Watershed Literacy Survey of Carson River Watershed Residents

Study Conducted for
the Carson Water Subconservancy District

2026

RESPONSIVE MANAGEMENT

WATERSHED LITERACY SURVEY OF CARSON RIVER WATERSHED RESIDENTS

2026

Responsive Management

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EXECUTIVE SUMMARY

This study was conducted for the Carson Water Subconservancy District (CWSD) to evaluate residents' literacy about the Carson River Watershed. In particular, the study assessed watershed residents' levels of concern about watershed health, their participation in activities or behaviors that may impact the watershed's environment, and their awareness of marketing efforts by CWSD to encourage responsible stewardship. The study also included a trends analysis to help assess progress that has been made toward getting more residents to be better stewards of the Carson River Watershed. The study entailed a scientific, probability-based telephone survey of residents of the Carson River Watershed in Nevada and California, ages 18 and older.

METHODOLOGY

For the survey, telephones were selected as the preferred sampling medium because of the almost universal ownership of telephones among residents of the Carson River Watershed. The telephone survey questionnaire was developed cooperatively by CWSD and Responsive Management. The questionnaire was available in English and Spanish.

The sample database of watershed residents was drawn from counties in which the watershed is located, sampled in proportion to their populations (Carson City, Churchill County, Douglas County, and Lyon County in Nevada, and Alpine County, California). The telephone sample was representative of all residents of the Carson River Watershed.

Telephone surveying times were Monday through Friday from noon to 8:00 p.m., local time. A multi-callback design was used to maintain the representativeness of the sample. When a resident could not be reached on the first call, subsequent calls were placed on different days of the week and at different times of the day. When potential cell phone respondents could not be reached after repeated call attempts, they were sent a text message from a Nevada number inviting them to take the survey online as a self-administered survey. The text provided a link to the online survey that had an introduction with more information and instructions to begin the survey.

The survey was conducted in December 2025 and January 2026. Responsive Management obtained 877 completed surveys with Carson River Watershed residents. The analysis of data was performed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management. The analysis also examined trends based on similar questions asked in Responsive Management's 2015 survey conducted for CWSD. For the entire sample of adult Carson River Watershed residents, the sampling error is at most plus or minus 3.30 percentage points at the 95% confidence interval.

OPINION ON THE HEALTH OF THE CARSON RIVER WATERSHED

- **Water is a top-of-mind issue to residents—both the quality and quantity, so water issues will resonate with Carson River Watershed residents. The environmental *health* of the watershed also is an issue that should resonate well.**

  Concern about water issues exceeded that for any other environmental issue, when residents were asked in an open-ended question: 31% named water quality/quantity, compared to 17% saying development/loss of habitat/loss of open space and 11% saying wildfires.

  When asked to rate the level of importance they give to the health of the Carson River Watershed's environment, 48% give the highest rating of importance to it (a rating of 10 on the 0 to 10 scale), and a majority (57%) rate it as a 9 or 10 in importance.

  In a direct question about the health of the watershed, 48% of residents did not say it is healthy (23% said it is unhealthy, and 25% gave a neutral response).

  Lyon County residents, Churchill County residents, and women are the most likely to say that the Carson River Watershed's environment is unhealthy.

- **There is evidence that outreach is working: the group most likely to give a high rating to the importance of the health of the watershed are those who recall seeing/hearing "Your Actions Matter" messages.**

  Nearly two thirds of *those who saw/heard "Your Actions Matter" messages* gave a rating of 9 or 10 to the importance of the health of the watershed: 64% did so. This is markedly higher than residents overall (57% of them gave a 9 or 10 rating) (The scale went from 0 to 10, with 10 being the highest level of importance.)

  Other groups more likely than residents overall to give a high rating include older residents (64%) and Churchill County residents (also 64%).

  Among those who had seen/heard messages, 82% agree that they have become more mindful about water quality, and 76% say that they have started doing things to help protect water.

  Demographic groups most likely to agree that the messages made them more mindful about water quality are young and middle-aged residents, Lyon County residents, Hispanic residents, and women. On the other hand, those least likely to agree are Douglas County residents and older residents.

- **Despite outreach, there is still plenty of room for improvement in residents' knowledge. Just over a quarter of residents think that they do *not* affect the watershed's health at all.**

  Just over a quarter of residents (27%) choose *not at all* when asked how much they affect the health of the watershed. Another 41% think they affect it *a little*. This means that 68% of residents could be moved to a higher level of concern. (On this question, only 27% of residents said that they affect the health of the watershed *a great deal* or *a moderate amount*.)

  The demographic groups most likely to say that they do not affect the health of the watershed at all are Churchill County residents and men: 37% of Churchill County residents and 34% of men responded *not at all* when asked about how much they affect the health of the watershed. (Compared to 27% among residents overall, as stated above.)

KNOWLEDGE OF WATERSHEDS

- **Knowledge of watersheds and residents' connection to them needs to be improved. For the most part, residents do not know that they live in a watershed and that their actions can affect the Carson River Watershed, and they have only a vague idea of where stormwater flows when it leaves their property.**

  Only 35% of residents said that they currently live in a watershed. In particular, Hispanic residents, young residents, those in the lower education bracket, Carson City residents, and women lack knowledge that they live in a watershed. When asked where water flows from their property, residents most commonly said that it flows into the street with little knowledge beyond that.

FACTORS AFFECTING THE HEALTH OF THE WATERSHED

- **Pollution in general terms is recognized as negatively affecting the health of the Carson River Watershed. It is unclear how much residents know about the sources of pollution: 53% said pollution is the most important issue negatively affecting the Carson River Watershed, but only 23% said it is *non-point source pollution* caused by storm run-off.**

  In this open-ended question, 53% gave a pollution-related response as the most important issue, but only 23% said *non-point source* pollution.

- **It would appear that outreach needs to convince residents that their efforts and actions can make a difference, particularly outreach to Lyon County residents and younger residents. Top actions thought to positively affect the health of the Carson River Watershed include protecting habitat along the river, protecting the river's headwaters, reducing polluted run-off, and protecting wetlands. These were rated higher than residents' individual efforts and actions.**

  In this question, eleven terms were presented to residents, and they rated the importance of each on a 0 to 10 scale, with 0 being not at all important to the health of the watershed and 10 being extremely important. The actions listed above had the highest mean ratings, at 8.6 up to 8.8.

  However, near the bottom of the graph—with a lower mean rating than those above—was *individual efforts by people like you to protect or conserve water* (this had a mean rating of 8.1). In particular, low percentages of Lyon County residents and those younger than the median age felt that individual efforts are important.

- **Despite the above implication, there are many people who are currently taking action to improve the health of the watershed.**

  Among those who named an action that could be taken to improve the health of the watershed (this was 82% of all Carson River Watershed residents), three quarters of them said that they are currently taking that action.

AWARENESS OF CONSERVATION MESSAGES AND ADS

- **A not insubstantial percentage of Carson River Watershed residents (16%) had seen or heard the "Your Actions Matter" messages in the past 5 years.**

  On the other hand, 79% said that they had not seen/heard the messages in the past 5 years. (Another 5% responded with *don't know*, suggesting that they might have seen/heard the messages.)

  No demographic group is markedly more likely or less likely to have seen/heard the "Your Actions Matter" messages than residents overall. In other words, the messaging is reaching all demographic groups about the same.

  Note, however, that those who have seen/heard the messages are more likely than those who did not to highly rate the importance of the health of the watershed. This suggests that the outreach is making a difference in opinion.

- **Outreach on radio, television, and social media are reaching residents of the watershed. Additionally, utility/water bills are also reaching residents.**

  When asked where they saw/heard "Your Actions Matter" messaging, the top responses (in an open-ended question) were radio ads/messages (25% of those who saw/heard), television ads or messages (22%), social media (21%), and utility/water bills (12%).

  The body of the report shows the list of stations on which messages were seen/heard. At the top of the list is "Spectrum cable" in general. Other commonly named stations include KUNR – Public Radio, KNPB (Channel 5) PBS station, and 99.1 FM Talk (Fox News Radio).

- **The most commonly heard messages were "Water Connects Us All" (drinking water comes from your watershed; protect water quality), "Recycle Motor Oil" (do not put motor oil down the drain), and "Bag It" (pick up and dispose of pet/dog waste or poo in a trash receptacle).**

  The body of the report shows the full list of messages with the percentages having seen/heard them.

- **The most commonly actions taken prompted by the "Your Actions Matter" messaging are conserving water, cleaning up trash, using less fertilizer and lawn chemicals, and making landscaping and storm drainage more ecological.**

  The body of the report shows the full list of actions taken after having seen/heard messages.

ACTIONS THAT RESIDENTS ARE TAKING TO IMPROVE THE CARSON RIVER WATERSHED'S ENVIRONMENT

- **The positive actions residents can take to improve the health of the Carson River Watershed that are most commonly taken include picking up litter (85% of all residents say that they always or frequently pick up litter when they see it), picking up their pet's waste (92% of those with a pet always or frequently do this), and reducing noxious/invasive weeds on their property (75% always or frequently do this).**

  The table on the following page shows the percentages who could take the positive action and who took the action.

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	95.4	95.4
Reduced noxious/invasive weeds	79.7	87.4	69.7
Picked up pet's waste	70.9	95.0	67.4
Reduced pesticide/herbicide use	79.7	74.4	59.3
Reduced fertilizer use	79.8	74.0	59.1
Changed landscape for water	79.8	42.9	34.3
Redirected downspouts	79.8	37.9	30.3

No demographic group is markedly less likely to do these actions, compared to residents overall.

- **Two actions discussed in the survey have a negative affect on the Carson River Watershed's environment. Fortunately, a very low percentage dispose of motor oil down the storm drain. However, more than a third of all residents (39%) wash their car in their driveway.**

For each of the following actions, 89% could take them (because 89% own a car), and 44% of those with a car wash it in the driveway at times (this works out to 39% of all residents).

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
(N) Washed car in driveway	89	44	39
(N) Disposed oil down storm drain	89	2	2

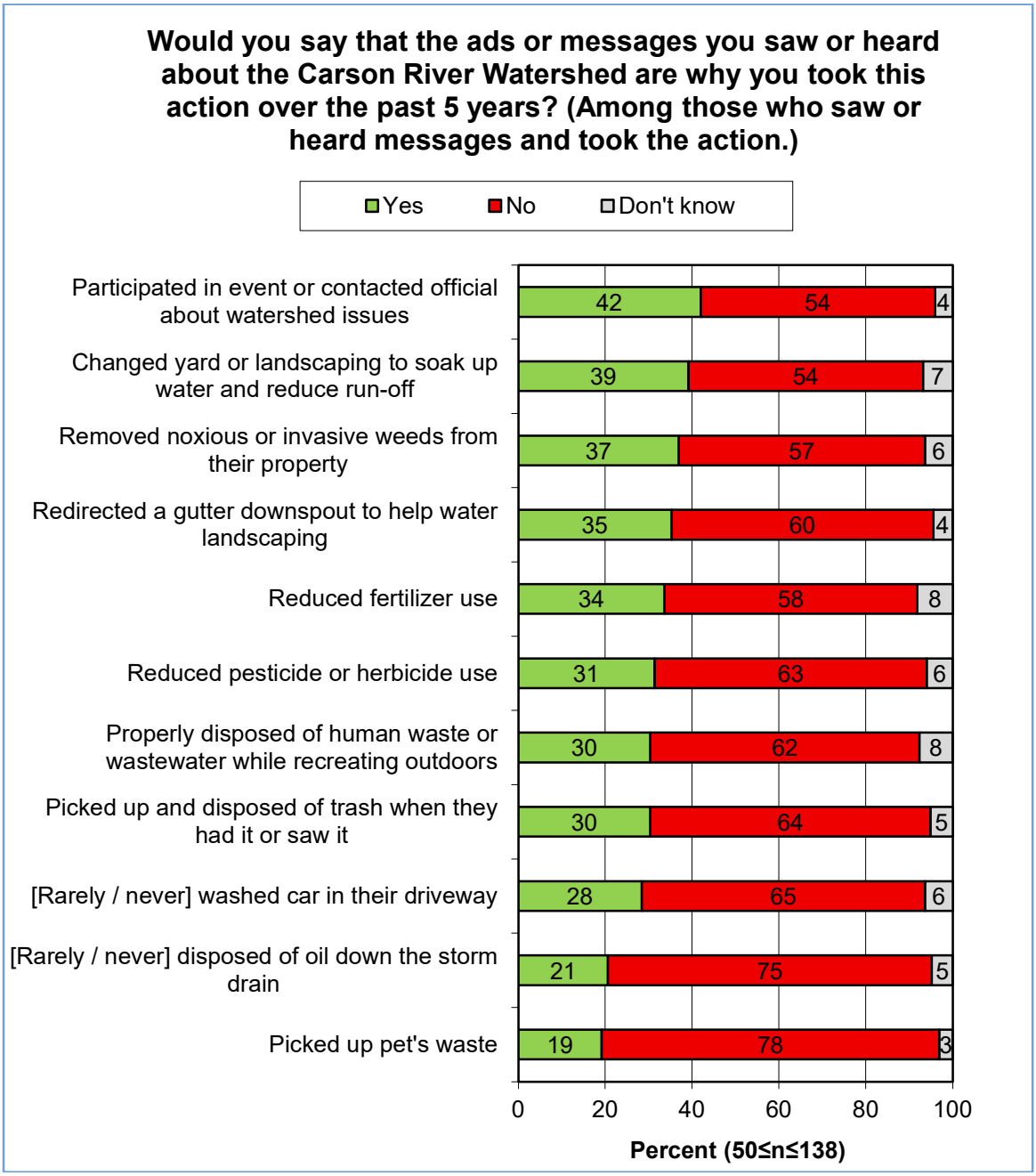
(N) = negative environmental action

- **More than a third of those with landscaping at their residence (38%) have altered the gutter downspout to water the plants, and more than that (43%) have changed their landscaping to more ecologically control water, in the past 5 years.**

These actions were asked about using a yes-no answer set (as opposed to the above, which used a scale).

- **The ads and messages that residents saw/heard are important reasons that those who took actions did so. The following graph shows that, among those who saw/heard messages and who took actions, substantial percentages say the outreach is the reason they took the action.**

  As shown in the graph, from 19% to 42% (depending on the action) of these respondents were prompted by the messaging.



TRENDS AND GRADING

- **An important component of this project was to compared opinions and behaviors now with those from 2015, to see if opinions and behaviors have improved. Since 2015, ratings of the importance of the health of the Carson River Watershed has increased.**

  In 2015, the mean rating of importance for this (on a 0 to 10 scale) was 8.27. It is 8.52 in the current survey.

- **Likewise, the importance residents attach to floodplain conservation, recreation use and management, protection of habitat along the river, and addressing invasive species have all increased since 2015.**

  These were rated on the 0 to 10 scale previously discussed. For floodplain conservation, the mean rating increased from 7.7 in 2015 to 8.1 in 2026. For recreation use and management, the mean went from 7.5 to 7.8. For protection of habitat along the river, the mean went from 8.6 to 8.8, and for addressing invasive species, the mean went from 7.9 to 8.1.

- **A higher percentage of pet owners in the current survey pick up their pet's waste, compared to pet owners in the 2015 survey (87% in 2015, compared to 95% today). Also, a higher percentage of those with a lawn have reduced noxious/invasive weeds on their property (70% had done so in 2015; 87% did so in the current survey). Finally, reducing fertilizer use among those with a lawn went from 63% in the 2015 survey to 74% in the current survey.**

  Picking up pet waste among pet owners went from 87% in the 2015 survey to 95% in the current survey. Reducing noxious/invasive weeds went from 70% in the 2015 survey to 87% in the current survey. Reducing fertilizer use went from 63% in 2015 to 74% in the current survey. The body of the report includes all the trends, including those that did not show positive movement.

- **This report also includes a section that gives grades to changes of opinion and behaviors. The benchmarks for an A, B, C, D, and F were set by a 2016 marketing report. It may be that the grading benchmarks were set very high. Nonetheless, of the eleven elements in the grading scheme, there was good progress on five of them, with an A, three B's, and one C awarded.**

The table that follows shows the grades given.

Question	Letter Grade
1. Do your currently live in a watershed?	F
2. How important to you, personally, is the health of the Carson River Watershed's environment?	C *
3. How much would you say you affect the health of the Carson River Watershed's environment?	D
4. Reducing polluted run-off to improve water quality. (How important do you think this is to the health of the Carson River Watershed's environment?)	F
5. Protecting habitat along the river. (How important do you think this is to the health of the Carson River Watershed's environment?)	B *
6. Addressing invasive species. (How important do you think this is to the health of the Carson River Watershed's environment?)	D
7. Reduced fertilizer use. (How often have you done this in the past 5 years?)	A *
8. Picked up your pet's waste. (How often have you done this in the past 5 years?)	B *
9. Washed your car in your driveway. (How often have you done this in the past 5 years?)	F
10. Disposed of oil down the storm drain. (How often have you done this in the past 5 years?)	D
11. [HISPANIC/LATINO GRADING] Disposed of oil down the storm drain. (How often have you done this in the past 5 years?)	B
Grade Point Average	C
Grade Point Average without item 10	C

* Indicates that the change resulting in the given grade was statistically significant.

DATA AND INFORMATION IN THE REPORT

- **The final recommendation is for those developing outreach to use the information in this report, which includes information on the techniques for effective outreach as well as a section that shows demographic, opinion-related, and participatory characteristics of various target markets.**

  These demographic/opinion/participatory summaries of various target markets are included for Carson River Watershed residents overall, Hispanic residents, men and women, younger residents and older residents (split at the median age), those in the higher and lower education brackets, residents living in their same location less than 10 years and more than 10 years, and by county of residence (for four counties with enough sample for these summaries to be developed: Carson City, Churchill County, Douglas County, and Lyon County).

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INTRODUCTION AND METHODOLOGY

This study was conducted for the Carson Water Subconservancy District (CWSD) to evaluate residents' literacy about the Carson River Watershed. In particular, the study assessed watershed residents' levels of concern about watershed health, their participation in activities or behaviors that may impact the watershed's environment, and their awareness of marketing efforts by CWSD to encourage responsible stewardship. The study also included a trends analysis, in which results of this survey were compared to those from a similar survey conducted in 2015, to help assess progress that has been made toward getting more residents to be better stewards of the Carson River Watershed. The study entailed a scientific, probability-based telephone survey of residents of the Carson River Watershed in Nevada and California, ages 18 and older. Specific aspects of the research methodology are discussed below.

USE OF TELEPHONES FOR THE SURVEY

For the survey, telephones were selected as the preferred sampling medium because of the almost universal ownership of telephones among residents of the Carson River Watershed (both landlines and cell phones were called). Additionally, telephone surveys, relative to mail or online surveys, allow for more scientific sampling and data collection, as well as higher response rates. Also, telephone surveys provide a much faster turnaround time and lower costs compared to mail surveys.

Furthermore, telephone surveys also allow respondents who cannot or will not respond to a mail or online survey to participate. Mail and online surveys systematically exclude those who have difficulty reading. According to statistics published by the U.S. Department of Education (2019), 54% of U.S. residents 16 to 74 years old, which represents about 130 million Americans, lack proficiency in literacy, reading below the sixth-grade level. Therefore, many might be reticent to complete a mail or online survey they must read to themselves. In addition, those with poor or limited internet service or who are intimidated by technology may be reticent to complete a survey online. In a telephone survey, however, a live interviewer reads the survey questions, clarifies them if necessary, and assists the respondent with completing the survey, making it an excellent option to reduce bias and increase response rates for the survey.

Finally, telephone surveys also have fewer negative effects on the environment than do mail surveys because of reduced use of paper and reduced energy consumption for delivering and returning the questionnaires.

QUESTIONNAIRE DESIGN

The telephone survey questionnaire was developed cooperatively by CWSD and Responsive Management, based primarily on the previous survey conducted in 2015 as well as the research team's familiarity with natural resource issues. The telephone survey was computer coded for Responsive Management's computer-assisted telephone interviewing (CATI) system. An important aspect of this system is that the computer controls which questions are asked and allows for immediate data entry. Each telephone survey, however, is administered by a live interviewer.

Asking any single respondent all of the questions that CWSD wanted to ask would have made the survey too long. Therefore, to allow all the questions to be included in the survey while making the survey short enough for respondents to complete, the sample was randomly split in some places, with half the sample getting some questions and the other half getting other questions. In this way, the survey was not egregiously long for any single respondent, yet all the questions of interest were asked. Because the split was random, no bias was introduced.

Responsive Management also developed an online version of the questionnaire that was given to those who had cell phones and who could not be reached after repeated call attempts, as explained further on. This version was the same as the telephone version with slight wording adjustments to account for the online mode. Note that the online survey was closed, meaning it was available only to respondents who were specifically selected for the survey; it was offered only to those who were in the telephone sample.

Both versions of the questionnaire were available in English and Spanish.

Responsive Management conducted pre-tests of both versions of the questionnaire to ensure proper wording, flow, and logic in the survey.

SURVEY SAMPLE

The sample database of watershed residents was drawn from the counties in which the watershed is located, sampled in proportion to the populations of the counties. The telephone sample was provided by MSG, a firm that specializes in providing scientifically valid samples for survey research, and it was representative of all residents of the Carson River Watershed. The probability-based sampling process ensured that each watershed resident had an equal chance of being selected for the survey. Screener questions at the outset of the survey ensured that each respondent was at least 18 years old and verified that each respondent was a resident of the Carson River Watershed (potential respondents were asked for their county, town, and zip code to confirm the telephone sample information). CWSD provided the list of zip codes.

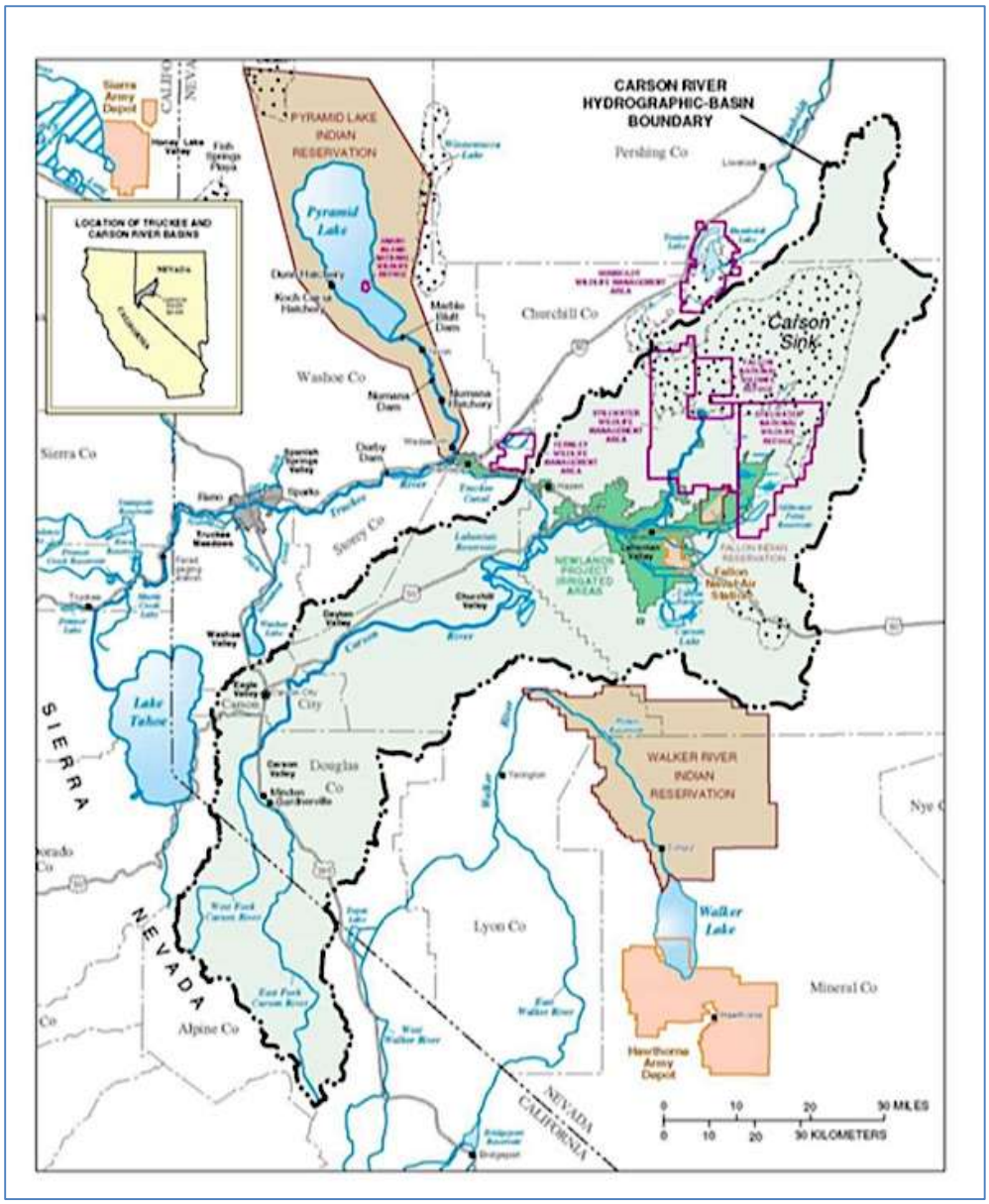
The areas that make up the Carson River Watershed are as follows:

- Alpine County, California
- Carson City, Nevada (independent city)
- Churchill County, Nevada
- Douglas County, Nevada
- Lyon County, Nevada
- Storey County, Nevada

Zip Codes of Study Area			
89403	89423	89460	89705
89406	89428	89496	89706
89410	89429	89701	96120
89411	89440	89703	

A map of the study area is shown on the next page.

Carson River Watershed Area



Two zip codes were added since the 2015 study: 89428 (Gold Hill, Silver City) and 89496 (Naval Air Station). A telephone sample was not available for the Naval Air Station, although respondents who stated that 89496 was their zip code qualified for the survey.

TELEPHONE SURVEY DATA COLLECTION AND QUALITY CONTROL

The interviews were conducted using Responsive Management's CATI system, which utilizes software for telephone data collection. The survey data were entered into the computer as each interview was being conducted, eliminating manual data entry after the completion of the survey and the concomitant data entry errors that may occur with manual data entry. The survey instrument was programmed so that the CATI system branched, coded, and substituted phrases in the survey based on previous responses to ensure the integrity and consistency of the data collection. The software also allowed for error checks during the interview to help ensure that the data were accurate and valid.

For quality control of the telephone surveys, Survey Center managers monitored interviews in real time and provided feedback to the interviewers. To ensure that the data collected are of the highest quality, the interviewers are trained through lectures, role-playing, and video training, according to the standards established by the American Association for Public Opinion Research. The Survey Center managers conducted briefings with the interviewers prior to the administration of this survey. Interviewers were instructed on type of study, study goals and objectives, handling of survey questions, interview length, termination points and qualifiers for participation, interviewer instructions within the survey questionnaire, reading of the survey questions, skip patterns, and probing and clarifying techniques necessary for specific questions on the survey questionnaires, thereby ensuring the integrity of the data.

Telephone surveying times were Monday through Friday from noon to 8:00 p.m., local time. A multi-callback design was used to maintain the representativeness of the sample, to avoid bias toward people easy to reach by telephone, and to provide an equal opportunity for all watershed residents to participate. When a resident could not be reached on the first call, subsequent calls were placed on different days of the week and at different times of the day.

When potential cell phone respondents could not be reached after repeated call attempts, they were sent a text message from a Nevada number inviting them to take the survey online as a self-administered survey. The text provided a link to the online survey that had an introduction with more information and instructions to begin the survey. This online option helped to raise the response rate. The text and online introduction are shown below, first the English version and then the Spanish version.

Text Message to Cell Phone Nonrespondents to Encourage Participation (English)
Hello, I'm Jeremiah from Responsive Management reaching out on behalf of the Carson Water Subconservancy District to ask you some questions about local issues.

You do not need to be knowledgeable about any specific topics or engage in any specific activities to participate in the study. Please consider taking this brief survey: LINK

Reply STOP to opt-out.

Online Introduction for Cell Phone Nonrespondents Who Were Provided the Link (English)
This scientific survey is being conducted on behalf of the Carson Water Subconservancy District. The purpose of the survey is to better understand residents' interest in, knowledge of, and opinions on water resources in your area.

The study is for research purposes only and no one will try to sell you anything or ask for donations.

You do not need to be knowledgeable about any specific topics or engage in any specific activities to participate in the study.

Your responses will be kept strictly confidential and will not be associated with your name or contact information in any way.

Thank you for your time and willingness to participate.

Text Message to Cell Phone Nonrespondents to Encourage Participation (Spanish)
Hola, soy Jeremiah de Responsive Management. Me comunico en nombre del Distrito de Subconservación de Agua de Carson para hacerle algunas preguntas sobre temas locales.

No necesita tener conocimientos sobre temas específicos ni participar en actividades particulares para formar parte del estudio. Por favor, considere responder esta breve encuesta: LINK

Responda STOP para optar por no participar.

Online Introduction for Cell Phone Nonrespondents Who Were Provided the Link (Spanish)
Esta investigación científica se está llevando a cabo en nombre del Distrito de Subconservación del Agua de Carson (Carson Water Subconservancy District). El propósito de la encuesta es comprender mejor el interés, el conocimiento y las opiniones de los residentes sobre los recursos hídricos en su zona.

Este estudio tiene fines exclusivamente de investigación y nadie intentará venderle nada ni le pedirá donaciones.

No es necesario tener conocimientos sobre ningún tema específico ni participar en ninguna actividad concreta para participar en el estudio.

Sus respuestas se mantendrán bajo estricta confidencialidad y no se asociarán de ninguna manera con su nombre ni con su información de contacto.

Gracias por su tiempo.

The survey was conducted in December 2025 and January 2026. After the surveys were obtained, the Survey Center managers and statisticians checked each completed survey to ensure clarity and completeness. Responsive Management obtained 877 completed surveys with Carson River Watershed residents.

DATA ANALYSIS

The analysis of data was performed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management. The results were weighted by demographic characteristics (age, gender, and Hispanic population) to U.S. Census data so that the sample would proportionally represent adult residents in the Carson River Watershed as a whole.

The analysis also examined trends based on similar questions asked in Responsive Management's 2015 survey conducted for CWSD. Only those questions with similar wording could be compared in the trends analysis, and only closed-ended questions were compared. (Open-ended questions are those for which no answer set is provided. Closed- and open-ended questions are fully explained further on.)

The analysis of open-ended questions entailed having the analysts examine the verbatim responses and assign them into response categories. These results were then quantified and presented in "Multiple Responses Allowed" graphs. Overall, analysts categorized nearly 2,000 open-ended responses.

On questions that asked respondents to provide a number (e.g., number of years living in their current zip code), the graph shows ranges of numbers rather than the precise numbers. Nonetheless, in the survey each respondent provided a precise number, and the dataset includes this precise number, even if the graph only shows ranges of numbers. Note that the calculation of means and medians used the precise numbers that the respondents provided.

SAMPLING ERROR

Throughout this report, findings of the statewide survey are reported at a 95% confidence interval. For the entire sample of adult Carson River Watershed residents, the sampling error is at most plus or minus 3.30 percentage points. This means that if the survey were conducted 100 times on different samples that were selected in the same way, the findings of 95 out of the 100 surveys would fall within plus or minus 3.30 percentage points of each other. Sampling error was calculated using the formula described below, with a sample size of 877 and a population size of 125,156 adult Carson River Watershed residents.

Sampling Error Equation

$$B = \left(\sqrt{\frac{\frac{N_p(.25)}{N_s} - .25}{N_p - 1}} \right) (1.96)$$

Where: B = maximum sampling error (as decimal)
N_P = population size (i.e., total number who could be surveyed)
N_S = sample size (i.e., total number of respondents surveyed)

Derived from formula: p. 206 in Dillman, D. A. 2000. *Mail and Internet Surveys*. John Wiley & Sons, NY.
Note: This is a simplified version of the formula that calculates the maximum sampling error using a 50:50 split (the most conservative calculation because a 50:50 split would give maximum variation).

PRESENTATION OF RESULTS

In examining the results, it is important to be aware that the questionnaire included several types of questions:

- Single response questions: Some questions allow only a single response.
- Multiple response questions: Other questions allow respondents to give more than one response or choose all that apply. Those that allow more than a single response are indicated on the graphs with the label, "Multiple Responses Allowed."
- Open-ended questions are those in which no answer set is presented to the respondents; rather, they respond with anything that comes to mind from the question.
- Closed-ended questions have an answer set from which to choose.
- Scaled questions: Many closed-ended questions (but not all) are in a scale, such as one that ranges from strongly approve to strongly disapprove.
- Series questions: Many questions are part of a series, and the results are primarily intended to be examined relative to the other questions in that series (although results of the questions individually can also be valuable). Typically, results of all questions in a series are shown together.

Most graphs show results rounded to the nearest integer; however, all data are stored in decimal format, and all calculations are performed on unrounded numbers. For this reason, some results may not sum to exactly 100% because of this rounding on the graphs. Additionally, rounding may cause apparent discrepancies of 1 percentage point between the graphs and the reported results of combined responses (e.g., when “strongly agree” and “moderately agree” are summed to determine the total percentage of agreement).

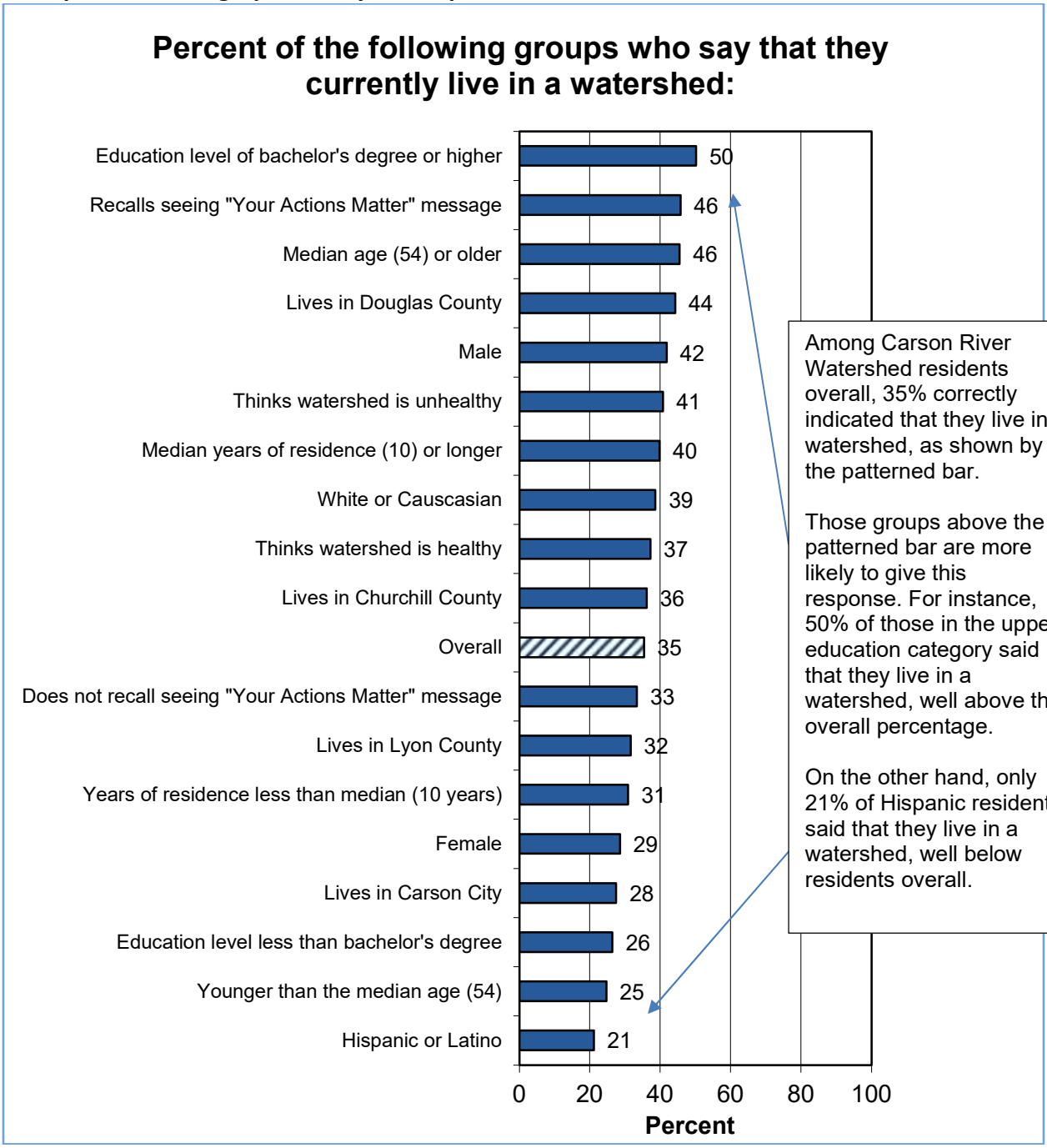
The analysts also produced special graphs that have many demographic and participatory characteristics on a single graph, as shown in the example on the following page. These demographic analyses graphs show how various groups responded to a given question. The example shows the percentage of Carson River Watershed residents who indicated that they live in a watershed (although used as an example, it shows actual data from this survey).

Overall, 35% of residents correctly said that they live in a watershed, as shown by the patterned bar. Those groups above the patterned bar have a higher rate of giving this response than watershed residents overall. For instance, the demographic analyses graph shows that 50% of residents in the upper education category said that they live in a watershed, substantially above the overall rate. On the other hand, those groups below the overall bar are less likely to give this response. For example, only 21% of Hispanic residents said that they live in a watershed, the lowest rate among the groups included in the demographic analyses.

When one group is above the overall bar, its counterpart or one of its counterparts typically will be below the overall bar. For instance, males in the example are above the overall bar, and females are below the overall bar.

Finally, if a group is close to the overall bar (for instance, Churchill County residents in this example), then the group should not be considered markedly different from residents overall. A rule of thumb is that the difference should be 5 percentage points or more for the difference to be noteworthy.

Example of a Demographic Analyses Graph

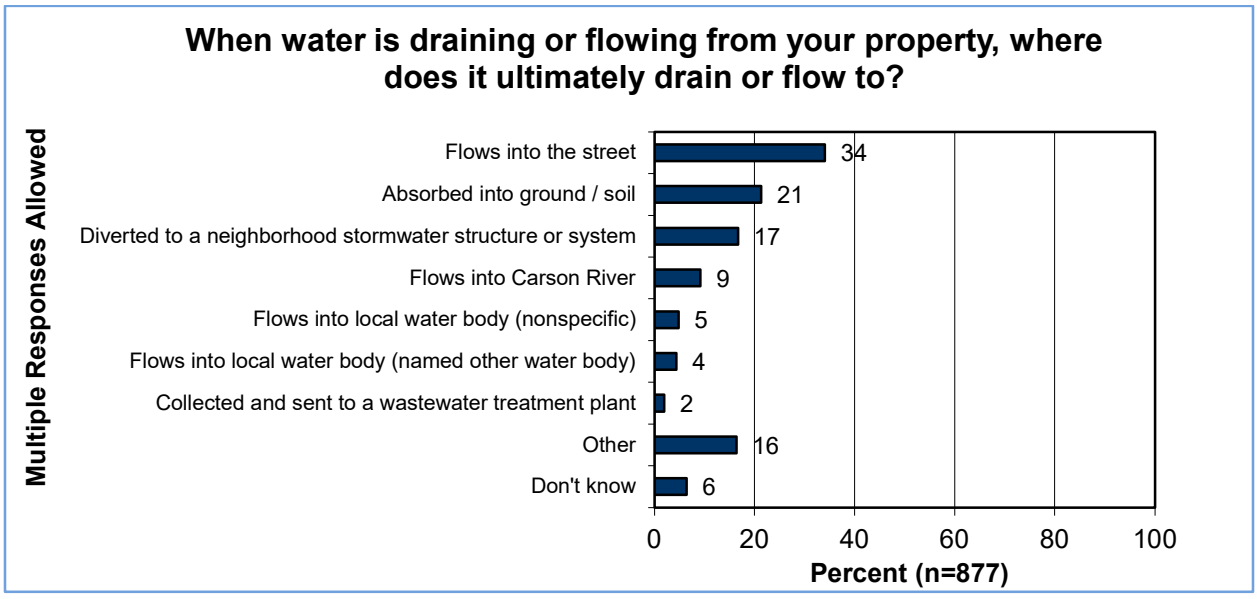


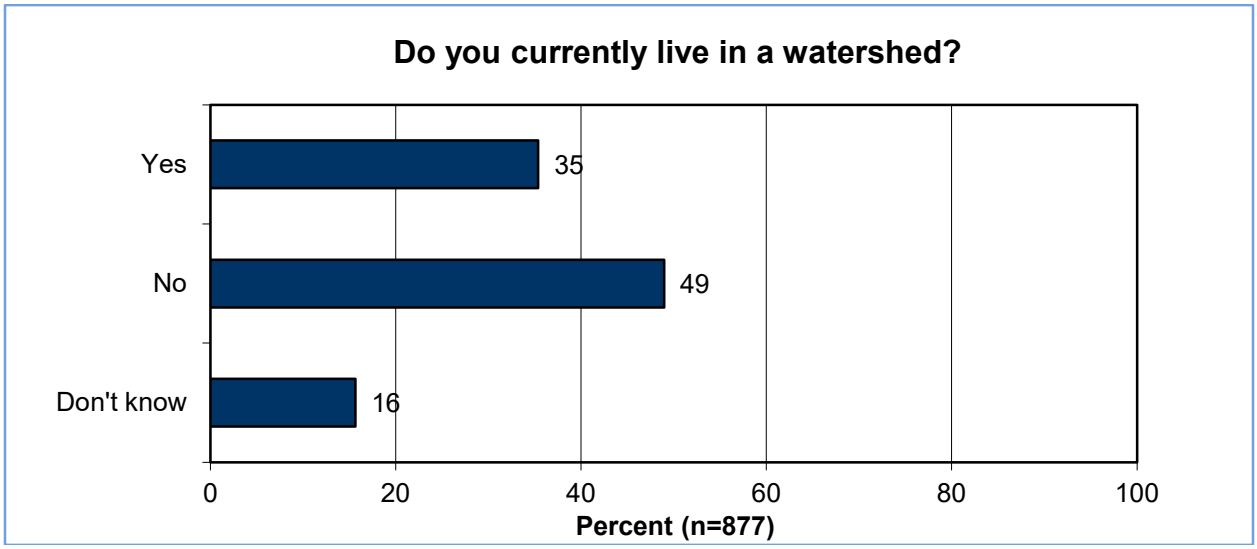
Note: In these graphs, "Median years of residence (10) or longer" and its counterpart refer to residency in the particular zip code in which the respondent currently lives.

KNOWLEDGE OF WATERSHEDS

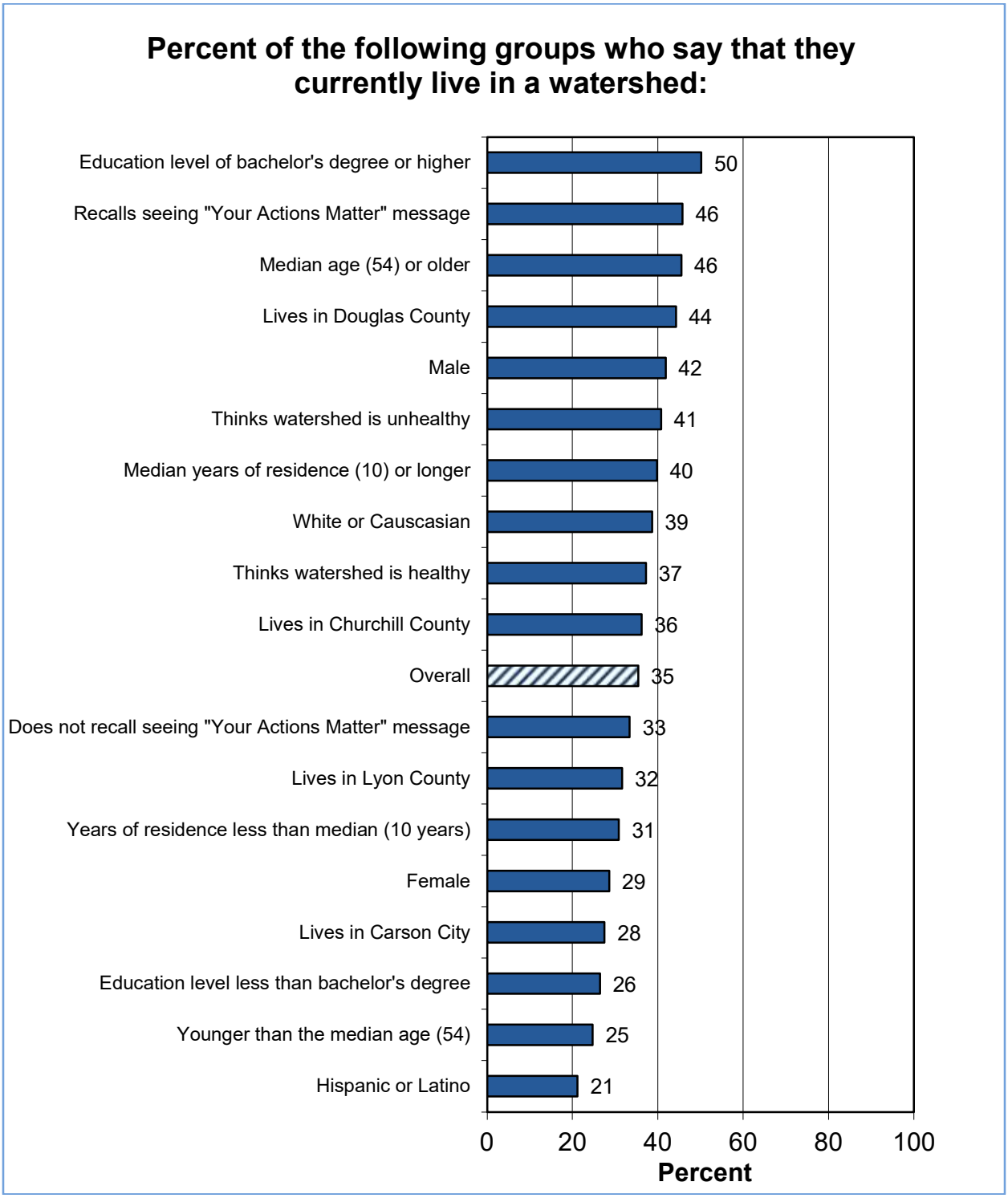
An open-ended question asked residents where drainage such as rainwater from their property ultimately flows to. The top responses are flows into the street (34% stated this), absorbed into the ground/soil (21%), and diverted to a stormwater system (17%). Only 9% specifically indicated that it ultimately flows into the Carson River. Note that the top responses are not necessarily incorrect, as those conduits could lead to the Carson River, although they do not represent the ultimate destination. Write-in "other" responses can be viewed in the appendix.

Over a third of watershed residents (35%) correctly indicated that they live in a watershed, whereas 49% think that they do not and 16% do not know.





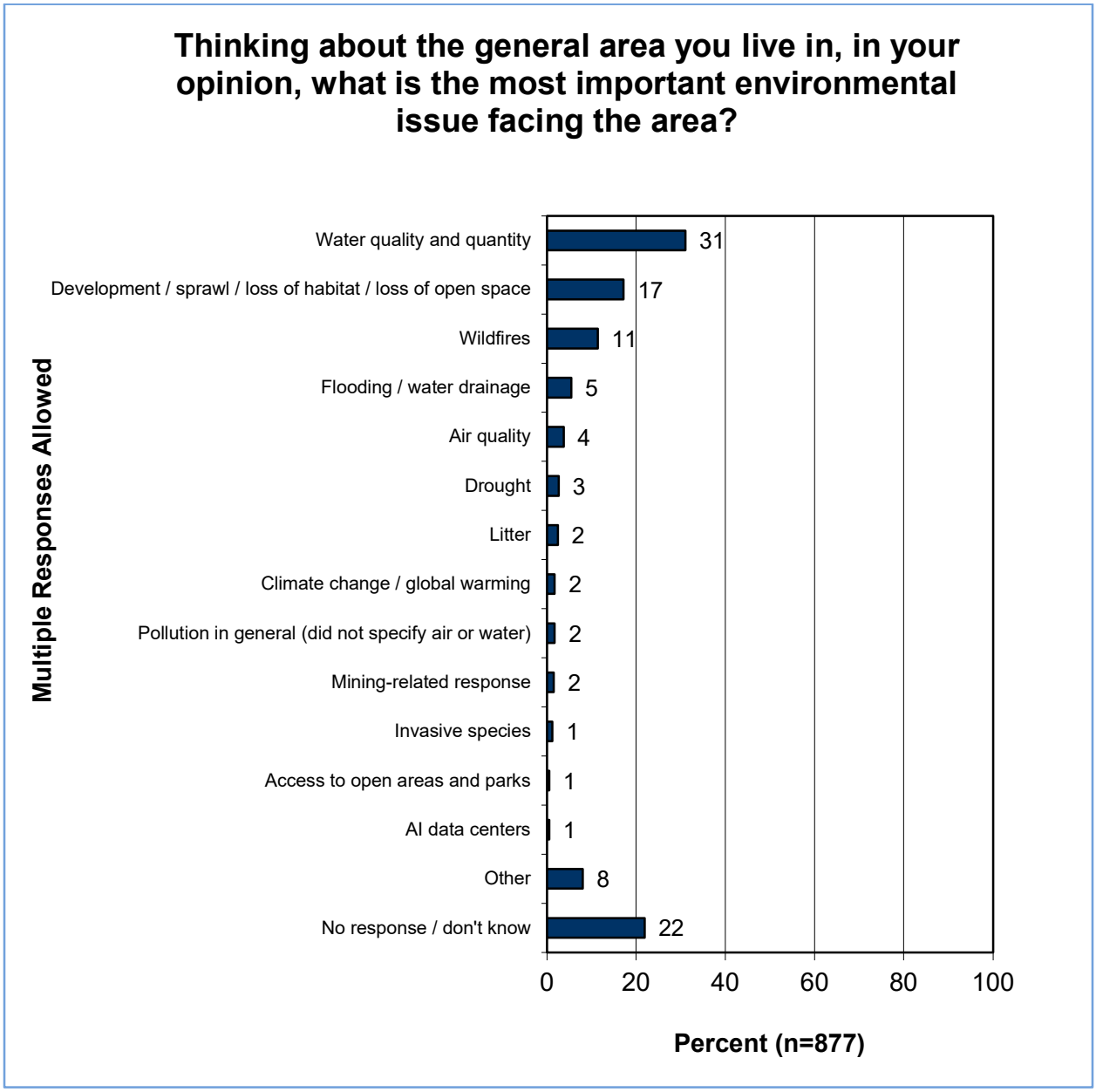
In the demographic analyses, the groups most likely to indicate that they live in a watershed include those in the upper education category, those who recall “Your Actions Matter,” older residents, and Douglas County residents. (Note: this graph was used as the example of how to interpret these types of graphs; it is shown here again as a convenience to the reader.)



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

HEALTH OF THE CARSON RIVER WATERSHED

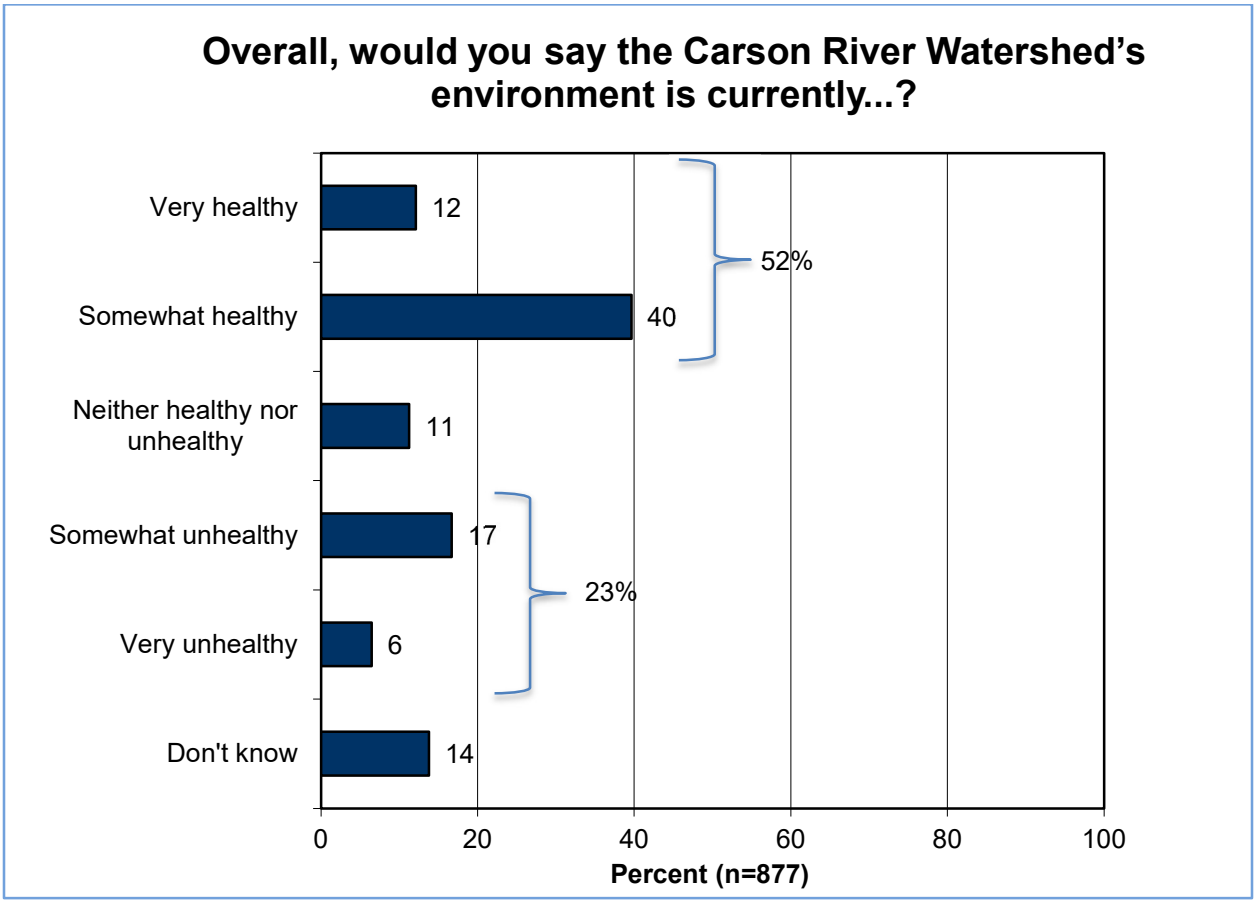
Nearly a third of watershed residents stated that water quality and quantity is the most important environmental issue facing their area, in an open-ended question. Other responses named by over 10% of residents are development/loss of open space and wildfires. The full list is shown, and "other" responses are shown in the appendix.



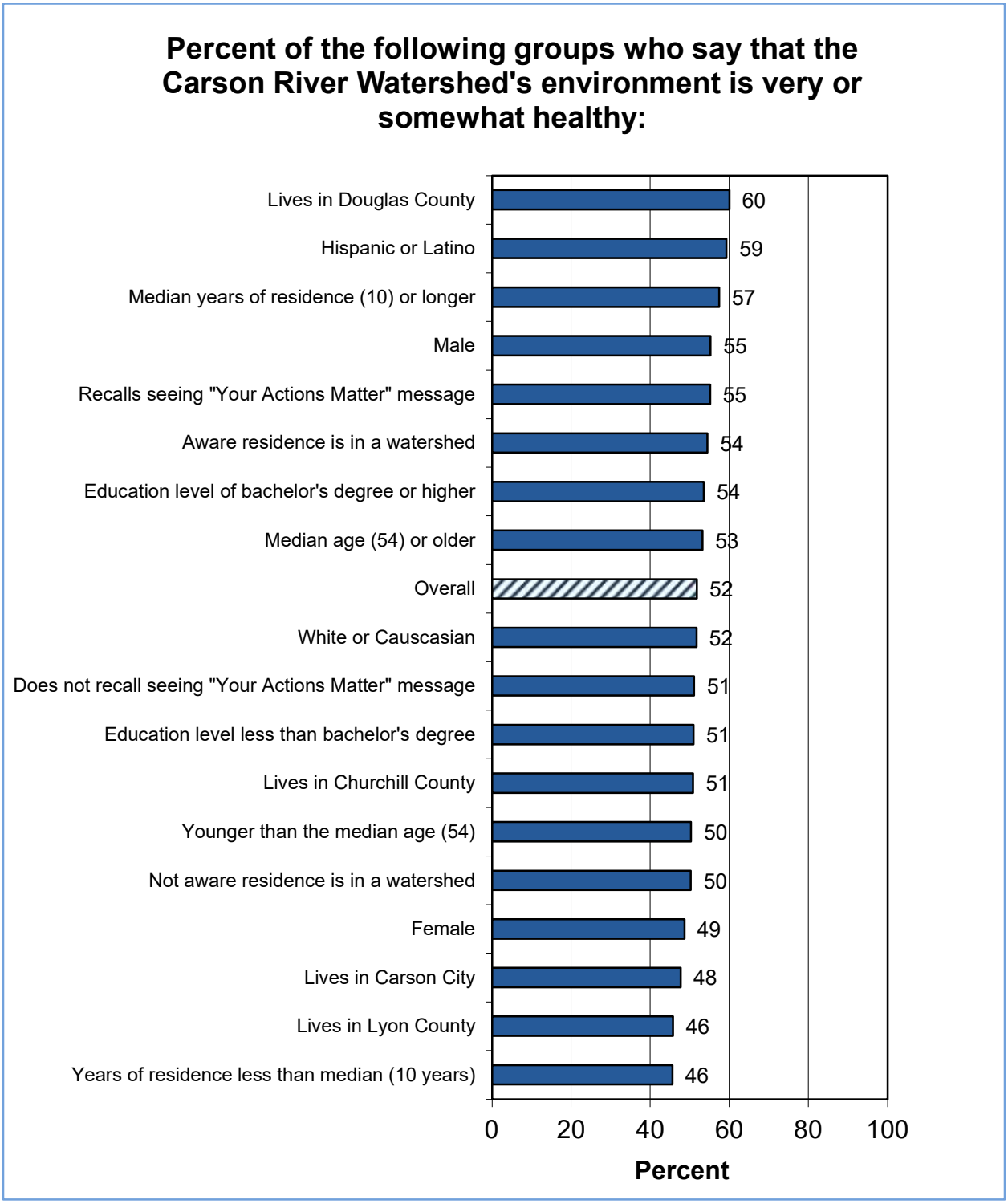
The survey provided the following information to respondents:

> For the purposes of this study, we consider your residence to be in a watershed area, specifically in the Carson River Watershed. Water and run-off in your area drain into the Carson River.
>
> Next, I would like to ask you about your opinions on the health of the Carson River Watershed. First, I would like to define the watershed area that I am asking about for you. The Carson River Watershed is located east of the Sierra Nevada range and includes portions of Alpine County in California and Douglas, Carson City, Storey, Lyon, and Churchill Counties in Nevada. The Carson River is 184 miles long and its watershed encompasses nearly 4,000 square miles, including forested headwaters, valley floodplains, and the wetlands at the river's end near Fallon, Nevada.

The survey then asked questions about the health of the Carson River Watershed. By about a 2-to-1 margin, residents more often say that the Carson River Watershed's environment is healthy (52% say it is *very* or *somewhat* healthy) than say it is unhealthy (23%).

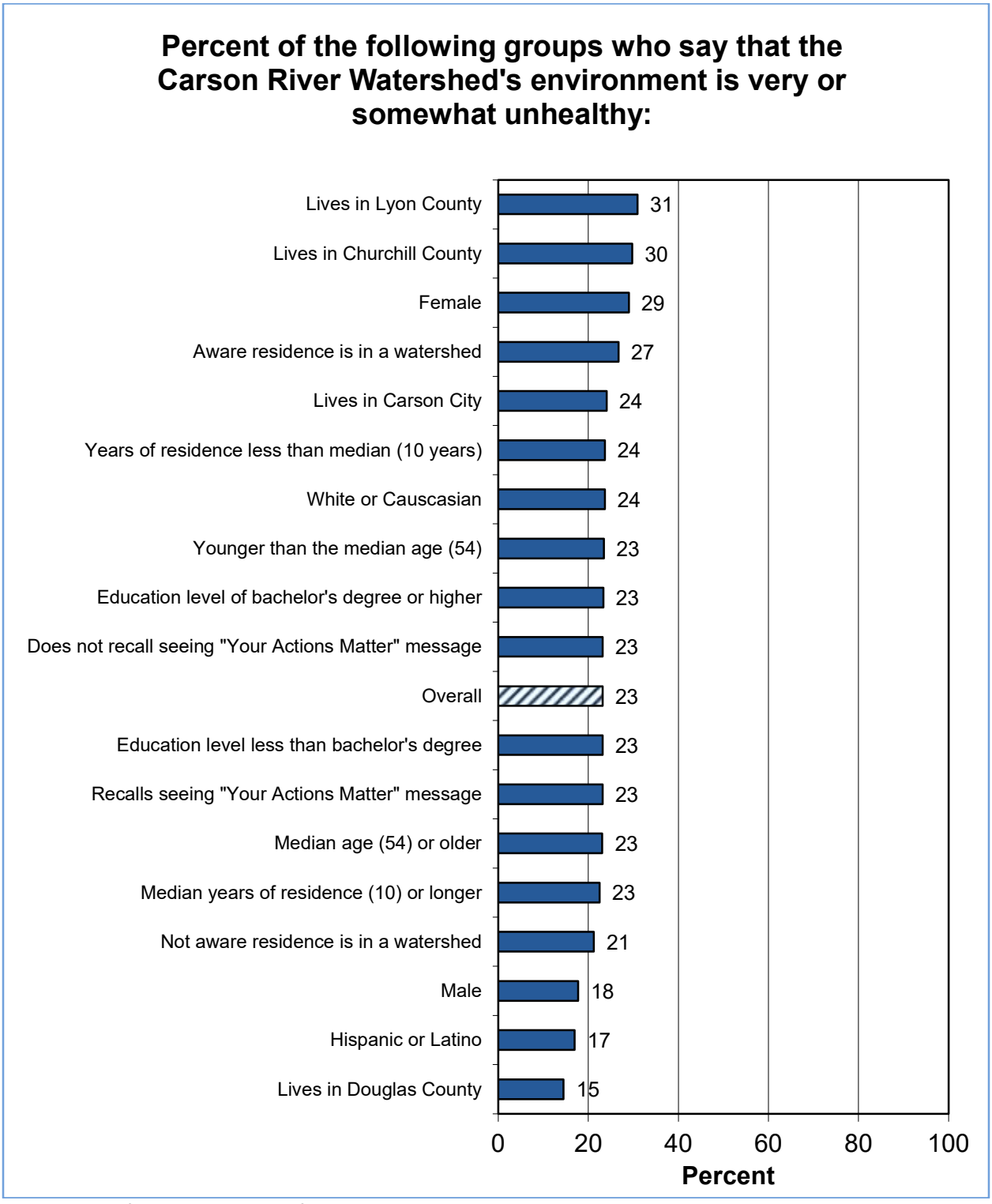


Douglas County residents, Hispanic residents, and those who lived in their current area 10 years or longer most often say that the watershed is healthy. In general, however, there is little variation between the groups.



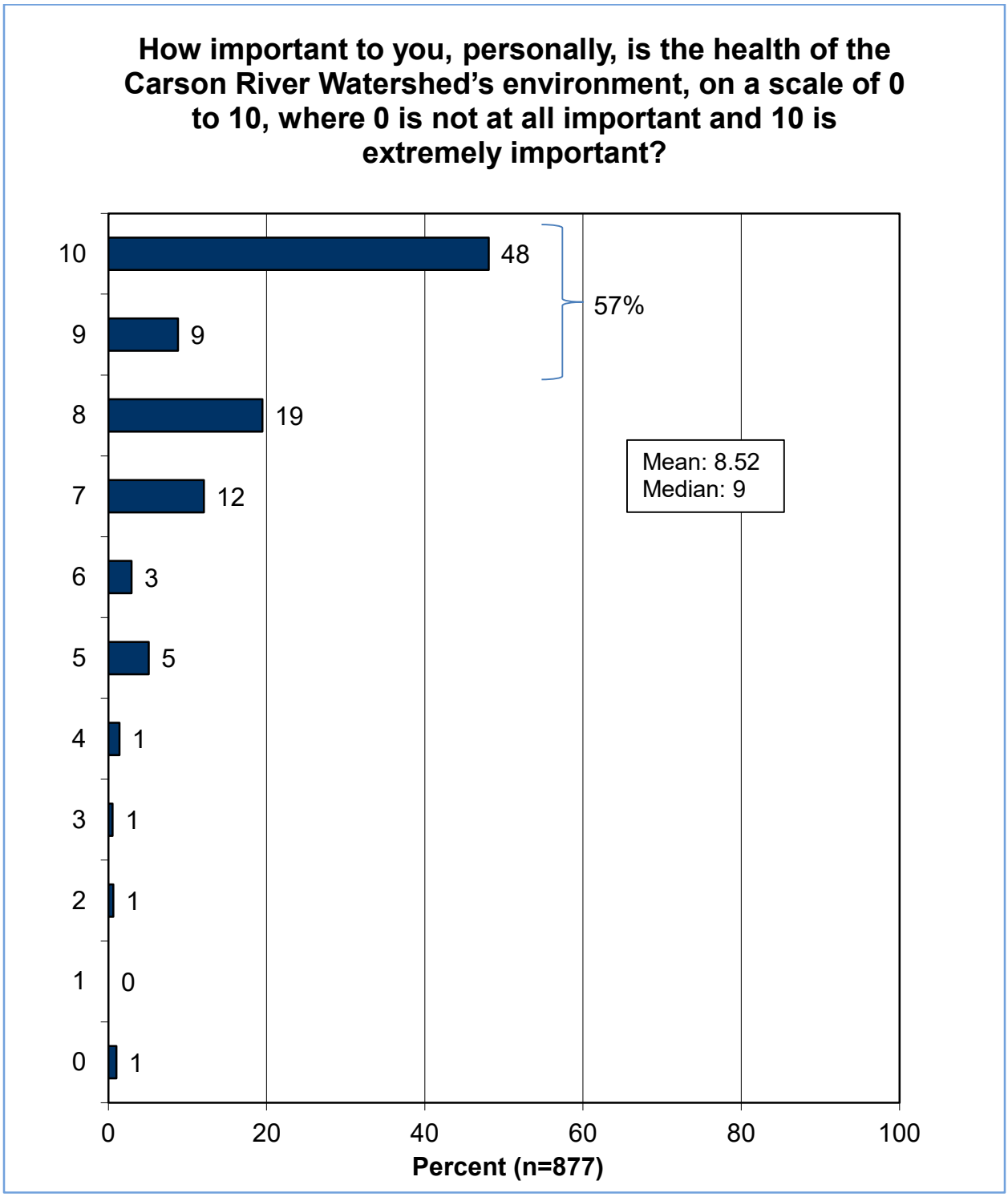
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Those most likely to say that the watershed is unhealthy are residents of Lyon and Churchill Counties and women.

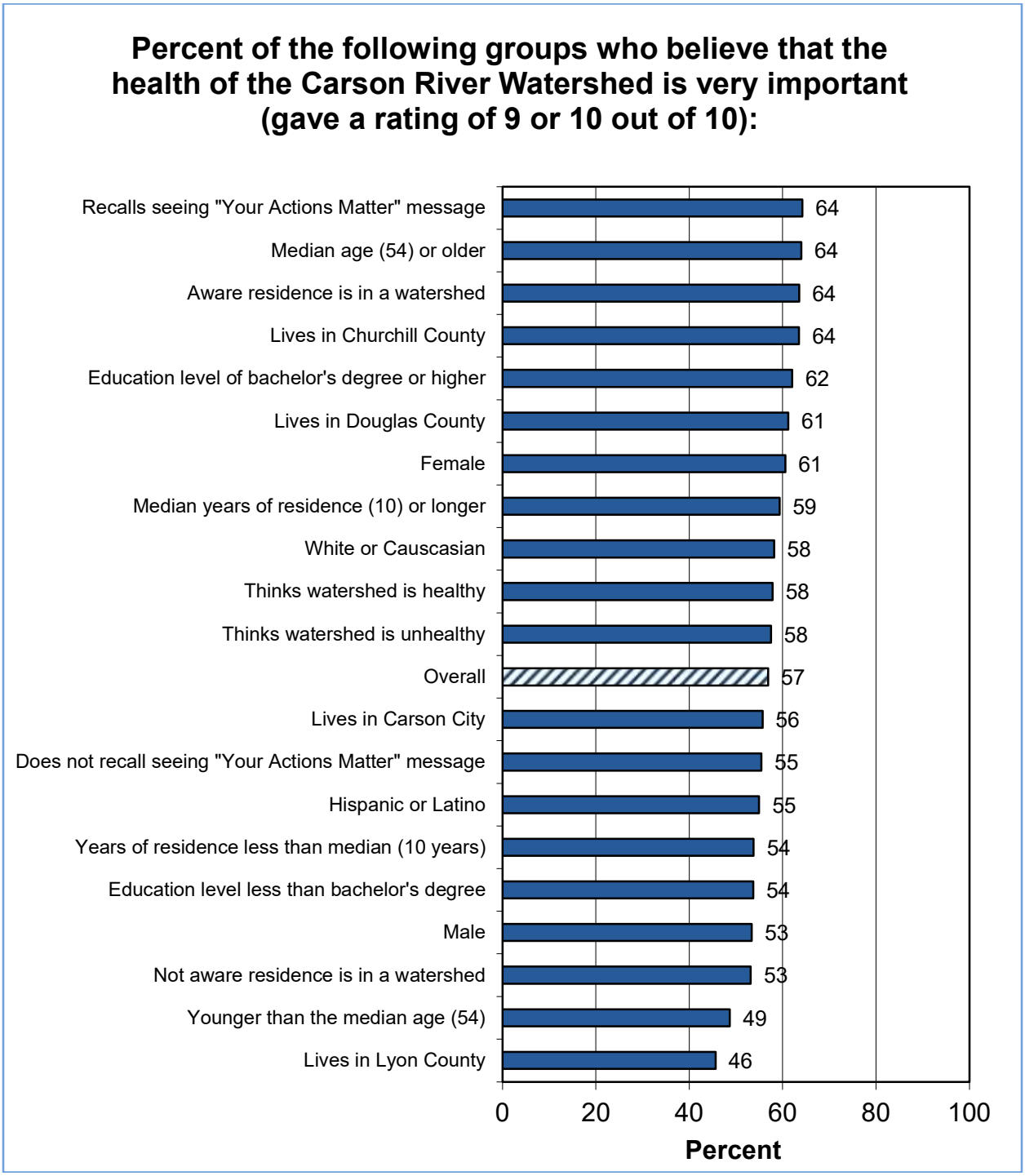


See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Watershed residents were asked to rate how important the health of the Carson River Watershed's environment is to them, on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important. The mean score was 8.52 and the median was 9, with 57% of respondents rating this a 9 or 10.

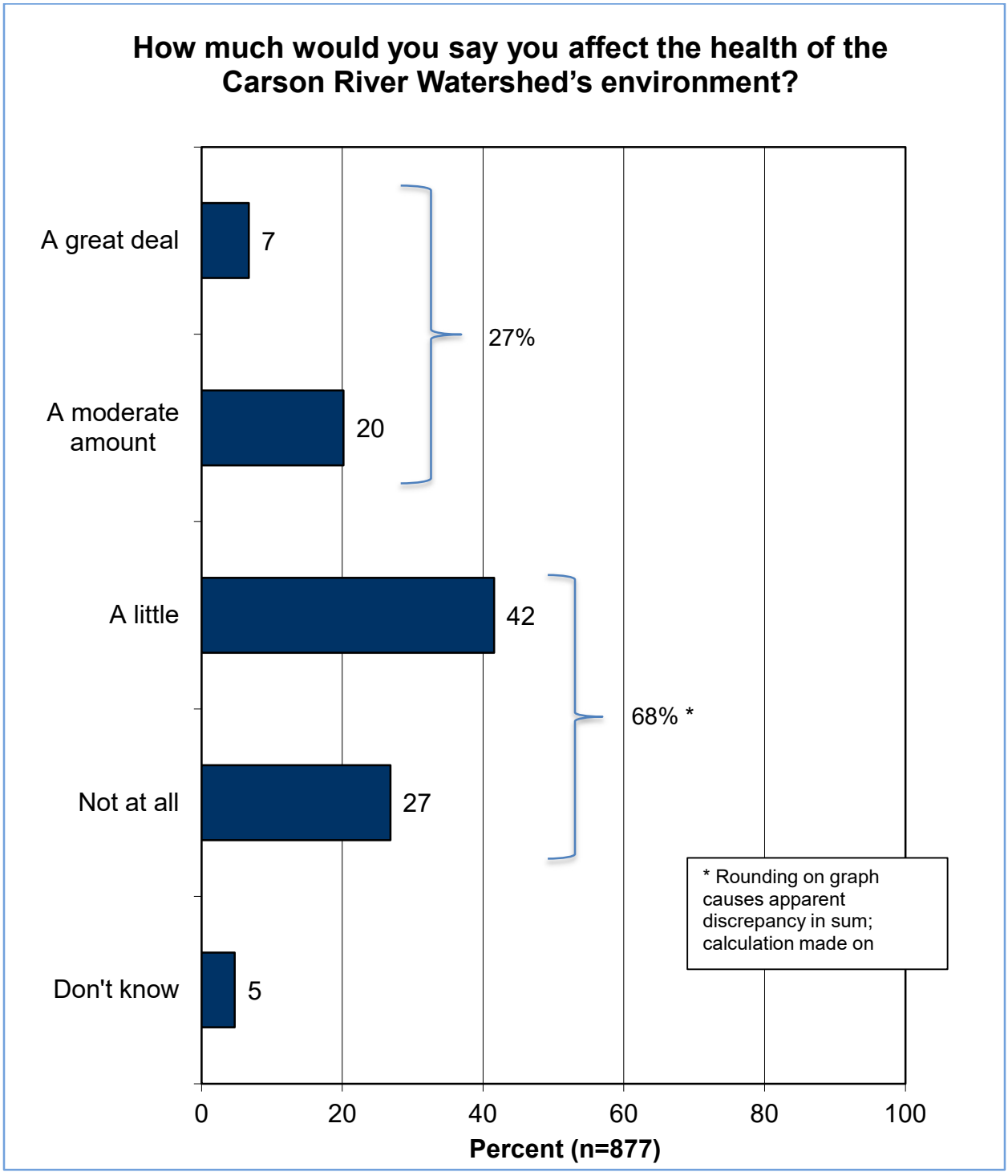


Groups who most often indicate that the watershed's health is very important (rating it 9 or 10) are those who recall the "Your Actions Matter" message, older residents, those who are aware they live in a watershed, and Churchill County residents.

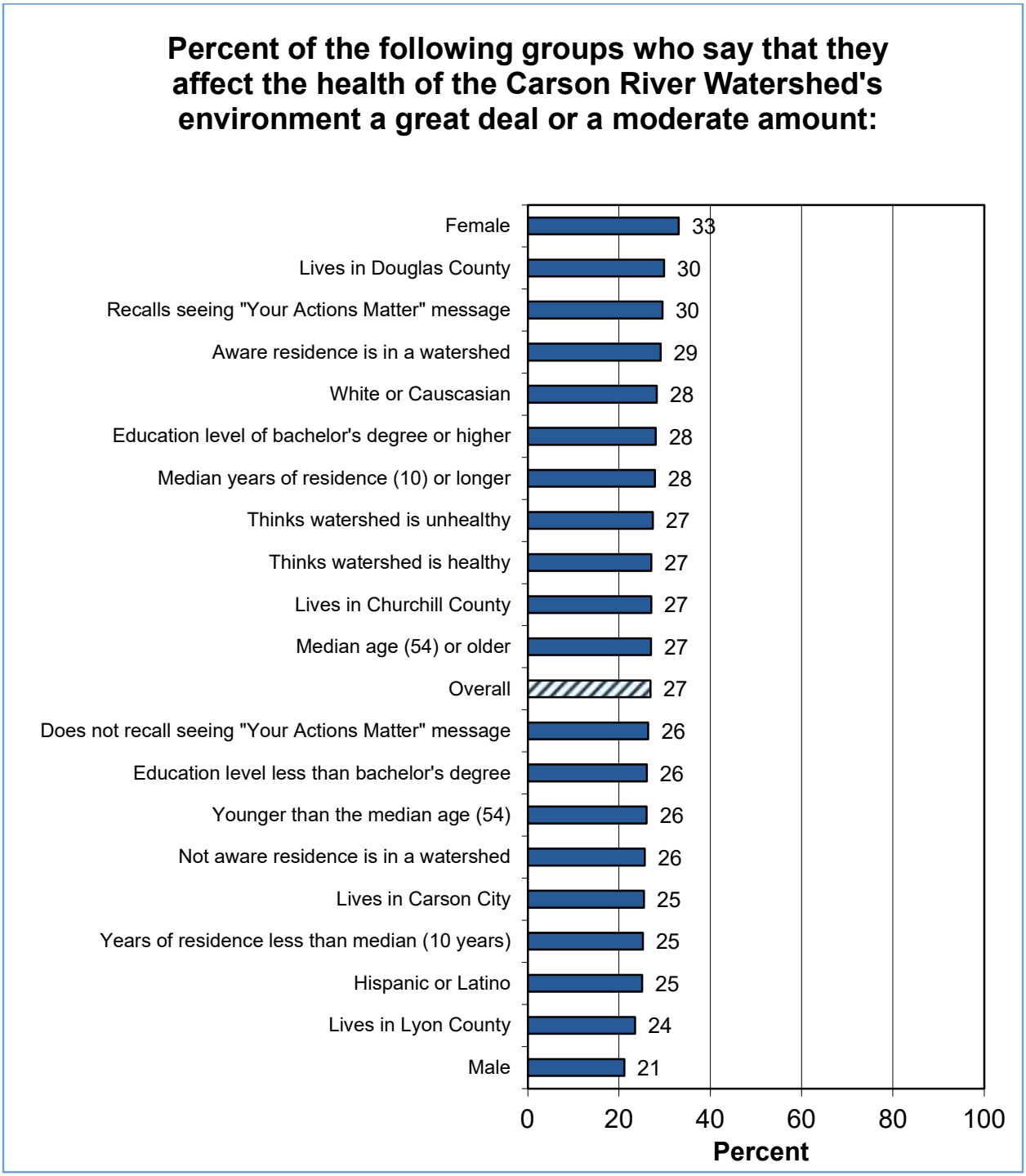


See pages 7-8 for an explanation of how to read these demographic analyses graphs.

About a quarter of residents (27%) say they affect the health of the Carson River Watershed's environment *a great deal* or *a moderate amount*, the top half of the scale, while 68% say they do *a little* or *not at all*, the bottom half. The most common response is *a little*, at 42%.

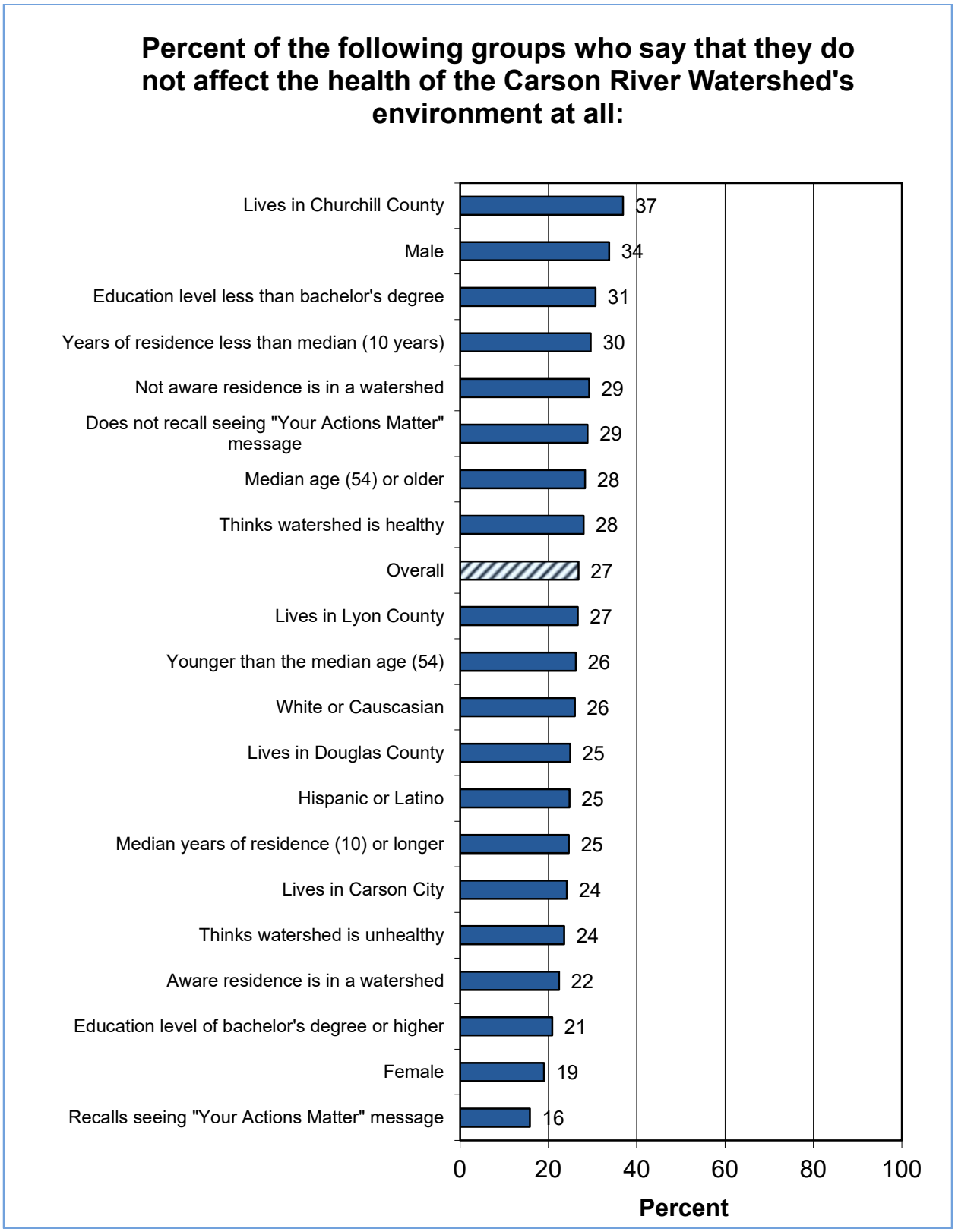


Women are the most likely and men are the least likely to say that they affect the health of the watershed's environment *a great deal* or *a moderate amount*. Otherwise, there are no marked differences between the groups.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

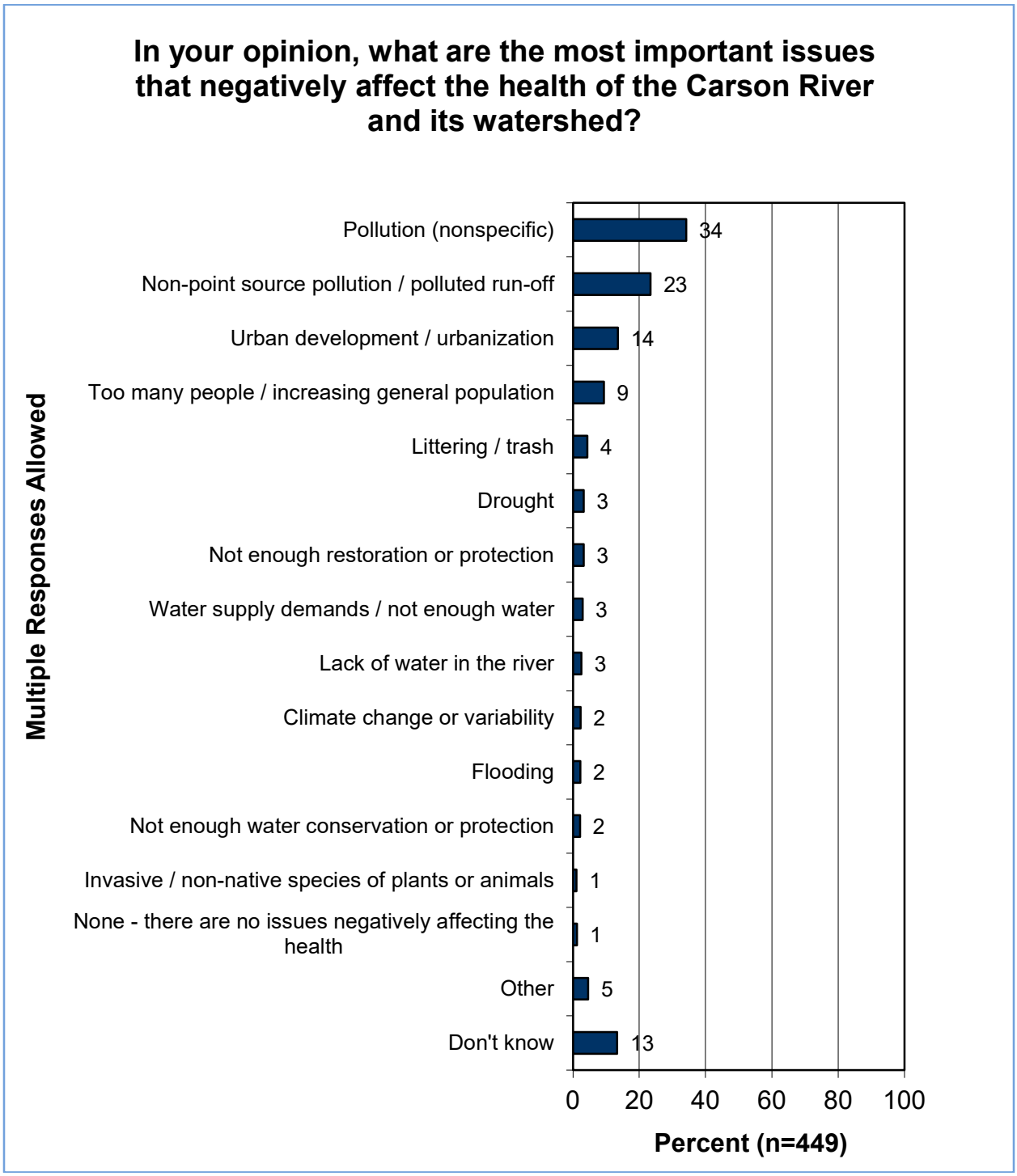
Churchill County residents and men were the groups most likely to say that they do not affect the watershed's environment at all.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

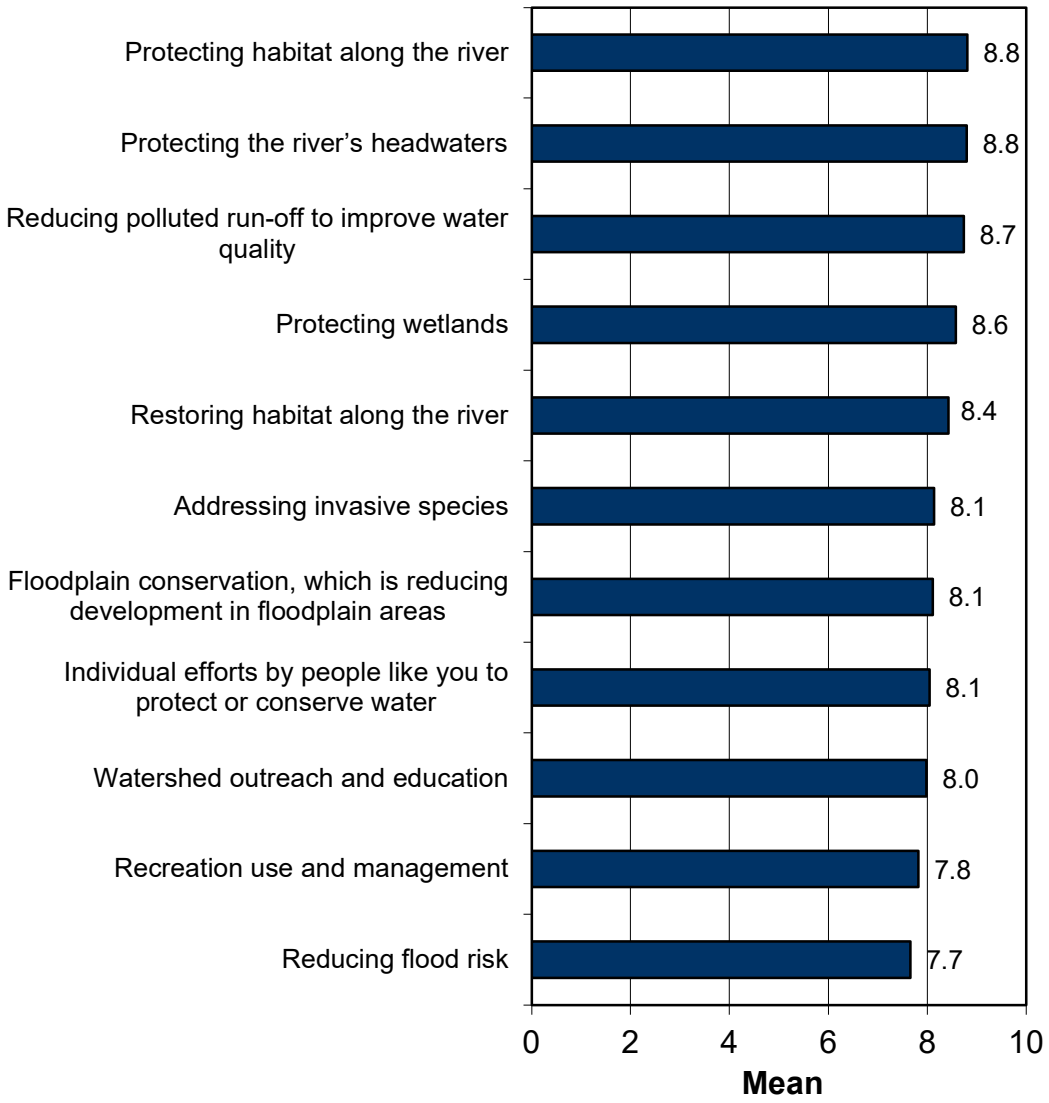
FACTORS AFFECTING THE HEALTH OF THE CARSON RIVER WATERSHED

In an open-ended question, residents most often stated that the most important issues that negatively affect the health of the Carson River and its watershed are pollution in general (34% stated this), polluted run-off (23%), and urban development (14%).

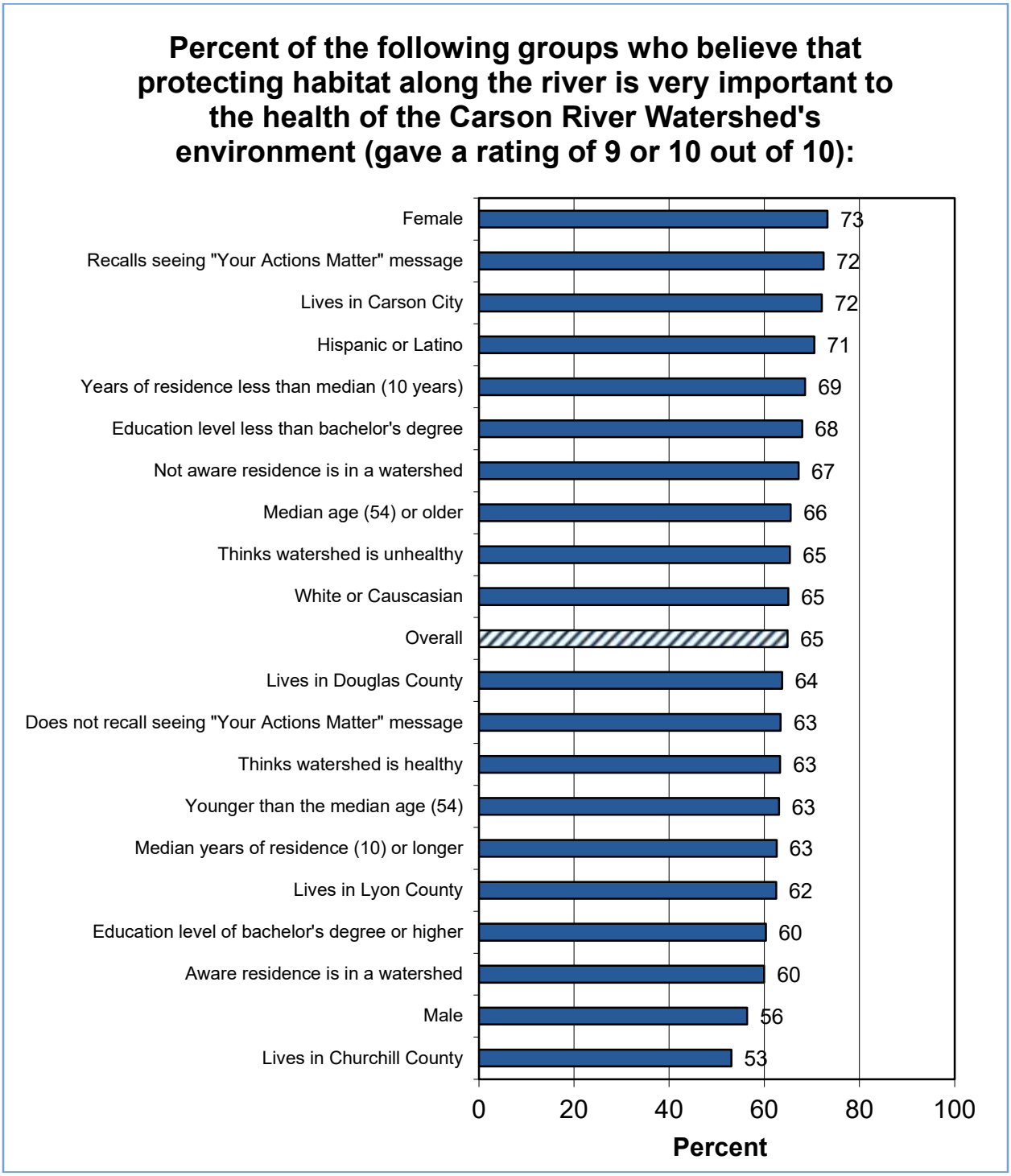


The survey asked residents to rate a series of environmental actions on their importance to the health of the Carson River Watershed, on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important. Of the actions listed, the top tier of mean ratings includes protecting habitat along the river (mean rating of 8.8), protecting the river's headwaters (also 8.8), reducing polluted run-off (8.7), protecting wetlands (8.6), and restoring habitat along the river (8.4). Mean ratings for the remaining actions range from 7.7 to 8.1.

Please tell me how important you think each of the following is to the health of the Carson River Watershed's environment, on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important.

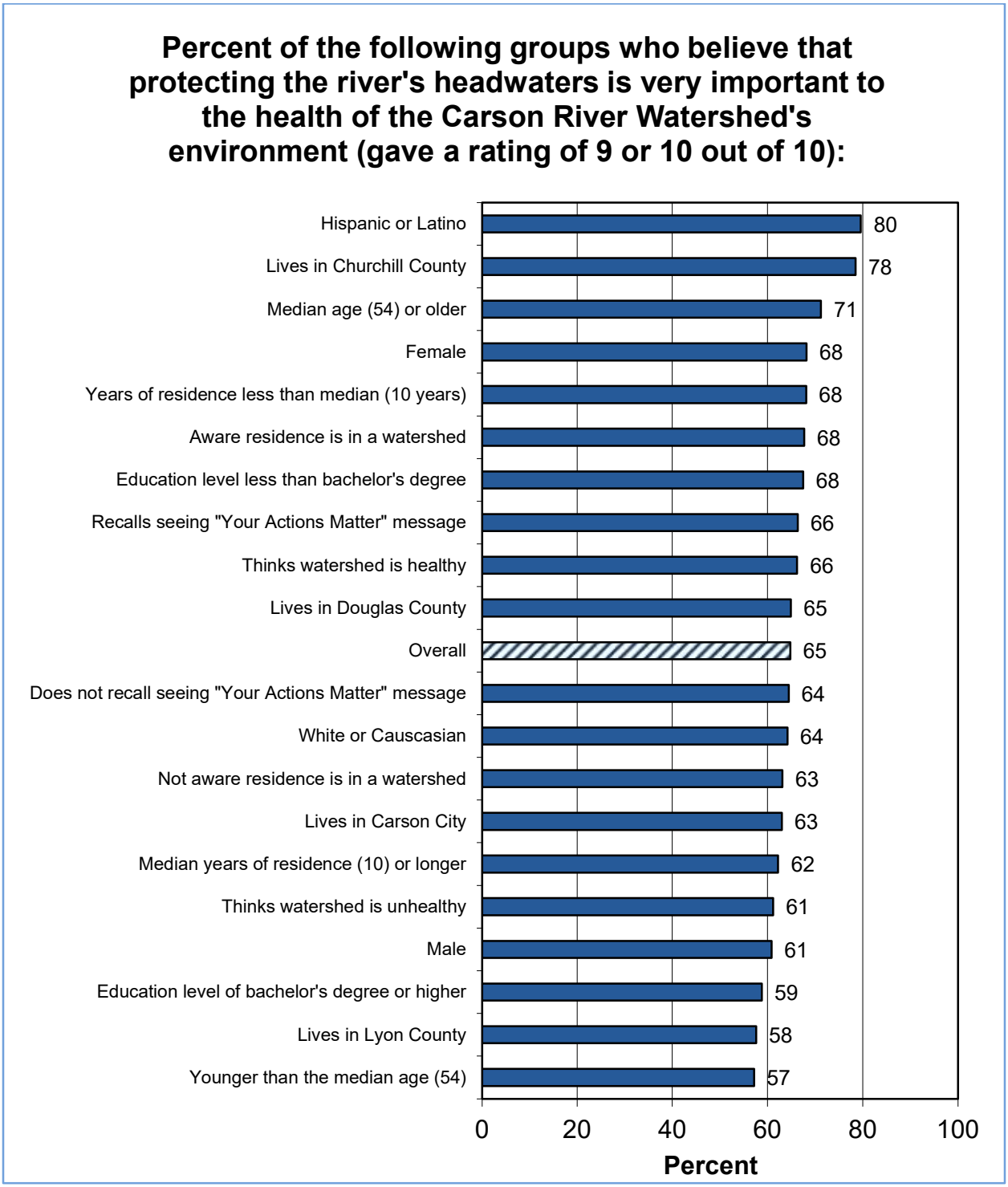


Demographic analyses graphs are shown for the top results of the preceding series. The groups most often indicating that protecting habitat is very important to the Carson River Watershed's health (giving a rating of 9 or 10) are women, those who recall the "Your Actions Matter" message, Carson City residents, and Hispanic residents.



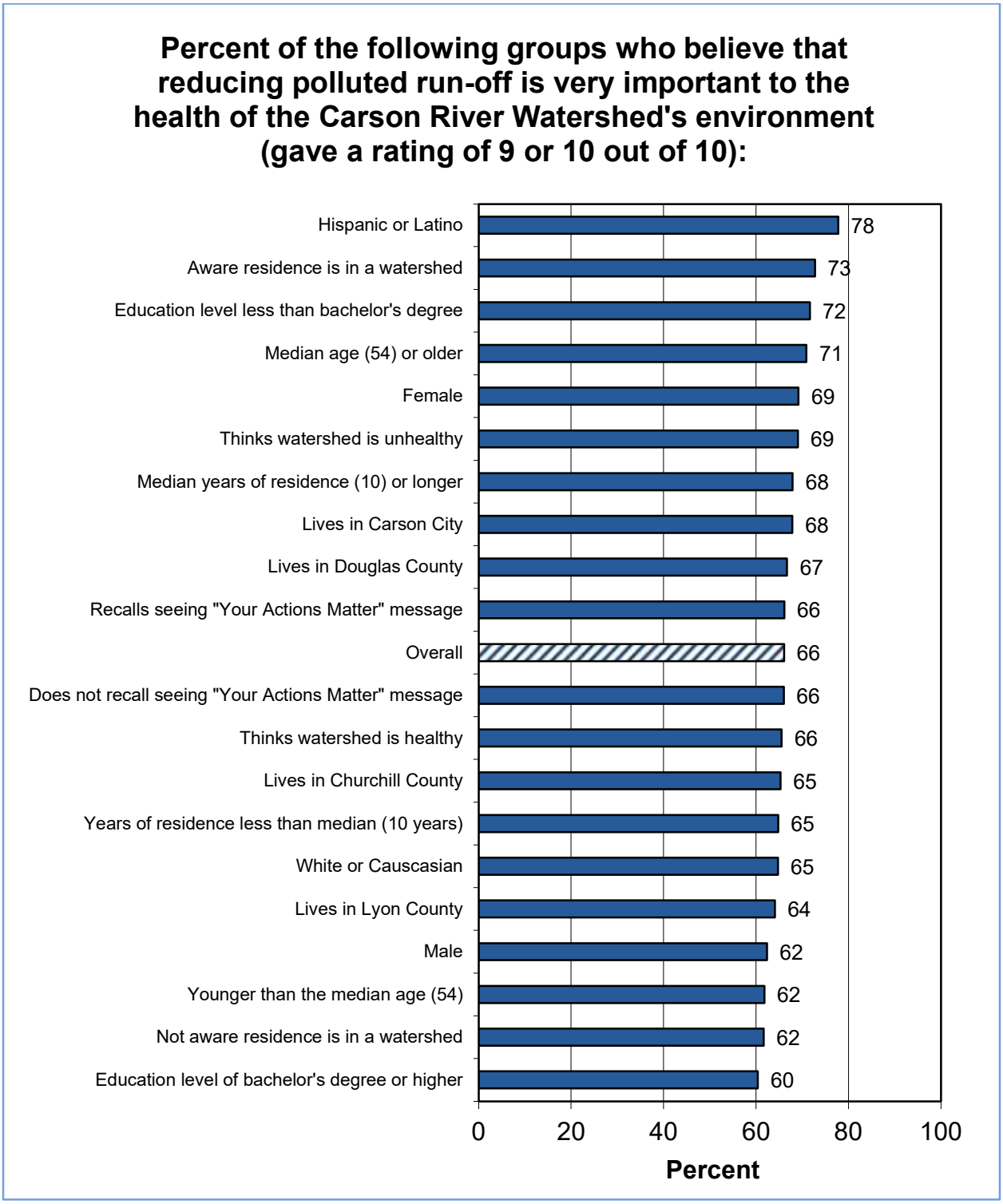
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Hispanic residents, Churchill County residents, and older residents most often give a 9 or 10 rating to the importance of protecting the Carson River's headwaters.



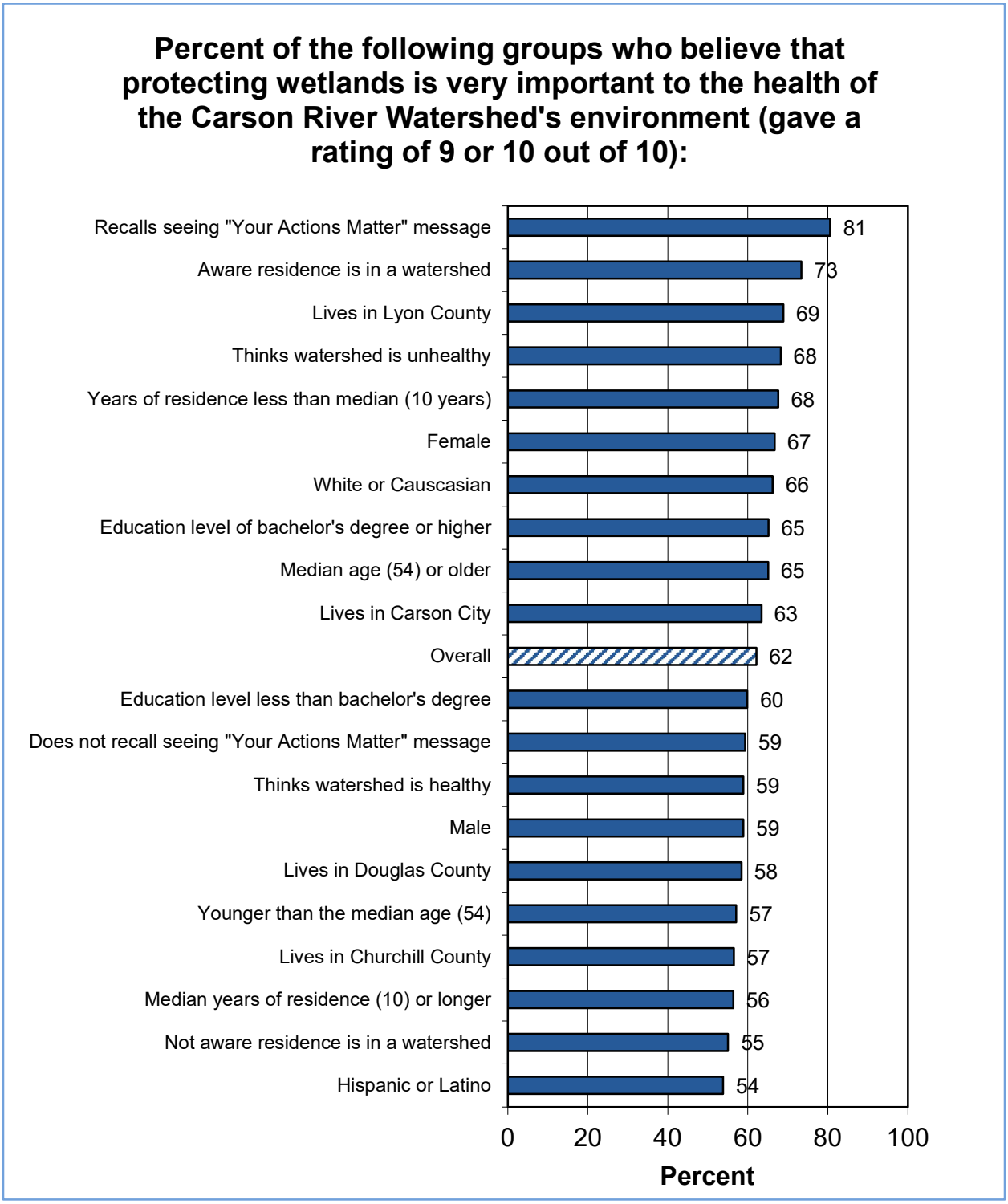
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Those most often saying that reducing polluted run-off is very important are Hispanic residents, those aware that they live in a watershed, those in the lower education category, and older residents.



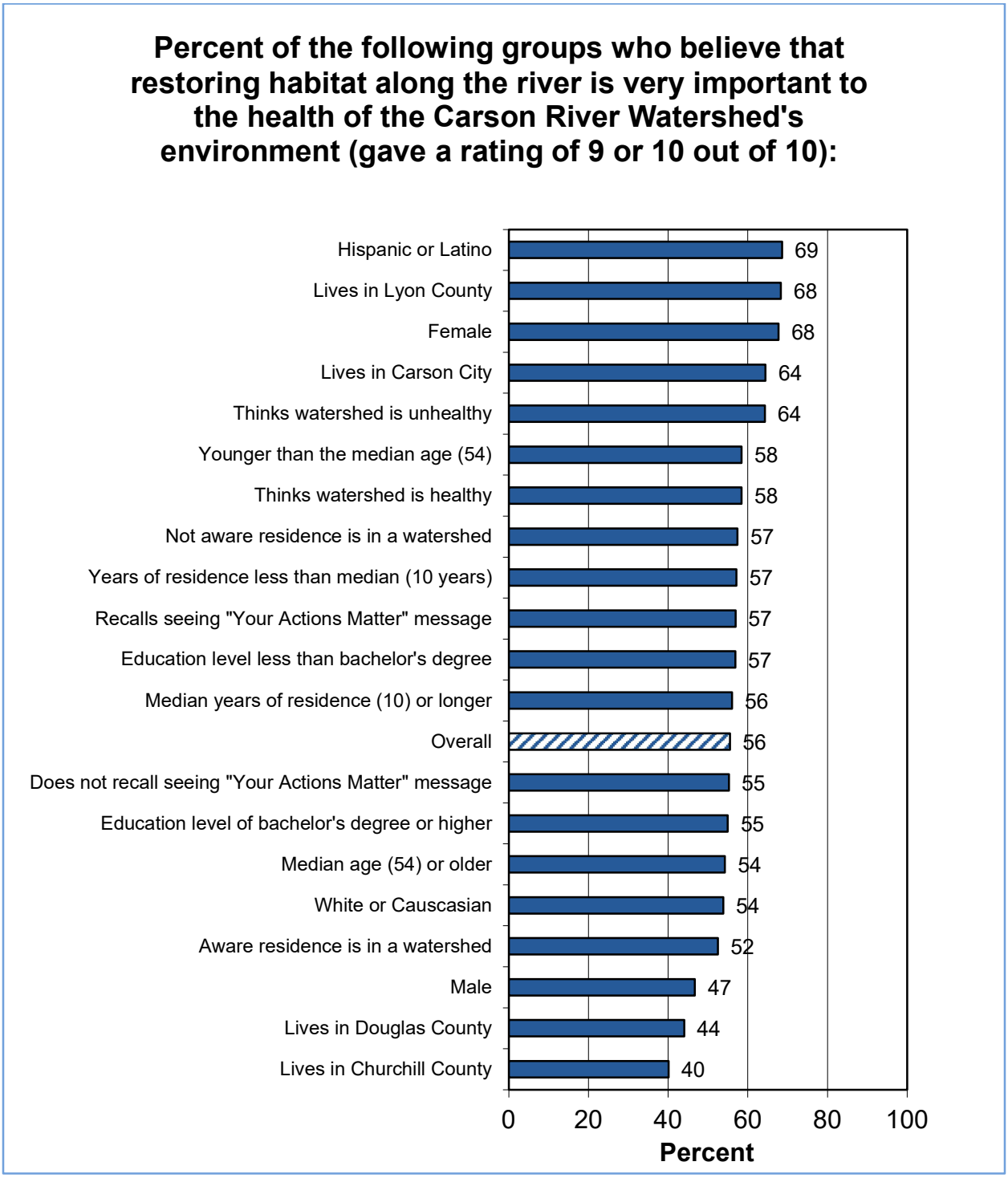
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Protecting wetlands is most important to those who recall “Your Actions Matter” messaging, those aware that they live in a watershed, Lyon County residents, those who think the watershed is unhealthy, and those living in their area less than 10 years.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

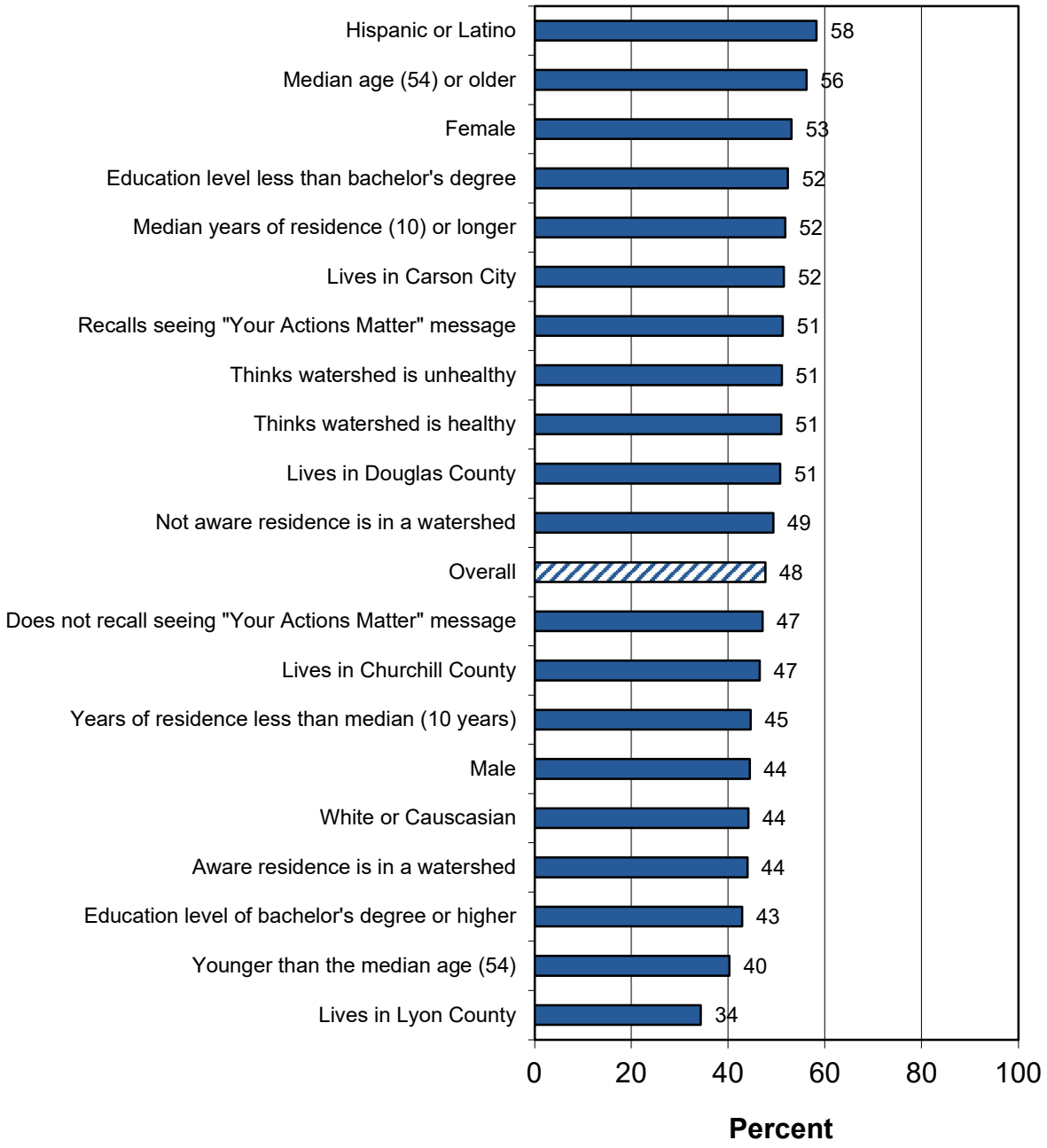
Restoring habitat along the river got the highest ratings of importance from Hispanic residents, Lyon County residents, and women. A second tier includes Carson City residents and those who think the watershed is unhealthy.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

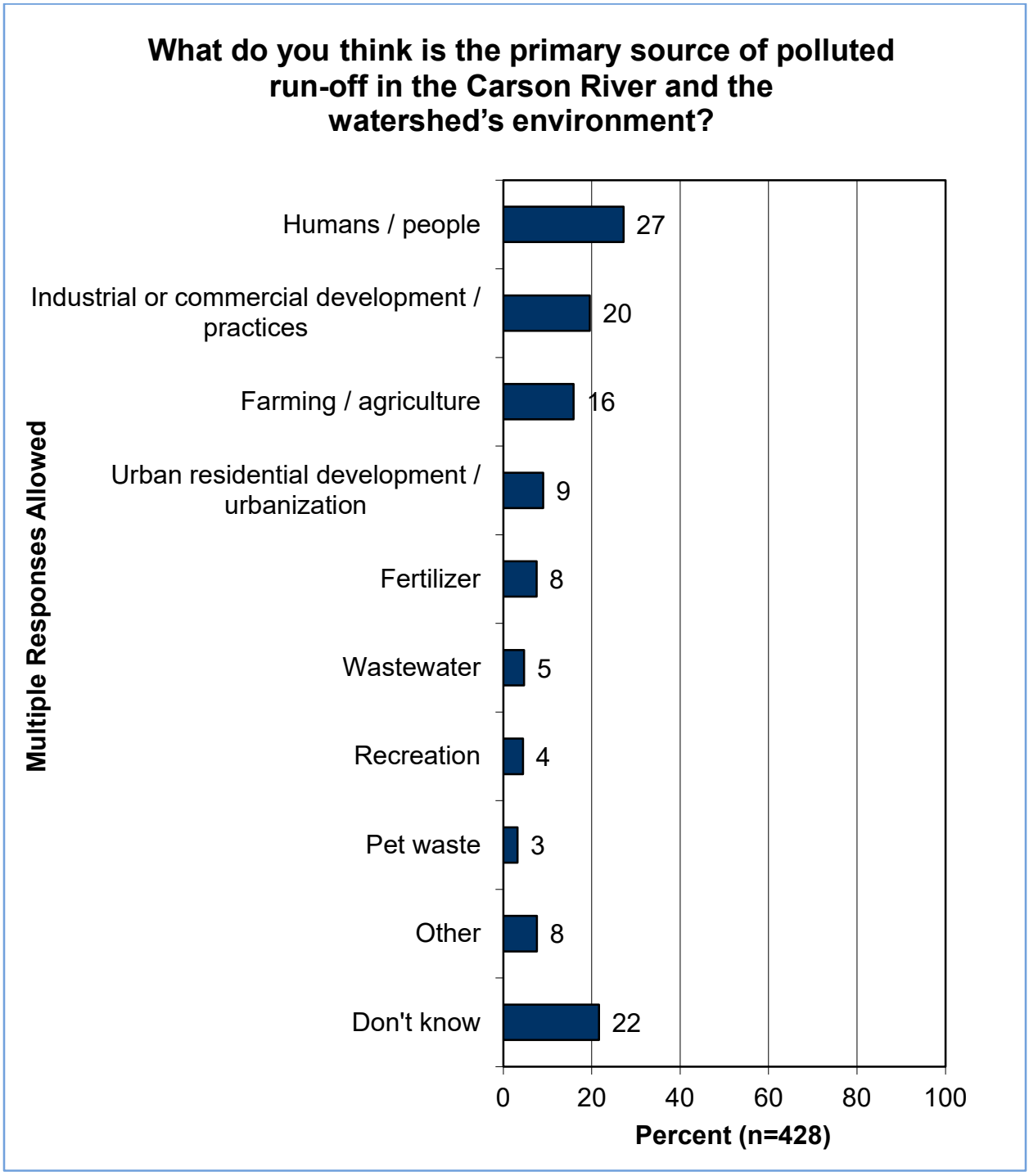
Individual efforts received the highest ratings of importance from Hispanic residents, older residents, and women. On the other hand, the least likely are residents of Lyon County and younger residents.

Percent of the following groups who believe that individual efforts by people to protect or conserve water is very important to the health of the Carson River Watershed's environment (gave a rating of 9 or 10 out of 10):



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Watershed residents most often indicate that human activity is the primary source of polluted run-off into the Carson River, in an open-ended question. This is followed by industrial or commercial development and agriculture. (Although most responses are specific examples of human activity, "humans/people" in general emerged as the top response.) "Other" responses are shown in the appendix.

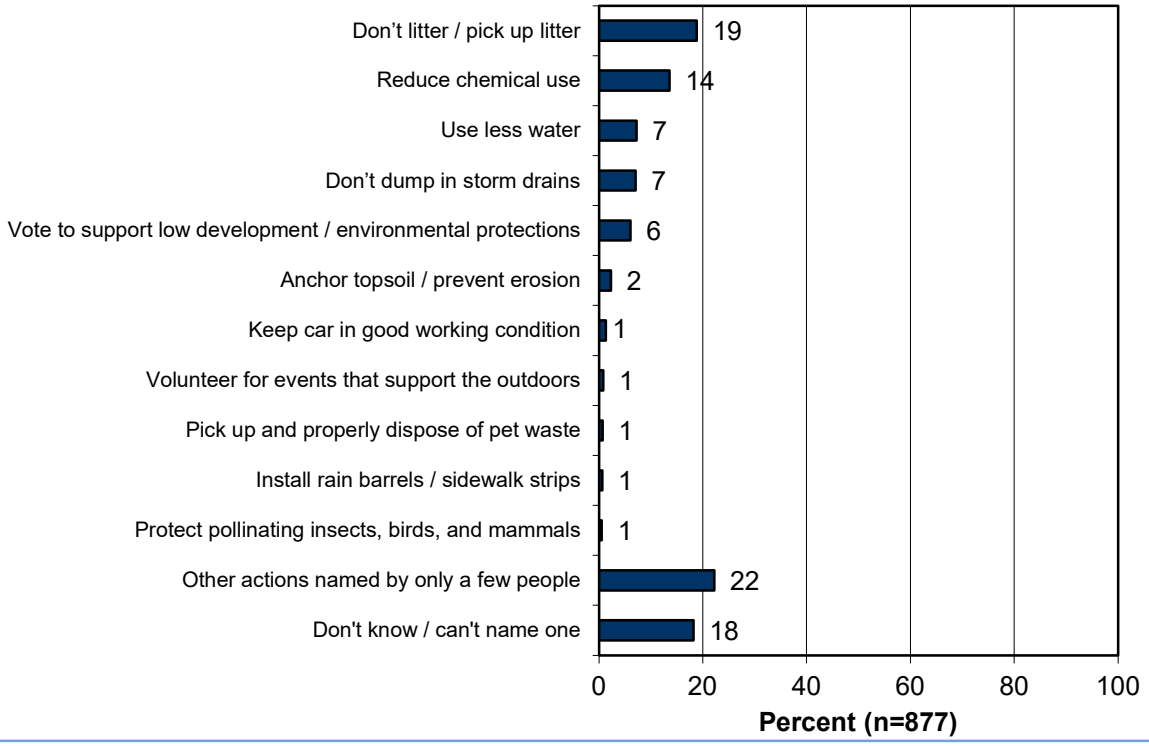


ACTIVITIES THAT CONTRIBUTE TO WATER HEALTH

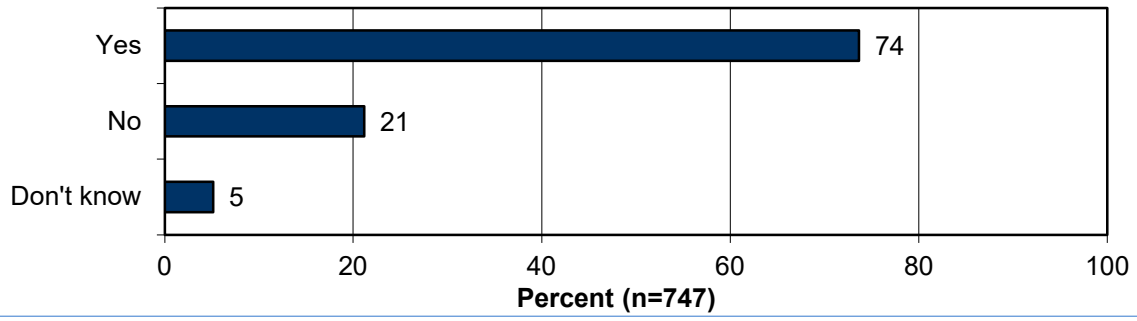
Watershed residents were asked to name the single most important action they can take to help protect or improve the health of the Carson River and its watershed's environment, in an open-ended question. Over four fifths (82%) named a specific action, with not littering or picking up litter and reducing chemical use at the top of the list. "Other" responses can be viewed in the appendix.

Among those who named an action, 74% indicated that they are currently taking the action.

In your opinion, what is the single most important action you can take to help protect or improve the health of the Carson River and the watershed's environment?

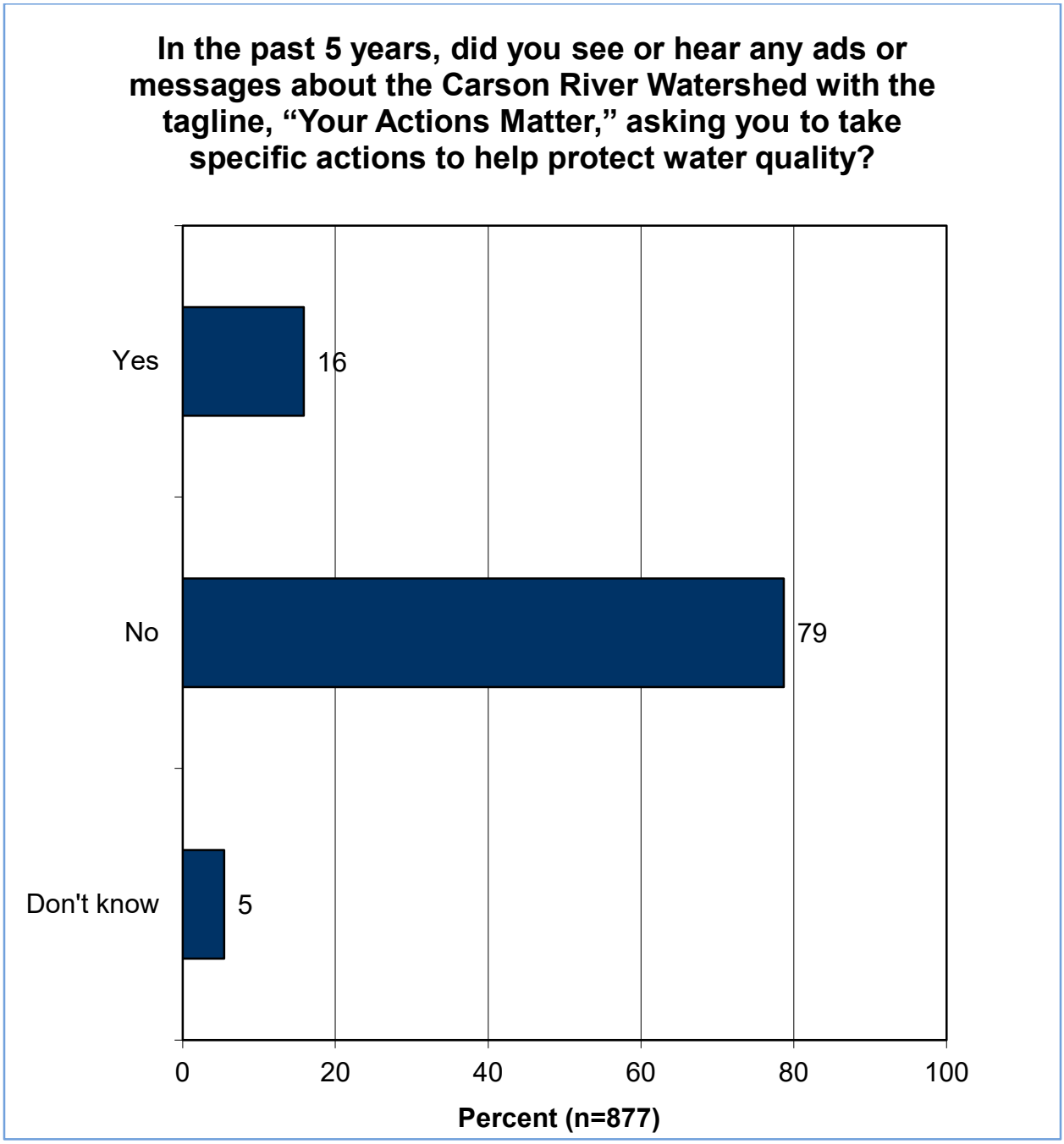


Are you currently taking this action? (Among those who named an action.)

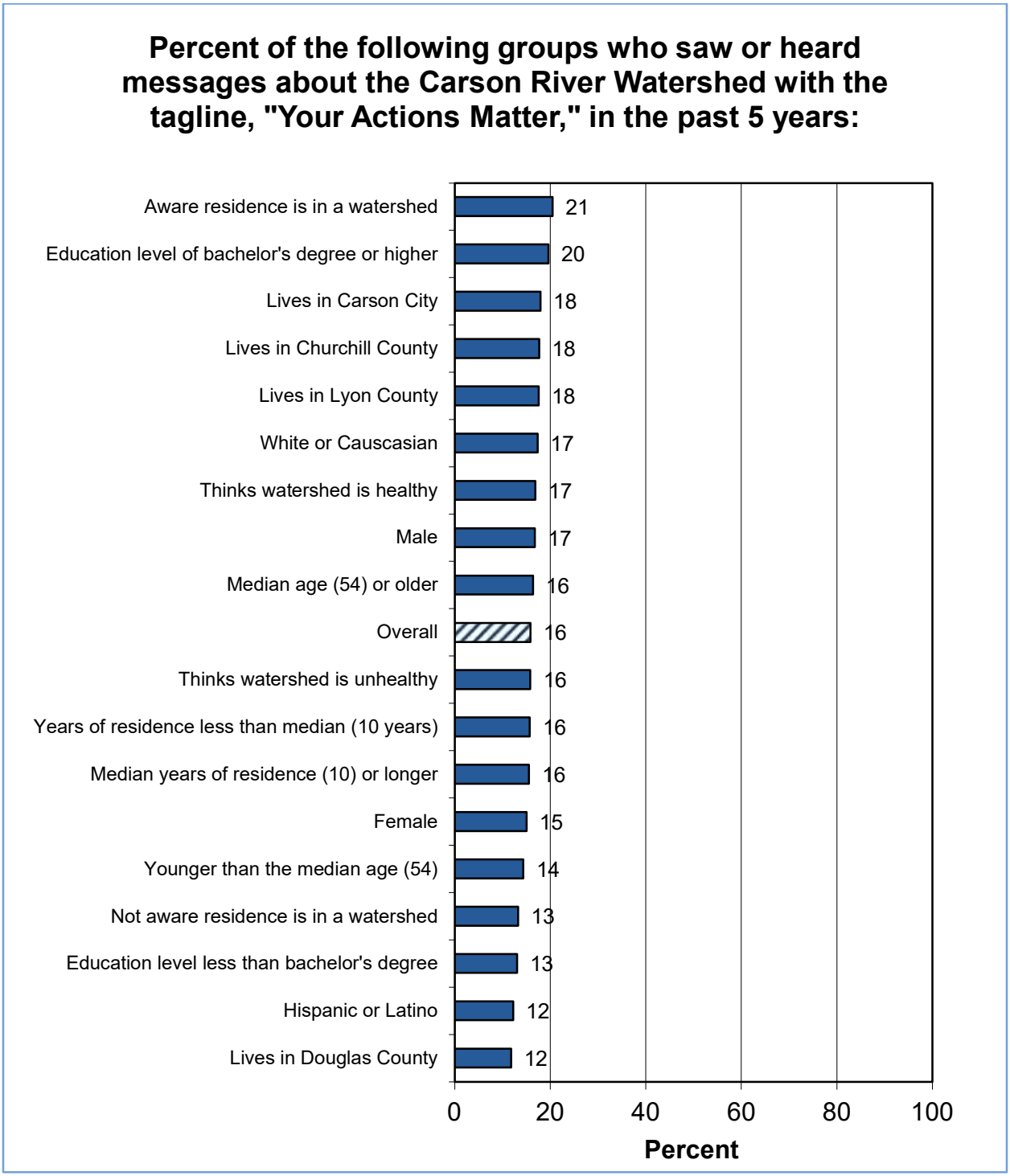


AWARENESS OF CONSERVATION MESSAGES AND ADS

Overall, 16% of watershed residents saw or heard ads or messages about the Carson River Watershed using the tagline, "Your Actions Matter," in the past 5 years.



Exposure to the "Your Actions Matter" messaging was very uniform across the groups. Only those who indicated knowing that they live in a watershed were markedly more likely than residents overall to have seen or heard the messaging.

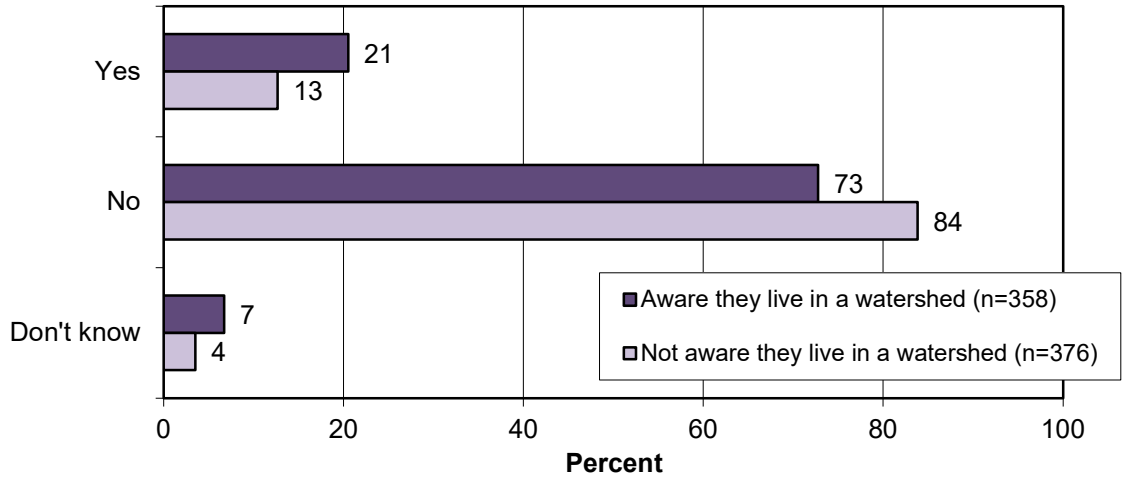


See pages 7-8 for an explanation of how to read these demographic analyses graphs.

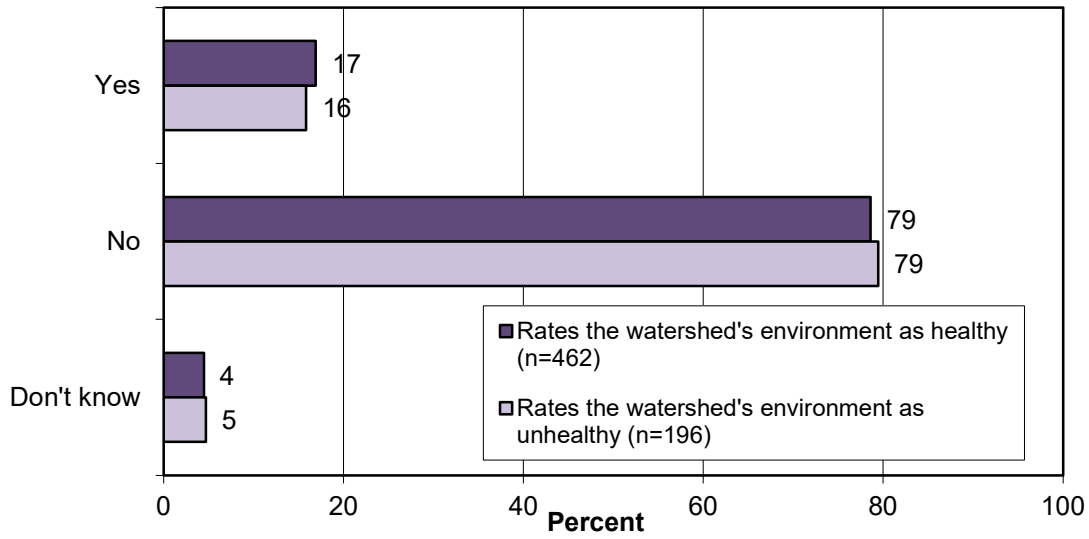
Crosstabulations were run to examine awareness of the messaging more closely. First, as shown in the previous demographic analyses graph, those aware that they live in a watershed were markedly more likely to recall the messaging compared to their counterparts.

On the other hand, there is virtually no difference between those who think the watershed is healthy or unhealthy regarding awareness of the messaging.

In the past 5 years, did you see or hear any ads or messages about the Carson River Watershed with the tagline, "Your Actions Matter," asking you to take specific actions to help protect water quality?

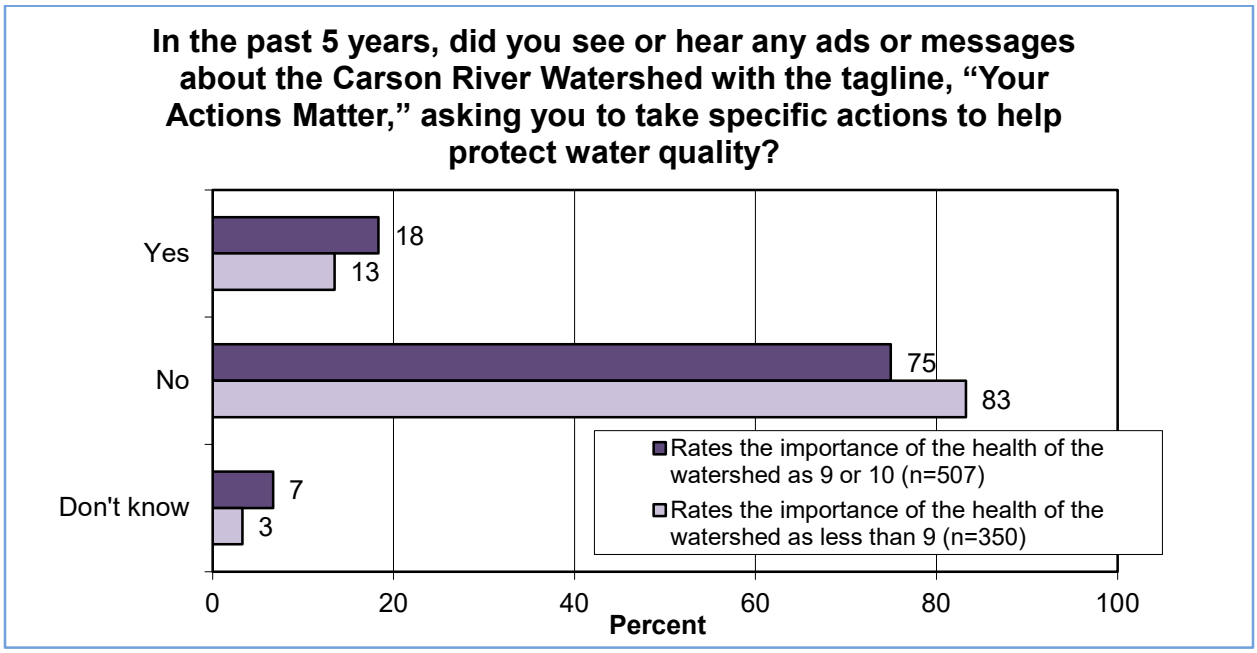


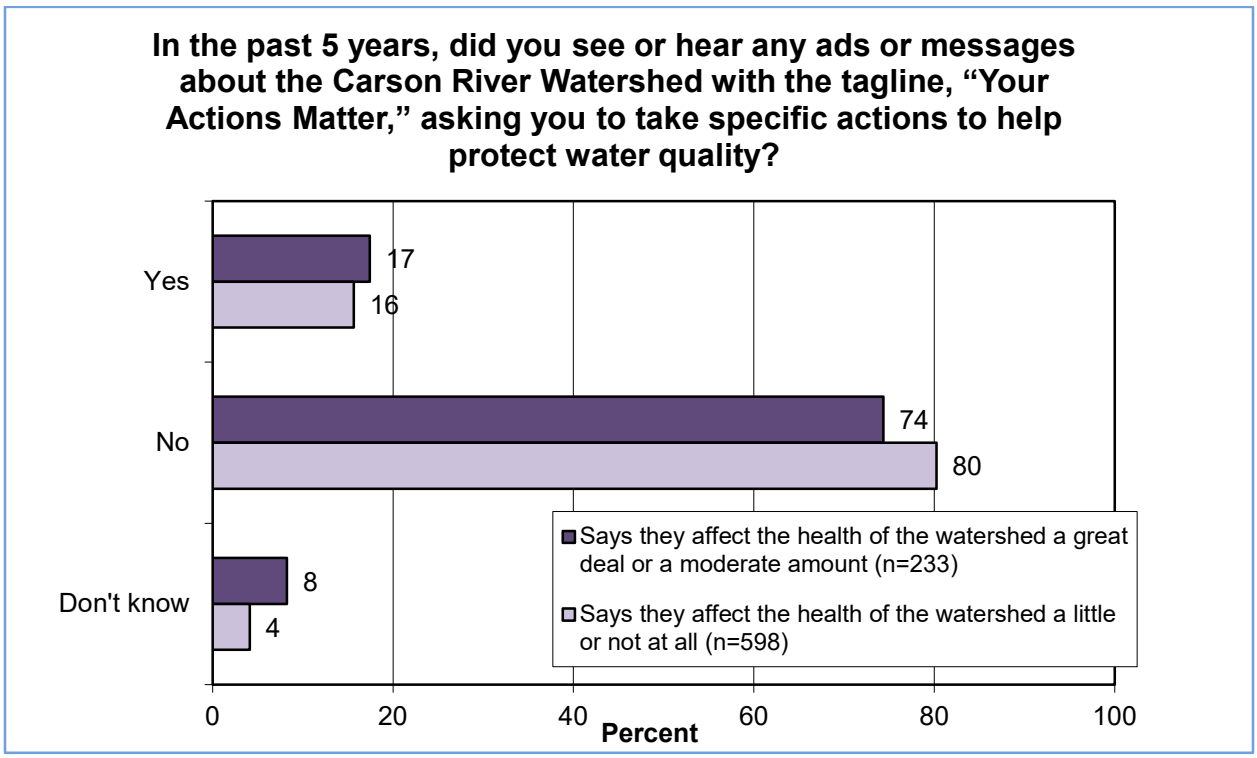
In the past 5 years, did you see or hear any ads or messages about the Carson River Watershed with the tagline, "Your Actions Matter," asking you to take specific actions to help protect water quality?



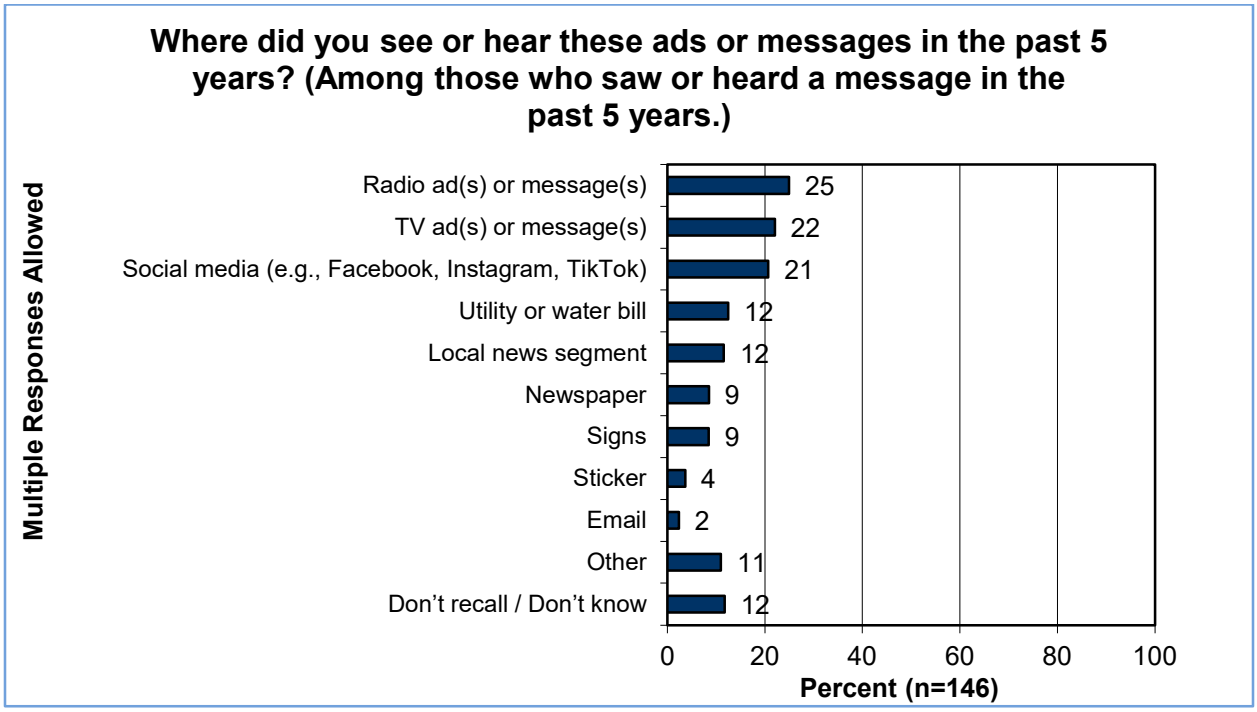
Those who rate the importance of the watershed's health a 9 or 10 were markedly more likely to have seen the "Your Actions Matter" messaging compared to those who gave a lower rating.

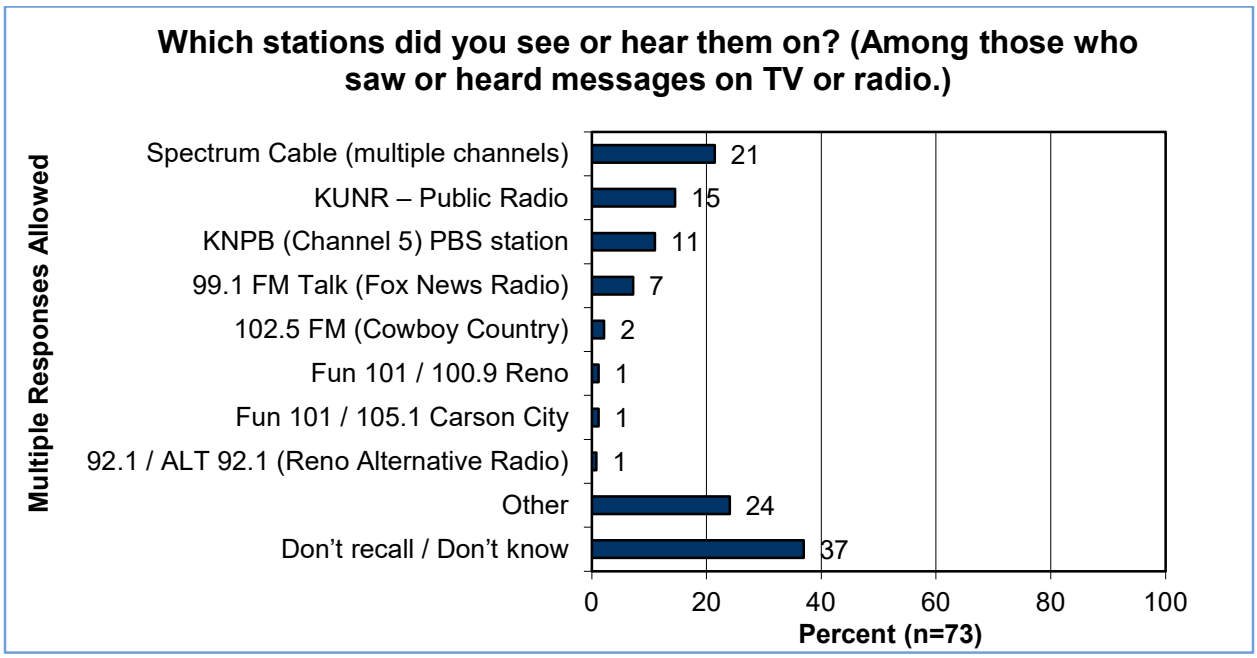
Finally, recall of "Your Actions Matter" was compared between those who say they affect the watershed's health *a great deal* or *a moderate amount* to those who say *a little* or *not at all*. The former group was only 1% higher than the latter group in saying that they saw or heard messages; however, the former group more often replied with don't know than with no, compared to the latter group.



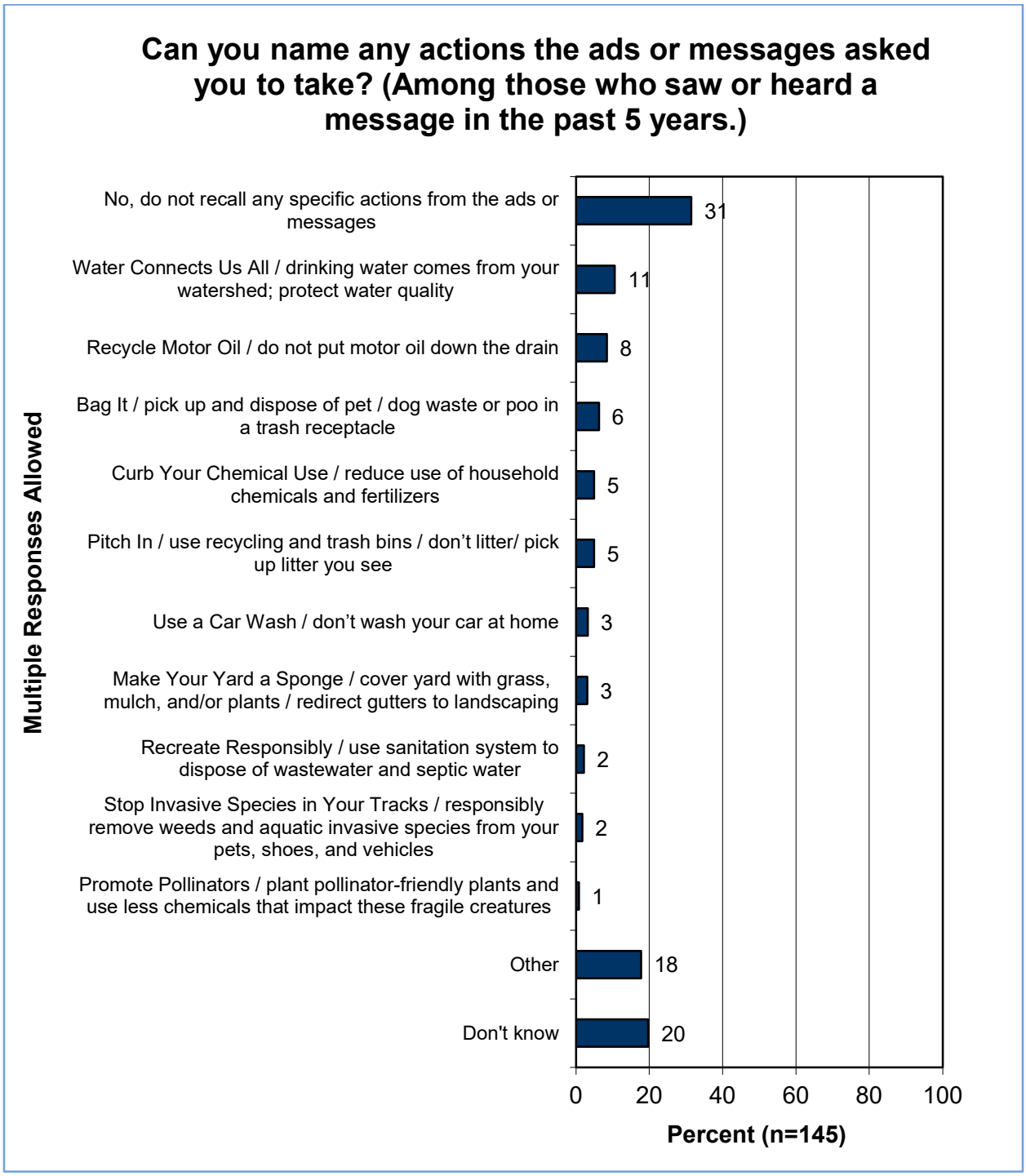


Those who saw or heard "Your Actions Matter" ads most often encountered them on radio, TV, or social media. Spectrum Cable (across multiple channels) was the most common source for those who saw or heard messages on TV or radio.

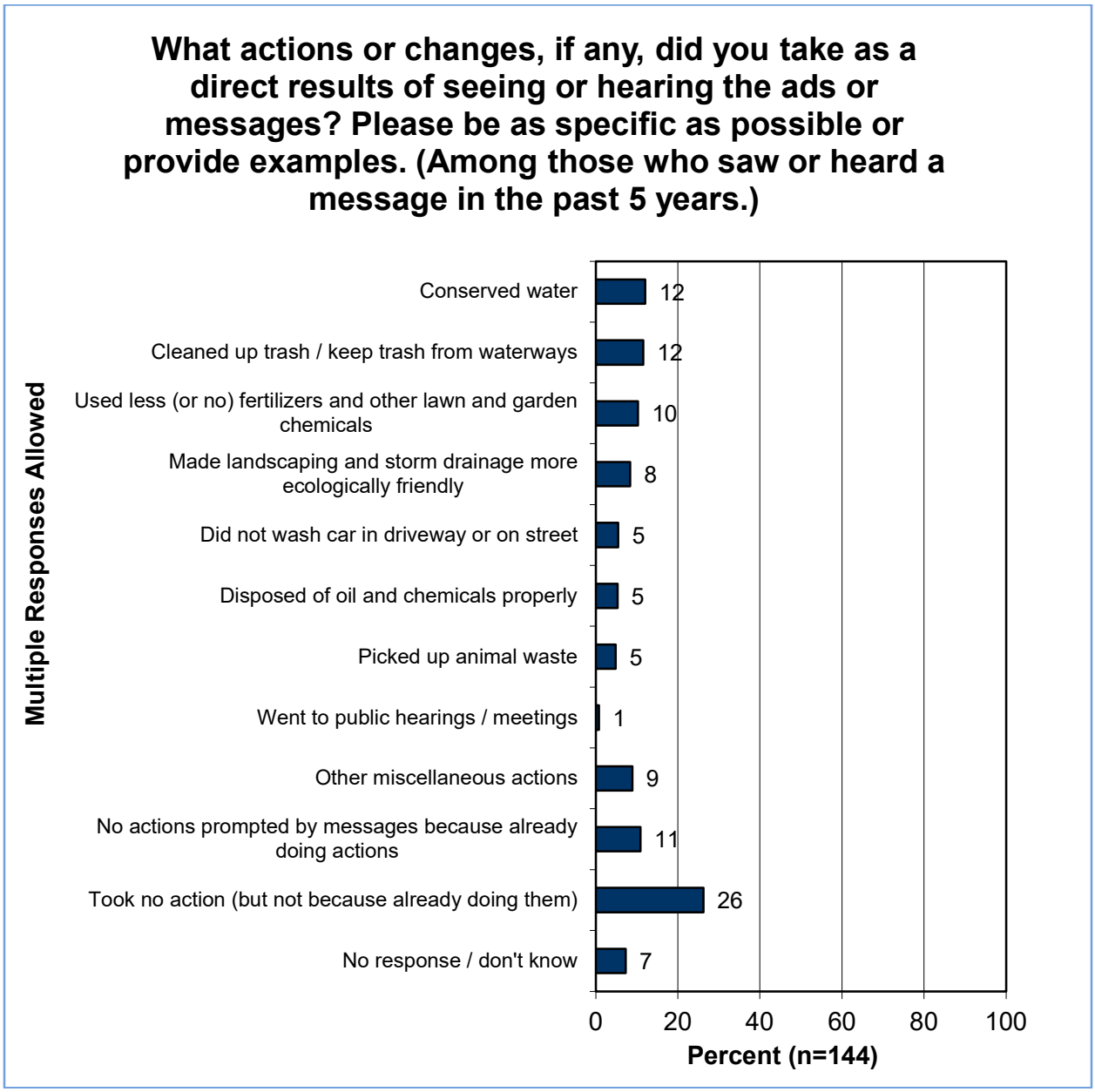




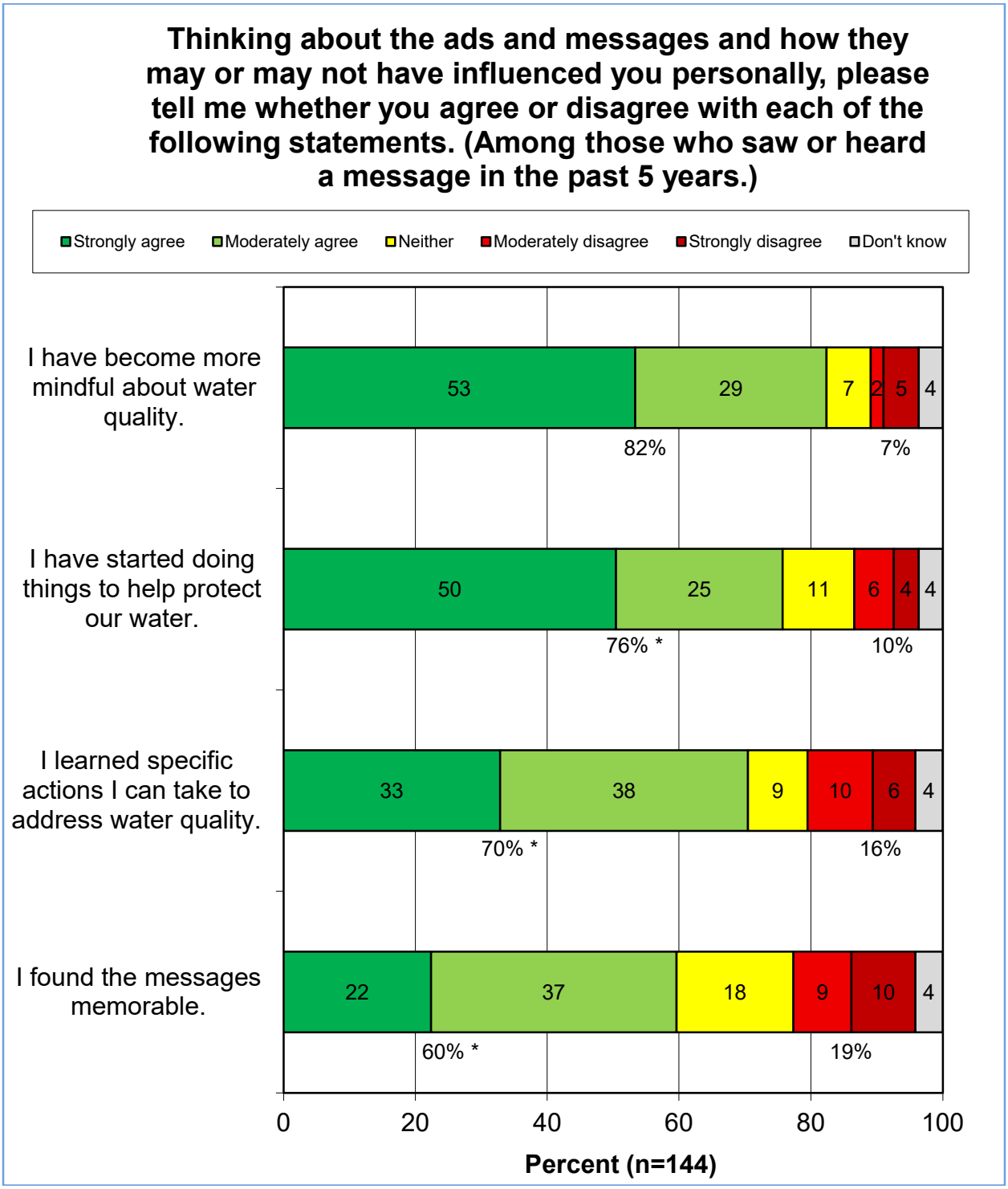
Nearly a third of those who saw or heard messages could not recall any specific actions encouraged by the messages. Otherwise, the top actions recalled were to protect water quality, to not put motor oil down the drain, and to pick up after their pet. "Other" responses are shown in the appendix. (The graph shows the message that pertained to the action.)



Among those who saw or heard messages, the top actions taken as a result of the messages were to conserve water, to clean up trash, and to use less or no lawn chemicals.

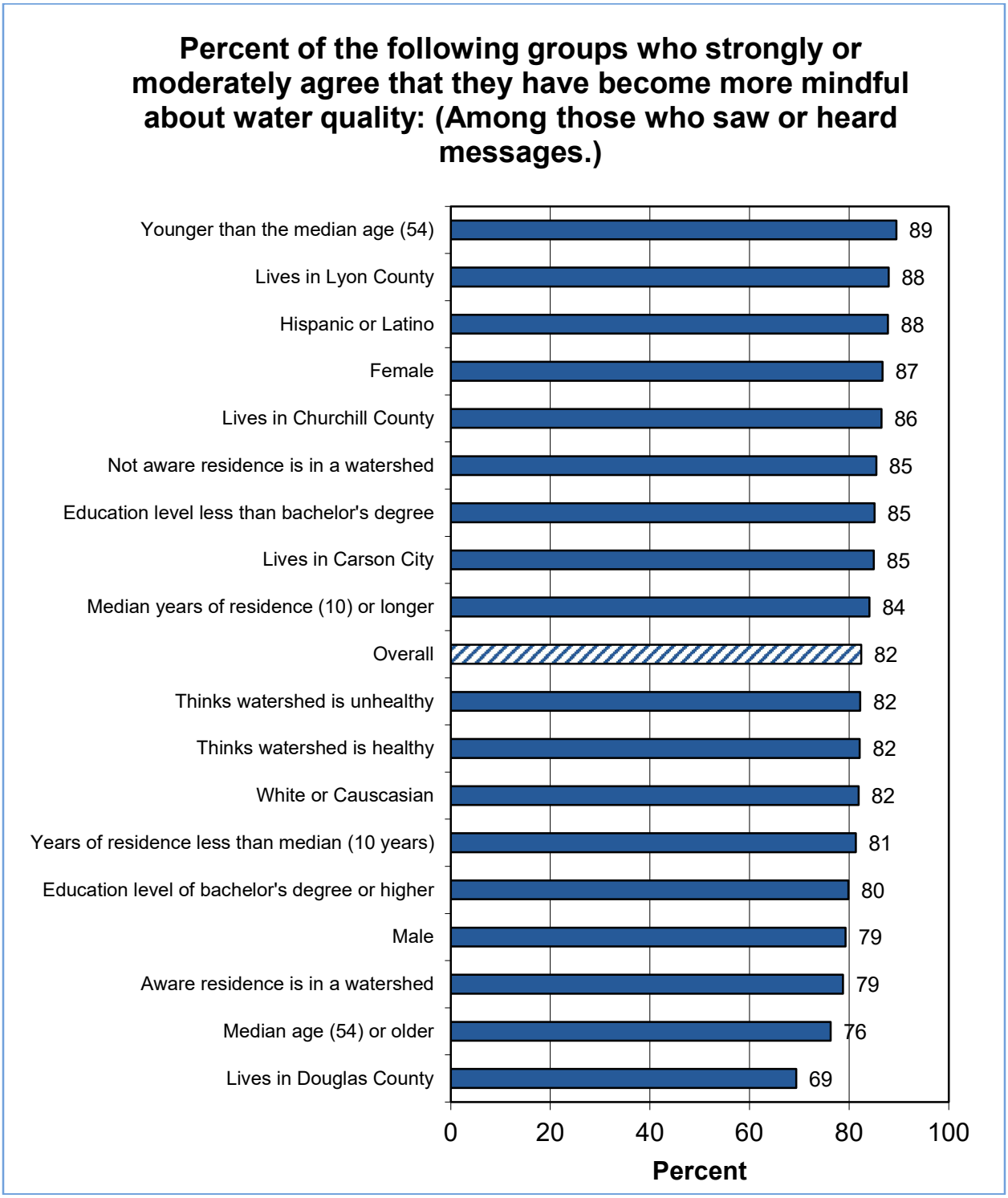


Those who saw or heard messages were asked if they agree or disagree with four statements about the messages. Two statements are clearly at the top, with approximately half of those who saw/heard messages *strongly* agreeing: "I have become more mindful about water quality" (53% *strongly* agree, and 82% agree overall) and "I have started doing things to help protect our water" (50% *strongly* agree, and 76% agree overall).



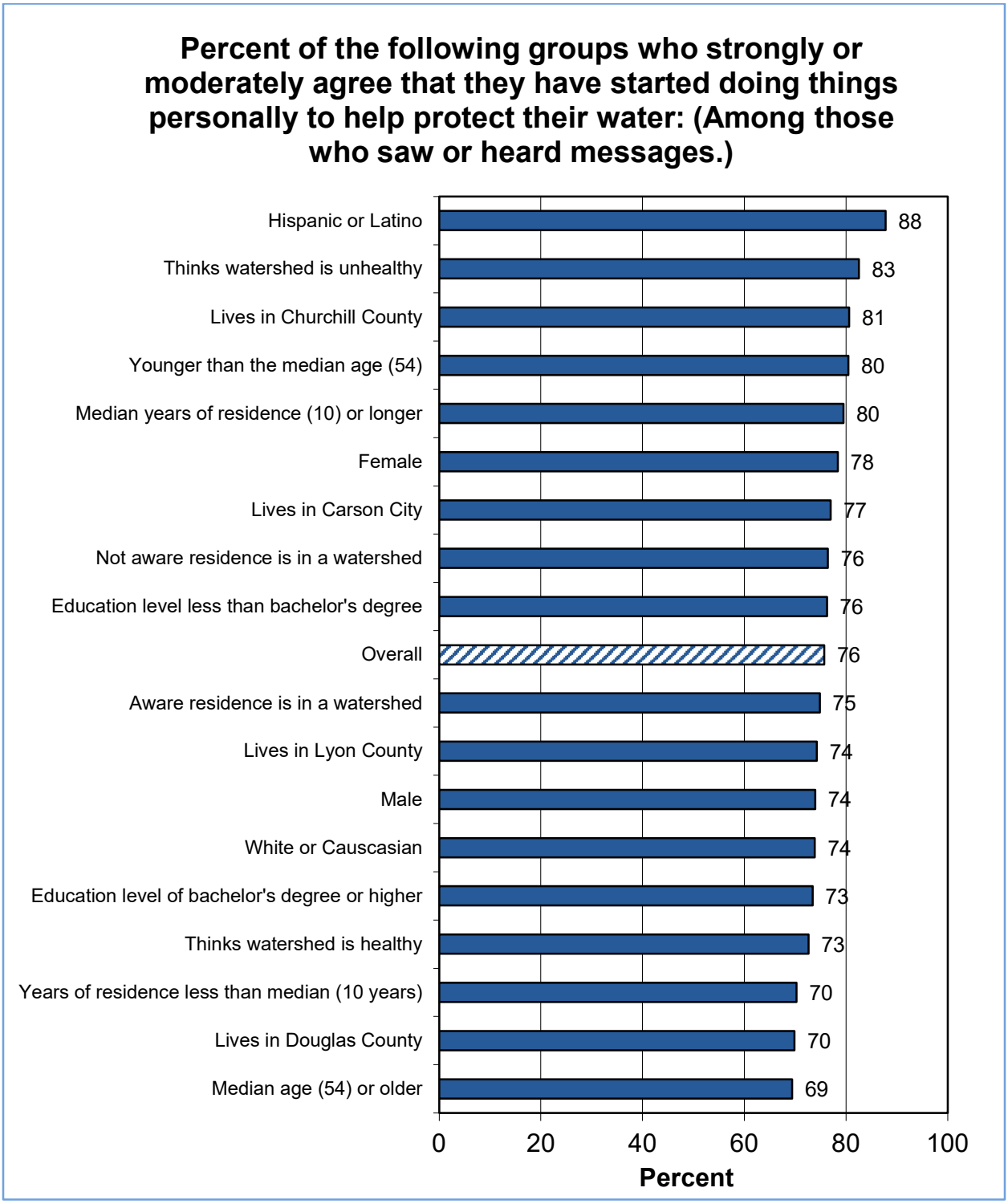
* Rounding on graph causes apparent discrepancy in sum; calculation made on unrounded numbers.

Among those who saw or heard messaging, the groups who most often agree that the messaging has made them more mindful about water quality include younger residents, Lyon County residents, Hispanic residents, and women.



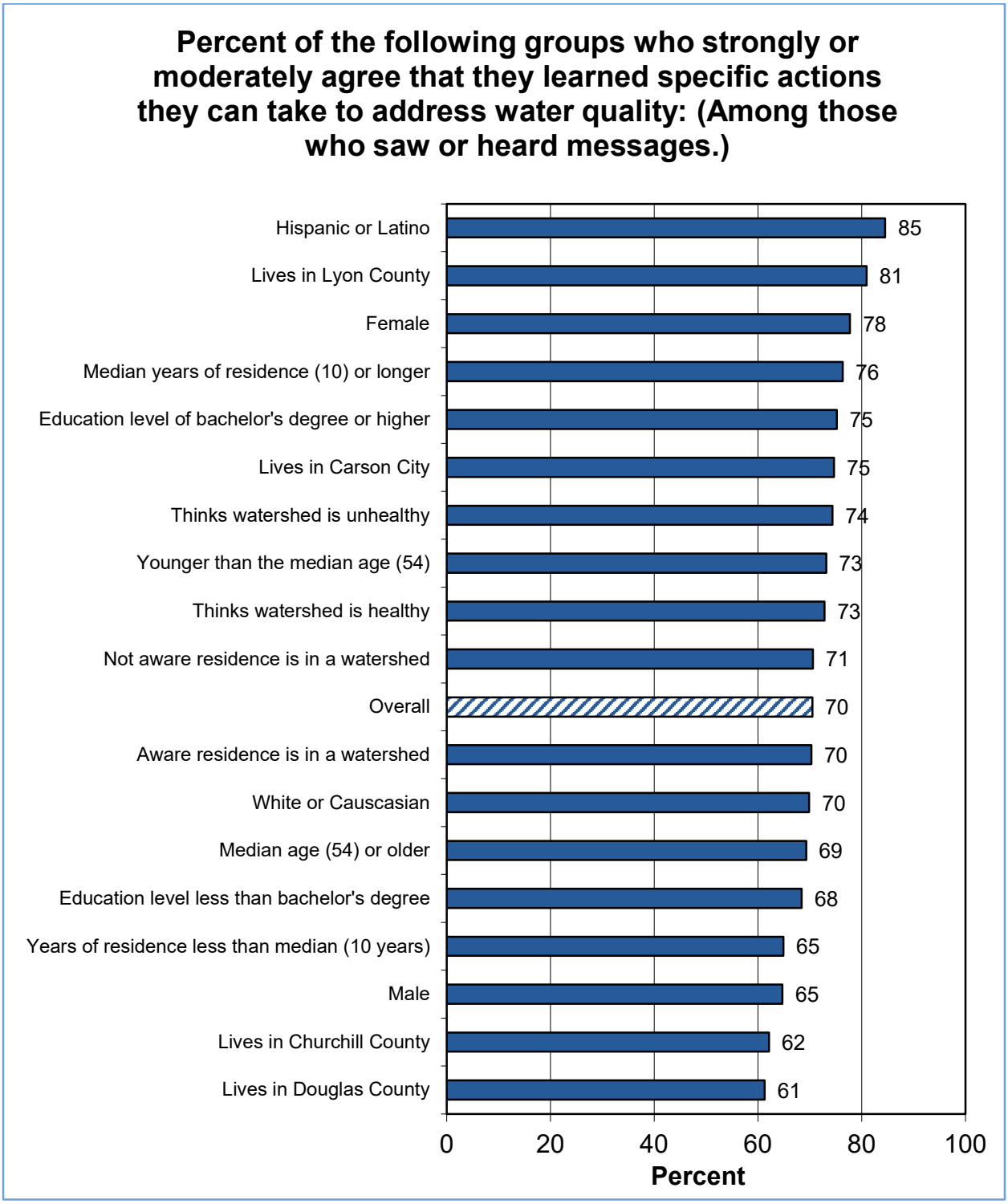
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Hispanic residents are substantially more likely than others who saw or heard messages to agree that they have started doing things personally to protect the water. Others more likely than residents overall to agree are those who think the watershed is unhealthy and Churchill County residents.



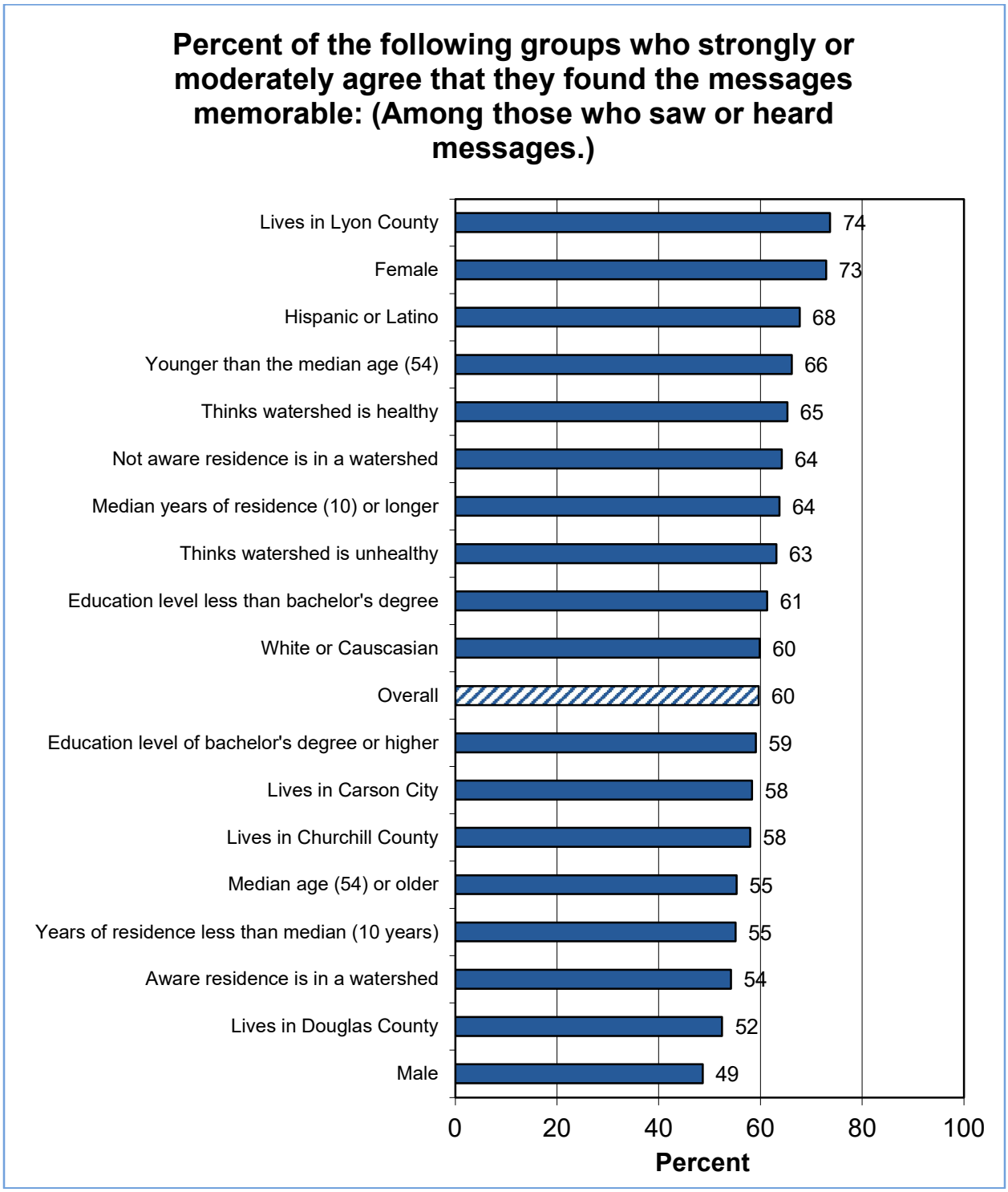
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Hispanic residents, Lyon County residents, women, those at their residence 10 years or more, those in the higher education bracket, and Carson City residents most often agree that they learned specific actions they can take to protect water quality from the messages they saw or heard in the past 5 years.



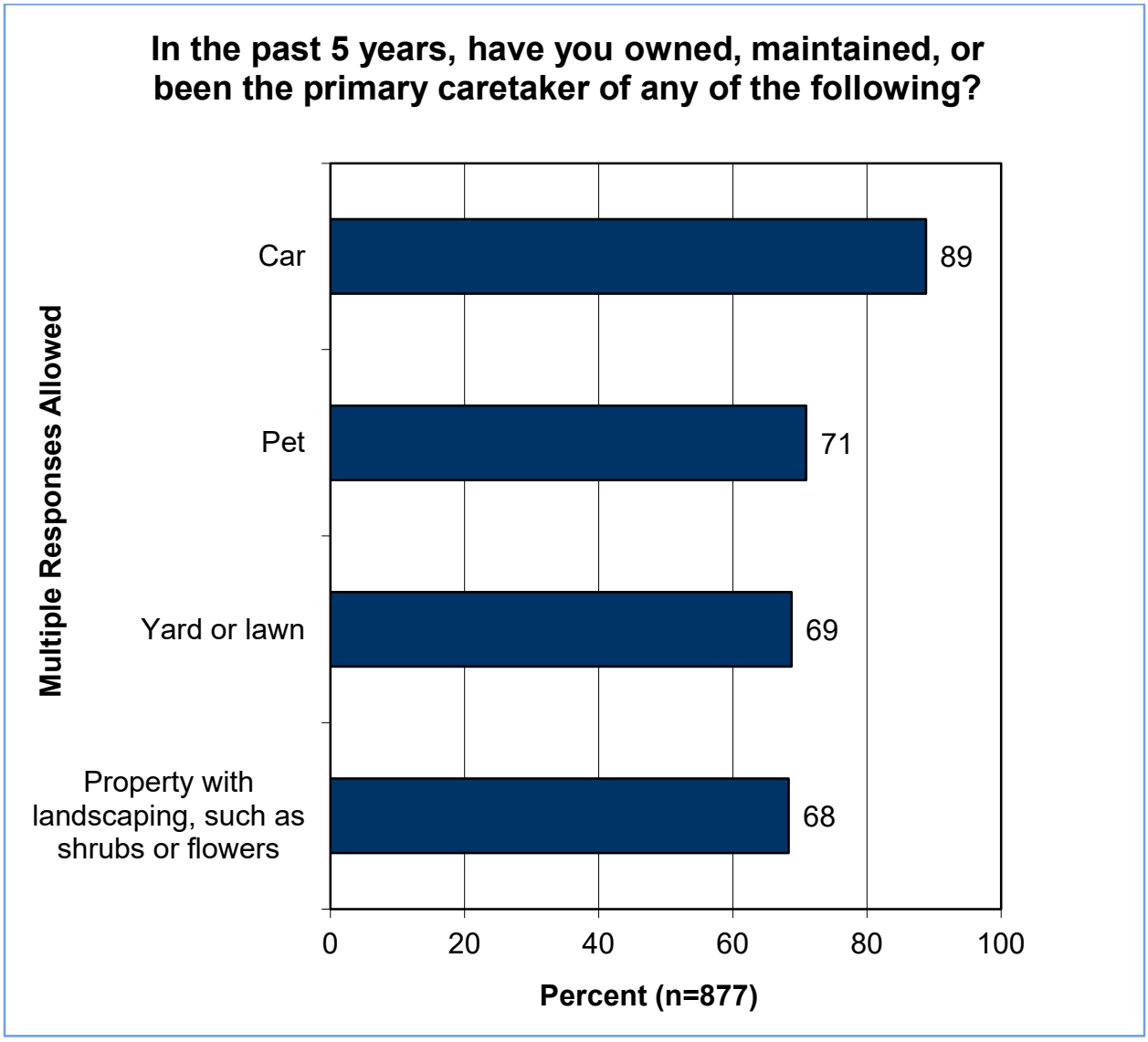
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Lyon County residents, women, Hispanic residents, and younger residents most often agree that the messages they saw or heard were memorable.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

The survey asked watershed residents if they had taken specific actions within the past 5 years that affect the health of the Carson River Watershed. To first determine who could actually take the actions, a question asked about pet ownership, landscaping, and so forth, shown below.



Based on their responses, residents were asked about actions they could have taken affecting the health of the Carson River Watershed. Results are discussed below, broken out among the "owner" groups established by the previous question (except for the first two questions that were asked of all residents).

Two questions were asked of all residents, and among all residents:

- 85% *always* or *frequently* picked up and properly disposed of trash when they had it or saw it (56% *always* did so).
- 11% *frequently* or *sometimes* participated in a watershed-related work day, field trip, workshop, or public meeting or contacted an elected official or representative about watershed issues. (*Always* was not a response option for this question because it is not applicable.)

Among those with a pet:

- 92% *always* or *frequently* picked up their pet's waste (76% *always* did so).

Among those who participated in backpacking, camping, or related outdoor recreation (note that only 61% of the overall sample did these activities; the answer set for this question included an option for not having done the activities):

- 83% *always* or *frequently* disposed of human waste properly (73% *always* did so).

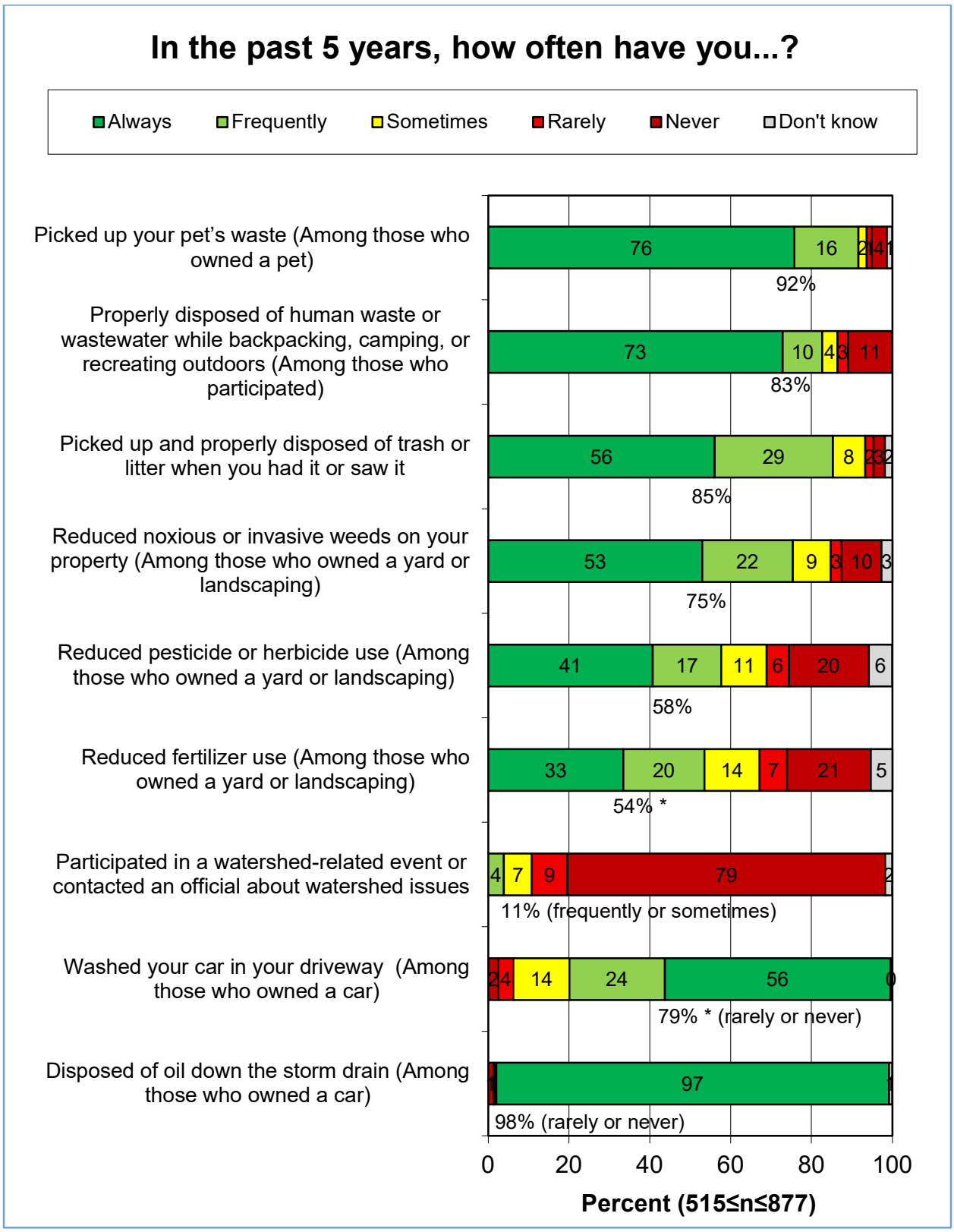
Among those with a yard or landscaping:

- 75% *always* or *frequently* reduced noxious or invasive weeds on their property (53% *always* did so).
- 58% *always* or *frequently* reduced pesticide or herbicide use (41% *always* did so).
- 54% *always* or *frequently* reduced fertilizer use (33% *always* did so).

All of the previous actions help the environment. There were two questions about harmful environmental actions, asked of those who own a car. Among those with a car:

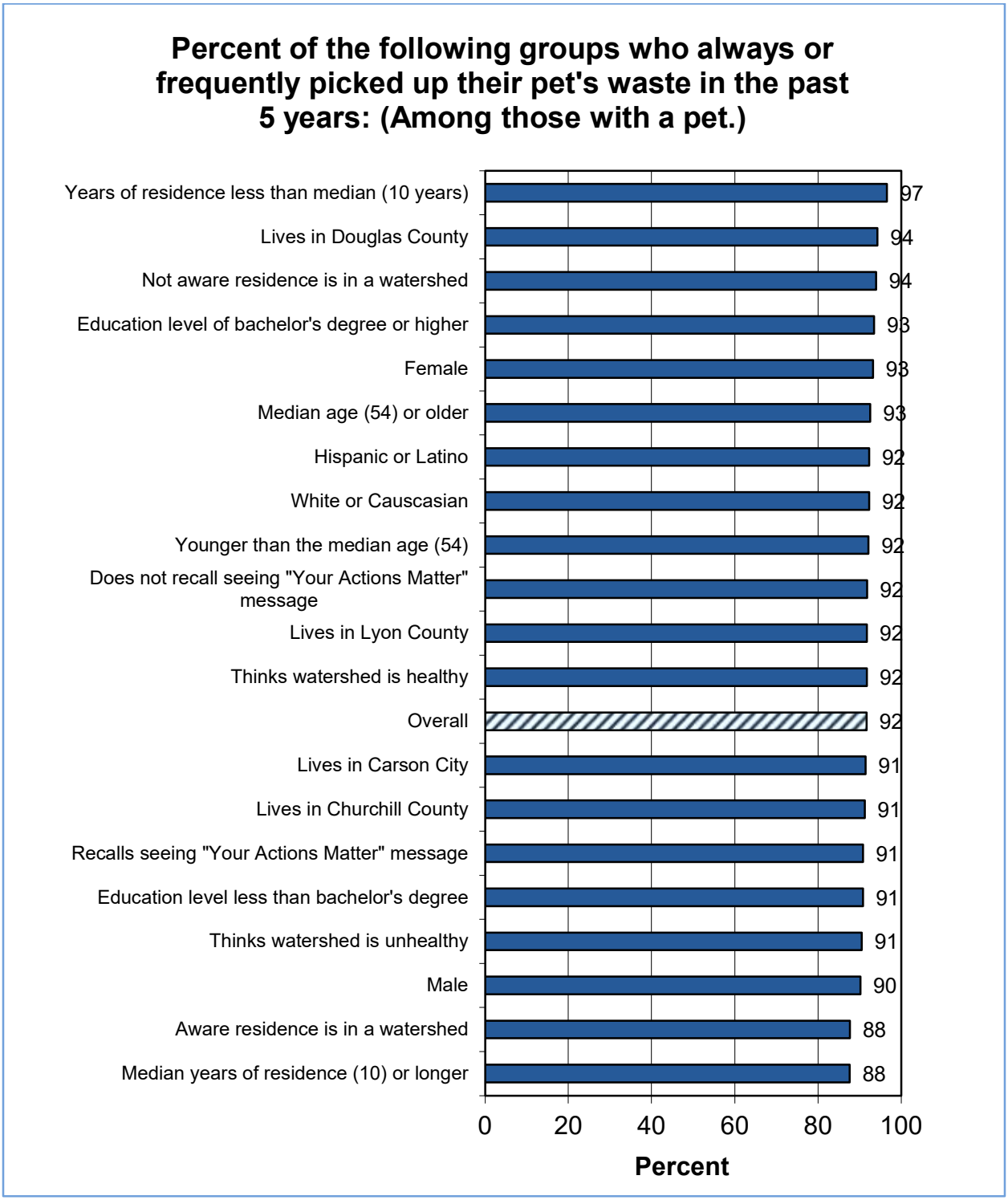
- 2% disposed of oil down the storm drain at some time (97% *never* did so).
- 44% washed their car in their driveway at some time (56% *never* did so).

The graph on the following page uses a "green light-red light" motif to indicate the responses exhibiting the desired behavior—to *always* or *frequently* do the beneficial actions. Because the last two actions are detrimental to the Carson River Watershed, the "green light-red light" motif has been reversed on the bars for those questions, as *never* is the most desired behavior. Because the graph needs a full page for display, it appears on the following page. Results are sorted by the first response option (which is *always*, with the exception of attending workshops or events, in which *frequently* is the first response). Sums of *always* and *frequently* percentages are shown below the bars, with the exceptions of the last three items for the reasons discussed.



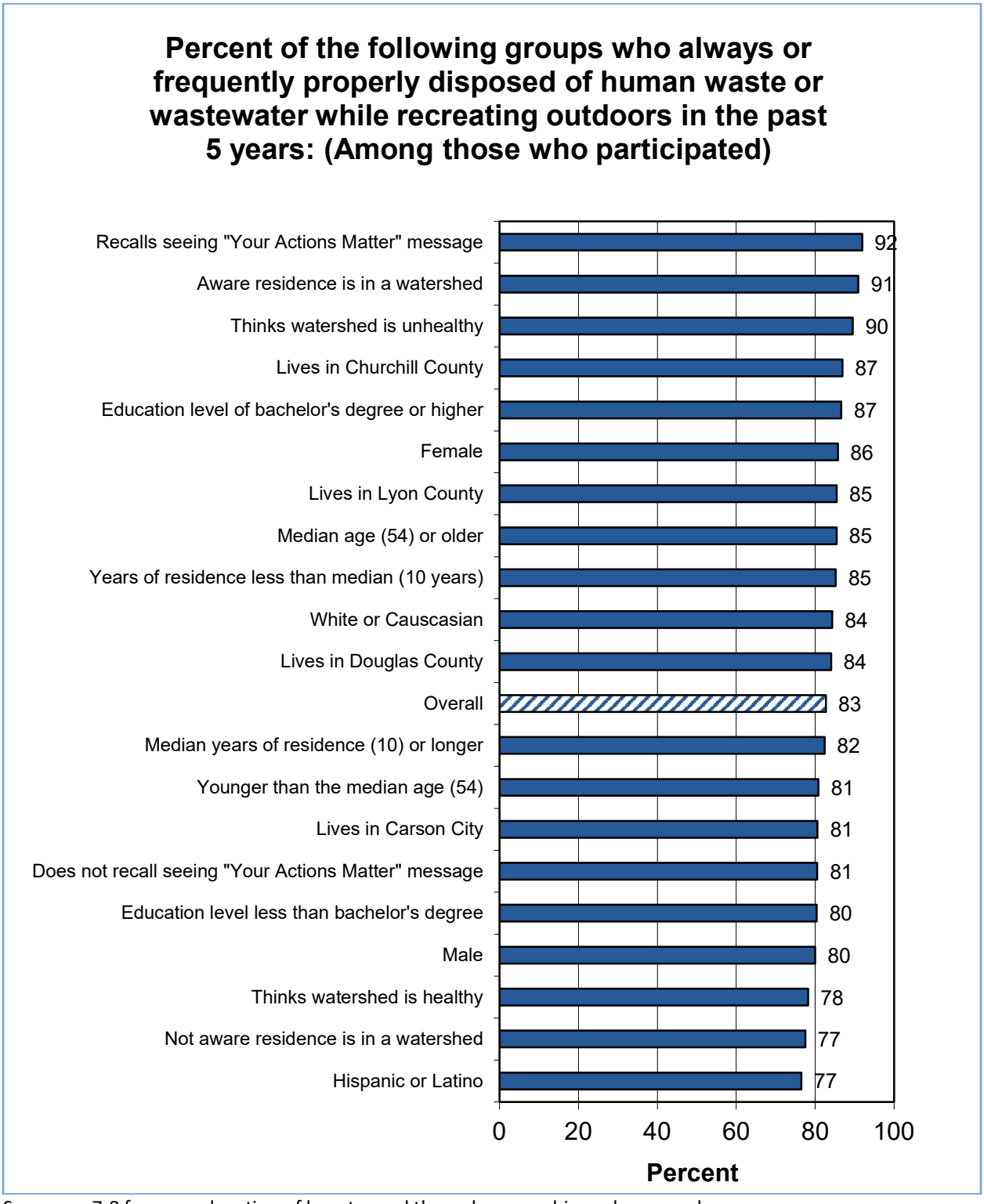
* Rounding on graph causes apparent discrepancy in sum; calculation made on unrounded numbers.

Demographic analyses graphs are shown for most of the series. Pet owner groups are consistently good about picking up their pet's waste. Those who lived at their current residence less than 10 years are the most likely to do so.



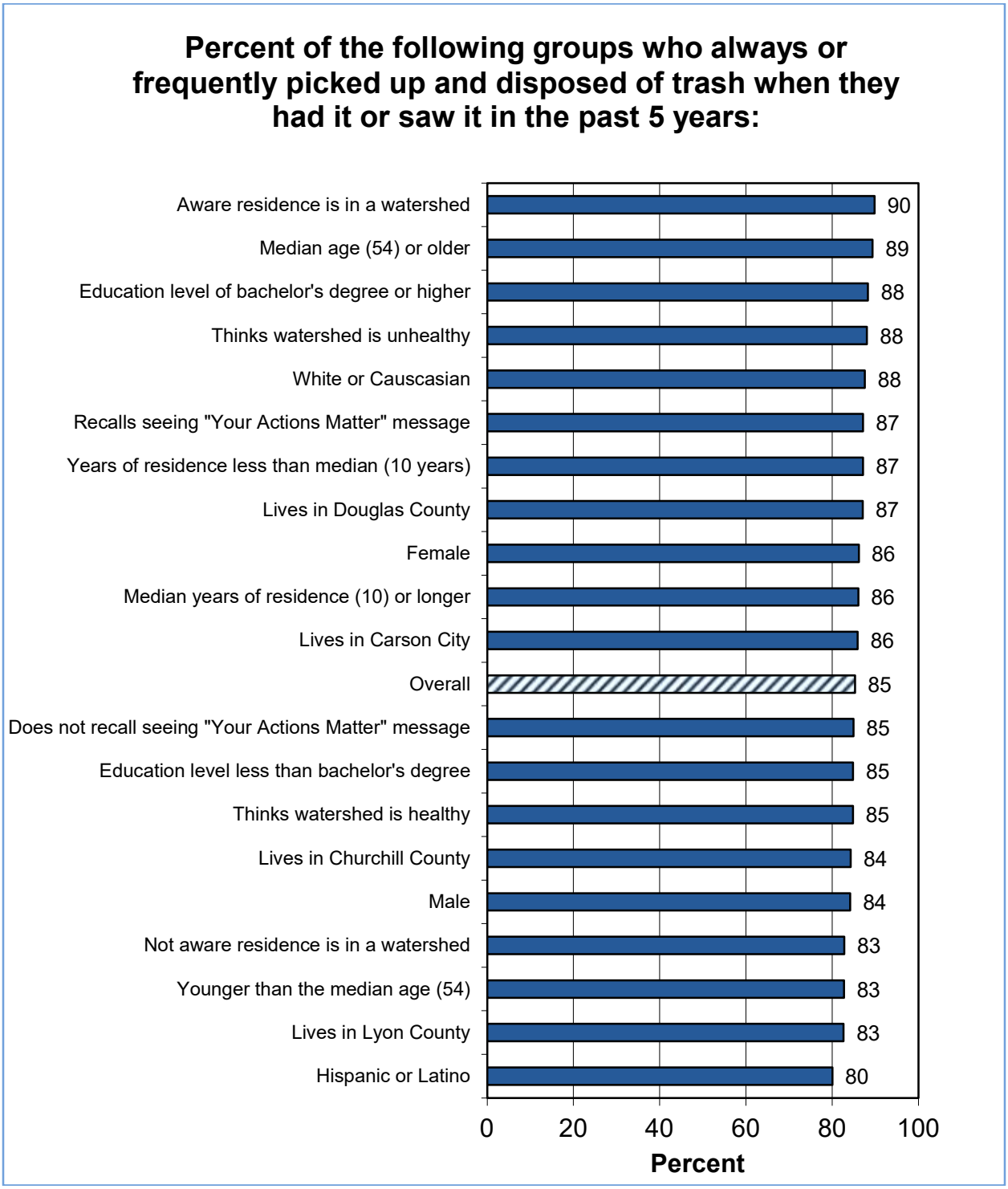
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Among those who participated in backpacking, camping, or similar outdoor recreation (61% of residents did so over the past 5 years), the groups most often saying they always or frequently dispose of human waste properly are those who recall “Your Actions Matter” messaging, those aware that they live in a watershed, and those who think the watershed is unhealthy.



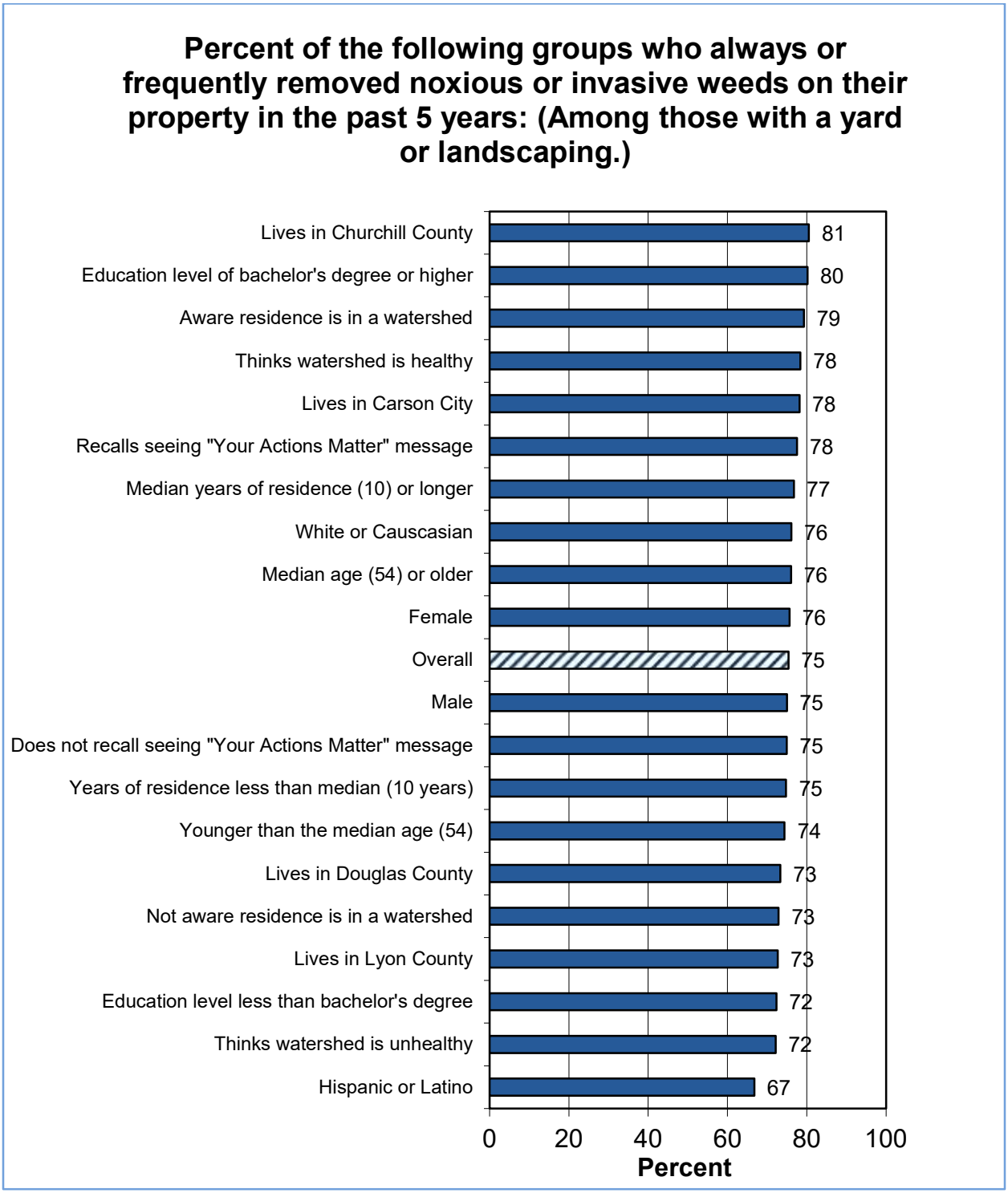
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Those aware that they live in a watershed are more likely than residents overall to pick up and dispose of trash when they have it or see, but in general there is little variation between the groups.



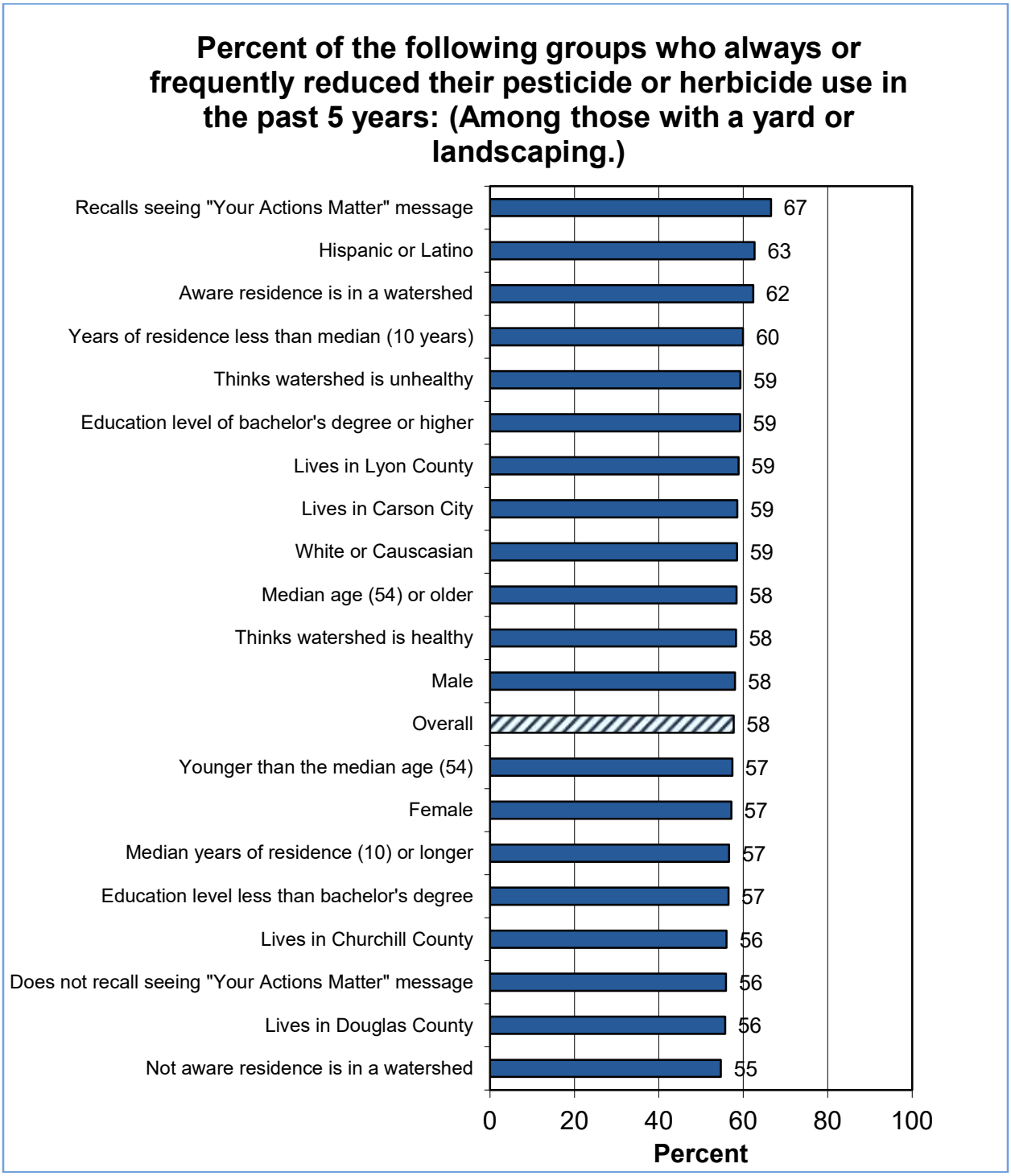
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Yard owners most likely to remove noxious or invasive weeds from their property are Churchill County residents and those in the higher education category.



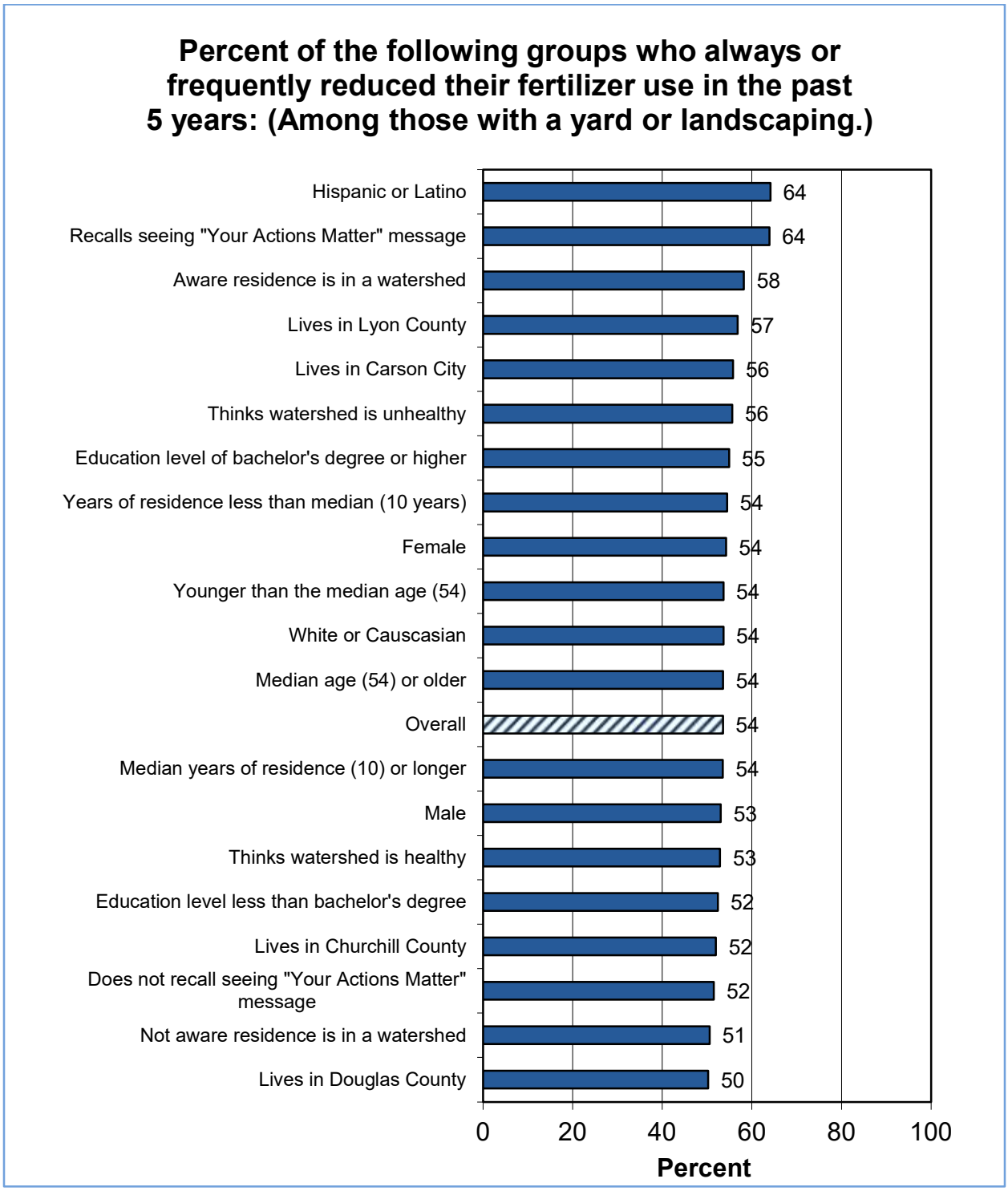
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Yard owners who saw or heard “Your Actions Matter” messages or who are Hispanic most often reduced their pesticide or herbicide use in the past 5 years.



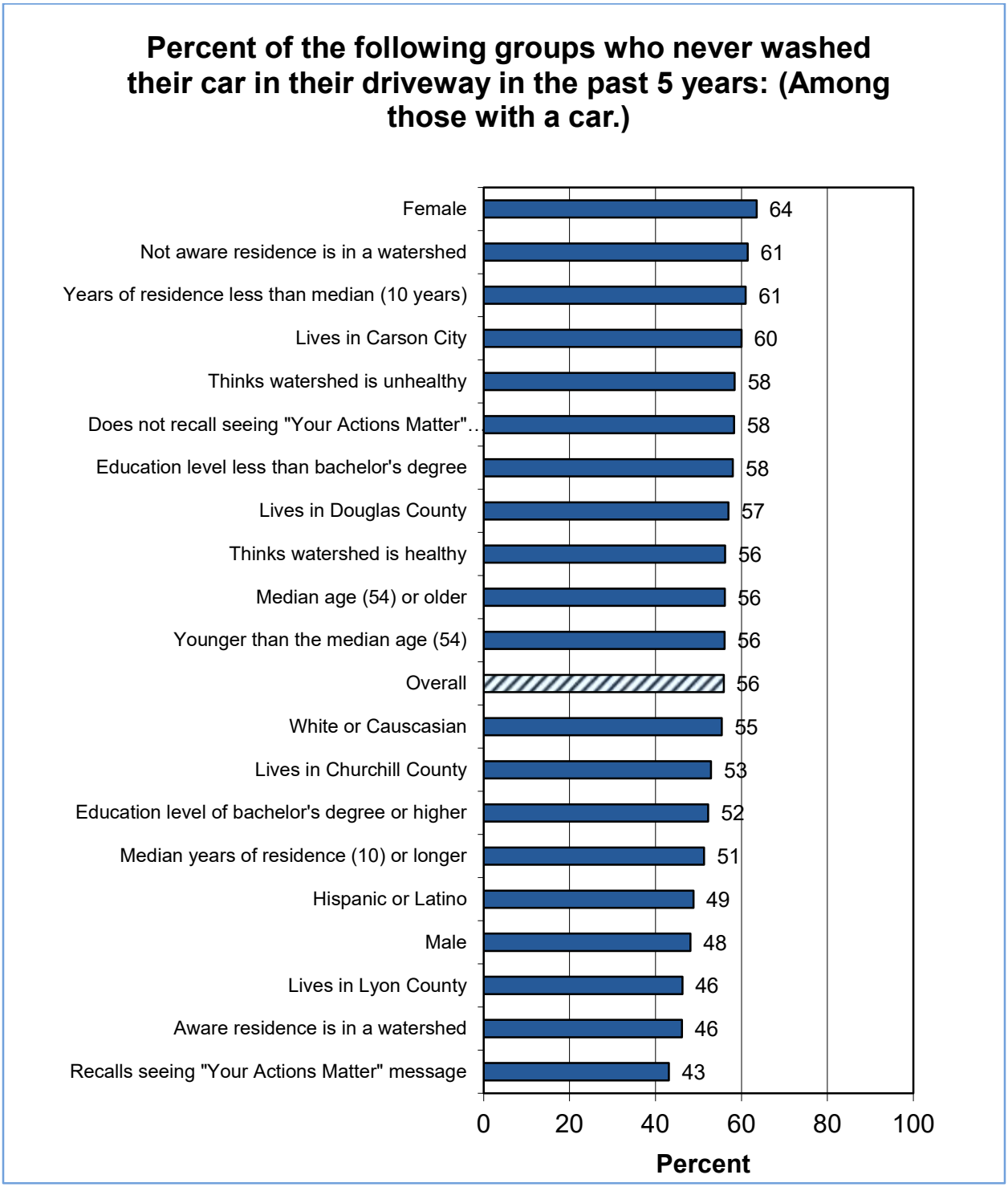
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Like the previous graph, Hispanic residents and those who saw or hear messages top the list of lawn owners who reduced their fertilizer use.



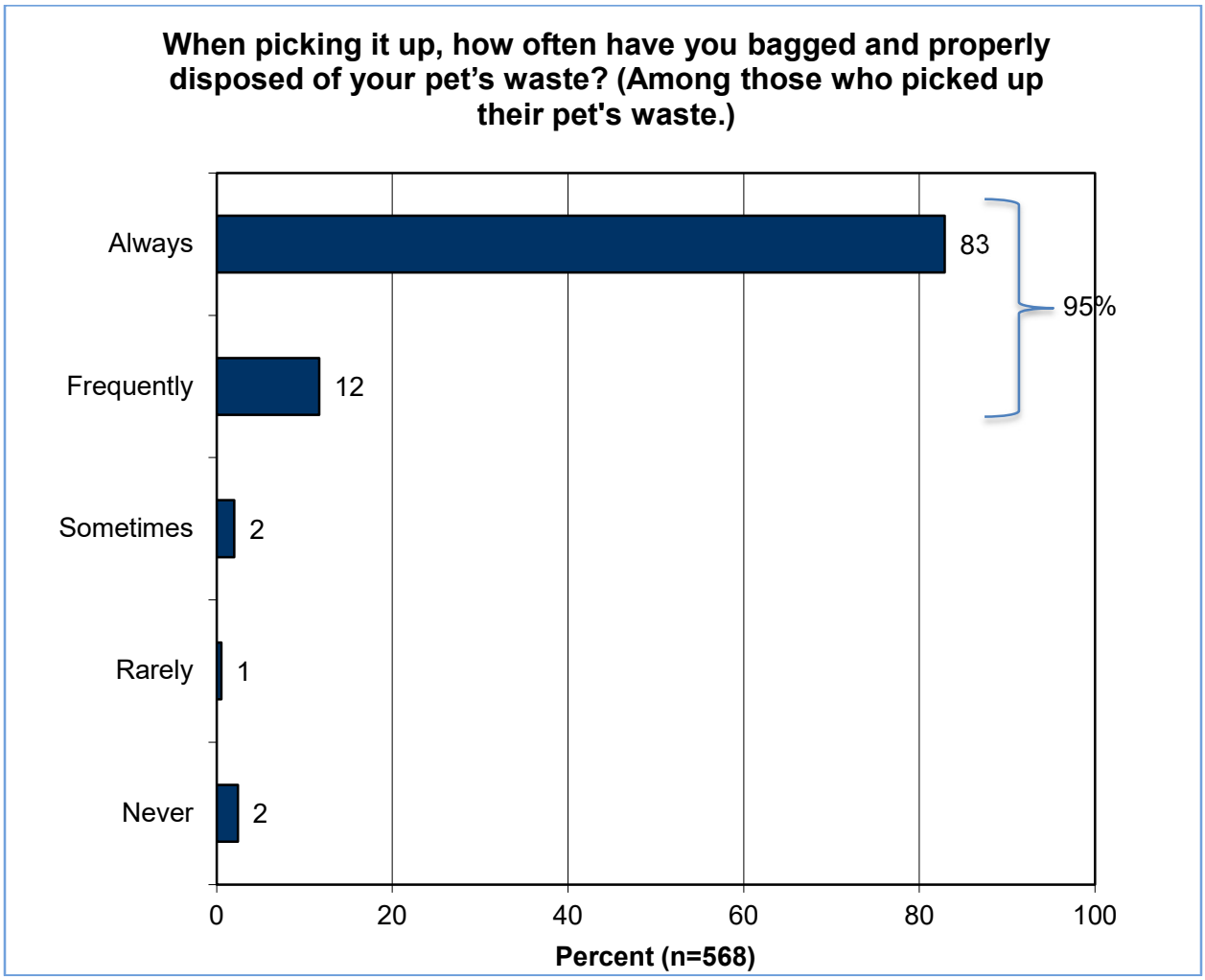
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Car owners who most often indicated that they *never* washed their car in their driveway in the past 5 years are women, those who did not indicate living in a watershed, and those living in their area less than 10 years.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

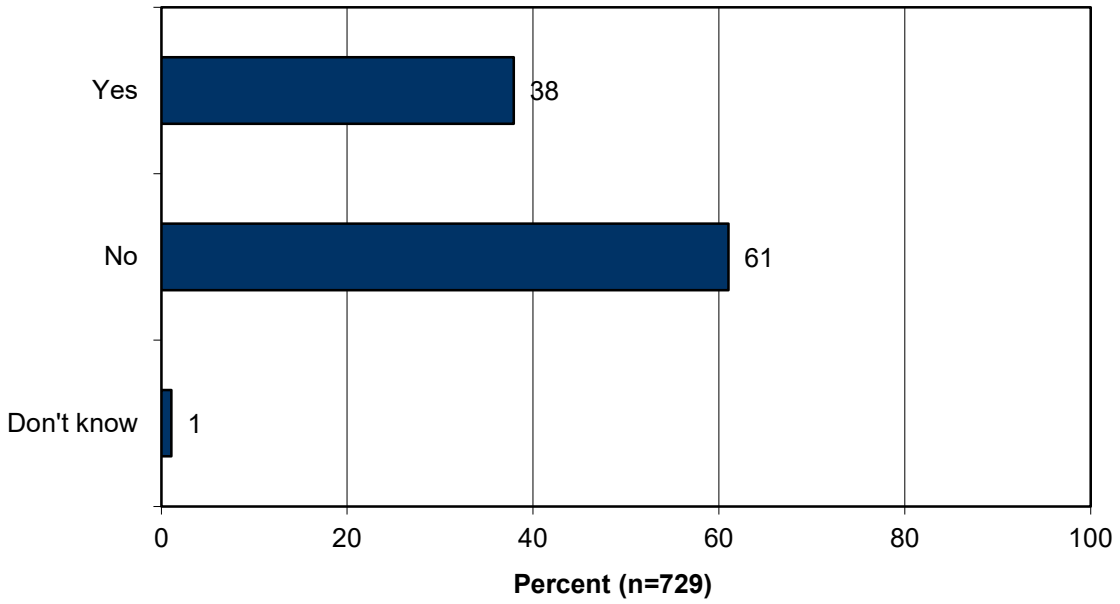
Among pet owners who indicated that they picked up their pet's waste, 83% *always* disposed of it properly and 12% *frequently* did so.



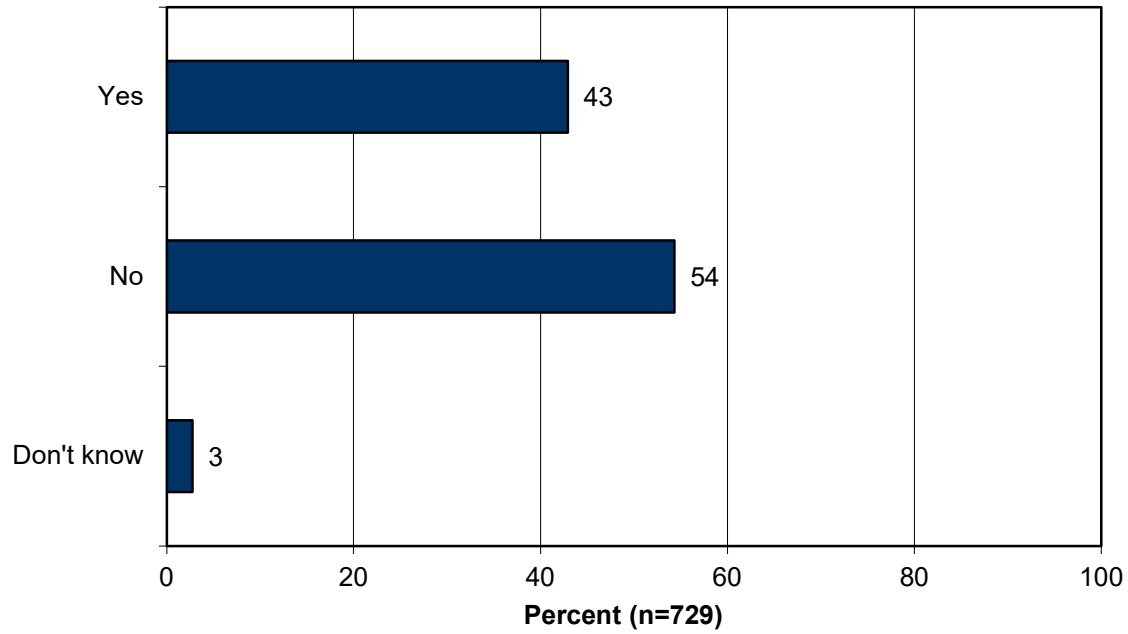
The two graphs on the next page represent watershed residents who owned a lawn/yard or property with landscaping over the past 5 years, using a yes-no answer set instead of the frequency answer set used in the above questions. First, 38% of these residents have redirected a gutter downspout to help water their landscaping or yard.

In a similar result, 43% of this group have changed their landscaping or yard to capture and soak up water like a sponge, thereby reducing run-off from the property.

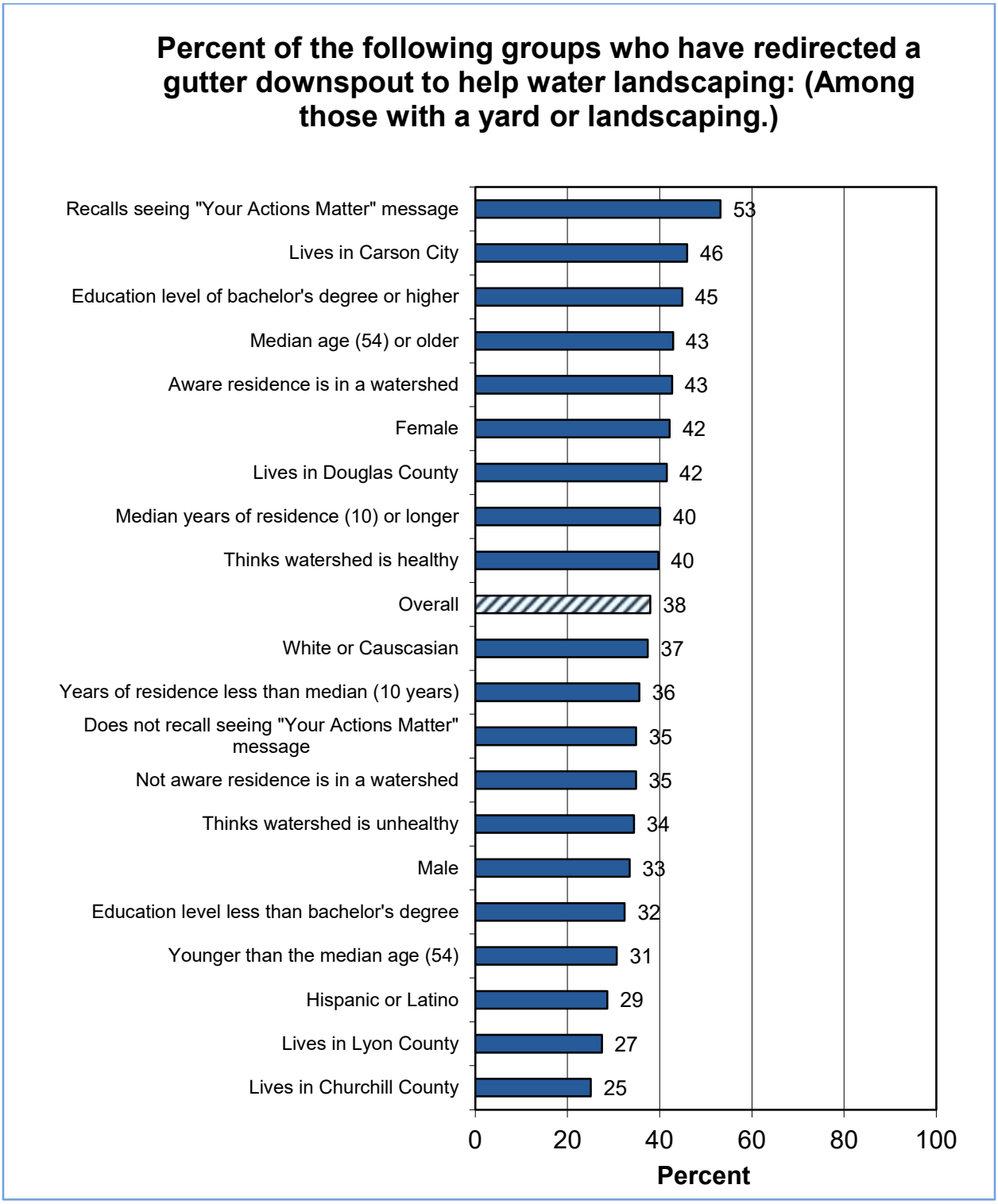
In the past 5 years, have you redirected a gutter downspout to help water the landscaping or yard? (Among those who owned a yard or landscaping.)



In the past 5 years, have you changed your landscaping or yard to capture and soak up water like a sponge, so less water runs off your property? (Among those who owned a yard or landscaping.)

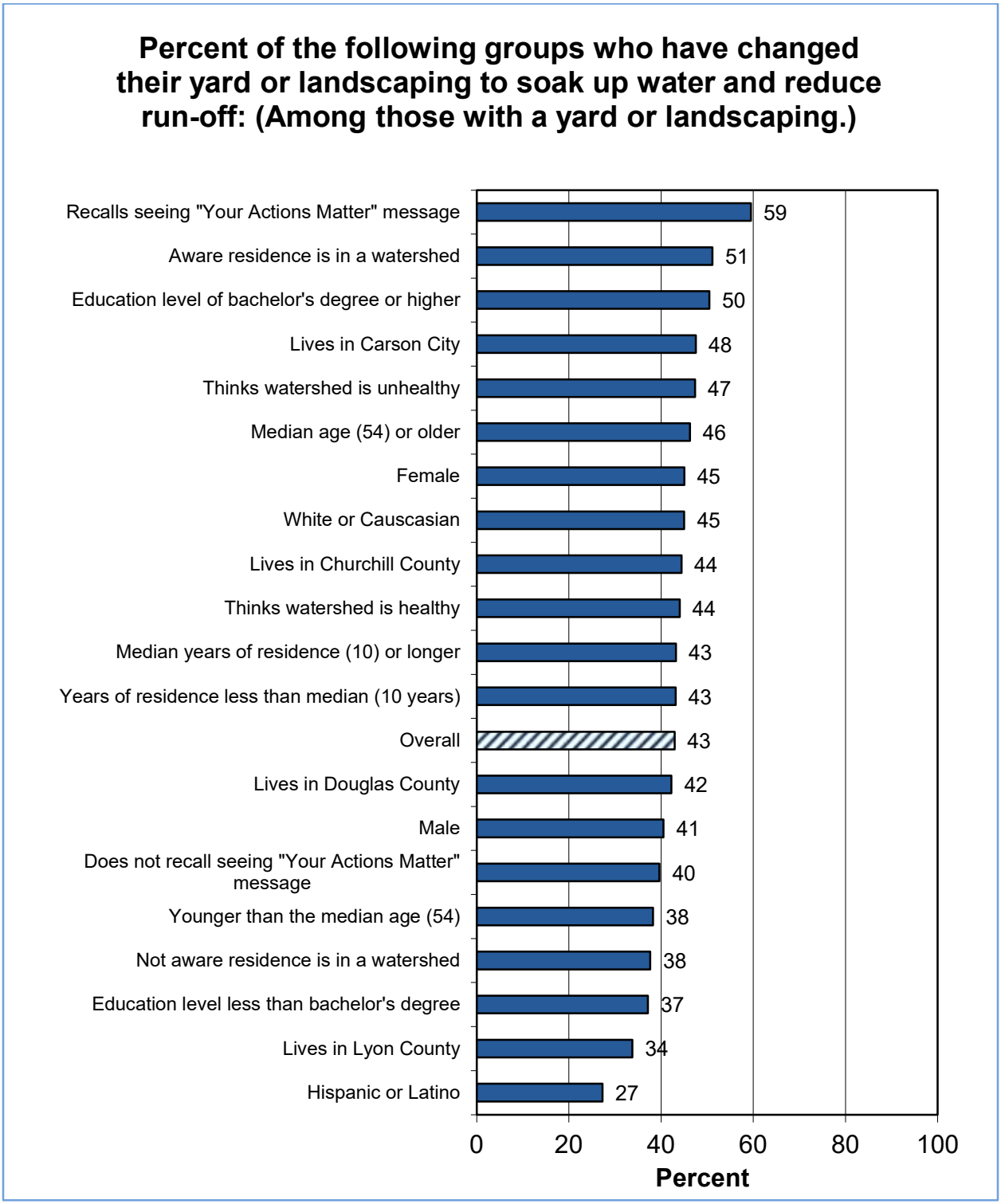


Property owners who were most likely to redirect their gutter downspout include those who saw or heard messages, Carson City residents, and those in the upper education bracket.



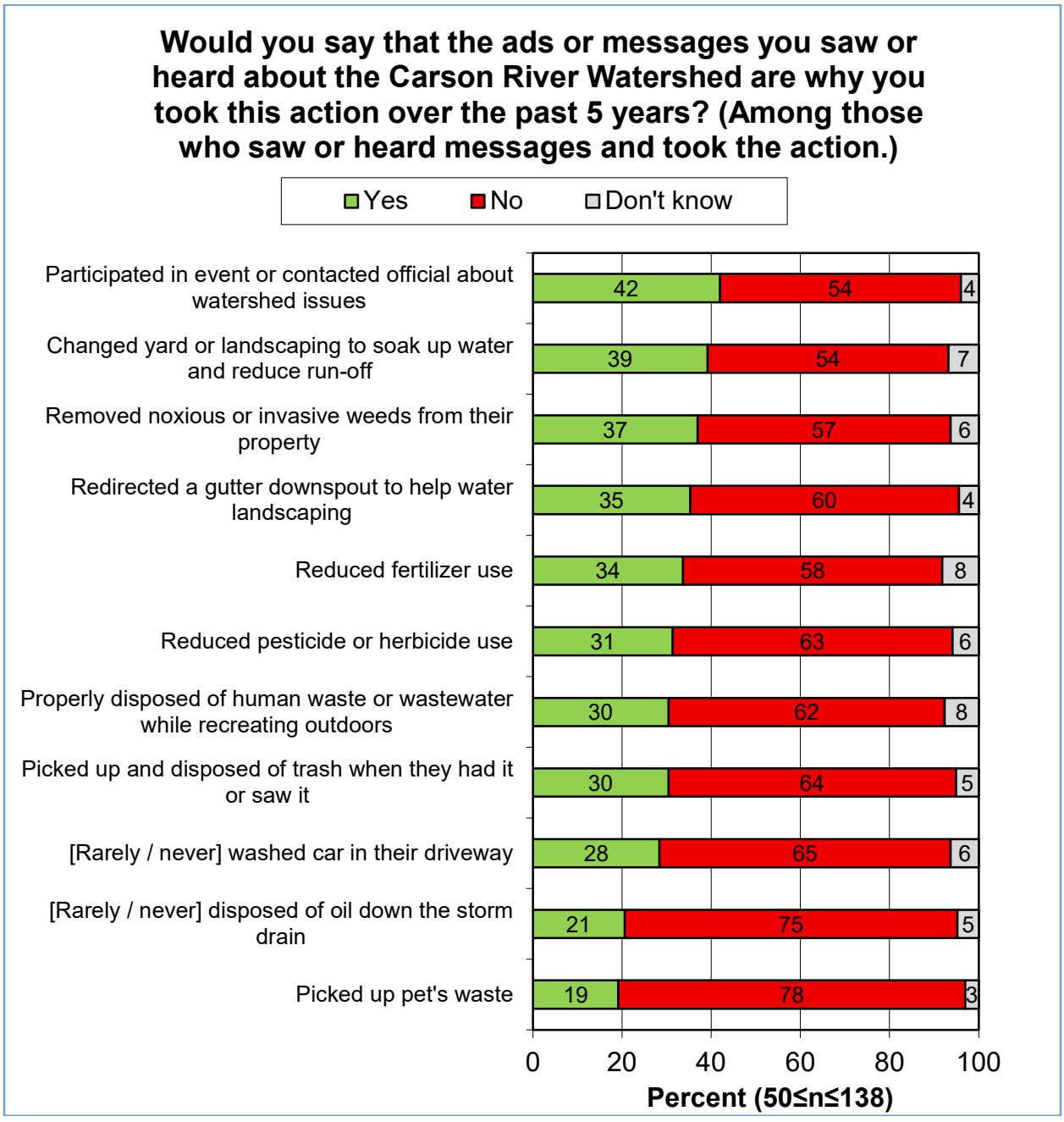
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Those who most often indicated that they changed their yard or landscaping to soak up water and reduce run-off are those who saw or heard “Your Actions Matter” messaging, those aware that they live in a watershed, and those in the upper education category.

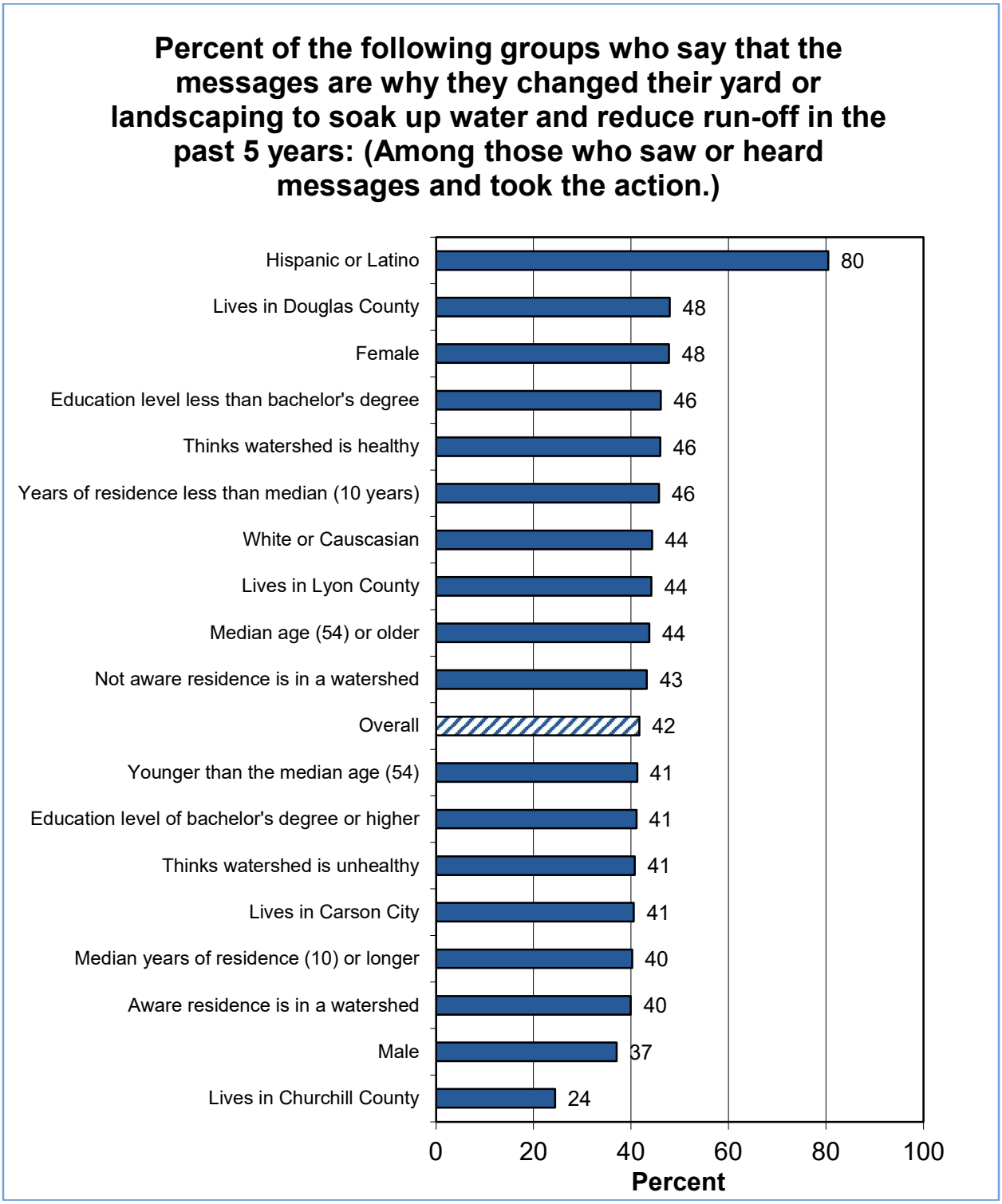


See pages 7-8 for an explanation of how to read these demographic analyses graphs.

The next series of questions went to those who saw or heard "Your Actions Matter" messages over the past 5 years *and* who took one or more of the listed actions (the sample size may be low for some, as so few qualified for some of the questions); for each they took, they were asked if the messaging was *why* they took the action. Over a third of respondents in these groups said that the messaging was why they took the following actions: participated in an event or contacted an official about watershed issues, changed yard or landscaping to soak up water and reduce run-off, removed noxious weeds from their property, redirected a gutter downspout to water the yard or landscaping, and reduced fertilizer use.

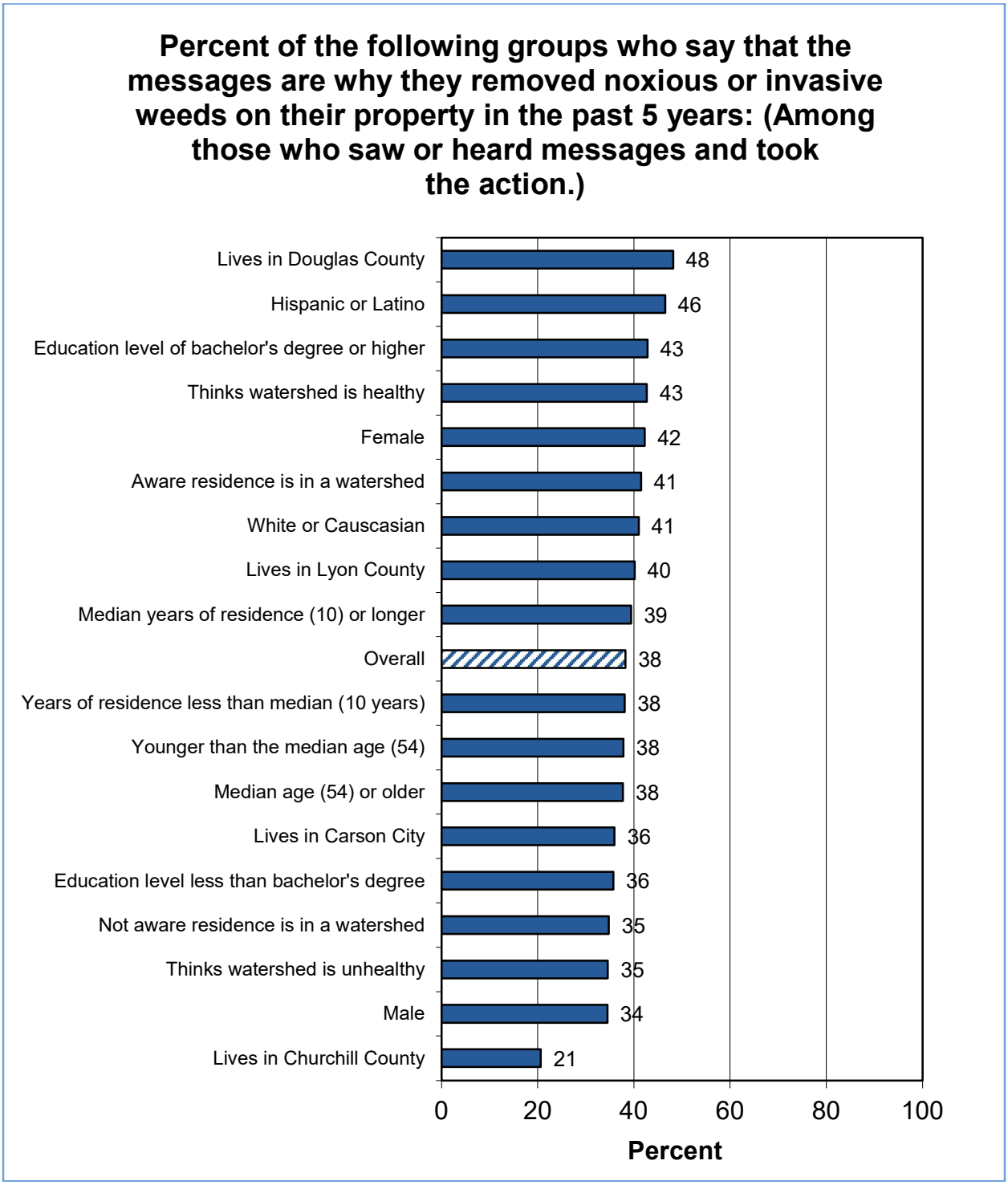


Demographic analyses were run on the questions in the series shown above, among those with enough sample to be valid. Hispanic residents are far above other groups in saying that messages are why they changed their yard or landscaping to soak up water. A second tier includes Douglas County residents and women.



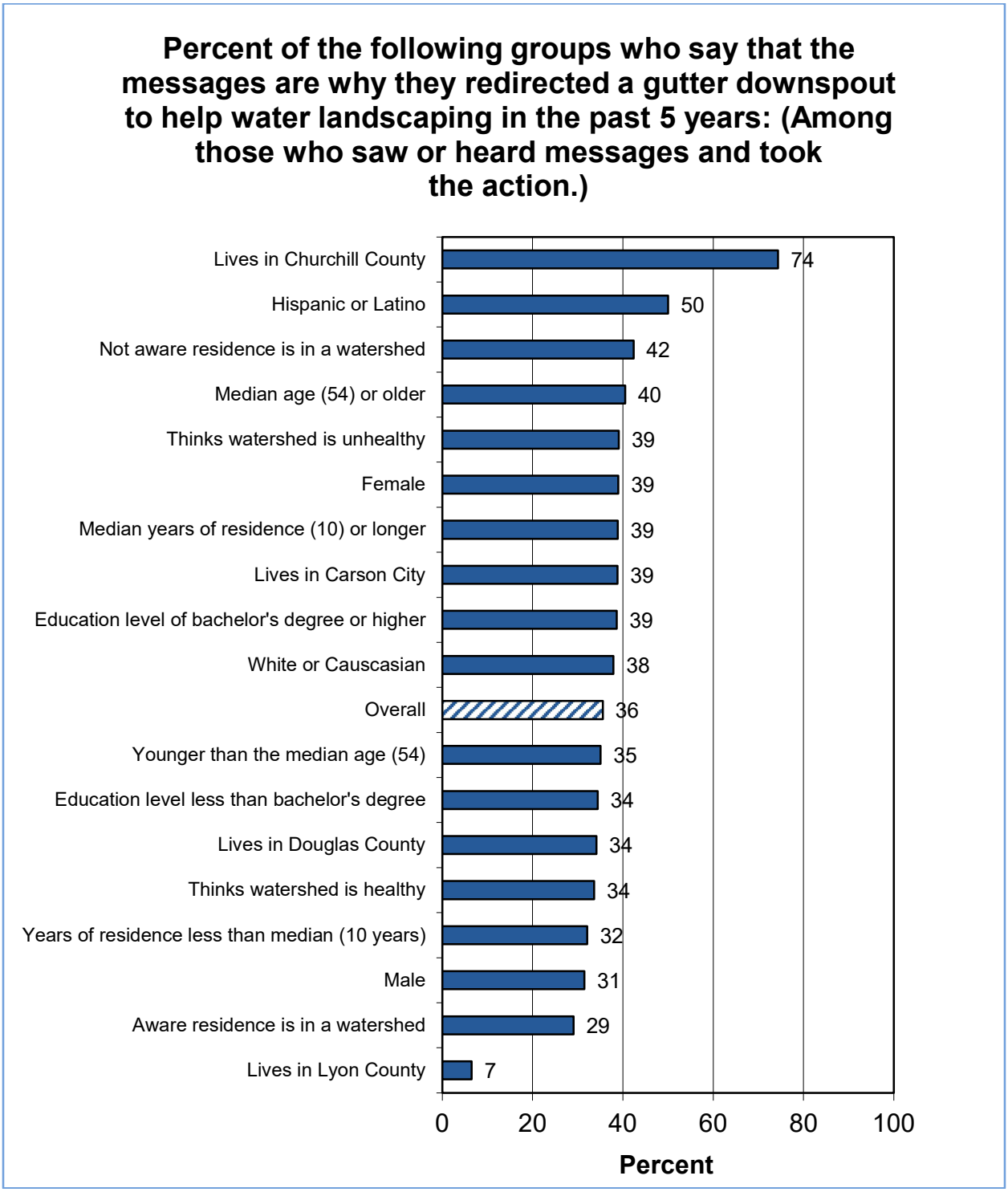
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Douglas County residents and Hispanic residents were most likely to say that the messages are why they removed noxious or invasive weeks from their property.



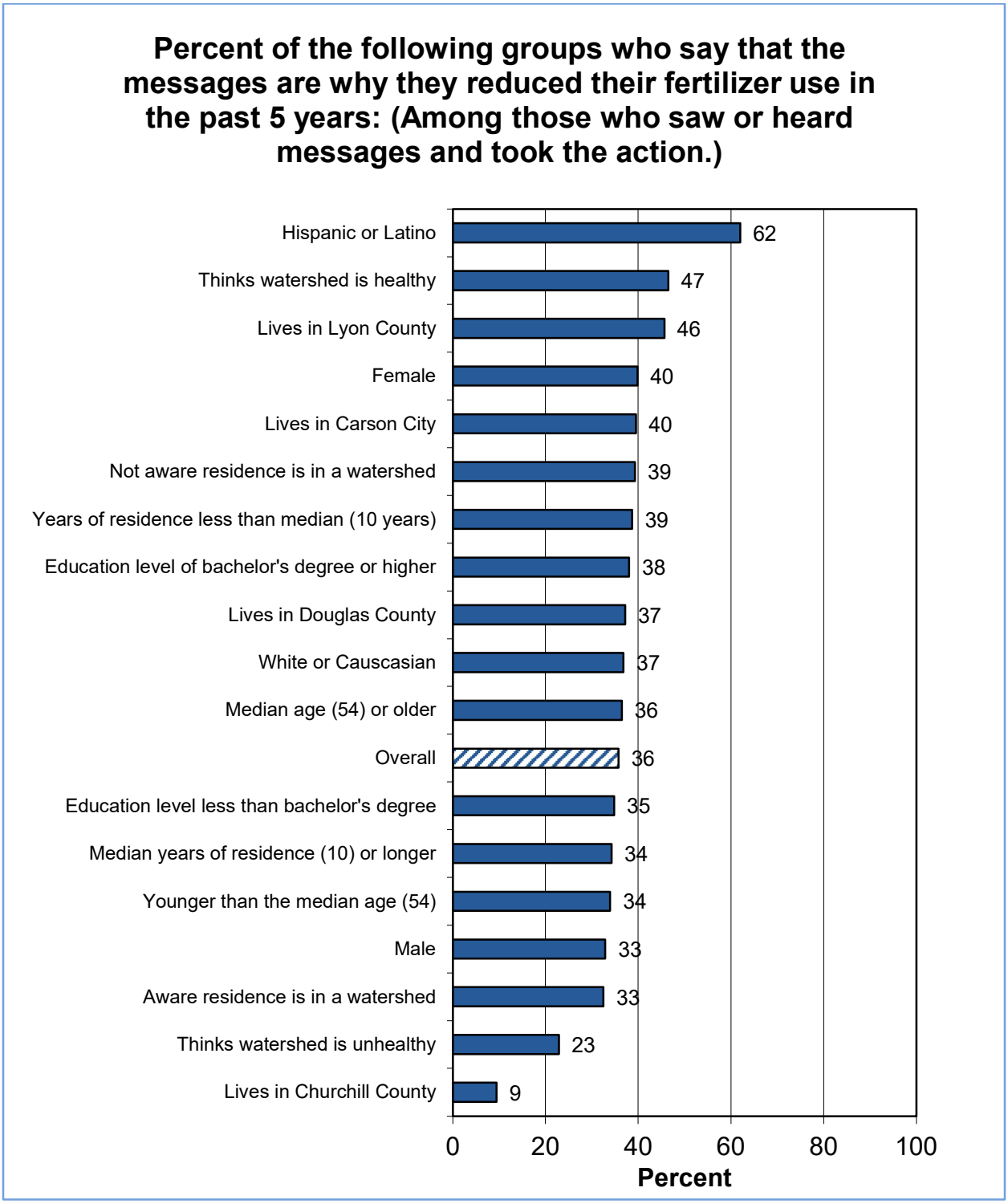
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Churchill County residents are far above other groups in saying that messages are why they redirected their gutter downspouts, followed by Hispanic residents.



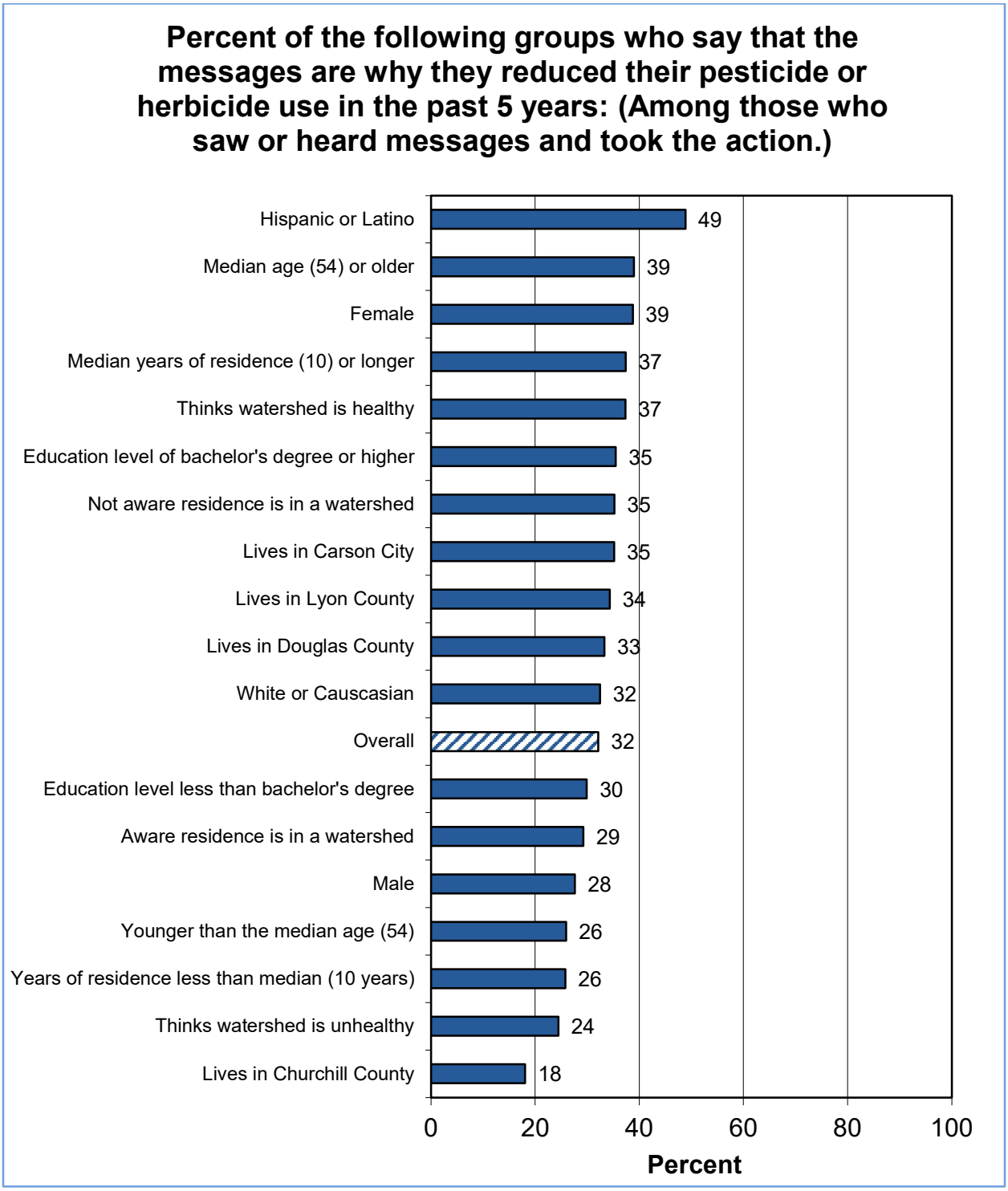
See pages 7-8 for an explanation of how to read these demographic analyses graphs.

Hispanic residents most often indicated that the messages are why they reduced their fertilizer use in the past 5 years, distantly followed by those who think the watershed is healthy and Lyon County residents.



See pages 7-8 for an explanation of how to read these demographic analyses graphs.

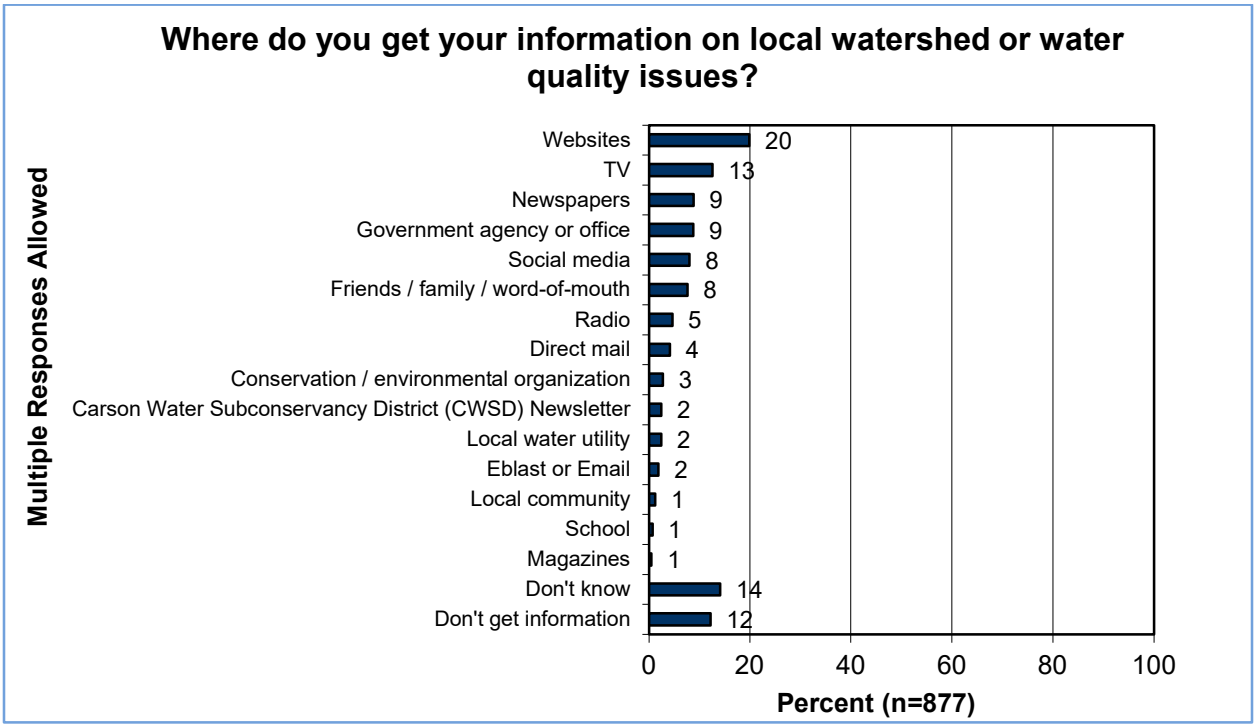
Finally in this section, Hispanic residents most often indicated that the messages are why they reduced their pesticide or herbicide use, distantly followed by older residents and women.

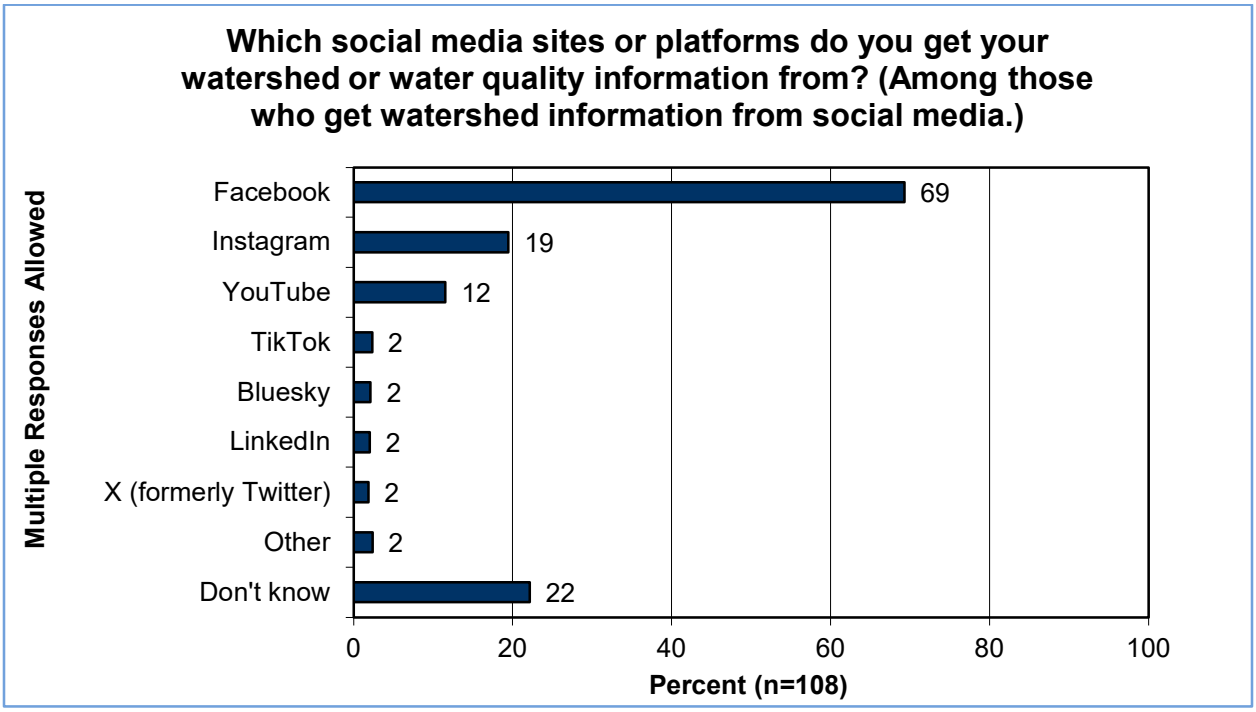


See pages 7-8 for an explanation of how to read these demographic analyses graphs.

SOURCES OF INFORMATION

When asked in an open-ended question where they get their information on local watershed or water quality issues, residents most often stated websites in general (20% stated this) and TV (13%). Those who use social media most commonly use Facebook by far.

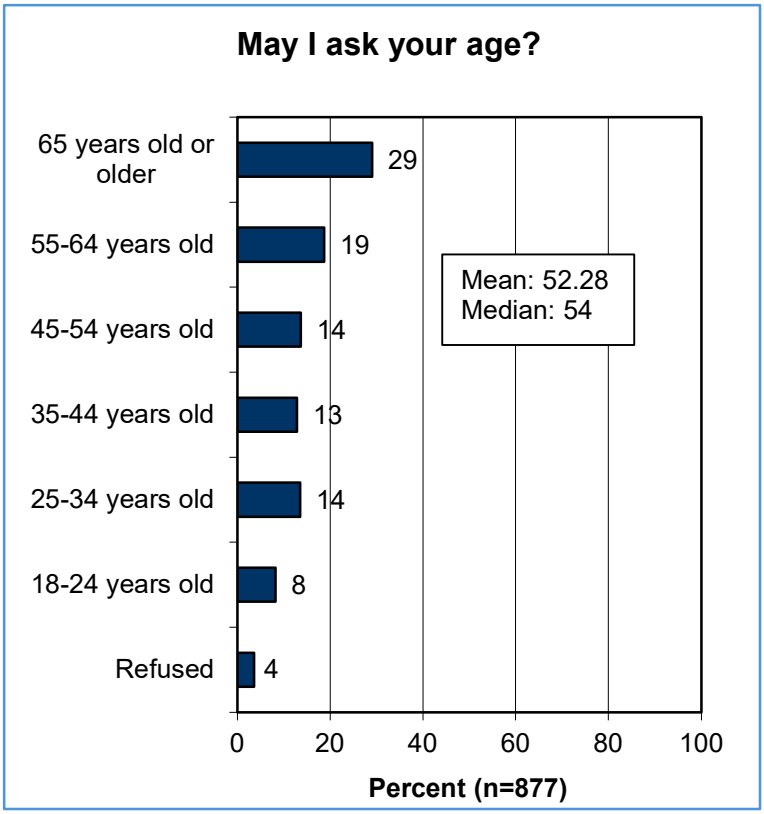


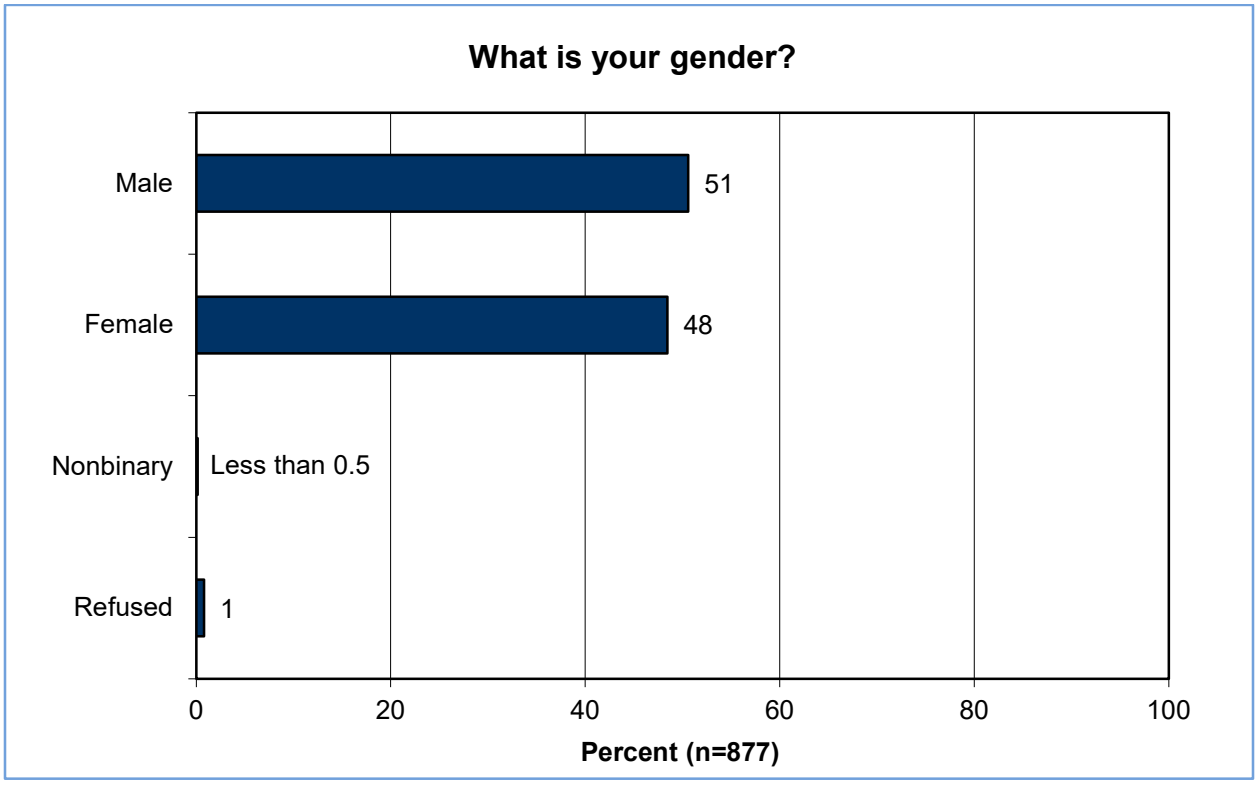


DEMOGRAPHIC CHARACTERISTICS

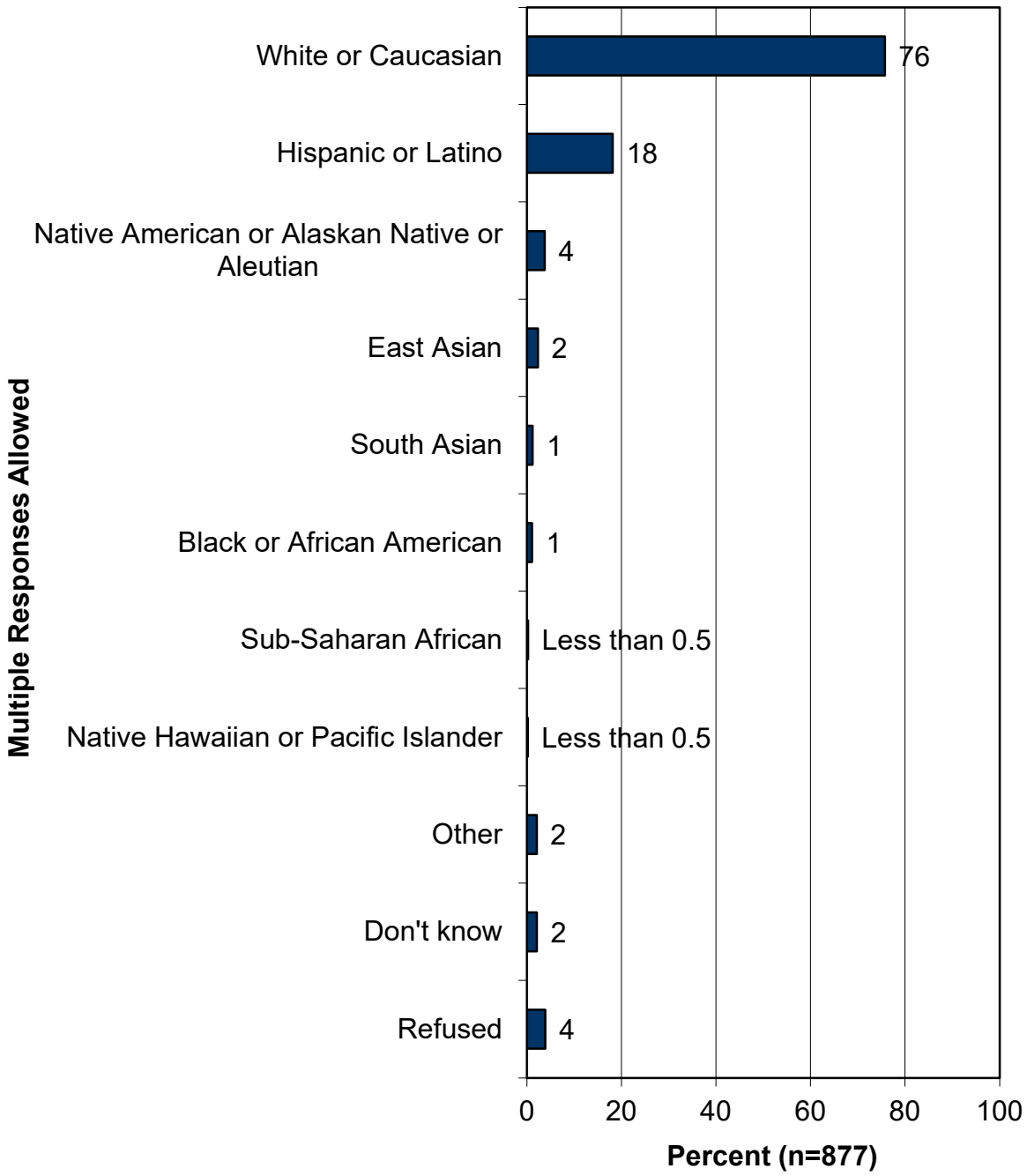
The following demographic characteristics were collected by the survey, primarily for crosstabulations and further analyses:

- Age
- Gender
- Race or ethnicity
- Education level
- County of residence
- Years of residence

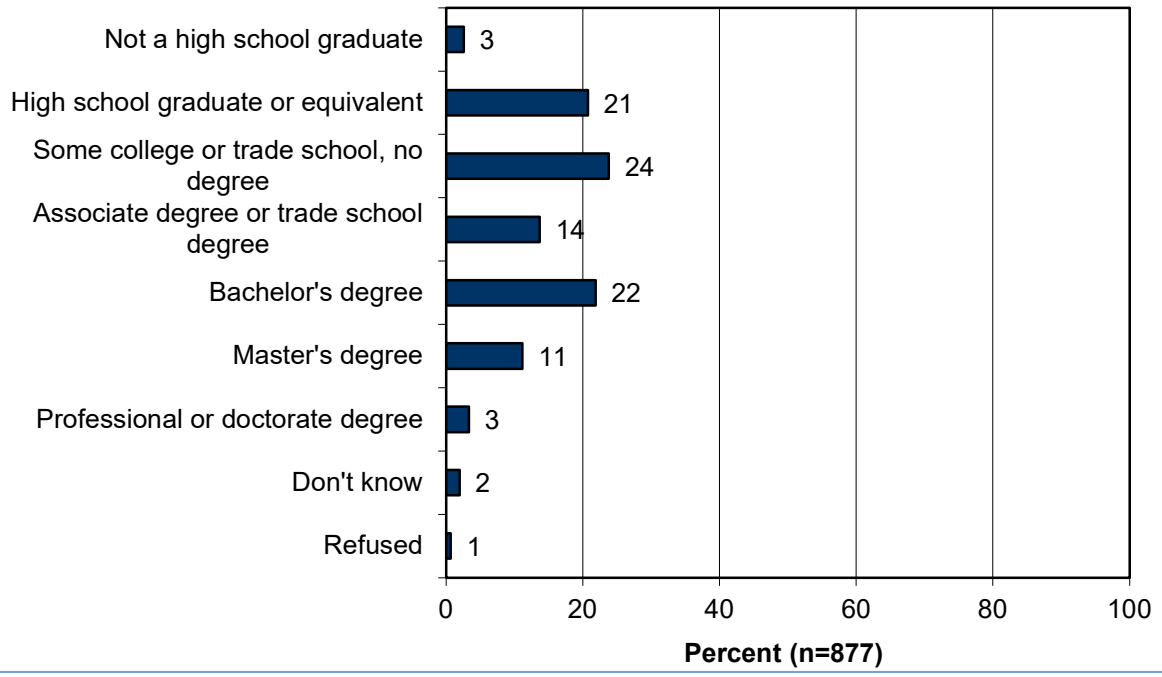




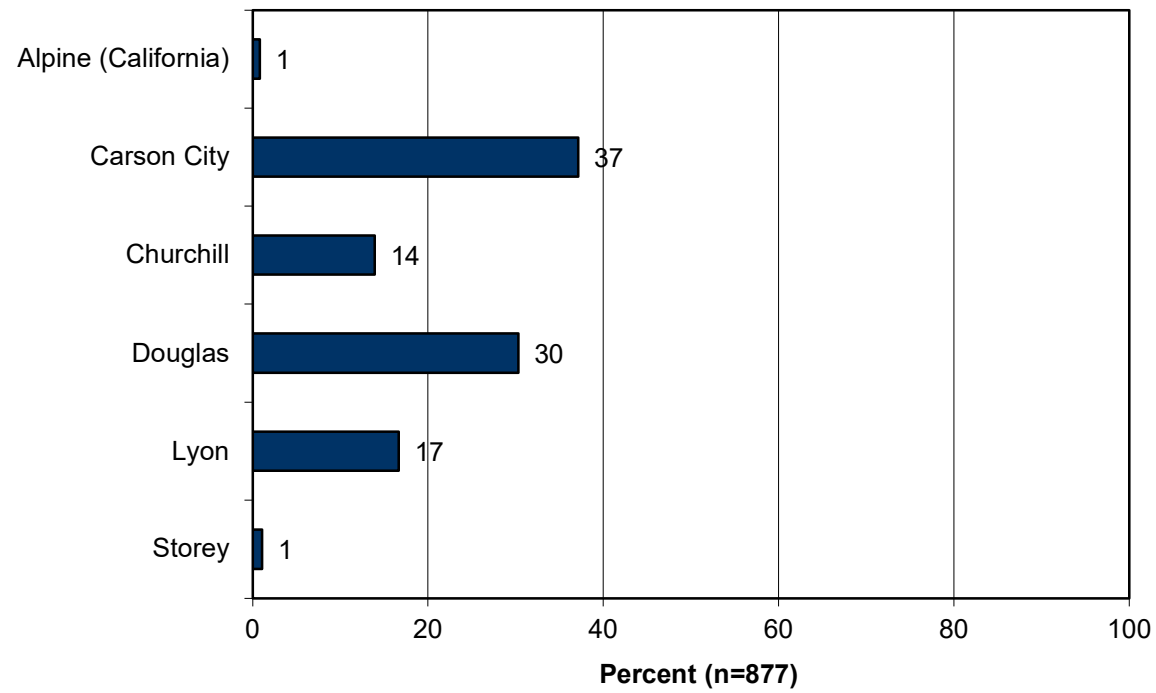
What races or ethnic backgrounds do you consider yourself? Please mention all that apply.



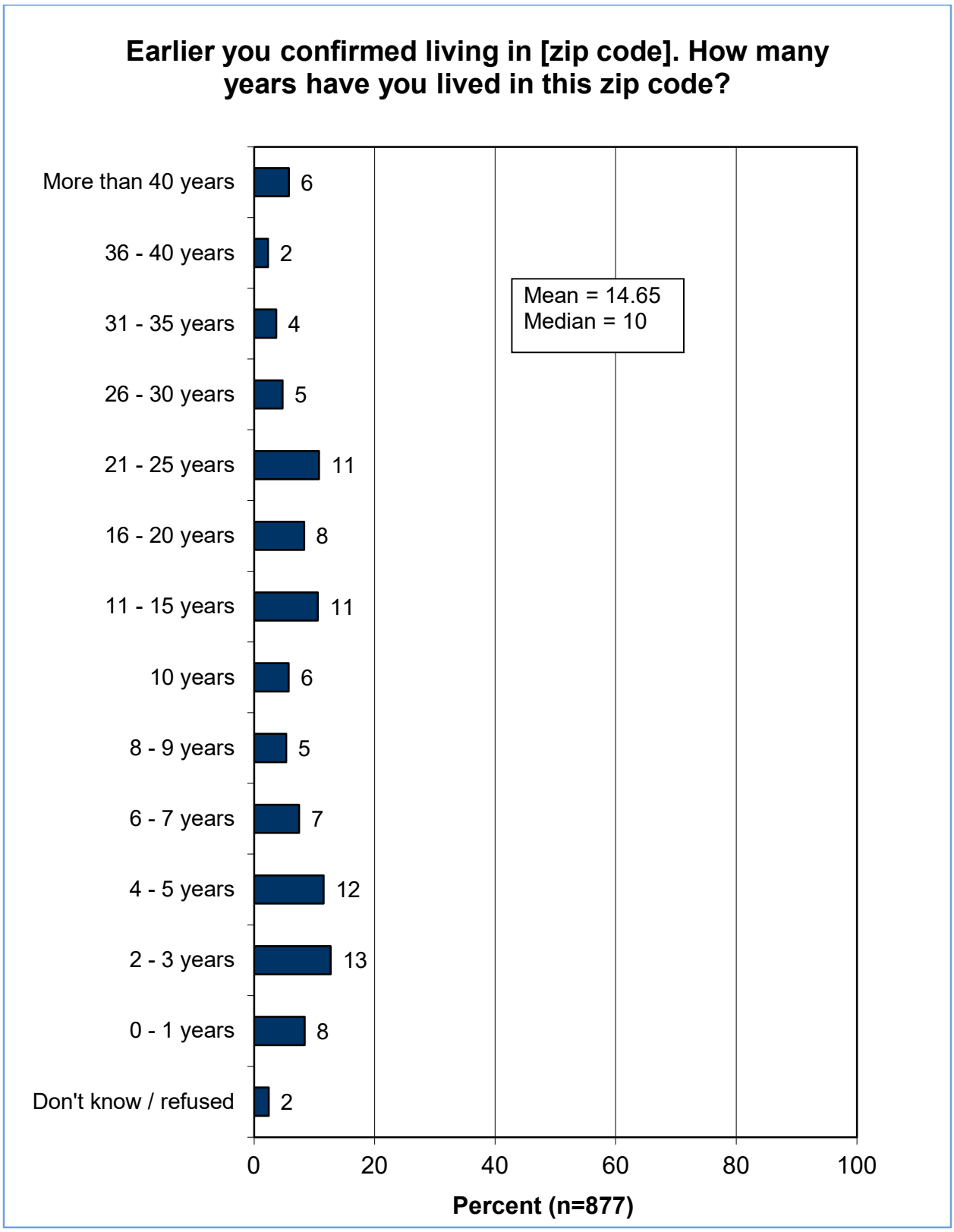
What is the highest level of education you have completed?



In which county do you currently live?



Note: Locations are in Nevada except where otherwise indicated.


Earlier you confirmed living in [zip code]. How many years have you lived in this zip code?
More than 40 years
6
36 - 40 years
2
31 - 35 years
4
26 - 30 years
5
21 - 25 years
11
16 - 20 years
8
11 - 15 years
11
10 years
6
8 - 9 years
5
6 - 7 years
7
4 - 5 years
12
2 - 3 years
13
0 - 1 years
8
Don't know / refused
2
Mean = 14.65
Median = 10
0
20
40
60
80
100
Percent (n=877)

TRENDS AND GRADING

This chapter presents a trends comparison of current results to those from Responsive Management's 2015 survey for CWSD and presented in the report titled, *Watershed-Literacy Survey of Carson River Watershed Residents*.

This is followed by a grading of key questions based on positive or negative movement in the trends; the grading scheme was developed in the 2016 document prepared by Responsive Management for the Carson River Coalition (CRC) titled, *Marketing and Communications Plan for the Carson River Watershed*.

TRENDS

The original study was conducted in June 2015, and the above-referenced report was issued in July 2015. Results are discussed below, organized by positive trends, neutral trends, and negative trends.

Positive trends are as follows:

- Respondents gave a higher rating of how important the health of the Carson River's Watershed is to them personally, on a scale of 0 to 10. The mean rating increased from 8.27 in 2015 to 8.52 in 2026. Furthermore, the percentage giving a top rating of 10 increased slightly from 45% to 47%.
- The survey presented a series of environmental actions, and it asked respondents to rate how important each is to the health of the Carson River Watershed's environment, on a scale of 0 to 10. The actions below had positive trends in being seen as more important.
    - Floodplain conservation (reducing development in floodplains): the mean rating increased from 7.7 in 2015 to 8.1 in 2026.
    - Recreation use and management: 7.5 to 7.8.
    - Protection of habitat along the river: 8.6 to 8.8.
    - Addressing invasive species: 7.9 to 8.1.
- In an open-ended question, residents were asked to name the single most important action that they can take to protect or improve the health of the Carson River Watershed. Looking at the verbatim responses collectively, 76% named a specific action in 2015, whereas 82% named an action in 2026.
- A series of questions asked respondents if they had taken environmental actions over the past 5 years. The actions below had positive trends.
    - Picked up their pet's waste (among pet owners): The percentage taking this action increased from 87% in 2015 to 95% in 2026.
    - Reduced noxious or invasive weeds on their property (among those with a yard or lawn): 70% to 87%.
    - Reduced fertilizer use (among those with a yard or lawn): 63% to 74%.

Neutral trends are as follows (a trend is considered neutral if the difference is within 2% or a mean rating of 0.1):

- The survey asked respondents how much they affect the health of the Carson River Watershed's environment. The percentage of those saying *a great deal* stayed at 7%, and those saying *a moderate amount* stayed essentially the same, as well.
- The mean ratings of importance for the restoration of habitat along the river moved from 8.3 in 2015 to 8.4 in 2026.
- The percentage who participated in a watershed-related work day, field trip, workshop, or public meeting or contacted an elected official or representative about watershed issues also stayed nearly the same, going from 19% in 2015 to 20% in 2026.
- The percentage who disposed of oil down the storm drain remained at 2%.

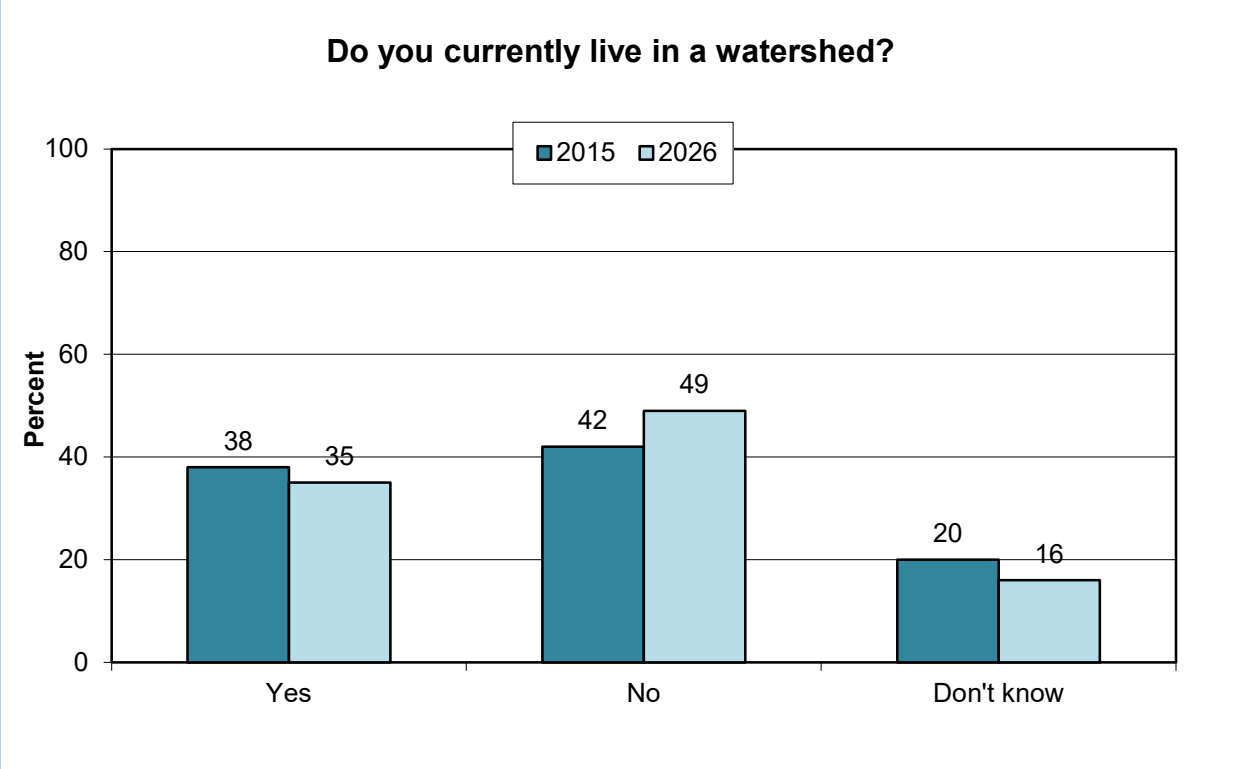
Negative trends are as follows:

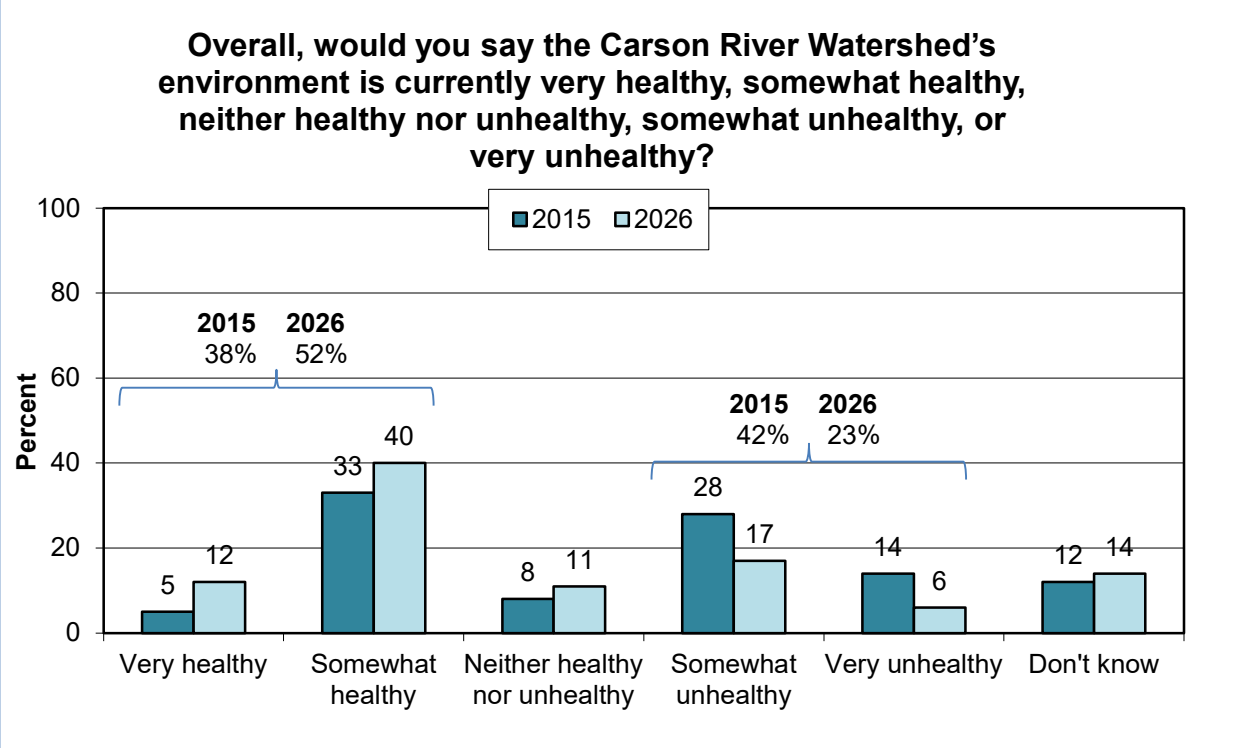
- The percentage saying that they live in a watershed decreased from 38% in 2015 to 35% in 2026.
- The series of questions about the importance of various environmental actions to the watershed's health, rated on a 0 to 10 scale, had negative trends for the actions listed below.
    - Human efforts to protect or conserve water: the mean rating decreased from 8.9 in 2015 to 8.1 in 2026.
    - Reducing polluted run-off: 9.0 to 8.7
    - Watershed outreach and education: 8.3 to 8.0.
    - Protection of the river's headwaters: 9.0 to 8.8.
- An open-ended question asked respondents about the single most important action they can take to protect or improve the health of the Carson River Watershed. In a positive trend listed above, a higher percentage of respondents named a specific action compared to the 2015 study. However, in a follow-up question among those who named an action, the percentage of those who had taken that action in the previous 5 years decreased from 85% in 2015 to 74% in 2026.
- The percentage of those with landscaping who redirected their gutter downspout to water their landscaping decreased from 54% in 2015 to 42% in 2026.
- The percentage of car owners who washed their car in the driveway increased from 41% in 2015 to 44% in 2026.

Finally, one trend cannot be said to be positive or negative, as there is no specific direction that is better or worse for the Carson River Watershed's environment.

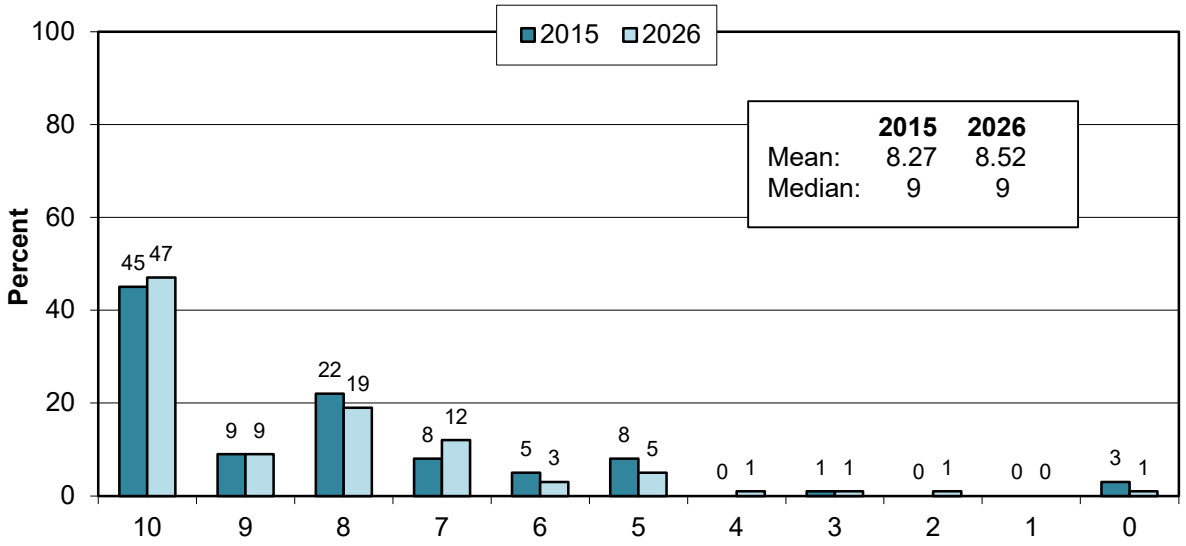
- Carson River Watershed residents are much more optimistic about the health of the watershed's environment: the percentage saying that the watershed is *very* healthy increased from 5% in 2015 to 12% in 2026. Meanwhile, the percentage saying it is *somewhat* healthy increased from 33% to 40%. This corresponds to a combined percentage (*very* or *somewhat* healthy) increasing from 38% to 52%.

Trends graphs start on the next page.

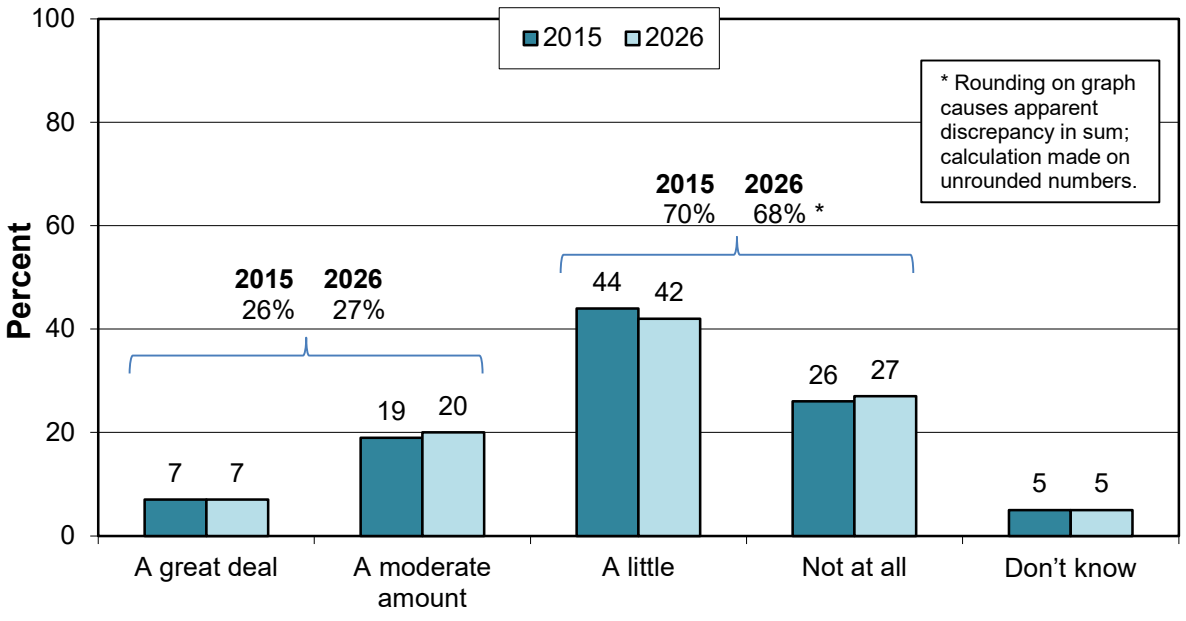

Do you currently live in a watershed?
2015
2026
Percent
100
80
60
40
20
0
38
35
42
49
20
16
Yes
No
Don't know

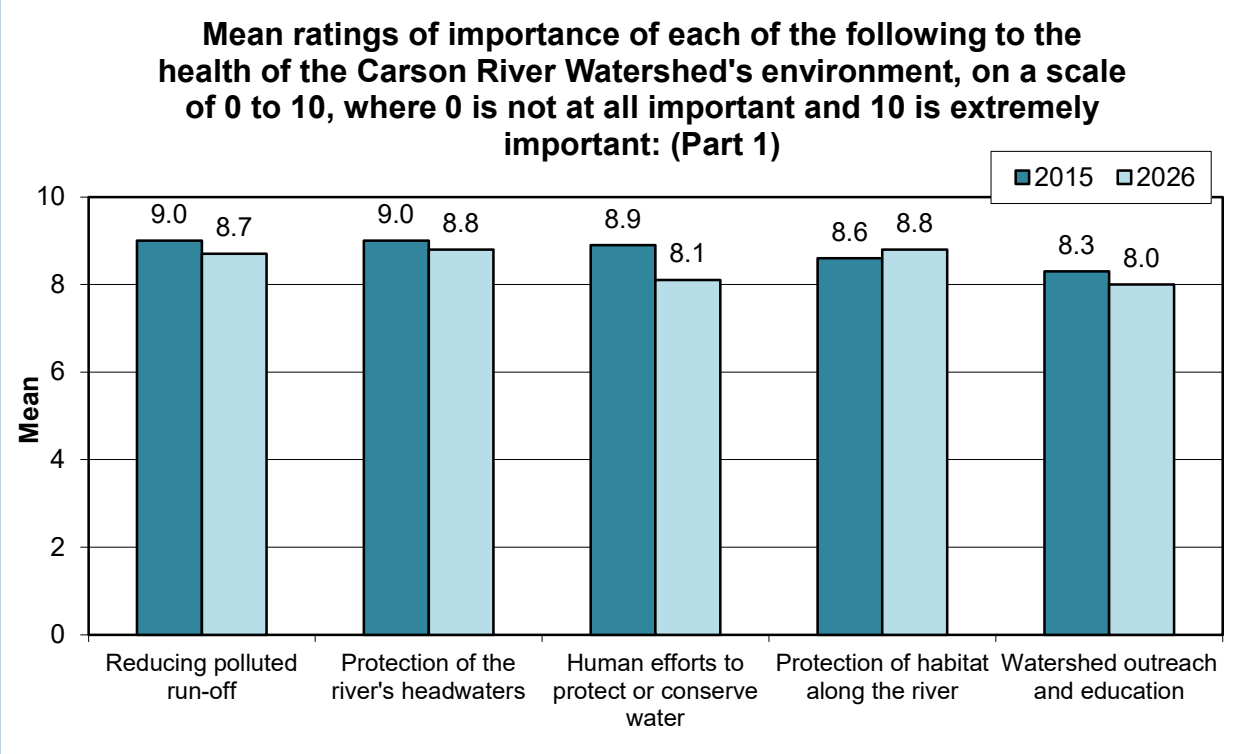

Overall, would you say the Carson River Watershed's environment is currently very healthy, somewhat healthy, neither healthy nor unhealthy, somewhat unhealthy, or very unhealthy?
2015
2026
Percent
100
80
60
40
20
0
2015 38%
2026 52%
2015 42%
2026 23%
5
12
33
40
8
11
28
17
14
6
12
14
Very healthy
Somewhat healthy
Neither healthy nor unhealthy
Somewhat unhealthy
Very unhealthy
Don't know

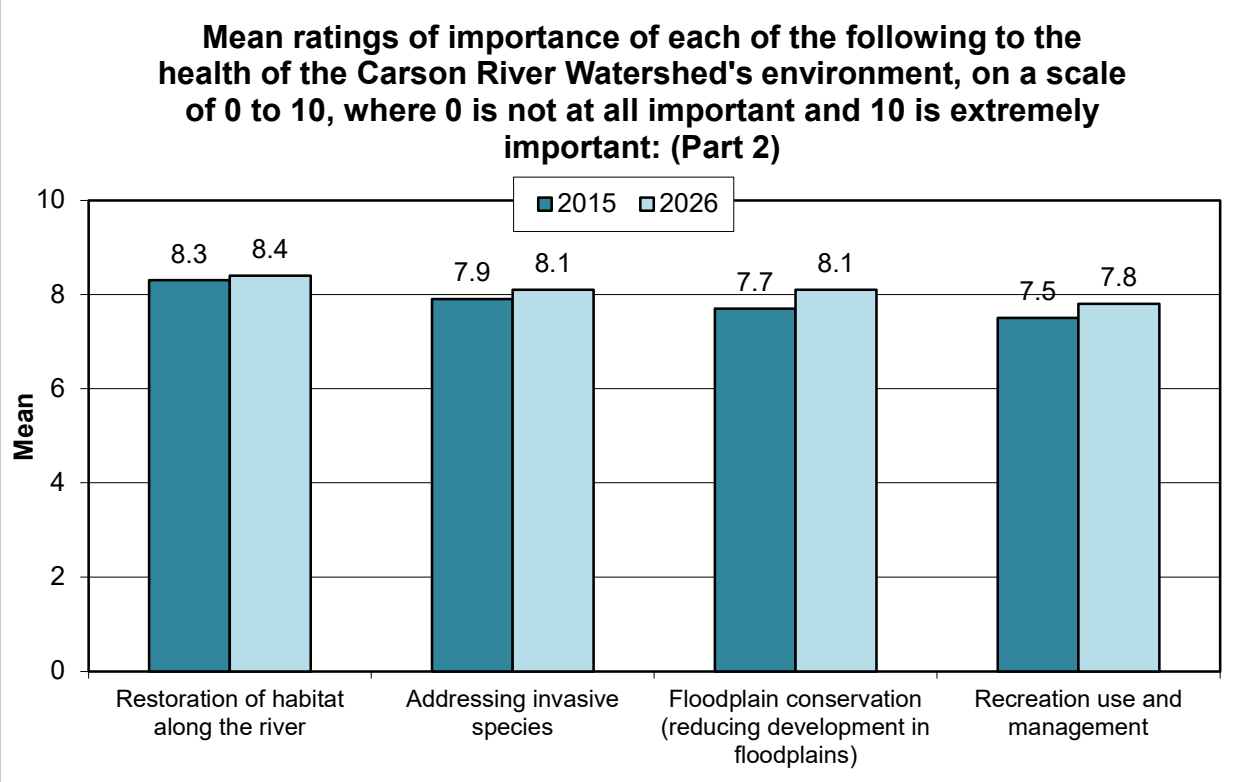
How important to you, personally, is the health of the Carson River Watershed's environment, on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important?



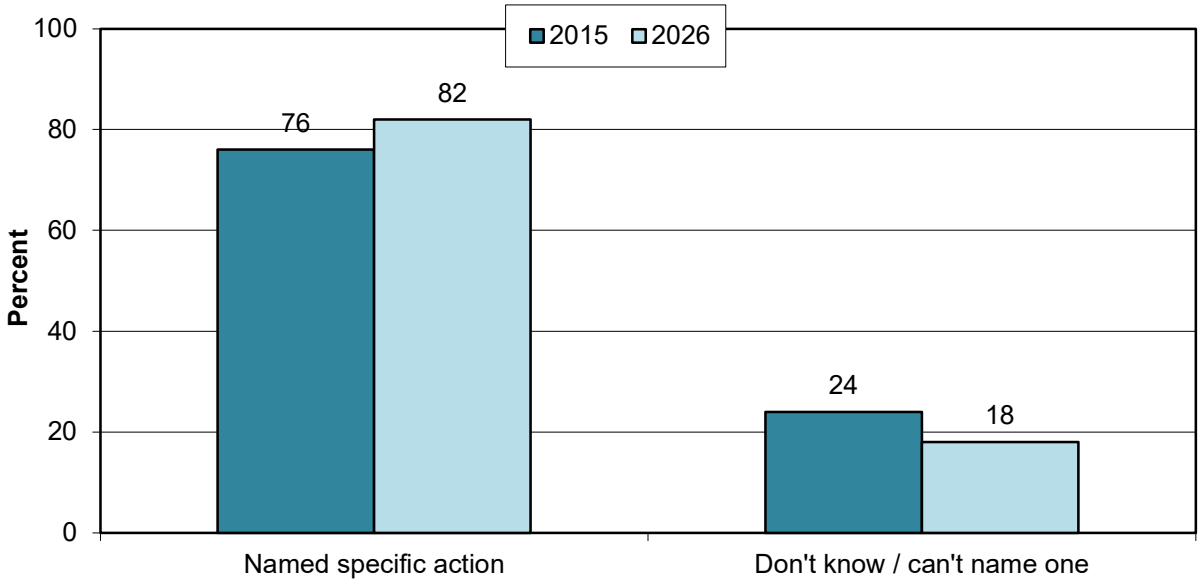
How much would you say you affect the health of the Carson River Watershed's environment?



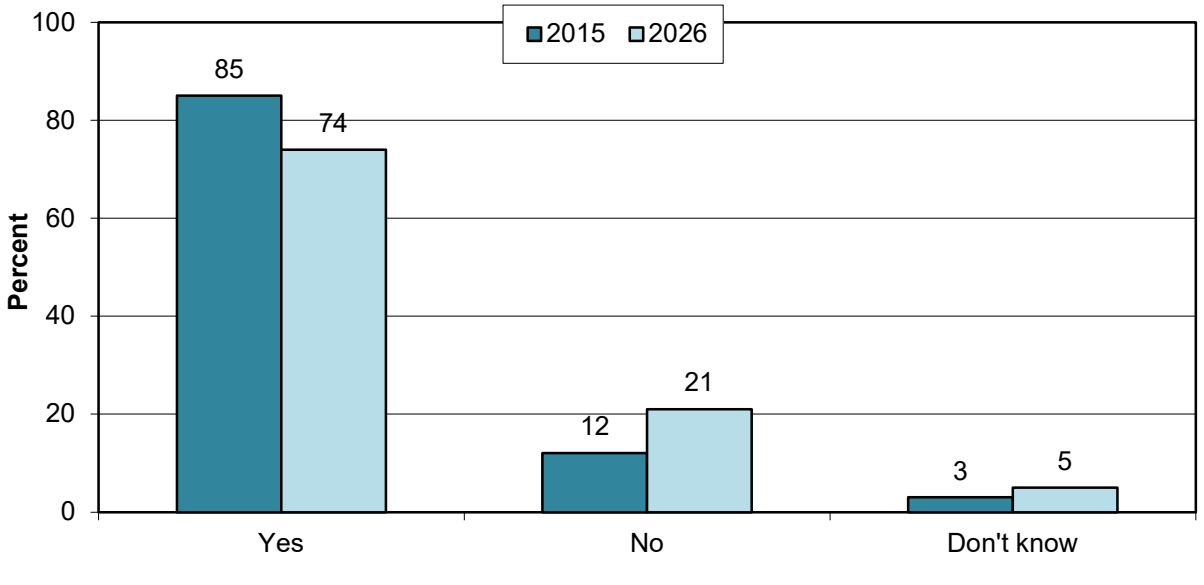

Mean ratings of importance of each of the following to the health of the Carson River Watershed's environment, on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important: (Part 1)
2015
2026
Mean
10
8
6
4
2
0
9.0
8.7
9.0
8.8
8.9
8.1
8.6
8.8
8.3
8.0
Reducing polluted run-off
Protection of the river's headwaters
Human efforts to protect or conserve water
Protection of habitat along the river
Watershed outreach and education

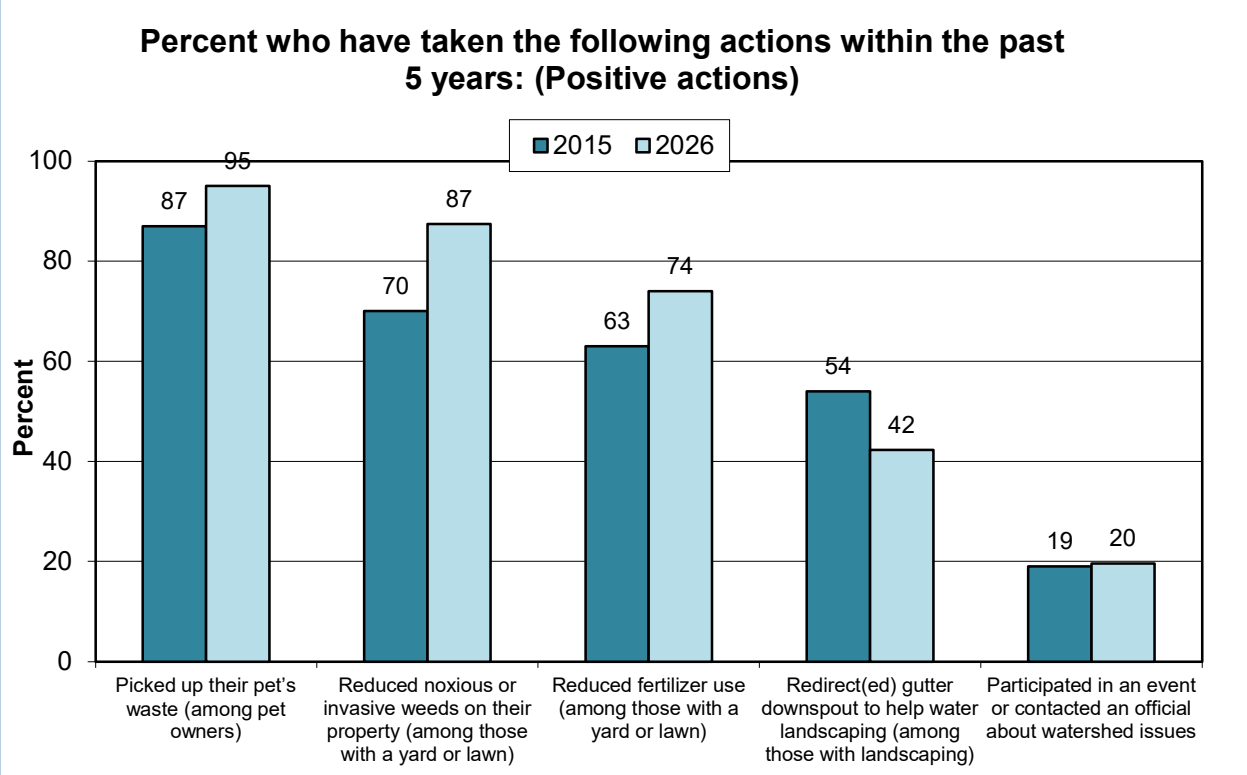

Mean ratings of importance of each of the following to the health of the Carson River Watershed's environment, on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important: (Part 2)
2015
2026
Mean
10
8
6
4
2
0
8.3
8.4
7.9
8.1
7.7
8.1
7.5
7.8
Restoration of habitat along the river
Addressing invasive species
Floodplain conservation (reducing development in floodplains)
Recreation use and management

In your opinion, what is the single most important action you can take to help protect or improve the health of the Carson River and the watershed's environment?

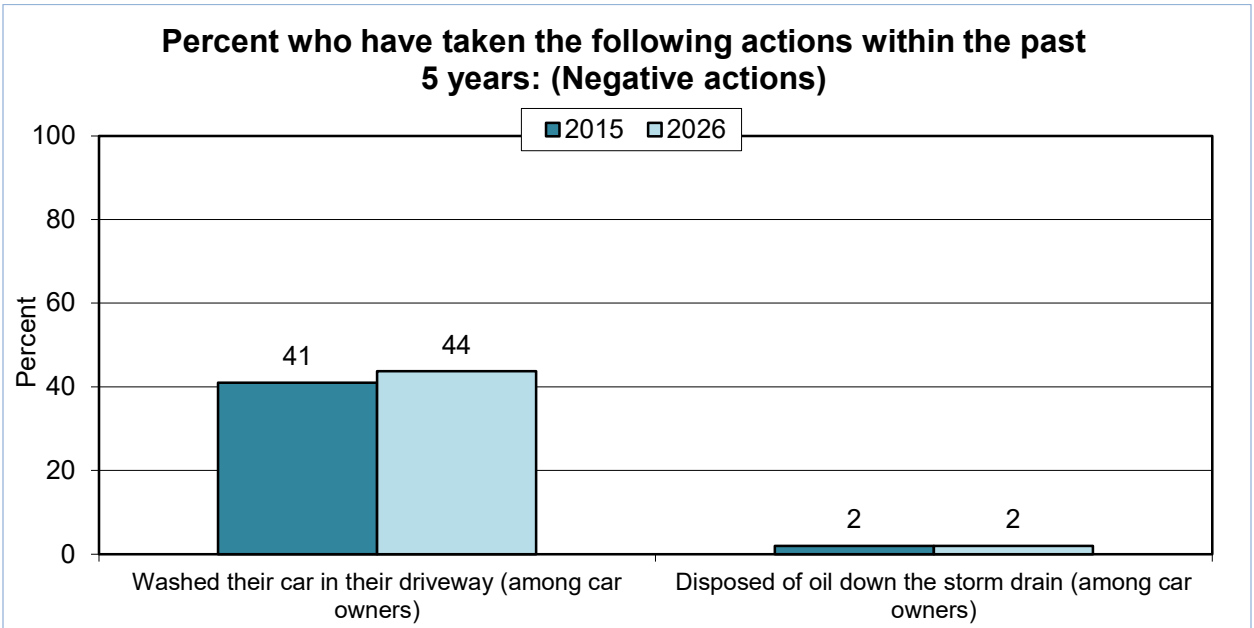


Are you currently taking this action? (Among those who named an action.)





Note: This series was presented with a frequency scale in 2026 (always-frequently-sometimes-rarely-never). Results were converted to yes/no percentages for a direct comparison to 2015 results. The questions were asked only of those who could take the actions (e.g., the pet waste question was asked only of those with a pet), as indicated on the graph.



Note: This series was presented with a frequency scale in 2026 (always-frequently-sometimes-rarely-never). Results were converted to yes/no percentages for a direct comparison to 2015 results. The questions were asked only of those with a car, as indicated on the graph.

GRADING

The evaluation (or grading) plan that was developed in the 2016 marketing report was based on twelve questions, with goals (or benchmarks) for each question, with a letter grade assigned for the specific results. For instance, one question was, "Do you currently live in a watershed?" The 2015 report shows that 38% of study area residents responded that they do. (In reality, all people in the study area live in a watershed.) The goal was for at least 48% of area residents to realize that they live in a watershed for an A in the grading system, with lesser amounts ranging down to the baseline for a D. If less than the baseline realized that they live in a watershed, an F was to be awarded.

Of the twelve original questions that were to be used in the grading system, two were deleted from the 2026 survey (to shorten the survey—it was too long with all the questions included). This left ten questions for the grading system. However, the grading system included one question twice—first for the overall results and the second for results among Hispanic/Latino residents. This made eleven items to be used in the grading system.

For the overall grade, the individual grades for these eleven items were assigned, and then the overall Grade Point Average (GPA) was taken from those eleven items. The ten questions (which make up eleven items) used in the grading are shown in the tables that follow. The tables show the criteria (i.e., the actual responses) used in the grading system, the 2015 survey results (which make up the baseline), the 2026 survey results, and the resulting grade.

As shown in the following tables, the overall GPA is 1.6, which rounds to a C letter grade. Rounding is permissible in this system to account for the lack of values for A+ grades (or any plus or minus grades); otherwise, it would be nearly impossible to get a 4.0 GPA, and thus nearly impossible for an A to be assigned.

One observation is important: some of the criteria appear to be particularly difficult to achieve, especially the overall results for dumping motor oil down a storm drain. In the 2015 report, 2% overall had done this. Setting a criterion for this, then, is problematic because there is so little room for improvement and also because the actual amount in that report (2%) is less than the margin of error. If this overall item is removed from the grading table, the resulting GPA is 1.7, which would round to a C.

As these tables need a full page or more for display, they start on the next page.

Question	Baseline Result (2015)	Goal	Current Result (2026)	Grade	Grade Points
1. Do you currently live in a watershed? Yes No [Percentage who responded "Yes"]	38%	48% (A) 43% (B) 41% (C) 38% (D)	35%	F	0
2. How important to you, personally, is the health of the Carson River Watershed's environment? 0 to 10 scale [Mean rating]	8.27	9.00 (A) 8.75 (B) 8.52 (C) 8.27 (D)	8.52 Significant at the 95% Confidence Interval	C	2
3. How much would you say you affect the health of the Carson River Watershed's environment? A great deal A moderate amount A little Not at all [Percentage who responded "A great deal"]	7%	17% (A) 12% (B) 10% (C) 7% (D)	7%	D	1
4. Reducing polluted run-off to improve water quality. (How important do you think this is to the health of the Carson River Watershed's environment?) 0 to 10 scale [Percentage rating it "9" or "10"]	71%	81% (A) 76% (B) 74% (C) 71% (D)	66%	F	0
5. Protecting habitat along the river. (How important do you think this is to the health of the Carson River Watershed's environment?) 0 to 10 scale [Percentage rating it "9" or "10"]	56%	66% (A) 61% (B) 59% (C) 56% (D)	65% Significant at the 95% Confidence Interval	B	3
6. Addressing invasive species. (How important do you think this is to the health of the Carson River Watershed's environment?) 0 to 10 scale [Percentage rating it "9" or "10"]	49%	59% (A) 54% (B) 52% (C) 49% (D)	50%	D	1

Question	Baseline Result (2015)	Goal	Current Result (2026)	Grade	Grade Points
7. Reduced fertilizer use. (How often have you done this in the past 5 years?) Always Frequently Sometimes Rarely Never [Percentage reporting that they did this.]	63%	73% (A) 68% (B) 65% (C) 63% (D)	74% Significant at the 95% Confidence Interval	A	4
8. Picked up your pet's waste. (How often have you done this in the past 5 years?) Always Frequently Sometimes Rarely Never [Percentage reporting that they did this.]	87%	97% (A) 92% (B) 89% (C) 87% (D)	95% Significant at the 95% Confidence Interval	B	3
9. Washed your car in your driveway. (How often have you done this in the past 5 years?) Always Frequently Sometimes Rarely Never [Percentage reporting that they did this.]	41%	31% (A) 36% (B) 39% (C) 41% (D)	44%	F	0

In the grading system for the questions on this page, C and D were not assigned a value; default value for D is set as no change from the baseline for a D; C was then set as the midpoint between D and B.

Question	Baseline Result (2015)	Goal	Current Result (2026)	Grade	Grade Points
10. Disposed of oil down the storm drain. (How often have you done this in the past 5 years?) Always Frequently Sometimes Rarely Never [Percentage reporting that they did this.]	2%	1% (A) NA (B) NA (C) 2% (D)	2%	D	1
11. [HISPANIC/LATINO GRADING] Disposed of oil down the storm drain. (How often have you done this in the past 5 years?) Always Frequently Sometimes Rarely Never [Percentage reporting that they did this.]	7%	3% (A) 5% (B) 6% (C) 7% (D)	4%	B	3

In the grading system, only the A was assigned a value overall, so no values can be set for the overall results for B or C, as there is no further room for movement. (NA = not applicable)

No difference was statistically significant at the 95% confidence level.

Question	Letter Grade	Grade Points
1. Do your currently live in a watershed?	F	0
2. How important to you, personally, is the health of the Carson River Watershed's environment?	C	2
3. How much would you say you affect the health of the Carson River Watershed's environment?	D	1
4. Reducing polluted run-off to improve water quality. (How important do you think this is to the health of the Carson River Watershed's environment?)	F	0
5. Protecting habitat along the river. (How important do you think this is to the health of the Carson River Watershed's environment?)	B	3
6. Addressing invasive species. (How important do you think this is to the health of the Carson River Watershed's environment?)	D	1
7. Reduced fertilizer use. (How often have you done this in the past 5 years?)	A	4
8. Picked up your pet's waste. (How often have you done this in the past 5 years?)	B	3
9. Washed your car in your driveway. (How often have you done this in the past 5 years?)	F	0
10. Disposed of oil down the storm drain. (How often have you done this in the past 5 years?)	D	1
11. [HISPANIC/LATINO GRADING] Disposed of oil down the storm drain. (How often have you done this in the past 5 years?)	B	3
Grade Point Average	C	1.6
Grade Point Average without item 10	C	1.7

(Letter grade is based on rounding the GPA to the integer; 1.7 rounds to 2.)

Note: These two questions in the original grading system were removed from the 2026 survey.

At least 12% of residents indicate that they know a great deal about watersheds (baseline is 9%).	Deleted from survey for 2026.
At least 70% of residents indicate that yard and land maintenance practices affect the health of the Carson River and watershed environment a great deal or a moderate amount (baseline is 67%).	Deleted from survey for 2026.

The final table in this section shows the statistical tests that were run.

Question	Baseline Result (2015)	Current Result (2026)	Statistical Test
1. Do you currently live in a watershed? [Percentage who responded "Yes"]	38%	35%	Not significant
2. How important to you, personally, is the health of the Carson River Watershed's environment? [Mean rating]	8.27	8.52	Significant (p = 0.014)
3. How much would you say you affect the health of the Carson River Watershed's environment? [Percentage who responded "A great deal"]	7%	7%	Not significant
4. Reducing polluted run-off to improve water quality. (How important do you think this is to the health of the Carson River Watershed's environment?) [Percentage rating it "9" or "10"]	71%	66%	Not significant
5. Protecting habitat along the river. (How important do you think this is to the health of the Carson River Watershed's environment?) [Percentage rating it "9" or "10"]	56%	65%	Significant (p = 0.010)
6. Addressing invasive species. (How important do you think this is to the health of the Carson River Watershed's environment?) [Percentage rating it "9" or "10"]	49%	50%	Not significant
7. Reduced fertilizer use. (How often have you done this in the past 5 years?) [Percentage reporting that they did this.]	63%	74%	Significant (p = 0.000004)
8. Picked up your pet's waste. (How often have you done this in the past 5 years?) [Percentage reporting that they did this.]	87%	95%	Significant (p = 0.000001)
9. Washed your car in your driveway. (How often have you done this in the past 5 years?) [Percentage reporting that they did this.]	41%	44%	Not significant
10. Disposed of oil down the storm drain. (How often have you done this in the past 5 years?) [Percentage reporting that they did this.]	2%	2%	Not significant
11. [HISPANIC/LATINO GRADING] Disposed of oil down the storm drain. (How often have you done this in the past 5 years?) [Percentage reporting that they did this.]	7%	4%	Not significant

MARKETING AND COMMUNICATIONS APPROACH

The 2016 report for the Carson River Coalition (CRC) contained an extensive section on marketing that still applies, with modifications, to this day. This is the approach the CRC should adopt to develop a full plan to market and communicate conservation information to the relevant audiences and inspire behavioral change among watershed residents. Findings from the research, including behavioral tendencies among certain demographic groups, can be used to guide a marketing effort, but it is essential that the CRC first assess its organizational capabilities and identify specific goals for desired outcomes. The survey data and other research discussed in this document make up the foundations for the full plan. While the steps outlined in this section detail the process for developing the plan, the final marketing and communications effort will be the result of careful planning, introspection, and coordination on the part of the CRC.

BASIS OF THE MARKETING AND COMMUNICATIONS APPROACH

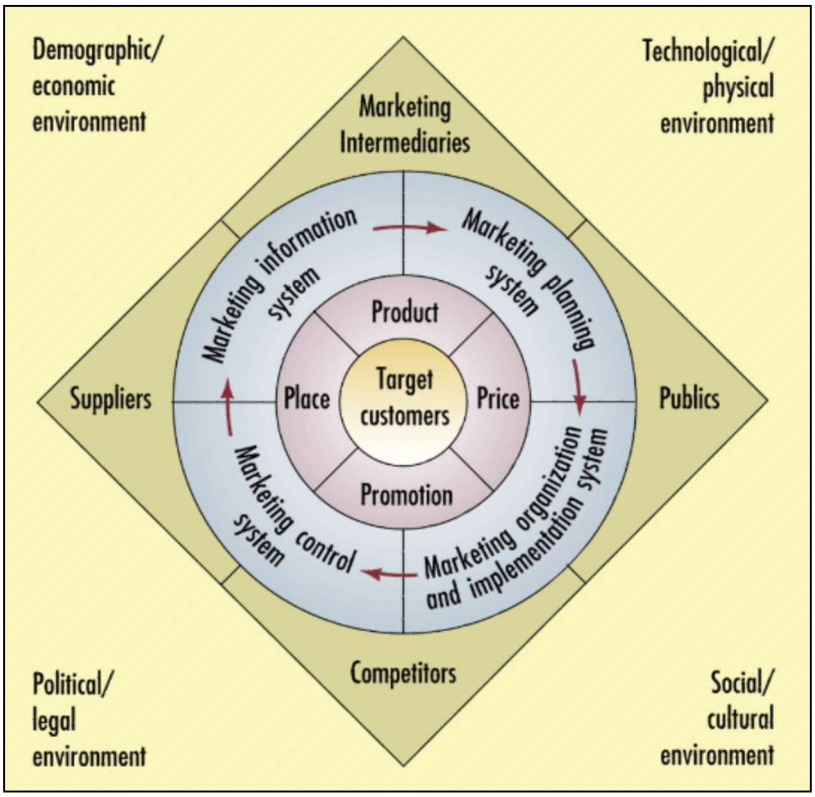
The CRC has a variety of communications options. For example, CRC may communicate with watershed residents through in-house media such as websites, blogs, or social media accounts, but it can also communicate through publications and news releases. These options may be efficient avenues for communicating to target audiences, although there may be little knowledge of whether the communication is effective.

The ultimate goal is to convert in-house media to *earned* media (earned media is unpaid publicity received from third parties like customers, journalists, or influencers, generating increased reach without direct advertising costs), the result of residents' decisions to support a cause or embrace a marketing effort. Media is *earned* when objective third parties are persuaded to write favorably about an organization or effort. Earned media translates into positive publicity and may be the result of initial news releases, story pitches, press conferences, blogs, or social networking. The benefit of earned media is that it is highly credible to typical people in that (supposedly) non-biased sources are encouraging a belief or behavior. Awareness and interest generated by earned media can be highly influential and valuable.

The importance of following through on the marketing and communications strategies discussed here is very important. It can be that the implementation of a marketing or communications plan does not occur in full because the process is viewed by staff as being too overwhelming. Therefore, it is important to address various outreach components through prioritization. First, determine those things that can be accomplished easily and take the necessary steps to implement these tasks. Next, determine tasks that may require a higher level of time, effort, and funding. Accomplishing these tasks, even if it takes a period of a year or more, will help pave the way for lower priority items that depend on the implementation of the higher priority items. Progress is achieved as each item in the plan is addressed and completed. Initial accomplishments will help build momentum and sustain the desire to advance and improve.

A marketing or systematic communications approach leads to the most effective decisions and the development of the most appropriate programs, products, or services (in this case, a series of outreach efforts to generate awareness and inspire behavioral or attitudinal change).

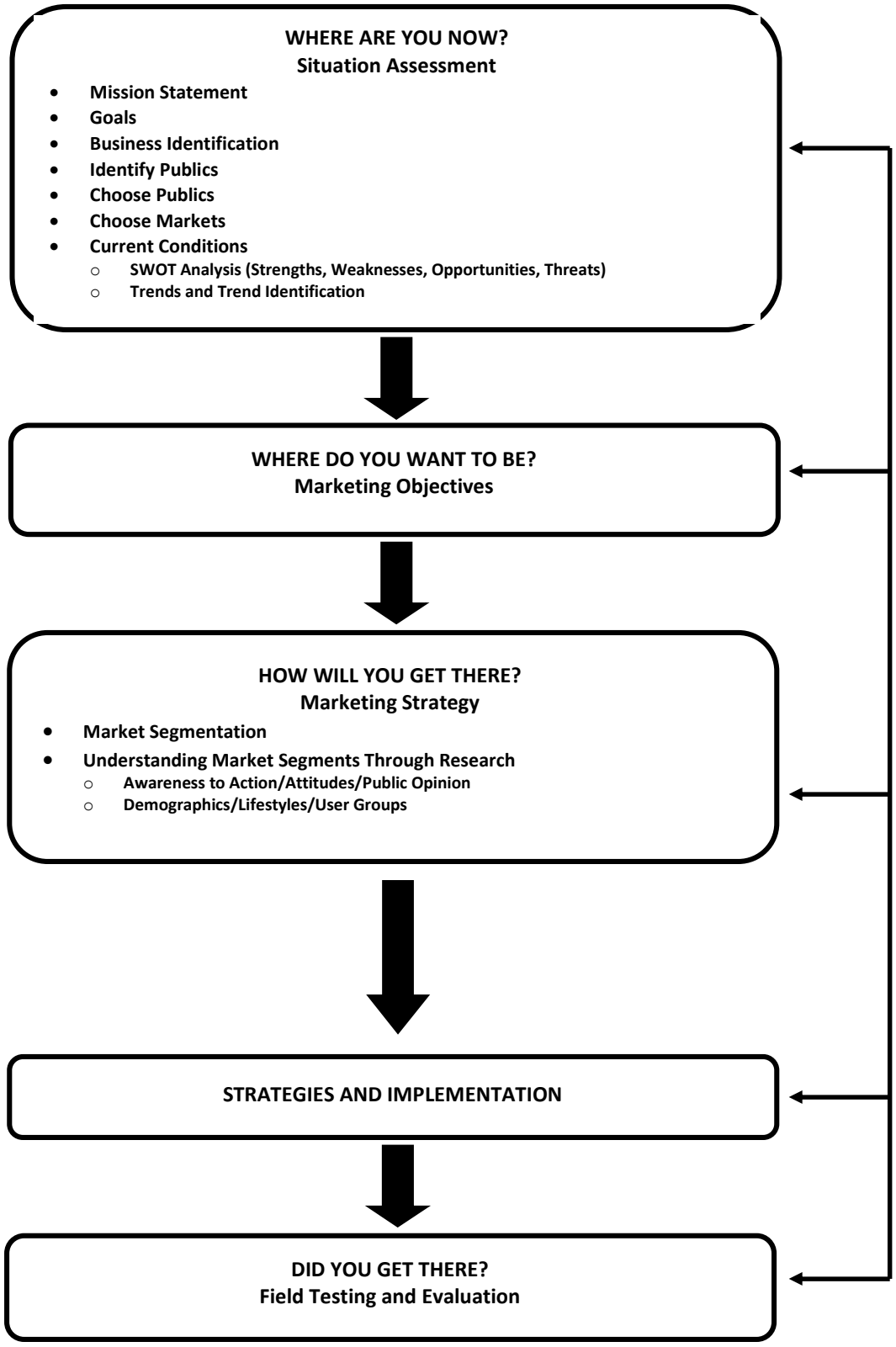
Within the context of conservation and natural resource management, marketing is the deliberate and orderly step-by-step process of first defining what exactly is to be achieved; understanding and defining different groups of constituents (markets) through research; and then tailoring programs, products, or services to meet those needs through the manipulation of the marketing mix: product, price, place, and promotion (see the accompanying graphic).



Source: Kotler, P. 2002. *Marketing Management* (11th edition). Upper Saddle River, New Jersey: Prentice Hall.

The purpose of marketing and communications in the context of Carson River awareness and conservation efforts is to both better meet the goals of the agencies and organizations and to better meet the needs of watershed residents and constituents by providing them with beneficial programs, information, or services. Again, while the information in this section provides a roadmap to guide the CRC in the development phase, the ultimate strength of the plan depends on long-term commitment, organized and deliberate planning based on current research, and consistent assessment and evaluation.

The graphic below shows the communications process model.



PROCESS FOR PLAN DEVELOPMENT

There are four major steps in marketing and communications planning: analyzing opportunities, developing strategies, planning programs, and managing efforts (Kotler, 2002). This process follows the standard format for good planning (see the graphic on the previous page). It asks the following questions:

1. Where are we now? (Situation assessment)
2. Where do we want to be? (Opportunities and objectives)
3. How will we get there? (Strategies and program planning)
4. Did we get there? (Evaluation)

The initial effort requires a look inward to assess organizational capabilities, resources, shortcomings, and essential needs.

Situation Assessment: Where Are We Now?

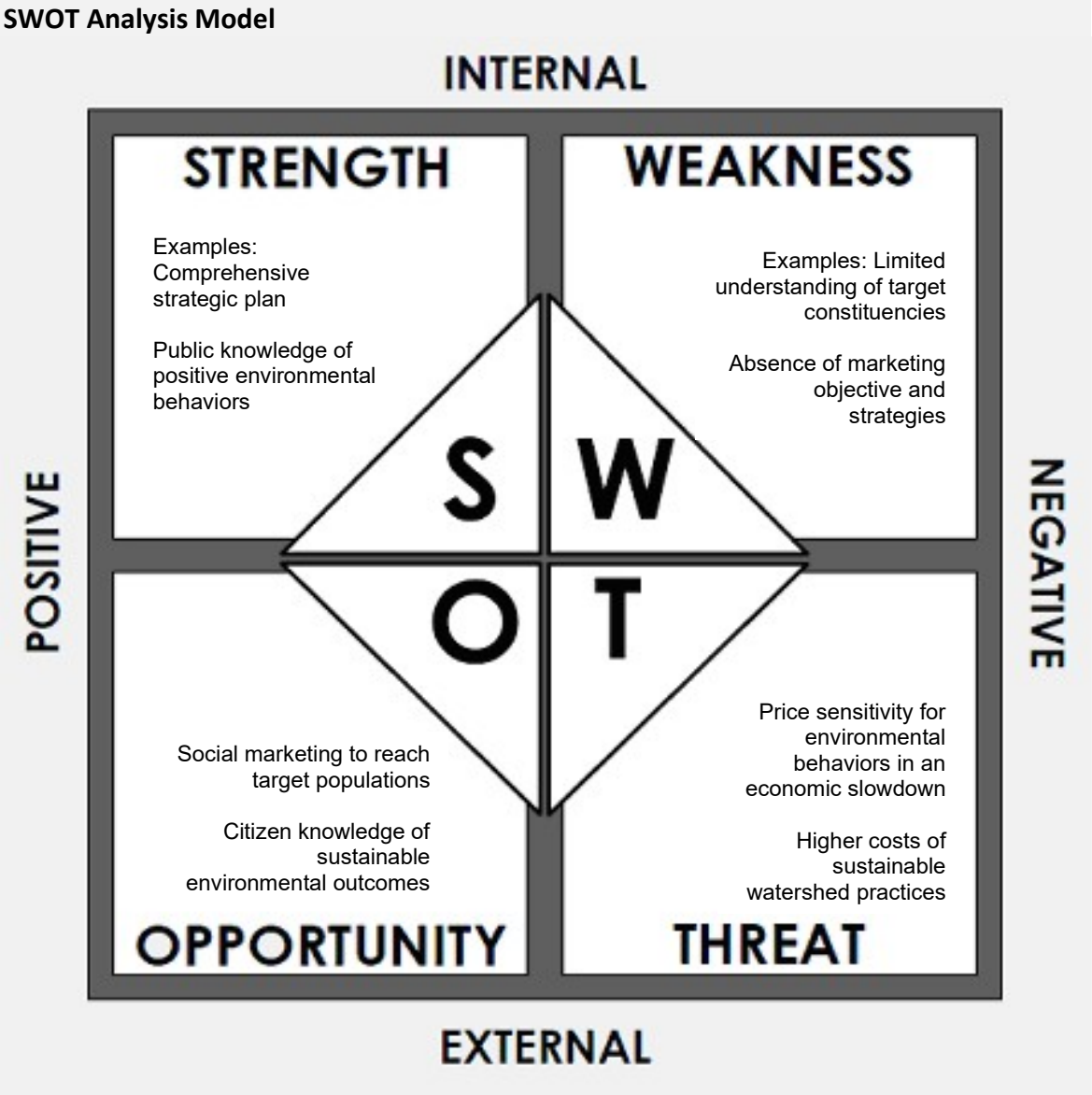
For a situation assessment, the organization takes a careful look at where it is now.

Identifying Publics: There is no such thing as the general public. The research in this report clearly indicates that people's relation to the Carson River Watershed is affected by a variety of factors, including age, ethnicity, and gender, among other variables. A list of one's publics is important in identifying one's place in a particular market.

Choosing Publics: A commonly heard phrase in marketing is that "You can't be all things to all people." A systematic marketing and communications process means making choices, and making choices means deciding specifically which groups will be targeted at any given time, with timing being different for different target markets (audiences). Different markets require different strategies. It is all right to choose more than one market to target, but it is important to keep in mind each group may require different strategies.

Current Conditions: The trend identification portion of the marketing process allows an organization to become proactive rather than reactive. A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a strategic assessment of an organization's current conditions, including internal organizational strengths and weaknesses, and external opportunities and threats (see the graphic on the next page). The SWOT analysis helps identify conditions that influence the success fulfillment of marketing objectives. The analysis is used to determine marketing strategies by capitalizing on strengths, minimizing weaknesses, utilizing opportunities, and mitigating threats.

SWOT Analysis Model



Source: Adapted from a model by SmartDraw.com.

SWOT Analysis—Carson River Coalition

While a detailed evaluation of the CRC is not within the scope of this initial planning effort, it is nonetheless a recommended process in which the CRC can evaluate current internal and external conditions prior to developing marketing and communications strategies. The resulting bullet point lists, offered as examples, may assist planning efforts with an understanding of the "big picture" by compiling extraneous facts into an easily understandable visual model.

The following items are suggested for consideration:

Strengths. The CRC should take stock of existing resources.

- Motivated staff with substantial professional experience.
- CRC is in charge of a resource that is valued by its residents.
- Technical resources, including the CRC website and social media.
- Administrative and internal support.
- Existing partnerships.

Weaknesses. The CRC should assess any limitations that apply.

- Staff turnover.
- Lack of adequate resources for communications.
- A need for the CRC to track who they are reaching.
- A need to improve communications in general at the organization.
- Lack of experience in outreach methods.
- A need to improve and/or drive traffic to the CRC website.
- Organization branding issues.

Opportunities. The marketing and communications plan will be a roadmap for change and improvements

- Social media including Facebook, Twitter, Instagram, blogs, and YouTube.
- Management and coordination are already in place.
- Existing relationships with local news outlets.

Threats.

- Diminished funds for marketing and communications.
- Difficulty in changing entrenched behavior.
- Low levels of awareness among residents.
- Lack of effective coordination, cooperation, and communications among partners.

Marketing/Communications Objectives: Where Do We Want to Be?

Once an organization identifies where it is on its marketing and communications, the next step is to decide where it wants to be. This phase of the planning is for developing specific objectives directed toward the accomplishment of goals—these should be specific and measurable statements of what, when, and how much will be achieved (Crowe, 1983). It is important to note where this objective setting is placed in the marketing process—at the end of the situation assessment. This is because realistic objectives cannot be set until there is a thorough understanding of where the organization is presently. As applied to the Carson River Watershed, the organization should carefully note current knowledge and attitudinal levels, conservation behaviors, and other essential baseline information against which future progress may be measured. After completing a comprehensive situation analysis, the organization is now ready to set informed, measurable objectives for evaluative results.

For the marketing/communications plan to be effective, it must both set and serve specific, firm objectives. Key elements to consider in defining marketing/communications objectives

include identifying a target audience (public), determining the organization's public image and how the organization wants to be perceived by the public, developing attainable timelines, and defining metrics to evaluate the results. Marketing/communications objectives are a major touchstone for the overall marketing/communications plan; the marketing/communications plan will be written with clearly defined objectives in mind, and ultimately, marketing and communications efforts will be evaluated against these criteria.

Objectives should be clearly defined and communicated. Many programs and initiatives fail from the start because objectives are not agreed upon and written down by those involved. Perhaps the best example of obtuse objectives occurs when it comes to "informing and educating" a market about environmental/water conservation issues. Informing and educating a target market is a laudable goal but not a feasible objective—"informing and educating" is too broad and non-specific. In the objective portion of the marketing process, "informing and educating" the public needs to be refined to something more specific, such as increasing factual knowledge, increasing concern, altering opinions, changing attitudes, or altering behavior. Taking the time to complete a situation assessment is extremely valuable. After all, if an organization does not know where it is or where it wants to be, how will it get there?

Marketing/Communications Strategy: How Will We Get There?

At this point, the plan has identified where the organization is and where it wants to be. The "marketing strategy" section of the plan identifies how it will get there.

Market Segmentation. First, the market should be segmented; this section of the marketing/communications plan identifies the specific market segment(s). Who are they exactly? Recall that there is no such thing as a general public. Additionally, what are the demographic characteristics of the market segment? What do they want and what do they need? What are their attitudes and opinions about the topic under consideration? It is important to understand that marketing is not a one-size-fits-all effort. It is clear from the research that marketing efforts need to be tailored to provide specific information or motivation to specific groups.

By targeting specific groups with specific messages, marketing efforts will become more effective, and their outcomes can be more effectively measured. Outcome evaluation and program success can be measured by comparing awareness, attitudes, and behaviors before and after implementation of these efforts. Limitations in time, budgets, and staffing require that the CRC identify the highest priority audiences. This report contains detailed quantitative information on the full range of potential target markets within the Carson River Watershed and should be used to set specific marketing and communications objectives.

Media (Journalists). Because the media plays an essential role in communicating to the recommended target audiences, the CRC should focus on cultivating solid and positive relationships with these organizations and individuals. Specifically, the CRC will need to consider the following media groups when implementing the recommendations in the plan:

- Traditional Media: newspapers, magazines, television.
- Online Media: blogs, newsletters, online editions of newspapers and magazines.
- Special Interest Media: environmental, health-based, and nature-based media.

Demographic Locations. Beyond individual groups, geography plays an important role in segmenting audiences—regional delineations throughout the Carson River Watershed have implications on demographic characteristics and, consequently, the manner in which the CRC communicates with the audiences in each area. Demographic characteristics of various groups, including residents of each county, can be found in an earlier section of this report.

HOW MESSAGING CAN CHANGE BEHAVIORS

Ample literature exists exploring the process through which people may be motivated to change their behavior or engage in certain actions, with much of this research focusing on behavioral changes relating to conservation or environmental issues specifically. Such information provides useful context for the ways in which the proposed data collection and outreach tasks may facilitate the desired changes in behavior among Carson River Watershed residents.

Heberlein in his book, *Navigating Environmental Attitudes* (2012), warns against the expectation of consistency in a person's attitudes, noting that, while attitudes may tend toward consistency, attitudes are not strictly bound by this. Heberlein further notes that attitudes based on direct experience tend to be the strongest and most stable. In line with this, Heberlein states that strong attitudes may be especially resistant to change because they are based on direct experience, identities, and values. Finally, using data from several experimental studies, Heberlein asserts that merely providing the public with information is unlikely to produce changes in behavior on its own.

This latter observation, in fact, is in direct agreement with research findings from Schultz (2011), which likewise indicate that education through messaging or outreach alone is generally insufficient for causing changes in conservation behaviors. Schultz finds that motivation, rather than information and education, is the primary cause of changes in conservation behaviors; accordingly, he recommends that messages intended to change behaviors focus on or otherwise include a motivational component designed to move the recipient to action. According to Stern (2000), some of the most prominent motivating elements include self-interest, social responsibility, and self-transcendent values. In separate research, Schultz (2001) also found that individuals who perceive themselves as being connected to and a part of nature tend to be more likely to engage in various conservation actions and behaviors—this concept may be applied to messages that present an opportunity to reinforce such feelings of interconnectedness.

Expounding on the development of effective messages, Cialdini (2003) provides some critical insights into how outreach messages ought to be framed. Specifically, Cialdini recommends that messages avoid depicting problematic behaviors as frequent or commonplace: in doing so, such messages may inadvertently reinforce the idea that numerous people are engaging in a problematic behavior, thereby subtly communicating the behavior as socially normal. This principle may be relevant to messages that attempt to discourage washing cars in the driveway, disposing of oil down a storm drain, or wasting water: depicting such behavior as rampant or especially common may weaken the argument against it, as individuals may perceive such behavior to be a social norm or even acceptable.

The point regarding the effect of perceived social norms is based on a study carried out by Cialdini et al. (1990) in which two separate groups of participants were given the opportunity to litter in either a pristine environment or an environment already covered in litter. As predicted, participants were far more likely to litter in the latter setting, thereby adhering to the social norm suggested by the state of the environment. In a later experiment, Cialdini et al. (2006) examined the effect of wording on a sign posted in Arizona's Petrified Forest National Park,

which mentioned that the everyday theft of petrified wood from the forest resulted in a total removal of "14 tons a year, mostly a small piece at a time." To test the effect of messages that avoided communicating the extent of the theft by visitors, researchers erected other signs that simply instructed park visitors not to steal the wood. Later, it was determined that these instructively phrased signs resulted in significant decreases in the theft of the wood, in stark contrast to the signs which communicated theft as a social norm.

It must be noted that social norms may also be effective at reinforcing *positive* behavior, as was found in a study conducted by Ferraro and Price (2013) exploring how best to encourage water conservation behaviors. In the experiment, the researchers distributed two types of messages to residents of Cobb County, Georgia: the first message only included information on how to conserve water, while the second message included the same information but added a "socially normative" component comparing the recipient's water usage with median county water usage rates for the previous year (in this way, the recipient was able to compare his or her behavior to the behavior of the wider community). The researchers report that the socially normative messages strongly appealed to high-use consumers, and that water consumption rates were more likely to decrease among those who received the messages containing the social norm component.

The perceived achievability of the actions communicated in outreach messages may also influence likely receptivity and compliance. On this point, Costanzo et al. (1986) found that messages communicating "single, achievable, specific actions" are generally more likely to facilitate changes in behavior than are more generalized or vague exhortations ("Protect the environment" and "Save the planet" are given as examples of the latter).

As a case illustrating the relative effectiveness of messages characterized by focus and brevity, one may refer to the National Safe Boating Council's "Wear It!" campaign. This initiative, intended to increase rates of life jacket use among boaters, employed simple, direct messaging. Indicators of program effectiveness were encouraging, as more states adopted the campaign materials and boating fatalities nationwide trended downward (U.S. Coast Guard, 2014). Additionally, evaluation of the "Wear It!" outreach effort found that boaters in locations with high marketing activity, compared to boaters in locations with no marketing activity, were significantly more likely to wear life jackets always or most of the time (Paul Werth Associates, 2014).

Other literature provides insights into the manner in which outreach and education may be distributed, and this information may help refine certain approaches to the proposed research objectives pertaining to public engagement and awareness.

Building on theoretical foundations in psychology, marketing, and social science research, McKenzie-Mohr and Smith (1999) proposed a "community-based social marketing" approach to fostering sustainable behaviors. Community-based social marketing proceeds from the understanding that the most effective delivery of outreach will come from the community level. A central aspect of this approach is the removal of barriers that prevent engagement or participation in an activity, while at the same time emphasizing or enhancing benefits of the activity.

McKenzie-Mohr and Smith outline five major steps of the community-based marketing approach:

1. Selecting a behavior to target.
2. Identifying barriers to and benefits of the behavior.
3. Developing a strategy that both reduces barriers to the behavior and increases perceived benefits of the behavior.
4. Implementing a pilot approach to the strategy.
5. Continually evaluating the strategy once it has been fully implemented.

Jensen (2010) provides an overview of how the University of Minnesota's Sea Grant Program incorporated certain aspects of the community-based marketing approach into its adoption of the "Stop Aquatic Hitchhikers" program, an initiative sponsored by the National Aquatic Nuisance Species Task Force, the U.S. Fish and Wildlife Service, and the U.S. Coast Guard to raise awareness of invasive species among boaters and other recreationists. As program coordinator, Jensen examined survey data indicating the most effective delivery modes for information as well as chief motivations for taking action on the invasive species issue. Signs, billboards, and stickers produced for the program also took into account the social norm principle by incorporating images of boaters checking their vessels for invasive species. The incentives identified for the desired behavior were laws and regulations, enforcement activities, and fines. Evaluation components included a literature review, direct observation, interviews, focus groups, and survey questionnaires, with the latter determining that, after program implementation, overwhelming majorities of boaters in Minnesota indicated that they would be very likely to take action to prevent the spread of aquatic invasive species.

ASSESSING THE EFFECTIVENESS OF EFFORTS

Surveys and focus groups are commonly used tools for gauging the human dimensions component of resource management, as they provide detailed, timely, and scientifically sound data. These methods are also routinely used to aid in the discipline of communications, particularly in the evaluation of outreach efforts and strategies.

In one pertinent case study, Landers et al. (2006) implemented an outreach effort to reduce nutrient pollution affecting the Chesapeake Bay. The outreach was designed to convince residents of the Washington, D.C., area to fertilize their lawns in the fall, rather than in the spring (when run-off had the greatest potential to flow into the Bay). The initiative reframed the environmental issue of Chesapeake Bay protection as an appeal to ensure the availability of seafood from the Bay. A 2004 pre-initiative telephone survey of watershed area homeowners established that, while residents expressed concern about Bay protection, few engaged in direct actions to ensure the sustainability of the Bay.

Marketing materials implemented included paid television and print ads, media stories in various outlets, posters, brochures, lawn signs (in cooperation with some lawn care companies that partnered), decals, door hangers, and restaurant coasters (in cooperation with restaurant partners). A post-initiative telephone survey found that 72% of respondents could recall a major theme of the initiative. Comparisons of treatment and non-treatment groups revealed that 46% of those not exposed to the initiative planned to fertilize their lawn in the spring, compared to only 40% of those who were exposed to the initiative (though notable, this difference was not statistically significant). However, the data suggested that the initiative may have influenced some individuals to stop fertilizing their lawns altogether.

A similar study conducted by Responsive Management (2003) for the Georgia Department of Natural Resources' Pollution Prevention Assistance Division was implemented to better understand Georgia residents' attitudes and opinions toward water resource issues in the state. The study examined residents' willingness to participate in water conservation measures, incentives and constraints to water conservation in Georgia, and the educational messages to which the Georgia public was likely to respond. There were three phases to the project: a series of pre-survey focus groups with Georgia residents, a telephone survey of the Georgia public, and a series of post-survey focus groups with Georgia residents.

Results from the study demonstrated that a majority of the Georgia public was concerned about water resource issues, although there was greater concern for water *quality* over water *quantity*. The implication was that an effective water conservation initiative that sought to conserve *quantity* would need to connect it to water *quality* in order to elevate overall awareness and concern. Additionally, the data suggested that Georgia residents needed to be informed about household activities that consumed more water than residents thought.

DEMOGRAPHIC AND MARKETING INFORMATION FOR KEY AUDIENCES

The pages that follow contain tabulated data on various potential target audiences, such as Hispanic residents, men, and women. The tables show key demographic characteristics as well as responses to certain questions and behaviors related to the Carson River, based on the current survey. The specific questions used in these analyses, where not obvious, are listed below:

Questions Shown in the Demographic and Marketing Information Tables		
Demographic Table	**Question Wording**	**Response Set**
Years of Residency in Current Zip Code	Earlier you confirmed living in zip code [PREVIOUS CODE GIVEN BY RESPONDENT INSERTED INTO QUESTION WORDING]. How many years have you lived in this zip code?	Numeric response
Percent Saying They Live in a Watershed	Do you currently live in a watershed?	Yes No
Importance of Health of Carson River Watershed	How important to you, personally, is the health of the Carson River Watershed's environment on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important?	0 to 10 scale
Importance of Actions	Next, please tell me how important you think each of the following is to the health of the Carson River Watershed's environment on a scale of 0 to 10, where 0 is not at all important and 10 is extremely important. [ITEMS ASKED ABOUT] Reducing polluted run-off to improve water quality Floodplain conservation, which is reducing development in floodplain areas Recreation use and management Addressing invasive species Protecting habitat along the river Restoring habitat along the river Individual efforts by people like you to protect or conserve water Protecting the river's headwaters Reducing flood risk Protecting wetlands Watershed outreach and education	0 to 10 scale
Saw/Heard "Your Actions Matter" Messaging	In the past 5 years, did you see or hear any ads or messages about the Carson River Watershed with the tagline, "Your Actions Matter," asking you to take specific actions to help protect water quality? The ads or messages may have been on radio, video, online, or in print.	Yes No
Sources of Information on Water Issues	Where do you get your information on local watershed or water quality issues?	Open-ended

For actions taken, some questions only pertained to those who could actually take the action. For instance, the "redirected downspouts" question was asked only of those who own, maintain, or act as the primary caretaker of a yard or lawn or property with landscaping. The question wording and the group it is asked of are shown below for the actions included in the tables. Most of the actions positively affect the Carson River Watershed; the two actions at the bottom of the table are negative, designated with (N).

Questions Shown in the Demographic and Marketing Information Tables		
Table Label	**Complete Wording**	**Asked of:**
Redirected downspouts	In the past 5 years, have you redirected a gutter downspout to help water the landscaping or yard?	In the past 5 years, have you owned, maintained, or been the primary caretaker of any of the following? is one of the following answers: "Yard or lawn" or "Property with landscaping, such as shrubs or flowers."
Changed landscape for water	In the past 5 years, have you changed your landscaping or yard to capture and soak up water like a sponge, so less water runs off your property?	
Picked up pet's waste	In the past 5 years, how often have you picked up your pet's waste?	In the past 5 years, have you owned, maintained, or been the primary caretaker of any of the following? is the following answer: "Pet."
Reduced fertilizer use	In the past 5 years, how often have you reduced fertilizer use?	In the past 5 years, have you owned, maintained, or been the primary caretaker of any of the following? is one of the following answers: "Yard or lawn" or "Property with landscaping, such as shrubs or flowers."
Reduced pesticide/ herbicide use	In the past 5 years, how often have you reduced pesticide/herbicide use?	
Reduced noxious/ invasive weeds	In the past 5 years, how often have you reduced noxious/invasive weeds?	
Picked up litter	In the past 5 years, how often have you picked up and properly disposed of trash or litter when you have seen it?	Asked of all.
(N) Disposed oil down storm drain	In the past 5 years, how often have you disposed of oil down the storm drain?	In the past 5 years, have you owned, maintained, or been the primary caretaker of any of the following? is the following answer: "Car."
(N) Washed car in driveway	In the past 5 years, how often have you washed your car in your driveway?	

The "redirected downspouts" and "changed landscaping for water" questions used a yes/no response set. All other questions used an Always/Frequently/Sometimes/Rarely/Never response set. For those questions, respondents who answered any of the top four responses were coded as having done the action.

Note that "Don't know" responses (as well as refused and, in some cases, other responses when they were not large) were removed from demographic data before the percentages were run on the data from the following tables: Gender, Age, Education Level, Ethnicity, Years of Residency in Current Zip Code, and County of Residence. The analysis was done this way to match the methods requested by the CRC for the analogous information included in the 2016 project component, *Marketing and Communications Plan for the Carson River Watershed*. For this reason, there may be a mismatch of a couple of percentage points between the tables here and the results of the survey in the previous parts of this report caused by the exclusion of "Don't know" responses; this does not alter the overall gist of the findings presented here.

Carson River Watershed—Residents Overall: Demographic Characteristics (Tables show percentages)

Gender	
Male	51.1
Female	48.9
Age	
Mean	52.28
Median	54
Education Level	
Not a high school graduate	2.7
High school graduate	21.3
Some college or trade school	24.5
Associate's / trade sch. degree	14.1
Bachelor's degree	22.5
Master's degree	11.5
Professional degree / PhD	3.5
Ethnicity	
White / Caucasian	75.7
Hispanic / Latino	18.1
Native Am. / Alaskan native	3.8
East Asian	2.3
Years of Residency in Current Zip Code	
Mean	14.65
50 years or more	3.2
41-50 years	2.7
31-40 years	6.2
21-30 years	15.9
16-20 years	8.5
11-15 years	10.9
6-10 years	19.1
0-5 years	33.5

County of Residence	
Alpine County, CA	0.8
Carson City, NV (Ind. City)	37.1
Churchill County, NV	13.9
Douglas County, NV	30.3
Lyon County, NV	16.7
Storey County, NV	1.1
Percent Saying They Live in Watershed	
Know they live in watershed	35.4
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	56.9
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	66.0
Protecting the river's headwaters	64.8
Human efforts to protect or conserve water	47.7
Protecting habitat along the river	64.9
Watershed outreach and education	44.6
Addressing invasive species	50.5
Floodplain cons. (reduce dev. in floodplain)	49.3
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	15.9
Sources of Information on Water Issues	
Percent get information from television	12.6
Percent get information from newspapers	8.9
Percent get information from websites	19.9

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	95.4	95.4
Reduced noxious/invasive weeds	79.7	87.4	69.7
Picked up pet's waste	70.9	95.0	67.4
Reduced pesticide/herbicide use	79.7	74.4	59.3
Reduced fertilizer use	79.8	74.0	59.1
Changed landscape for water	79.8	42.9	34.3
Redirected downspouts	79.8	37.9	30.3
(N) Washed car in driveway	88.8	43.7	38.8
(N) Disposed oil down storm drain	88.8	2.0	1.8

(N) = negative environmental action

Carson River Watershed—Hispanic/Latino Residents:
Demographic Characteristics
18.1% of Carson River Watershed survey respondents are Hispanic/Latino
(Tables show percentages)

Gender			County of Residence	
Male	64.5		Alpine County, CA	0.0
Female	35.5		Carson City, NV (Ind. City)	50.2
			Churchill County, NV	12.4
Age			Douglas County, NV	19.4
Mean	40.08		Lyon County, NV	18.0
Median	36		Storey County, NV	0.0
Education Level			**Percent Saying They Live in Watershed**	
Not a high school graduate	5.1		Know they live in watershed	21.2
High school graduate	36.3			
Some college or trade school	27.1		**Importance of Health of Carson River Watershed**	
Associate's / trade sch. degree	14.4		Percent rating it 9 or 10	55.0
Bachelor's degree	11.3			
Master's degree	5.9		**Importance of Actions (Percent Rating It 9 or 10)**	
Professional degree / PhD	0.0		Reducing polluted run-off	77.8
			Protecting the river's headwaters	79.6
Ethnicity			Human efforts to protect or conserve water	58.3
White / Caucasian	26.0		Protecting habitat along the river	70.5
Hispanic / Latino	100.0		Watershed outreach and education	48.2
Native Am. / Alaskan native	4.1		Addressing invasive species	49.8
East Asian	5.3		Floodplain cons. (reduce dev. in floodplain)	42.9
Years of Residency in Current Zip Code			**Saw/Heard "Your Actions Matter" Message**	
Mean	12.00		Percent saw/heard in past 5 years	12.3
50 years or more	0.8			
41-50 years	3.0		**Sources of Information on Water Issues**	
31-40 years	1.7		Percent get information from television	10.8
21-30 years	15.8		Percent get information from newspapers	3.5
16-20 years	10.0		Percent get information from websites	16.9
11-15 years	9.8			
6-10 years	18.5			
0-5 years	40.3			

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	91.8	91.8
Picked up pet's waste	62.4	98.6	61.6
Reduced noxious/invasive weeds	63.1	86.3	54.4
Reduced pesticide/herbicide use	63.1	78.5	49.5
Reduced fertilizer use	63.1	77.6	48.9
Redirected downspouts	36.9	28.7	18.1
Changed landscape for water	36.9	27.3	17.2
(N) Washed car in driveway	83.3	51.2	42.6
(N) Disposed oil down storm drain	83.3	4.4	3.7

(N) = negative environmental action

Carson River Watershed—Male Residents:
Demographic Characteristics
51.1% of Carson River Watershed survey respondents are male
(Tables show percentages)

Gender	
Male	100
Female	0
Age	
Mean	51.17
Median	52
Education Level	
Not a high school graduate	3.3
High school graduate	23.8
Some college or trade school	25.4
Associate's / trade sch. degree	15.3
Bachelor's degree	19.2
Master's degree	8.7
Professional degree / PhD	4.1
Ethnicity	
White / Caucasian	73.9
Hispanic / Latino	23.1
Native Am. / Alaskan native	3.7
East Asian	1.4
Years of Residency in Current Zip Code	
Mean	14.78
50 years or more	3.7
41-50 years	3.5
31-40 years	5.4
21-30 years	13.5
16-20 years	9.7
11-15 years	11.2
6-10 years	18.8
0-5 years	34.1

County of Residence	
Alpine County, CA	1.1
Carson City, NV (Ind. City)	36.2
Churchill County, NV	15.5
Douglas County, NV	27.2
Lyon County, NV	18.3
Storey County, NV	1.8
Percent Saying They Live in Watershed	
Know they live in watershed	41.9
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	53.4
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	62.4
Protecting the river's headwaters	60.8
Human efforts to protect or conserve water	44.5
Protecting habitat along the river	56.4
Watershed outreach and education	43.5
Addressing invasive species	45.5
Floodplain cons. (reduce dev. in floodplain)	43.9
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	16.8
Sources of Information on Water Issues	
Percent get information from television	11.7
Percent get information from newspapers	7.4
Percent get information from websites	21.8

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	95.7	95.7
Reduced noxious/invasive weeds	81.1	88.0	71.3
Picked up pet's waste	66.7	94.2	62.9
Reduced fertilizer use	81.3	74.6	60.6
Reduced pesticide/herbicide use	81.1	74.4	60.3
Changed landscape for water	81.3	40.6	33.0
Redirected downspouts	81.3	33.5	27.2
(N) Washed car in driveway	90.0	51.4	46.3
(N) Disposed oil down storm drain	90.0	2.1	1.9

(N) = negative environmental action

Carson River Watershed—Female Residents:
Demographic Characteristics
48.9% of Carson River Watershed survey respondents are female
(Tables show percentages)

Gender	
Male	0
Female	100
Age	
Mean	53.42
Median	57
Education Level	
Not a high school graduate	2.1
High school graduate	19
Some college or trade school	23.8
Associate's / trade sch. degree	12.7
Bachelor's degree	25.7
Master's degree	14
Professional degree / PhD	2.8
Ethnicity	
White / Caucasian	79.1
Hispanic / Latino	13.3
Native Am. / Alaskan native	3.6
East Asian	3.3
Years of Residency in Current Zip Code	
Mean	14.39
50 years or more	2.7
41-50 years	1.9
31-40 years	6.5
21-30 years	18.5
16-20 years	7
11-15 years	10.7
6-10 years	19.6
0-5 years	33.1

County of Residence	
Alpine County, CA	0.6
Carson City, NV (Ind. City)	38.3
Churchill County, NV	12.6
Douglas County, NV	33.1
Lyon County, NV	15.1
Storey County, NV	0.4
Percent Saying They Live in Watershed	
Know they live in watershed	28.6
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	60.6
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	69.2
Protecting the river's headwaters	68.2
Human efforts to protect or conserve water	53.1
Protecting habitat along the river	73.3
Watershed outreach and education	45.9
Addressing invasive species	55.2
Floodplain cons. (reduce dev. in floodplain)	55.2
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	15.0
Sources of Information on Water Issues	
Percent get information from television	13.3
Percent get information from newspapers	10.5
Percent get information from websites	18.3

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	**Percent Who Could Take Action Who Took Action**	**Percent of All**
Picked up litter	100.0	94.9	94.9
Picked up pet's waste	75.4	95.5	72.1
Reduced noxious/invasive weeds	78.2	86.9	68.0
Reduced pesticide/herbicide use	78.2	74.7	58.4
Reduced fertilizer use	78.2	73.9	57.8
Changed landscape for water	78.2	45.0	35.2
Redirected downspouts	78.2	42.2	33.0
(N) Washed car in driveway	87.9	36.0	31.6
(N) Disposed oil down storm drain	87.9	1.9	1.7

(N) = negative environmental action

Carson River Watershed—Residents Younger Than the Median: Demographic Characteristics

50% of Carson River Watershed survey respondents are younger than the median
(Tables show percentages)

Gender	
Male	54.9
Female	45.1
Age	
Mean	NA
Median	NA
Education Level	
Not a high school graduate	3.5
High school graduate	30.8
Some college or trade school	19.8
Associate's / trade sch. degree	14.8
Bachelor's degree	20.9
Master's degree	8.6
Professional degree / PhD	1.5
Ethnicity	
White / Caucasian	70.0
Hispanic / Latino	30.9
Native Am. / Alaskan native	4.0
East Asian	3.4
Years of Residency in Current Zip Code	
Mean	10.93
50 years or more	3.0
41-50 years	2.3
31-40 years	13.3
21-30 years	8.2
16-20 years	9.9
11-15 years	22.6
6-10 years	40.6
0-5 years	3.0

County of Residence	
Alpine County, CA	0.8
Carson City, NV (Ind. City)	43.6
Churchill County, NV	13.2
Douglas County, NV	23.4
Lyon County, NV	18
Storey County, NV	1.1
Percent Saying They Live in Watershed	
Know they live in watershed	24.8
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	48.7
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	61.8
Protecting the river's headwaters	57.2
Human efforts to protect or conserve water	40.3
Protecting habitat along the river	63.1
Watershed outreach and education	42.8
Addressing invasive species	44.9
Floodplain cons. (reduce dev. in floodplain)	41.0
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	14.4
Sources of Information on Water Issues	
Percent get information from television	8.4
Percent get information from newspapers	3.5
Percent get information from websites	22.1

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	94.8	94.8
Picked up pet's waste	74.5	97.0	72.3
Reduced noxious/invasive weeds	72.9	87.6	63.8
Reduced fertilizer use	73.1	72.7	53.1
Reduced pesticide/herbicide use	72.9	71.9	52.4
Changed landscape for water	73.1	38.3	28.0
Redirected downspouts	73.1	30.7	22.5
(N) Washed car in driveway	86.9	43.9	38.2
(N) Disposed oil down storm drain	86.9	1.7	1.5

(N) = negative environmental action

Carson River Watershed—Residents Median Age or Older:
Demographic Characteristics
50% of Carson River Watershed survey respondents are median age or older
(Tables show percentages)

Gender			County of Residence	
Male	48.4		Alpine County, CA	0.9
Female	51.6		Carson City, NV (Ind. City)	31.4
			Churchill County, NV	13.8
Age			Douglas County, NV	36.5
Mean	NA		Lyon County, NV	16.1
Median	NA		Storey County, NV	1.2
Education Level			**Percent Saying They Live in Watershed**	
Not a high school graduate	2.0		Know they live in watershed	45.5
High school graduate	12.3			
Some college or trade school	28.4		**Importance of Health of Carson River Watershed**	
Associate's / trade sch. degree	14.0		Percent rating it 9 or 10	64.0
Bachelor's degree	24.2			
Master's degree	13.9		**Importance of Actions (Percent Rating It 9 or 10)**	
Professional degree / PhD	5.2		Reducing polluted run-off	70.9
			Protecting the river's headwaters	71.2
Ethnicity			Human efforts to protect or conserve water	56.2
White / Caucasian	84.7		Protecting habitat along the river	65.6
Hispanic / Latino	6.7		Watershed outreach and education	47.4
Native Am. / Alaskan native	3.6		Addressing invasive species	56.8
East Asian	1.0		Floodplain cons. (reduce dev. in floodplain)	57.5
Years of Residency in Current Zip Code			**Saw/Heard "Your Actions Matter" Message**	
Mean	18.14		Percent saw/heard in past 5 years	16.4
50 years or more	6.4			
41-50 years	2.4		**Sources of Information on Water Issues**	
31-40 years	10.1		Percent get information from television	17.3
21-30 years	18.0		Percent get information from newspapers	14.6
16-20 years	8.0		Percent get information from websites	17.9
11-15 years	11.6			
6-10 years	16.5			
0-5 years	27.0			

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	97.5	97.5
Reduced noxious/invasive weeds	87.6	86.9	76.1
Reduced pesticide/herbicide use	87.6	77.1	67.6
Reduced fertilizer use	87.6	75.4	66.0
Picked up pet's waste	69.0	94.5	65.2
Changed landscape for water	87.6	46.3	40.5
Redirected downspouts	87.6	42.9	37.6
(N) Washed car in driveway	92.2	43.6	40.2
(N) Disposed oil down storm drain	92.2	1.8	1.7

(N) = negative environmental action

Carson River Watershed—Residents With at Least a Bachelor's Degree: Demographic Characteristics

37.5% of Carson River Watershed survey respondents have at least a bachelor's degree
(Tables show percentages)

Gender	
Male	44.6
Female	55.4
Age	
Mean	56.48
Median	59
Education Level	
Not a high school graduate	0.0
High school graduate	0.0
Some college or trade school	0.0
Associate's / trade sch. degree	0.0
Bachelor's degree	60.1
Master's degree	30.7
Professional degree / PhD	9.2
Ethnicity	
White / Caucasian	84.6
Hispanic / Latino	8.5
Native Am. / Alaskan native	2.9
East Asian	0.9
Years of Residency in Current Zip Code	
Mean	14.77
50 years or more	3.9
41-50 years	3.0
31-40 years	7.1
21-30 years	12.6
16-20 years	6.8
11-15 years	13.9
6-10 years	19.3
0-5 years	33.5

County of Residence	
Alpine County, CA	1.1
Carson City, NV (Ind. City)	35.1
Churchill County, NV	8.6
Douglas County, NV	40.8
Lyon County, NV	12.8
Storey County, NV	1.5
Percent Saying They Live in Watershed	
Know they live in watershed	50.2
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	62.1
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	60.4
Protecting the river's headwaters	58.8
Human efforts to protect or conserve water	42.9
Protecting habitat along the river	60.3
Watershed outreach and education	49.4
Addressing invasive species	50.1
Floodplain cons. (reduce dev. in floodplain)	53.5
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	19.6
Sources of Information on Water Issues	
Percent get information from television	14.8
Percent get information from newspapers	12.8
Percent get information from websites	17.9

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	98.2	98.2
Reduced noxious/invasive weeds	89.0	90.1	80.3
Picked up pet's waste	75.4	96.1	72.4
Reduced pesticide/herbicide use	89.0	77.3	68.8
Reduced fertilizer use	89.0	75.4	67.2
Changed landscape for water	89.0	50.5	44.9
Redirected downspouts	89.0	44.9	40.0
(N) Washed car in driveway	91.3	47.3	43.2
(N) Disposed oil down storm drain	91.3	0.6	0.6

(N) = negative environmental action

Carson River Watershed—Residents Without a Bachelor's Degree:
Demographic Characteristics
62.5% of Carson River Watershed survey respondents do not have a bachelor's degree
(Tables show percentages)

Gender			County of Residence	
Male	55.6		Alpine County, CA	0.7
Female	44.4		Carson City, NV (Ind. City)	38.5
			Churchill County, NV	16.9
Age			Douglas County, NV	23.4
Mean	49.62		Lyon County, NV	19.5
Median	50		Storey County, NV	0.9
Education Level			**Percent Saying They Live in Watershed**	
Not a high school graduate	4.3		Know they live in watershed	26.5
High school graduate	34.1			
Some college or trade school	39.1		**Importance of Health of Carson River Watershed**	
Associate's / trade sch. degree	22.5		Percent rating it 9 or 10	53.7
Bachelor's degree	0.0			
Master's degree	0.0		**Importance of Actions (Percent Rating It 9 or 10)**	
Professional degree / PhD	0.0		Reducing polluted run-off	71.6
			Protecting the river's headwaters	67.5
Ethnicity			Human efforts to protect or conserve water	52.4
White / Caucasian	73.0		Protecting habitat along the river	68.0
Hispanic / Latino	24.5		Watershed outreach and education	43.0
Native Am. / Alaskan native	4.3		Addressing invasive species	51.0
East Asian	3.3		Floodplain cons. (reduce dev. in floodplain)	47.4
Years of Residency in Current Zip Code			**Saw/Heard "Your Actions Matter" Message**	
Mean	14.49		Percent saw/heard in past 5 years	13.1
50 years or more	2.8			
41-50 years	2.5		**Sources of Information on Water Issues**	
31-40 years	5.6		Percent get information from television	11.9
21-30 years	17.8		Percent get information from newspapers	6.9
16-20 years	9.5		Percent get information from websites	21.5
11-15 years	9.3			
6-10 years	19.0			
0-5 years	33.5			

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	95.1	95.1
Picked up pet's waste	69.6	94.4	65.7
Reduced noxious/invasive weeds	75.3	85.4	64.3
Reduced fertilizer use	75.5	72.9	55.0
Reduced pesticide/herbicide use	75.3	72.4	54.5
Changed landscape for water	75.5	37.2	28.1
Redirected downspouts	75.5	32.4	24.5
(N) Washed car in driveway	88.7	42.0	37.3
(N) Disposed oil down storm drain	88.7	2.9	2.6

(N) = negative environmental action

Carson River Watershed—Residents Lived at Zip Code 10 Years or More: Demographic Characteristics

50% of Carson River Watershed survey respondents lived 10 years or more at zip code
(Tables show percentages)

Gender	
Male	51.5
Female	48.5
Age	
Mean	55.73
Median	59
Education Level	
Not a high school graduate	3.3
High school graduate	21.5
Some college or trade school	23.6
Associate's / trade sch. degree	13.9
Bachelor's degree	20.7
Master's degree	12.7
Professional degree / PhD	4.2
Ethnicity	
White / Caucasian	74.1
Hispanic / Latino	17.2
Native Am. / Alaskan native	4.0
East Asian	0.2
Years of Residency in Current Zip Code	
Mean	NA
50 years or more	6.0
41-50 years	5.1
31-40 years	11.6
21-30 years	29.8
16-20 years	16.0
11-15 years	20.4
6-10 years	11.1
0-5 years	0.0

County of Residence	
Alpine County, CA	0.7
Carson City, NV (Ind. City)	37.4
Churchill County, NV	16.0
Douglas County, NV	30.2
Lyon County, NV	14.3
Storey County, NV	1.5
Percent Saying They Live in Watershed	
Know they live in watershed	39.8
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	59.3
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	67.9
Protecting the river's headwaters	62.2
Human efforts to protect or conserve water	51.8
Protecting habitat along the river	62.6
Watershed outreach and education	46.7
Addressing invasive species	51.0
Floodplain cons. (reduce dev. in floodplain)	54.0
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	15.6
Sources of Information on Water Issues	
Percent get information from television	14.0
Percent get information from newspapers	12.9
Percent get information from websites	19.2

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	97.1	97.1
Reduced noxious/invasive weeds	84.9	87.9	74.6
Picked up pet's waste	73.6	93.2	68.6
Reduced fertilizer use	84.9	78.8	66.9
Reduced pesticide/herbicide use	84.9	76.3	64.7
Changed landscape for water	84.9	43.2	36.7
Redirected downspouts	84.9	40.1	34.1
(N) Washed car in driveway	90.4	48.7	44.0
(N) Disposed oil down storm drain	90.4	2.1	1.9

(N) = negative environmental action

Carson River Watershed—Residents Lived at Zip Code Less Than 10 Years: Demographic Characteristics
50% of Carson River Watershed survey respondents lived less than 10 years at zip code (Tables show percentages)

Gender			County of Residence	
Male	51.2		Alpine County, CA	1.0
Female	48.8		Carson City, NV (Ind. City)	37.4
			Churchill County, NV	11.0
Age			Douglas County, NV	30.3
Mean	48.56		Lyon County, NV	19.6
Median	48		Storey County, NV	0.7
Education Level			**Percent Saying They Live in Watershed**	
Not a high school graduate	2.0		Know they live in watershed	30.9
High school graduate	21.0			
Some college or trade school	25.3		**Importance of Health of Carson River Watershed**	
Associate's / trade sch. degree	14.4		Percent rating it 9 or 10	53.8
Bachelor's degree	24.4			
Master's degree	10.2		**Importance of Actions (Percent Rating It 9 or 10)**	
Professional degree / PhD	2.7		Reducing polluted run-off	64.8
			Protecting the river's headwaters	68.1
Ethnicity			Human efforts to protect or conserve water	44.7
White / Caucasian	79.2		Protecting habitat along the river	68.6
Hispanic / Latino	20.2		Watershed outreach and education	43.1
Native Am. / Alaskan native	3.8		Addressing invasive species	50.7
East Asian	4.8		Floodplain cons. (reduce dev. in floodplain)	44.6
Years of Residency in Current Zip Code			**Saw/Heard "Your Actions Matter" Message**	
Mean	NA		Percent saw/heard in past 5 years	15.7
50 years or more	0.0			
41-50 years	0.0		**Sources of Information on Water Issues**	
31-40 years	0.0		Percent get information from television	11.5
21-30 years	0.0		Percent get information from newspapers	4.7
16-20 years	0.0		Percent get information from websites	20.6
11-15 years	0.0			
6-10 years	28.2			
0-5 years	71.8			

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	96.0	96.0
Picked up pet's waste	69.9	97.3	68.0
Reduced noxious/invasive weeds	75.6	87.4	66.1
Reduced pesticide/herbicide use	75.6	72.3	54.7
Reduced fertilizer use	75.8	69.0	52.3
Changed landscape for water	75.8	43.2	32.7
Redirected downspouts	75.8	35.6	27.0
(N) Washed car in driveway	89.3	38.7	34.5
(N) Disposed oil down storm drain	89.3	2.0	1.7

(N) = negative environmental action

Carson River Watershed—Carson City Residents:
Demographic Characteristics
37.1% of Carson River Watershed survey respondents are Carson City residents
(Tables show percentages)

Gender	
Male	49.7
Female	50.3
Age	
Mean	49.81
Median	48
Education Level	
Not a high school graduate	4.1
High school graduate	23.9
Some college or trade school	23.5
Associate's / trade sch. degree	13.2
Bachelor's degree	19.8
Master's degree	12.0
Professional degree / PhD	3.5
Ethnicity	
White / Caucasian	68.8
Hispanic / Latino	24.5
Native Am. / Alaskan native	3.3
East Asian	3.3
Years of Residency in Current Zip Code	
Mean	14.36
50 years or more	3.4
41-50 years	1.5
31-40 years	6.9
21-30 years	16.3
16-20 years	7.2
11-15 years	11.2
6-10 years	18.6
0-5 years	34.8

County of Residence	
Alpine County, CA	0.0
Carson City, NV (Ind. City)	100.0
Churchill County, NV	0.0
Douglas County, NV	0.0
Lyon County, NV	0.0
Storey County, NV	0.0
Percent Saying They Live in Watershed	
Know they live in watershed	27.5
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	55.7
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	67.9
Protecting the river's headwaters	63.0
Human efforts to protect or conserve water	51.6
Protecting habitat along the river	72.1
Watershed outreach and education	51.7
Addressing invasive species	53.1
Floodplain cons. (reduce dev. in floodplain)	47.8
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	18.0
Sources of Information on Water Issues	
Percent get information from television	14.6
Percent get information from newspapers	7.1
Percent get information from websites	20.3

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	95.8	95.8
Picked up pet's waste	68.1	95.2	64.8
Reduced noxious/invasive weeds	74.5	86.9	64.7
Reduced fertilizer use	74.8	74.5	55.7
Reduced pesticide/herbicide use	74.5	74.3	55.4
Changed landscape for water	74.8	47.5	35.5
Redirected downspouts	25.2	46.0	34.4
(N) Washed car in driveway	89.3	39.5	35.3
(N) Disposed oil down storm drain	89.3	2.6	2.3

(N) = negative environmental action

Carson River Watershed—Churchill County Residents:
Demographic Characteristics
13.9% of Carson River Watershed survey respondents are Churchill County residents
(Tables show percentages)

Gender	
Male	56.3
Female	43.7
Age	
Mean	51.83
Median	54
Education Level	
Not a high school graduate	2.7
High school graduate	23.7
Some college or trade school	36.1
Associate's / trade sch. degree	14.1
Bachelor's degree	16.0
Master's degree	5.7
Professional degree / PhD	1.6
Ethnicity	
White / Caucasian	77.9
Hispanic / Latino	16.2
Native Am. / Alaskan native	6.3
East Asian	2.5
Years of Residency in Current Zip Code	
Mean	19.58
50 years or more	7.3
41-50 years	7.5
31-40 years	9.2
21-30 years	11.8
16-20 years	10.9
11-15 years	11.1
6-10 years	19.0
0-5 years	23.2

County of Residence	
Alpine County, CA	0.0
Carson City, NV (Ind. City)	0.0
Churchill County, NV	100.0
Douglas County, NV	0.0
Lyon County, NV	0.0
Storey County, NV	0.0
Percent Saying They Live in Watershed	
Know they live in watershed	36.2
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	63.5
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	65.3
Protecting the river's headwaters	78.5
Human efforts to protect or conserve water	46.6
Protecting habitat along the river	53.1
Watershed outreach and education	51.8
Addressing invasive species	54.4
Floodplain cons. (reduce dev. in floodplain)	55.0
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	17.7
Sources of Information on Water Issues	
Percent get information from television	11.2
Percent get information from newspapers	9.0
Percent get information from websites	19.1

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	**Percent Who Could Take Action Who Took Action**	**Percent of All**
Picked up litter	100.0	94.9	94.9
Picked up pet's waste	72.5	93.7	68.0
Reduced noxious/invasive weeds	73.4	91.8	67.3
Reduced fertilizer use	73.4	74.9	54.9
Reduced pesticide/herbicide use	73.4	71.1	52.1
Changed landscape for water	73.4	44.4	32.6
Redirected downspouts	73.4	25.1	18.4
(N) Washed car in driveway	85.2	47.1	40.1
(N) Disposed oil down storm drain	85.2	3.1	2.7

(N) = negative environmental action

Carson River Watershed—Douglas County Residents:
Demographic Characteristics
30.3% of Carson River Watershed survey respondents are Douglas County residents
(Tables show percentages)

Gender			County of Residence	
Male	46.1		Alpine County, CA	0.0
Female	53.9		Carson City, NV (Ind. City)	0.0
			Churchill County, NV	0.0
Age			Douglas County, NV	100.0
Mean	56.19		Lyon County, NV	0.0
Median	60		Storey County, NV	0.0
Education Level			**Percent Saying They Live in Watershed**	
Not a high school graduate	1.0		Know they live in watershed	44.3
High school graduate	14.5			
Some college or trade school	19.8		**Importance of Health of Carson River Watershed**	
Associate's / trade sch. degree	13.8		Percent rating it 9 or 10	61.2
Bachelor's degree	30.0			
Master's degree	15.9		**Importance of Actions (Percent Rating It 9 or 10)**	
Professional degree / PhD	5.1		Reducing polluted run-off	66.7
			Protecting the river's headwaters	64.9
Ethnicity			Human efforts to protect or conserve water	50.8
White / Caucasian	83.1		Protecting habitat along the river	63.7
Hispanic / Latino	11.6		Watershed outreach and education	33.9
Native Am. / Alaskan native	2.7		Addressing invasive species	45.4
East Asian	1.1		Floodplain cons. (reduce dev. in floodplain)	53.2
Years of Residency in Current Zip Code			**Saw/Heard "Your Actions Matter" Message**	
Mean	14.24		Percent saw/heard in past 5 years	11.8
50 years or more	2.0			
41-50 years	2.8		**Sources of Information on Water Issues**	
31-40 years	5.1		Percent get information from television	9.7
21-30 years	17.9		Percent get information from newspapers	14.6
16-20 years	9.7		Percent get information from websites	18.4
11-15 years	11.3			
6-10 years	18.0			
0-5 years	33.2			

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	Percent Who Could Take Action Who Took Action	Percent of All
Picked up litter	100.0	96.0	96.0
Reduced noxious/invasive weeds	85.0	88.6	75.3
Picked up pet's waste	68.2	96.7	66.0
Reduced pesticide/herbicide use	85.0	77.3	65.7
Reduced fertilizer use	85.0	75.8	64.4
Changed landscape for water	85.0	42.3	35.9
Redirected downspouts	85.0	41.5	35.3
(N) Washed car in driveway	85.6	42.6	36.5
(N) Disposed oil down storm drain	85.6	1.2	1.0

(N) = negative environmental action

Carson River Watershed—Lyon County Residents:
Demographic Characteristics
16.7% of Carson River Watershed survey respondents are Lyon County residents
(Tables show percentages)

Gender	
Male	55.9
Female	44.1
Age	
Mean	50.93
Median	51
Education Level	
Not a high school graduate	2.9
High school graduate	27.3
Some college or trade school	25.4
Associate's / trade sch. degree	16.3
Bachelor's degree	19.6
Master's degree	7.4
Professional degree / PhD	1.2
Ethnicity	
White / Caucasian	73.8
Hispanic / Latino	19.5
Native Am. / Alaskan native	4.3
East Asian	2.5
Years of Residency in Current Zip Code	
Mean	11.04
50 years or more	0.4
41-50 years	0.0
31-40 years	4.4
21-30 years	15.4
16-20 years	8.4
11-15 years	9.3
6-10 years	20.1
0-5 years	42.0

County of Residence	
Alpine County, CA	0.0
Carson City, NV (Ind. City)	0.0
Churchill County, NV	0.0
Douglas County, NV	0.0
Lyon County, NV	100.0
Storey County, NV	0.0
Percent Saying They Live in Watershed	
Know they live in watershed	31.6
Importance of Health of Carson River Watershed	
Percent rating it 9 or 10	45.6
Importance of Actions (Percent Rating It 9 or 10)	
Reducing polluted run-off	64.1
Protecting the river's headwaters	57.6
Human efforts to protect or conserve water	34.4
Protecting habitat along the river	62.5
Watershed outreach and education	43.5
Addressing invasive species	49.3
Floodplain cons. (reduce dev. in floodplain)	43.1
Saw/Heard "Your Actions Matter" Message	
Percent saw/heard in past 5 years	17.6
Sources of Information on Water Issues	
Percent get information from television	15.0
Percent get information from newspapers	1.9
Percent get information from websites	22.3

Actions Taken (ranked by percent of all; positive and negative actions ranked separately)			
	Percent Who Could Take the Action	**Percent Who Could Take Action Who Took Action**	**Percent of All**
Picked up litter	100.0	93.1	93.1
Reduced noxious/invasive weeds	86.4	86.1	74.4
Picked up pet's waste	78.9	94.1	74.2
Reduced pesticide/herbicide use	86.4	71.6	61.9
Reduced fertilizer use	86.4	69.3	59.9
Changed landscape for water	86.4	33.8	29.2
Redirected downspouts	86.4	27.5	23.7
(N) Washed car in driveway	96.0	52.9	50.7
(N) Disposed oil down storm drain	96.0	1.4	1.3

(N) = negative environmental action

(Note, these tables could not be produced for Alpine County and Storey County because the sample size in those locations is too low.)

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APPENDIX: OPEN-ENDED RESPONSES

Write-in "other" responses are shown here in their entirety. Minor edits were made for consistency of presentation and to correct obvious errors, but otherwise the responses are shown verbatim.

When water is draining or flowing from your property, where does it ultimately drain or flow to? ("Other" responses)
Down the gutter.
A ranch.
Basin.
High points as well.
Used to have a good ecosystem here.
Floods in the parking lot.
Agricultural ditch.
Curb gutters.
Sewers.
Sinks into the lawn.
Straight to desert.
Goes into tubes.
Lake.
Into the yard.
Retention basin and a golf course.
Not draining.
Tribal Watershed.
Storm drainage.
Drain system.
Downhill.
Drain on other side of my complex.
Everything stays in the property.
French drains.
Into a greenbelt or desert land.
Brunswick canyon.
Lower part of property.
On property.
None runs off.
Irrigation ditches/drainage.
West toward the river.
Storm drains.
Flood basin.
To the gutter.
Crops/reservoir.
Retentions ponds.
A ditch.
Back of property.
Gutters take it.
Into a ravine.
Street culverts but they overflow and rainwater surrounds my house.
Drainage.

When water is draining or flowing from your property, where does it ultimately drain or flow to? ("Other" responses)
Storm drain.
Ground and storm drain.
Pine nut creek.
Channels into a basin and then into creek.
Drainage behind apartment.
Rolls out the front gate.
Ditch.
Carson Valley.
Drainages.
Storm system.
From the gutter to a drain.
Pond.
Pond in the back yard.
Drain ditch.
It pulls up.
Downhill.
Flows into dessert.
Drainage ditch.
Street drain or collection sites.
Canal.
I don't have drainage.
Backyard.
Drainage ditch.
Horse creek.
Into a ranch dwn st.
Gutter.
Into a ditch above the freeway.
West.
Into desert.
Rain.
No water that runs to or from my property.
Topez basin.
Down the mountain.
Ok.
Culvert.
Sewage.
Into the drain ditch.
Golf course.
Desert.
Drains.
Run-off sewers.
Sewage system.
Cardelli ditch.
Sits into pond.
Gutter.
Neighbors yd.
Toward the airport in Mindan.

When water is draining or flowing from your property, where does it ultimately drain or flow to? ("Other" responses)
Down hill from our house.
Drainage area built on side of rd.
Drain at the end of the cul de sac.
Watershed catch basins in neighborhood.
Sewer.
Irrigation ditches.
Drainage ditch.
Walker.
Into Topaz Lake.
Into a sewer.
Golf Course.
West fork river.
Aquifer or basin.
In the meadows.
Down the curb and side drain.
Its a wash and nothing floods off my property.
Drain ditch into stillwaters.
My neighbors.
Street.
Neighboring property.
Flows into the local watershed but couldn't remember the watershed name.
South.
Creek.
Stays in yard.
A la calle.
Ditch.
Holding pond on golf course.
Storm sewer.
Main canal ditch.
I Effectively capture all the rainwater that falls on my 1 acre lot. I have not observed off property drainage since 2015. At that time it drained to the Carson River floodplain.
My land.
East.
Down the hill to my neighbors.
Storm drain.
Dumo.
Gutters.
Irrigation ditches.
Floods the neighbor - and then a drainage ditch.
Clair Creek.
Wildlife refuge.
Drainage pond.
The drain system.
Nowhere.
Sewer system.
Runs into ditch.
Down the gutter.

When water is draining or flowing from your property, where does it ultimately drain or flow to? ("Other" responses)
Under my house.
My yard.
And my home.
Irrigation canal and refuge.

Thinking about the general area you live in, in your opinion, what is the most important environmental issue facing the area? ("Other" responses)
Utility costs.
Need recycling.
Over processing in the Carson River canyon.
Wildlife preservation.
Not much, traffic lack of housing.
Cloud seeding.
The rural area.
Selling public to private people.
Too many people for the hospital and not enough grocery stores.
People.
The airport— noise pollution.
Noisy motor vehicles.
Homelessness.
I would say field reduction needed- overgrowth of trees and all that stuff, which impacts the watershed and everything else.
I live in an area that has 1 entrance into and out and it's over a bridge that is quite old and I worry if there is a fire or something and the only entrance is blocked.
Too many Californians.
Wind.
Mismanagement by Land Management and Nevada Department of Wildlife.
Electricity. Wind.
Area going down due to lack of maintenance.
Wildlife.
Healthy environment.
Environmental safety.
Lack of vegetation on east side of town.
Ranches.
Trying to get rid of local politicians.
A lot of traffic.
Keeping big government out of local control.
Need more infrastructure— all building has stopped because of the lack of pipelines; need more functional shopping options. Travel 45 minutes to an hour for regular shopping.
Don't know/ flood zonehasn't happened yet.
Republicans.
Heavy winds.
Natural disaster preparation and mitigation.
Maintenance.
California drivers.
Weather modification.. The spraying.
The amount of sand and salt that is thrown so freely after a small or large storm, also the lack of street cleaning, we see the street sweeper come by once every two months ifwe're lucky!
Stuff from the airport.
The price of housing.
Lack of residential housing.
In my' environment' rent is too high.
We need more things for people to be able to enjoy outside.

Thinking about the general area you live in, in your opinion, what is the most important environmental issue facing the area? ("Other" responses)
Wood burning stoves.
Lack of snow.
Politics that citizens don't like; corrupt agencies.' They just took my life.'' Slandered us— threw us in jail.' Rural areas being turned into urban development. USA Parkway came in.' Driving people out of town' Friends had rescued horses that we being rehabbed, they put over 200 pounds on them, and they said they're mistreated. Wild horses being destroyed; not living— just existing. They have no foals. Changes the whole ecosystem. Pushing people out who want to care for the land and see it prosper— turning into houses.
Sidewalks.
Lack of recycling.
Lack of amenities.
There is no street light on the highway coming up 50 making a right on highland there are a lot accidents.
Mismanagement of county funds and building allotment.
Internet drops.
Safe roads.
Natural resources.
The meth.
Deer coming into town.
Sand- ruins a lot of stuff horses- I would like to see them more protected.
Feral horses.
To many wild horses.
Wind is intense and has been known to take items that end up everywhere.
Moving too many natural resources.
Low income housing.
The streets.
Wild horses.
The dessert.
Oil down the road and saftey cleaning.
The lumber yard on the Carson Watershed behind Costco.
Wildlife.
Too hot too cold.
Safety in general.

In your opinion, what are the most important issues that negatively affect the health of the Carson River and its watershed? ("Other" responses)
Construction.
Mercury; cars.
Environmental dumping from industrial areas.
More homes.
Pollution.
Pesticides over agriculture fertilization, lack of mountain run-off.
Industry, farming and fire.
Homeless people and number of people dumping int 0 the water.
Agricultural run-off treatment.
Dumping hazardous material.
Run-off.
Trash.
Upstream usage.
Chemicals in the water that drain into the river.
Mining.
Not maintenance it or managing.
Left over affects from the mining and roadwork.
Things from humans like waste litter etc.
Poor management.
Industry.
Use of fertilizers.
Used for farms.
Noxious weeds.
Mercury and mines.
Wildland fire.
Trash.
Too much mercury.
2 cycle engines.
Pesticides.
Pesticide and fertilizer use.
Agriculture.
From the past mining area.
Burn scars.
Leviathan mine.
Needs cleaning up in general.
Mercury.
Pollutants and lack of management.
Poor lawn/ roadside maintenance.
Chemical dumping.
Littering.
Mines.
Mercury, river banks civilization.
Throwing things in the river is unhealthy.
Fire.
Lack of education and outreach about human impacts on the environment.
Dams.

In your opinion, what are the most important issues that negatively affect the health of the Carson River and its watershed? ("Other" responses)
Run-off.
Human.
Mines and settlement, mercury.
Not enough vegetation to soak up water.
Bad run-off, pesticides and agriculture.
Chemical from mining.
Pesticides on lawns.
Little amount of snowfall.
Litter.
Homeless people that live around it.
Algae blooms.
Arsenic levels in the water.
Hangover from mining days.
Fires nd mimes.
Wild fires.
Illegal dumping/ mining from years ago/ farming run-off.
That the river is maintained.
Cattle/ horses/ and pets and not cleaning up after them.
Past mining.
Over use by bad government policy.
Fishing.
Fertilizers from farmers.
Run-off from agriculture fertilizer from cattle or horses.
Animals.
Chemicals from fire.
The mercury from the mines, homelessness.
Agricultural pesticides.
Farms that over irrigate.
Trash that gets in the river.
Poor maintenance from public works don't keep dry creeks clear of debris.
Mine run-off.
Overdraft.
Carson river.
Water flow in the summer months.
Sorensen's dumping into the river.
Lead in water.
Farming, agriculture.
Illegal dumping.
Diverting water from downriver users.
Agriculture practices.
Snow pack in the mountains, the run-off.
Changing wet lands.
Chemicals.
Old mines.
Increasing population.
Water right, management, industrial run-off.
Littering in it.

In your opinion, what are the most important issues that negatively affect the health of the Carson River and its watershed? ("Other" responses)
Debris.
Pollution.
Illegal immigration.
Insecticides.
Snow pack in the sierras.
Fertilizers agriculture dirty.
Lack of drains that lead to the watershed.
People in general.
Lack of knowledge.
Mercury content from cement plant.
Chemicals.
Management of the waterflow.
Farming run-off.
Not too much because its not industrial out here.
Recreation safety based on how unhealthy it is— cattle run-off; dogs have contracted protozoans from the water; dead fish; it's dirty.

Currently, polluted run-off is an important issue affecting the health of the Carson River and the watershed's environment. What do you think is the primary source of polluted run-off in the Carson River and the watershed's environment? ("Other" responses)
Drought and black gnats.
People dumping fluids hazardous materials that can get into the Carson River.
Chemicals.
Over watering.
Mercury from the old timers mining.
Trash.
Mining.
Littering.
Environmental surrounding areas.
Trash.
See end note.
Automobile stuff.
Run-off.
Roads.
Household chemicals, like salts for driveways.
Run-off from neighborhoods.
Old mining.
Filth.
Sediment.
Mining.
Mercury.
Trash.
Cattle.
Allocation of the water of various uses.
Illegal immigrants.
Poorly repaired water lines.
The mine that is being developed and expanding.
Fields and streets.
Mercury from Comstock era.
Industrial growth, degradation of the habitat of overpopulation of horses.
The mine.
Oil and gas.
Prior mining operations.
Ranching and agricultural run-off.
Human feces.
Cars leaking oil.
Mercury from mining.
Left over downed trees from fires in the area! They need to be cleaned up and removed from hills.
Pesticides.
People dumping in the sewers.
Miners murc.
Chemicals.
Litter and waste.
Human activity.
Automobiles.

Currently, polluted run-off is an important issue affecting the health of the Carson River and the watershed's environment. What do you think is the primary source of polluted run-off in the Carson River and the watershed's environment? ("Other" responses)
Rain from the junkyard.
Cattle.
Military base.
Forrest fire run-off.
Contaminants.
Mining from years ago— arsenic& other chemicals still are left.
Homeless people living along the shores.
Rivers should be cleaned up from time to time. After a flood there is a lot of trash along the banks of the local rivers.
Roads.
The land itself, the dirt.
Minning.
Vehicles.
Small factories.
Oil.
Soil.
To many residents.
Sucks.
Pesticides.
Mine chemicals.
Pesticides that farmers use.
Farming ranching.
Chemicals from yard maintenance.
Pesticides and stuff people use in their yards.
Mining.
Any kind of dumping.
Too many cows.
Road run-off and air pollution.
Down the street.
Smog.
Algae.
Nevada DOT California Transit.
Garbage; house don't dump water into the river.
Most recent fire and not using native plants and trees to replant.
Fires.
Insecticides.
Mining in past mercury.

In your opinion, what is the single most important action you can take to help protect or improve the health of the Carson River and the watershed's environment? ("Other" responses)
Educated on it.
Pollution education.
Don\' t dam up the water.
More cleanup efforts.
Have less waste and encourage others.
Make sure nothing makes it to the river.
Conserve water.
Conserve water.
Keep pollution out of the river as much as possible.
Keep working to enhance the habitat.
Mismanagement.
Educate people around.
Educating people.
Follow good stewardship of the environment.
I can't do anything about it.
I make sure I don\' t put anything noxious in it.
Education/ knowledge.
Monitor our own run-off from our property and reporting polluters if we see them.
Don\' t dump pollutants.
Doing whatever I can to make sure the area doesn't' t grow anymore, whatever I can do personally to discourage more human impact, reduce growth in the area both industrially and residentially.
Contain chemicals& pollutants.
Pay attention more education.
Educating others on how to better care for the environment.
Prevent run-off.
Be informed.
Be conservative.
Be careful with fertilizer/ people be careful with spills.
Elect county commissioners who will put a stop to the uncontrolled,' dumb' growth.
Being cognitive of any chemical fertilizers on my property, staying away from chemicals.
Protect the river.
Support the maintenance of the river.
Spread awareness.
Cleaning up— pet waste& litter.
Spread awareness of proper disposal.
Clean up don't leave trash.
Control run-off from property.
Keep myself informed.
Awareness.
Aware of what goes into the water.
Don't let urban sewage flow into the river!
Protect the riparian habitat along the river.
Educate.
Bring awareness.
Tell neighbor.

In your opinion, what is the single most important action you can take to help protect or improve the health of the Carson River and the watershed's environment? ("Other" responses)
Stop Geoengineering as it affects everything on the ground. They are putting more chemicals into the environment than the farmers for sure.
Clean up after their dogs.
Keep water flowing.
Not getting a water softener, people don' t realize what they do to the water.
Cleaning up toxins on property.
Cars working don't try waste.
Clean up as u go along.
Keep the government from buying ranches which is what this survey is.
Giving feedback.
Educating people about the watershed and the environment.
Making people aware of the 'do's and don't' to protect and letting us know who exactly is in that range to most effect and control damage.
Maintaining property to avoid household run-off that is polluted.
Population.
Hold the recipients of our tax dollars responsible to do their jobs.
Awareness to pollution.
Preventing toxins draining into the river.
Be more proactive.
Protecting run-off.
Preventing agricultural pollution on my own farm.
Everything previously mentioned.
Give ppl info on how to manage pollution better.
Follow educational materials.
Keeping people out who pollute the area and illegal dumping.
Eliminate illegal immigration.
Farming run- off from old farm equipment.
Overall conservation.
Deport illegal immigrants.
Preventing people from dumping anything.
Prevent any further.
Being aware of the actions you take to keep things out of storm drains(examples agriculture pesticides and oil down storm drain).
Keep pollutants off ground, dispose of things keep vehicle in good shape.
Educating people especially politicians.
Responsible use.
Buy bottled water.
Going in and hiring an outside source to remove mercury, clean the river.
Keep the free range cows from bathing and polluting it.
Being educated.
Awareness.
Awareness.
Talk to irrigation company.
Respect the river and surrounding environment.
Keep your immediate environment clean of such things that could run into the water.
Keep drain clear.
Don't put stuff in the irrigation canal.

In your opinion, what is the single most important action you can take to help protect or improve the health of the Carson River and the watershed's environment? ("Other" responses)
Speaking up.
Create a storm water utility.
Education.
Run-off cleaning.
Report all known pollution sources to the city.
Educate the population that lives in or resides in that area.
Remove dead foliage.
Be aware of pollution and not putting things into it.
Don't dump trash
Caring for ground and what\' s dumped into it.
Learn more info about it.
Participate in community talks.
Protecting wetlands.
Polluting, I think it should be a felony to pollute.
Keeping oils and pollutants from running into river.
Not start fires.
Community involvement.
Run-off mgmnt.
Not so many cows.
Decrease population.
Be more cognizant of run-off from private property.
Awareness of status of the river.
Keep cattle away from river riparian zones.
Mining the water in the reservoir.
Protecting what goes in the drains.
Stay informed.
Conserving.
Don\' t pollute and the run-offs.
Remove the homeless encampments that piss n poop in the river.
Be organic.
Keep pollutants out of the river.
Said vehicles are running over it.
Monitoring with corporate entities dump into the river.
Conservation.
Keep going.
Housing cap.
Don't waste in the river.
Education.
Control run-off.
If I\ m by the river and see anything I pull it out.
Educating people on the water.
Be more aware.
Correctly disposing of waste.
Convince people NOT to move into the area.
Teach teach teach!!!! People about how important the environment truly is for all life on earth. Inform inform inform!!!!!! Especially to the idiots that just visit the area.
To remove homeless.

In your opinion, what is the single most important action you can take to help protect or improve the health of the Carson River and the watershed's environment? ("Other" responses)
Education and programs to people know.
Knowing how to dispose of things to avoid them getting in the water, education, knowing to avoid chemicals like fertilizers.
Better monitored.
Education.
Having proper info.
Conservation of water, toxic run-off.
Environmentally friendly products.
Advocacy.
Don' t waste water.
Be careful with waste water and contaminates.
Awareness of what it is.
Don' t waste it.
Dispose of chemicals and trash properly.
Add extra filters to make sure it\' s pure.
Increase wetlands.
Be careful what I put down the drain.
Keeping drains clear.
Pollution.
Sewer plant in California that send there waste here.
Greater awareness; pay more attention and look around more.
Just clean up.
Development.
Pray.
Personal responsibility.
Be conscious of what' s flowing into it.
Education, awareness, town meetings, FB posts& comments.
Cleaning containments.
Gain more or give knowledge.
Mindfulness about one\' s on actions; be aware.
Protect and reporting any illegal activity on the Carson river.
I don't do anything to affect.
Keep people aware.
Keeping it clean and keeping the environment around it clean.
Keep own environment clean.
Help parks with cleanup.
Gaining knowledge about it.
To try and keep the rivers snd streams clean for the future.
Keeping a very clean yard and clean drainage areas.
Encourage folk to move out.
Floods or fires.
Disposing of items correctly.
Don' t dump anything that shouldn't be dumped into it.

Which stations did you see or hear them on? (Among those who saw or heard messages on the radio or TV.) ("Other" responses)
104. 5.
98. 1, and news channel 8.
Cable, channel 2.
Local.
Channel 2 or 4.
Antennae.
The three local stations.
Dish.
All local stations TV and radio.
KOZZ.
KKOH.
102. 7, 106. 9.
Channel 8.
Carson Now.
106 9 radio.
Tv.
KLMN in Reno.
Newspaper.
780 am koh.
CBS.

Can you name any actions the ads or messages asked you to take? ("Other" responses)
Ad asking people to conserve water in the summer.
Letting water run on sidewalk.
Don't dump.
Don't pollute and conserve water.
Reducing pesticides and use natural chemicals.
Don't beat the fish in the water.
Be more aware.
Don't dump down drain.
Don't throw trash in the river.
Reducing usage of fertilizer and pesticides reduce non point source pollution.
Irrigation ditch.
Follow local water schedule.
Watering on our water days only.
Disposing of batteries and medical pills and waste management.
Picking up litter. Dogs poop.
Prevent things from going down the storm drain.
Conserve water.
Don't water on certain days, not dumping.
Be Mindful of water use.
Watch run-off and trash.
Protect the watershed from waste.
Don't clean your fish near the water's edge.
Do not pollute.
Don't waste water.
Pick up don't litter leave it like you find it.
Do not dump into storm drains they lead to lakes and rivers.

What actions or changes, if any, did you take as a direct result of seeing or hearing the ads or messages? Please be as specific as possible or provide examples. (Among those who saw or heard a message in the past 5 years.) ("Other" responses)
Worked for irrigation and saw a lot of stuff that needed to be done to help the rivers. The campaign was a reminder of what needed to be done.
Sold a car that had an oil leak.
I just tried to be more aware of what's going on around me and how the environment and things have changed.
Become more aware of what's going on.
Infiltration, recycling, reduce waste, reduce purchasing...
Voted on new irrigation replacement. Canals.
I would say it was more being reflective and being aware, not so much that I needed to change, but to be mindful of it.
Just staying conscious of topic.
Passed on the messages on to others. When I became more aware.
Water filter.
Reduce sediment within the Carson River watershed, clean and maintain most of the storm drain system in Douglas County.
Best management practices.
I'm an environmentalist, try to have minimal impact.
To filter my water before watering flowers and giving it to animals.

Where do you get your information on local watershed or water quality issues? ("Other" responses)
Local news.
Nextdoor app.
What I have seen on Carson Now.
Emails, news.
Fb.
News.
Test own water.
News or media, water company leaving nite on door.
Surveys.
Phone surveys— ask my wife.
I was a farmer for 20 years and was on a conservation board.
Government mail.
Nice lady that call.
Our call.
Was involved in the courts regarding water law decisions for 20 years!!
Aquarius pine series/ NWIS web.
County offices.
Anywhere available.
I'm uninformed no where.
Museum.
Common sense, do the right thing when no one is looking.
We'll water.
Epa n Douglas County.
City or county people.
Community.
I'm a local elected official.
Fisherman.
Recreational areas; love and care for the watershed.
Fallon tribe safety committee.
Clubs.
Public knowledge.
Tv.
Company bought house from.
City clean water filing.
Lyon county utilities.
Carson website.
Newsbreak on phone if fb.
Gardenerville water company.
Fishing reports online.
Deserts well Corp.
Fairs.
I look at the water run-off on my property and take action as needed unlike the government.
Specialized publications and employment.
Ctrukee meadows tmwa newsletter.
The only thing I have seen is water quality report from the city of Carson once or twice a year.
Carson Now or nextdoor app.
Observation.

Where do you get your information on local watershed or water quality issues? ("Other" responses)
Advertisement.
Being observant.
Have not looked.
General improvement district.
Surveys.
Independent research.
Fb sites.
Pass.
Pcid.
Clubs.
County extension office.
Life and work experience through the fire service.
Hoa.
County commissioners.
In depth.
Meetings.
Water test samples from my well.
Carson City public utilities water bill.
Work for public works.
I look it up and I get notifications.
Travel events.
Flyer in the mail.
Pamphlets.
Only if it comes across I don't look out for it.
News alert on phone but don't get much.
Everywhere.
I have always been concerned about the environment, I don't really pay attention to ads or messages, but I have seen them.
Yu tube.
G. I. D.
I pay my water bill and they send reports.
Homeowner's association.
You!!
Various sources, no single source in particular.
Boy scouts, blm.
Interacting with the river itself.
See it myself.
Haven't.

ABOUT RESPONSIVE MANAGEMENT

Responsive Management is an internationally recognized survey research firm specializing in natural resource and outdoor recreation issues. Our mission is to help natural resource and outdoor recreation agencies, businesses, and organizations better understand and work with their constituents, customers, and the public.

Focusing only on natural resource and outdoor recreation issues, over the past 35 years, Responsive Management has conducted multimodal, telephone, mail, and online surveys, as well as on-site intercepts, focus groups, public meetings, personal interviews, needs assessments, program evaluations, marketing and communication plans, and other forms of human dimensions research measuring how people relate to the natural world. Utilizing our in-house, full-service survey facilities with 75 professional interviewers, we have conducted studies in all 50 states and 15 countries worldwide, totaling more than 1,200 human dimensions projects *only* on natural resource and outdoor recreation issues.

Responsive Management has conducted research for every state fish and wildlife agency and every federal natural resource agency, including the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, the National Park Service, the U.S. Forest Service, the Bureau of Land Management, the U.S. Army Corps of Engineers, and the U.S. Coast Guard. Additionally, we have also provided research for all the major conservation NGOs including the Archery Trade Association, the American Sportfishing Association, the Association of Fish and Wildlife Agencies, the Hunters' Leadership Forum, Ducks Unlimited, the Izaak Walton League of America, the National Shooting Sports Foundation, the National Wildlife Federation, the Recreational Boating and Fishing Foundation, the Rocky Mountain Elk Foundation, Safari Club International, the Sierra Club, Trout Unlimited, and the Wildlife Management Institute.

Other nonprofit and NGO clients include the American Museum of Natural History, the BoatUS Foundation, the National Association of Conservation Law Enforcement Chiefs, the National Association of State Boating Law Administrators, and the Ocean Conservancy. As well, Responsive Management conducts market research and product testing for numerous outdoor recreation manufacturers and industry leaders, such as Winchester Ammunition, Vista Outdoor (whose brands include Federal Premium, CamelBak, Bushnell, Primos, and more), Trijicon, Yamaha, and others.

Responsive Management also provides data collection for the nation's top universities, including Auburn University; Boise State University; California Polytechnic State University, San Luis Obispo; Clemson University; Colorado State University; Cornell University; Duke University; George Mason University; Michigan State University; Mississippi State University; North Carolina State University; Oregon State University; Penn State University; Rutgers University; Stanford University; State University of New York; Stony Brook University; Texas Tech; University of Alaska; University of California-Davis; University of California-San Diego; University of Connecticut; University of Florida; University of Hawai'i; University of Montana; University of New Hampshire; University of Southern California; Virginia Commonwealth University; Virginia Tech; West Virginia University; Yale University; and many more.

Our research has been upheld in U.S. Courts, used in peer-reviewed journals, and presented at major wildlife and natural resource conferences around the world. Responsive Management's research has also been featured in many of the nation's top media, including *Newsweek*, *The Wall Street Journal*, *The New York Times*, Fox News, CNN, National Public Radio, and on the front pages of *The Washington Post* and *USA Today*.