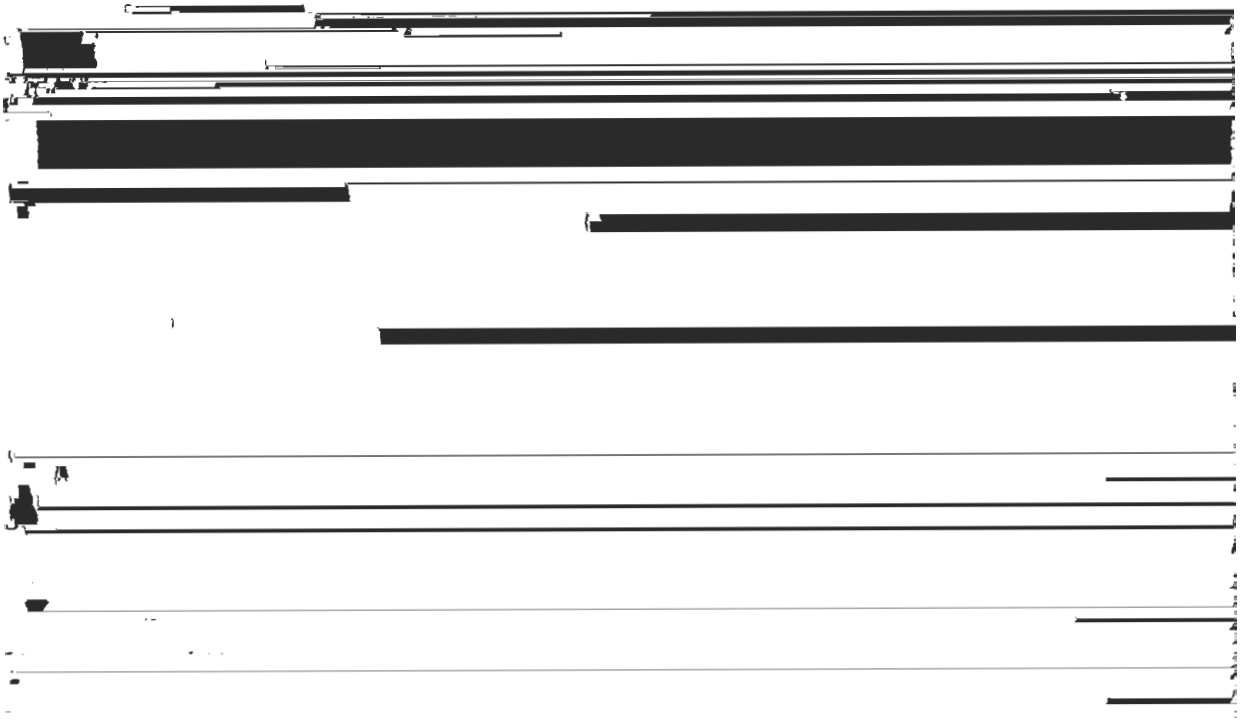
59. Based upon major ecological principles, we should conclude that (TP = 1795, EL = 664, NI = 1131)

%TP	%EL	%NI		
4	2	6	a)	humans are a climax species that will last indefinitely.
10	8	11	b)	the human species will soon become extinct; nothing
71	79	67	c)*	the human species will last as long as there is a balanced ecosystem that will support human life.
15	11	17	d)	there is no way of predicting what will happen to the human species; ecological principles do not apply to humans.

60. The process of photosynthesis in green plants (TP = 1794, EL = 666, NI = 1128)

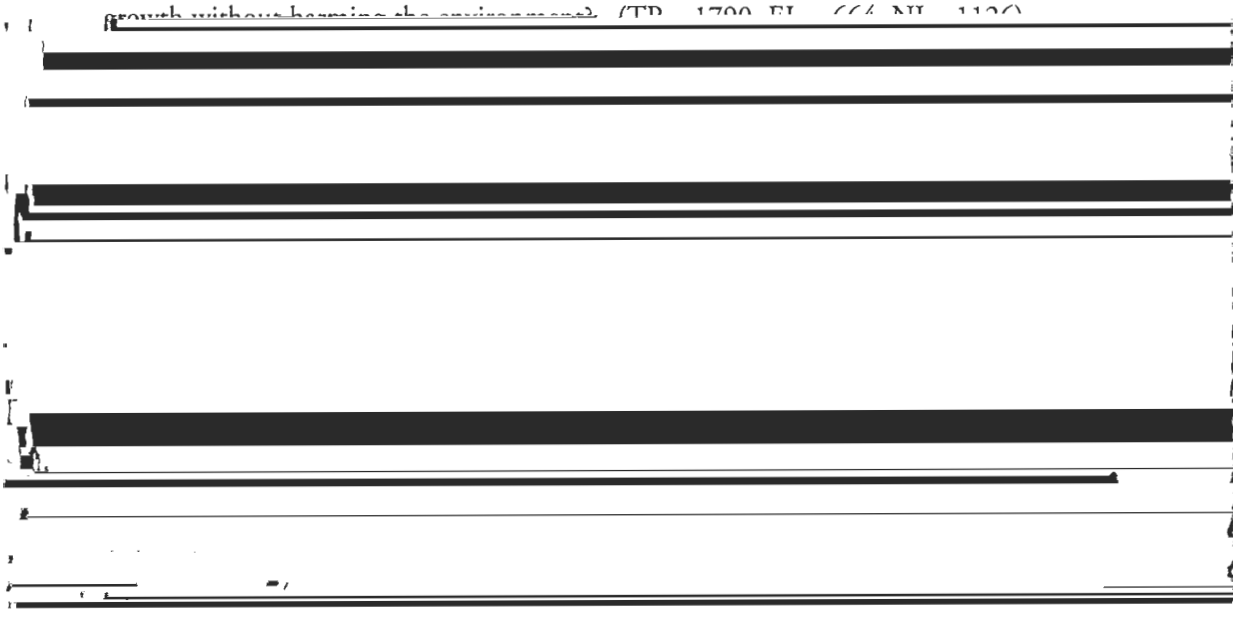
%TP	%EL	%NI		
18	14	21	a)	uses sunlight to burn energy in plants.
[illegible]			b)*	

63. A particular aquatic ecosystem is contaminated by a chemical which tends to remain stored in body fat. The highest concentration of this chemical would most likely be found in which group

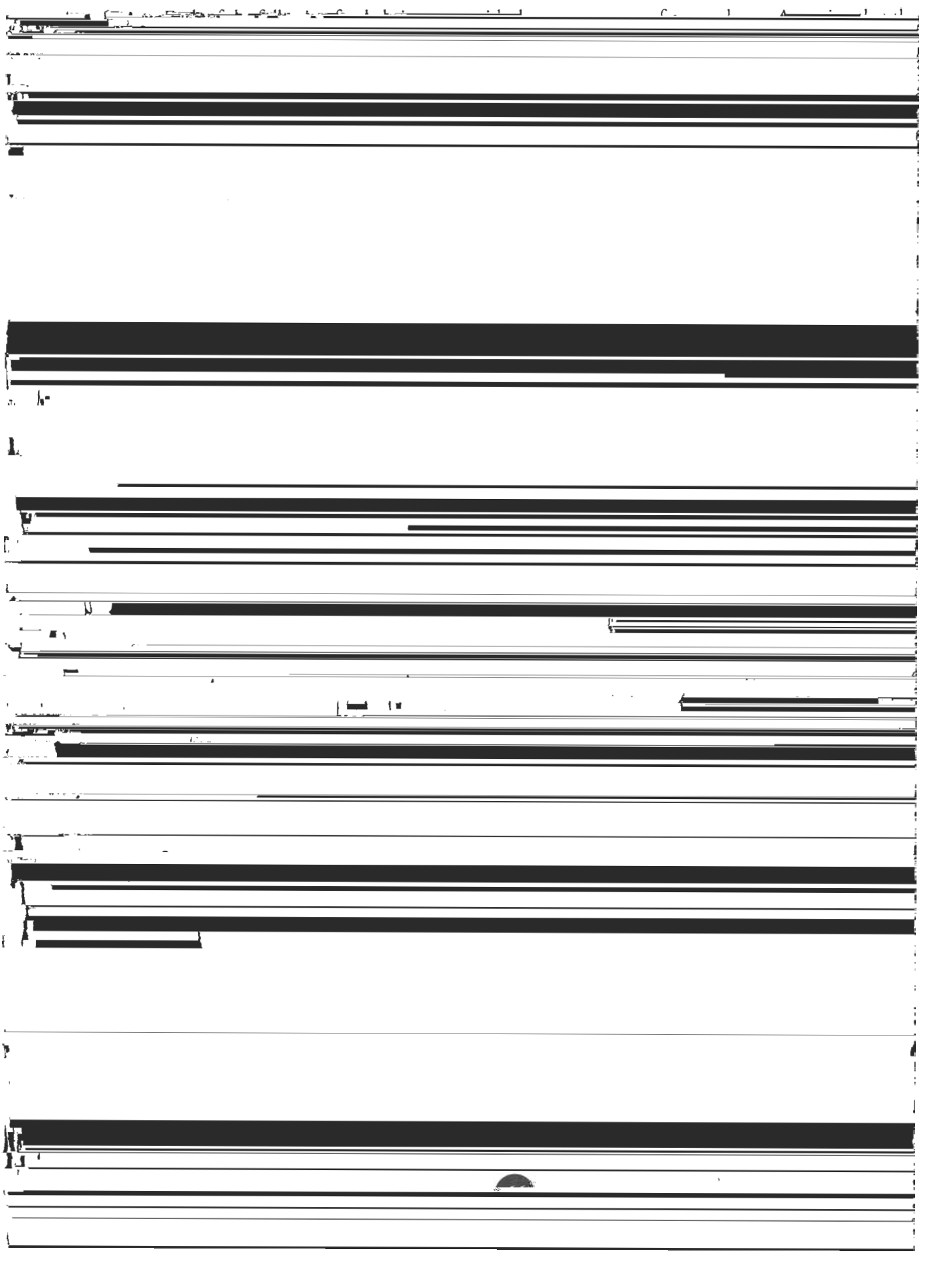


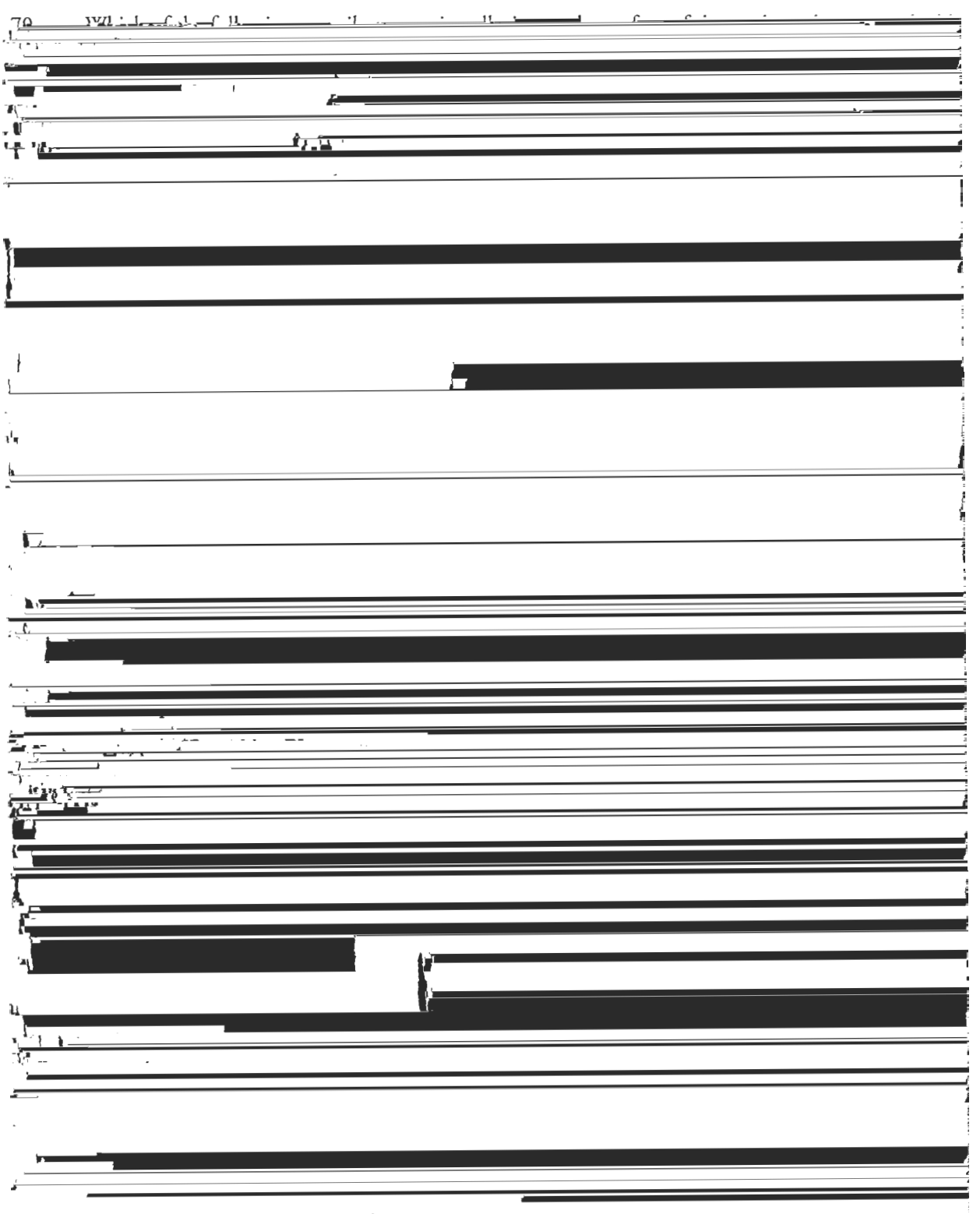
%TP	%EL	%NI		
16	11	19	a)	plant life
13	11	14	b)	minnows
28	25	30	c)	fish that eat insects and plants
43	52	37	d)*	fish-eating birds

64. Which of the following phrases refers to the potential ability of a system to support population growth without harming the environment? (TP = 1790, EL = 664, NI = 1126)



%TP	%EL	%NI		
32	44	24	a)*	[redacted]





%TP	%EL	%NI		
10	8	11	a)	nitrous oxide
13	12	13	b)	methane
65	67	63	c)*	ozone
13	13	13	d)	sulfur dioxide

[redacted]

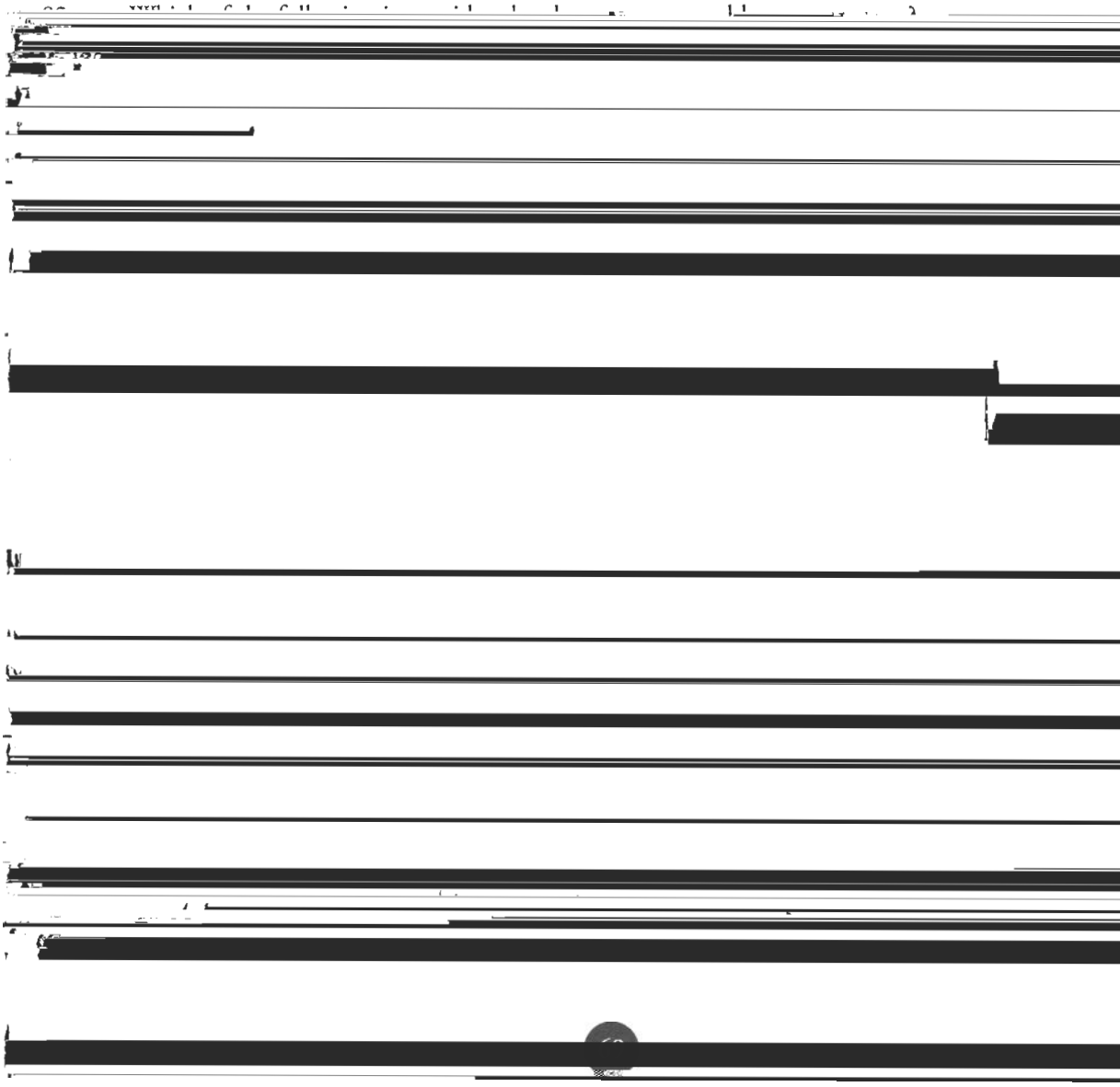
%TP	%EL	%NI		
44	56	37	a)*	habitat alteration by humans.
17	13	19	b)	the illegal poaching or collecting of animals and plants.
28	25	31	c)	changes in the Earth's atmosphere due to human activities

80. Which of the following results in the most serious waste or loss of our usable water? (TP = 1786, EL = 662, NI = 1124)

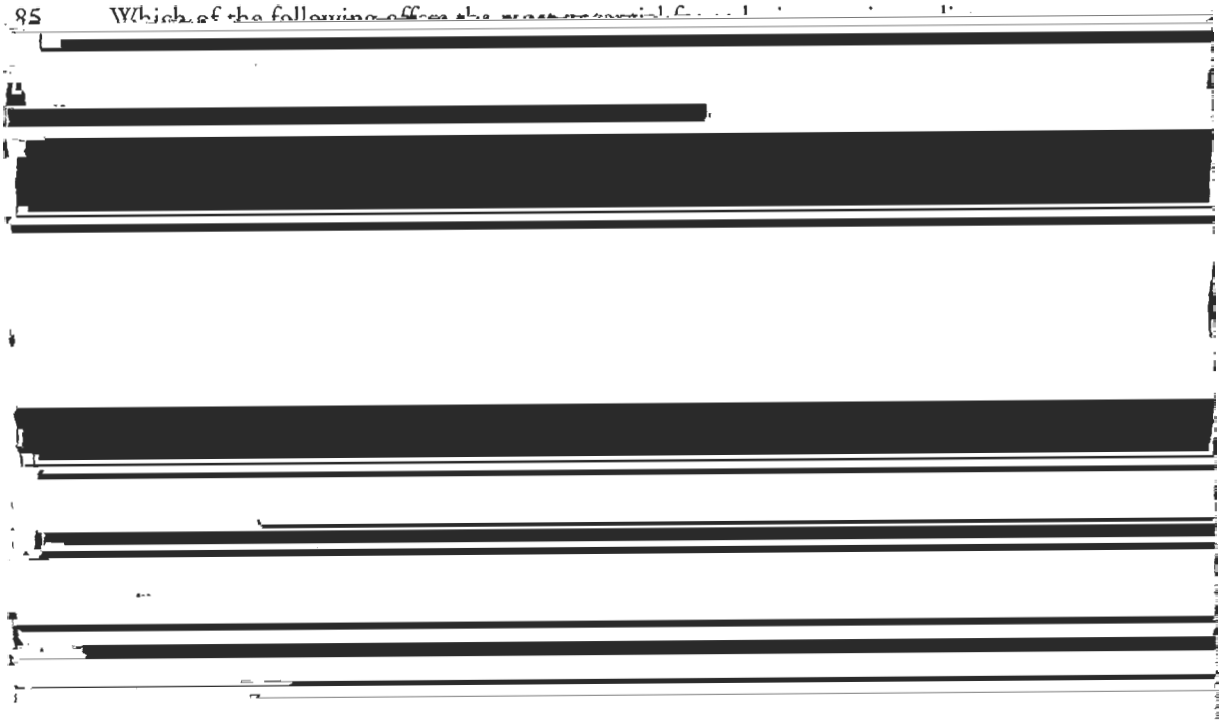
%TP	%EL	%NI		
24	22	25	a)	contamination by bacteria
22	20	22	b)	uncontrolled drainage
44	48	42	c)*	careless usage
10	8	11	d)	improper storage

81. Which of the following would be most likely to result in soil erosion? (TP = 1801, EL = 666, NI = 1135)

%TP	%EL	%NI		
11	7	13	a)	an increase in nutrients added to the soil
55	68	48	b)*	the removal of vegetation
18	13	21	c)	contour plowing of hillsides
16	11	18	d)	aeration of the soil by bacteria



85 Which of the following offers the most essential [illegible]



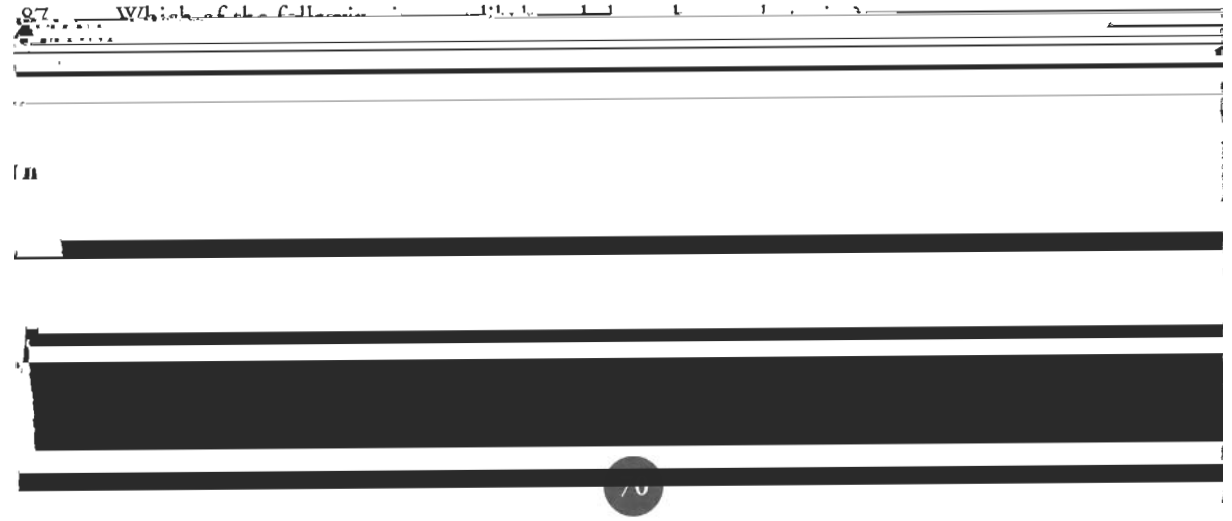
problems? (TP = 1780, EL = 664, NI = 1116)

%TP	%EL	%NI		
17	14	18	a)	geothermal power
59	67	54	b)*	energy conservation
13	10	14	c)	biomass conversion
12	9	13	d)	tidal power

86. Having your household water tested is important if (TP = 1786, EL = 662, NI = 1124)

%TP	%EL	%NI		
7	5	8	a)	you live in an old house.
12	8	14	b)	your water comes from a well.
6	4	7	c)	you live in an agricultural area.
76	84	71	d)*	all of the above.

87. Which of the following [illegible]



Summary of Response Frequencies and Means
1992 Environmental Education Survey of Wisconsin Teachers

SECTION I

1. How many years have you been teaching in your current district? N=914

1.	1 to 5 years (n=262; 28.6%)	3.	11 to 15 years (n=129; 14.1%)	5.	21 to 25 years (n=147; 16.1)

[redacted]

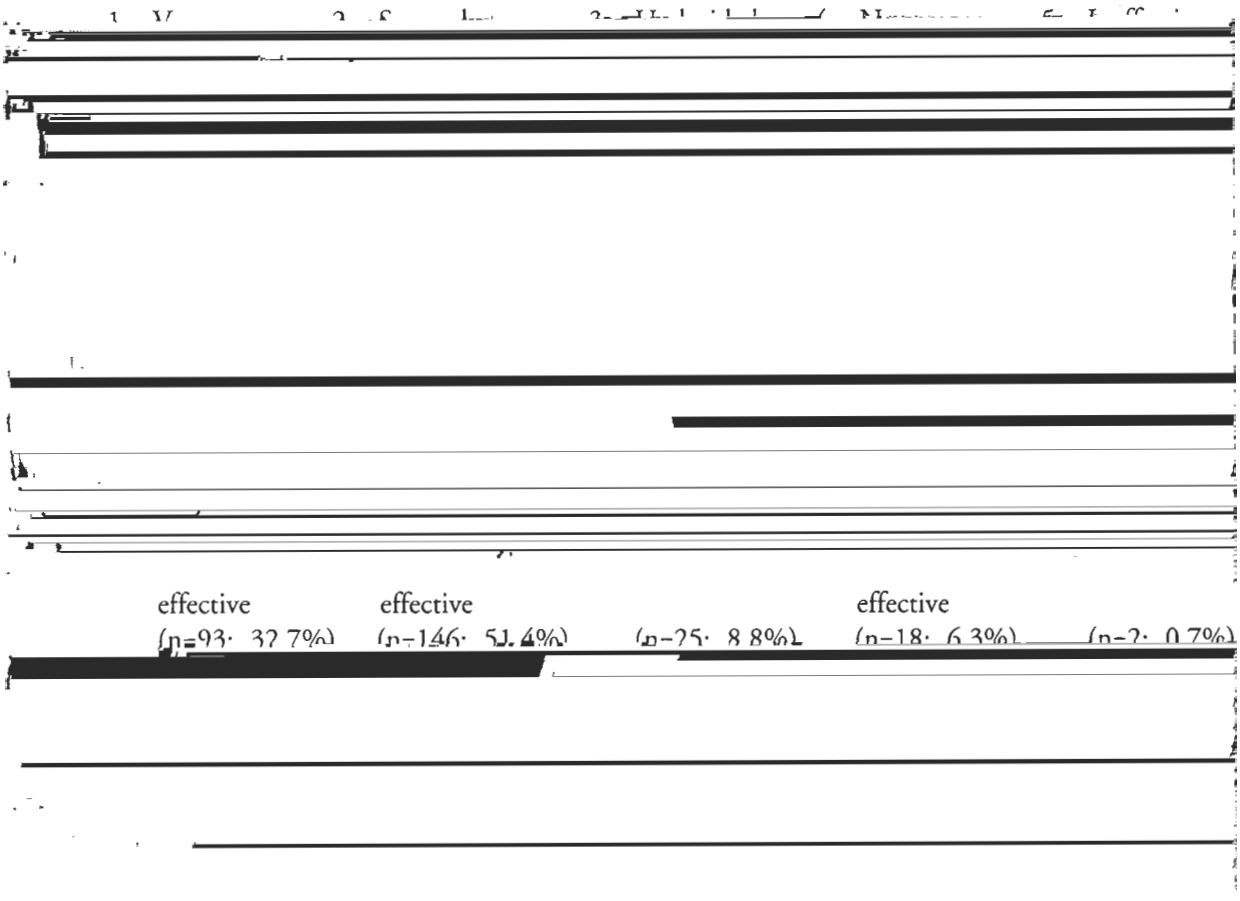
2. In total, how many years have you been teaching? N=915

1.	1 to 5 years (n=155; 16.9%)	3.	11 to 15 years (n=139; 15.2%)	5.	21 to 25 years (n=158; 17.3%)
2.	6 to 10 years	4.	16 to 20 years	6.	Over 25 years

[redacted]

9. Fill in the number of courses you have taken. (See page 85 for results)

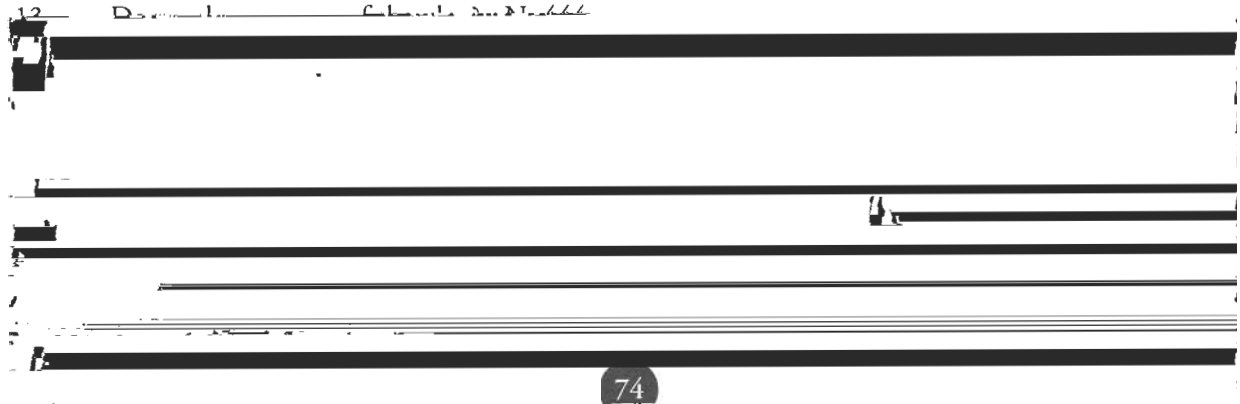
10. Rate the general value of the EE course(s) with regard to effectiveness in preparing you to teach about the environment. N=284



11. What grade level or subject area do you teach? (See page 86 for summary of responses and also grade level/subject area relationships to questions 3, 5, and 14.)

12. Does your school district have a written EE curriculum plan? N=905

1. Yes (n=271; 29.9%)
2. Not sure (n=476; 52.6%)
3. No (n=158; 17.5%)



16 Please indicate which ONE statement best represents the situation which would influence you

the most to infuse environmental concepts into your classroom teaching. (Choose only one)

6.	A goal of my teaching is to increase students' level of environmental responsibility. N = 625; M = 4.16; SD = 0.83	215 34.4	345 55.2	27 4.3	28 4.5	10 1.6
7.	Teachers should provide students with opportunities to gain actual experience in resolving environmental issues. N = 626; M = 4.14; SD = 0.71	179 28.6	374 59.7	61 9.7	5 0.8	7 1.1
8.	Teachers should help students develop a set of values and feelings of concern for the environment. N = 627; M = 4.43; SD = 0.68	315 50.2	286 45.6	15 2.4	4 0.6	7 1.1
9.	I am/was actively involved in helping to					

14. For each subject that you teach, approximately how much time per week do you spend teaching about the environment? N=620

1. Less than 30 minutes (n=461; 74.4%)
2. 31 minutes to 60 minutes (n=119; 19.2%)
3. 61 minutes to 90 minutes (n=23; 3.7%)
4. 91 minutes to 120 minutes (n=7; 1.1%)
5. 121 minutes to 150 minutes (n=6; 1%)
6. 151 minutes to 180 minutes (n=1; 0.2%)
7. 181 minutes to 210 minutes (n=1; 0.2%)
8. 211 minutes to 240 minutes (n=1; 0.2%)
9. Over 240 minutes (n=1; 0.2%)

15. For all subjects that you teach combined, approximately how much time per week do you spend teaching about the environment? N=618

1. Less than 30 minutes (n=261; 42.2%)
2. 31 minutes to 60 minutes (n=206; 33.3%)
3. 61 minutes to 90 minutes (n=79; 12.8%)
5. 121 minutes to 150 minutes (n=14; 2.3%)
6. 151 minutes to 180 minutes (n=8; 1.3%)
7. 181 minutes to 210 minutes (n=8; 1.3%)
8. 211 minutes to 240 minutes (n=2; 0.3%)
9. Over 240 minutes (n=6; 1%)

16. Indicate how many of the above methods you feel are valuable for teaching about the environment. N=620

[redacted]

2.	3 - 5	(n=34; 5.5%)
3.	6 - 8	(n=60; 9.7%)
4.	9 - 11	(n=82; 13.2%)
5.	12 - 14	(n=117; 18.9%)
6.	15 - 18	(n=322; 51.9%)

17. For question 17, please do the following two things:

[redacted]

effectively to teach students about the environment.

[redacted]

19.	As a result of attending my class, students are more knowledgeable of ecological foundations and environmental issues. N = 624; M = 3.65; SD = .85	70 11.2	337 54	163 26.1	38 6.1	16 2.6
20.	I am effective at teaching students the skills needed to resolve environmental issues. N = 619; M = 3.39; SD = .80	40 6.5	241 38.9	270 43.6	59 9.5	9 1.5
21.	As a result of attending my class, students are more aware of the impact their individual behaviors have on the environment. N = 603; M = 3.98; SD = .82	117 19.4	386 64	80 13.3	13 2.2	7 1.2
22.	My pre-service teacher education effectively prepared me in using cognitive education methods to teach students about the environment. N = 157; M = 3.19; SD = 1.09	10 6.4	70 44.6	27 17.2	39 24.8	11 7
23.	My in-service or post-graduate courses effectively prepared me in using cognitive education methods to teach students about the environment. N = 251; M = 3.63; SD = .89	29 11.6	135 53.8	56 22.3	26 10.4	5 2

SECTION IV

Affective Education Methods

This section refers to the use of affective education methods which can be used to examine attitudes and

24. Indicate how many of the above approaches you feel are valuable for helping students examine attitudes and values pertaining to environmental issues. N=578

1.	1	(n=9; 1.5%)
2.	2	(n=21; 3.6%)
3.	3	(n=65; 11.1%)
4.	4	(n=99; 17%)
5.	5	(n=81; 13.9%)
6.	6	(n=57; 9.8%)
7.	7	(n=123; 21.1%)
8.	Not sure	(n=123; 21.1%)

25. For question 25, please do the following two things:

effectively to help students examine attitudes and values pertaining to

Tabulation of methods perceived used effectively: N=503

1. Sensory or awareness activities (n=424)
5. Inculcation (n=65)

7. I may have used these methods, but do not know them by these names. (n=111; 34.3%)
8. My school district doesn't allow values education. (n=4; 1.2%)
9. None of the above. (n=68; 21%)

		SA	A	U	D	SD
27.	As a result of being in my class, students better understand the roles that values play in environmental issues. N = 599; M (mean) = 3.52; SD = .82	42 7	302 50.4	202 33.7	37 6.2	16(n) 2.7(%)
28.	I believe students are more sensitive toward the environment as a result of attending my class. N = 605; M = 3.80; SD = .73	68 11.2	387 64	125 20.7	14 2.3	11 1.8
29.	[redacted] beliefs, attitudes, and values regarding	37	298	232	22	14
	[redacted] my class. N = 603; M = 3.53; SD = .77					

[redacted]

Ecomanagement The process of taking physical action toward the environment for [redacted]

34. Please indicate the MAIN reason you have not involved your students in one or more of the above actions. (Choose only one)

1.	There is no time	(n=70; 21.9%)
2.	It is inappropriate for of the grade level	(n=79; 24.8%)
3.	I do not have the knowledge	(n=63; 19.7%)
4.	These actions are not related to subject	(n=49; 15.4%)
5.	My administration does not support	(n=3; 0.9%)

[redacted]

	SA	A	U	D	SD
[redacted]					
aware of the need to become involved in	39	275	212	62	14 (n)
[redacted]					

[redacted]

N = 602; M (mean) = 3.44; SD = .85

36. As a result of taking my class, students have

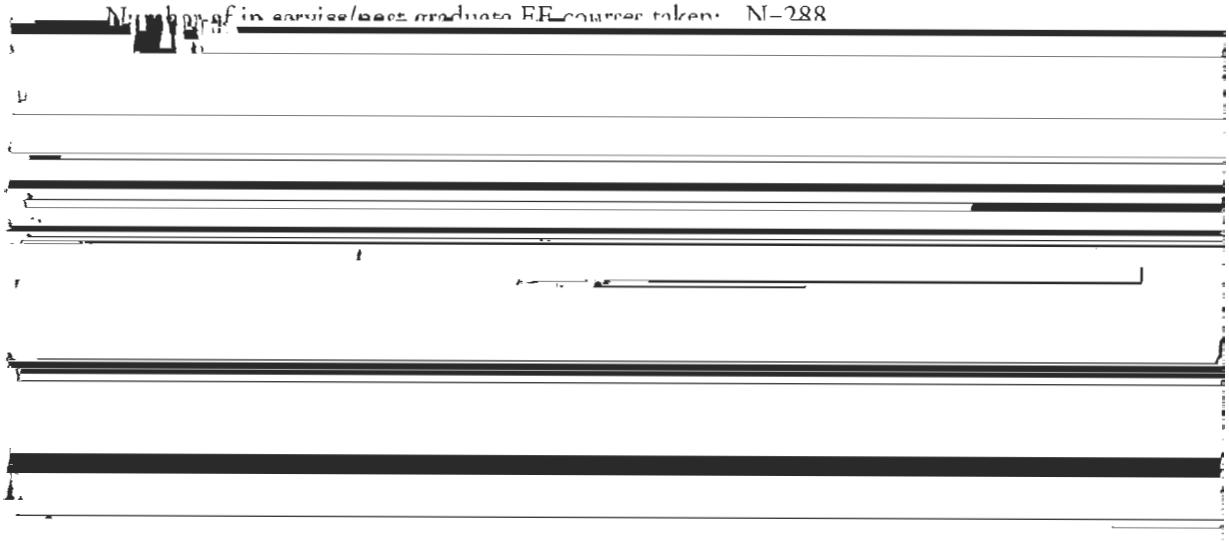
gained actual experience in resolving	35	229	156	144	35
[redacted]					

Name of University where rec'd EE training		Does Infuse			Doesn't Infuse		
[redacted]							
UW La Crosse	(n=17; 11.1%)	15/88	6	9	2/12	0	2

Universities where received EE training con't. (Results of question #6)	Does Infuse n/%	Pr 85	Po 85	Doesn't Infuse n/%	Pr 85	Po 85
Mt. Senario College	1/100	1	0	0/0	0	0
Outagamie Teachers College	1/100	1	0	0/0	0	0
Racine/Kenosha Teachers College	1/100	1	0	0/0	0	0
Sheyboygan Teachers College	1/100	1	0	0/0	0	0
Silver Lake College	1/100	1	0	0/0	0	0
Taylor County	1/100	1	0	0/0	0	0
UW Center Baraboo	1/100	0	1	0/0	0	0
UW Center Baron	1/100	1	0	0/0	0	0
UW Center Washington	1/100	0	1	0/0	0	0
UW Parkside	1/100	1	0	0/0	0	0
UW Stout	1/100	0	1	0/0	0	0

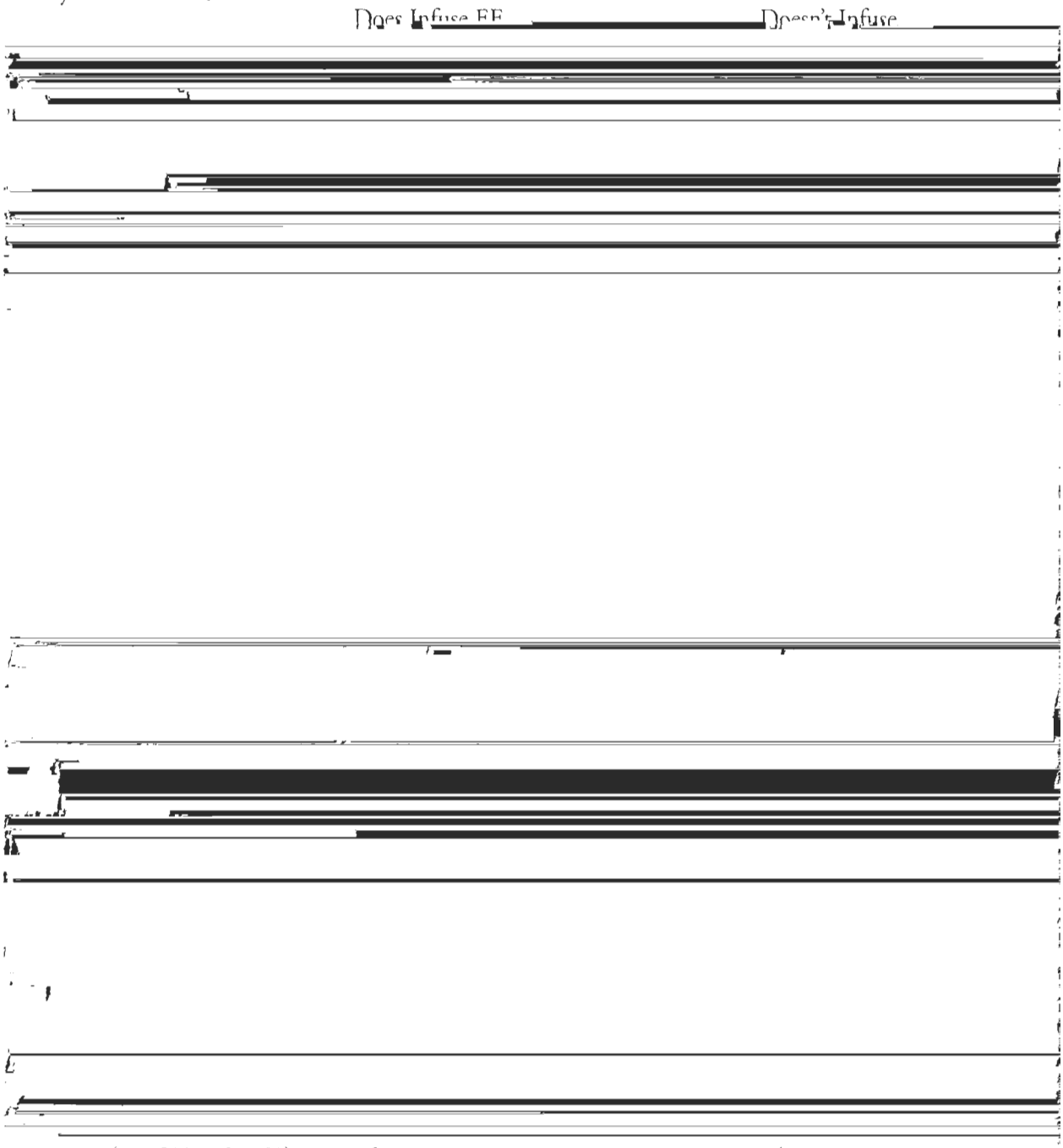
Results from question #9:

Number of in service/post graduate EE courses taken: N=288



2	(n=75; 26%)
3	(n=34; 11.8%)
4	(n=18; 6.3%)
5	(n=13; 4.5%)

Results from question #11:
What grade level or subject
do you teach? N=906



	(n = 517; 57.1%)	76				24			
2.	Science	66	51	15	9	4	1	3	2
	(n = 70; 7.7%)	94				6			
3.	Social Sciences	23	18	5	3	8	7	1	1
	(n = 31; 3.4%)	74				26			
4.	Language Arts	32	18	14	2	31	21	10	0
	(n = 63; 7%)	51				49			

Summary of Response Frequencies and M

1994 Environmental Education Survey of Wisconsin School Administrato

1994 Environmental Education Survey of [redacted]s

Editor Note: The following data was compiled from two environmental education surveys, one sent to Wisconsin public school principals and the other sent to directors of curriculum in February of 1994. Although questions on each survey were virtually identical, principals answered questions based on the situation in their school and directors of curriculum reported on the situation in their district. In this summary, the term "school/district" is used to indicate that the word "school" appeared in the principal survey and "district" appeared in the survey to directors of curriculum. Some other symbols in this survey are defined as follows:

principal/director of curriculum = the word "principal" appeared on the survey to principals and

3. Please indicate which population you supervise or work with the most.

		(N=901)		(N=199)	
		n	%	n	%
1.	elementary personnel (K-8)	491	54.5	13	6.5
2.	middle school/jr. high personnel (6-9)	136	15.1	—	—
3.	secondary personnel (9-12)	212	23.5	4	2.0
4.	personnel from all grade levels	31	3.4	173	86.9
5.	middle/secondary teachers	31	3.4	—	—
6.	other administrative staff	—	—	9	4.5

4. Please estimate the number of environmental education workshops you have attended.

		Principal (N=901)		Director of Curriculum (N=199)	
		n	%	n	%
1.	none	203	22.6	40	20.1
2.	1 - 2	368	40.9	95	47.7
3.	3 - 4	191	21.2	41	20.6
4.	5 - 6	44	4.9	11	5.5
5.	more than 6	93	10.3	12	6.0

For questions #5 through #14, administrators were asked to indicate their opinion about the following statements. In this summary P = principals; DC = directors of curriculum.

			strongly disagree		disagree		undecided		agree		strongly agree	
			P	DC	P	DC	P	DC	P	DC	P	DC
5.	build student awareness and sensitivity to the total (human and natural) environment.	n	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		%	.2	.5	.3	.5	.8	.5	34.4	34.7	64.3	63[illegible]
13.	[illegible] the environment should be infused into the existing curricula in my school	n	5	3	12	1	44	1	419	78	418	116
		%	.6	1.5	1.3	.5	4.9	.5	46.7	39.2	46.5	58.3
14.	[illegible] about the environment should be taught as a separate subject in my school	n	261	62	348	79	153	22	86	28	[illegible]	[illegible]
		%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[redacted]

15. How many students are in your district? Principals Directors of Curriculum

19.- Does your school have a person designated as the environmental education specialist, coordinator or chairperson? -

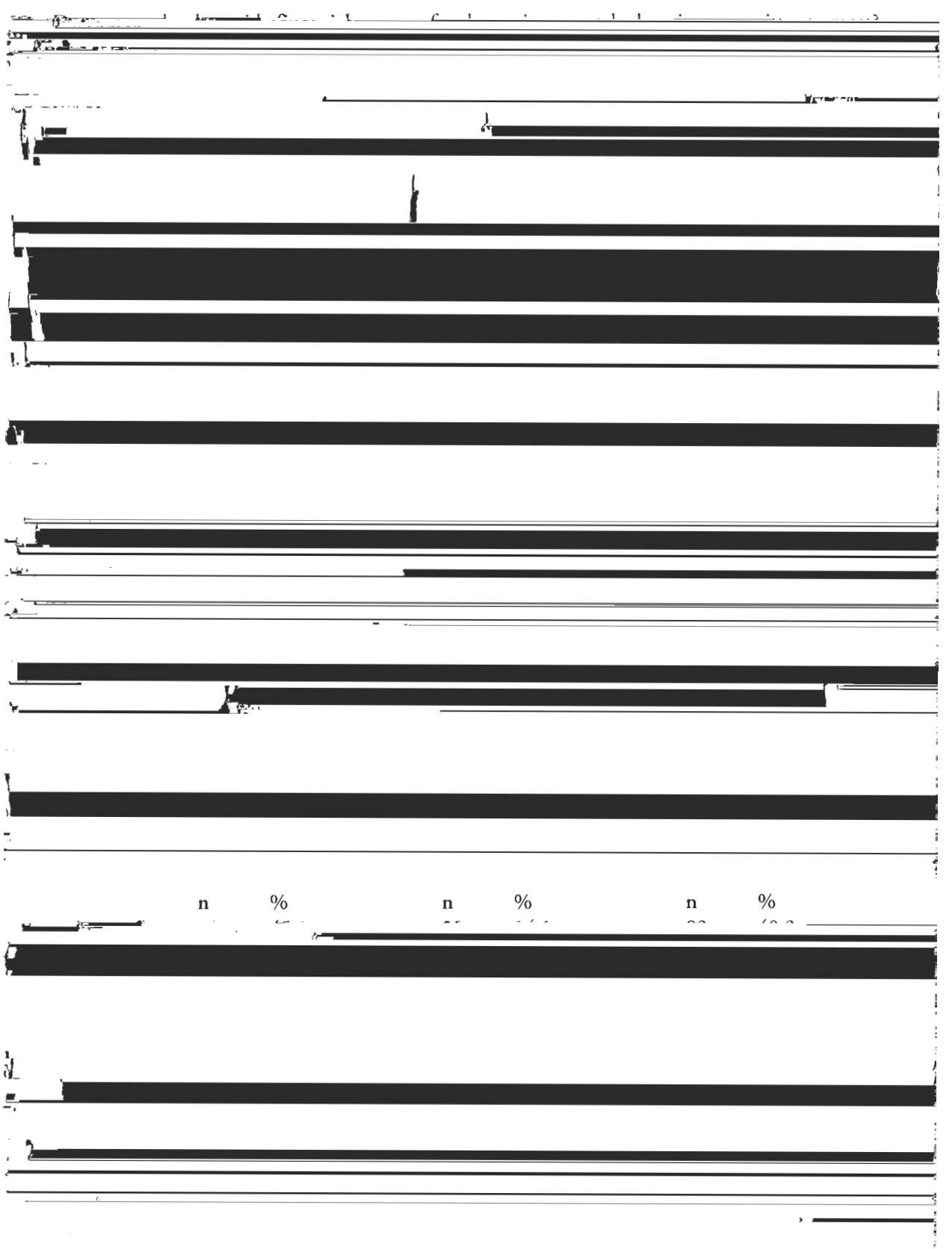
	1. Yes		2. Not sure		3. No	
	n	%	n	%	n	%
P (N=898) -	369	41.1	75	8.4	454	50.6

20 - Please circle the response which most accurately describes the position:-

[redacted]

1.	full time, paid position	32	8.8
2.	part time, paid position	70	19.2
[redacted]			
4.	voluntary position with no release time	200	54.9

[redacted]



	n	%	n	%	n	%
DC (N=65)	39	60.0	2	3.1	24	36.9

25. How many environmental education courses/in-services has your school or school district offered for

28. In your **best estimate**, approximately how much time **per week** does the average teacher in your

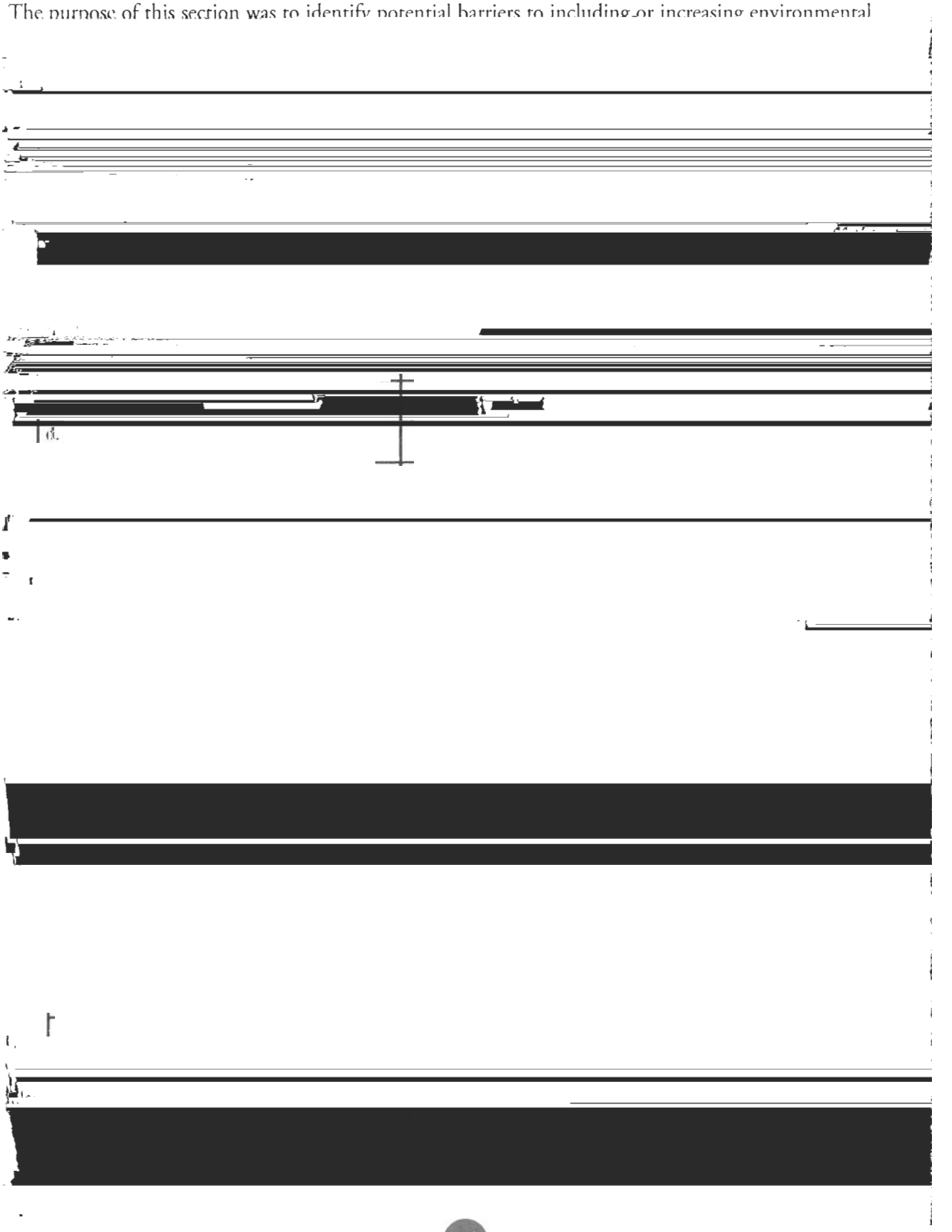
[redacted]

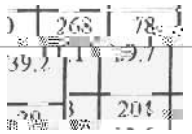
		n	%	n	%
1. Less than 30 minutes		483	54.2	78	39.2
2. 31 minutes to 60 minutes	(1 hour)	254	28.5	68	34.2
3. 61 minutes to 90 minutes	(1 1/2 hours)	36	4.0	7	3.5
4. 91 minutes to 120 minutes	(2 hours)	13	1.5	2	1.0
5. 121 minutes to 150 minutes	(2 1/2 hours)	2	.2	1	.5
6. 151 minutes to 180 minutes	(3 hours)	-	-	1	.5
7. 181 minutes to 210 minutes	(3 1/2 hours)	-	-	-	-
8. 211 minutes to 240 minutes	(4 hours)	1	.1	-	-
9. Over 240 minutes	(more than 4 hours)	2	.2	-	-
10. Don't know		100	11.2	42	21.1

SECTION III

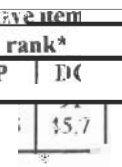
The purpose of this section is to obtain information about administrators' general support for EE. For the

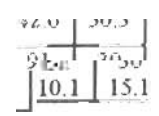
The purpose of this section was to identify potential barriers to including or increasing environmental



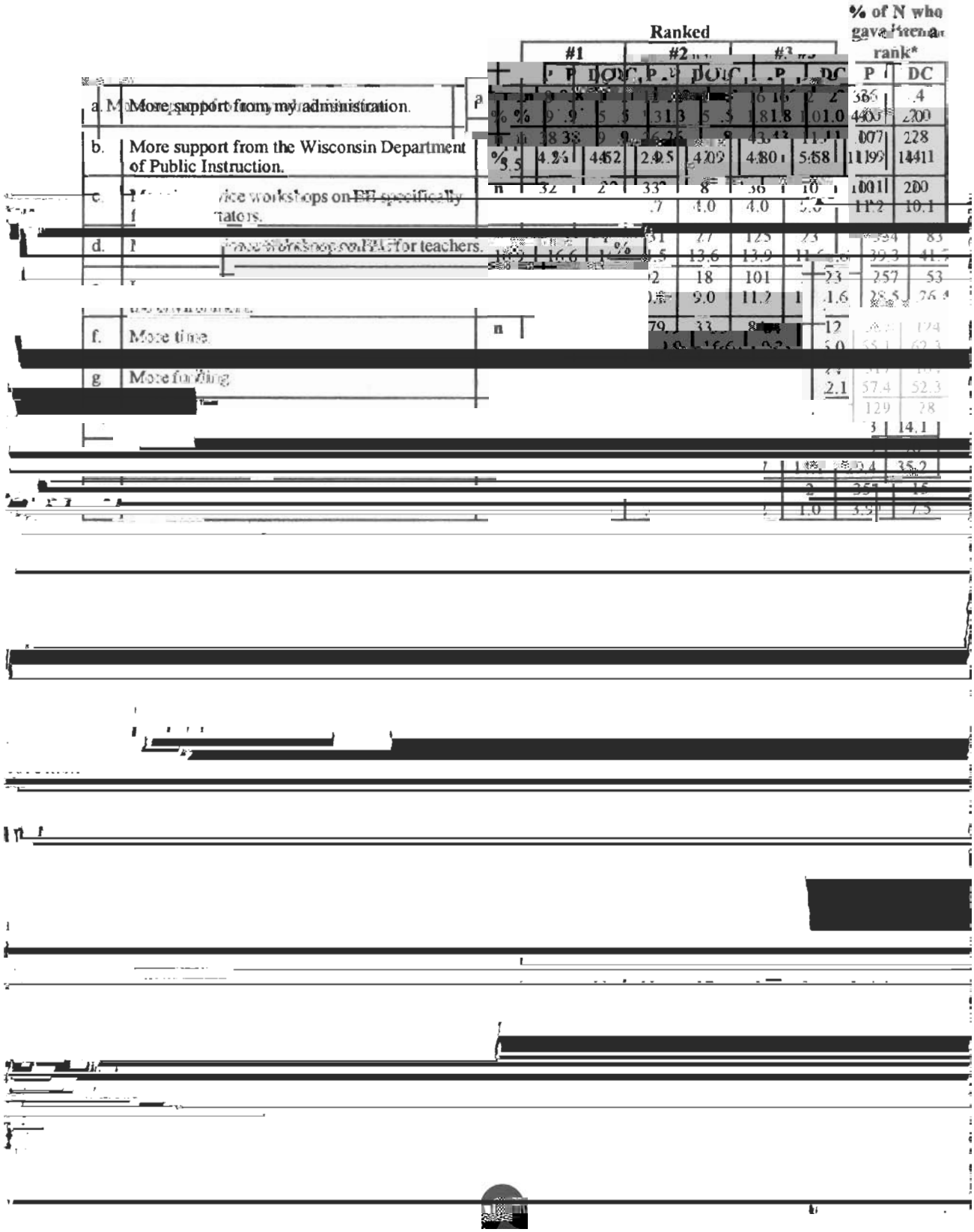


P	DC	P	DC	P	DC	P	DC





41. Please indicate the top <u>three</u> statements which **BEST** represent the situation that would most influence you to include or increase environmental education in your school. Put a "1" in the box corresponding to the most influential situation, a "2" in the box corresponding to the second most influential situation, etc.



Instrument Development Framework

Student Environmental Literacy Assessment

I. AFFECTIVE LEARNING OUTCOMES

A. Environmental Sensitivity/Awareness

B. Positive Attitudes and Values for the Prevention and Remediation of Environmental Problems and Issues Regarding:

1. Air Quality

[redacted]

3. Soil Quality and Quantity
4.. Wildlife and Habitat
5. Energy

II. PER[illegible]NTALLY RESPONSIBLE BI[illegible]

6. Human Population and Health
7. Waste
8. General Attitude Towards Environmental Problems

III. BE[illegible]SPECTIVES ON ENVIRONMENTALLY [illegible]ONSI[illegible]EHAVIOR

A. Locus of Control
B. Assumption of Personal Responsibility

[illegible] BEHA[illegible]ORAL LEARNING OUTCOMES

[redacted]

IV.

[redacted]

D. Political Action

2. Change and Limiting Factors

   a. Change as a natural process

   b. Biotic and abiotic limits to growth, size, and distribution of populations

3. Energy Flow

   b. Transfer of energy through living systems

   c. First and second laws of energy (conservation of energy, entropy)

   d. Need for a consistent source of energy by systems and individuals

   e. Photosynthesis and respiration

4. Biogeochemical Cycling

   a. Conservation of matter; nutrient and materials cycling

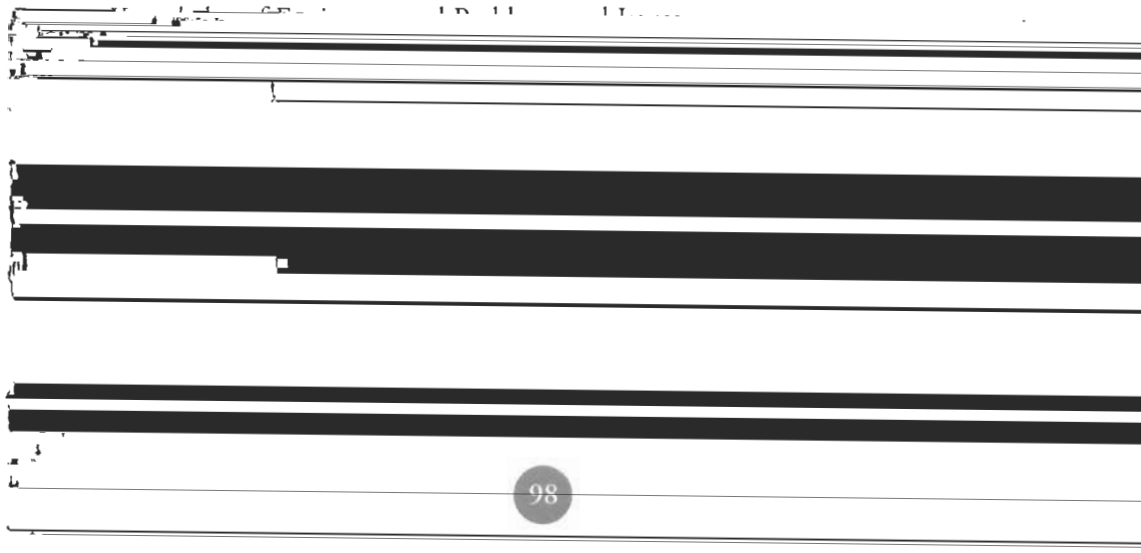
   b. Hydrologic cycle

5. Ecosystems and Biodiversity

   a. Importance of biodiversity

   b. Interdependence of organisms

   c. Ecosystems



6. Human Population and Health
    a. Overpopulation
    b. Environmental Health Hazards

7. Waste
    a. Solid Waste
    b. Hazardous Wastes

C. Knowledge of Environmental Issue Investigation and Action Strategies

1. Knowledge of strategies used to investigate environmental problems and issues
2. Knowledge of appropriate action strategies for the prevention or resolution of environmental problems and issues

Fifth Grade Environmental Literacy Assessment
Correspondence of Items to Instrument Development Framework

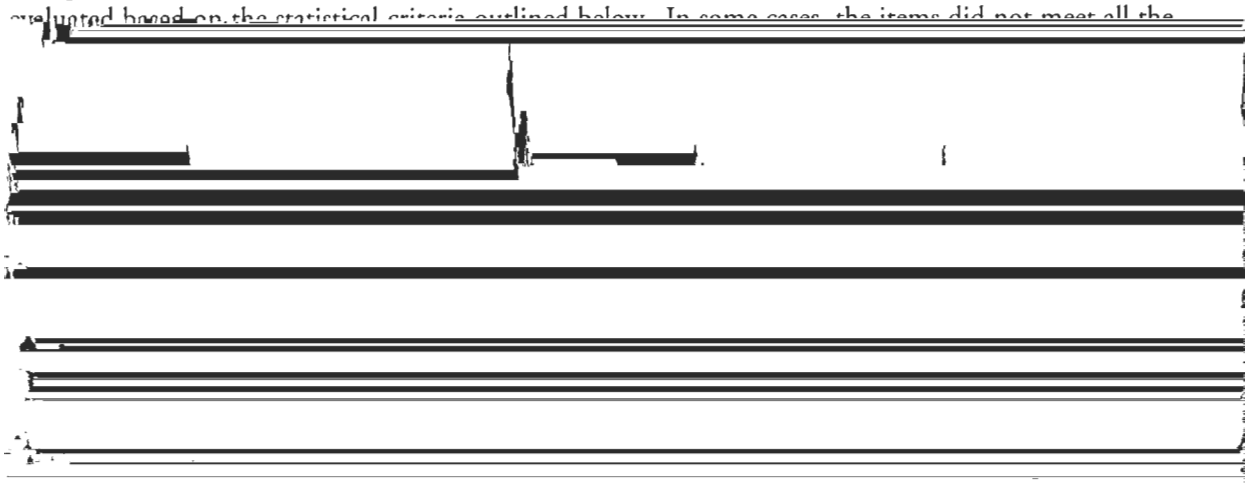
Instrument Development Framework	Item #s
I. AFFECTIVE OUTCOMES	
A. Environmental Sensitivity/Awareness	
B. Attitudes and Values for the Prevention and Remediation of Environmental Problems and Issues	[redacted]
[redacted]	
III. PERSPECTIVES ON ENVIRONMENTALLY RESPONSIBLE BEHAVIOR	
A. Locus of Control	20 - 22
[redacted]	
D.	
[redacted]	
A. Ecomanagement	27 - 29, 39, 40

Description of Item Analysis and Criteria Used for Selection of Items included in the Student Environmental Literacy Assessment Instruments

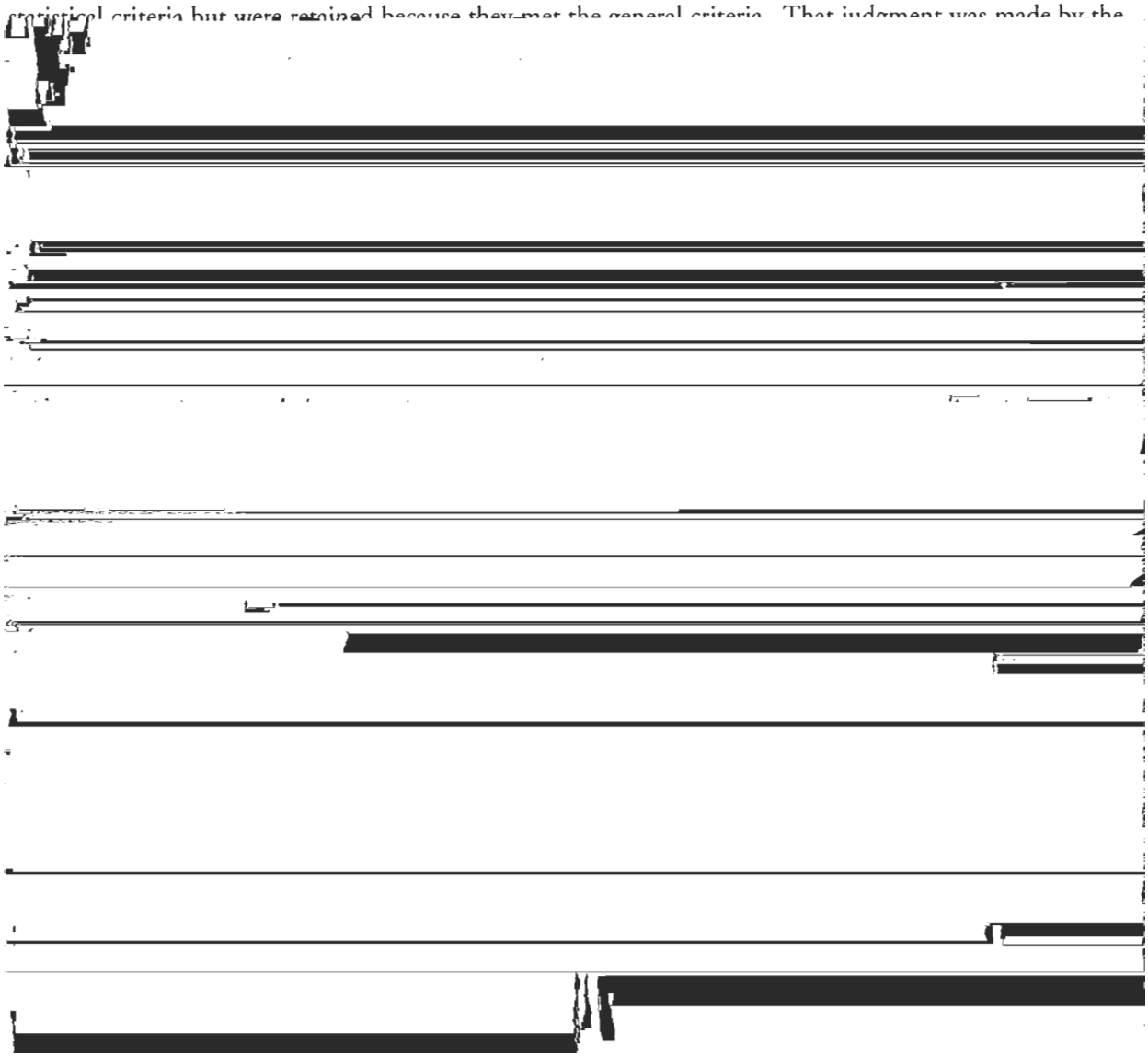
Item Analysis

Assembly of Final Instruments: Criteria for Inclusion of Items

After statistical data were obtained on the items and the subscales contained in the pilot instruments, the next procedure was to determine which items should be included in the final instrument. Items were evaluated based on the statistical criteria outlined below. In some cases, the items did not meet all the



statistical criteria but were retained because they met the general criteria. That judgment was made by the



Demographic Survey Given to Teachers Administering the Student Environmental Literacy Assessments

To the Administering Teacher:

Please answer the following questions regarding the students taking the Environmental Survey. This information is important in the analysis of the surveys and will be used to compile a final report to various state agencies. Please return this form with the student answer sheets in the prepaid envelope provided. Thank you for your cooperation!

1. What size community do **most** of the students live in? (please circle only one)

   a) rural or small town (population of community is less than 20,000)
   b) [redacted]
   c) large urban (population of community is more than 100,000)

2. Do you think the students in this class are representative of the students at this grade level in your [redacted]

   b) no
   c) not certain

3. We are trying to determine if students who are identified by their teachers as being 'environmentally [redacted]

Results of Teacher Survey t-test

Comparisons Between Teachers Who Have and Have Not Received In-service EE Training Relative to Their Perceived EE Competencies, Attitudes, and Class Time Spent

	N	n	M	SD	t	DF	Probability
Competencies							
Overall	527				3.32	525	.001
In-service		215	3.69	.58			
No In-service		312	3.52	.60			
Cognitive	591				3.67	589	.000
[redacted]							
No In-service		356	3.65	.64			
Affective	582				3.35	580	.001
In-service		228	3.74	.69			
No In-service		354	3.54	.68			
Actions	576				2.17	574	.030
In-service		227	3.26	.80			
No In-service		349	3.12	.81			
Attitudes	604				3.04	602	.002
[redacted]							
No In-service		368	4.09	.51			
Class Time							
Item 13	615				4.15	613	.000
In-service		238	2.18	1.06			
No In-service		377	1.85	.91			
Item 14	604				3.37	602	.001
In-service		235	1.53	1.13			
No In-service		374	1.29	.62			
Item 153	607				3.43	605	.001
In-service		233	2.35	1.59			
No In-service		374	1.94	1.34			

Results of Teacher Survey t-test

Comparisons Between Teachers Whose Districts Have and Do Not Have EE Curriculum Plans Relative to Their Perceived EE Competencies, Attitudes, and Class Time Spent

	N	n	M	SD	t	DF	Probability
Plan		170	3.77	.55			
No Plan		267	3.58	.53			
Attitudes	507				.03	505	.978
Plan		202	4.18	.63			
No Plan		305	4.17	.50			
Class Time							
Item 13	514				4.16	512	.000
Plan		202	2.31	1.06			
No Plan		312	1.94	.93			
Item 14	509				1.05	507	.296
Plan		201	1.46	.88			
No Plan		308	1.37	.89			
Item 153	507				2.85	505	.005
Plan		200	2.36	1.46			
No Plan		307	2.00	1.31			

Chi-square comparisons between principals who have not attended any environmental education courses, in-services or workshops and those who have attended 3 or more EE courses relative to

	3 or	c^2	d.f.	p =