Environmental Attitudes, Knowledge and Behaviors of Surveyed Residents of Pickens County, SC





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Executive Summary

The Pickens Countywide Stormwater Consortium and Clemson's Carolina Clear program conducted a survey of Pickens County residents from October-December 2010. The primary goal of the survey was to assess the knowledge and attitudes of Pickens County residents toward stormwater and the environment, which could serve as the foundation for developing and measuring the future success of a targeted regional stormwater education program.

The sample consisted of 85 residents of Pickens County. Given the sample size, the margin of error is ± 11% at a 95% confidence level.

Brief Description of Sample

The sample of respondents differs somewhat from the general population of Pickens County. The survey respondents were 57% male and 39.2% female, compared with 49.8% females in the general population of Pickens County (numbers reported by U.S. Census Bureau). Of the survey respondents, 96.2% were Caucasian, compared with 90.2% of the general population of Pickens County. With respect to age, 32.9% of respondents were 65 years old and older, compared to 13.7% of the general population. The homeownership rate of Pickens County (in year 2000) was 73.5%, compared to 83.5% of survey respondents. The education level of residents completing the survey was slightly higher than the county average (19.1% having a Bachelor's degree or higher) with 36.7% having a Bachelor's degree or higher.

Summary of Findings

The summary below presents some research findings:

- Pickens County residents are concerned about water quality and place a high value on local waterways. 65% of respondents are "very concerned" and 30% are "somewhat concerned" about pollution in local waterways. More than 96% of respondents indicated water resources are important to the livelihood and quality of life in Pickens County.
- Residents have a basic understanding about various causes of poor water quality. 97.5% of respondents indicated that what people do on the land affects local water quality. Approximately 77% of respondents "strongly agreed" or "agreed" that inspection and pump out of septic tanks protects water quality but 16.5% indicated they did not know. Nearly 70% indicated they "strongly agreed" or "agreed" that pet waste is a source of bacteria pollution in local waterways. Nearly 80% of respondents did not believe that stormwater was treated before being discharged to local waterways.

Respondents were asked to rate the extent to which eight activities impacted local waterways. More than 50% of respondents indicated that each activity had "great impact" or "some impact"

with industrial sites, fertilizers and lawn care chemicals that people use on their lawns and gardens, and fuel and oil leaks from trucks, buses, or automobiles all above 85%.

Respondents were most likely to say the following sources of pollution had "very little impact" or "no impact" on water quality: runoff from people washing their cars (40.5%) and pet waste (35%).

- Concern is not equivalent to the level of knowledge regarding watersheds. Only 32.9% of respondents selected the most correct definition of a watershed.
- Pickens County residents are engaging in some environmentally responsible behaviors, although some residents are engaging in behaviors that could have a negative impact on water quality. In regards to driving a vehicle with a motor oil leak, disposing of oil, paint, or other chemicals in storm drains, dumping grass clippings or leaves down storm drains or backyard creeks, and storing fertilizers and pesticides in leaking containers, more than 90% of respondents indicated they "hardly ever" or "never" engage in the behavior or "does not apply". On the other hand, 34% of respondents said they "hardly ever" or "never" pick up after their pets while walking. 20% also indicated they "hardly ever" or "never" consider the likelihood of rain before treating the lawn with fertilizer or pesticide.
- Respondents use a variety of media to obtain local/regional information and news. The most frequently selected source of information was the TV-Evening News (74.7%). The internet and local newspaper were the next most frequently selected sources of information (45.6% and 34.2%). Billboards/posters and events/workshops were the least frequently selected sources (6.3% and 3.8%).

Project Goals

From early October through early December 2010, the Pickens County Stormwater Consortium and Carolina Clear conducted a survey of Pickens County residents. Information gleaned from the survey describes the current level of knowledge that surveyed Pickens County residents possess concerning stormwater. Collecting information about existing knowledge and attitudes toward stormwater and the environment will allow for an education program to be planned and tailored to the needs of Pickens County residents.

Specific survey objectives include:

- 1. To gauge the level of concern of residents of Pickens County about local water quality and environmental issues
- 2. To evaluate the level of knowledge of Pickens County residents concerning certain behaviors and practices that affect local water quality
- 3. To gather information surrounding household behaviors of Pickens County residents that may affect local waterways

The responses collected will aid surveyors in formulating a baseline understanding of Pickens County residents concerning environmental and water quality issues. This baseline will provide a starting point from which a specific and intentional education program can be designed and by which future success can be measured.

Methodology

This research effort consisted of surveys of Pickens County residents conducted in person at the Pickens County Flea Market as well as at two voting precincts in Pickens County on Election Day. Some survey responses were also collected via email and over the internet. All survey respondents were residents of Pickens County, South Carolina. A copy of the survey can be viewed in Appendix A. Clemson University's Institutional Review Board granted permission for human subject research to take place.

The sample size of 85 Pickens County residents allows the survey results to estimate with a margin of error of \pm 11% at a 95% confidence level. This means that the survey results are within about 11% of capturing the true results for all Pickens county residents. Survey data was collected from the following Pickens county zip codes:

29671	29640	29642	29657	29682	29631
29685	29630	29611	Other		

Most of the 10-15 minute surveys were conducted in person by one of two interviewers, either on an iPad or with a paper copy of the survey. Interviewers conducted surveys with willing participants at the

Pickens County Flea Market between 7:00 a.m. and 9:00 a.m. during the month of October. Surveys were also conducted on Election Day (November 2) at the following polling locations that were preapproved by the Pickens County Registration and Elections Committee:

Poll #129 Liberty 1 First Baptist Church 403 Edgemont Ave Liberty, SC 29657

Poll # 121 Pickens 1 Crescent Hill Baptist Church 115 Crescent Hill Road Pickens, SC 29671

Several additional guidelines were specified by the Pickens County Registration and Elections Committee to be followed while interviewing at voting precincts:

- 1. No solicitation inside a polling place
- 2. Restrict solicitation to voters as they leave the polling place
- 3. Establish the point of solicitation to one side of the flow of voters to and from the polling place
- 4. Advise the Precinct Clerk of your plans to solicit responses to the questionnaire from the voters

Conducting surveys at the above listed voting precincts ensured that all survey participants were residents of Pickens County.

Data Analysis

Descriptive statistics were used to summarize important results from the survey data. Data gathered for each question was sorted and relative frequencies were created to better understand and analyze the information. Summary statistics are discussed in further detail in the section below.

Sociodemographic Characteristics of Respondents

The sample of respondents differs somewhat from the general population of Pickens County. The survey respondents were 57% male and 39.2% female, compared with 49.8% females in the general population of Pickens County (numbers reported by U.S. Census Bureau). 96.2% of survey respondents were Caucasian, compared with 90.2% of the general population of Pickens County. With respect to age, 32.9% of respondents were 65 years old and older, compared to 13.7% of the general population. The homeownership rate of Pickens County (in year 2000) was 73.5%, compared to 83.5% of survey respondents. The education level of residents completing the survey was slightly higher than the county average (19.1% having a Bachelor's degree or higher) with 36.7% having a Bachelor's degree or higher.

Main Findings

Concern for Local Waterway Pollution

Concern for local waterway pollution was measured through the following question: "How concerned would you say you are with pollution in your local streams and waterways?" Respondents were given the following options: very concerned, somewhat concerned, not very concerned, not at all concerned, do not know, and prefer not to answer. Survey results indicate that residents of Pickens have a high level of concern for local waterway pollution with 95% of survey respondents indicating they were "very concerned" or "somewhat concerned".

Concern for waterway pollution was also addressed by asking residents how important they feel water resources are to the quality of life in Pickens County. Over 85% of respondents indicated they feel that water resources are "very important" to the livelihood and quality of life in their community. In addition, 81% of those surveyed said they have changed their behavior in the past two years out of concern for drought conditions.

These statistics begin to paint a picture that illustrates Pickens County residents as a group of citizens that care deeply about water quality and view water resources as vital to their community's livelihood. Since the majority of Pickens County residents share a concern for the environment, they are more likely to be open to a stormwater education program that will benefit them and their water resources.

Understanding the Definition of a Watershed

Survey respondents were asked to choose one of seven options as the best definition of a watershed. Only 32.9% responded with the correct answer of, "area that drains into a specific river or lake." Almost 60% chose an incorrect definition of a watershed, with most people indicating that they thought "reservoir that serves as a municipal water source" was the best definition of a watershed. These results seem to signify that Pickens County residents are unfamiliar with commonly used environmental terminology. This is an important observation to be taken into account when designing an education program. Definitions should be clearly stated and alternate words choices should be explored.

Knowledge of Issues That Affect Water Quality

Survey participants were asked several questions focused on measuring their level of understanding of water quality issues. To gauge knowledge about stormwater, respondents were asked if they believe stormwater is treated before reaching our lakes, streams, and beaches. Approximately 80% of respondents believe that this water is not treated. Survey participants were also asked "In general; how much does what people do on the land affect the quality of their local streams and waterways?" Nearly all (97.6%) indicated they believe that what people do on the land affects local water quality (71.3% "a great deal" and 26.3% "somewhat"). 77% of those surveyed felt that septic tank inspections and pump outs protect water quality, but only about 36% of those with a septic tank indicated that they had pumped it out or had it inspected in the last two years.

Most respondents indicated that they believe natural, native vegetation is "very effective" at maintaining land along a river or lake (59.5%), while half of respondents believe planting bushes and shrubs along waterways is "somewhat effective." A slim majority (35.1% versus 22.1% for "very effective" and 31.2% for "somewhat effective") think that mowing grass or other vegetation close to the water is "not at all effective" at maintaining land along a body of water (see Appendix B, Figure 1).

Around 70% of survey takers chose either "strongly agree" or "agree" when asked if pet waste is a source of bacteria pollution in local waterways; 13.9% believe that pet waste has "great impact" on local waterways, while 50.6% responded with "some impact" and 35.5% responded with either "very little impact" or "no impact".

When asked to rank eight activities as having "great impact," "some impact," "very little impact" or "no impact" on local waterways, respondents ranked the following activities as having "great impact": industrial sites (68.4%), fuel and oil leaks from vehicles (60.8%), fertilizers and lawn chemicals (50.6%), farms operations (43%), and sediment or dirt from construction sites (41.8%). Survey takers ranked the following activities as having "some impact": pet waste (50.6%), runoff from people washing their cars (46.8%), and parking lot runoff (41.8%). Runoff from people washing their cars and pet waste had the highest percentages of people rank them as having "very little impact" or "no impact" on local waterways (40.5% and 35.5%, respectively). See Appendix B, Figure 2 for a visual illustration of the above listed statistics.

Household Practices with the Potential to Affect Local Water Quality

Most survey respondents (81%) claimed that, in the past two years, they have "never" stored fertilizers or pesticides in leaking containers and almost half (48.1%) refer to product information and instructions on the bag or container determine how much fertilizer or pesticide to use and when to use it. Also, 34.2% of respondents have their soil tested by the local Cooperative Extension office and receive directions based on those results and 12.7% of people that completed the survey do not use fertilizers or pesticides. When asked how they dispose of household chemical such as paint, paint thinners, cleaners, or pesticides, 67.1% of survey takers responded that they take them to the landfill on appointed days.

In the last two years, over half of those surveyed have "never" done the following: operated a vehicle with a motor oil leak (58.2%), disposed of oil, paint, or other chemicals down storm drains (83.3%), or dumped grass clippings or leaves down storm drains or backyard creeks (82.3%). About 61% (26.6% responded "always" and 34.2% responded "nearly always") consider the likelihood of a rainstorm before treating lawns with fertilizers or pesticides and almost a quarter of respondents indicated they "never" pick up after their pet on a walk. Another 29.1% indicated that picking up after their pet on a walk "does not apply," but many of these respondents verbally expressed that they never walk their pet, and don't feel the need to pick up after their pet in their own yards. Only about 33% "always" or "nearly always" pick up after their pet on a walk (see Appendix B, Figure 3).

Information on How Pickens County Residents Access News

Most respondents, about 75%, receive local information and news through watching the evening news on television. The next most frequently chosen sources for receiving local information and news were the internet (45.6%) and the local newspaper (34.2%). See Appendix B, Figure 4 for a complete illustration of the ways Pickens county residents gain access to news information.

Comparison to other Counties

In 2009, Carolina Clear and Clemson's Department of Sociology collaborated to conduct phone interviews similar to this survey in several South Carolina counties (Horry, Georgetown, Charleston, Berkeley, Dorchester, Lexington, Richland, Sumter, Florence, and Darlington). Most of the survey goals were parallel to the objectives in this survey and the end results were also quite comparable. Several notable points are discussed below.

Most survey respondents in all counties are concerned about the water quality in their respective areas and feel that waterway integrity is important to their livelihood. Based on widespread findings across all the surveys, it seems that education efforts should target owners of septic tanks, pet owners, and should also cover general issues that affect water quality. Among the most common issues that people surveyed ranked as having "little" or "no" impact on water quality were runoff from washing cars, pet waste, parking lot runoff, and construction site sediment deposits. In response to water quality questions related to septic tank care, between 13% and 20.8% responded that they did not know if inspection and pumping out of septic tanks protects water quality.

More education is also needed on the definition of a "watershed." Out of all the counties surveyed, never more than one-third of respondents knew the correct definition of a watershed (the Midlands region, consisting of Lexington, Richland, and Sumter counties, had the highest percentage of correct definition responses at just 33.1%).

All of the counties surveyed reported that the most common ways they receive their news is through the television morning and evening news, the internet, and the local newspaper.

Recommendations Summary

This survey provides some important insight into the attitudes and behaviors of Pickens County residents toward stormwater and other environmental issues. Several central recommendations and areas in need of education emerge from the survey results.

An overarching observation that can be drawn from the survey is that Pickens County residents
express concern for local water quality and view their water resources as vital to the
community's livelihood. This sentiment seems to be shared with citizens of other counties

- surveyed throughout South Carolina. The fact that citizens are concerned about water quality issues indicates that they may be more open to learning more about water quality issues and what they can do to improve local waterways.
- Certain water terminology used throughout the survey could serve as source of confusion for many residents of Pickens County. When asked to choose the best definition of a watershed, only 32.9% responded with the correct answer of, "Area that drains into a specific river or lake." These results seem to signify that Pickens County residents are unfamiliar with this environmental terminology. This is an important observation to be taken into account when designing an education program. Definitions should be clearly stated and alternate words choices should be explored. This confusion could also originate from poor background knowledge of general watershed principles. Education on watershed basics would provide a firm foundation upon which more in-depth information can be layered.
- Stormwater education efforts should be geared towards informing citizens about behaviors and issues that affect water quality. Survey results indicated that many Pickens County residents may not be aware that some behaviors such as allowing pet waste to remain uncollected, washing vehicles on nonporous ground, and not having septic tanks inspected and pumped properly, can negatively local waterways. Considering the level of concern for local water pollution, an education program could certainly alter some of these behaviors in the future and help to improve water quality in South Carolina in the long run.
- Based on survey responses, some of the best ways to reach the residents of Pickens County are through the local television news, newspapers, and the internet. Organizations such as Carolina Clear should utilize these resources to educate the public about the nature of the organization as well as to circulate information on water quality and stormwater management. Social networking sites such as Facebook and Twitter can be used to reach the younger demographic and provide education on water quality issues at an early age.

Conclusion

The results of this survey provide an informative baseline for designing and implementing a water quality education program targeted to the residents of Pickens County. The key findings of the survey pinpoint the areas about which citizens need the most education. The water quality education program that stems from the survey findings will help channel the concern that Pickens County residents share for local water quality issues into behaviors that will positively affect the waterways in Upstate South Carolina.

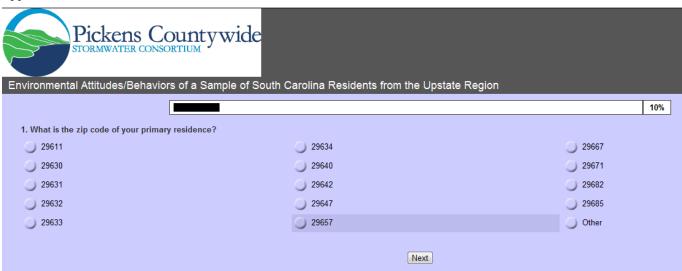
References

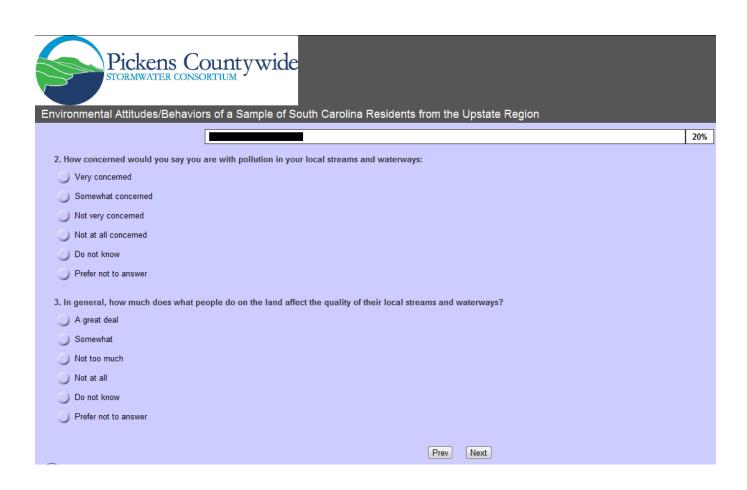
CC Telephone Survey Results - 2009 : Public Service : Clemson University : South Carolina. *Clemson University*. 2009. Web. 07 Dec. 2010.

http://www.clemson.edu/public/carolinaclear/surveys.html>.

Pickens County QuickFacts from the US Census Bureau. *State and County QuickFacts*. 16 Aug. 2010. Web. 07 Dec. 2010. http://quickfacts.census.gov/qfd/states/45/45077.html.

Appendix A

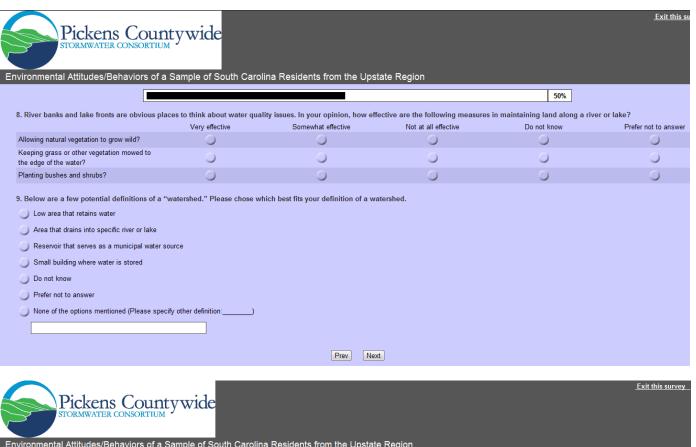




To what extent do you agree or disagree with the following statements? Your choices are as follows:
Strongly Agree Agree Disagree
Strongly Disagree Don't Know Prefer Not to Answer
Trefer Not to Allower
4. Inspection and pump out of septic tanks protects water quality.
Strongly agree
O Agree
O Disagree
Strongly disagree
On't know
Prefer not to answer
5. Pet waste is a source of bacteria pollution in lakes, rivers, and streams.
Strongly agree
→ Agree
○ Disagree ○ Disagree
Strongly disagree
On't know
Prefer not to answer
Prev Next



Environmental Attitudes/Behaviors of a Sample of South Carolina Residents from the Upstate Region				
			40%	
6. Stormwater is runoff from yards and roads. Do	you believe that this stormwate	r is treated before reaching our lakes, streams,	and beaches?	
Yes, it is treated.				
No, it is not treated.				
O not know				
Prefer not to answer				
7. These are some possible sources of water poll	ution. Please indicate if each h	as a great impact, some impact, very little impa some impact	ct or no impact on streams of lakes in y very little impact	our area. no impact
Fertilizers and lawn chemicals that people use on their lawns and gardens?	O O	O O	O O	O
Fuel and oil leaks from trucks, buses or automobiles?	0	0	9	9
Pet Waste?	0	9	0	0
Runoff from people washing their cars?	0	0	0	0
Industrial sites?	0	9	9	0
Farms operations?	0	0	0	0
Sediment or dirt from construction sites?	0	0	9	0
Parking lot runoff?	0	0	0	0
		David Nave		
		Prev Next		

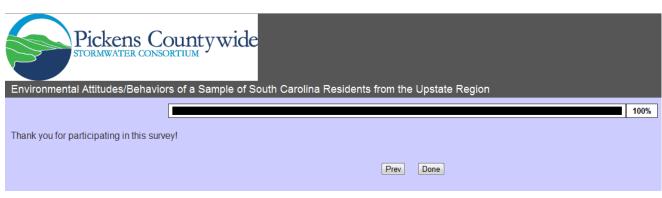


Environmental Attitudes/Behaviors of a Sample of South Carolina Residents from the Upstate Region 60% 10. How do you determine how much fertilizer or pesticide to use and when to use it? Chose all that apply. Friends, neighbors and relatives tell you how much to use and when to use it. You have your soil tested by the local Cooperative Extension office and receive directions based on those results Lawn care company takes care of it Home & Garden Store advice Lawn care company recommendation Not applicable. I do not use fertilizers or pesticides. You read the product information and instructions on the bag or container. Other (please specify) 11. In the past 2 years, have you made an effort to reduce water usage out of concern for drought conditions? O No Do not know Prefer not to answer Prev Next

15. Of the options listed below, what are the three primary ways you receive local/regional information and news:	
TV-Evening News	
TV-Morning News	
Radio-public (NPR)	
Radio-general	
Newspaper-regional	
Newspaper-local	
Billboards/posters	
Events/workshops	
Internet	
Other (please specify)	
16. How important do you feel water resources are to the livelihood and quality of life in Pickens County ?	
○ Very important	
Somewhat important	
Not at all important	
No opinion	
O Do not know	
Prefer not to answer	
Prev Next	
Pickens Countywide STORMWATER CONSORTIUM	
STORMWATER CONSORTIUM 2	
Environmental Attitudes/Behaviors of a Sample of South Carolina Residents from the Upstate Region	
	90%
Now we just have a few demographic questions. These are only for statistical purposes and will remain completely confidential.	
17. What category includes your age at your last birthday? Are you	
Under 18	
◯ 18 to 24	
25 to 34	
35 to 44 45 to 54	
○ 65 or older	

Do not know
Prefer not to answer

18. What is the highest level of education that you have completed?
Junior high school or less (1st to 8th grade)
Some high school
Graduated high school or earned GED
Some college or technical school, but no degree
Two-year college degree
Four-year college degree
Post graduate degree (Ph.D., MD, etc.)
Do not know
Prefer not to answer
19. Do you rent or own the home in which you are currently living?
Rent
Own
O not know
Prefer not to answer



Appendix B

River banks and lake fronts are obvious places to think about water quality issues. In your opinion, how effective are the following measures in maintaining land along a river or lake?

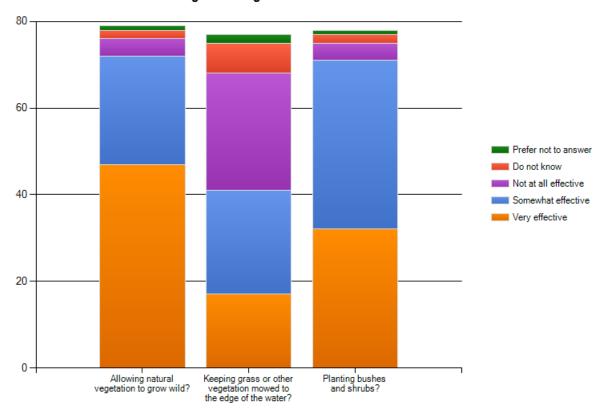


Figure 1. Responses to the question, "In your opinion, how effective are the following measures in maintaining land along a river or lake?"

These are some possible sources of water pollution. Please indicate if each has a great impact, some impact, very little impact or no impact on streams of lakes in your area.

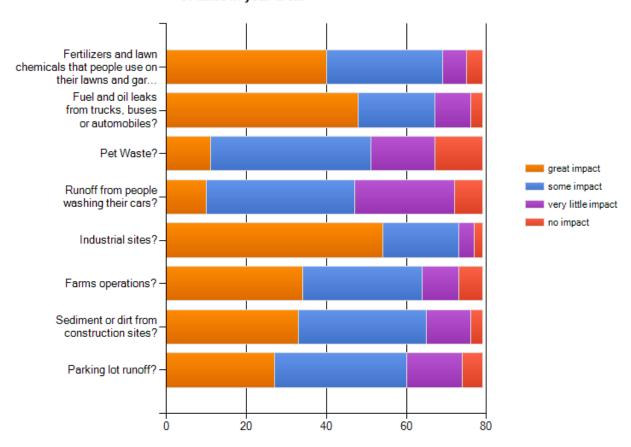


Figure 2. Comparison of 8 specific, possible sources of pollution asked as having great impact, some impact, very little impact, or no impact on local streams and lakes in the survey region.

Please indicate how often, in the past two years, you have done the following:

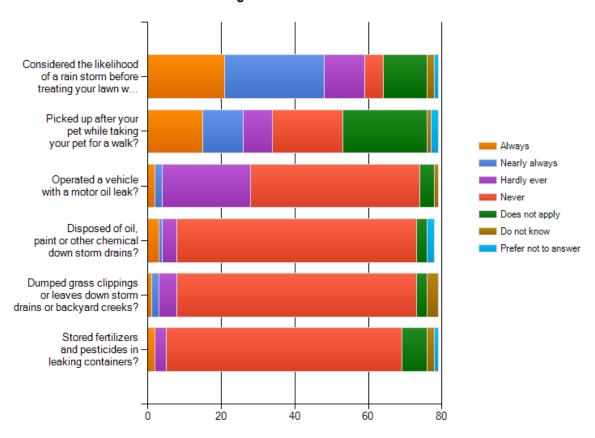


Figure 3. Summary of Pickens County residents' participation in environmentally positive and negative behaviors.

Of the options listed below, what are the three primary ways you receive local/regional information and news:

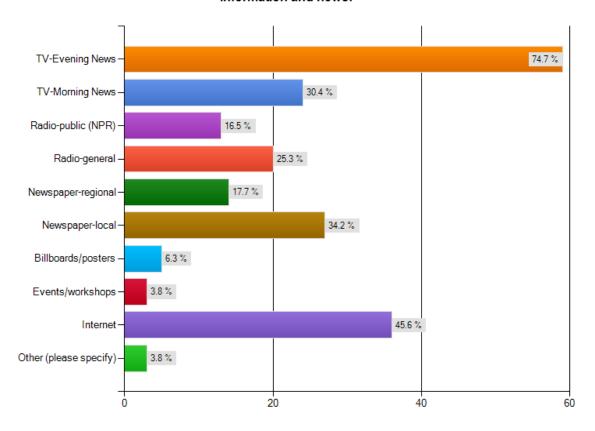


Figure 4. Summary of how Pickens County residents receive local information and news.