8   Information and Education Strategy

The Information and Education (I/E) strategy has been developed in conjunction with several partner groups, individuals and organizations. An I/E Subcommittee met regularly to review the social indicator survey results and used this information to craft the strategy goals and objectives and evaluation metrics. The I/E strategy goals, objectives and action items were driven by the social indicator data, TMDLs, primary and secondary pollutants and designated uses not being met. The purpose of the I/E strategy is to use the goals, objectives and action items to educate the public and ultimately result in behavior changes that restore or protect the designated uses in the Watershed.

As previously, discussed the Red Cedar Watershed is currently developing a WMP. Due to similar audience demographics, primary pollutants, TMDLs and designated uses not being met, the I/E strategy was developed in partnership with the Red Cedar Watershed team. When aiming to change human behavior, this partnership will set the stage for success since many citizens in the Watersheds travel back and forth between the Red Cedar and Middle Grand River Watersheds.

8.1   Social Indicators of Water Quality

The planning project conducted a detailed survey for the social indicators of water quality from three core audiences (e.g., urban residents, exurban/suburban residents, and agricultural producers). Detailed information on the social context of water quality (e.g., attitudes, perceptions, information sources, behavioral intentions, etc.) complemented the bio-physical watershed inventory information. Throughout the writing of the WMP, the ECD and stakeholders incorporated both sets of information, examining where water quality impairments are occurring, sources of water quality, and stakeholder awareness of these impairments, and activities households/landowners are doing that contribute to the water quality impairments. Strategies to reduce nonpoint source pollutants that were developed through the watershed management planning process were examined within the context of stakeholder willingness to implement such activities, and prioritized accordingly. If stakeholders are not likely to implement strategies, then it is unrealistic to expect pollutant load reductions as a result of the WMP. Detailed information from each audience is necessary to develop specific management practices to reduce key nonpoint source pollutants, inform outreach activities, and track performance over time.

The purpose of collecting information on residents' knowledge, awareness, land uses, information sources, and demographics (hereafter referred to as social indicators of water quality) is to better identify needed management and outreach strategies included in the Middle Grand River WMP. Detailed information from three key audiences (urban residents, exurban residents, and agricultural producers) was used to develop audience specific outreach strategies to reduce key nonpoint source pollutants, inform outreach activities, and track performance over time. In addition to incorporating this information into the WMP, these data can also be used as baseline data to compare the efficacy of future I/E projects if they are to be funded and implemented.

The specific questions of this project included:

1. What are stakeholders' perceptions of water quality, current impairments, and sources of water pollution, practices to improve water quality, information sources, and general demographics differ among the three groups?
2. How do stakeholders' responses differ from each other?
3. What are the most likely effective stakeholder outreach (I & E) to help achieve water quality goals?

The goals for this project were to collect information on social indicators of water quality in a scientific way that provides valid and reliable information on the awareness and perceptions of the Watershed by key stakeholders. The results from these surveys informed the WMP, future outreach and education programs, provided baseline data as to the efficacy of I & E outreach strategies at achieving goals in improving perceptions about water quality and land uses that have a positive impact on water quality.

The data quality objectives for this project were:

- **Precision:** Given the population size of our three audiences and the desired number of response needed for analysis, the sample size (Table 43) was selected with a goal of 96% confidence level and a sampling error of +/-5%.(Genskow & Prokopy, 2010; Dillman, 2000). A 95% confidence interval for most analysis. In addition, ICS Marketing Support Services compared our sample/census contact databases to the National Change of Address database and reduced any addresses that did not match current addresses to help reduce undeliverable surveys.
- **Bias and representativeness:** The City of Lansing parcel data was used to draw a random sample of the "urban residents" while the county parcel datasets (clipped to the watershed boundaries) without the City of Lansing parcel data were used to draw a random sample for the "exurban residents". A census of farms registered in the North American Industry Classification System that have ZIP codes within the Watershed for the "agricultural producers" stakeholders in this project was used. A census of the agricultural producers was needed rather than a random sample because there are so few of them. Additionally, a non-respondent telephone survey was conducted to determine if there is a response (or non-response) bias in the returned surveys.
- **Comparability:** ECD compared the respondent and non-respondent data and looked for differences and evaluated if the differences were meaningful, and what should be done about it. The responses of the three audiences were compared together. Currently, however, SIDMA only allows for paired data analysis so ECD used IBM SPSS Statistics software program for this comparison.

This project utilized The Social Indicator Planning and Evaluation System (SIPES) for Nonpoint Source Management (version 2.1) (Genskow & Prokopy, 2010) to inform the conceptual framework of questions that will be asked on the surveys. ECD followed a modified Tailored Design Method (Dillman et al., 2009) that consists of four waves of mailings (cover letter/questionnaire, thank you/reminder postcard, cover letter/questionnaire, and final thank you/reminder post card). The four waves were mailed over a four week period of time followed by a two week waiting period before interviewers'

contacted non-respondents to collect additional data to examine differences between respondents and non-respondents for each of the three audiences of interest.

There are three main stakeholder populations in the Watershed. They are: Urban Residents (non-rural, non-agricultural), Exurban Residents (non-urban, non-agricultural), and Rural Agricultural Producers (non-urban, must be an active producer). These groups were the key stakeholders of interest because their perceptions and land uses, and distinct stewardship behaviors relevant to their contexts, have the potential to greatly impact water quality.

The estimated population and needed sample/census size for each group is outlined in Table 43.

Table 43. Key stakeholders in the Middle Grand River Watershed Planning initiative, estimate population, needed sample/census size, Michigan, 2012.

Audience Group	Estimated Population	Sample/Census Size
Urban Residents	70,000	945
Exurban Residents	61,000	945
Agricultural Producers	411	411
Total	131,411	2,301

The social indicators of water quality survey were implemented by ICS Marketing Support Services with oversight by staff of ECD. The mail-back survey was implemented according to the Tailored Design Method (Dillman et al, 2009) during July - September 2012. After the survey was implemented as part of the random selection and census of this study, ECD created a general survey link in SIDMA and posted the link on the middlegrandriver.org watershed planning website. Interested residents/stakeholders were able to complete the survey and provide input.

The contact information of individuals in the sample was kept confidential and responses were never associated with their contact information (e.g., mailing address) (anonymity). Responses are in a database and presented in aggregate summaries in project reports, outreach materials, and in the SIDMA tool, where social indicators of water quality information are available to state and federal agencies. ECD will store the completed questionnaires for five years.

Data from partially completed returned questionnaires were entered into the response dataset. It was not necessary that each respondent complete every response in order for their responses to be used. In survey research it is commonly an option that potential respondents may skip a question if they do not feel comfortable answering it. Respondents sometimes wrote additional comments on the survey. In these cases, ECD reviewed and summarized their comments that they offered.

See Appendix 13 for the Social Indicator Data QAPP.

8.1.1 Social Indicator Survey Results[2]

Overall, some differences in socio-demographics were observed. Most agriculture producer respondents reported having a high school degree or less (37%), while >40% of urban and exurban resident respondents reported having a two or four-year degree (Table 45). Respondents reported their most important water resources activities were for scenic beauty (urban residents and agriculture producer) and for picnicking and family activities (exurban residents) (Table 46). All groups had the highest agreement that trash and debris in the water were moderate or severe problems (Table 47). However, approximately one-third of all group respondents reported bacteria and viruses in the water (e.g., *E.coli*) were a moderate or severe problem in the Middle Grand River Watershed (Table 47). Respondents in all groups nearly agreed that it is their personal responsibility to help protect water quality, and that using recommended farm best management practices or caring for lawn and yard can influence water quality of local streams and lakes (Table 48). Similarly, at least three-quarters of respondents in all groups agreed that the quality of life in their community depends on good water quality (Table 48). Differences in perceived sources of water pollution exist. Forty-two percent of agriculture producer respondents believe waterfowl droppings are the primary cause, while 45% of urban resident respondents believe excessive crop production fertilizers are the primary source of water pollution (Table 49). Meanwhile, 45% of exurban resident respondents reported that excessive lawn fertilizer/pesticides were a moderate or severe problem as a source of water pollution (Table 49). Urban resident respondents had the highest perceived consequences of poor water quality for all five dimensions (e.g., lower property values, odor, fish kills, excessive aquatic plants or algae, and decreased opportunities for water recreation) compared to exurban resident and agriculture producer respondents (Table 50). The reasons behind making decisions for one's property were quite similar; respondents from all three groups expressed personal out-of-pocket expenses, not having access to the equipment that I need, and lack of available information about a practice as the top reasons influencing one's decision about property management related to water quality (Table 51). Michigan State University Extension (MSUE) was the most trusted source of information for all respondent groups (Table 52). Conservation Districts are one of the most trusted information sources for agriculture producer respondents behind MSUE. For exurban resident respondents, county health departments are the most trusted information source behind MSUE, while the Michigan Department of Natural Resources (MDNR) is the most trusted information source for urban resident respondents after MSUE. Nearly all agriculture producer respondents reported having a septic system, though few problems with it were reported (Table 53). In contrast, approximately one-third of exurban respondents reporting having a septic system but similarly few problems were reported.

Implications

The ECD and the I/E Subcommittee were tasked with preparing a response for key question #3 (What is the most likely effective stakeholder outreach (I & E) to help achieve water quality goals?).

It is apparent that partnering with MSUE, county health departments, and the MDNR to help communicate and educate stakeholders may benefit any efforts because of the high level of trust specific stakeholder groups have for these agencies. The biggest area for stakeholder outreach may be

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[2] Social indicator survey analysis prepared by Heather Triezenberg.

in educating stakeholders on the actual types of top water pollution in the Watershed, and the specific sources of the top pollutants, to help stakeholders develop a more accurate understanding of the water quality problems in their area. Given the high level of agreement with personal responsibility to protect water quality and using recommended best management practices on farms or caring for lawn and yard to limit influence to local streams, it is likely that if stakeholders have a better understanding of the problems and sources of water quality issues, then they will be willing to engage in behaviors that improve water quality in the Watershed. Finally, in the absence of cost-share or mini-grant programs to ease out-of-pocket expenses, resources such as information about specific best management practices or availability of equipment needed to implement practices may help ease the barriers to stakeholders adopting stewardship behaviors that protect water quality.

See Appendix 14 for the Agriculture, Exurban (Rural Residential) and Urban Summary.

Table 44. Overall response rates to mail surveys (usable response rate for analysis)

Agriculture Producers	Exurban Residents	Urban Residents
38% (16%)	42% (28%)	30% (16%)^

^No significant differences between respondents and non-respondents (p<0.05); analyses are based upon pooled responses from questionnaire respondents and telephone survey respondents.

Table 45. Respondent socio-demographic characteristics

Socio-demographic characteristics	Agriculture Producers	Exurban Residents	Urban Residents
Male/female	91%/9%	69%/31%	55%/45%
Education level			
High school or less	37%	14%	15%
Some college	28%	20%	15%
2 or 4 year degree	25%	49%	40%
Post-graduate degree	9%	17%	25%
Description of where you live			
Town, village, or city	5%	43%	88%
Isolated rural, non-farm residence	3%	16%	5%
Rural subdivision or development	8%	36%	7%
On a farm	85%	5%	1%
Total household income, last year			
<$24,999	n/a	9%	11%
$25,000 - $49,999	n/a	28%	32%
$50,000 - $74,999	n/a	26%	28%
$75,000 - $99,999	n/a	20%	16%
>$100,000	n/a	17%	13%
Approximate size of residential lot			
>1/4 acre	n/a	38%	65%
>1/4 acre to <1 acre	n/a	30%	22%
1 acre - >5 acres	n/a	21%	8%

>5 acres	n/a	11%	5%
Own house	n/a	99%	99%
Rent house	n/a	1%	1%

Table 46. Important water resource activities

Most important activity	Agriculture Producers	Exurban Residents	Urban Residents
For canoeing/kayaking/other boating	14%	15%	14%
For eating locally caught fish	14%	12%	9%
For swimming	2%	7%	13%
For picnicking and family activities	7%	41%	13%
For fish habitat	21%	19%	17%
For scenic beauty	41%	6%	36%

Significant differences F=8.721 (df=2), p=<0.01

Table 47. Perceptions of sources of water quality impairments

Moderate or Severe Problem	Agriculture Producers	Exurban Residents	Urban Residents	Differences F (df=2)
Sedimentation (dirt and soil) in the water	28%	29%	30%	8.220^
Nitrogen	20%	17%	22%	15.894^
Phosphorus	25%	18%	21%	18.649^
Bacteria and viruses in water (e.g., *E.coli*)	27%	20%	32%	12.059^
Trash or debris in the water	38%	37%	51%	11.011^
Algae in the water	22%	30%	32%	4.206^
Not enough oxygen in the water	24%	18%	21%	10.278^
Pesticides	23%	26%	36%	15.341^

^=p<0.05

Table 48. Opinions related to water quality

Agree or Strongly Agree	Agriculture Producers	Exurban Residents	Urban Residents	Differences F (df=2)
Using recommended management practices on farms improves water quality.	91%	n/a	n/a	
The way I care for my lawn and yard can influence water quality in local streams and lakes.	n/a	79%	80%	
It is my personal responsibility to help protect water quality.	96%	92%	89%	n.s.
It is important to protect water quality even if it slows economic development.	67%	75%	75%	n.s.
My actions have an impact on water quality.	72%	81%	82%	n.s.
I would be willing to pay more to improve water quality.	15%	35%	45%	7.859^
I would be willing to change the way I care for my lawn and yard to improve water quality.	48%	59%	69%	4.969^
The quality of life in my community depends on good water quality in local streams, rivers and lakes.	75%	78%	83%	n.s.

^=p<0.05

Table 49. Sources of water pollution

Moderate or severe problem source	Agriculture Producers	Exurban Residents	Urban Residents	Differences F (df=2)
Sewage treatment plant discharge	27%	24%	35%	8.761^
Farm field soil erosion	24%	30%	37%	18.839^
Streambank soil erosion	18%	27%	34%	10.699^
Excessive lawn fertilizer/pesticide	n/a	45%	53%	
Improper HHHW disposal	33%	31%	51%	13.956^
Improper motor oil/antifreeze disposal	23%	26%	42%	8.821^
Improperly maintained septic systems	21%	19%	25%	11.899^
Manure from farm animals	22%	25%	n/a	
Waterfowl droppings	42%	38%	38%	10.124^
Pet waste	9%	17%	25%	12.834^
Excessive crop production fertilizers	n/a	36%	45%	
Residential stormwater runoff	27%	29%	34%	11.516^
Roof runoff	n/a	n/a	37%	

Street runoff	n/a	n/a	47%	

^=p<0.05

Table 50. Perceptions of consequences of poor water quality

Moderate or Severe Problem	Agriculture Producers	Exurban Residents	Urban Residents	Differences F (df=2)
Reduced opportunities for water recreation	14%	28%	42%	7.865^
Excessive aquatic plants or algae	23%	27%	37%	10.739^
Fish kills	12%	18%	31%	12.705^
Odor	11%	18%	39%	11.986^
Lower property values	11%	18%	35%	7.140^

^=p<0.05

Table 51. Making decisions for my property

Some or A Lot	Agriculture Producers	Exurban Residents	Urban Residents	Differences F (df=2)
Personal out-of-pocket expenses	58%	47%	60%	n.s.
Lack of government funds for cost share	35%	n/a	n/a	
My own physical abilities	n/a	37%	43%	
Not having access to the equipment that I need	45%	35%	51%	n.s.
Lack of available information about a practice	38%	40%	45%	n.s.
No one else I know is implementing the practice	20%	24%	28%	7.454^
Concerns about reduced yields	35%	n/a	n/a	
Approval of my neighbors	24%	17%	14%	4.376^
Don't want to participate in government programs	38%	n/a	n/a	
Requirements or restrictions of government programs	48%	n/a	n/a	
Possible interference with my flexibility to change land use practices as conditions warrant	43%	n/a	n/a	
Don't know where to get information and/or assistance about those practices	n/a	32%	39%	
Environmental damage caused by practice	31%	20%	11%	4.823^
I don't own the property	12%	n/a	n/a	
Legal restrictions on my property	n/a	20%	15%	
Concerns about resale value	n/a	30%	18%	

Not being able to see a demonstration of the practice before I decide	18%	32%	27%	5.900^
The need to learn new skills or techniques	n/a	34%	33%	

^=p<0.05; n.s. = non-significant at p<0.05

Table 52. Trusted sources of information

Moderate or very much trusted	Agriculture Producers	Exurban Residents	Urban Residents	Differences F (df=2)
Local watershed project	n/a	55%	57%	
Local government	n/a	61%	52%	
U.S. Environmental Protection Agency	n/a	54%	63%	
Michigan State University Extension	89%	72%	76%	n.s.
MI Dept of Ag and Rural Development	61%	57%	63%	3.488^
MI Department of Environmental Quality	42%	58%	63%	7.943^
Environmental groups	16%	39%	47%	10.636^
Local garden center	n/a	42%	40%	
Lawn care company	n/a	28%	15%	
Local community leader	n/a	26%	24%	
Neighbors or friends	75%	43%	44%	n.s.
MI Department of Natural Resources	54%	63%	67%	4.178^
County Health Departments	47%	72%	59%	6.490^
Local land trusts	n/a	26%	23%	
Conservation Districts	79%	51%	45%	n.s.
Natural Resources Conservation Service	68%	n/a	n/a	
Farm Service Agency	71%	n/a	n/a	
Crop consultants	67%	n/a	n/a	
Fertilizer representatives	56%	n/a	n/a	
Farm Bureau	72%	n/a	n/a	

^=p<0.05; n.s. = non-significant at p<0.05

Table 53. Septic systems

Most important activity	Agriculture Producers	Exurban Residents	
Yes – have a septic system	94%	34%	
Septic system – slow drains	1%	5%	
Septic system – sewage backup in house	n/a	2%	
Septic system – bad smells	n/a	3%	
Septic system – sewage on the surface	1%	1%	
Septic system – sewage flowing to ditch	n/a	1%	
Septic system – frozen septic	n/a	1%	
Septic system – other	n/a	1%	
Septic system – no problems	37%	42%	
Septic system – don't know	n/a	3%	

Would like a reminder from local health department regarding inspection/maintenance of your septic system.	3%	20%
Would like a local government agency to handle inspection and maintenance of septic systems.	8%	27%

8.2 Information and Education Goals

To aid in the achievement of the WMP goals it was necessary to create goals for the I/E strategy. The social indicator survey provides data from Urban, Rural Residential (Exurban) and Agriculture stakeholders living in the Watershed. The data collected provides the basis for which the overarching I/E strategy goals were created. The overarching goals are based upon common trends amongst all three audiences.

Goals are defined as general statements that express broad focus of effort and link back to driving forces.

The overarching goals of the I/E strategy are to:

1. Increase awareness of low perception impairments, *E.coli,* Sediment and Dissolved Oxygen.
2. Create an education plan that is built upon multiple facets and capitalizes on existing efforts to reach the target audience.
3. Foster partnerships with trusted sources identified through the social indicator survey for each target audience.
4. Continue to partner with the Middle Grand River Organization of Watersheds on a regional education campaign.
5. Increase availability of information about best management practices.

The I/E Subcommittee created audience specific goals as well based on results of the social indicator survey (Table 54).

Table 54. I/E Audience Goals

Urban		Agriculture		Rural Residential
Goals		Goals		Goals
Increase the willingness to change the way individual cares for their lawn and yard to improve water quality.		Increase awareness of long term sustainable economics, with a focus on flexible options to achieve water quality improvement, land owner choice in selection of practices and monetarily feasible with or without government cost share.		Encourage adoption of Best Management Practices specific to a rural residence such as landscaping with native plants, septic maintenance, buffers along riparian areas and ditches.
Increase willingness to pay more to improve water quality and communicaite that there are low cost options available to achieve water quality improvement.		Build relationships with the 4-H, Future Farmers of America, farmers markets, agri-business, agriculture cooperatives, Michigan Food and Farming Systems, equine associations, large animal veterinarians, Michigan Milk Producers Association and drain commission communties to achieve water quality improvement.		Build relationships with the 4-H, wildlife and habitat organizations and drain commission communities
Build partnerships with the business, neighborhood association, and municipal communties.		Increase peer-peer interaction to engage the agriculture community in adoption of best management practices.		Foster a sense of place through educational signage. For example, road signs that say: You are entering the Middle Grand River Watershed or You are driving over the X tributary of the Middle Grand River Watershed.
Increase opinion that pet waste, residential stormwater runoff, roof runoff, streambank soil erosion and street runoff are sources of water quality pollution in the watershed.		Increase opinion that farm field soil erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater runoff are sources of water quality pollution in the watershed.		Connect water quality impairments to picnicking and family activities as this ranked highest among important water resource activities.
Connect water quality impairments to scenic beauty and people enjoying water resources as this ranked highest among important water resource activities.		Connect water quality impairments to scenic beauty as this ranked highest among important water resource activities		Increase opinion that farm field soil erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater runoff are sources of water quality pollution in the watershed.

8.3 Information and Education Objectives

Objectives are defined as specific, measurable, action-oriented, relevant, time focused and based on the goals. The social indicator data was used to set measurements such as the percentage by which to increase perception or willingness.

To achieve the overarching goals of the I/E strategy the following objectives were created:

1. Increase awareness of low perception impairments by 4%.
2. Identify and participate in three avenues by which the target audience communicates and obtains information. This could include social media, peer-peer, organizational networks, hands on demonstrations, etc.
3. Identify three trusted sources through the social indicator survey when conducting Information and Education activities.
4. Partner with the Middle Grand River Organization of Watersheds on a yearly basis to deliver a regional education campaign to target audience.
5. Create one watershed based information network to deliver best management practices information to target audience.

The I/E Subcommittee created audience specific objectives as well based on results of the social indicator survey (Table 55).

Table 55. I/E Audience Objectives

Urban		Agriculture		Rural Residential
Objectives (in priority order)		**Objectives (in priority order)**		**Objectives (in priority order)**
Increase awareness of low costs options to achieve water quality by 4%.		Increase willingness to adopt Best Management Practices by 4%.		Increase willingness to adopt Best Management Practices by 4%.
Increase willingness to change the way an individual cares for their lawn/yard to improve water quality by 4%.		Increase opinion that farm field soil erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater runoff are sources of water quality pollution in the watershed by 4%.		Increase opinion that farm field soil erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater runoff are sources of water quality pollution in the watershed by 4%.
Increase willingness to pay more to improve water quality by 4%.		Hold 3 peer-peer educational events per year.		Install educational signage at 100 locations across the Watershed.
Co-host 1 event with a trusted partner once a year.		Identify 3 trusted sources willing to participate in a demonstration project.		Identify 3 local governments willing to participate in a demonstration project.
Identify 3 neighborhood associations willing to participate in a demonstration project.		Hold 3 educational events per year in partnership with a trusted source. For example a farm safety day, cover crop workshop.		Hold 3 workshops per year at a conveniently located community facility such as a library, school, township hall, etc.
Participate in 3 community events per year to promote water quality Best Management Practices.		Use 3 images and/or messages related to scenic beauty when engaging audience in information and education strategies. This could include: images of a farm, streams, ditches with native grasses and wildflowers, etc.		Conduct 4 direct mailings per year.
Hold 2 social media efforts within a 5 year period.				Use 3 images and/or messages related to picnicking and family activities when engaging audience in information and education strategies. This could include: family playing near a stream, children and water, safe food as it relates to water quality and *E.coli*, etc.
Use 3 images and/or messages related to scenic beauty and people enjoying water resources when engaging audience in information and education strategies. This could include: picnicking near a stream, walking along a stream, fishing, images of fish, paddling and boating, etc.				

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8.4   Developing Messages

The I/E strategy will utilize existing messages that are current in use throughout regional educational efforts. Messages include education of the following topics:

- Pet waste reduction
- Manure storage and application
- On-site septic system maintenance
- Conservation methods
- Native plantings
- Rain barrel use and downspout disconnection
- Low impact development techniques
- No-phosphorous fertilizer use and application
- Waste reduction efforts
- Appropriate waste disposal
- Car washing techniques
- Sedimentation reduction/prevention

8.5   Selecting Delivery Mechanisms and Activities

Delivery mechanisms are a crucial component of the I/E strategy. Getting the public engaged is the first step to changing their knowledge and behavior to do their part in protecting and improving water quality. There are several water quality related education efforts currently underway in the watershed and surrounding areas. In addition, the survey data provides us with a list of agencies and partners that have established credibility as a trusted source to our local residents. The I/E strategy aims to utilize the existing educational efforts and partnerships with trusted sources to create an effective and efficient approach to outreach and education. Delivery mechanisms include:

- Demonstration projects
- Workshops with trusted sources
- Exhibit display
- Print materials (brochures, posters)
- Promotional items
- Social media
- Public access television
- Local radio
- Billboards
- Incentive programs (septic cleaning coupons)
- Giveaways
- Direct mail
- Community newspapers
- Multi-media

8.5.1 Regional Collaboration and Partnerships

Regional partnerships will be a necessary factor in implementation of the I/E strategy. The existing regional collaborative efforts are the backbone of the I/E strategy. The WMP will work to enhance and strengthen these existing efforts through increased partnerships, funding and evaluation of our efforts.

Middle Grand River Organization of Watersheds (MGROW)

There are many watershed initiatives being conducted regionally. These include the Middle Grand River Watershed Planning Project (MGRWP), Red Cedar Watershed Planning Project (RCWP) Greater Lansing Regional Committee for Stormwater Management (GLRC), Friends of the Looking Glass, Friends of the Maple River and the Maple River Implementation Project. Since all of these efforts have similar components of I/E; including audiences, pollutants, messages, calls to action, events, clean ups, etc. the Tri-County Regional Planning Commission (TCRPC) has facilitated a regional approach to I/E with the help of the Middle Grand River Organization of Watersheds (MGROW).

MGROW is an umbrella organization that is striving to service the following watersheds: Maple, Looking Glass, Red Cedar and the Middle Grand. MGROW works to bring collaborative solutions, improve recreational opportunities and public perception of our local water resources.

The TCRPC Mid-Michigan Program for Greater Sustainability is supporting the work of MGROW to create a regional and collaborative to I/E approach that is cost effective, efficient, and will help sustain water resource education for the long term. The purpose of the campaign is to relay to the public that while they might not live directly on the river, what they do affects water quality. Very simple action-oriented language is used to hopefully change behavior:

- Pollution Isn't Pretty
- Learn what you can do to help keep our water clean.
- Even if you don't live near water, the fertilizer, pet waste, motor oil and other pollutants from your yard end up in Michigan's fresh water supply.
- Pet waste on the ground means *E.coli* in our water. Clean up after your pup.
- Gasoline. Weed Killer. Nail Polish. Motor Oil. Fertilizer.
- What does on the ground ends up in our water. Pour sparingly.

The campaign is titled: Pollution Isn't Pretty (PIP). The website associated with the campaign (pollutionisntpretty.org) is a gateway page linking to all local watershed initiatives including the MGRWP.

Red Cedar Watershed Planning Project I/E Strategy

The RCWP, the adjacent nonpoint source planning effort, has also developed an I/E Strategy. The TCRPC has served and provided input to both the MGRWP and RCWP I/E Committees, as well as coordinated the Regional Education Campaign on MGROW's behalf. This is important as TCRPC can serve as the liaison for these groups with the same demographics and water quality impairments.

Greater Lansing Regional Committee for Stormwater Management (GLRC) Public Education Plan

The Greater Lansing Regional Committee for Stormwater Management (GLRC) is a guiding body comprised of participating Municipal Separate Storm Sewer System (MS4) communities within the Greater Lansing Region. The committee has been established to guide the implementation of the entire MS4 Stormwater Program for the communities within three identified watersheds: the Middle Grand, Red Cedar and Looking Glass River watersheds. The GLRC focuses on the following components of I/E:

- Promote public responsibility and stewardship in the applicant's watershed(s).
- Inform and educate the public about the connection of the MS4 to area waterbodies and the potential impacts discharges could have on surface waters of the state.
- Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4.
- Promote preferred cleaning materials and procedures for car, pavement, and power washing.
- Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers.
- Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4.
- Identify and promote the availability, location, and requirements of facilities for collection or disposal of household hazardous waste, travel trailer sanitary wastes, chemicals, yard wastes, and motor vehicle fluids.
- Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure.
- Educate the public on, and promote the benefits of, green infrastructure and Low Impact Development.
- Promote methods for managing riparian lands to protect water quality.
- Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to stormwater runoff.

GLRC Members are currently implementing their GLRC Public Education Plan and will be partners in the I/E strategies of the Middle Grand Watershed. The I/E Strategy includes these activities and expands them to other geographical areas of the watershed, throughout Ingham, Eaton, Clinton and Ionia Counties.

Social Media

ECD, MGROW and the GLRC, are beginning to understand the importance of social media such as Facebook and Twitter, etc. when trying to outreach to the public and our local residents. Social media is also a very useful way to connect with other partners, sharing each other's events, activities and ideas.

Local Events

River clean ups provide a unique opportunity to interact with the public while on the river itself. The Lansing Board of Water & Light, in partnership with the Impression 5 Science Museum, conducts an Adopt A River event on the Grand River in downtown Lansing, not far from the Red Cedar confluence.

Each spring the TCRPC Groundwater Management Board's Children's Water Festival is held on the Michigan State University Campus.

The Mid-Michigan Environmental Action Council (Mid-MEAC) Volunteer Stream Monitoring program monitors the macroinverterbrate communities in the Red Cedar and Grand Rivers. They conduct a volunteer training day, and a spring and fall collection day. A local entomologist and aquatic biologist assist with macroinvertebrate identification. This is a hands-on activity for volunteers and an opportunity to educate them about indicators of water quality.

Potential Partners

- Grand Learning Network K-12 Teachers
- Area Conservation Districts (CD)
- Local units of government: Drain Commissions, Parks, Health Departments, Municipalities, etc.
- Michigan Department of Agriculture (MDARD): Michigan Agricultural Environmental Assurance Program (MAEAP)
- Michigan State University (Institute of Water Research (IWR), departments and student initiatives)
- Michigan State University Extension (MSUE)
- USDA Natural Resource Conservation Service (NRCS)
- Environmental and conservation curriculum programs: Project Fish, Project Wet, Project Learning Tree, etc.
- Farm Bureau
- Michigan Food and Farming Systems (MIFFS)
- Mid-MEAC
- TCRPC-GLRC
- Greening Mid-Michigan
- MGROW
- Friends of the Watershed Groups: Maple, Looking Glass, Lansing River Trail, Paddle Clubs, etc.
- Michigan Water Stewardship Program Website
- Neighborhood Associations
- Michigan Department of Natural Resources (MDNR)
- MDEQ
- Human service nonprofits (including faith community)
- US EPA
- Michigan Energy Options (MEO)
- Capital Area Humane Society (CAHS), Veterinary Clinics, County Animal Controls and Animal Rescue Groups (specifically when targeting pet waste reduction)
- Local businesses: lawn and garden, landscape and turf grass management, veterinary clinics, agricultural service providers, commercial associations, etc.

8.6 Implementation of I/E Strategy

With any I/E strategy the ultimate goal is to change human behavior. The social indicator data was used to craft an implementation strategy for each audience, Urban, Agricultural and Rural Residential (Exurban). The tables below outline the strategy for each audience. Strategies were defined as short term (ST), one to five years and long term (LT) six year plus. Given the results of the survey data there are a couple consistent trends amongst the three audiences, however; it is important to approach each audience as unique. Subsequently, when segments within an audience are further defined such as aiming to target urban young professionals owning a home, an appropriate strategy would need to be adapted to that particular segment of the audience. The I/E strategies developed are aimed to serve as a resource to guide an interested organization in the right direction when crafting an I/E project.

8.6.1 Linking I/E Strategy to Critical Zones and Priority Ranking

While some I/E efforts will cover large regional areas, other strategies must be targeted (ex: pilot projects, demonstration sites, and direct mailings). As previously discussed in Chapters 4 and 5, Columbia Creek, Skinner-Extension Drain and Silver Creek subwatersheds have defined critical zones and first phase priority ranking based on *E.coli* concentration and BST results and TMDLs. Chapter 7 reflects the importance of focusing best management implementation practices in these areas. Similarly, the I/E strategy highlights the importance of engaging residents and landowners in these subwatersheds and their critical zones as the top priority for education and behavior change.

Table 56. Urban Audience I/E Strategy

	Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Urban	Use social media to expand audience discussion and sharing of information related to water quality to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS)	Twitter; Facebook; Pinterest; Instagram; LinkedIn; etc.	PIP, partner organizations, federal agencies, nonprofits, etc.	Everyone	ST - ongoing	$35,000 salary/social media manager	Likes, followers, shares, discussion/comments
	Identify 3 neighborhood associations willing to participate in a demonstration project to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Direct contact; association newsletters/communications; demonstration project itself	Lansing area - Allen; Old Town, South Lansing; Baily; Westside; NW	Municipalities; GLRC; CD; Mid-MEAC; human service nonprofits (faith community); Friends/watershed nonprofits	ST	Minimum of 5,000/project	Demo project built; number of people reached; assessment of pre/post project; future practice installation
	Co-host 1 event with a trusted partner to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Direct contact; trusted partner communication channels; social media	Recycling events; Landscaping for Water Quality, Rainbarrels and Home Energy Efficiency Workshops	***DNR; MSUE; USEPA, MDARD, MDEQ,** MEO, Mid-MEAC, GLRC, TCRPC	ST - ongoing	$3,000 for printing, promotional items, etc.	Number of attendees; media coverage of event; assessment of pre/post project
	Participate in 3 community events per year to promote water quality BMPs to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Interactive presentation and/or guest speaker; material distribution; promotional items	Children's Water Festival, Arbor Day, MDEQ Earth Day; Quietwater Symposium, Community art/music events and initiatives	TCRPC, CD, GLRC, State/Federal government, nonprofits, higher education institutions	ST - ongoing	$3,000/event	Number of attendees/participants; media coverage of event; assessment of pre/post project

Notes: *Organizations in **bold** were identified by the social indicator survey as the top five trusted sources of information.

Table 56. Urban Audience I/E Strategy

	Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Urban	Increase awareness of low cost options (i.e. native plants, rain gardens, rain barrels, pervious pavers, downspout disconnect, turf management BMPs, pet waste management), to achieve water quality to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	CD, MSUE, Michigan Water Stewardship Website, MEO, Mid-MEAC, GLRC, MDEQ, US EPA	TCRPC, CD, GLRC, State/Federal government, nonprofits, higher education institutions	ST - ongoing	$40,000 to develop campaign and materials	Increase awareness by 4%
	Increase willingness to change the way an individual cares for their lawn/yard to improve water quality to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS)..	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	MI Turfgrass Foundation, Michigan Water Stewardship Website, PIP, MSUE	TCRPC, CD, GLRC, State/Federal government, nonprofits, higher education institutions	ST - ongoing	$40,000 to develop campaign and materials	Increase willingness by 4%
	Increase willingness to pay more to improve water quality to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS)...	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials, demonstration projects, interactive presentations, community events	CD, MEO, MSUE, Michigan Water Stewardship Website, GLRC	Everyone	LT	$40,000 to develop campaign and materials	Increase willingness by 4%

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Table 56. Urban Audience I/E Strategy

	Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Urban	Increase opinion that pet waste, residential stormwater runoff, roof runoff, streambank erosion and street erosion are sources of pollution to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS)….	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	PIP, Michigan Water Stewardship Website, MSUE, GLRC, MDEQ, US EPA	TCRPC, CD, GLRC, State/Federal government, nonprofits, higher education institutions	ST - ongoing	$40,000 to develop campaign and materials	Increase opinion by 4%
	Use 3 images and/or messages related to scenic beauty and people enjoying water resources when engaging audience to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Use images and/or messages related to picnicking near a stream, walking along a stream, fishing, images of fish, paddling and boating, etc. in social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	Pure Michigan; MGROW, MDNR, Local and County Parks	TCRPC, CD, GLRC, State/Federal government, nonprofits, higher education institutions	ST - ongoing	No cost if use existing images and messages. If development required that is TBD.	Estimated number of people reached; social media and website statistics, response to images and/or messages through direct engagement or survey feedback

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Table 57. Agricultural Audience I/E Strategy

	Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Agricultural	Increase willingness to adopt Best Management Practices to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	PIP, CD, NRCS, MDARD-MAEAP, MSUE programs	TCRPC, CD, State/Federal Government, Nonprofits, Higher Education Institutions, Agricultural Service Providers, Livestock Associations (including equine)	LT	$40,000 to develop campaign and materials	Increase willingness by 4%, number of BMPs installed
	Identify 3 trusted sources willing to participate in a demonstration project to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS)...	Direct contact, partner communications, demo project itself	CD, NRSC, MDARD, Farm Bureau, MIFFS, MSUE	TCRPC, CD, State/Federal Government, Nonprofits, Higher Education Institutions, Agricultural Service Providers, Livestock Associations (including equine)	LT	Minimum of $20,000/project	Demo project built; number of people reached; assessment of pre/post project; future practice installation
	Hold 3 educational events per year in partnership with a trusted source. For example a farm safety day, cover crop workshop to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS)...	Direct contact, partner communications, workshop itself	CD, NRCS, MDARD, MSUE programs	***DNR; MSUE; USEPA, MDARD, MDEQ,** TCRPC, CD	ST	$3,000 for printing/ promotional items, etc.	Number of attendees; pre-post survey

Note: *Organizations in **bold** were identified by the social indicator survey as the top five trusted sources of information.

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Table 57. Agricultural Audience I/E Strategy

Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Hold 3 peer-peer educational events per year to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Direct contact; social media, newsletters	Farm Bureau, MIFFS, CD, MAEAP, Agricultural Service Providers, MSUE, Livestock Associations (including equine)	TCRPC, CD, State/Federal Government, Nonprofits, Higher Education Institutions, Agricultural Service Providers, Livestock Associations (including equine)	LT	$3,000/event	Number of attendee; pre-post survey
Increase opinion that farm field soil erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater runoff are sources of water quality pollution to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	CD, NRCS, MDARD, MSUE programs,	TCRPC, CD, State/Federal Government, Nonprofits, Higher Education Institutions, Agricultural Service Providers, Livestock Associations (including equine)	LT	$40,000 to develop campaign and materials	Increase awareness by 4%
Use 3 images and/or messages related to scenic beauty when engaging audience in information and education strategies to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Use images and/or messages related to farming, streams, ditches with native grasses and wildflowers, etc. in social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	Pure Michigan, MGROW, MDARD, Farm Bureau, MIFFS, MSUE	TCRPC, CD, State/Federal Government, Nonprofits, Higher Education Institutions, Agricultural Service Providers, Livestock Associations (including equine)	ST - ongoing	No cost if use existing images and messages. If development required that is TBD.	Estimated number of people reached; social media and website statistics, response to images and/or messages through direct engagement or survey feedback

Agricultural

Table 58. Rural Residential (Exurban) Audience I/E Strategy

Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Increase willingness to adopt best management practices to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	CD, Michigan Water Stewardship Website, MDEQ, US EPA	TCRPC, CD, GLRC, State/Federal Government, Nonprofits, Higher Education Institutions	LT	$40,000 to develop campaign and materials	Increase willingness by 4%
Identify 3 local governments willing to participate in a demonstration project to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Direct contact; municipal/community newsletters/communications; demonstration project itself	Needs to be created	Local Governments, TCRPC, CD, Nonprofits	LT	Minimum of $5,000/project	Demo project built; number of people reached; assessment of pre/post project; future practice installation
Conduct 4 direct mailings per year to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Direct mail	Community news, utilize tax mailings, postcard	Local Governments, TCRPC, Nonprofits, MSUE, CD	ST	$5,000/11,600 homes	Number of residents mailed; website traffic
Hold 3 workshops per year at a conveniently located community facility such as a library, school, township hall, etc. to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Interactive presentation and/or guest speaker; material distribution; promotional items	CD, MSUE programs, Mid-MEAC	TCRPC, CD, GLRC, State/Federal Government, Nonprofits, Higher Education Institutions	ST	$3,000 for printing/promotional items, etc.	Number of attendees; assessment of pre/post workshop

Rural Residential

Table 58. Rural Residential (Exurban) Audience I/E Strategy

	Action (in priority order)	Delivery Method	Existing Programs	Partners	Timeline ST/LT	Cost	Evaluation
Rural Residential	Install educational signage at 100 locations across the Watershed to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Strategic sign placement	GLRC watershed signs, PIP	GLRC, Road Commissions, MGROW	LT	$8,000/100 signs	Number of signs installed; traffic counts
	Use 3 images and/or messages related to picnicking and family activities when engaging audience in information and education strategies to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Use images and/or messages related to families playing near a stream, children and water, safe food as it relates to water quality and *E.coli*, etc. in social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials.	PIP, partner organizations, federal agencies, nonprofits, etc.	Everyone	ST	No cost if use existing images and messages. If development required that is TBD.	Estimated number of people reached; social media and website statistics, Response to images and/or messages through direct engagement or survey feedback
	Increase opinion that farm field soil erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater runoff are sources of water quality pollution to increase awareness of and reduce low perception impairments (*E.coli*, Sediment and TSS).	Social media, newsletters, public presentations, billboard campaign, trusted partner communication channels, promotional items and materials	PIP, GLRC, CD, NRCS, MDARD, MSUE programs	TCRPC, CD, GLRC, State/Federal Government, Nonprofits, Higher Education Institutions	LT	$40,000 to develop campaign and materials	Increase awareness by 4%

8.7 I/E Strategy Evaluation

Evaluation of the I/E strategy is important so that partners can apply adaptive management techniques to efforts within the Watershed when necessary. Since valuable social indicator survey data exists, it would be beneficial to conduct another social indicator survey after several components of the strategy have been implemented. This repeat survey should be designed to incorporate the same audiences as previously surveyed (Urban, Rural Residential (Exurban) and Agriculture).

The following parameters should be part of the evaluation:

- Did awareness of the following sources of pollution: farm field erosion, streambank soil erosion, improperly maintained septic systems, manure from farm animals, pet waste and residential stormwater increase by 4%?
- Did willingness to adopt best management practices increase by 4%?
- Did opinion that pet waste, residential stormwater runoff, roof runoff, streambank soil erosion and street erosion are sources of pollution increase by 4%?
- Did willingness to pay more to improve water quality increase by 4%?
- Did willingness to change the way an individual cares for their lawn/yard to improve water quality increase by 4%?
- Did awareness of low cost options (ie; native plants, rain gardens, rainbarrels, pervious pavers, downspout disconnect, turgrass best management practices and pet waste) to achieve water quality increase by 4%?

Ideally an evaluation process would take place five to seven years after several components have been implemented. Part of the evaluation process should involve a cost-benefit analysis to determine the fiscal impact of the I/E strategy.

Partner interest, commitment and capacity will play a large role in completing I/E projects to improve water quality within the Watershed. Ultimately, the success of the I/E strategy will be defined by the attainment of designated uses and the restoration of TMDL reaches due to behavior change.

8.8 I/E Strategy Summary

The purpose of the I/E strategy is to use the goals, objectives and action items to educate the public and ultimately result in behavior changes that restore or protect the designated uses in the Watershed.

The social indicator data was used to craft an I/E strategy for each audience, Urban, Agricultural and Rural Residential (Exurban). Each audience contains specific goals and objectives that should be used as a guide when designing and implementing I/E projects. Given the amount of activity and leadership within the Watershed, the I/E strategy places an emphasis on regional collaboration to achieve audience goals and objectives. Lastly, the I/E strategy highlights the importance of engaging residents and landowners in the first phase priority subwatersheds and their critical zones as the top priority for education and behavior change.