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Informing Extension Program Development Through Audience Segmentation: Targeting High Water Users

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Abstract

Human reliance on water has led to water issues globally. Although extension professionals have made efforts successfully to educate the general public about water conservation to enhance water resource sustainability, difficulty has been found in reaching high water users, defined as residents irrigating excessively to their landscape irrigation needs without awareness of the environmental impacts. This study sought to identify differences in water conservation behavior engagement between the general public and high water users to facilitate the development of extension programs targeting high water users. Florida residents (N = 516) and high water users in Florida (N = 512) were surveyed for this descriptive and comparative study. Respondents were asked to indicate their current engagement in water use behavior, water conservation strategies, and the likelihood of engaging in water conservation and related societal behaviors. Compared to the general public, high water users reported a higher frequency of engagement in water use behaviors, and were less likely to engage in water conservation and related societal behaviors. Based on the findings it is recommended that extension professionals segment the high water users from the general public as a specific clientele and develop educational programs relevant to their specific needs and behavioral patterns.

Keywords: extension education, audience segmentation, water, landscape, conservation

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Introduction

Water is essential to human life; however, human activities have negatively impacted water resources (Oki & Kanae, 2006). As the world population continues to grow, water demand has increased rapidly and led to global climate change (Vörösmarty, Green, Salisbury, & Lammers, 2000). In addition, water issues, such as water pollution and contamination, water scarcity, degradation of water quality, waterlogging, and increased water salinity levels have been reported worldwide as a result of population growth, climate change, and the mismanagement of land use (Young, Dooge, & Rodda, 1994). In order to improve the sustainability of water resources, extension professionals have made efforts towards solving water issues by developing educational programs to educate a wide range of audiences about water conservation technologies and practices (Bruening & Martin, 1992; McCann & Gold, 2012; Singletary & Daniels, 2004). Researchers have suggested that the diversity of audiences, based on demographic

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characteristics and cultures, may cause issues in regards to the effectiveness of extension programs (McDowell, 2004). Therefore, extension programs have to be developed based on community needs, priorities, and lifestyles (McDowell, 2004; Raison, 2010).

Levels of water use vary within communities as water needs related to supporting local residents, business, and industries vary (United States Environmental Protection Agency [USEPA], 2014a). In rural areas, water is primarily used for agriculture, while in suburban and urban areas residential use plays a major role in water consumption (USEPA, 2014a). According to the USEPA (2014a), the average daily water consumption per household in the United States is more than 300 gallons with about 70% for indoor use and 30% for outdoor use. Mayer et al. (1999) indicated the indoor water use per capita was accounted for with 27% for the toilet, 22% for the clothes washer, 17% for showering, 16% for general faucet use, 14% for leaks, 2% for baths, 1% for dishwashers, and 2% for other domestic use. Cautions have been made by USEPA (2014b) regarding increased competition for water sources caused by a growing population and a demand that "communities across the country are starting to face challenges regarding water supply and a need to update aging water treatment and delivery systems" (para. 2).

In Florida, pressure is being placed on water resources by a growing population, prosperous tourism, and an active agricultural industry (Barnett, 2007; Marella, 2013). Marella (2013) indicated the public supply in Florida accounted for 37% of freshwater withdraw, 52% of fresh groundwater use, and 13% of fresh surface water use. Florida residents consumed a high volume per capita water use and urbanization of Florida has led to increased water use for landscape irrigation (Haley, Dukes, & Miller, 2007; Marella, 2013). However, many Florida residents are unaware of how the landscaping management practices they use can impact the environment (Israel & Knox, 2013) including the general water supply. Monaghan, Ott, Wilber, Gouldthorpe, and Racevskis (2013) identified this specific group of urban water users as high water users. High water users were found to be residents living in neighborhoods with a homeowners association (HOA), older in age, higher incomes and education levels than the general public (Monaghan et al., 2013). Monaghan et al. (2013) investigated the users' water conservation behaviors associated with landscape irrigation and found they preferred to hire a contractor instead of managing their own yards and were less concerned about water conservation practices, which was similar to the finding of Israel and Knox's (2013) study.

Efforts have been made by University of Florida Extension and lawmakers to develop educational programs, restrictions, and informational campaigns to engage the general public in proper water management practices and water conservation strategies (Greene, 2010; Lee, Tansel, & Balbin, 2013; University of Florida Extension, 2014). However, while many Florida residents have engaged in water conservation behaviors and were interested in learning more about water issues (Roper & Lamm, 2014), engagement in conservation efforts and an interest in learning about water conservation may not be exhibited by certain residents (Israel & Knox, 2013; Monaghan et al., 2013). According to Israel and Knox (2013) and Monaghan et al. (2013), high water users, such as HOA residents, may have their water management practices strongly influenced by HOA restrictions, which leads to less concern about water conservation. Therefore, this study sought to determine if high water users and the general public were different in their actual water use behaviors and their support of water conservation behaviors. By understanding the differences between high water users and the general public, the fifth priority of the National Research Agenda: "efficient and effective agricultural education programs" (Doerfert, 2011, p. 10) can be reached. As a result of this research, extension professionals will be better prepared to develop programs related to water conservation by targeting the proper audience leading to positive learning outcomes.

Conceptual Framework

Audience segmentation is a concept derived from the traditional mass marketing approach, which strategically targets audiences based on the social power within a group exhibiting similar characteristic,

and has been widely used in social marketing for behavior change (Andreasen, 2006; Kotler & Roberto, 1989). Kotler and Roberto (1989) indicated shared characteristics within a group can be geographical characteristics (region, population density, climate), socio-demographic attributes (age, income, social class), psychological profiles (attitudes, personality traits, values), and behavioral characteristics (patterns of behavior or decision making types). By segmenting audiences, the homogeneous group can benefit the marketing process through a better understanding of the audience's needs, higher satisfaction that will increase the likelihood of audience's behavior continuum, and effective communication and distribution strategies (Andreasen, 2006; Kotler & Roberto, 1989). Additionally, the resources and efforts put into a program can be organized more efficiently with audience segmentation by basing them on an audience's specific needs and interests (Andreasen, 2006).

Social marketing has been used in environmental and conservation efforts frequently (Shaw, 2010), with audience segmentation being suggested by various researchers. Salmon, Brunson, and Kuhns (2006) investigated nonindustrial private forest owners to understand their education needs and indicated the studied forest owners could be segmented into three groups according to a prior evaluation survey measuring "respondents' evaluations of the importance of various benefits of land-ownership" (p. 421). Adhikarya (1994) suggested the use of audience segmentation in extension programming to better reach audience needs and provide proper information to the proper audiences. Brunson and Price (2009) conducted a study targeting small-acreage landowners and found that the landowners characterized differently based on demographic features, information-use patterns, and delivery preferences. This finding indicated that a proper use of audience segmentation can save money used for program materials while maintaining quality extension programming. Another study conducted by Tyson and Broderick (1999) examined woodland owners' intentions to practice estate conservation planning. The audience segmentation in this study was based on woodland owners' intentions, leading to the need for strategic program planning for campaign planning on estate conservation.

Israel and Hague (2002) indicated the importance of using segmentation concepts for extension program recruitment. While Monaghan et al. (2013) studied how audience segmentation can be used for extension programming on water conservation behavior, the identified group, HOA residents, was indicated as an audience extension professionals should target specifically. However, extension professionals have limited resources and increased numbers of urban residents with specific needs; therefore the need to focus financial resources is more important than ever (Harder, Lamm, & Strong, 2009). To focus limited resources more efficiently, extension professionals needs to understand their audiences to improve program planning, particularly for services in urban areas where Extension typically lacks advocacy (Harder et al., 2009). In order to assist extension professionals in optimizing educational programs related to water conservation targeting high water users, needs assessments are needed to identify the differences between this audience and the general population. Based on the previous literature, a conceptual model was designed (see Figure 1).

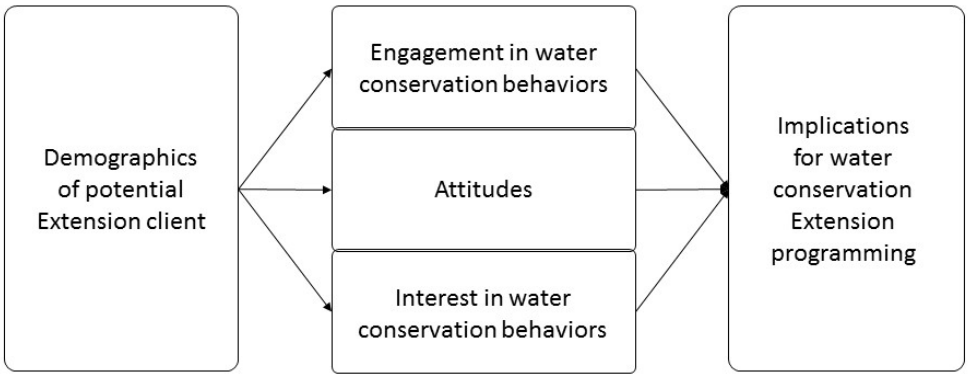

Figure 1. Audience segmentation conceptual model for extension programming associated with water conservation behaviors.

Based on previous research, high water users are supposed to have particular demographic characteristics, which impact their engagement, attitudes, and interests in water conservation behaviors (Monaghan et al., 2013). By understanding high water users' reported engagement, attitudes, and interests in water conservation behaviors, extension professionals will be able to develop extension programming that best fits high water users' needs and interests. As a result, this new programming, based on the concept of audience segmentation, will be expected to have a higher potential for successfully convincing high water users to engage in water conservation behaviors.

Purpose and Objectives

The purpose of this study was to identify differences in levels of engagement in water conservation behaviors between the general public and high water users in Florida in order to further facilitate the development of extension programs targeting high water users' adoption of water conservation behaviors. The objectives were to compare:

1. The water use behaviors the general public and high water users currently engage in;
2. The water conservation strategies the general public and high water users currently apply;
3. The water conservation behaviors the general public and high water users would like to engage in; and
4. The societal behaviors associated with water conservation the general public and high water users would like to engage in.

Methods

This study was descriptive and comparative using online surveys to investigate the differences in water conservation behaviors between the general public and high water users in Florida. Two surveys were conducted in Florida using the same questionnaire, but different groups of respondents were reached: one for the general public and the other for high water users. The survey instrument was developed based on the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012). Respondents aged 18 years or older living in Florida were recruited for the surveys.

The respondents were asked questions regarding their water use behaviors, water conservation strategies they are currently engaged in, and the likelihood of engaging in the water conservation and societal behaviors associated with water conservation. Respondents' water use behaviors were measured using 7 statements on a five-point Likert-type scale ranging from 1 = *Never*, 2 = *Almost Never*, 3 = *Sometimes*, 4 = *Almost Every Time*, 5 = *Every Time*. The respondents were able to choose *Does Not Apply*

when answering the question, and responses of *Does Not Apply* were transformed as missing values. Responses to the 7 items were averaged to create overall water use behavior index scores which were found reliable in both surveys (general public: $\alpha = .79$; high water users: $\alpha = .75$). As for measuring respondents' water conservation strategies they are currently engaged in, a three-point scale of -1 = *No*, 0 = *Not Sure*, 1 = *Yes* was used in five statements. The responses to the five items were averaged to create overall water conservation strategy index scores. Respondents' likelihood of engaging in the water conservation behaviors was measured by 12 statements using a five-point Likert-type scale ranging from 1 = *Very Unlikely*, 2 = *Unlikely*, 3 = *Undecided*, 4 = *Likely*, 5 = *Very Likely*, while societal behaviors associated with water conservation were measured by eight statements using the same five-point Likert-type scale. Again, a *Not applicable* option was available in the water conservation and societal behaviors questions, and responses of *Not applicable* were treated as missing values. Responses to the 12 water conservation behavior items were averaged to create overall water conservation behavior index scores with reliability of $\alpha = .80$ in the general public survey and $\alpha = .81$ in the high water user survey and responses to the eight societal behavior items were averaged to create a societal behavior associated with water conservation index scores which were found reliable in both surveys (general public: $\alpha = .85$; high water users: $\alpha = .87$). Lastly, respondents were asked to answer several demographic questions including sex, race/ethnicity, age, zip code (later converted to rural-urban continuum codes), annual household income, educational level, political beliefs, and participation in an HOA.

A panel of experts reviewed the survey to ensure face and content validity of the instrument. The panel of experts included the Chief Executive Officer of the Florida Nursery, Growers and Landscape Association, an assistant professor and extension specialist in water economics and policy, the Director of the Center for Landscape Conservation and Ecology, the Director of University of Florida Water Institute, the Director and associate director of Center for Public Issues Education, an assistant professor specializing in agricultural communication, an emeritus professor specializing in biological and agricultural engineering, a post-doctoral associate, a graduate student, a research analyst, and a research coordinator who had been studying water issues.

Data for the two surveys were collected using a non-probability opt-in sampling method by collaborating with a public opinion survey research company. Non-probability sampling methods have been commonly used in public opinion research (Baker et al., 2013). Since non-probability sampling methods strive to represent the population, participation rates are used rather than response rates with participants gradually invited to participate until specific quotas are filled (Baker et al., 2013). The participation rate for the general public survey was 67% with 767 individuals invited to enter the survey resulting in 516 useable responses. Post-stratification weighting methods were used (Kalton & Flores-Cervantes, 2003) to enhance the representativeness of the results and overcome the limitations of non-probability sampling, including non-participation biases, selection, and exclusion (Baker et al., 2013).

As for the survey of the high water users, a participation rate of 25% was obtained with 2,028 being invited to take the survey, resulting in 512 useable responses that met the criteria, including living in specific counties and identified as having the excessive irrigation practices (Davis & Dukes, 2014) needed to classify the respondents as high water users and considered a large enough sample size to be representative of the population of interest (Baker et al., 2013). Since quotas were used *a priori* to identify targeted respondents, data were not weighted. After collecting the responses to the two surveys, descriptive statistics and *t*-tests were conducted using SPSS® 22.0 to achieve the objectives of this study.

Results

The demographic characteristics of the respondents in the two surveys are shown in Table 1. The respondents to the general public survey included 54% females ($n = 277$), and 46% males ($n = 239$), while the high water user respondents were 54% female ($n = 277$), and 46% male ($n = 235$). Caucasian/White (Non–Hispanic) was the dominant ethnicity group with 89% ($n = 458$) in the general public survey and

94% (*n* = 479) in the high water user survey. Most of the respondents in the general public survey were between 49 to 69 years of age (*n* = 401, 64%), while in the high water user survey most of the respondents were between 49 to 79 years of age (*n* = 342, 67%). More than half of the respondents' household income levels were less than $49,999 in the general public survey (*n* = 289, 56%), whereas almost half of the respondents in the high water user survey had household incomes ranging between $75,000 to $149,999 (*n* = 242, 47%). The education level of the respondents in the general public survey was reported highest in some college (*n* = 128, 25%), no degree and 2 year college degree (*n* = 128, 25%), while in the high water user survey it was a 4 year college degree (*n* = 206, 40%). Lastly, the respondents' involvement in HOAs was 30% (*n* = 156) in the general public survey and 74% (*n* = 379) in the high water user survey.

Table 1

Demographic Characteristics

	General Public (*N* = 516)		High water users (*N* = 512)	
Characteristic	*n*	%	*n*	%
Sex				
Female	277	53.7	277	54.1
Male	239	46.3	235	45.9
Race				
African American	39	7.6	21	4.1
Asian	5	1.0	8	1.6
Caucasian/White (Non–Hispanic)	458	88.8	479	93.6
Native American	6	1.2	5	1.0
Other	11	2.1	9	1.8
Hispanic Ethnicity	45	8.7	41	8.0
Age				
19 and younger	4	0.8	1	0.2
20-29	48	9.3	17	3.3
30-39	47	9.1	65	12.7
40-49	142	13.7	78	15.2
50-59	122	23.7	119	23.3
60-69	137	26.5	144	28.1
70-79	77	15.0	79	15.4
80+	10	2.0	9	1.8
Household Income				
Less than $49,999	289	56.0		
$50,000 to $74,999	122	23.6	141	27.5
$75,000 to $149,999	90	17.4	242	47.3
$150,000 to $249,999	14	2.7	101	19.7
$250,000 or more	1	0.2	28	5.5

Table 1 (continued)

Demographic Characteristics

Characteristic	General Public (N = 516)		High water users (N = 512)	
	n	%	*n*	%
Educational Level				
Less than 12th grade	3	0.6	1	0.2
High school graduate	115	22.3	27	5.3
Some college, no degree	128	24.8	76	14.8
2 year college degree	128	24.8	65	12.7
4 year college degree	66	12.8	206	40.2
Graduate or professional degree	76	14.7	137	26.8
HOA Partnership				
Yes	156	30.2	379	74.0
No	360	69.8	133	26.0

Water Use Behaviors

Respondents indicated how often they performed the listed water use behaviors on a five-point Likert-type scale (1 = *Never*, 2 = *Almost Never*, 3 = *Sometimes*, 4 = *Almost Every Time*, 5 = *Every Time*). The results can be seen in Table 2. The behavior where the most respondents indicated they never or almost never performed the behavior was "I flush cooking oil down the toilet" both for the general public and high water users, followed by "I allow used motor oil to run down a storm drain" both for the general public and high water users. Responses to the seven items were summed and averaged to create an overall water use behaviors index score ranging from one to five. The overall index score of water use behaviors by the general public (M = 1.56, SD = 0.51) was significantly lower than the high water users (M = 1.82, SD = 0.70) when an independent t test was run (t = -5.03, p = .01) indicating the general public was less likely to engage in the behaviors than high water users.

Table 2

Water Use Behavior Engagement

Behaviors	Frequency of Performing Water Use Behaviors (%)					
	Never/ Almost Never		Sometimes		Almost Every Time/ Every Time	
	G	H	G	H	G	H
I flush cooking oil down the toilet	91.0	91.2	2.1	2.3	1.0	3.5
I allow used motor oil to run down a storm drain	78.6	88.5	0.8	2.0	1.2	3.7
I hose down my driveway	66.1	84.8	10.9	10.0	2.0	4.4
I allow soapy water to run down a storm drain	62.0	75.0	10.1	12.1	5.6	8.2

Table 2 (continued)

Water Use Behavior Engagement

Behaviors	Frequency of Performing Water Use Behaviors (%)					
	Never/ Almost Never		Sometimes		Almost Every Time/ Every Time	
	G	H	G	H	G	H
I let my sprinklers run when it has rained or is raining	55.4	74.4	4.3	12.7	1.8	6.6
I let my sprinklers run when rain is predicted in the forecast	50.5	52.7	7.8	28.1	3.3	12.7
I leave the water running in the kitchen when washing and/or rinsing dishes	49.8	43.0	28.3	29.1	20.5	27.7

Note: Respondents were allowed to select *Does Not Apply* and the *Does Not Apply* responses are not included in the table. G = *General Public*, H = *High water users*.

Water Conservation Strategies

Respondents were asked to indicate their engagement in a specific set of water conservation strategies on a three-point scale (-1 = *No*, 0 = *Not Sure*, 1 = *Yes*). The results can be seen in Table 3. The water conservation strategies used by the most respondents in both the general public and high water user groups were water-efficient toilets and low-flow showerheads. Respondents in both groups were least likely to use rain barrels to collect water for use in their landscapes and using recycled wastewater to irrigate their landscapes. Responses to the five strategies were summed and averaged to create an overall index score ranging from -1 to 1. The overall index scores were -0.14 for the general public (SD = 0.49) and -0.10 for High water users (SD = 0.46) indicating they were not likely to have engaged in all five water conservation strategies. When compared using an independent t test, the index scores were not significantly different between the two groups (t = -1.46, p = .14) indicating the general public and high water users engaged in water conservation strategies at the same level.

Table 3

Water Conservation Strategy Application

	Use of Water Conservation Strategies (%)					
	No		Not Sure		Yes	
Water Conservation Strategies	G	H	G	H	G	H
I have water-efficient toilets installed in my home	26.9	23.6	15.1	7.0	57.9	69.3
I have low-flow shower heads installed in my home	29.1	25.4	16.7	11.5	54.3	63.1
I have low-water consuming plant materials in my yard	41.5	45.1	23.1	16.2	35.5	38.7
I use recycled wastewater to irrigate my lawn/landscape	70.9	69.7	10.5	5.3	18.6	25.0
I use rain barrels to collect water for use in my garden/lawn	83.1	90.4	3.1	1.2	13.8	8.4

Note: G = *General Public*, H = *High water users*.

Water Conservation Behaviors

Respondents identified their level of likelihood of engaging in listed water conservation behaviors on a Likert-type scale (1 = *Very Unlikely*, 2 = *Unlikely*, 3 = *Undecided*, 4 = *Likely*, 5 = *Very Likely*). The results can be seen in Table 4. The water conservation behavior most respondents reported they are very likely to engage in was responsibly disposing of hazardous materials both for the general public (n = 360, 69.8%) and high water users (n = 396, 77.3%), followed by only running the washing machine when it is full for the general public (n = 345, 66.9%) and only watering your lawn in the morning or evening for high water users (n = 386, 75.4%). Respondents' scores were summed and averaged to create an overall index score ranging from one to five. The index score in general public of likelihood of engaging in water conservation behaviors (M = 4.19, SD = 0.54) was significantly higher than high water users (M = 4.03, SD = 0.54) when compared using an independent t test (t = 3.66, p = .00).

Table 4

Water Conservation Behavior Engagement

	Likelihood of Engaging in Water Conservation Behaviors (%)					
	Very Unlikely/ Unlikely		Undecided		Likely/ Very Likely	
Water Conservation Behaviors	G	H	G	H	G	H
Responsibly dispose of hazardous materials	0.8	1.2	5.2	2.5	83.4	93.5
Only run the dishwasher when it is full	1.8	3.0	3.5	2.3	75.7	91.5
Only run the washing machine when it is full	2.3	6.9	4.8	3.5	90.0	89.1
Only water your lawn in the morning or evening	1.2	1.2	3.7	2.9	62.4	88.3
Sweep patios and sidewalks instead of hosing them down	2.2	3.5	7.4	6.4	74.8	85.5
Avoid purchasing plants that require a lot of watering	4.3	5.1	12.2	12.5	73.7	80.4
Use biodegradable cleaning products	9.7	6.4	20.7	22.1	68.8	71.1
Reduce your use of natural resources	6.6	7.9	21.3	21.3	68.5	70.1
Reduce the number of times a week you water your lawn	2.6	10.9	6.4	12.3	57.7	68.0
Reduce use of pesticides if your landscape quality would decrease	7.4	22.8	17.6	29.3	48.6	42.9
Reduce use of fertilizer if your landscape quality would decrease	6.8	22.1	17.1	28.9	49.8	44.3
Keep a timer in the bathroom to help you take a shorter shower	46.1	63.5	21.1	17.2	28.8	18.1

Note: Respondents were allowed to select *Not Applicable* and the *Not Applicable* responses are not included in the table. G = *General Public*, H = *High water users*.

Societal Behaviors Related to Water Conservation

Respondents were asked to indicate their level of likelihood of engaging in eight societal behaviors related to water conservation on a Likert-type scale (1 = *Very Unlikely*, 2 = *Unlikely*, 3 = *Undecided*, 4 = *Likely*, 5 = *Very Likely*). The results can be seen in Table 5. Within the eight behavior statements, supporting water restrictions issued by their local government was the societal behavior most respondents indicated they were very likely or likely to engage in for both the general public and high water users, followed by voting to support water conservation programs. When compared, the index scores for the general public ($M = 3.31$, $SD = 0.79$) were significantly higher than the high water users ($M = 3.15$, $SD = 0.80$) when compared using an independent t test ($t = 3.13$, $p = .00$) indicating the general public is more likely to engage in societal behaviors related to water conservation than high water users.

Table 5

Likelihood of Engaging in Societal Behaviors Related to Water Conservation

Societal Behaviors	Likelihood of Engaging in Societal Behaviors (%)					
	Very Unlikely/Unlikely		Undecided		Likely/Very Likely	
	G	H	G	H	G	H
Support water restrictions issued by my local government	3.1	4.7	15.9	15.4	79.9	79.0
Vote to support water conservation programs	2.8	6.3	16.1	18.0	78.7	74.4
Vote for candidates who support water conservation	3.0	6.4	25.4	28.9	69.0	63.3
Visit springs, lakes, state parks, etc., to learn about water issues	23.8	26.3	27.9	31.4	45.4	41.2
Donate to an organization that protects water	33.2	38.8	35.7	30.7	29.0	29.9
Volunteer for a stream clean up or wetland restoration event	40.6	48.2	29.8	27.5	25.4	22.8
Join a water conservation organization	41.3	53.9	35.5	25.6	21.0	19.9
Buy a specialty license plate that supports water protection efforts	54.6	65.7	22.7	19.5	19.8	14.5

Note: Respondents were allowed to select *Not Applicable* and the *Not Applicable* responses are not included in the table. G = *General Public*, H = *High water users*.

Conclusion and Implications

The key findings of this study indicated high water users are more likely to engage in negative water use behaviors than the general public and showed different patterns when it came to their likelihood of engaging in water conservation behaviors when compared to the general public. It is important to note a limitation of the study, which is that more respondents of the general public survey responded "*Does Not Apply*" than the high water users when asked if they let their sprinklers run when it has rained or is raining or when rain is predicted in the forecast. The large number of respondents in the general public respondents reporting "*Does Not Apply*" indicated they may not have a yard or lawn to take care of and therefore do not engage simply because they do not have the opportunity. Despite this limitation, the findings of this study mirror those found by others. Israel and Knox (2013) and Monaghan et al. (2013) found Florida residents involved in HOAs rarely adjust their water use behaviors regarding landscaping indicating a lack of engagement in water conservation behaviors.

When it came to respondents' use of water conservation strategies, no differences were found between the general public and the high water users. This finding indicated both groups applied water conservation strategies, preferring to practice strategies associated with less labor such as installing low-water consuming toilets and showerheads when compared to recycling water, a more time intensive task. While efforts have been made to engage the public in water conservation behaviors (Greene, 2010; Lee et al., 2013), the findings from this study imply Florida residents broadly may not be willing to engage in water conservation behaviors if the costs (either financial or in time invested) are too great.

Overall, the findings also indicated the general public was more likely to engage in water conservation behaviors than high water users supporting previous research on this group (Monaghan et al., 2013). The exception to this was that both the general public and high water users indicated they were very unlikely or unlikely to save water by using a timer to take a shorter shower indicating that personal needs take precedence over saving water.

Within the listed water conservation behaviors related to landscaping, high water users indicated a low likelihood of engaging in the behaviors, which would sacrifice the quality of their landscapes. When compared to the general public, high water users were less likely to reduce their use of pesticides and fertilizers confirming research that high water users tend to put more effort into maintaining landscape quality and hold a high quality landscape in high regard (Israel & Knox, 2013). Nevertheless, these findings also imply high water users may not be aware of the environmental impacts caused by their landscaping management practices.

According to the concept of audience segmentation (Andreasen, 2006; Kotler & Roberto, 1989) a target group, high water users in this case, was identified through shared demographic characteristics. Similar to the characteristics identified by Monaghan et al. (2013), the high water users in this study were characterized as older in age, having higher incomes and education levels than the general public. In addition, a larger portion of the high water user population lives within HOAs that regulates what they are allowed to do in terms of their landscaping practices and may impact their decision making. The findings of this study imply that high water users have a particular behavior pattern showing they care more about landscaping quality than adverse environmental impacts caused by water use behaviors. Since this is different from the general public, high water users should have extension programming developed specific to their needs to further delve into the importance of proper landscape care. This finding supports research that supported the use of behavioral patterns for audience segmentation when developing extension programming (Brunson & Price, 2009).

Moreover, in spite of high water users' concern about landscape quality, the respondents did indicate a certain level of likelihood in engaging in water conservation behaviors and related societal behaviors. Such a finding implies high water users would be interested in conserving water to the extent that landscaping quality is retained. This supports Tyson and Broderick's (1999) findings that an audience's intention can be used as one of the components for audience segmentation. Conclusively, these findings imply extension programs can be developed in an effective and efficient manner by targeting high water users' specific needs (Andreasen, 2006; Kotler & Roberto, 1989).

Recommendations

In Florida, extension professionals have developed broad educational programs to educate the general public about water conservation (University of Florida Extension, 2014). However, the influence has had a limited impact on high water users, who tend to consume a large amount of water for landscape irrigation (Monaghan et al., 2013). Based on the findings of this study extension professionals should consider offering different programs for high water users than the general public due to their differences in level of reported engagement. In addition, when developing educational programs targeted at high water users, extension professionals should use materials more relevant to their needs and behavior patterns in order to improve the effectiveness of the programs (Adhikarya, 1994; Brunson & Price, 2009).

The high water users examined in this study indicated an interest in water conservation, revealing a potential need for educational programs associated with water conservation (Tyson & Broderick, 1999). In the case of high water users, alternative landscaping practices that can improve water use efficiency while maintaining landscape quality would be favorable, and societal behaviors associated with authority, such as support of government restriction and voting, would also increase engagement. Extension professionals who design water conservation educational programs should also consider including water

conservation strategies that require minimal effort and financial commitment. Materials and strategies easy to practice would likely enhance adoption.

In terms of future research, similar studies should be conducted in other parts of Florida known to have high water users to see if engagement differs upon geographic location or if high water users in general have the same perceptions since this research was focused on a specific part of the state. Further segmenting audiences could help drive extension programming in specific parts of the state as well as increase understanding of high water users as a broad audience. Future studies should also include examining high water users' interests in learning and participating in extension programming to facilitate program recruitment efforts. In addition, high water users' preferred communication channels should be assessed to improve effectiveness and efficiency in establishing extension programs that will be used. For example, this audience may not want to attend a face-to-face workshop but would be willing to watch online videos on their own time. Knowing this information would assist extension educators in focusing their time and attention in developing educational materials and experiences that would reach high water users as a targeted audience. Future studies are also recommended to assess any newly developed water conservation focused extension education programs targeting high water users to see what impact they have over time and if this specific audience is receptive to extension programming thereby reducing the amount of water used statewide, assisting in ensuring we have a future water supply.

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