AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

The Use and Opportunity of Cooperative Organizational Forms as an Innovative Regulatory Tool Under the Clean Water Act

Kurt Stephenson
Dept of Ag & Applied Econ
Virginia Tech
Blacksburg, VA 24061
Email: Kurts@vt.edu
Phone 540-231-5381

Leonard Shabman
Resources for the Future
1616 P Street, NW
Washington DC
Email: Shabman@rff.org
Phone (202) 328-5139

Abstract:

Numerous reforms to introduce financial incentives and flexibility into the Clean Water Act have been proposed. Cooperative organizational forms that consolidate multiple regulated entities under a single organizational umbrella are an overlooked, but potentially useful avenue for reform. In concept, these new organizational forms would function much like a farmer cooperative – using coordination and consolidation to lower input costs to its members. Illustrations of how cooperative organizational forms can be used to lower costs and enhance regulatory flexibility in both the water quality and wetland programs are provided.

Selected Paper prepared for presentation at the Southern Agricultural Economics Association Annual Meetings Little Rock, Arkansas, February 5-9, 2005

Copyright 2005 by Kurt Stephenson and Leonard Shabman. All rights reserved. Readers may make verbatim copies of this document for noncommercial purposes by any means, provided that this copy right notice appears on all such copies. *Research for this paper was supported by a grant from the Powell River Project.*

The Use and Opportunity of Cooperative Organizational Forms as an Innovative Regulatory Tool Under the Clean Water Act

In debates over environmental policy reform, economists frequently express enthusiasm for the use of trading programs to achieve goals under the Clean Water Act. In the most general sense, trading programs allow regulated parties to transfer legal and financial responsibilities to another entity who can fulfill these responsibilities in a more cost effective way. Such trading programs are a way to insert financial incentives and flexibility into a command-oriented regulatory program. In water quality policy, economists promote effluent trading programs as a way to reallocate a limited number of discharge rights. The Environmental Protection Agency (2003, 2004) increasingly echoes the sentiment of economists and has recently released a number of policy announcements supporting the development and use of effluent trading programs. Similar concepts are applied to the nation's wetland program. The Corps of Engineers (1995) administers a variety of permitting programs regulating wetland fills. As part of a national no-net-loss wetland goal, the Corps allows fill permit applicants to offset wetland losses by purchasing wetland enhancement credits (a form of compensatory wetland mitigation) from third party commercial wetland bankers.

Trading programs designed to achieve environmental goals reflect the economists' interest in markets and market processes. Yet, Ronald Coase in his seminal 1937 paper "Theory of the Firm" argues that the firm can be thought of as an organizational mechanism to avoid or lower transaction costs associated with market transactions. Coase's general thesis is that firms exist because it may be more cost-effective to coordinate some economic activity within the confines of a single organization than conducting transactions among multiple, independent firms. A large body of work has since explored and elaborated on the relationship between

transaction costs and firm organization and formation (for example the work of Oliver Williamson). Similar reasoning may apply to regulatory policy reform under the Clean Water Act. Rather than creating a formal system of exchange between separate regulated entities, new organizational forms might be created to internalize the transfer of regulatory responsibilities within the confines of a single legal entity.

It is argued that new organizational forms that consolidate multiple regulated entities under a single organizational umbrella are an overlooked, but potentially useful avenue for environmental policy reform. Such an approach would create new organizational forms that coordinate and jointly manage the collective regulatory obligations of a group of regulated parties. In concept, these new organizational forms would function much like a farmer cooperative – using coordination and consolidation to lower input costs to its members. These new organizations could take on a number of different forms including structures similar to a cooperative, association, or a foundation. Private and public regulated entities alike could benefit from participation in these new organizations. If properly designed, such cooperative organizational forms could provide regulated parties financial incentives and decision-making flexibility typically associated with formal, "textbook" trading programs.

The objective of this paper is to illustrate the efficacy of creating new organizational forms as a way to create incentives and flexibility in the effluent control and wetland permitting programs. In each program, the types and origins of barriers to establishing trading mechanisms under the water quality and wetland programs are briefly reviewed. It is argued that the particular legal and regulatory structures of each program either prohibits, or imposes significant transaction costs to transferring regulatory responsibilities between regulated parties. The sources of these transaction costs in both the wetland and water quality program are somewhat

unique and the source of transaction costs under each program will be briefly described. Case study illustrations of how these new organizational forms can lower transaction costs are then provided.

Effluent Control (NPDES Permitting)

Trading programs are frequently advanced as a way to introduce flexibility and incentives into a command oriented system (Stephenson, Shabman, and Shobe). At a conceptual level, a trading program would authorize decentralize decision-makers to exchange the rights to discharge between trading parties. In the best known trading program in the U.S, the sulfur dioxide cap and trade program, a limited number of discharge rights are issued. The sum of these rights, called SO_2 allowances, represents a cap on permissible emissions and the rights are transferable. Thus, an allowance trade is a voluntary arrangement to shift SO_2 emission rights between two willing traders.

Such legal transfers of regulatory responsibilities to control waste discharges, however, are difficult to achieve and find in the water program. The CWA establishes direct regulatory authority over a subset of effluent discharge sources – called point sources. Point sources, historically these included industrial and municipal dischargers, are defined as sources with an identifiable point of discharge such as a pipe or ditch. Federal and state regulatory agencies authorize the discharge of effluent into water bodies through the issuance of National Pollution Discharge Elimination System (NPDES) permit. An NPDES permit authorizes the discharge of effluent into the waters of the United States based on EPA-identified technology-based effluent standards.

The legal uncertainties and rigidities of the technology-based effluent standards and the NPDES permit process make the transfer of regulatory requirements between regulated (point)

sources legally tenuous and risky (Stephenson, Shabman and Geyer 1999). First, unlike the air program, the CWA never explicitly endorses or acknowledges that effluent trading is a legitimate water quality management strategy. Second, once technology-based effluent limits are established and written into permits, the Clean Water Act prohibits regulators from "backsliding" — issuing less restrictive effluent limits in the future. The anti-backsliding language creates substantial legal risks for a discharger seeking to purchase discharge rights. Third, reopening permits to execute a trade is often perceived to be risky and costly. For instance, the CWA instructs the regulators to routinely revisit and tighten these standards as new pollution control technologies become available. If such behavior occurs, any superior pollution control performance intended to generate transferable surplus would be confiscated. Fourth, NPDES permits tend to be prescriptive, frequently specifying the types of effluent control practices that must be implemented and maintained. Such conditions limit discharger's ability to exercise discretion in seeking to lower effluent levels to generate surplus allowances.

Given the legal and institutional structure of the CWA, trading programs that transfer regulatory effluent control requirements between regulated point sources are rare. So-called "point-nonpoint" trades have been given more attention, but still lack the most basic requirements for a market-like program. Under the CWA, any source not defined as a point source and regulated under federal law and is called a nonpoint source. Sources typically classified as nonpoint sources include agricultural operations. Many have observed that the marginal effluent control costs to these unregulated sources is substantially less than for regulated point sources, thus offering the possibility of cost-reducing trades between point and nonpoint sources (REF). In the context of NPDES permitting, the form of point-nonpoint trading that emerges is called an offset program (Stephenson and Shabman 2002). Offsets arise when

regulatory officials apply effluent limitations on point sources that cannot be economically or technically achieved. To remain in compliance, regulatory officials require the point sources to finance off-site effluent controls, typically at nonpoint sources. What is important about offsets for his paper is that no "trade" or transfer of effluent control responsibility occurs between the point and nonpoint sources. Instead of the nonpoint source assuming new effluent control responsibility as the result of selling an offset to a point source, the nonpoint source controls become a new regulatory condition in the point source's NPDES permit. Thus, the financial and legal liability for achieving nonpoint source effluent reductions still rests with the point source. Nonpoint offsets are not trades, but rather extensions of the existing NPDES permits.

Discharger Associations

Thus, effluent trading programs as economists might recognize the concept have yet to be implemented in the CWA. Yet, many of the advantages that arise from the creation of a market for discharge rights could be, and are, being achieved through the creation of discharger *associations*. Rather than trying to develop ways to transfer regulatory responsibilities between individual sources, the concept of a discharger association takes a different approach. A discharger association assembles the regulatory responsibilities of many individual dischargers and places those regulatory responsibilities under the management of a single new organizational entity – a discharger association. Government regulatory agencies treat the association as a single permitted entity and issue a single permit (legal authorization to discharge) to the association. Association members are then free to reallocate responsibility for meeting the aggregate regulatory responsibility within the confines of the association.

The assembling of sources under a single permitted organization greatly reduces the risks and costs of shifting effluent control responsibilities *between* regulated parties. A discharger

association reduces costs and risks of exchange by creating an organizational umbrella in which sources can determine how the collective regulatory requirement can be met. The discharger association is analogous to firm's allocating resources between different enterprises within the firm. Experience with discharger associations under the CWA also indicate that reduced regulatory risks and costs have occurred while expanding discharger decision-making flexibility and improving pollution prevention incentives.

Two of the larger scale applications of a compliance association have occurred in the Neuse and Tar-Pamlico river basins in North Carolina (Stephenson and Shabman 2002; Stephenson, Shabman, and Boyd 2005). In both programs the state of North Carolina was concerned about nutrient enrichment of estuary waters. The state imposed an aggregate load cap on industrial and municipal dischargers equivalent to a 30 percent reduction in nitrogen loads from identified baselines. In both programs, the state granted individual point source dischargers a choice: 1) accept new requirements to control nitrogen through individual NPDES permits or 2) form and join a discharger association. The rigidities associated with individual NPDES permits provided enough incentive for most point source dischargers to opt for the second option.

North Carolina required the association to meet a single mass load cap. In the Tar-Pamlico case, the legal requirement to meet the mass load cap was established by an enforceable contractual agreement signed by the association and the state of North Carolina. In the Neuse program, a single "group compliance permit" was issued to the association. Both legal mechanisms established financial penalties for the two associations if aggregate discharges of the group exceed the association cap. All penalties paid by the associations would be used by the state of North Carolina to secure offsetting nitrogen reductions from the implementation of

nonpoint source controls. North Carolina established the fee on a per lb (kg) basis and is sufficiently large to more than offset any exceedance of the association cap. Individual NPDES permit conditions for nitrogen are issued to all members if the associations refuse to pay any required penalties.

The two associations are separate legal entities governed by a set of by-laws created by the dischargers. The associations are financed by membership dues agreed to and paid for by its members. The membership fees are sufficiently large to finance both operation of the association and to build a reserve in the event that the association mass load cap is every exceeded. Association decisions are conducted through a board of directors selected by the members.

A key advantage of the association is similar to that of an formal effluent trading program: granting dischargers flexibility to decide how best to meet the aggregate load cap. North Carolina grants each association considerable discretion to determine how discharges will be controlled and provides a reasonably stable setting for investment in aggressive pollution prevention activities. The state grants the associations broad authority to decide where nitrogen control will occur among association members without each member having to enter into a formal or lengthy regulatory approval process with the regulatory agency. The association members collectively decide how responsibility for meeting the nitrogen cap will be allocated among its members.[1] Thus, the Association achieves the same end as an "open" market for discharge rights – a low-cost mechanism for dischargers to reallocate effluent controls to achieve a fixed cap. Moreover, individual dischargers are not required to use specific control practices, nor are their operational choices constrained by technology-oriented NPDES permit

[1] Interestingly the Tar and Neuse Associations have different internal procedures for this reallocation. In the Tar Pamlico association, responsibility for meeting individual effluent targets is an informal agreement among its members. The Neuse Association assigns individual nitrogen allocations to its members and members agree to pay additional fees to the association if discharge exceeds their individual allocation.

requirements. Because the legal arrangements between the state and the associations focus on an aggregate load cap rather than how the cap is achieved, association members are assured that aggressive reductions in discharges will not be penalized by more stringent individual permit requirements.

To date, the associations have performed well. Both associations have managed to keep nitrogen loads considerably below their respective caps.[2] Compliance costs have also fallen below original projections. Further, there is some evidence that the association concept is producing incentives for strong cooperative behavior that did not exist prior to implementation. Under the association, the financial self-interest of individual dischargers now extends to the nitrogen control performance of the other members. Afterall, negligence or poor performance of an association member can have direct financial consequences on the entire membershipo of the association. The association provides a place and organization for members to share expertise about nitrogen control (personal communication with Roy Blount and Mike Templeton). The sharing of expertise is particularly valuable for small sewage treatment plants that may lack the expertise and resources to exploit operational efficiencies.

In addition, both the Neuse and Tar associations have been a catalyst to help improve the effluent control performance of nonmembers. In two separate examples, North Carolina regulators were confronted with dischargers outside the association who were in constant violation of their individual permit requirements. In response, North Carolina began legal proceedings against these dischargers under standard CWA enforcement provisions. The noncompliant dischargers approached the associations for assistance and a request to join. The associations agreed to accept these dischargers only under conditions that would allow the

[2] The Tar Pamlico Association has existed longer than its Neuse counterpart. Tar Pamlico association was formed in the mid 1990s while the Neuse association formed in the last few years.

association to help these dischargers improve effluent control performance (personal communication with Roy Blount and Mike Templeton). While the Neuse association is still working out the details with the new member, the Tar-Pamlico association facilitated significant improvements in effluent treatment and the once noncompliant discharger is now a solid and productive member of the association (personal communication, Roy Blount).

Wetland Permit Program

National concern over the loss of wetlands led to a national commitment to achieve a no net loss of wetland acres and functions. The no net loss goal has become a key focal point for structuring the nation's regulatory programs governing wetland alterations. The federal permit program created by Section 404 of the Clean Water Act is administered by the U.S. Army Corps of Engineers (Corps). Under 404, anyone wishing to place fill material in an area delineated as a wetland and that falls under the legal jurisdiction of Section 404 is required to secure a permit from the Corps. If a permit is issued, the permittee is legally and financially required to restore degraded wetlands not affected by the fill activity or create new wetlands. The expectation is that these "compensation wetlands" will offset the permitted loss of wetlands area and functions and thus support the no net loss goal. These compensation wetland are often called wetland "credits" (Shabman and Scodari 2004).

Historically, regulatory preferences have been given to providing these compensatory wetlands as close to the fill site as possible ("on-site") and as similar to the wetland types lost to the fill activity ("in-kind"). The permittee assumed the responsibility for constructing these on-site, in-kind compensatory wetlands. Overtime, however, it became apparent that many of these

on-site compensatory wetlands were failing to fully replace lost wetlands (NRC 2001).[3] Now, permittees are allowed (under certain circumstances) to secure compensatory mitigation off-site. This possibility, in turn, led to the development of private commercial mitigation banks and offered the possibility of the development of private competitive markets for wetland credits (Shabman, Scodari and King, 1994).

Private commercial banks develop compensatory mitigation sites independent and away from fill activities in order to produce wetland credits for sale to future permittees. Once the wetland credits have been certified (wetland creation determined to be ecologically successful), commercial credit suppliers can then sell credits to permittees with compensatory mitigation requirements. Unlike the offset program in water quality program, the purchase of credits by the permittee is accompanied with a transfer of legal and financial responsibility to secure the compensatory wetland from the permittee to the commercial mitigation banker.

While commercial banks have expanded considerably in the last decade, the original promise of markets of competitive markets wetland credits has gone largely unfulfilled. A variety of regulatory conditions have created barriers to market entry and have created thin markets characterized by limited price competition. Although a full discussion of the challenges of creating a private wetland credit market is beyond the scope of this paper, many of the barriers are a consequence of the costs and uncertainties surrounding the 404 regulatory program. On the supply side, the challenges of certifying credit creation with regulatory officials drive up the cost of credit creation. The demand side is characterized by a variety of uncertainties arising from the regulatory program such as: changing scope of the regulatory jurisdiction of the program, changing regulatory preferences for on-site and in-kind mitigation, and limited geographic range

[3] In some cases there may simply be inadequate or insufficient sites to construct compensatory wetlands on-site. Furthermore, some wetland functions, such as wildlife habitat, may be difficult to achieve on-sites next to developed areas (NRC 2001).

of acceptable credit trades (for a more detailed discussion see Shabman and Scodari 2004). Given this regulatory context, private credit sellers provide only a small fraction of the total wetland offsets required by regulators, and credit prices generally appear to be well above credit production costs (Shabman and Scodari 2004).

Cooperative Options: Foundations and Associations

The costs and uncertainties surrounding the 404 permitting program might create opportunities for cooperative-like organizational arrangements to improve both the quality and cost-effectiveness of securing compensatory mitigation. Organizations like a mitigation association have been used successfully in the wetland program to provide members with off-site compensatory mitigation. In the early 1990s, a group of homebuilders in Ohio sought to create a way to meet wetland mitigation requirements under Section 404. The formation of the foundation was motivated by homebuilder concerns about the limited on-site compensatory options and uncertainties concerning the availability and price of commercial wetland credits. The homebuilders created a nonprofit foundation, the Ohio Wetlands Foundation, for the purpose of constructing compensatory mitigation projects. The Ohio Homebuilders Association provided the initial startup funds to the foundation and the Foundation's Board of Trustees is made up primarily of members of the Homebuilders Association. The Foundation now receives yearly income from the sale of wetland credits and sells credits to anyone in need of wetland mitigation credits. As a nonprofit organization, the foundation charges credit prices only sufficient enough to cover the full cost their wetland projects. The Ohio Wetland Foundation is one example of how competitors (homebuilders) pooled resources and work cooperatively to satisfy specific regulatory requirements at a lower overall cost.

Similar concepts are now being investigated as a way for coal companies in the Appalachian region to meet new 404 regulatory requirements (Stephenson and Shabman 2004). Recently, the U.S. Army Corps of Engineers (COE) extended the 404 permitting program to the placement of fill from surface mining activities in ephemeral and intermittent streams (streams that do not carry water continuously through the year). Coal companies are now required to construct stream restoration and enhancement project to offset effects of the fill on the aquatic environment. A mitigation association would be a legal entity created exclusively to coordinate and provide compensatory mitigation for a group of mining companies who are members. Various designs of a mitigation association option are being considered as mechanism to provide both on-site and off-site compensatory mitigation. [4]

Currently, most compensatory mitigation is provided by individual companies in the immediate vicinity of the fill (on or next to the permitted site). Opportunities for low cost on-site mitigation can sometimes be achieved because the heavy equipment and operator labor skills needed for executing a well designed stream restoration and enhancement project are readily available. In fact, low cost aquatic restoration and enhancement opportunities may be so abundant in the vicinity of the mining site, surplus mitigation (mitigation in excess of the fill activity) could be provided (if allowed by regulators).

Yet, the opposite may also be true. The mining site may not offer sufficient amount of stream restoration or enhancement opportunities to fully compensate for the total amount of fill activities. The company may have limited experience or access to expertise to design stream restoration projects. The lack of adequate mitigation sites and restoration expertise might be a particular problem for medium- to small-size mining operations. Furthermore, mitigation

[4] This effort involves a collaborative dialogue between industry, regulatory officials, and conservation groups and is being funded by the Powell River Project.

regulations often require long-term maintenance and site protection of an on-site mitigation project. The regulatory or legal prohibitions against future site disturbance of a mitigation site may preclude future re-mining operations and further limit on-site mitigation options.

Thus, the mining industry *as a whole* may be able to generate sufficient low cost on-site mitigation to cover all stream impacts within a given area, but not necessarily at every mining site. The challenge is to take advantage of these individual on-site opportunities whenever they occur and then make them available to serve the mitigation needs of the industry as a whole.

A mitigation association could potentially fill this role. One role of a mitigation association would be to consolidate on-site mitigation credits of its members and then allow members to draw on those credits to meet their collective mitigation requirements. For instance, suppose mining companies A, B, and C formed a mitigation association. Together companies A, B, and C are seeking permits to fill 2,000 feet of intermittent stream. Member C has few on-site compensatory mitigation opportunities, but Members A and B together could construct enough on-site compensatory mitigation to completely offset the stream impacts of all three members. The association as a whole has generated sufficient compensatory mitigation to cover the total stream impacts of members A, B, and C even if all individual members have not. In such a situation, the association would operate to ensure joint compliance with 404 compensatory mitigation requirements. The association members would benefit by being able to take advantage of feasible, low cost on-site mitigation options regardless of where they exist, so that mitigation compliance costs of all three companies would be reduced. For this to happen the association would adopt procedures where members in need of credits could pay other members who have produced credits in excess of their own needs.

A mitigation association could also be used to create consolidated mitigation projects that are *off-site* from *any* of its members. The Association, rather than a commercial credit seller, would be responsible for identifying, constructing, and initially paying for these consolidated compensatory mitigation projects. An association of mining companies would be well positioned to identify future off-site compensatory mitigation needs because the members would know future mining plans and sites. This knowledge would help reduce some of the demand uncertainty surrounding the private banking option. In planning for off-site mitigation, the Association would have strong incentives to identify low costs sites with a high probability of achieving ecological success. Like other mitigation options, a mitigation association would be required to provide long-term maintenance requirements and insure that mitigation projects will succeed ecologically. Unlike the private banking option, however, the Association also have strong incentives to pass cost savings back to the member mining companies. The Association would pay for the cost of off-site mitigation projects by collecting payments from the members who need off-site mitigation credits.

Summary

Economists have a long history of promoting and designing trading programs for environmental amenities. Economists believe that the twin aims of introducing incentives and decision-making flexibility will improve both environmental and ecological performance of regulatory program. The specific legal and regulatory context in which these programs must be grafted, however, can make the transfer of rights in such system costly and legally tenuous. Other alternatives, however, exist to achieve similar ends. As Coase articulated nearly 70 years ago, the many productive activities are conducted within the confines of the firm rather than

through market transactions because the transaction costs are lower within a single organization. This paper illustrates a number of ways in which cooperative organizations of regulated parties (new “firms”) can improve regulatory program implementation under the Clean Water Act. In both the water quality and wetland regulatory programs, groups of regulated parties have formed new organizational forms that synthesize regulatory requirements under a single organizational structure. The consolidation of regulatory requirements economizes on regulatory costs and uncertainties and provides dischargers with new decision-making flexibility to meet these requirements. In advocating and promoting environmental policy reform, economists may be able to offer more constructive and realistic policy alternatives if consideration and research into policy alternatives was expanded beyond the invisible hand of the market to the visible discretion of a “firm”.

References

Coase, R. H. "The Nature of the Firm" *Economica* 4 (November 1937).

National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington DC: National Academy Press, 2001.

Shabman, L. and P. Scodari. "The Past, Present and Future of Wetland Credit Sales" Resources For the Future, Discussion Paper 04-48, December 2004.

Shabman, L. and K. Stephenson, and W. Shobe "Trading Programs for Environmental Management: Reflections on the Air and Water Experiences." *Environmental Practice* 4 (September 2002) 3: 153-162

Shabman, L. P. Scodari, and D. King. *Expanding Opportunities for Successful Wetland Mitigation: The Private Market Alternative.* IWR Report 94-WMB-3. Alexandria VA, U.S. Army Corps of Engineers, Institute for Water Resources, 1994.

Stephenson K. and L. Shabman. "The Trouble with Implementing TMDLs" *Regulation* 24:1 (Spring 2001): 28-32.

Stephenson, K., L. Shabman, and L. L. Geyer. "Watershed-based Effluent Allowance Trading: Identifying the Statutory and Regulatory Barriers to Implementation." *The Environmental Lawyer* 5:3 (June 1999): 775 - 815.

Stephenson, K. and L. Shabman. "Mitigation Associations: A Cooperative Option to Meet Section 404 Mitigation Requirements" *Virginia Mining Journal* 17(2004)2: 4-11.

U.S. Army Corps of Engineers, "Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks" *Federal Register,* Vol. 60, No. 228, 58605-58614, November 28, 1995.

U.S. Environmental Protection Agency. *Water Quality Trading Assessment Handbook*, Office of

Water, EPA-841-B-04-001, November 2004.

U.S. Environmental Protection Agency. “Water Quality Trading Policy”, Office of Water, January 13, 2003.