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# Kentucky Streams and Wetlands, 2009-2017: A Comparative Study

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Eastern Kentucky University



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# KENTUCKY STREAMS AND WETLANDS

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A comparative study of interview data from 2009 and 2017 concerning a planning framework for the Kentucky Streams and Wetlands Conservation and Restoration Program.



Honors Thesis  
Submitted in Partial Fulfillment  
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# KENTUCKY STREAMS AND WETLANDS

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## Abstract:

The bulk of Eastern Kentucky University's 22 county service region provides an ideal landscape within which to observe, study and promote awareness on key, critical issues facing the commonwealth today regarding environmental conservation and restoration, as well as the impacts made upon communities. These issues are not new to Kentuckians and have been studied and concerned citizens state-wide for many years. Owing to her years of work and data collections in the area of stream and wetlands conservation in Kentucky (particularly Eastern Kentucky), Sociologist Dr. Stephanie Mcspirit has provided ideal conditions to explore this issue at the undergraduate level. Through the process of examining, updating and analyzing data collected approximately 8 years ago, this paper attempts to understand efforts, perspectives, concerns and the main themes of prescriptive advice from citizens, politicians and experts working at all levels of authority in the environmental arena. As transcripts are annotated from both face to face and telephone interviews, steering committee meetings, presentations, lectures and surveys conducted during this time frame, further research questions will arise which address many of these issues *as they stood 8 years ago*. Using this information, current factors, trends and concerns will be examined by reviewing relevant academic literature and

gathering current data by re-interviewing key stakeholders in a follow-up format, using the same questions as before, in order to form a basis for comparison. The information gained as a result will further inform and craft the most poignant questions to pose, moving forward, and it will provide a larger, more empirically-based framework of study within which to conduct further studies. An additional focus will be made on the impact that these issues visit upon the people who live, work and play in the region, their basic social institutions, such as family and health care, and the underlying social contract which has eroded for them-in part, in the face of ever-deteriorating environmental conditions.

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## Kentucky Streams and Wetlands: A Comparative Study, 2009-2017

### Introduction

With over 90,000 miles of streams, many of which are headwater streams, Kentucky has one of the most extensive and complex water systems in the United States. These streams need protections because they provide important ecological services to the surrounding environment. Many provide drinking water to surrounding communities both within as well as outside our state. Once, in the not too distant past, Kentucky possessed over 80 percent more wetlands than the present day, primarily due to agriculture and urban sprawl. Many of the remaining twenty percent are struggling with various impairments (Ky. Partners for Fish and Wildlife). Together, streams and wetlands in the Commonwealth continue to support some 35% of our nations fauna, including many exotic or threatened species (ibid).

Following the announcement by Federal Authorities of a “No Net Loss” policy regarding water and wetland resources and faced with these challenges, Kentucky began

funding research aimed at developing a comprehensive program to protect and restore streams and wetlands in the Commonwealth. In 2008, in cooperation with the Kentucky Department of Water, Dr. Stephanie Mcspirit, Associate Professor at Eastern Kentucky University, began to conduct and coordinate research in order to develop a planning framework to guide policy makers in the development and implementation of this program. A steering committee was formed, comprising State, Federal and University experts and stakeholders in the field to help guide the process. Panels were held in order to encourage many such experts to share their views, suggestions and expertise on the subjects of water quality, stream impairments, wetland restoration, permitting and mitigation techniques and many other important issues, both in terms of challenges as well as opportunities. In addition, over 40 telephone interviews were conducted, targeting stakeholders at various levels from all over the state, in order to gather additional data from a broader range of views. Additionally, an online survey was conducted, aimed in much the same way and gathering much the same data, which produced 723 valid responses at a 67% response rate (Mcspirit, 2010). In 2017, additional telephone interviews were conducted for the purpose of collecting additional data for review, alongside data gathered from the original work.

### Initial Findings

Through the process of reviewing and analyzing past survey and field interview data collected approximately 8 years ago and telephone interviews in 2017, for the purpose of developing a planning framework for the State's streams and wetlands conservation and restoration program, (Mcspirit D. S., 2009), two questions found in the standard survey questions (which were asked of all stakeholders who participated), were

found to produce a rather consistent response pattern. Questions eight and nine ask respondents/interviewees to identify the top two or three opportunities or challenges, respectively, in the years ahead for achieving streams and wetlands conservation and restoration goals, as set forth according to the previously mentioned “No Net Loss” policy. The following four responses categories represent the most consistent found among the experts interviewed or surveyed:

- 1) Funding: This recurring concern relates to all aspects of our topic and has been characterized as the main predictor of the success of any program or organization relating to conservation/restoration efforts.
- 2) Regulations: Another recurring concern, often centering on not the creation of new or tougher regulations, but tighter *enforcement* of existing ones, and streamlining of various processes.
- 3) Partnerships: Included here are multiple related concepts, such as continuing and strengthening of inter-agency partnerships, but also better communication and cooperation with stakeholders at all levels, especially farmers and land-owners who have a perhaps more personal stake in these matters.
- 4) Outreach/Education: Experts have pointed to adoption of regular curriculum in all phases of primary education, as well as education of politicians and other decision makers. Education of and outreach to land owners was also emphasized.



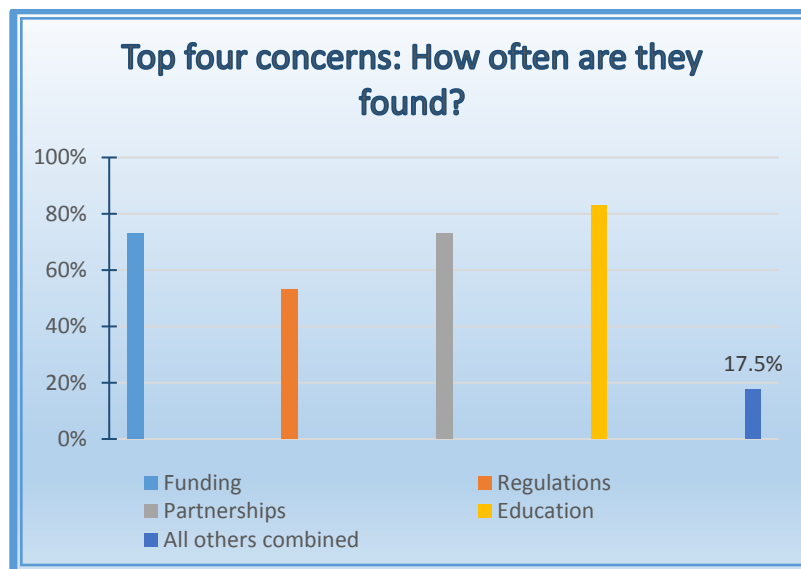


Figure 1: Percentage of times each of 4 consistent concerns were found; Smith, 2015. n=48

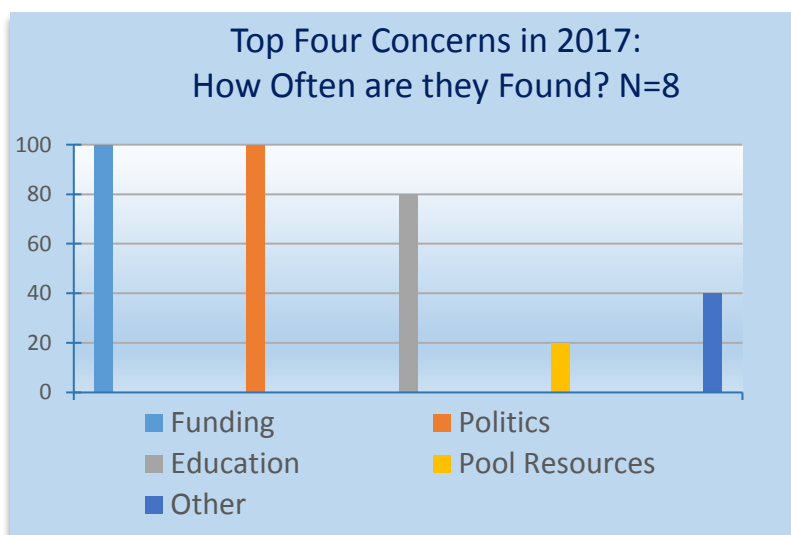


Figure 2: Percentage in 2017 of times each of the four most consistent concerns were found (Smith, 2017).

In 2017, telephone interviews were conducted, targeting key stakeholders who were interviewed in 2009. The same questions were asked of these

stakeholders, with the idea that views can change over several years, and new concerns can arise with changing conditions. Figure 2 illustrates the preliminary results of this follow up work. The findings of this second phase of the project will be outlined below. It should be noted that these two sets of findings do not

identify the same four themes. Again, this will be discussed in detail in the following sections.

First, two points should be made regarding these observations. First, there was found to be both interplay and overlapping influences among the four categories in both phases of this project. This factor will emerge from the more detailed discussion that follows. Second, it was interesting to note the support this finding receives in the form of high correlation with the major concerns expressed by steering committee members during the 14 moderated panels which were conducted alongside the interview/survey efforts included in the first phase of the project. This too will become more evident throughout this Study.

#### Funding, 2009

A Kentucky environmental engineer has noted that “Groups that have stable sources of funding can be, and typically are successful” (Smothers, Circ 2008). A Basin Coordinator and community organizer specifically in the field of our topic, echoes these sentiments with a bit sharper point, saying, “One of the biggest indicators of success is money and funding” (ibid). This was found to be the typical trajectory of the many comments found regarding barriers to success among the data reviewed. In fact, funding was most often cited as the *primary concern* or the most pervasive barrier to overall success in protecting and conserving this precious resource and restoring, minimizing and/or mitigating losses sustained through development, storm water runoff in urban areas, agriculture, resource extraction and non-point sources of contamination. As an ichthyologist at the biology department at ECU has observed, “...for these programs that are out there to be effective, it boils

down to money, and it always does” (Harrel & Eisiminger, 2008). Funding for conservation and restoration work has been a difficult matter to negotiate, simply because, while funding may come from a number of sources such as grants through organizations like the Appalachian Regional Council (A.R.C.), Federal contributions through EPA, US Fish and Wildlife Service, and many lower-level, but very important State and local sources, there is struggle over how these funds are to be spent. For example, the Kentucky Department of Fish and Wildlife Resources (KDFWR) administers a streams and wetlands mitigation process which is mandated under Federal authority through the Army Corps of Engineers. This statute requires all instances of mitigation to be matched by a proportionate fee, to be paid to a mitigation bank or paid into the “Fees in Lieu Of “ program, handled directly by KDFWR, who appropriates such funds into off-site mitigation in the form of restoration efforts, preferably within the watershed where the original loss or impairment was incurred. These projects are costly. A KDFWR employee and advocate for conservation and restoration efforts, works for this program. He estimates that the average cost of the projects his agency has identified, designed and forwarded to the construction phase to be \$818,000 (Zimmerman, unk). With the total miles of restoration estimated to be 32.5 over 31 approved projects (this was several years ago, and 14 of those 31 were still in the design stage), one can begin to appreciate the massive funding requirements – and this is mainly on the side of restoration. “It has been proven countless times that it is cheaper to protect a good quality stream than to restore a poor quality stream”, argues another stakeholder in the above quoted panel discussion. Echoing this wisdom, there

has been significant agreement expressed in these transcripts that, while restoration efforts are indeed vital to an overall strategy, we should consider *conservation* efforts to be of greater importance when considering overarching policies. Yet, often when faced with budget deficits, Federal and State legislatures have often authorized cuts in funding for conservation programs and projects.

### Funding, 2017

Funding was again a major concern stakeholders expressed in the interviews which took place in 2017. A former KY Watershed Coordinator recently remarked, “It’s bleak, the amount of funding that exists for these projects” (Withrow, 2017). The issue of funding, whether Federal, State or local, was brought up in 100% of interviews. Another concern, discussed below, was also mentioned in all interviews. However, it is the issue of limited funds which was actually stated and restated more often during these interviews (34 vs.13 for politics, respectively) which places this issue firmly at the top of all concerns expressed by stakeholders in these interviews. “Funding is always an issue we keep coming back to”, remarked an Army Corp of Engineers project director who was for several years heavily involved in Kentucky streams and wetlands issues at the state level. According to stakeholders, the reason funding is at the top of the list, so to speak, is because it is involved with almost each and every aspect of the restoration process, and in is heavily influential in every aspect of conservation efforts.

### Regulations, 2009

Regulations have been cited in 65% of the transcripts reviewed. When it comes to government regulations, it should take little effort to establish that things

can quickly become complicated, even to the point of virtually stalling program efforts mandated by the very agencies which create the regulations. As a leader in environmental research and sustainability issues at ECU remarked in a 2008 panel interview, “People want to help but the regulatory framework stops them from doing what is right... if you follow one regulation you might be violating another one at the same time” (Jones, Panel Interview, 2008). While some took a more assertive, almost Machiavellian approach, calling for new or tougher regulations, others sought only to bring better organization and streamlining into the overall focus. A Ky. Department of Transportation Cabinet employee in charge of its Stream and Wetland Mitigation Program was interviewed during this project. He relates the gravamen of frustration which has been experienced by him and other experts:

“I feel that the 401 and 404 programs are (ironically) barriers to the efforts to conserve and restore our streams and wetlands. “The permitting process is extremely cumbersome and extremely expensive.” It can take 1-2 years just to obtain a permit so that some beneficial work can commence. You can more quickly get a permit to impact a stream than a permit to fix a stream. “There is just something inherently wrong with that I think.” They are trying to figure out what makes a successful stream project which is a hard task to complete. It takes a huge amount of work and man power (This of course relates to funding, author’s note). In my opinion it should be quicker to get a permit, we should not have to wait so long” (Peake, 2008)

Others have pointed out other concerns, such as the director of the Water Resource Center at Western Kentucky University. He suggests that “The regulatory agencies have the greatest potential to be effective.”, but cites a lack of “...political will to enforce the statutes and regulations that currently exist” (Ernest, Circ 2008). Offering at least some support for this claim, he points mainly to “...strong lobbies in the State that prevent enforcement of regulations in certain sectors (ibid). Meanwhile, further evidence of the

intersectionality among these themes can be seen in the remarks of a consultant and resource manager for multiple agencies, such as the Commonwealth's Wetland Reserve Program. Regarding enforcement of existing regulations, he cites a "...lack of personnel", and furthermore, comments on "having suitable regulations for development and making sure that there *is the man power and dollars out there to oversee those regs*" (Howell, circ. 2008, emphasis mine) So, while regulations remain a major concern among a significant number of experts across Kentucky, there also remains some disagreement among them as to the defining aspects of enforcement which stand in the way of progress.

#### [Regulations, 2017](#)

Regulatory issues were again given as concerns in some telephone interviews. However, the subject did not garner the attention it once did, and was simply overshadowed by the issues discussed in the current work. It is worth mentioning what one prominent educator had to say in regard to regulations and recent regulatory changes: "...through the absence of any regular regulatory structure – the regulations are there – it's all about implementation, documentation and monitoring. By not doing any of those things, we are effectively bypassing the Clean Water Act" (Jones, 2017). This stakeholder was also concerned about the recent rollback of the Federal Stream Protection Rule, as were others. However, hers was not an eco-friendly, tree-hugging rant, but a much more pragmatic approach. As she stated: "The rollback of the Federal Stream Protection Rule is a disaster. I understand the concerns of the coal industry that the rule, as written, in effect put a chokehold on all their operations. But all or nothing are not the only choices. Coal mining, as a land use, is an activity which takes up a lot of land... We're talking

about the interface of land use and water quality, and when we talk about that, we have to be talking about the largest land users” (Ibid). Again, with this particular regulation, others agree that the rule was probably unacceptable *as written*, but that another rule, incorporating some form of compromise, should take its place as soon as possible.

### Partnerships 2009

As already noted, the concept of partnerships has been expressed in several different ways, and it is important to distinguish, if even broadly, among them. This is a theme in which comments were found both in terms of potential opportunities as well as potential barriers or difficulties. However, in any case, there was found to be a large consensus on the importance of partnerships. In fact, of the many transcripts reviewed, various partnerships were tied with funding, both being expressed as concerns 73% of the time. Some have espoused a more functionalist approach, such as A State-level employee in the field commented that “...any interagency partnership would be highly effective, whether that’s a governmental-educational partnership or even inter-government. I would say they’ve been pretty effective, due to the information sharing that goes on between them.” (Mitchell, 2008). The majority of experts, however, look toward a micro-level solution, pointing out that interaction and partnership with farmers, landowners and everyday citizens can produce greater political pressure as well as incorporate a well informed and broad range of perspectives. Again, and rather succinctly, an environmental expert at ECU is specific: “Everyone should be obliged to combine efforts. Important partners: 1) local watershed watch communities, a monitoring group made of over 1,500 volunteers all over the state who test waters. There is a serious complication-the Division of Water does not recognize their data and there is no functional relationship between the

Division of Water and the watershed watch groups. 2) NRCS-agricultural community: includes conservation districts, Future Farmers of America, 4-H, etc. These join together many of the local people that have the potential to formulate great partnerships.

Networking with locals is also a possibility” (Jones, Panel Interview, 2008). This example dovetails nicely with the prior comments in terms of the level of communication, or lack of communication, which can result from effective partnerships. Effective communication lies at the heart of one of one of the Kentucky Department of Water (KDOW) employee’s greatest concerns. He favors a holistic approach, but is specific on the issue of micro-level communications. In his words:

“I can tell you by experience one of the first things that you do if you go onto a farmer’s field and he has a stream with a lot of erosion and stream bank problems, flowing out at corners and bends, when you start telling him what you can do to fix that problem, if he’s been living on that property for his whole lifetime and maybe his parents’ lifetime, if you start rattling off a lot of jargon to explain to him how you can fix his problem, depending on what you propose, he’s going to know whether or not you actually know what you’re talking about. I would say that because he’s a farmer, not a stream geomorphologist, but what he has done that we haven’t witnessed what that stream has done for potentially the past 40, 50, 60 years of his life” (Eisiminger, 2008).

Another stakeholder concurs, as her response indicates: “With that I’ve seen and with these restoration projects, if you can get one landowner on board, a lot of times you can get others on board, because they see the positive effect” (ibid). It is necessary to point out that this is by no means a novel concept. In his 2000 article entitled “Public Participation Methods: A Framework for Evaluation”, and echoing this sentiment, another stakeholder makes the following observation: “ In any case, public input has



arguably been incorporated into risk management in an informal manner over many years as public opinion has often driven political and governmental choices...” (Rowe & Frewer, 2000). There has been a shift in political and public thought regarding decision making strategies in risk and resource management since the era in which the Clean Water Act was enacted in 1972. There has been much talk of a “Watershed Approach “to conserving and protecting water resources which emphasizes heavy involvement of stakeholders at the grass-roots level; i.e., the people who use the resources. This paradigm shift makes sense in light of the fact that non-point source pollution of our streams and wetlands has gained widespread attention resulting from a growing number of studies which conclude that such sources represent one of, and arguable the single most significant factor in impairments at the watershed level. Overall, a collaborative approach which involves citizen stakeholders at every level of the policy-making process should continue to develop and strengthen, until this has become a standard for effective operationalization of streams and wetland conservation efforts.

### [Partnerships 2017](#)

The concern about building partnerships, particularly partnerships between locally-based organizations and landowners, thus reinforcing the watershed approach to conservation, was not a prominent concern among stakeholders in the 2017 interviews. The fact of the importance of *ongoing* partnerships was discussed, but in terms of major opportunities or barriers/challenges to conservation/restoration goals, this issue was subsumed by the larger issues currently being discussed. One Stakeholder, however, did make this one comment: “These partnerships seem to come and go – they’re a great tool for building

trust and cooperation and awareness, but they always seem to wane. I think they often run out of money and then, will (Withrow T. , 2017).

### Outreach/Education 2009

Outreach and education were cited most often in the total of all panels, interviews and surveys reviewed in this study. In fact, only 7 transcripts, out of over 50, contained no reference whatsoever to education as either a possible opportunity or as a potential barrier or difficulty (83%). In terms of substance, again, there is a divided emphasis. While some experts point to education and outreach to farmers and landowners, as quoted above, others find that education efforts should be focused elsewhere. Two main avenues were emphasized as positive opportunities in this regard. First, educating our politicians. One education expert in Kentucky explains that: “Many politicians are not knowledgeable about water quality issues and their ignorance hurts efforts to help the environment” (Smothers, Circ 2008). It certainly makes sense that our most influential Kentuckians should be as knowledgeable as possible on matters in which they are tasked to manage, including policies involving streams and wetlands conservation and restoration. Secondly, education of our youth has shown to be a strong suggestion among all experts who commented on the subject of education.” Education is very important because it is what creates positive opportunities”, commented an Army Corps of Engineers employee during a panel discussion. “...let them start out young and let them learn the importance of streams and wetlands.” (Devine, 2008). In agreement, another expert states the importance a bit differently, saying that we need to “... get young people involved with water quality issues in their local areas. I think older people are already set in their ways in thinking, so it’s harder to influence those people into changing their point

of view and how things are done. But if the younger generation is involved at the local level in water resource issues, and they understand the importance of water resources and keeping those resources in good shape, I think that changing the mindset of the average Kentucky citizen to where they understand the importance of water resources to themselves and others is an attainable goal.” (Vierheller, 2008). While it is doubtful that this comment meant that today’s generation of farmers and citizen stakeholders should be forgotten or given up on, this content nevertheless points to a very important factor in the human experience, that of socialization, and particularly *primary* socialization, which is thought to conclude by age seven in most children. This is the period known popularly as the *formative years*, and represents the time when a child learns the basic structure and dominant ideology in the society in which they live, as well as their place in it. Moreover, this is the time when, through social interaction, a child begins to form a concept of *self*, and begins to construct their basic personality and worldview, which in many ways become a permanent set of traits throughout life. An emphasis toward educating children on the importance of environmental issues as early as kindergarten appears sound in this light. In terms of the public education system, even though this typically marks the beginning of the “secondary socialization stage”, it is felt, at least by the author, that due to the fact that the school setting represents the first array of social interaction outside the family, that continued exposure through elementary school and throughout high-school to environmental conservation issues, including the protection of our streams and wetlands, would have similar long-lasting effects and would be perhaps one of the soundest investments possible toward achieving a generation of citizens who not only understand

the issues, but who feel, as a matter of civic responsibility (due to their upbringing, so to speak) that it is their duty to maintain involvement in such matters.

### Outreach/Education 2017

Education was once again one of the top concerns of stakeholders interviewed in 2017.

The prevailing view has shifted somewhat since 2009 in that, in 2009 there was more focus on educating farmers and politicians, where in 2017, the interest in education has shifted to children and the primary education platform. The importance of education as a way to address one of the barriers that we face today in terms of conserving these precious resources, seems key to our overall plan of success in the longer view. This is where sociology can explain, or at least has the *scientific jurisdiction*, as it were, to attempt to explain, why this is so, and how educational strategies can have a more lasting and remedial effect on things such as a “knowledge problem” (see below) or attitudes of citizens and future stakeholders toward these matters.

It is interesting to note at first what might seem obvious, once said, but it is important to say first, so that it is in the reader’s mind going forward. How folks feel about environmental issues depends on who they are. We are all different.... but how do we get to be so different? Studies have shown that there are several “social bases of environmental concern” (Fredrick Buttel, 1981) (these have become the basis for much academic study). These are factors such as age, gender, and ideology, and yes, education. “Place” affects environmental views as well. If you live in an area which has a great conservation program, and you have not experienced many negative effects of water pollution, you may not view this as a very urgent matter. You may, for example, favor

conserving resources rather than using them now in order to create jobs, if you live in a region with a low unemployment rate. How do you think many folks in Eastern Kentucky would feel if they were faced with this decision? (No jobs...)

Some who were interviewed in 2009 and in 2017 have commented on the perception of a “Knowledge problem” in general when it comes to stream and wetlands conservation and restoration. They were talking primarily about landowners and local officials who normally make decisions regarding efforts to conserve or restore water resources.

Accordingly, a call for expanded education and training opportunities was made, and yes, this is probably an accurate assessment and a reasonable response.

But Stakeholders are looking at this from a different angle. Not to throw out what others have said in 2009, as it is very important for those who make the major decisions to know what they are doing. This is obvious. The best decisions can only be made from a point of having the best, most accurate information.

This is about educating young people. This is where Sociologists can provide input, as much sociological theory is predicated upon a concept known as socialization, both primary and secondary (Parsons, 1956). This is the time in a young person’s life when life-long values and world-views are established. Sometimes called *the formative years*, this period of profound learning and impression-making is thought to end around five or six years of age for most children. While it might sound as though stakeholders are slowly giving up on older generations and looking to the youngest generations to affect long-term change in attitudes and perceptions regarding environmental issues such as these, and some element of this may well be in extant, it seems instead to be a matter of resource conservation itself that is causing this shift in emphasis, this time the resource

being money. It is thought by those who commented in this way that a concerted effort to establish environmentally friendly attitudes, conservation minded and knowledgeable, will be in the long run far more cost effective.

### Pooling of resources

The idea of pooling resources and concentrating project efforts geographically was mentioned in 20% of the recent interviews. This concept harkens back to the issue of funding, and again this underscores the expense of conservation and restoration projects. The idea of pooling resources took two major forms, and was not spoken of in 2009. First was concern for a shift in long-term development strategy toward *green development*. Second “...in terms of overall water quality...” we need to be looking at clustering best management practices (agricultural, author’s note) ... We are trying to get the most bang for our buck” (Jones, 2017). This means, as an environmental institute director explained, that instead of spending the money and investing the time to institute best management practices (BMPs) in diverse sectors of a watershed, as opportunities or convenience become available, these BMPs should be clustered, meaning practiced in neighboring sectors, in order to maximize the benefits of such techniques. Currently, there is nothing to compel, and very little to incentivize landowners to participate in conservation or restoration projects, and little follow-up support for them when they are willing to participate. It is mostly done on a voluntary basis, so that it is very difficult to integrate clusters of areas together to be cost effective and efficient.

### Political Climate

The current Political climate was a major concern of stakeholder interviews in 2017, most characterized as a *barrier* to progress. There is concern, due to the current conservative majority, both on the Federal and State level, that certain elements Often expressed as “political will”, this category of concern is often tied directly and understandably to the issue of funding, and was barely mentioned in 2009. Today cited in 100% of all interviews. This was aptly summarized by a retired Kentucky Department of Water Employee, who stated: “...There is no political will to get this job done right” (Withrow T. , 2017). Some stakeholders plainly stated that this is not a new development, as Kentucky has a long history of political inaction in environmental issues, and that the current circumstances simply add to all of the difficulties already discussed. It is, after all, our lawmakers who ultimately control funding for environmental stewardship and remedial programs.

### No Net Loss?

Many more stakeholders are now familiar with the Federal *No Net Loss* concept than were in 2009. In fact, that is a part of what was, in 2009, called a *knowledge problem*. However 100% agree that this goal has not been met in the commonwealth. A Biologist at ECU was interviewed for this project. His view was that, though regulations for mitigation were intended to replace function, the criteria have been implemented to replace mainly lost acreage (or stream-length, author adds). His opinion was that: “What’s being lost should be replaced in function and acreage and within the same environment. That’s just not the way it has been implemented so far...” (Richter, 2017).

The Kentucky Department of Water publishes a report each year called a 303(d) report, which reports of number of impairments known in the major watersheds. According to latest available 303(d): (KDOW, 2014)

- 2,597 listed impairments requiring Tmdl (Total Maximum Daily Load)
- 254 WERE NEW LISTINGS
- 64 WERE DELISTED

This may not tell the entire story, but it does at least show that in Kentucky, we are nowhere near a state of *no net loss* of streams and wetlands.

### Conclusion

Convincing evidence has emerged from both parts of this study; Past interview and survey data and follow-up telephone interviews, that the issues of Funding, (enforcement of) regulation, partnerships and outreach/education have weighed heavily in the minds of expert stakeholders from all corners of the Commonwealth when applied to the subject of streams and wetlands conservation and restoration. The comments quoted herein were woven throughout a large pseudo (but nevertheless, statewide) discussion, and the author has concluded that there was a majority attitude of open-mindedness and candor regarding issues the participant was perhaps less than knowledgeable in. This suggested an atmosphere of honesty and sincere concern, as the balance between ecological and economic needs seemed implicitly understood, and there was found to be, on balance, an encouraging amount of optimism amid concerns and or criticisms. Though education, particularly among farmers and politicians, was the most prominent potential opportunity found throughout the data reviewed in 2009, funding was most often cited as the most critical factor in predicting/determining the success of a conservation program or its components or partners. It was even mentioned during one 2009 interview that local, volunteer driven organizations are often effective for this very reason, that is, the fact that such organizations do not rely on a reliable source of funding. Hence, such a group is not



beholden to any outside influence in the political sense. Such groups tend to be small, further uncomplicating many matters while keeping any expenses very low. Also, leadership, communication and cooperation tend to flow more smoothly in the absence of money and with a common goal motivated by perhaps more personal reasons. Funding is also a political hotbed, by definition. There seems to be disagreement over both where the funds gathered should be applied, as well as the effectiveness of mitigation projects. Examples were given such as what follows from one interview: “This mitigation work that occurs somewhere else – it may be in an area that really doesn’t have that kind of special characteristic that the other had. So, it’s not an even trade-off.” In 2017, the issue of funding is even more worrisome to stakeholders, being cited in 100% of all interviews and being iterated more often than any other issue.

In 2009, partnerships on all levels were consistently praised as purveyors of efficiency and economy. Though government interaction and inter-agency partnerships were cited (or wished for), there were more concerns about extending opportunities to stakeholders and groups of all sizes, right down to the individual farmer. Partnerships also included those with the education system, showing yet another confluence of themes which can sometimes be in fact interdependent. Sharing of information and communication were seen as the most beneficial effects of healthy partnerships in these matters. These issues of formation of partnerships seem to have been settled by 2017. That, or it has been subsumed by more pressing matters in the present. Finally, outreach and education was the most popular theme found among the 2009 data reviewed for this study. The focus has shifted in 2017 to education of our youngest citizens via public education curriculum. Following sound sociological research, it was even suggested that curriculum and activities related to resource conservation, including streams and wetlands conservation and restoration, be implemented as early as grade school. However, the frequency of the comments regarding education as a factor in achieving the ideals of the Federal “No Net Loss” concept in 2009 underscores the perceived level of importance assigned to this factor by stakeholders. While education of politicians and corporate decision-makers on the complexities, supporting activities, (such as continued monitoring following mitigation activities) and the need for a long-term approach were emphasized, in 2009 there was more concern for education for citizens, from farmers to landowners and

especially to children through the public education system. From this study, I have formed several questions which could form the basis for further research. There are questions that arise from each of the four themes identified. The following list is but a sample of the many questions which have emerged:

- 1) Are organizations in KY concerned with stream/wetland conservation which are volunteer driven more effective than those which are run by paid staff?
- 2) The comment was made by a professional in the field that groups which have stable funding are typically successful. Is this always true? Is funding alone the most important factor to consider when evaluating a group's success? He was mainly referring to smaller, grass-roots orgs. Are there examples of grass-roots orgs involved with stream/wetland issues which can be considered successful and which survive on volunteer efforts and uncertain, sporadic funding? (such as volunteer donations, fundraisers, ect...) This is really just an extension of question one.
- 3) Are efforts being made to enlist Kentucky's education institutions in the effort to educated children on the importance of stream and wetlands conservation and restoration?
- 4) In what ways are regulatory agencies reaching out to landowners in order to encourage clustering of BMP in agriculture in Kentucky?
- 5) How are environmental groups adapting to the current political climate in terms the continuing decline, both in funding and in apparent interest, in environmental issues?

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