

Report for 2002ID16B: Community-Directed Water Protection Strategy: Focus Communities in North-central Idaho, including the Nez Perce Indian Reservation

- Water Resources Research Institute Reports:
 - NA
- Conference Proceedings:
 - NA
- Articles in Refereed Scientific Journals:
 - NA
- Dissertations:
 - Owen, Amy, 2003, Community-Directed Water Protection Strategy: Focus Communities in North-central Idaho, including the Nez Perce Indian Reservation, Ph.D., Department of Geography, College of Science, University of Idaho, Moscow, Idaho, pp 13.
- Book Chapters:
 - NA
- Other Publications:
 - NA

Report Follows

Problem, Research Justification and Research Objectives:

Problem Statement: Under enhancements to the 1974 Safe Drinking Water Act that were enacted in 1996, all states are now required to develop plans to assess all public drinking water sources (USEPA, 2002). For many states, this involves the defining of the geographical protection zones for all of the public water sources within the state. In Idaho, as in the majority of the United States, the actual protection of the water source zone is voluntary and must be implemented by the community or water system. In Idaho the delimited source zones and a preliminary potential contaminant inventory and susceptibility report are delivered to the public water systems. It is up to a community to develop a plan to protect that water system using this information. With states due to have all delineations complete by 2003 (notwithstanding extensions and exceptions) the implementation of protection plans by communities is immanent all across the United States.

The federal government provides funding and guidance to the states to develop source assessments, but it is largely up to the states to determine how the actual protection planning by the communities in the state will be completed. Most states, including Idaho, have a voluntary program that leads to certification when the planning requirements have been met. While a voluntary approach is likely the most appropriate, there is a noted lack of motivation for communities to develop plans, the development of plans that lack involvement from the greater community, and a lack of action in implementing adequate protective measures (Bokor and Harper, 2002). Additionally, there is a lack of a way to track the progress and effectiveness of community protection planning of communities across the United States. The social nature of planning and the voluntary and diverse mechanisms within different regions and states makes it very difficult to devise a way to track the overall effectiveness of the community planning. In essence, there is funding being spent for states to assess water sources of communities, and a lack of a mechanism to ensure effectiveness and to track progress.

Research Need and Justification Communities: All over the United States will be planning for protection for their drinking water sources in the near future. Most of the states will be providing drinking water source assessments, geographical zones that depict the origination and protection zones for each water source. There is a real and immanent need for better methods for communities to be able to access information that will assist them in understanding their unique water sources and the potential threats to these sources in order to devise appropriate protection mechanisms. There is also a need for better ways to involve the entire community in the planning process so that implementation of the protective measures is carried out in reality. Finally, there is a need to measure progress in a way that centers on communities in different regions, social, economic and cultural settings and is useful to the states and the federal government.

Research Goal: The purpose of this research is to provide new information on community drinking water protection planning and evaluation for specific use with the source assessments and protection programs determined by states and assisting entities.

Research Question, Goals and Objectives: The research questions are as follows:

- How can communities more effectively involve and increase the awareness and education of community members and therefore develop and implement plans more effectively?
- How can the effectiveness of community planning be measured in a way that is useful to the states and the federal government?

The aim of this research is to provide new information on community drinking water protection through the following goals:

- The use of information tools and other techniques within the current drinking water management guidelines used in the selected area to increase participant understanding of the water source and awareness of the means to protect it that lead to more effective implementation.
- The development of a model based on the new information for use with state source assessment and protection frameworks to assist both communities and drinking water managers by increasing the knowledge base and involvement of the community participants.
- The development an evaluation element that is centered on community planning that is social in nature and hard to measure, that works in locals that differ socially, economically and culturally and may be useful at state and federal levels in tracking progress and effectiveness over time.

To address the research goals the following objectives are used to design and guide the experimental design and selection of methodology:

Protection Planning Field Experiment

- Set guidelines to select participating communities.
- Design a field experiment to develop and test techniques to increase participant education, awareness and involvement in protection planning.

Evaluation Measure Development

- Utilize information from existing Federal guidelines, the mapping and planning experiments, and a drinking water manager survey to develop methodology for the evaluation of community drinking water protection plans.

Model Development

- Draw conclusions on the results and present recommendations in the form of a model that includes this new information on increasing participant involvement and education and an evaluation methodology.

Statement of Results or Benefits:

In a large sense, this project addresses the problem of encouraging and tracking the effectiveness of participatory decision making at the community level. Specifically, the results will add to the knowledge base of community efforts in implementing effective

water management measures in a way that is beneficial to the communities and useful to the state programs that manage their drinking water sources.

On a regional level, the results of the study will directly benefit the volunteer communities and constituents and the Nez Perce Tribe (most of the communities reside within 1836 Treaty Boundaries).

Nature and Scope of the Research:

Nature of Research: The testing of methods to increase community awareness, involvement and evaluation in drinking water protection planning with volunteer communities within Idaho. The methods are tested within the accepted Idaho State drinking water plan certification process. A model is developed that includes an evaluation element for use by communities and drinking water managers. This project continues research by utilizing the data gathered and analyzed during the 2001-2002 project “Integrated Drinking Water Protection on the Clearwater Plateau of Idaho, including the Nez Perce Indian Reservation.” The graphic tools developed during that phase are used in the planning experiment as graphic tools for planning.

Scope of Research: The scope of the research is the development of a theoretical generalization drawn from the results of the observation and testing of methods within the actual drinking water protection planning of several communities in Idaho. The focus for the planning experiment is voluntary participation at the municipal level. The manager survey focus is voluntary participation from drinking water managers from each state in the United States.

Methods and Results:

Planning Experiment

Planning Experiment Design: The following general guideline for municipal source protection planning in Idaho was used as the initial study framework:

1. Several communities expressed a desire to develop a protection plan.
2. The Idaho Rural Water Association (which follows steps that lead to Idaho certification) assists in planning.
3. The State source assessment is used to develop the plan through a planning team.
4. Once the requirements have been completed, the plan is state certified.
5. The plan is reviewed every 3 years for re-certification.

The following options to increase the awareness and involvement of the community were presented to the community and through the planning team. Facilitation was offered to assist in the increased involvement efforts (beyond the current procedure outlined above).

1. Use of graphic tools by the planning team and in public meetings.
2. Enhanced public notification methods to increase involvement of the greater community beyond the planning team.
3. Public meeting to inform the greater community of planning and to gather more support and interested planning team members.
4. Public open house to raise public awareness and gather comments and ideas from the community for the draft plan.

The options were offered objectively and without positive or negative feedback, with the understanding that they could choose from them freely. Variable in the experiment are choices made by planning teams and the observed use or non-use of these options. The results were noted through observation and digital photographs taken at the public meetings.

Selection of Communities for Planning Experiment Participation: The communities of Nezperce, Orofino, Winchester and Lapwai were selected as potential participants using the selection criteria. All four communities had recently been delivered a source assessment from IDEQ, had not yet developed protection plans, had expressed interest in protection planning, had participated in the mapping study, and had distinct water protection issues. The city council was given a brief presentation on the planning process and the additional opportunities that would be presented as part of this research.

Nezperce is concerned about high levels of nitrate in the deep aquifer, from which the source water is drawn. Orofino is chiefly concerned that the current source of water, the Clearwater River, is unprotected from the major highways that lie adjacent to the entire source area. Winchester indicated concerns about land use and contaminants, mainly regarding recreation and water quantity and quality. Lapwai expressed concerns about pesticides in the groundwater and about growth and planning in an area with little remaining buildable land. All of the communities immediately agreed to participate in the planning experiment.

Enhanced Notification Options: The planning team is customarily formed through selection of the city council; either volunteer or recruited participants make up the planning team. Options were presented for the purpose of reaching more people in the community. The community was notified of the upcoming water planning, and offered an opportunity to participate in planning.

Table 1 lists the options for enhanced notification

Table 1. Options for Increasing Public Notice of Drinking Water Plan

Action	Options
Public Notification	<ul style="list-style-type: none"> ▪ Notice in Water Bill ▪ Notice in School Flyers (focus on 6th and middle school) ▪ Flyer or Bulletin Posted in Areas of High Visibility ▪ Local paper Community Service Posting ▪ Special Invitation Letters to Resource Managing Entities

	and Landowners
Content of Above Public Notice Options	<ul style="list-style-type: none"> ▪ Drinking Water Planning is Beginning for this Community ▪ Planning Committee Being Formed ▪ Announce Public Meeting (if selected) ▪ Community Involvement Opportunities

All four communities elected to send out public announcements. All communities elected to announce the planning process and an upcoming public meeting in the local newspaper and as a notice sent in the water bill to each household. Orofino additionally sent out a school “take home” notice to parents of elementary school students and also sent an extensive special invitation list to natural resource and other entities that may be helpful in planning such as the US Army Corps of Engineers and the State Highway Department. Both Orofino and Nezperce posted flyers at convenience stores and other high traffic areas. Lapwai sent a color bulletin to each household (Lapwai’s own option).

Public Meeting Options: The public meeting attendance was generally low despite the enhanced public notification methods. Orofino had 8 attendees, mostly natural resource entity representatives and no community members present that were unconnected to the city council. Lapwai and Nezperce had 7 attendees, with 2 and 3 community members respectively. Winchester had the largest attendance of 10 at the public meeting, with the highest number of community members at 5. It is likely that Orofino’s good response from the natural resource and related entities is due to the many special invitation letters that were sent out to these parties. It is more difficult to determine the reason for the relatively high turnout of community members at Winchester’s public meeting. With the special color bulletins sent to each household in Lapwai, it was expected that Lapwai would have the largest turnout of community members. The time of year is also important. The Lapwai City Clerk suggested that Lapwai’s public meeting might have had lower attendance due to the date’s proximity to the holidays.

A power-point presentation was given by the facilitators. Following that, a question and answer session provided further understanding to participants. The maps developed in the first year were used to assist in providing understanding, as discussed in more detail in the following section on use of graphic tools.

Although there were not many participants, those that attended were very positive about the planning process and water protection. It was well noted that at the beginning of the meeting there was a very low awareness level of the water source what protection entailed. It was striking at the speed at which the participants put together extremely complex hydrogeological ideas. The use of the PowerPoint presentation in conjunction with the maps was very effective. The reason for this is likely that the participants have at their disposal a storehouse of anecdotal information about their locality and water source. The maps help them visualize the overall water source in a larger context, with the added layers of protection planning process, contaminant threats, geological setting,

and land use and ownership patterns. These help the participant form a pattern or context in which to frame all that they know about their location.

Workshop Options: Table 2 lists options that were presented to each planning team for an open house to present the draft plan and to get input from the community members.

Table 2. Options for public workshop for community education and input on plan

Action	Options
Display of draft Drinking Water Plan	<ul style="list-style-type: none"> ▪ Display maps from mapping project ▪ Display maps that show source protection areas in detail ▪ Display of major points of plan on signs or posters ▪ Display of other (name)
Water Education Materials	<ul style="list-style-type: none"> ▪ Display of literature and pamphlets to “take home” ▪ Demonstration of groundwater model ▪ Other (name)
Getting Input on Plan from Participants	<ul style="list-style-type: none"> ▪ ”Talking Tables” where they give input on each part of Plan ▪ Open-speaking floor for community members ▪ Mapping exercise, participants write over maps to show ideas/and or add to the contaminant inventory ▪ Other (name)
Workshop Facilitation	<ul style="list-style-type: none"> ▪ Researcher and IRWA ▪ IDEQ assists or is present ▪ Planning Team assists or is present ▪ Other (name)
Public Announcement of Workshop	<ul style="list-style-type: none"> ▪ Post in Newspaper Draft Plan and Invitation to Workshop (at least 2 weeks prior to workshop) ▪ Take home note to schools (name age group) ▪ Flyers posted ▪ Other (name)
Serving Food to Make Open House more Attractive	<ul style="list-style-type: none"> ▪ Coffee and refreshments ▪ Dinner items such as chili, corn bread, hot dogs, nachos and sub sandwiches ▪ Brownies, cookies, etc.

All four communities elected to have workshops for the purpose of presenting the draft plan and getting ideas and input from the community on the plan. The communities requested all of the items that were offered on the option list.

Visual aids were displayed - large, laminated, color wall maps that were developed during the first year of research. Tables were set up to display water protection literature. A large felt and Velcro board displayed the draft water plan, with three sections: an introduction to water planning, the threats to water quality for that community’s water source, and draft management options that the planning team had recommended.

A table was set up with the Idaho Rural Water Association groundwater model. This model shows a life-like visual of a working aquifer. It has layers of sand and impermeable layers complete with wells, streams and lakes. When red ink is injected into the wells, it infiltrates other wells, different aquifer layers, and eventually the lake and stream.

The tables were set up in a horseshoe fashion, with food placed at the beginning of the circuit. This was to encourage the community members to see everything and to feel free to stop and ask questions. Planning team members and the facilitators were on hand during this beginning informal “information browsing” period.

A ring of chairs was set up at the open end of the horseshoe pattern. Following the informal perusal of information, participants were called to sit at the chairs. A flip chart was set up in front, and two facilitators were present. One facilitator answered questions about the water plan, management options and threats to water quality. The second facilitator solicited participant input and wrote it down without comment.

Public notification of the workshops was through articles in the most popular local newspapers. In addition, small flyers and large color bulletins were posted in public areas. The city of Nezperce arranged for a radio interview, as radio is a popular form of communication in that locale. The cities of Winchester and Lapwai sent out notices in water bills. The City of Orofino has a plan that includes several communities working together, and placed articles in two separate newspapers. In addition, a lighted sign that flashes community information announced the open house.

Attendance at the open houses was better than at the first round of public meetings. Nezperce had 22 community members, Winchester 14 and Lapwai 17. These figures do not include the planning team and facilitators. These were fairly good turnouts considering the small size of these communities. Orofino, with a multi-community plan and a larger population surprisingly had the lowest turnout of 7 community members.

During the information period the participants gravitated to the visual and graphic tools – the colorful large maps and the groundwater model. They preferred looking at large graphics and talking with the facilitators and planning team to reading materials. The information board, water protection information and a large comment board were of far less preference. In fact, only one comment was left on an unattended comment board during all four open houses.

During comment sessions, the participants at first asked many questions of the discussion facilitator. At every open house, the participants were reluctant to write the comments on an unattended comment board. Yet they became very free with offering comments as a group in front of a flip chart. These comments showed a good understanding of the water source and ideas for protection. Again, in every case, the planning team found the comments useful. In addition, the participants showed an interest in becoming more involved in protection planning. They voiced a new understanding that the community needed to be involved in order that changes would be implemented. They conveyed an

understanding that water protection would be ongoing and may change over time as the protection needs changed. This was evidence that the open houses served the purpose of raising awareness.

Use of Graphic Tools: The graphic aids were developed during the first year of research. These are large, laminated, color wall maps that depict the water source, source protection area, hydrogeology, land use, ownership, potential contaminants and contaminants of concern to the communities. Many participants noted the helpfulness of the maps in assisting them in understanding the water source and how protection may be implemented. It was notably observed that the participants spent the most time at the maps in comparison with other displays. Virtually every participant spent time at the maps, and most spent more time at the maps than at other displays. Many of the participants commented that after looking at the maps they understood what their water source was, where it came from and the need and means for protecting it.

The planning experiment determined which methods for increased public involvement were selected and the response to those methods by four communities in Idaho. The following conclusions were drawn:

1. Community leaders (planning teams) have a desire to increase the awareness and involvement of community members.
2. Creative methods are needed for notification of the community of water planning and public meetings. These will vary by the community.
3. More than one public meeting is more effective. As the community becomes familiar with the idea of planning, public meeting attendance will rise.
4. Large, colorful maps that utilize state source assessment; land use, ownership, hydrogeological and contaminant information are invaluable tools for increasing public awareness in water protection.
5. Public meeting participants prefer visual water protection information over written.
6. Public meeting participants prefer to give water protection comments in a facilitated group over individually.

Evaluation Measure and Model Development The evaluation measures are designed to be useful to communities for effective planning and for updating and determining progress on existing plans. In addition, the measures are intended to provide information that is useful to states in their source assessment and protection programs and for the federal government in assisting in evaluating local plan strategy and effectiveness. The effectiveness of municipal or local protection plans is difficult to measure, yet remains a goal at the state and federal level. USEPA guidance, a state drinking water protection manager survey, the results of the planning experiment, and the city council survey and mapping experiment (field study conducted the first year of research) are used to develop the evaluation measures.

EPA Source Protection Strategy: As part of a source protection strategy, EPA is working closely with states and others to determine if contamination prevention efforts making a

contribution to public health. A draft of a protection strategy and a matrix of measures (USEPA, 2003) were used as a guideline in the development of the evaluation measures in order to provide information from local source protection plans that will be useful to states and to the USEPA in tracking the progress of local plans. The USEPA matrix and the strategy were used to guide the questions that were asked of state drinking water protection managers and the city council members, as well as in the design of the planning experiment. The following elements in the strategy were identified as guidelines that would be useful in evaluating local or community protection plans:

A local protection strategy or plan includes these elements:

- A local team or partnership
- A process for using state source water assessment information
- A preventative action list
- A contingency plan for an alternative water source

Measure of implementation of the above elements:

- All four elements above are implemented
- There is partial implementation of these elements
- The strategy is not implementing the elements

Drinking Water Protection Manager Survey: All 50 states plus Washington DC (which has its own water source) were selected as the sample for a special group survey. The managers represent a special group of state drinking water professionals. The manager from each state is selected as the most knowledgeable manager in that field for that state. The results are not presented as representing individual states or state policy, but as an experienced state manager group that can provide information on current and past protection planning efforts.

The selected sample group is professional state drinking water source protection managers, and there are 51 (state) units that each has a central office manager. Because the sample size is relatively small all participants were highly encouraged to respond to increase the validity of the results.

The survey was tailored to provide information on ways that experienced managers feel that progress can be evaluated and barriers overcome. A partially open-ended survey was created to allow participants to easily add more information and to encourage response on often-sensitive drinking water protection issues. The survey, responses to the survey, comments from participants and ranking analysis are detailed in Appendix B. There were eleven semi-open ended questions. Eight of the questions asked for a ranked response to several given responses (highest or best response to lowest or least). In addition, an “other” selection was placed in the responses to give the participants the choice to add a response of their own. Two questions were yes/no or either/or and one was fill in the blank.

A telephone interview was offered in order to further encourage reluctant or busy participants. The surveys were sent by email following an introductory email that described the objectives for the research and the survey. The drinking water manager

contact names and email addresses were obtained from a USEPA website (2002d). Up to 7 follow-up emails were sent to non-respondents. Subsequently, up to 3 telephone calls were made to selected participants that had as yet failed to respond and/or return the survey. The telephone messages offered a telephone survey as an alternative to the electronic response. Of the 51 that were selected for the sample group, 100% participated.

The survey questions were analyzed by adding the number of participants that responded to a question with each ranking level. For instance, those ranking a question as being of highest priority were added, those ranking a selection as second highest priority and so on. A group ranking was derived by selecting the answer that had the highest response in each category. The following conclusions are drawn from the survey and interviews:

1. Over half of State Drinking Water Protection managers do not think community protection plans actually protect the water source.
2. In current planning efforts, funding, technical support and networking with other communities is what is lacking in effective planning.
3. The major barriers to water protection that the communities face is local land use practices, lack of motivation and lack of “buy in”.
4. Success in planning is best measured by the presence of an ongoing committee, the degree and number of land use changes such as zoning, and improvements in contaminant levels.
5. The factors that best define Adequate/appropriate protection mechanisms are the community is educated on sources and threats, the plan is truly representative of community and the community members feel involved.
6. A state can best assist communities in planning through funding incentives, decreasing regulation, facilitating workshops and seminars and providing spatial data for education.
7. The federal government can best assist states in assisting communities by increasing protection funding, greater flexibility in fund use and responding to each state’s unique character.
8. Communities can best foster their own protection planning by forming true working water committees, creative and effective public notification, education and workshops and seminars.
9. Entities that should work closely with the communities in protection planning are county/extension, other water source related communities, non-government/non-profits, and the state.
10. The percentage of state protection planning programs that are voluntary is 86%.
11. Approximately 18% of community protection plans are completed in the US (a very rough figure as reported by the state managers at the time of writing).

Survey of City Council Members: The members of the city councils of 12 communities were given a brief survey to determine major water protection needs during the first year of research. The survey was given to the city councils and those that assisted the council. The survey design was semi-open, with four questions asked, several possible choices

offered and an option to provide an answer that was not listed. Conclusions drawn from the survey are as follows:

1. The biggest issues facing the communities in protecting drinking water sources are financial (77%), contamination (42%), political/jurisdictional (42%), land use (32%), and growth/planning (30%).
2. These issues are best resolved by receiving information on contaminants (46%), land use and ownership (42%), water source boundaries (40%), jurisdictional (35%), and infrastructure (33%).
3. The communities specified that they would be most comfortable in working on drinking water protection activities with the State (81%), County and Conservation Districts (47%) and Federal (12%) entities.
4. Government resource managing entities could do more to assist in drinking water protection by more technical assistance (77%), data sharing (56%), financial assistance (16%) and better regulatory assistance (7%).

Mapping Experiment Results: The results of the mapping experiment during the first year of research are summarized below:

1. The largest barriers to accessing the data and to motivation in protection planning are trust and privacy issues, and concern for increased regulation and associated cost.
2. When given access to graphic data from the state and state source water assessment, the communities elect to design large, color wall maps for community education purposes.
3. Communities select graphic data that addresses water protection issues that are unique combinations in each place as related to political, jurisdictional, and infrastructure as well as land use, hydrogeology, terrain, potential contaminants and risk of pollution to the source.
4. Although these issue combinations are complex and unique to each place, similar sets of spatial data and display formats are chosen to address them.

Evaluation Matrix: An evaluation matrix was developed by designing requirement categories from the USEPA evaluation strategy and matrix (Table 3). The results from the state drinking water manager survey, city council survey and mapping experiment (first year research) and the planning experiment were used to develop measures within the requirement categories.

The measures are designed to provide information from the communities that will be useful in tracking progress as well as for state and federal reporting, tracking and management. The matrix has an easy to read and mark format, and contains buttons that can be linked to databases and accessed from websites.

Table 3. Community Drinking Water Plan Evaluation Measures

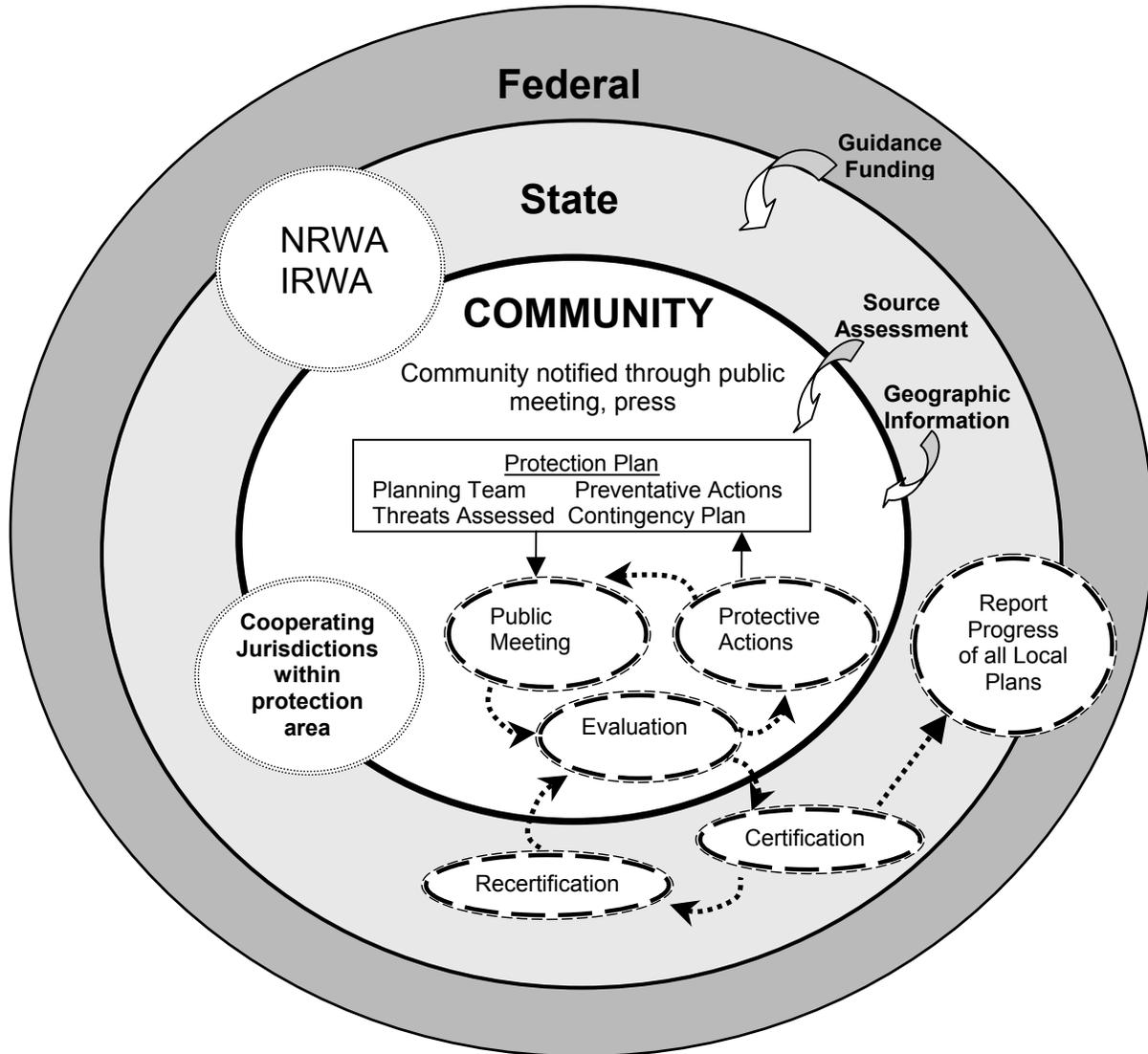
USEPA/State Requirement	Community/Local Planning Evaluation Measure	None	Partial	Fully
Local Planning Team	Community leadership declared intention to develop a local water source protection plan			
	Concerns expressed by community leadership were addressed by the state/assisting entities			
	Community leadership notified constituents of the protection planning process			
	Community leadership provided constituents with an opportunity to participate in planning			
	A protection planning team was formed from local constituents			
	Public events such as open houses were given by the planning team to gain support/input from community			
	The planning team remains or forms a committee to manage and track progress on the plan			
Use of State Source Assessment	A complete state source assessment was provided to the community planning team			
	Graphic information that includes source area was developed with/by planning team			
	Graphic information that includes source area was made available to community constituents			
	Community feels it has access to spatial and tabular data as requested by the community			
	The community met (any) state requirements for a contaminant inventory			
	The local plan utilizes and adequately portrays the state source assessment, including water source vulnerability/susceptibility rating			

Preventative Action	Preventative/management actions adequately address threats			
	Water quality standards are within state/federal requirements			
	An implementation committee or board composed of local constituents meets at least twice a year to manage plan actions			
	Preventative actions to involve and update the community are present in the plan			
	Preventative actions have been implemented this plan period (under state certification)			
	If protection zone reaches beyond municipal limits, zoning or other mechanisms have been implemented to provide adequate protection			
Contingency Plan	A contingency or emergency back-up plan is in place to provide an alternate water source to the community			
	Specific water distribution means and/or locations have been designated to provide efficient water distribution in case of source failure			

Model for Increased Participant Involvement: A model to increase public awareness and involvement in community or municipal drinking water protection was developed using the results of the first and second years of research (Figure 1). The model is designed for use by communities with the assistance of the state and the facilitating or assisting entities. The research tested education and involvement methods within an existing state protection-planning format that leads to state certification in Idaho. The model applies results and conclusions drawn from the mapping experiment and city council survey (first year research) and the community planning experiment (second year research).

The model is a non-linear flow-loop with the community as its focus and center. The state is nested within the United States, and the community is nested within a state. The National Rural Water Associations and Idaho Rural Water Association (used as an example in the model for working with communities in the state of Idaho) are assisting entities that work with municipalities to assist them in developing water protection plans. Any assisting entities that work within a state framework can be substituted.

Figure 1. Model for Local or Community Drinking Water Planning and Evaluation



The federal government provides the states with funding and guidance for developing water source assessments and overall protection plan guidance. The community or local protection plan is developed by the community with the assistance of the state and/or

assisting entities and with any municipalities or jurisdictions that lie within the geographic water source protection area. Once community leadership has expressed a commitment to develop a plan, the entire community is notified and given the opportunity to participate through the most effective press avenues for the local and/or public meetings. The state provides the planning community the source assessment and any information that is requested that would be useful in education and increasing awareness for the purpose of informed decision-making. There is a decided emphasis on spatial or geographic information due to the effectiveness in educating people and the preference that communities show in selecting and using it over tabular or written information. Developing a protection plan involves four elements that are recognized in USEPA guidance: a planning team, use of the source assessment to assess threats, preventative actions and a contingency plan.

Community leaders, especially in smaller municipalities, often develop the protection plan. The greater community is given the opportunity to understand the water source and major threats to quality, the proposed preventative actions and given a chance to give feedback and ideas at public meetings and workshops. Revisions to the plan are made following gathering of public input and comment. The implementation phase begins, and the plan is evaluated by the community (see evaluation measures in previous section). The state reviews the plan and determines whether it will be certified. Plan revision continues in an ongoing loop of implementation, more public input, and re-evaluation and possible re-certification. In the State of Idaho plans are re-certified every 3 years. The evaluation measures are developed to be useful on an ongoing basis. Documentation and reporting of the certification and evaluation of the local or community plans is reported and tracked at the federal level for overall progress in the United States.

The advantage of this model is that it was developed using very low constraint methods, and the results have little likelihood of being influenced internally by experimental control. Yet, there is much variation among communities in the United States, and there is a higher likelihood of external factors such as cultural or social bias or variation in this area. The model should be tested further before conclusions can be drawn on efficiency and widespread applicability.

Literature References

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USEPA, 2003. Office of Groundwater and Drinking Water, Prevention Strategy and Matrix of Measures, Website: <http://www.epa.gov/safewater/protect/contamprev.html>