Agricultural Pollution in Puget Sound:

Inspiration to Change Washington's Reliance on Voluntary Incentive Programs to Save Salmon

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Western Environmental Law Center

Agricultural Pollution in Puget Sound: Inspiration to Change Washington's Reliance on Voluntary Incentive Programs to Save Salmon

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Executive Summary

Puget Sound salmon are in trouble. In 2011, the treaty Indian tribes in Western Washington issued an alarming report, *Treaty Rights at Risk: Ongoing Habitat Loss, the Decline of the Salmon Resource, and Recommendations for Change*. The authors describe the beleaguered state of Puget Sound salmon, making it clear that the reason for the decline "is a lack of federal and state government leadership, policy, commitment and coordination toward a set of salmon recovery goals and objectives."[1] Specifically:

> **The U.S. government continues to approve federal actions and federally funded state actions that either do not contribute to, or actually impede recovery of salmon habitat.** The result is the continued slow degradation of habitat that already has suffered from years of pollution, poor land use practices, and other factors. This situation sets the bar higher and higher for tribes to continue our way of life, while setting it lower and lower for those who would destroy the salmon's home. This uncoordinated approach solidifies habitat losses and ultimately fails to protect our huge investment of funding, time, and effort.[2]

Five years later, in spite of the treaty tribes' clear and precise recommendations for change, **salmon populations continue to decline**. For example, the Washington Department of Fish and Wildlife reports that across Puget Sound, "salmon fisheries will be constrained in several areas this year because of low returns of wild and hatchery coho," "about one-third the size of the run predicted in 2015."[3]

Why is this happening? Unsustainable agricultural practices are degrading the waters that feed Puget Sound. To protect salmon, agricultural operations must comply with water quality laws. In Washington, taxpayers spend millions of dollars to protect and restore existing salmon habitat through the use of countless voluntary incentive programs, which essentially pay landowners not to pollute. These programs, some of which deliver important conservation benefits, are ineffective in ensuring agriculture is conducted in a manner that protects water quality. This is because **there is no regulatory backstop to ensure agricultural operations comply with state water quality laws.**

The federal Clean Water Act orders "the discharge of pollutants into the navigable waters be eliminated by 1985."[4] The time has come for Washington to put these words into action, 31 years later than intended, and endorse a regulatory approach to sources of agricultural pollution. To do so, this report seeks to inspire the following changes:

1. The Washington Department of Ecology should establish mandatory, science-based agricultural best management practices.
2. The Washington legislature should enact new legislation mandating scientifically supported best management practices for agriculture.
3. The Washington Department of Ecology should use its existing statutory authority to enforce water quality laws and eliminate nonpoint sources of agricultural pollution.
4. The U.S. Congress should repeal section 1619 of the Farm Bill, which prevents the disclosure of critical information regarding how federal dollars are spent to prevent agricultural pollution.
5. The Washington legislature should repeal farm plan confidentiality provisions in state law.
6. Government agencies should fund conservation practices that last in perpetuity.
7. Voluntary incentive programs aimed at protecting water quality should be consolidated and implemented by the Washington Department of Ecology.
8. Governor Inslee should convene an independent science panel on salmon recovery to ensure that the billions of dollars spent on voluntary incentive programs in this state are being used to fund conservation practices that are based in sound science and demonstrably protect water quality and salmon habitat.

Agricultural Pollution in Puget Sound

Long-Term Decline of Puget Sound Water Quality

Federal and state agencies have been aware of water quality problems in the Puget Sound watershed for well over 30 years. Today, in Puget Sound "[t]he state faces a challenge to meet Federal and State Clean Water Act water quality responsibilities, with a failure to meet Water Quality Standards in several geographic regions, as well as substantial pressures on a variety of species."[5] While Puget Sound is healthy enough that people can swim at many beaches (88 percent of swimming beaches were open in 2014) and harvest shellfish in some locations (81 percent of shellfish beds were open in 2014)[6], pollution continues, habitats are degraded or disappearing, and many species, including salmon, continue to decline. To protect Puget Sound and the native salmonid populations who call this estuary home, the science is clear that we must change tactics to prevent further habitat loss and water quality degradation.

The Washington State Department of Ecology (Ecology), the state agency charged with protecting the waters of this state,[7] recently reported that only two of 17 reporting regions in Puget Sound showed any improving tendencies for their Marine Water Condition Index.[8] Ecology concluded that the findings highlight significant negative changes in water conditions in Puget Sound.[9] The Puget Sound Partnership[10] reported in 2015 that of 27 vital sign indicators, only 10 show improvements and "few are at—or even within reach of—their 2014 interim targets. Therefore, there is little evidence they are on a trajectory to reach the 2020 targets."[11] The Marine Water Condition Index is worsening and the freshwater Water Quality Index has not improved.[12] The 2015 *State of the Sound* report prepared by the Puget Sound Partnership reiterates that many assigned actions are making little or no progress.[13] Now, with the anticipation of adding more than 1 million people to the Puget Sound region in the next 15 years and the increasing threats associated with climate change and ocean acidification, the quality of our waters and the health of Puget Sound are expected to decline irreparably if we do not make swift and effective changes to our current regulatory and conservation efforts.[14]

Water Quality and Estuarine Health are Essential to the Survival of Puget Sound Salmon

Puget Sound is a unique and indispensible resource to our region. Puget Sound holds incredible cultural, environmental, economic, aesthetic and recreational value that impacts nearly ever person in Western Washington.[15] The reasons to be persistent in our efforts to save Puget Sound and its native salmon populations are many and best articulated by the late Billy Frank, Jr.:[16]

> *"It takes a lifetime. There's no quitting, no retiring, no getting sick. We have to be here for the salmon, the shellfish, the animals, the birds. They're all dying and there aren't enough of us to save them. This is our children I'm talking about, and our grandchildren, and their children. We can't quit on them…ever."*

Billy Frank, Jr.

As an estuary, Puget Sound should be one of the most productive natural environments in the world.[17] The Sound and its tributary waters are critical for the survival of many species, including the seven native salmon species and various shellfish that call Puget Sound home. The sheltered waters of estuaries provide protected places to spawn, giving estuaries the nickname "nurseries of the sea."[18] Most commercially valuable fish species depend on estuaries at some point during their development.[19] Estuaries provide habitat for more than 75 percent of U.S. commercial fish catch and 80-90 percent of the recreational fish catch.[20] The health of estuaries nationwide has declined over the past several decades, and research shows that we are continuing to lose critical estuarine habitat in Puget Sound.[21] According to the Puget Sound Partnership, "[w]e have lost almost 60 percent of our historical estuarine wetland habitat."[22] In 2007, the National Estuary Program rated the overall condition of the Puget Sound as only "fair."[23] The 2015 State of the Sound reports that the Marine Water Quality Index continues to worsen.[24]

The Treaty Tribes of Puget Sound and the Coast, co-managers of salmon and shellfish in the Pacific Northwest, released a paper titled *Treaty Rights at Risk – Ongoing Habitat Loss, the Decline of the Salmon Resource, and Recommendations for Change* in 2011.[25] In this important and alarming report, the tribes point out that the right to fish that was reserved in the treaties is meaningless if there are no fish left to catch.[26] The tribes cite numerous examples across Puget Sound of continued loss of habitat and announce a call for action from our federal, state, local, and tribal governments to reverse the downward trend of our salmon and their habitat.[27] Specifically, the tribes ask that the federal government "require federal funding that supports state programs and pass-through grants to be conditioned so that all funded efforts are designed to achieve consistency with state water quality standards and salmon recovery plan habitat objectives."[28] Two years later in 2013, the Puget Sound Partnership found that no progress has been made in improving the biological condition of small salmon-bearing streams in the Puget Sound basin and overall the biological condition of our waters had declined.[29] The 2015 *State of the Sound* similarly reports a continued worsening of indicators for salmon abundance and survival.[30]

The cumulative damage done to Puget Sound causes significant habitat loss and declines in species dependent on those habitats, including salmon and shellfish.[31] Of Puget Sound's seven native salmon species, three are listed as endangered under the Endangered Species Act (ESA) and the others are listed as threatened.[32] The National Marine Fisheries Service (NMFS) has assessed the progress of the Puget Sound Chinook Salmon Recovery Plan since its federal approval in 2007.[33] NMFS reported that important habitat for Chinook was still being lost after the first five years of the recovery plan and that habitat protection efforts need substantial improvement.[34]

The loss of salmon in the region has significant social, cultural, and economic consequences. The remaining populations of salmon are at less than 5 percent of their historical levels.[35] Salmon harvest has continued to decline significantly since the 1980s. In 1981 over 50 million pounds of salmon were harvested annually, but today we harvest less than 10 million pounds.[36] The Skagit River Chinook populations have been on a long-term decline over the last century as illustrated by the significant declines in harvest from 40,000-50,000 fish in the 1930s to only a few hundred in the 1990s.[37] The value of the Puget Sound salmon fishery currently is estimated at more than $60 million a year, but salmon are worth more than money.[38]

Salmon are vital to Pacific Northwest tribal cultural and spiritual practices. Salmon also play a critical role, in the ecosystem contributing throughout their life cycle to food chains and

nutrient cycles.[39] Salmon are both an indicator species and keystone species for the overall health of the Puget Sound ecosystem because they are susceptible to changes in the quality of our freshwater streams as well as marine waters, and because they play such an important role in supporting the entire ecosystem.[40] As an indicator species, "[s]almon are our canary in the coalmine – their decline signals a loss of the Sound's ability to support all life, not only salmon."[41] As a keystone species, salmon have an impact on the ecological system that is disproportionately large compared to their abundance. The removal of a keystone species such as salmon can cause fundamental alterations to the entire ecological system, throwing it off balance.[42]

Research has shown that salmon populations are critical in transferring energy and nutrients in land from the Pacific Ocean to aquatic and terrestrial ecosystems.[43] When salmon return upstream to spawn they provide a source of carbon, nitrogen, and phosphorous that is essential to the growth of juvenile salmon and other animals in the watershed's food web.[44] The presence of salmon carcasses in streams increases the density of macroinvertebrates, which feed on the carcasses. Juvenile salmon eat the macroinvertebrates, an important food source that supports the juveniles' growth and survival.[45] A study found that due to declining salmon runs, the rivers of Puget Sound are receiving only 3 percent of the marine-derived organic matter that was once delivered to those rivers by salmon.[46] The nutrients brought inland by the returning salmon are bioavailable to the ecological community and are delivered throughout the watershed reaching farther into the headwaters of small streams that might otherwise be nutrient deficient.[47]

The forests surrounding the waterways where salmon spawn benefit from the nutrients salmon provide when animals that consume the salmon carcasses transfer the nutrients into the terrestrial food web.[48] The salmon are an important food source at all stages of their life cycle for other wildlife, including long-distance migratory birds.[49] The Skagit River, which has the highest population of all five salmon species in Puget Sound, is an important winter-feeding area for migrating bald eagles.[50] An analysis of bone samples from grizzly bear skeletons killed in the Columbia River basin between 1856 and 1931 show that 35-91 percent of the carbon and nitrogen were derived from marine-based nutrients.[51] Scientists have concluded that the loss or severe depletion of salmon populations can have major effects on the entire population biology of the region.[52]

Nonpoint Source Pollution Degrades Puget Sound

Addressing and regulating nonpoint sources of pollution to improve water quality and salmon health and habitat in Puget Sound presents a significant challenge.[53] Nonpoint source pollution often represents a large proportion of pollutant loading that leads to impairment of water quality.[54] As of this writing, in Washington state, over 2,400 water bodies are listed as impaired under the federal Clean Water Act.[55] In the past 10 years, 392 Washington water bodies have been added to the impaired list while only 68 have been delisted.[56] Most of the listings are for temperature, bacteria, dissolved oxygen and nutrients, all commonly associated with agricultural pollution sources.[57] In addition, pathogens that degrade water quality enter Puget Sound from wastewater treatment plants (approximately 100 discharge into Puget Sound), onsite sewage systems (approximately 300 large and 500,000 small onsite sewage systems exist in the Puget Sound basin), commercial and recreational boat sewage discharge,[58] and agricultural lands (which cover about a third of the Puget Sound region).[59] Of these sources, Ecology found nonpoint source pollution from marinas and recreational boating is "generally a less pervasive nonpoint issue compared to agriculture and urban/residential areas."[60] Ecology's *Assessment of Nonpoint Pollution in Washington State* observed that past

impaired water listings may have focused more on point sources, so it can be expected that future listings are likely to address impairments with greater contributions from nonpoint sources.[61] Therefore, Ecology noted, "it is likely that these listings represent a large future workload for [nonpoint source] pollution control…[Nonpoint source pollution] is continuing to endanger our public health, natural resources, and aquatic ecosystems."[62]

> "Reducing pollution in runoff from agricultural lands will help achieve recovery targets for freshwater quality, shellfish bed recovery, freshwater aquatic habitat, swimming beaches, dissolved oxygen in marine waters, and marine sediment quality."
>
> Puget Sound Partnership Action Agenda, Chapter 3 Agricultural Runoff (December 2011), at 195.

The Environmental Protection Agency (EPA) defines nonpoint source pollution as any source of water pollution that does not meet the legal definition of a "point source" as defined in the Clean Water Act. Nonpoint pollution sources are diffuse in that they do not have a single point of origin, such as a pipe or outfall, or are not introduced into a receiving stream from a specific outlet. Some of the most common categories of nonpoint sources are agriculture, forestry, urban stormwater runoff, and mining.[63] In the National Water Quality Inventory released by the EPA, "agriculture nonpoint source pollution was the leading source of water quality impacts on surveyed rivers and lakes, the second largest source of impairment to wetlands, and a major contributor to contamination of surveyed estuaries and groundwater."[64] It is well documented that agriculture is a major contributor to nonpoint source pollution in Washington state.[65]

Significant amounts of nonpoint source pollution in Puget Sound originate in places such as the Samish, Nooksack, and Stillaguamish watersheds where agriculture is a predominant land use.[66] Whatcom County's Water Quality Program reports "that only 20 percent of the monitoring sites in Whatcom County are meeting water quality standards."[67]

Discharges and runoff from agricultural operations carry pollution in the form of bacteria, pathogens, chemicals, nutrients, and sediments due to soil erosion, pesticide use, and mishandling of animal waste.[68] Additionally, the loss of riparian vegetation due to farming too close to waterways can result in increased temperatures and reduced dissolved oxygen content of our waters.[69]

Nonpoint Sources of Pollution Impede Salmon Recovery Efforts

Ecology and the Washington State Department of Agriculture (WSDA) recognize the threat to salmon survival caused by ongoing nonpoint source pollution to our waters.[70] The poor water quality in Skagit and Whatcom counties, largely due to agricultural sources, is a particular area of concern because the rivers support salmon populations for several salmon species and the area's water quality directly impacts the many shellfish beds along the counties' coasts. The Samish, Stillaguamish, and Nooksack watersheds have consistently had the highest annual yields of nitrogen relative to their size of all Puget Sound area watersheds.[71]

All forms of transported nitrogen are potential contributors to eutrophication.[72] In eutrophication, high levels of nitrogen cause rapid algal growth. When the algae dies and decays, it consumes dissolved oxygen in the water, reducing the oxygen available to fish and other aquatic life.[73] In addition to eutrophication, excessive nitrogen causes other water quality problems. Dissolved ammonia may be toxic to fish and nitrates in drinking water are dangerous to humans, especially newborns.[74]

The Puget Sound Partnership has recognized that "[r]educing nutrient pollution is important,

particularly in areas like parts of Puget Sound where harmful algal blooms and depressed oxygen levels affect both aquatic life and human use and health."[75] Ecology reports that nitrogen levels in Puget Sound have been steadily increasing from 1999 to present.[76]

Highlight:

Ocean Acidification: Good Nutrients vs. Bad Nutrients

While salmon contribute healthy nutrients to the Puget Sound ecosystem, nutrient pollution, including from agriculture, contributes to the growing problem of ocean acidification. Scientists agree Puget Sound is becoming more acidic.[77] While the uptake of atmospheric carbon dioxide is the primary driver of open-ocean acidification, secondary contributions, such as nutrient pollution from land-based sources like agriculture exacerbate the acidification effects in Puget Sound. "Coastal regions that receive large volumes of freshwater, especially when the freshwater contains high levels of dissolved nutrients or organic material" are especially susceptible.[78] Leading researchers have recognized that "addressing local factors such as nutrient pollution could offset some of the local acidification impacts…" [79] "For coastal communities in the U.S., the path to confronting souring seas can likely be found close to home in their very own back yards…Ocean acidification should become a part of the conversation among [water] quality managers, stormwater managers, agricultural managers…and it tends not to be in that space."[80]

Studies of nutrient loading often combine agricultural nutrient pollution with anthropogenic sources (other than wastewater treatment plants) into "total riverine inputs."[81] As its own category, rivers and streams are a significant source of nutrients, contributing 41 percent of all annual local nitrogen inputs and 19 percent in summer.[82] In the rivers and streams that feed the Puget Sound, animal manure is the single largest potential nutrient contributor.[83] This conforms with other nationwide studies that identify agriculture as a major contributor, and specifically, *animal manure is the single largest source of nitrogen pollution from agriculture*.[84] While nutrient pollution in Puget Sound is undoubtedly a multi-causal problem, ocean acidification scientists and policy experts have identified agriculture as an industry particularly appropriate for nutrient regulation as one means to stem the tide of ocean acidification.[85]

Elsewhere in Puget Sound, high water temperatures and low dissolved oxygen levels are a clear threat to fish.[86] During the 2009-2011 monitoring period, Ecology found that no site in the Samish-Skagit basin consistently met water temperature standards.[87] Elevated water temperatures reduce dissolved oxygen in the water.

Low dissolved oxygen levels affect the growth rates of salmonids, as well as their susceptibility to disease and ability to endure other environmental stressors and pollutants, such as fecal coliform and pesticides.[88] Higher temperatures also increase salmon vulnerability to disease, and the toxicity to salmonids of many substances intensifies as temperatures rise.[89]

Increasing trends in concentrations for 10 pesticides was reported by WSDA in 2013.[90] In the Skagit-Samish basin, concentrations of pesticides have been high enough to be of chronic concern for fish and aquatic invertebrates (the food for young salmon).[91]

Since at least 1993, high bacterial loads in the waters of Skagit and Whatcom counties due to pollution from agricultural waste have raised major concern for salmon and shellfish health.[92]

Bacterial pollution from fecal coliform contamination is a widespread problem in the Puget Sound region, and one of the most common water quality problems.[93]

Nearly half of all of Puget Sound waters that have been assessed are affected by fecal contamination and there was a steady increasing trend in fecal coliform pollution in Puget Sound from 1998-2007.[94]

The presence of bacteria in the water can affect salmon immunoresponse and stress levels, ultimately increasing their susceptibility to infection.[95] Existing monitoring efforts most commonly test water for fecal coliform, which

acts as an indicator that pathogenic bacteria, viruses, and protozoans are also present in the water.[96]

Fecal coliform found in the water also indicates that animal waste may be entering the water and contributing to the ecologically damaging nutrient pollution described above.[97]

Highlight:

Puget Sound Shellfish: The Canary in the Coal Mine

Zyanya Breuer, University of Washington School of Law Class of 2016

Shellfish are significant to the ecology, culture, and economy of Puget Sound and are currently threatened by nonpoint source agricultural pollution. The Pacific Northwest treaty tribes have harvested shellfish in the region for over 12,000 years.[98] Shellfish sales contribute over $107 million annually to Washington's economy. Additionally, the shellfish industry directly and indirectly employs more than 3,200 people and provides the state with an estimated economic contribution of $270 million through business infrastructure, state harvesting licenses, and shellfish harvesting tourism.[99] Tourists and residents purchase 160,000 licenses to harvest shellfish from our waters, providing more than $1 million in state revenues.[100] The Washington Department of Fish and Wildlife estimates that the shellfish harvesting trips made to Puget Sound beaches each year provide a net economic value of $5.4 million to the region.[101] However, these economic drivers and cultural traditions may soon wither and die because of under-regulated agricultural pollution.

"Of the approximately 190,000 shellfish areas in Puget Sound, about 36,000 acres – or about 19 [percent] of commercial and recreational shellfish beds – are closed due to pollution. Over the past 30 years, Department of Health, Office of Shellfish and Water Protection (OSWP) has downgraded the classification of about 56,000 acres and upgraded the classification of about 46,000 acres."[102]

In 1997 and again in 2014, hundreds of acres of Portage Bay shellfish areas were downgraded from "approved" to "restricted" for high levels of fecal coliform bacteria that failed to meet the National Shellfish Sanitation Program water quality standards.[103] From 2011 to 2014 there have been 52 shellfish harvesting area closures implemented in the Samish basin alone due to high levels of fecal coliform bacteria, an indicator of fecal pollution from warm-blooded animals.[104]

The Lummi Nation estimates its shellfish harvesters lost $8 million in revenue from 1996 to 2006, when 180 acres of Portage Bay shellfish beds were closed.[105]

Agriculture as a Nonpoint Source of Water Pollution in Puget Sound

EPA acknowledges that agriculture is a leading source of impairment to our nations' rivers and streams.[106] Animal manure and commercial fertilizers were identified as the two largest nutrient sources to the Puget Sound basin in 1998.[107] As early as 1993, the Nooksack River, which runs through Whatcom County dairy country, was monitored on a monthly basis for high levels of fecal coliform.[108] In 1997 the Washington Department of Health noted, "[a]gricultural wastes originating in the Nooksack River watershed are an actual, as opposed to a potential pollution source, and represent a high probability of being the principle source of fecal coliform contamination in Portage Bay."[109] Agricultural and rural areas constitute about 30-35 percent of the Puget Sound region.[110] When not managed properly, these lands have the potential to produce "significant sediment, nutrient, pathogenic, and chemical loads to stormwater though nonpoint sources."[111] The Washington state office of the Natural Resources Conservation Service (NRCS) has identified water quality degradation from excessive sediments in surface waters, excessive nutrients in surface and ground waters, and excess pathogens and chemicals from manure, biosolids or compost applications as state resource concern priorities.[112]

Industrial dairy farms are one significant source of agricultural pollution in the Puget Sound region. In fact, the NRCS has identified dairy farms as an "indicator" of excess nutrients in surface and ground waters as well as an "indicator" of excess pathogens and chemicals from manure or compost

applications.[113] Dairy cows produce, on average, about 120 pounds of manure per day. This includes the fecal and urinary wastes that contain pollutants that can be transported by water, including oxygen-demanding substances, nitrogen, phosphorous, and other nutrients, organic solids, salts, pathogenic bacteria, and sediments.[114] With approximately 250,000 dairy cows in Washington, the state's dairy farms produce about 30 million pounds of manure in a single day.[115] Approximately one-third of the state's diary cows reside in Whatcom and Skagit counties.[116] Industrial dairies store manure in unlined lagoons and often over-apply it to fields as a means to dispose of the significant amounts of manure they produce.[117] There are approximately 415 unlined manure lagoons in Puget Sound counties, many adjacent to, or in close proximity with, the waters that feed Puget Sound.[118]

Figure 1: Locations of WSDA-permitted dairy farms in 2013

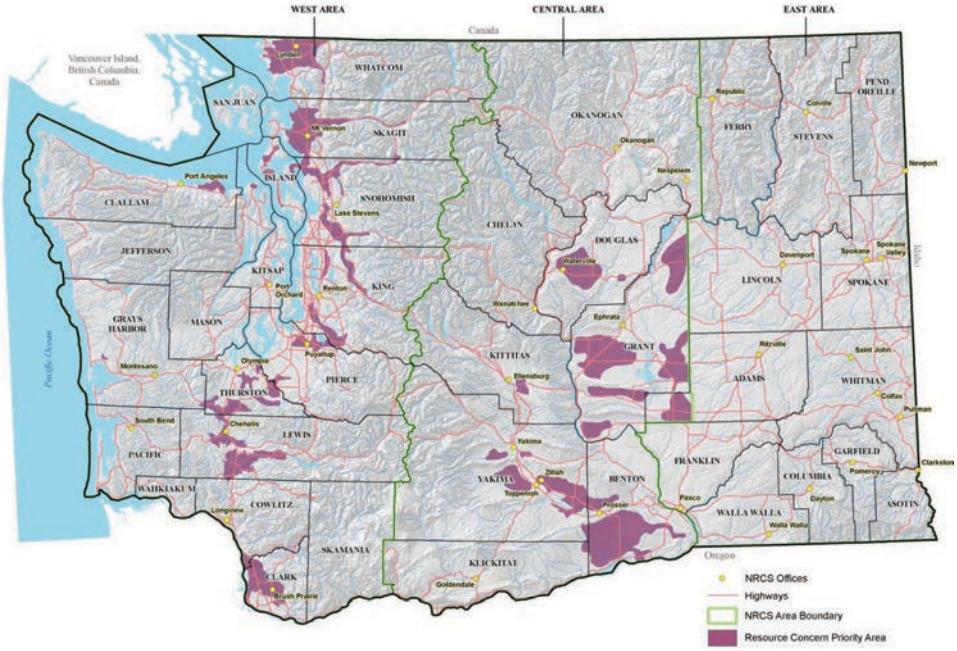


Figure 2: USDA NRCS Washington State Office, Spokane, State Resource Assessment 2011: Priority Resource Concerns, Washington State (August 2011), at 23[117]

Research has confirmed that elevated nitrogen concentrations in streams can be caused by agricultural activities in upstream watersheds.[119] EPA acknowledges animal manure from agricultural activities is "a primary source of nitrogen and phosphorous to surface and groundwater."[120] Nitrogen is naturally present in soils but is added in the form of manure or commercial fertilizer to increase crop production.[121] When more nitrogen is applied to fields than can be absorbed by the crops and soil (i.e. above agronomic rates), runoff and seepage of pollutants to surface water occurs when it rains and under other conditions.[122] Additionally, over-application of manure can lead to excess concentrations of contaminants in groundwater, including nitrates, causing an environmental and public health threat.[123] Ecology has found that "[b]esides human health effects of nitrate, nitrate in groundwater can adversely affect surface water by increasing primary productivity in streams, rivers, and lakes hydraulically connected to the aquifer system. When algal and plant material that depend on nitrogen decompose, oxygen depletion can adversely affect fish and other aquatic life."[124]

A study by the United States Department of Agriculture (USDA) found that two-thirds of U.S. cropland does not meet criteria for good nitrogen management and improvements in management

are needed to increase nitrogen use efficiency.[125] The extent of the damage to our waters from agricultural pollution of nitrogen is unknown because most agricultural activities are not subject to any kind of permit or monitoring requirements.[126]

It is estimated that the cost of removing nitrate from U.S. drinking water supplies would be more than $4.8 billion per year.[127] In 2007, 63.5 million kilograms of nitrogen and 16.1 million kilograms of phosphorous from animal manure were produced in Washington state.[128] Because of widespread nitrate contamination in drinking water, Ecology has developed the Washington Nitrate Prioritization Project to identify areas as "Nitrate Priority Areas," where nitrates in groundwater exceed drinking water standards.[129]

The Samish, Stillaguamish, and Nooksack watersheds have consistently had the highest annual yields of nitrogen relative to their size of all Puget Sound area watersheds.[130] Ecology notes that these three watersheds also have relatively high agricultural land uses.[131] The Nooksack River discharges the largest nitrogen load of all U.S. rivers north of Puget Sound[132] and was identified in 1999 for its high nitrogen yields which researchers attributed to over-application of animal manure and commercial fertilizers.[133]

No Washington state water quality criteria currently exist for nitrogen in surface water, though there is a human health criterion for nitrate published by the EPA.[134] Several Ecology studies have confirmed that the rate, timing and amount of manure applications on fields were the prevailing factors affecting nitrate levels in groundwater.[135] The Sumas-Blaine Aquifer in northern Whatcom County is the main drinking water source for 18,000-27,000 people and has some of the most widespread and elevated nitrate

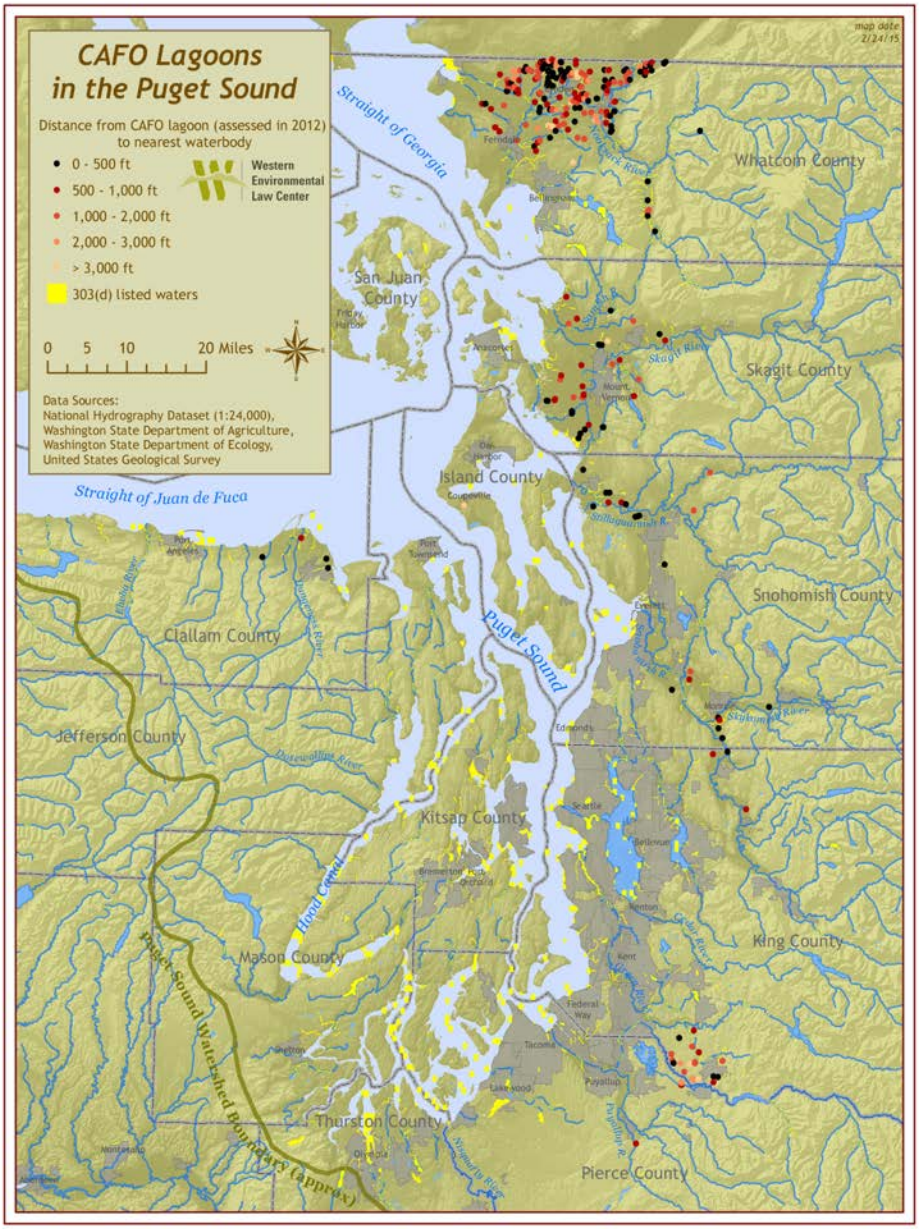


Figure 3: Proximity of CAFO lagoons to Puget Sound

contamination in Washington state, with water often reaching concentrations of more than double the maximum contaminant level.[136] Ecology found that 97 percent of the nitrogen loading to the ground is from agricultural activities and 66 percent is attributed to manure applied to fields.[137] The nitrate contamination problem in drinking water not only raises public health concerns, but economic concerns as well because citizens are forced to find alternative sources of drinking water. Ecology has noted that "[s]everal public water systems in Northern Whatcom County are under Washington State Department of Health (WDOH) compliance orders because nitrates are over the limit, yet a new source proves hard to come by due to the limited nature of the aquifer and water rights issues."[138]

Runoff and seepage from fields receiving excessive quantities of manure can also contain extremely high levels of bacteria, such as fecal coliform, that can cause shellfish bed and beach closures.[139] Bacterial pollution from fecal contamination, largely from agricultural nonpoint sources,[140] is the most widespread and common water quality problem in the Puget Sound region.[141] Nearly half of all of the Puget Sound waters that have been assessed are affected by fecal contamination.[142] In Northwest Washington, an average of 84 percent of sites listed as impaired by Ecology are impaired due to high bacteria loads year round.[143] Molecular and genetic assessment of nonpoint pollution in Washington state by Oregon State University (OSU) found that the most frequent source of bacterial contamination detected was from ruminants.[144] In a parallel study, OSU determined that due to the heavy dairy farming in the region, the most likely source of the ruminant contamination was cows.[145]

Highlight:

Notes from the Field

Lee First, North Sound Baykeeper &
Sue Joerger, Field Director, Puget Soundkeeper Alliance

Note: Because of agency recalcitrance to inspect agricultural operations, local organizations, such as the Waterkeepers, often serve as citizen watchdogs making sure our waters are being protected from pollution.

In Skagit County, man-made waterways known as "V-ditches" are allowed if they do not drain to a salmon stream. V-ditches are commonly observed in the lower Skagit and Samish delta areas and add high amounts of turbidity, and depending upon the type of use, likely add fecal coliform, nutrients, and other agricultural chemicals. Many of the fields are expansive, with as many as a dozen V-ditches per field.

An application of manure solids was made to this field in mid-November. Because nothing is growing on this field, there is no biological uptake of nutrients. Seasonal rains carry nutrient-rich runoff into roadside ditches, in many cases via V-ditches. The runoff from these fields reaches tributaries of the Samish and Skagit rivers. This is a common observation in the lowlands of Skagit and Whatcom Counties.

Many former dairy pastures and hay fields are being converted to berry fields in Whatcom County. The land base for which dairy farmers are able to apply manure is shrinking. Many areas with poor drainage are being converted to blueberry fields. We have learned that it is common practice to mulch newly planted blueberry fields with manure solids and sawdust mulch for the first three years after planting new blueberry plants. In times of heavy rains, these fields contribute fecal coliform to nearby ditches and streams. Fecal coliform levels from 4,000-6,000 fecal coliform colonies per 100 mls were recorded flowing off a field in this area.

In the northeast corner of the agricultural area of Whatcom County, the Sumas River watershed is home to very intense agriculture, including expansive berry fields and some of the larger dairies in Whatcom County. We have observed excessive manure applications, including applications and piles of solids near the Sumas River and its tributary, Johnson Creek. This photo shows a newly planted berry field that has received a combination of mulch and manure solids that drain to a roadside ditch and Saar Creek during wet conditions. Because our local Department of Ecology staff are funded by a grant that focuses on the priority areas of Portage Bay and Drayton Harbor, little attention is given to following up on water quality complaints that we submit for the Sumas watershed.

Other examples of dairy pollution witnessed in the field and reported to Ecology since 2012:

- Production area runoff into Snoqualmie River in King County and into Joe Leary Slough in Skagit County.
- Over application of manure in November visible on the field near the Stillaguamish River in Snohomish County and Joe Leary Slough in Skagit County.
- Manure application on saturated fields with standing water adjacent to the Samish River in Skagit County.
- Manure application with leaking hoses spraying into the air near Joe Leary Slough in Skagit County.
- Manure application with disconnected hoses draining into a ditch near Joe Leary Slough in Skagit County.
- Manure injection operation conducted adjacent to freshwater well standpipe of local resident in Burlington, in Skagit County.
- Application of chicken manure bedding to field with V-ditches that drain to Thomas Creek in Skagit County.
- Muddy water from bare fields draining into ditches that lead to the Samish River, Joe Leary Slough and the mouth of the Skagit River.
- Aerial dispersal of chicken bedding.
- Cows in areas draining to surface water in King County.
- Fields with recent manure application draining to ditches that drain to surface waters.
- Transportation of 7,800 poultry layers in open cages in freight trucks on I-5 leaving a trail of manure.

With heavy dairy farming around the waters that feed Puget Sound, it is likely that cows are the primary source of the bacterial contamination contributing to shellfish bed closures. Several agencies have confirmed that conclusion. In 1997, the Department of Health identified agricultural wastes from dairy farms as the only "high probability" source of bacterial pollution to Portage Bay due to the fact that there were (and still are) over 100 dairy farms in the area with many BMP violations.[146] In 2002, the Lummi Nation reported that "[m]onitoring in the Nooksack River watershed confirmed that the largest sources of bacteria loading [leading to shellfish closures in Portage Bay] were dairies and municipal wastewater treatment plants," and that Ecology modified the wastewater treatment plants' NPDES permits to ratchet down the discharge.[147] Nearly all the dairies are unpermitted. Similarly, in 2004, Whatcom County Public Works identified "[a]gricultural practices in California and Dakota Creek Watersheds" as one source of pollution leading to elevated fecal coliform levels in Drayton Harbor.[148]

In 2012, the Washington state Department of Health confirmed that "[m]any Puget Sound counties are challenged in their attempts to achieve landowner compliance with water quality standards for farm pollution" and identified "livestock management" as one of "seven major areas of focus" to restore shellfish areas.[149] In 2014, Whatcom County Public Works water quality sampling done in response to a discharge of manure from a dairy led WSDA to "consider enforcement options" because "[t]he discharge is contributing to an ongoing beach closure at the mouth of Terrell Creek in Birch Bay."[150] Also in 2014 WSDA wrote a letter to the dairies operating in the Kamm Creek watershed in Whatcom County clearly articulating the problem:

> This spring application season has been one of the wettest and most challenging for manure management in recent years. WSDA sample results show highly

elevated fecal coliform bacteria levels in the Kamm Creek watershed. These high bacteria levels influence the Nooksack River watershed and Portage Bay, which threaten to close shellfish growing areas. This exceedance of water quality standards is due to many factors/sources, including dairy manure applications. Several storm events have occurred this spring during and after application periods, resulting in loss of nutrients and contaminated field runoff.[151]

At the end of 2015 the Washington Shellfish Initiative[152] identified the need "to ensure manure land-application practices do not negatively impact water quality" in order to restore shellfish beds in Puget Sound.[153] Whatcom County identifies "animal waste from agricultural operations" as one "key potential source of bacteria that have been identified in Whatcom County coastal drainages."[154]

In general, Ecology has found that the agricultural monitoring locations around Puget Sound export more and higher concentrations of contaminants than expected.[155] Nationwide, urban and agricultural areas tend to export roughly equivalent concentrations of phosphorous and other pollutants.[156] However, in Puget Sound the residential monitoring locations exported fewer and lower concentrations of contaminants than expected when compared to the high agricultural concentrations.[157] This suggests agriculture in the Puget Sound basin is an even greater contributor to nonpoint source pollution than in other watersheds across the nation.[158] One contributing factor may be the lack of effective BMPs to control agricultural pollution. A Puget Sound Partnership Workgroup found that "[s]tormwater effectiveness monitoring on agricultural activities is sparse in Washington state" and that "[c]ommonly prescribed agricultural BMPs have no effect on preventing agricultural stormwater pollution from impacting water."[159]

Aside from the pollution caused by point and nonpoint source discharges of pollutants directly into surface and ground waters of the state, livestock degrade riparian areas when they are allowed access, causing habitat damage, shade reduction and associated increases in water temperature, erosion, and sedimentation.[160] This impact to the structure of the stream can increase flow of water into the stream and stream velocity, increasing the distance pollutants can be transported from pollution sources.[161]

Highlight:

The Push for "Big Dumb" Buffers[162] to Save Salmon

Larry Wasserman, Environmental Services Director, Swinomish Indian Community

Riparian or streamside vegetation provides six major functions related to salmon habitat. These are (1) shade, (2) filtration (3) bank stabilization, (4) organic litter, (5) large woody debris, and (6) microclimate. The role of these factors in providing necessary salmon habitat is as follows:

Salmon require cool clean water to live. Streamside vegetation provides shade, critical to stream temperature moderation. This vegetation also acts to filter nutrients and sediments from adjacent land use activities such as farming and forestry. The root systems of trees and brush along streams act to hold stream banks together during storm events and prevent erosion harmful to salmon habitat. Leaf litter from riparian vegetation also attracts insects – important food sources for salmon. The single largest factor affecting salmon habitat is the presence of large woody debris. This creates pools and riffles essential for salmon rearing and spawning, and provides hiding areas for juvenile and adult salmon. Finally, streamside vegetation affects the local microclimate, with large riparian areas serving to lower air and soil temperatures as well as to facilitate higher humidity and soil moisture. Inventories of riparian lands in Skagit County have shown that buffer quality is worst on agricultural lands, followed by lands within cities, forest lands, and finally federal lands. Currently, there are few regulations requiring the establishment of riparian buffers on agricultural lands.[163]

Since the mid 1990s, the Swinomish Indian Community has attempted to ensure agricultural activities adjacent

to salmon streams are conducted in ways protective of salmon resources. In 1997, when Skagit County exempted agriculture from its Critical Areas Ordinance protections and refused to adopt Growth Management Act provisions to designate and protect critical areas associated with salmon habitat on agricultural lands, the tribe joined Friends of Skagit County and others in challenging the county's actions. This lawsuit resulted in a decision requiring the county designate and protect critical area on agricultural lands. During the course of the following decade, the tribe and others were forced to appeal the county's continuing refusal to adequately protect critical areas associated with salmon habitat on agricultural lands. The issue was finally resolved in 2007 by the Washington state Supreme Court in *Swinomish Indian Tribal Community. v. Western Washington Growth Management Hearings Board*. The court found that the "no harm" standard of the Growth Management Act protects critical areas by only requiring the maintenance of existing conditions, regardless of how degraded they might be. In short, GMA does not provide a remedy from ongoing agricultural activities that result in failure to meet state water quality standards and that degrade salmon habitat.

Since this Washington Supreme Court decision, the tribe has sought other pathways to recover depleted salmon populations. In 2011, the tribe, along with 19 Western Washington tribes, initiated the treaty rights at risk initiative, which is an effort to engage federal agencies in a coordinated process to protect treaty-secured fishing rights and the habitat upon which they depend. As part of this effort, the Swinomish tribe worked successfully with the EPA and the National Oceanic and Atmospheric Administration (NOAA) to ensure that when money is provided to the farm community for environmental purposes, riparian buffers of adequate size must be installed as a condition of funding. Ecology agreed to use the money it has secured from EPA in ways consistent with riparian buffer widths recommended by NOAA as part of this process.[164] Unfortunately, as of this writing, numerous other agencies on both the state (the Salmon Recovery Funding Board, the Puget Sound Partnership and the Washington Conservation Commission) and federal (Natural Resources Conservation Service) level have yet to agree to apply comparable science-based standards when providing similar funding to agricultural landowners to meet water quality standards and/or habitat needs of salmon.

The Lack of Enforcement of Water Quality Laws

The Puget Sound Partnership acknowledged, "Ecology has the *responsibility* to control and prevent the pollution of streams, lakes, rivers, ponds, inland waters, salt waters, watercourses, and other surface and underground waters of the state of Washington."[165] To fulfill that duty, the Puget Sound Partnership found a need for increased enforcement, and set a goal for Ecology to "ensure compliance with regulatory programs designed to reduce, control, or eliminate pollution from working farms."[166]

Ecology has received over $1.5 million in funding from the National Estuary Program through Puget Sound Partnership since 2012, specifically for the purpose of increasing inspection and enforcement of current water quality standards.[167]

Yet Ecology has decreased its enforcement actions under its water quality program since 2012. From 2006-2011 the number of water quality enforcement actions by the water quality program ranged from 114-143 actions annually. In 2012 the level of Ecology enforcement actions drop to only 57.[168] In response to a request for the most recent trend data on enforcement, Ecology estimated that there were 97 enforcement actions by the water quality program in 2014 and 79 in 2015.[169] An Ecology water quality inspector explained that his job is to track down pollution sources that contribute to fecal coliform loading and shellfish bed closures and then find ways to offer technical and financial assistance. He stated, "[a] lot of my efforts go toward coordinating the team effort to get pollution problems fixed in a way that will not require formal enforcement."[170]

State and county agencies appear to be capable of conducting thousands of residential home inspections for on-site septic systems, yet far fewer farm inspections. In the Samish basin from 2010-2014, of the 4,253 septic systems that were assessed, 95 percent passed their inspections.[171]

Enforcement Totals by Program for 2004-2013										
Program	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Air Quality	108	88	89	114	124	134	136	99	106	128
Environmental Assessment Program	0	0	0	0	0	0	0	0	0	1
Hazardous Waste and Toxics Reduction	14	15	13	9	13	8	11	6	14	11
Industrial Section	35	20	20	22	17	7	20	15	15	23
Nuclear Waste	2		1	6	1		1		1	0
Shorelands and Environmental Assistance	14	5	1	8	6	4	9	3	8	13
Spill Prevention, Preparedness, and Response	90	69	91	109	151	122	67	70	93	81
Toxics Clean Up	54	54	56	70	108	153	79	118	159	162
Waste 2 Resources	18	74	60	33	20	13	11	80	5	4
Water Quality	86	106	139	142	129	114	119	143	57	71
Water Resources	11	13	18	8	2	32	16	13	15	17
Total	432	444	488	521	571	587	469	547	473	511

Table 1: Enforcement Data published by the Washington Department of Ecology[169]

From 2009-2013 in the Samish basin, only 174 farm inspections took place.[172]

The lack of inspections and enforcement when it comes to agriculture is not unique to the Puget Sound basin and is a major problem throughout the state of Washington, exacerbated by the over-reliance on voluntary incentive programs as a means to reduce pollution.

Highlight:

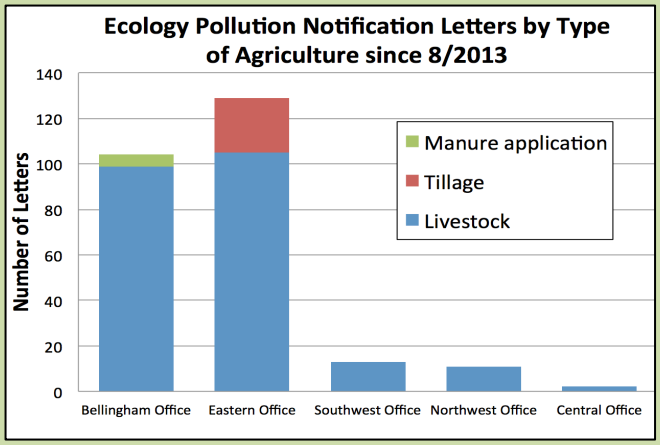
Pretty Please, With a Cherry on Top, Don't Pollute: An Eastern Washington Example

Jerry White and Jule Schultz, Spokane Riverkeepers

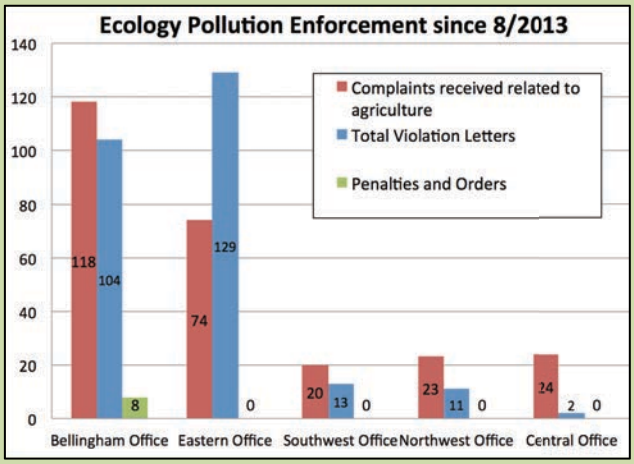
Washington state has two approaches to protect the quality of the public's water from agricultural pollution. Sadly, neither is functioning to provide the healthy, clean water to which the public is entitled. The federal government provides funding distributed by counties and the state to fund voluntary programs to address agricultural water quality problems. The Washington Water Pollution Control Act gives the Ecology the authority to regulate farm practices that protect water quality. This authority was upheld by the Washington Supreme Court in the *Lemire vs. Ecology* case (described on page 36) in 2013. Ideally, participation by the agricultural industry in voluntary programs would work in concert with regulatory frameworks to reinforce a culture of lawful behavior and practices that ensure public values are protected.

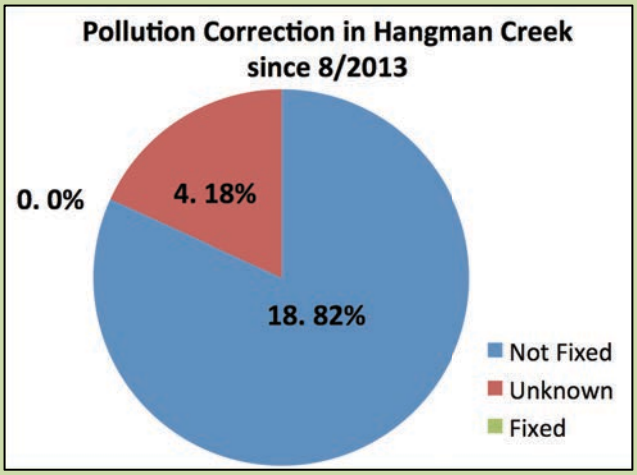
Within this process, Ecology identifies farm operations that are polluting the public's water through citizens' complaints and a Watershed Evaluation Process. They proceed with offering farm operations technical and financial assistance to correct their behavior and improve their practices via violation letters. If the behavior is not corrected, then punitive orders may be issued with associated fines.

In the eastern region and the Spokane River Watershed, the regulatory framework is in place but through inaction has become dysfunctional and counter productive. For example, since the *Lemire* case in the Eastern Region, 74 complaints have been lodged with Ecology and 129 follow-up "[v]iolation letters that offer technical and financial assistance have been sent to farm operations that are violating water quality law." Records show that of those 129 problem cases identified by Ecology, only one single farm has corrected its behavior and cleaned up its operations in a manner that protects water quality. Astoundingly, no administrative orders have been issued nor fines levied. To illustrate this pattern, see the figure below for comparison of Eastern Regional Office to Bellingham Field Office. Inside the eastern region, the



Spokane River tributary of Hangman Creek continues to have the worst water quality in the state. In this watershed, records show that out of 22 active pollution cases (since 2013), zero have been corrected.





This inaction has created a norm in which the agricultural industry breaks the law with impunity and virtually ignores water quality concerns. Ultimately, this inaction has sent a clear message that actual protection of the public's surface water is not a priority for Ecology, and emboldened polluters with the message that absolutely no enforcement is forthcoming for violators. In our watershed, as across the state, lawful behavior has broken down and as a result, Ecology is knowingly depriving the public of clean water, healthy fisheries and functioning ecological corridors that our rivers should deliver.

The people of Puget Sound are repeatedly advised to reduce water pollution by checking septic systems and by being told to do our part to "pick up the poo."[174] The emphasis on many county program websites is on septic and other sources of pollution unrelated to industrial agriculture.[175] Agencies spend taxpayer dollars to produce videos showing Bigfoot using a port-a-potty while claiming that "Bigfoot is elusive, just like some sources of water pollution."[176] But the tens of thousands of cows in industrial dairy operations in Puget Sound counties producing massive amounts of manure are neither mythical nor elusive. In an attempt to divert attention from agricultural pollution, many agencies focus on wastewater discharges from homes, waterfowl, pets, boats, and leaking septic systems. Skagit County even hired Crush the sewage sniffing dog, to help find human (but not bovine) sources of fecal coliform.[177] Agricultural sources of pollution, on the other hand, are frequently discussed in terms of "small" hobby farms in need of keeping animals fenced away from water bodies. But the tens of thousands of sedentary cows confined in industrial dairy operations in Puget Sound counties producing massive amounts of manure are neither mythical nor elusive. Industrial agriculture is the most significant, obvious, and concentrated source of fecal coliform and nutrient pollution plaguing Puget Sound.

When representatives from the Pollution Identification and Control program of Skagit County was asked at a meeting in November of 2015 where the pollution is coming from, the response was that they still do not have enough information to know, despite the millions of dollars poured into the Clean Samish Initiative (described on page 62).[178] However, 95 percent of over 4,000 septic system inspections in the Samish basin passed inspection.[179] In Whatcom County, Ecology found that on-site septic systems accounted for 1.2 percent of the annual nitrogen input to the land and subsurface overlying the Sumas-Blaine Aquifer, while manure applied to crops accounted for 66 percent of the nitrogen

input.[180] Similarly, in Yakima County, the top dairy county in Washington state, EPA found that "the contribution from residential septic systems to nitrate contamination in the monitoring and residential drinking water wells downgradient of the Dairies is negligible. The amount of nitrogen generated by the 224 residential septic systems on and within one mile downgradient of these dairies is insignificant relative to the amount of nitrogen produced by the dairies."[181] This suggests that very few septic systems are primary sources contributing to the pollution problem plaguing Puget Sound. While on-site septic systems certainly can contribute to pollution in Puget Sound and should be addressed, such a singular focus accomplishes little to recover Puget Sound salmon populations.[182]

WSDA, EPA, and Ecology have established significant amounts of data illustrating that agriculture significantly contributes to water pollution and bacterial contamination in Puget Sound. In recognition of this fact, WSDA released a Quality Assurance Project Plan for monitoring bacteria from dairies in August of 2015 and stated that they will be "increasing efforts to monitor dairies and other agriculture to reduce fecal coliform discharge. The focus is on watersheds with the greatest percentage of acreage associated with dairy operations."[183] A positive correlation between percentage of acreage associated with dairy operations and the concentration of fecal coliform loads in rivers is found in the data WSDA reports.[184] Yet local and state programs still insist on spending significant amounts of time, money, and resources on advising the public about septic system failure, and where Bigfoot should go to the bathroom. All this while avoiding the suggestion that industrial dairy operations, responsible for producing 3.6 million pounds of manure per day in Skagit county alone, and with at least 415 unlined manure lagoons leaking pollutants into the groundwater, are significant contributors to the pollution problem.

The conundrum of the inability to address the agricultural pollution problem facing Puget Sound perhaps is best described by the Lummi Indian Business Council, co-managers of the salmon and shellfish in Northern Puget Sound. According to the tribe, regulatory agencies have failed to change behaviors of polluters using voluntary programs, and the Puget Sound ecosystem and the people that depend on it bear the burden of this failure:

> The closure of Portage Bay shellfish beds reflects the fact that we have collectively failed to permanently change the behavior of community members in the Nooksack River watershed. As a result, tribal members including those on the lowest rungs of the economic ladder will once again be punished for the actions and inactions of others and the Lummi Nation's treaty rights to harvest shellfish will once again be violated.[185]

In spite of this, Washington policymakers insist on funding the same ineffective approaches, allowing water quality to deteriorate steadily. And when the agencies do actually address agricultural pollution, they carefully avoid any regulatory language, offering only "guidance" and "information." In a recent Ecology document assessing risks to water quality by livestock operations the report begins:

> This document provides information on livestock related water quality impacts to help landowners and producers make informed management decisions to protect water quality. Because Washington is geographically diverse, proper management practices can vary across the state. Therefore, this document can only provide general guidance.[186]

Ecology therefore suggests landowners have the option to choose not to protect water quality, but that notion is contrary to law.

Indeed, many within the agriculture community voice their opposition to regulation and enforcement of their land management activities. Concerns have been expressed that regulatory measures requiring application of best management practices will be cost prohibitive and compromise the welfare of the agriculture.[187] But the voluntary approaches to date are simply not working if you look at the water quality and health of the salmon populations in Puget Sound.

By not requiring polluters to comply with water quality laws through the enactment and enforcement of a regulatory approach to agricultural sources of pollution, we are fooling ourselves into believing we are on a path towards recovering Puget Sound. The future generations of this state cannot afford such self-deception,[188] a concept described by University of Washington School of Law Professor William H. Rodgers, Jr.:

> Conveniently, the decline of the salmon can be assigned credibly to any number of causes, which results in a perfect circle of recrimination. The history of the salmon fishery is a history of assigning blame for reductions on other animate and inanimate forces. When the fishwheels were banned on the Columbia in the 1930s, the canners assigned responsibility for the loss of the fish to the irrigators; the sports fishing people point to the Indians and the sea lions, the Indians look to the dam-builders and the ocean trawlers, the ocean fishers condemn the Japanese or hatchery people. The fact that responsibility for the decline of the salmon is extravagantly shared among the players adds only seeds of plausibility to the accounts of self-deception that inflate the roles of others while simultaneously conflating one's own. Frequently, these self-deceptions have become legal policy, in the form of campaigns to banish the fishwheels, shut down the Indians, and exterminate the sea lions.[189]

Photo: Manure lagoons (CARE Washington)

The Law

"No One Has The Right To Pollute:"[190] Development of the Regulatory Approach to Water Pollution in the U.S.

Since ancient times, sovereign governments have recognized their fiduciary responsibility to protect common natural resources, including water.[191] The U.S. has long acknowledged the need to regulate what is discharged into the waters of this nation. Congress initially addressed this need in 1899 with the passage of the Refuse Act, which states that it is against the law to "throw, discharge, or deposit…*any* refuse matter of *any* kind…into *any* navigable water of the United States, or into *any* tributary of *any* navigable water…"[192] The Refuse Act, still valid law today,[193] also creates liability for discharge of refuse onto the banks of navigable waters where the refuse could wash into that water by storm or flood.[194]

In 1948, Congress enacted the first Federal Water Pollution Control Act, which authorized federal agencies to assist local entities and industry to eliminate or reduce water pollution for the purpose of improving the conditions of surface and groundwater. This act was subsequently amended five times prior to the adoption in 1972 of the well-known Clean Water Act (CWA).[195] The CWA created the National Pollutant Discharge Elimination System (NPDES) permit program designed to regulate, and ultimately prevent discharges of pollutants from discrete conveyances known as point sources.[196]

The establishment of the NPDES permit program was a departure from the Refuse Act which simply made it illegal to discharge refuse into waters of the U.S., with no statutory mechanism to get regulatory permission to do so.[197] But the introduction of a waste discharge permit program was not new in Washington state, as a permit to discharge waste into waters of the state has been required since 1955.[198]

Congress declared in the CWA, "it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985."[199] This goal was thought to be unrealistically optimistic. The legislative history of the CWA "clearly establishes that the discharge of pollutants is unlawful. Unlike its predecessor program which permitted the discharge of certain amounts of pollutants under the conditions described above, this legislation would clearly establish that no one has the right to pollute—that pollution continues because of technological limits, not because of any inherent right to use the nation's waterways for the purpose of disposing wastes…The Committee believes it is important to clarify this point: no one has the right to pollute."[200]

The CWA is designed, in part, to regulate and prevent the discharge of pollutants from two different categories of pollution sources: point sources and nonpoint sources.[201] A point source is defined as:

> any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged.[202]

A nonpoint source of pollution is not defined in the CWA but is referenced frequently. Nonpoint source pollution "'should be understood as any source of water pollution or pollutants not associated with a discrete conveyance.'"[203] Nonpoint source pollution encompasses a broad category of sources and is defined by the EPA as follows:

> land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. The term "nonpoint source" is defined to mean any source of water

> pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act.
>
> * * *
>
> Unlike pollution from industrial and sewage treatment plants, nonpoint source (NPS) pollution comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters.[204]

The Regulatory Push for Technology to Eliminate Water Pollution

It was Congress' intent under the CWA that "a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters…"[205] The 1972 amendments to the CWA created technology-based standards for effluent limitations of point sources, and the NPDES program serves as the mechanism to implement and enforce these limitations.[206] The very purpose and success of the NPDES permitting scheme, and the subsequent achievement of the CWA's goals, revolves around forcing dischargers to develop and apply best technology to accomplish the ultimate goal of pollution elimination. The notion was that human ingenuity in the form of best technology would be the means by which we would eliminate the need to discharge pollutants into navigable waters:

> Section 301(a)(1) articulates the no discharge policy carried over from the Rivers and Harbors Act of 1899 ("the discharge of any pollutant by any person shall be unlawful"), and articulates the various formulations of the "best technology" principle to be met on a scheduled basis by industry and municipal sources moving towards the 1983 fishable/swimmable water and the 1985 no discharge goals…The most important of these [permit programs] is Section 402 establishing the [NPDES] as a comprehensive regulatory scheme replacing and supplementing the Refuse Act Permit Program.[207]

The use of "technology-forcing" as a means to change polluting behavior is common in other areas of environmental law. For example, technology-forcing serves as a bedrock principle of the federal Clean Air Act and has been described as follows:

> The idea, briefly put, is that the government can order into being technological achievements not now enjoyed by a particular industry. A policy of technology-forcing assumes that existing market forces fail to produce an appropriate level of pollution control, either because of explicit collusion among the manufacturers[208] or because of the inability of spillover victims to communicate and enforce their needs within the market. A policy of technology-forcing presupposes also that intervention by law will bring a response, either from the manufacturers themselves or equipment suppliers, and that these new forces can be loosed to create a technology that is "superior" to the ones it replaces. The metaphors of this movement are of reluctance overcome, of fires being lit, of perceived limits quickly surpassed, of wills and ways.[209]

The linchpin to technology-forcing under the CWA is the NPDES permit program that regulates the discharge of pollutants from "point sources." In essence, the permit serves as the regulatory tool designed to require the discharger to develop and implement pollution prevention technologies, thereby eliminating the need for the permit to

discharge in the first place. This is the reason permits last only for a period of five years[210] and why it is illegal for a permit to contain weaker effluent limitations and guidelines compared to the previous version of the permit, known as anti-backsliding provisions.[211]

The 1977 amendments to the CWA gave greater power to the administrator of the EPA "to deal with complex water pollution problems" and were focused on ensuring that different industries that discharge use the "best available technology to control pollution."[212] While important for the general scope of water pollution regulation, the 1977 amendments did not alter the major requirements of the NPDES permit program.[213] One distinguished commentator concluded, "the Clean Water Act of 1977 is filled with mid-course corrections that can be explained as constituent group reactions against objectionable policies emerging in the wake of the 1972 Amendments."[214]

Federal Regulation of Nonpoint Source Pollution Under the Clean Water Act

Originally, the CWA did not clearly define a regulatory strategy to address nonpoint source pollution, although it was clear that under the plain language of the Refuse Act, nonpoint source pollution was never legal.[215] Courts have stated that the CWA "provides 'no direct mechanism to control nonpoint source pollution.'"[216] However, the Study and Planning Provisions in the CWA contain several requirements regarding nonpoint source pollution, making it clear that congress did not intend to exempt this entire category of pollution from regulation under the CWA.[217] Indeed, the CWA made it clear that the principle of technology-forcing should be applied to nonpoint sources of pollution as well. For example, section 201 of the CWA requires states to prepare "[w]aste treatment management plans and practices" which "shall provide for the application of the best practicable waste treatment technology before any discharge into receiving waters" and "shall provide for consideration of advanced waste treatment techniques."[218] These plans are to "provide control or treatment of all point *and nonpoint sources of pollution*…"[219] As part of the development of the plan, states must "(i) identify, if appropriate, agriculturally and silviculturally related nonpoint sources of pollution, including return flows from irrigated agriculture, and their cumulative effects, runoff from manure disposal areas, and from land used for livestock and crop production, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources…"[220]

Similarly, section 303(d) of the CWA requires states to conduct water quality assessments of all surface waters in the state.[221] The water quality assessment is an agency document that is subject to public review and comment, and ultimate EPA approval. The waters that are assessed are assigned to particular categories that describe the quality of the water.[222] Those water bodies that do not meet state water quality standards are considered impaired, or "water quality limited segments" (WQLSs). For impaired waters, the state must prepare a water cleanup plan identifying a total maximum daily load (TMDL) for the pollutants that are found to impair those waters.[223] A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant.[224]

TMDLs for water quality impaired water bodies are developed by each state with delegated authority under the CWA and states must set the levels "necessary to implement the applicable water quality standards."[225] The TMDL must meet certain guidelines in order to be approved by EPA.[226]

TMDLs are composed of the waste load allocations for point sources, load allocations for nonpoint sources, natural background levels, and

a margin of safety.[227] These allocations are treated similar to allotments that are divided among the various sources of pollutants. The waste load allocation portion comes from permitted treatment facilities (including CAFOs), while most agricultural sources (except for CAFOs) fall under the load allocations portion for nonpoint sources.[228]

"The TMDL calculations are to ensure that the cumulative impacts of multiple point source discharges and nonpoint source pollution are accounted for. States may then institute whatever additional cleanup actions are necessary, which can include further controls on point and nonpoint pollution sources."[229] Once approved by EPA, "the identified WQLSs and TMDLs are incorporated into the state's water quality management plan under section 303(e)."[230]

The Government Accountability Office (GAO) has recently called into question the success of the TMDL program.[231] The GAO asked water resource experts and state water quality officials to review a random sample of TMDLs to determine their effectiveness, finding:

> [S]tate officials reported that long-established TMDLs generally do not exhibit factors most helpful for attaining water quality standards, particularly for nonpoint source pollution (e.g. farms and storm water runoff). The officials reported that landowner participation and adequate funding – factors they viewed as among the most helpful in implementing TMDLs – were not present in the implementation activities of at least two-thirds of long-established TMDLs, particularly those of nonpoint source TMDLs.
>
> * * *
>
> More than 40 years after Congress passed the Clean Water Act, however, EPA reported that many of the nation's waters are still impaired, and the goals of the act are not being met. Without changes to the act's approach to nonpoint source pollution, the act's goals are likely to remain unfilled.[232]

The introductory letter to the GAO report warns: "EPA has estimated that at historical funding levels and water body restoration rates, it would take longer than 1,000 years to restore all the water bodies that are now impaired by nonpoint source pollution."[233] In 1987, the CWA was amended to include section 319, nonpoint source management programs, designed to give more specific legislative authority to states to prevent and eliminate nonpoint source pollution. This new section carried the concept of the waste treatment management plan one step further and directed states to submit for EPA approval a report, commonly called a nonpoint source pollution prevention plan, which:

> (A) identifies those navigable waters within the state which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this chapter;
> (B) identifies those categories and subcategories of nonpoint sources or, where appropriate, particular nonpoint sources which add significant pollution to each portion of the navigable waters identified under subparagraph (A) in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements;
>
> (C) describes the process, including intergovernmental coordination and public participation, for identifying best management practices and measures to control each category and subcategory of nonpoint sources and, where appropriate, particular nonpoint sources identified under

> subparagraph (B) and to reduce, to the maximum extent practicable, the level of pollution resulting from such category, subcategory, or source; and
>
> (D) identifies and describes State and local programs for controlling pollution added from nonpoint sources to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which are receiving Federal assistance under subsections (h) and (i) of this section.[234]

States are specifically directed to identify best management practices (BMPs) "which will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular nonpoint source…taking into account the impact of the practice on ground water quality."[235] In addition, the state is required to identify a panoply "of programs (including, as appropriate, non-regulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects) to achieve implementation of the BMPs…"[236]

No later than 180 days after the state submits the plan to the EPA, the EPA administrator shall either approve or disapprove the plan.[237] Specified reasons can be invoked in order for the EPA to disapprove the plan.[238] If a state fails to submit the report to the EPA, the EPA is obligated to prepare the report on behalf of the state.[239] If a state fails to submit a plan or the EPA disapproves of a plan, "a local public agency or organization[240] with expertise in and authority to control water pollution from nonpoint sources in any area of such state which the administrator determines is of sufficient geographic size" may develop its own plan to control and abate nonpoint source pollution for that particular area, subject to EPA assistance and oversight.[241]

Highlight:

The Quest for the Holy Grail: Agricultural BMPs In Washington

Since at least 2009, Ecology has acknowledged it is necessary to identify and approve best management practices to fulfill several obligations under state and federal law. Those obligations include Washington's federally approved water quality standards, which require activities that generate nonpoint source pollution to achieve compliance with standards by implementing best management practices[242] "approved by the department [of Ecology]."[243] In 2010, Ecology released a preliminary draft of "Clean Water Practices for Livestock Grazing" in an effort to approve BMPs for one agricultural activity that causes nonpoint pollution.[244] The drafting of the BMPs was intended to "satisfy both the legal definition of BMPs and the compliance requirements for nonpoint sources of pollution, as defined by water quality regulations."[245] According to Ecology, the manual was also developed to help with landowner outreach:

> We have been asked by producers and CDs [Conservation Districts] for years for clarity and consistency for what is needed to protect clean water. The manual is intended to articulate those expectations – both to the public and across Ecology's regions – in a clear and consistent manner.[246]

Despite its simple intentions, the manual received significant opposition from select groups involved with developing farm plans – notably some conservation districts, and the Washington State Association of Conservation Districts. The draft manual was provided to these groups, along with Washington state tribes for preliminary technical review, only to result in the guidance document's demise shortly thereafter. As the record demonstrates, with the exception of comments from the tribes, the comments Ecology received did not address the technical proficiency of the BMPs. Instead, some conservation districts vociferously expressed that the very notion of Ecology identifying BMPs to satisfy their statutory obligations was amiss and therefore sought to bring all available pressure in a campaign to eliminate the manual.[247] Some conservation districts viewed the simple act of developing water quality guidance for nonpoint sources of pollution as an "Ecology take over."[248] The Washington Association of Conservation Districts even expressed concern that Ecology was creating "expectations" about the mere existence of a manual, and sought its elimination.

> The "on the ground" problem today with the BMP manual is that Ecology Water Quality staff, and especially the inspectors in the field, have shared with producers that they have an "expectation" of such a document coming out. *WACD has asked the director to have Ecology field staff instructed to not share any expectation of such a document with producers.*[249]

Despite over five months of consultation with NRCS and conservation districts, "little technical feedback was received."[250]

The overall result of the conservation districts' campaign against Ecology fulfilling statutory obligations to protect water quality was to eliminate the guidance manual and thwart the adoption of the BMPs. What proceeded, however, were several years of protracted negotiations among Ecology, conservation district representatives, EPA, NRCS, and tribes. During the first six-month round of the negotiations, conservation districts argued that NRCS Field Office Technical Guide was sufficient guidance to ensure protection of water quality and therefore should constitute Ecology-approved BMPs. In a memorandum from Ecology to workgroup participants, Ecology explained why NRCS standards could not fulfill Ecology's statutory obligations under law:

> The following memorandum serves to reiterate points made in Ecology's presentation at the July 7, 2010 workgroup meeting and the August 3, 2010 meeting, and to reply to several assertions made in the WSCC responses to NWIFC questions…Specifically, the responses clearly stated that "in Washington, NRCS practices standards are designed to meet state water quality standards." Based on information from the water quality BMP talks, Ecology's review of the NRCS technical guidance, and Ecology's experiences in working with this issue, we find that NRCS does not have performance standards that ensure that a producer will comply with Washington state water regulations.[251]

The workgroup negotiations did not result in agreement for Ecology to publish BMP guidance for nonpoint sources of pollution. Instead, state agencies decided to engage in director-level negotiations. At first these negotiations included Ecology, WSDA, and the State Conservation Commission. Again, after a year-plus of negotiations, the agricultural agencies could not agree to support adoption of BMPs that protect water quality.[252] Later other state and federal agencies were added to ongoing negotiations, as tribes sought federal support to address state agency inaction.[253]

These subsequent negotiations (in which the tribes did not directly participate) – also known as the 3 Directors talks – culminated in a January 2013 report to then-Governor Gregoire.[254] This report conceded that the process was focused on trying to make progress on management of three pollutants: nutrients, sediment, and bacteria [fecal coliform]. The report explicitly stated it was not trying to identify practices needed to address all water quality standards, including stream temperature problems and toxics.[255]

The draft report recommended using NRCS practice standards to address pollution from nutrients, sediment, and bacteria.[256] No technical justification for the selection of NRCS-based BMPs was provided,[257] even though it had already been documented that implementation of NRCS practice standards does not automatically result in compliance with any state water quality standard.[258] This further demonstrates that BMP selection was a product of political expediency and not technical, scientific or water quality expertise.

That the 3 Directors' report recommendations – inadequate as they are – have not been implemented also underscores the inability of the state of Washington to develop BMPs that meet water quality standards and protect beneficial uses, due to political resistance.

One very significant and influential provision of CWA section 319 is the grant program.[259] Pursuant to this section, EPA "shall make grants" "for the purpose of assisting the state in implementing" its nonpoint source pollution prevention program.[260] Congress directed EPA to prioritize funding for those programs that will:

(A) control particularly difficult or serious nonpoint source pollution problems, including, but not limited to, problems resulting from mining activities;

(B) implement innovative methods or practices for controlling nonpoint sources of pollution, including

regulatory programs where the administrator deems appropriate;

(C) control interstate nonpoint source pollution problems; or

(D) carry out ground water quality protection activities which the Administrator determines are part of a comprehensive nonpoint source pollution control program, including research, planning, ground water assessments, demonstration programs, enforcement, technical assistance, education, and training to protect ground water quality from nonpoint sources of pollution.[261]

There is a specific provision authorizing grants to protect groundwater quality.[262]

Section 320 of the CWA establishes the National Estuary Program (NEP), which allows the governor of any state to nominate an "estuary of national significance and request a management conference to develop a comprehensive conservation and management plan for the estuary."[263] The purpose of the plan is to "recommend priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected."[264] Puget Sound has been designated as an "estuary of national significance."

In 1990, Congress established the Coastal Nonpoint Pollution Control Program as part of the Coastal Zone Act Reauthorization Amendments (CZARA).[265] This program is administered jointly by NOAA and EPA.[266] The program is designed to implement enforceable management measures to prevent polluted runoff. The definition of management measures embraces the concept of technology-forcing:

> The term "management measures" means economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternative.[267]

Highlight:

Ecology's Nonpoint Source Pollution Plan

In July 2015, Ecology issued an update to its 2005 water quality management plan to control nonpoint sources of pollution pursuant to section 319 of the CWA. According to Ecology:

> Washington state's water quality management plan to control nonpoint sources of pollution (nonpoint plan) aims to protect public health and our natural resources from nonpoint pollution. It does so by identifying sources of pollution, setting a strategy for protecting and improving water quality, and restoring our waterways.
>
> The plan works to set clear goals and standards to achieve clean water and outline methods for evaluating our progress. State and federal agencies, local governments, tribes, special purpose districts, and citizens all play a role in achieving clean water, so public participation in the process is important.[268]

The plan is designed to maintain the state's eligibility for CWA section 319 grant funding and to comply with the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). In the 2015 plan, agriculture, specifically livestock keeping, crop production, grazing and non-commercial agriculture, is identified as a category of nonpoint source pollution.[269] Ecology committed to:

> continue to use its nonpoint source authority to address pollution problems on

> agricultural lands, and to develop additional strategies that might help…accomplish the goal of achieving clean water in Washington. As the state water quality agency, Ecology will continue to work on better defining what compliance with state water quality law means and to provide that feedback to landowners so they can make informed decisions.[270]

Ecology recognized that "our state lacks freestanding manuals, compendiums, or other guidance that identify BMPs for agriculture that ensure compliance with the WQ standards."[271] EPA went on to approve the plan in August 2015, in spite of Ecology's acknowledgement that no agricultural BMPs that protect water quality exist, which seems to violate the plain language of section 319 which directs states to "identify best management practices and measures to control each category and subcategory of nonpoint sources."[272]

In lieu of identifying BMPs as part of the plan, Ecology states that it will address the agricultural pollution problem by using tools including water clean-up plans (i.e. TMDLs); straight to implementation projects (which implement BMPs); grant and loan programs; complaint response and inspectors; education, outreach and voluntary programs; and partnerships.[273] Ecology contends that it will be hiring a contractor to develop a stakeholder process that will then be used to develop BMPs for agriculture.[274]Only time will tell whether Ecology will finally fulfill its responsibility to develop BMPs for agricultural pollution that protect water quality.

EPA's recent finding that Ecology's plan meets the requirements of CWA section 319 is bewildering in light of the fact that neither EPA nor NOAA has approved the state's coastal nonpoint pollution control program, of which the section 319 nonpoint plan is a component. Ecology's inability to fulfill its responsibilities under CZARA is well documented. In April 2013, NOAA and EPA informed Ecology that the agencies "are not prepared to approve Washington's [coastal nonpoint pollution program]" due to the failure to appropriately respond to tribal treaty rights concerns and to provide necessary protection to salmon habitat.[275] According to the federal agencies, "[d]espite our joint efforts, and those of many others, to address water quality and implement approved salmon recovery plans, salmon and their habitat continue to decline."[276]

In June 2015, EPA again informed Ecology that its "current draft plan does not address a final strategy for satisfying CZARA [Coastal Zone Act Reauthorization Amendments of 1990] requirements"[277] and NOAA provided Ecology with a number of recommendations needed to be incorporated "to achieve a fully approvable coastal nonpoint program and help protect salmon and salmon habitat."[278] Ecology's nonpoint plan remains noncompliant with the agency's responsibilities to protect salmon.

Thus in theory, Congress mandated a regulatory approach to prevent nonpoint source pollution using technological innovation in the federal Clean Water Act and other federal water quality laws. In practice however, this regulatory regime has been overshadowed by the voluntary approach to agricultural sources of nonpoint pollution endorsed in other federal laws relating to agriculture.

Recent Federal Attempts to Recover Puget Sound

On September 28, 2015, Reps. Denny Heck and Derek Kilmer introduced the Promoting United Government Efforts to Save Our Sound (PUGET SOS) Act.[279] This bill seeks to amend the Clean Water Act by adding a new section dedicated to the recovery of Puget Sound.[280] The bill establishes a Puget Sound Recovery Program Office within EPA Region 10 to coordinate recovery efforts between federal, state, local and tribal partners; directs federal agencies to ensure agency actions are consistent with the Puget Sound action agenda; creates an interagency Puget Sound Federal Leadership Task Force to coordinate recovery efforts; and requires biennial reports to Congress, the president and the Governor of Washington describing the progress of federal efforts to restore Puget Sound.[281] The proposed legislation acknowledges the threatened state of Puget Sound, in part due to agricultural pollution sources:

At this time, water and air pollution, sediment contamination, habitat loss and decline, and water flow disruption continue to devastate the fish, marine mammal, bird, and shellfish populations of Puget Sound, threatening local economies and tribal treaty rights and contributing to-

* * *

(A) significant declines in the populations of wild Chinook Salmon, Coho Salmon, Summer Chum Salmon, Steelhead, and Pacific Herring, which are essential food sources for humans, fish, seabirds, mammals, and other wildlife;

* * *

(F) the closing of shellfish beds from contaminated pollution caused by sources such as stormwater and agricultural runoff; and

(G) mortalities and morbidity in shellfish due to the acidification of Puget Sound.[282]

The bill does not include any substantive provisions that replace or enhance existing programs designed to address nonpoint sources of water pollution.

The Farm Bill: Paying Farmers Not To Pollute

In contrast to the regulatory programs, permits, and plans required under the Clean Water Act that were designed to eliminate water pollution using best technology, the Farm Bill takes a vastly different approach; one focused on paying agricultural producers not to pollute. The USDA conservation programs are authorized under various versions of the Farm Bill. The Conservation Reserve Program (CRP) was one of the first conservation programs authorized that is still in existence today, authorized by the Food Security Act of 1985 (1985 Farm Bill).[283]

CRP and the other programs authorized by the Farm Bill came about from lobbying efforts to regulate agricultural environmental impacts which began in the early 1980s.[284] Many had become concerned that past farm programs allowed farmers to cultivate erodible land resulting in the deterioration of water quality. By enacting the conservation programs, Congress recognized that farm programs should not only protect farmers' incomes, but should also encourage conservation of soil and water resources. Though the 1985 Farm Bill continued the theme of voluntary compliance, it implemented new conservation measures and has been referred to as “a landmark in the conservation of farmland.”[285]

Section 1619 of the 2008 Farm Bill

The Freedom of Information Act (FOIA) promotes open access of government records and mandates a “strong presumption in favor of disclosure.”[286] However, with the passage of section 1619 of the 2008 Food, Conservation, and Energy Act (2008 Farm Bill), the USDA and its “cooperators” became prohibited from disclosing certain, non-confidential information provided by participants in USDA grant programs.[287] The prohibition of disclosure in the Farm Bill is designed to ensure that the information falls within one of the nine exemptions of FOIA. Specifically, the information described in section 1619 now falls under exemption 3, which prohibits disclosure of information that a statute specifically exempts from disclosure in such a manner “as to leave no discretion on the issue.”[288]

Section 1619 exempts information that concerns (1) agricultural operations, farming or conservation practices, or the land itself and (2) geospatial data about agricultural lands or

operations.[289] This includes information that is regularly provided by agricultural producers when applying to participate in the USDA-funded voluntary incentive programs described herein. The section is broadly drafted and only provides for limited disclosure of a narrow category of information. Information may only be released in response to disease or pest threats to agriculture or if the agricultural producer consents to the disclosure.[290] The section does not restrict disclosure of information that has been transformed into a statistical or aggregate form, as long as individual owners or producers are not named.[291] The section also does not restrict disclosure of payment information and names and addresses of recipients of payments from agency voluntary incentive programs, as long as information relating to agricultural operations or conservation practices is not included.[292] What this means, then, is that it is impossible to ascertain what conservation practices are paid for with government dollars, let alone whether the practices are science-based, designed to improve water quality, or actually meeting water quality goals.

USDA interprets this provision as a prohibition on sharing the restricted information with other agencies or entities unless the agency or entity is "working in cooperation" with the USDA to provide technical or financial assistance to agricultural producers. Specifically, "[n]o USDA information can be released to any individual or entity including other federal or state agencies, when the information will be used for enforcement purposes."[293] For federal and state agencies to receive information relating to financial and technical assistance through the Farm Bill, the agencies must first sign memoranda of understanding with USDA to establish themselves as a USDA section 1619 "cooperator."[294] As part of the agreement, agencies agree to not release the restricted information to the public or to other entities.[295]

Transparency of programs funded by government dollars remains a critical bone of contention and section 1619's movement away from transparency in this context is troublesome. USDA pays out billions of dollars in federal subsidies, conservation payments, and other grants to agricultural producers every year, but it is impossible to determine if this windfall is improving water quality and salmon habitat, let alone whether the money is being used as intended.[296] Data that is otherwise available on locations of farms enrolled in programs such as CRP or the number of acres enrolled on each farm has not been available since section 1619 of the 2008 Farm Bill was enacted. Problems associated with organizational capacity, monitoring, and enforcement are unlikely to improve without transparency into these federal programs, especially when other agencies and state and local governments charged with protecting water quality cannot access the information.[297]

Section 1619 was enacted in response to a 2008 federal court of appeals decision holding the public interest in USDA activities outweighed farmer privacy interests implicated by a FOIA request.[298] In *Multi Ag Media LLC v. Dept. of Agriculture*, the plaintiffs brought an action against the USDA seeking the disclosure of agency records pertaining to the agricultural practices, acreage, soil, crops, and livestock of farms that participate in USDA programs.[299] The USDA had provided Multi Ag with most of the requested records, but withheld records pertaining to agricultural subsidy programs and GIS records,

citing FOIA exemption 6.[300] The D.C. Circuit explained, "[w]e are mindful that Congress enacted FOIA "to pierce the veil of administrative secrecy and to open agency action to the light of public scrutiny."[301] The court held, "[b]ecause there is a significant public interest in disclosure that outweighs the personal privacy interest USDA seeks to protect, we reverse the district court's grant of summary judgment in favor of USDA."[302]

Before *Multi Ag Media* was decided, there are no apparent references to a need to limit disclosure of farm practices or the need to control the gathering or disclosure of geospatial information in either the 2007 USDA Farm Bill Proposals[303] or the initial version of the 2008 Farm Bill from December 2007.[304]

By the end of February 2008, the conference committee agreed to an amended bill that, for the first time, contained section 1619, proposed initially by a senate amendment.[305] The section mandated that all geospatial data gathered by USDA be consolidated, portable, and standardized. This is the language that would ultimately become section 1619(a) of the enacted 2008 Farm Bill. The initial version of section 1619, however, did not include any language restricting the disclosure of information relating to geospatial data, conservation practices, or farm information (which makes up section 1619(b) of the enacted 2008 Farm Bill).

On May 8, 2008 a report referencing important changes and additions to the 2008 Farm Bill was published by Sen. Tom Harkin.[306] This report noted 83 important changes and additions to the new Farm Bill, yet included no references to or comments on the addition of section 1619.

On May 14, 2008, new language and additions, previously not considered by either chamber of Congress, were included in the latest version of the Farm Bill (HR 2419) agreed to by conferees and presented to the House and Senate for voting. During Congressional debates about the passage of the 2008 Farm Bill, Rep. Blumenauer was the only one to mention section 1619. He spoke several times, critiquing the inequitable distribution of financial aid that the Farm Bill allows: "[O]ver the last 12 years, 75 percent of the direct payments went to just 10 percent of the largest farmers."[307] Rep. Blumenauer went on to say:

> To add insult to injury, section 1619 will hide information under the Freedom of Information Act so the American public won't even know the facts. This is wrong. We can do better. We can stop giving assistance to the richest of farmers. We can redirect it to further strengthen nutrition and the environment."[308] "We have lots of money that is flowing to the richest farmers in America who don't need it. That's wrong. In fact, they have assumed that this bill is so egregious, I invite any of my colleagues to look at section 1619. The authors of the bill carve out an exemption to the Freedom of Information Act so that the recent Circuit Court ruling that would open this up to a spotlight is off limits."[309]

No one responded to his remarks and there is no legislative history to suggest that section 1619 received any discussion on the floor.

One week later, debate on whether to override the president's veto of the 2008 Farm Bill continued and Rep. Blumenauer once again attempted to highlight the strong exemption section 1619

allowed: "I mentioned last time that I was on the floor that this bill nullifies a federal appeals court decision under the Freedom of Information Act that ordered USDA to make public data that is critical to monitoring the economic and environmental impacts of these subsidies."[310] Rep. Blumenauer then described the manner in which section 1619 was adopted, "Nobody talked about this on the floor, drawing the veil over this information. It was inserted without public hearings, without debate, and will have serious oversight ramifications on how we manage these programs."[311] Subsequently Congress overruled the President's veto and the 2008 Farm Bill was enacted into law.

A 40-page report published by the Congressional Research Service on the major provisions of the 2008 Farm Bill contained no analysis of section 1619.[312] However, the report did include an exhaustive table of major provisions of the enacted bill, confirming the late appearance of section 1619 in the Farm Bill:

Prior Law/Policy	House-Passed Bill (H.R. 2419)	Senate-Passed Substitute Amendment (H.R. 2419)	Enacted 2008 Farm Bill (P.L. 110-246)
No comparable provision.	No comparable provision.	Requires USDA to consolidate geospatial database systems into a single system that is readily available to all agencies within two years of enactment. [Sec. 1719]	Adopts the Senate provision, with modification to limit disclosure of information. [Sec. 1619]

Table 2: Replicated from *The 2008 Farm Bill: Major Provisions and Legislative Action*[318]

Since the enactment of section 1619 in 2008, the USDA has used the statute to deny 2,252 FOIA requests.[313]

Indeed, public records requests submitted to gather information for purposes of this white paper were denied based on section 1619:

> Section 1619 of the Food, Conservation, and Energy Act of 2008 prohibits the disclosure of information relating to USDA funded programs. CREP is a federally funded program of the Farm Services Agency (FSA) and as such is covered [by] the Section 1619 restriction. This prohibition on disclosure includes geospatial (location) information relating to the federally funded activities.
>
> Under Washington's public disclosure statute, public records are available for inspection unless they fall within exemptions "or other statute which exempts or prohibits disclosure of specific information or records." RCW 42.56.070(1). State courts have interpreted the "other statute" exemption to include federal statutes.

For these reasons, we are precluded from providing specific information relating to CREP.[314]

Section 1619, purportedly written as a reaction to the *Multi Ag Media* decision for the purpose of protecting farmer privacy, has much broader impacts.

Section 1619 greatly restricts transparency into nearly all USDA-administered programs, making it virtually impossible to monitor the spending of finite government resources and to determine whether this money is actually being used in a manner that protects salmon and water quality.

Fiscal Year	Number of FOIA Denials Based on Section 1619	Number of FOIA Denials Based on Other Exemption 3 Statutes
2008	167	74
2009	432	63
2010	344	62
2011	385	100
2012	340	134
2013	354	101
2014	230	152
Total	**2,252**	**686**

Table 3: USDA reliance on Section 1619 to deny FOIA requests[315]

In *Multi Ag Media*, the court recognized that "there is a special need for public scrutiny of agency action that distributes extensive amounts of public funds in the form of subsidies and other financial benefits."[316] The court emphasized the importance of the public's significant interest in being able to examine the information an agency has so that it may monitor whether the agency is correctly doing its job.[317]

The court even discussed Congress's recognition of the importance of ensuring the responsible use of public funds when "it created the Office of Inspector General (OIG) within USDA to 'prevent and detect fraud and abuse' in the 'programs and operation' of the department."[318] Government audits of the USDA performed by the GAO have found waste and fraud within the agricultural subsidy programs that result in the misuse of millions, sometimes billions of dollars annually.[319]

Section 1619 not only shields information on how farmers are using federal dollars from the public eye, it shields how the USDA implements these voluntary incentive programs, to the detriment of the U.S. taxpayer.

Geospatial information is one of the most detailed, and therefore valuable, types of information available for conservation purposes. The USDA maintains a GIS database, which includes boundary information, land features, crop types, and soil type data.[320]

However, due to section 1619, the USDA does not release non-aggregated data about crop types, conservation practices, operations or land boundaries regarding agricultural land. In 2006, the Center for Biological Diversity and other conservation groups (collectively, CBD) filed a FOIA request requiring the USDA to disclose the GPS coordinates for wolf depredations.[321] CBD's research aimed to evaluate the USDA Wildlife Services program to aid the conservation efforts of an endangered species, the Mexican wolf.[322]

The USDA only provided the city and state where each depredation had occurred, withholding the specific GPS coordinates under section 1619.[323] CBD brought suit under FOIA against the USDA and the case went up to the Ninth Circuit Court of Appeals. The court held that even though the

request for the data had been filed before enactment of section 1619 of the 2008 Farm Bill, the statute applied retroactively and the GPS coordinates were exempt from disclosure under FOIA because section 1619 applied.[324] The data was not released.

When EPA developed the NPDES permitting requirements to prevent water pollution from CAFOs it specifically discussed the need to be able to use existing data sources instead of having to generate all of the data it needed itself.[325] Certainly the use of available existing sources of data on CAFOs, such as information from USDA, could save EPA a significant amount of public funding and time. In the EPA reporting rule, it stated that federal law prohibits USDA from disclosing data collected unless the information has been converted into a statistical or aggregate form to comply with section 1619.[326] The rule explains that EPA currently uses the publicly available aggregate information but that it needs to find ways it could "combine the publicly available, aggregated data from USDA with other data sources to obtain a comprehensive, consistent national inventory of CAFOs to assess and address their impacts on water quality."[327] It should not be this complicated. The EPA will remain unable to fully regulate water pollution from industrial agricultural operations such as CAFOs as long as it cannot access USDA data relating to the practices implemented by these facilities.

This inability for agencies to share information hampers pollution prevention efforts by the state as well. For example, as part of its technical assistance work, the Whatcom Conservation District assessed dairy farms in Whatcom County and identified some that needed to update their dairy nutrient management plans (DNMP) and implement other conservation practices, which are supposed to protect water quality. After the dairy operators were provided with the assessment and list of recommendations,

> Not one producer ever contacted [the Whatcom Conservation District] to have their DNMP updated. Some practices called for in the assessments were installed but most weren't. [The Whatcom Conservation District] also included one Planned Conservation Practices document; while the producer signed the plan and the board approved it (nearly 3 years ago), to my knowledge not one practice called for in the plan was ever implemented.[328]

The Whatcom Conservation District shared this information with WSDA, which has inspection and enforcement authority over dairies pursuant to state law,[329] but redacted all information identifying the farms that had failed to implement the necessary conservation practices, thwarting WSDA's ability to bring the farms into compliance.[330] Indeed, the Stevens County Conservation District Administrator Dean Hellie recently confirmed, "[w]e will not share landowner information with a state agency without permission and try to work in a way that balances the interests of both parties."[331]

A 2009 EPA report expressed frustration that the enactment of section 1619 "created additional uncertainty about whether NRCS field offices can share this information," referring to data about wetland delineations.[332] Since the enactment of section 1619, EPA must contact the landowner directly for this information and the landowners may then choose to deny permission to release the information.[333] The report highlights that in one

instance, EPA undertook an enforcement action against a farm owner only to later learn that NRCS had classified the farmland as exempt from § 404 requirements.[334] This type of inefficiency due to the inability to share information results in a waste of federal time and money.

Transparency of USDA agricultural programs is also necessary to ensure compliance and enforcement of the conditions of the voluntary incentive programs. A GAO report found that "almost half of USDA's field offices did not implement farm bill conservation compliance provisions as required, in part because the offices reported that they were uncomfortable with their enforcement role. Some field office staff said it was difficult to cite farmers for noncompliance in the small communities where the staff and farmers both live and work."[335] Moreover, noncompliance decisions were waived about 61 percent of the time, and the waiver decisions were often not adequately justified.[336]

Another GAO report found that NRCS data relating to mitigation measures and nutrient management plans was too highly aggregated to allow for a determination as to whether the conservation practices were appropriate to mitigate site-specific problems.[337]

The GAO could not determine what type of conservation practices were being funded under EQIP contracts, whether the practices had a water quality focus, or whether they were effective in improving water quality.[338]

NRCS officials responded by noting that, though not available at the national offices, the project-specific information is available at many field offices, but that program officials neither ask for nor analyze this site-specific information.[339] The GAO report concludes, "Without examining such data, however, it is difficult to see how NRCS can assure itself or the Congress that certain practices are not having unintended effects on water quality."[340]

The appropriations designated by the 2008 Farm Bill expired at the end of the 2012 fiscal year, however section 1619 of the 2008 bill remains in effect.[341] While the 2014 Farm Bill does not contain a section 1619 or any similar language, the conference committee for the 2014 Farm Bill expressed that the reporting and sharing of information should "[comply] with the requirements of section 1619 of the 2008 Farm Bill."[342] The law continues to be applied by the USDA and upheld by the courts to prohibit the disclosure of agricultural information.[343]

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) is a federal agency within the U.S. Department of Agriculture. NRCS claims to "provide America's farmers and ranchers with financial and technical assistance to voluntarily put conservation on the ground, not only helping the environment but agricultural operations, too."[344] NRCS describes its creation history as follows:

> On April 27, 1935 Congress passed Public Law 74-46, in which it recognized that "the wastage of soil and moisture resources on farm, grazing, and forest lands…is a menace to the national welfare" and established the Soil Conservation Service (SCS) as a permanent agency in the USDA. In 1994, SCS's name was changed to the

> Natural Resources Conservation Service to better reflect the broadened scope of the agency's concerns. In doing so, Congress reaffirmed the federal commitment to the conservation of the nation's soil and water resources, first made 80 years ago, that continues to this day.[345]

In addition to funding and implementing a vast array of voluntary incentive programs, NRCS develops "conservation practice standards," commonly referred to as "NRCS standards," which constitute what NRCS believes to be "best management practices" for a vast array of agricultural activities.

NRCS says it uses "best available science" in developing the standards, which are reviewed and updated by the national NRCS every five years.[346] Ecology, however, disagrees and has stated that the NRCS standards don't protect water quality in the CAFO context:

> Ecology has determined that NRCS FOTGs and NRCS technical guidance do not provide the level of protection necessary to assure compliance with Washington state's water quality standards or water pollution control act, and do not ensure that the effluent limitations of the CAFO permit will be met. Therefore, Ecology does not consider NRCS FOTGs [field office technical guides] and NRCS guidance to be technical standards for CAFO operations seeking permit coverage. It has been Ecology's experience that many plans submitted for CAFO permit coverage are inadequate and do not provide the level of protection required by the CAFO permit even though these plans are claimed to meet NRCS practice standards.[347]

More generally, Ecology has also found "[b]ased on information from the water quality BMP talks, Ecology's review of the NRCS technical guidance, and Ecology's experience in working with this issue, we find that NRCS does not have performance standards that ensure that a producer will comply with Washington state water regulations."[348]

State NRCS offices "must review and may supplement national standards to ensure they meet state and local criteria (regulations) that may be more restrictive than national criteria. States may adopt national level standards without supplements."[349] There are NRCS standards for manure management and application, stream channel bed stabilization, cover crops, and waste storage impoundments, among others.[350]

Highlight:

Ecology's Heroic, Yet Unsuccessful Efforts To Make NRCS Standard 590 Water Quality Compliant

NRCS Standard 590 is designed to provide farmers with guidance on how to manage the amount, source, placement and timing of nutrients and soil amendments, including manure.[351] One purpose of Standard 590 is "[t]o minimize agricultural nonpoint source pollution of surface and groundwater resources."[352] Currently, NRCS Standard 590 prohibits the surface application of manure on frozen and/or snow-covered soils or when the top two inches of the soil are saturated.[353] However, exceptions to the ban on winter applications of manure "can be made for surface-applied manure when specified conditions are met and adequate conservation measures are installed to prevent the offsite delivery of nutrients. The adequate treatment level and specified conditions for winter applications of manure (from October 15-until T-Sum values reach 200) must be defined by NRCS *in concurrence with the water quality control authority in the state."* [354]

Starting in 2012, Ecology worked with Washington state NRCS staff for more than two years to revise NRCS Standard 590. Ecology recommended, and the Washington state NRCS office agreed to changes regarding the winter application of manure.[355] Specifically, Ecology recommended language that limited winter applications of manure based on fixed calendar dates.[356] Ecology staff have consistently taken the position that there is evidence to suggest "that winter manure application can be conducted in a manner that is protective of both groundwater and surface water."[357] However, without explanation, the National NRCS office "decided not to accept the winter manure application section of Washington's new 590 practice," leading Ecology Director Maia Bellon to write NRCS a letter expressing her frustration with the process and demanding an explanation:

We continue to be concerned about winter manure application. This leaves my agency in an awkward position. We were excited to be able to work closely with NRCS to produce a revised 590 practice designed to better protect water quality in Washington. We were also gratified that NRCS, at a national level, recognized the importance of including state water quality agencies in the revision of the 590 practice, and required state concurrence for specific parts of the practice. We spent more than two years building relationships with NRCS staff, working to understand NRCS perspectives, and negotiating with NRCS to produce a 590 practice that met the needs of both of our agencies. Ecology's participation is vital to the production of a revised 590 practice for Washington. We also believe that the requirement for state water quality agency concurrence gives us a very specific role in the process. However, I am not inclined to spend another two years of work only to have our collective product dismissed with little to no explanation."[358]

Over three months later, NRCS responded with an explanation as to why Ecology's recommendation was not incorporated:

> It was our determination that the language you sought seemed regulatory in nature, did not accommodate site-specific conditions, and inserting a regulatory entity's language into an NRCS conservation practice standard designed to support voluntary conservation programs did not seem appropriate.[359]

NRCS then provided Ecology with a novel interpretation of the term "concurrence:"

> Use of the word "concurrence" reflects NRCS' recognition of the important role that state water quality control authorities perform, as well as NRCS' desire to work with those entities in addressing water quality. However, at the end of the day, Congress provided to USDA the authority for conservation programs like the Environmental Quality Incentives Program (EQIP), which provides financial assistance to farmers with contracts utilizing CPS 590. Congress did not provide USDA with approval to delegate that authority to another entity. Consequently, the intention of the word "concurrence" was for NRCS to work closely with our state partners to address this issue, but this does not transfer authority to a partner for a practice standard implementation.[360]

The NRCS therefore makes it clear that its practice standards are (1) voluntary, not regulatory in nature; and (2) do not need to protect water quality in the way that Ecology believes is necessary and appropriate to comply with state water quality standards. In addition, NRCS has a rather odd (and illegal) understanding of what the term "concurrence" means.[361] It appears that the decision to decline to accept Ecology's recommendation was "due to pressure from the Dairy Federation."[362]

State Regulation of Nonpoint Source Pollution

As discussed above, the federal water pollution control laws delegate to states substantial authority and responsibility to regulate nonpoint source pollution.[363] Additionally, Washington has several state laws designed to regulate and eliminate nonpoint sources of water pollution. For example, the Washington State Water Pollution Control Act states:

> It is declared to be the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and

> to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington. Consistent with this policy, the state of Washington will exercise its powers, *as fully and as effectively as possible*, to retain and secure *high quality* for all waters of the state.[364]

When the Water Pollution Control Act was adopted in 1945, the legislature made it a crime to violate the provisions of the act:

> Any person found guilty of willfully violating any of the provisions of this act, or any final written orders or directive of the Commission or a court in pursuance thereof shall be deemed guilty of a gross misdemeanor, and upon conviction thereof shall be punished by a fine of not more than one hundred dollars ($100) and costs of prosecution, or by imprisonment in the county [jail] for not more than one year, or by both such fine and imprisonment in the discretion of the Court. Each day upon which a willful violation of the provisions of this act occurs may be deemed a separate and additional violation.[365]

This provision is still good law today, but the fine has increased to "up to $10,000 and costs prosecution, or imprisonment in the county jail for up to 364 days, or by both…"[366]

Ecology, the state agency "designated as the state water pollution control agency for all purposes of the federal clean water act,"[367] has broad authority "to control and prevent the pollution of streams, lakes, rivers, ponds, inland waters, salt waters, water courses and other surface and underground waters of the state of Washington."[368] Similar to the federal CWA, in Washington:

> It shall be unlawful for any person to throw, drain, run, or otherwise discharge into any of the waters of this state, or to cause, permit or suffer to be thrown, run, drained, allowed to seep or otherwise discharged into such waters any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of the department, as provided for in this chapter.[369]

Also, any person who undertakes an activity that "results in the disposal of solid or liquid waste material into waters of the state" "shall procure a permit…"[370] As Ecology makes clear, "[u]nder state law, it does not matter whether the pollution comes from a point or NPS [nonpoint source], all pollution of state waters is subject to Ecology's authority to control and prevent pollution."[371]

There are two notable differences between federal and state water pollution control law. First, Ecology's regulatory jurisdiction is more expansive and applies to "waters of the state," which encompasses ground water.[372] Federal CWA jurisdiction, on the other hand applies to "waters of the U.S.," which only includes surface waters and groundwater that is hydrologically connected to navigable surface waters.[373]

Highlight:

"You Never Can Tell What Goes On Down Below:" Waters Of The U.S. Rule

Charlie Tebbutt, attorney, Law Offices of Charles M. Tebbutt

The question of point source vs. nonpoint source pollution gets muddled with the EPA's proposed Waters of the U.S. (WOTUS) rule,[374] presently being challenged by numerous industries and environmental organizations in multiple district courts.[375] The new WOTUS rule adopted by EPA in 2015 was in response to a complicated (i.e. plurality) U.S. Supreme Court decision that, according to one district court, made "sausage"[376] of the commonsense notion that waters that are hydrologically connected to navigable waters should be subject to jurisdiction under the CWA. Children's author Dr. Seuss summarized the concept of connected surface and groundwaters well, when in 1947 he described a small boy fishing in a pool seemingly connected

to nothing and the farmer teased him that he would never catch a fish in the small pool, but the boy was more optimistic, answering that he "might" catch a fish "'Cause you never can tell what goes on down below! This pool might be Bigger than you or I know! This MIGHT be a pool, like I've read of in books, Connected to one of those underground brooks! An underground river that starts here and flows Right under the pasture! And then…well, who knows? It might go along, down where no one can see, Right under State Highway Two-Hundred-and-Three!" Indeed, Dr. Seuss recognized "This might be a river, Now mightn't it be, Connecting McElligot's Pool With The Sea! Then maybe some fish might be swimming toward me!"[377] In *Rapanos*, a plurality decision illustrates the antipathy of the right-wing side of the court to preventing pollution.[378] Ignoring decades of precedent, the plurality sought to limit CWA regulation, while Justice Kennedy tried to create a whole new test for CWA inclusion of WOTUS.[379] EPA has taken the opportunity, with the new WOTUS rule, to weaken, rather than strengthen, the protections called for in the CWA.

One significant problem with the new WOTUS rule is that it would exclude certain "other waters" from federal CWA jurisdiction. Such waters could include irrigation return drains, canals, and ephemeral streams that, particularly in the arid West, are the main conveyances of agricultural pollution to larger navigable rivers. This new rule creates a potential black hole for pollution opportunities, because the CWA exempts return flow from irrigated agriculture from the definition of point source.[380] Agricultural return flow carries a slew of pollutants, ranging from sediment to manure to pesticides.

EPA has stated that the proposed rule, in part, is designed to "[e]ncourage the use of voluntary conservation practices."[381] In 2014 EPA stated that "[t]he proposed rule preserves existing Clean Water Act exemptions and exclusions for agricultural activities. In addition, in coordination with the NRCS, EPA and the U.S. Army Corps of Engineers [USACE] will now exempt 56 established NRCS conservation practices implemented in accordance with published standards from Clean Water Act Section 404 dredged or fill permitting requirements if they occur in waters covered by the Clean Water Act."[382] The exemptions were described in a March 25, 2014 interpretive rule, along with a memorandum of understanding issued the same date. However, on January 29, 2015, EPA and the USACE "withdr[e]w this interpretive rule [along with the MOU] as Congress directed in Section 112 of the Consolidated and Further Continuing Appropriation Act, 2015, Public Law No. 113-235."[383]

Large industrial agricultural operations routinely over-apply manure that runs off, and is sometimes directly discharged, into these "other waters" proposed for exemption under the WOTUS rule (some categorically excluded and others on a case-by-case basis). Agricultural point source discharges could escape federal CWA regulation altogether if these waterways are eliminated from WOTUS. All legal challenges to the new WOTUS rule are currently pending and a judicial interpretation of the validity of the rule is forthcoming.

The second difference between state and federal water quality control laws is that Ecology has the authority to take enforcement action not only when a person pollutes the water, but also if that person "creates a substantial potential to violate" Washington water quality laws.[384] Ecology's "potential to pollute" statutory authority stands in stark contrast to judicial interpretations of EPA's authority to only regulate actual, not potential, discharges from point sources under the CWA.[385] The Washington Attorney General's office has interpreted the "potential to pollute" authority to encompass the authority to mandate specific best management practices:

> Consequently, Ecology not only has authority to take action following nonpoint source pollution but has specific statutory authority to act proactively to prevent nonpoint source pollution from occurring in the first place. Ecology's authority includes the authority to require a nonpoint source polluter to implement specific management practices. Ecology's authority can be used to prevent nonpoint pollution and require 6217 management measure implementation, as necessary.[386]

Therefore, it is quite clear that Ecology has significant state regulatory authority to eliminate nonpoint source pollution pursuant to existing federal and state water quality laws.

Ecology's "Potential To Pollute" Authority

In 2013, the Washington State Supreme Court issued a strong decision upholding Ecology's exercise of its "potential to pollute" statutory authority in the agricultural nonpoint source agricultural pollution context. The case of *Lemire v. Ecology*[387] really began 10 years prior in 2003 when Ecology and the Columbia Conservation District performed a watershed evaluation identifying Lemire's ranch as having nonpoint source pollution problems negatively affecting water quality in the area.[388] From 2003-2008, Ecology inspected the Lemire property four times and documented "a number of conditions that it believed could contribute to the pollution in Pataha Creek."[389] Specifically, Ecology found "livestock with direct access to the creek, overgrazing of the riparian corridor, manure in the stream corridor, inadequate 'woody' vegetation, bare ground, erosion, cattle trails across the creek, trampled stream banks, and cattle 'wallowing' in the creek."[390] The following year, 2009, Ecology conducted inspections in March, April and May, finding similar conditions.[391] After six years of unsuccessful attempts "to work with Lemire to implement management practices that would curb pollution into the creek," Ecology issued an administrative enforcement order, directing Lemire to install a number of best management practices to prevent the pollution.[392] Lemire appealed the administrative order and the case eventually reached the Washington Supreme Court.

The court recognized that "Ecology is authorized to issue orders remedying not only actual violations of the state WPCA [Water Pollution Control Act, RCW 90.48], but also those activities that have a substantial potential to violate the WPCA."[393] The court clarified that, to establish a violation, Ecology had to show that "observations of the cattle's access to the stream was consistent with the kind of pollution found in the stream, such as sediment content, fecal coliform, and other disturbances of the water quality."[394] Ecology "was not required to rule out other sources of pollution in the creek."[395] The court went on to "hold that Ecology is authorized to regulate nonpoint source pollution"[396] and that Lemire "failed to prove that he has suffered any economic loss, let alone an economic loss that constitutes a taking."[397] In response to this court decision, in 2014 several bills were introduced in the Washington legislature seeking to curtail Ecology's ability to use their potential to pollute authority to regulate nonpoint source pollution, all of which failed.[398] As of the date of this report, the pollution problems on the property continue.

In a conciliatory effort to appease the agricultural community who believe that farmers like Lemire are unfairly targeted by Ecology (and to eliminate the threat of legislation restricting Ecology's potential to pollute authority), Ecology Director Maia Bellon established the Agriculture and Water Quality Advisory Committee.[399] The group includes 16 representatives, two from the environmental community, and meets on a quarterly basis. The committee produced a guidance document titled *Clean Water and Livestock Operations: Assessing Risks to Water Quality*.[400] The document recognizes the pollution problems caused by livestock and clearly identifies how certain practices can cause water pollution problems.[401] The document is merely informational and has no regulatory teeth.

Agricultural Sources of Pollution: A Shift Toward Voluntary Tactics

The CWA unequivocally states that "agricultural waste discharged into water" is a pollutant.[402] CAFOs are defined as point sources under the CWA and thus are to be covered by NPDES and/or state discharge permits.[403]

The federal effluent guidelines for CAFOs mandate a zero discharge standard for these industrial operations.[404] It was not until 1987 that the term "point source" was amended to "not include agricultural stormwater discharges and

return flows from irrigated agriculture," thereby lumping agricultural stormwater from CAFOs into the nonpoint source pollution category.[405]

The law is clear, however, that the agricultural runoff exemption does not encompass point source discharges from CAFOs.[406] In order for a discharge to be considered "agricultural stormwater" in the CAFO context, the discharge must be directly due to a precipitation event and only if the agricultural operator can affirmatively demonstrate that the manure was applied at agronomic rates.[407] But even if a discharge is "agricultural stormwater" and not subject to an NPDES permit, it is still subject to regulation and prevention by the state as a nonpoint source of pollution.

The federal and state law provisions described above make it clear that nonpoint source pollution is not "exempt" from regulatory requirements, but rather is subject to a variety of mechanisms designed to force the utilization of technology and management practices necessary to ultimately eliminate the pollution.

Nonetheless, the nonpoint pollution problem from the agricultural sector continues largely unabated because the best management practices and measures are primarily voluntary in nature. Furthermore, the regulatory agencies have largely abandoned the use of their enforcement authority, relying on the false premise that businesses voluntarily will change their conduct to prevent pollution. This decision is largely driven by the political ramifications of undertaking enforcement. Regardless, the current degraded state of Washington's waters proves that the departure from enforcement is ill advised.

It is undeniable that agriculture gets special treatment when compared to other sources of pollution. This reality, which likely reflects the political power of the agricultural industry in Washington and nationwide, has contributed to the push towards voluntary, as opposed to regulatory, means to deal with agricultural nonpoint source pollution.

For example, in Washington, before Ecology can issue a notice of violation for discharges from agricultural activities, the agency "shall consider whether an enforcement action would contribute to the conversion of agricultural land to nonagricultural uses. Any enforcement action shall attempt to minimize the possibility of such conversion."[408]

In addition, even though Ecology has been "designated as the state water pollution control agency for all purposes of the federal Clean Water Act,"[409] this authority has been largely suppressed for one specific industry: dairy CAFOs.[410]

In 1998, the Washington Legislature passed the Dairy Nutrient Management Act (DNMA): "to establish a clear and understandable process that provides for the proper and effective management of dairy nutrients that affect the quality of surface or ground waters in the state of Washington…It is also the intent of this chapter to establish an inspection and technical assistance program for dairy farms to address the discharge of pollution to surface and ground waters of the state that will lead to water quality compliance by the industry."[411]

Even though the legislature transferred to WSDA Ecology's inspection authority over dairy farms for water quality violations, a duty it had when EPA approved the state's NPDES program, there has been no federal approval of any delegation of NPDES authority to the WSDA.[412] At this time, Ecology still retains the exclusive state authority and obligation to issue the Washington CAFO General/State Discharge Permit, but WSDA conducts the inspections and makes enforcement recommendations.[413] This jurisdictional quagmire has led to massive amounts of pollution coming from CAFOs in Washington state causing an environmental and public health risk.

The legal propriety of this partial delegation of Clean Water Act authority is in question. WSDA inspections are expected to find evidence of violations, to "identify corrective actions for actual or imminent discharges that violate or could violate the state's water quality standards; [m]onitor the development and implementation of dairy nutrient management plans;" and to provide "technical assistance" to dairies in need.[414]

The legislature directed WSDA to prioritize inspecting those dairy farms based upon their "proximity to impaired waters of the state; and proximity to all other waters of the state."[415] State law requires all dairy farms in the state to prepare a nutrient management plan, which must be updated each and every time it "fails to prevent the discharge of pollutants to waters of the state."[416]

The Washington State Conservation Commission (WSCC) was directed to "develop a document clearly describing the elements that a dairy nutrient management plan must contain to gain local conservation district approval."[417] "It has been Ecology's experience that many [nutrient management] plans submitted for CAFO permit coverage are inadequate and do not provide the level of protection required by the CAFO permit even though these plans are claimed to meet NRCS practice standards."[418]

This division of duties between Ecology and WSDA has not led to increased water quality protection. In fact, the opposite is true. Dairies that have been "inspected" and "regulated" by the WSDA Dairy Nutrient Management Program have been shown to be significant polluters. For example, on January 14, 2015, Judge Rice in the Eastern District of Washington issued a landmark opinion finding that a large dairy CAFO in Eastern Washington (Cow Palace Dairy) was liable for groundwater contamination under the Resource Conservation and Recovery Act (RCRA), "a comprehensive statute that governs the treatment, storage, and disposal of solid and hazardous waste…"[419]

Specifically, "this court finds no genuine issue of material fact that Defendants' application, storage, and management of manure at Cow Palace Dairy violated RCRA's substantial and imminent endangerment and open dumping provisions and that all Defendants are responsible under RCRA."[420]

The court recognized that "although the parties dispute the magnitude of leakage, the fact that the lagoons leak is not genuinely in dispute."[421] Importantly, the court found that "plaintiffs have presented indisputable evidence that such leaking is leading to dangerous accumulations of nitrates in the deep soil between the lagoons that eventually will reach the underlying aquifer…there can be no dispute that the lagoons are leaking and thus allowing nitrate to accumulate in the soil at rates possibly higher than three million gallons per year."[422] The court also acknowledged the inadequacy of the NRCS standards: "even assuming the lagoons were constructed pursuant to NRCS standards, these standards specifically allow for permeability and thus, the lagoons are designed to leak."[423] Not only are the lagoons leaking, but "potentially at the rate of millions of gallons annually…"[424]

The court unequivocally held that "[Cow Palace Dairy's] activities were contributing to the contamination of the groundwater" and thus there was clear evidence that the dairy was discharging to the waters of this state. The Court found "there is no triable issue that when Defendants excessively over-apply manure to their agricultural fields–application that is untethered to the DNMP and made without regard to the fertilization needs of their crops–they are discarding the manure and thus transforming it to a solid waste under RCRA."[425] Such a discard would constitute a discharge of pollutants for purposes of the water quality laws. The court went onto find that the nitrate from the manure generated by the "dairy's operations are contributing to the high nitrate levels in the groundwater."[426]
Judge Rice's ruling in the Cow Palace case serves as a poignant illustration of the WSDA's regulatory failure to address the rampant pollution caused by

CAFOs. Prior to the litigation, WSDA completed an inspection report regarding Cow Palace.[427] In that report, the WSDA inspector said: "Nice clean well run facility. Collection and storage is in great shape."[428] Amazingly, the inspector went on to say: "Thanks for your attention to nutrients!"[429] The citizens around the facility who have had to drink nitrate-contaminated drinking water for years are not so grateful.

And it does not appear that WSDA's inability to prevent the massive pollution occurring at the Cow Palace facility is accidental. In fact, more recently a WSDA inspector informed a dairy farmer who was the subject of a complaint that "there is currently no state requirement to maintain an up-to-date dairy plan or follow your plan."[430]

When this kind of information comes from the government official responsible for protecting water quality, it is not surprising that dairies are applying manure routinely in violation of their dairy nutrient management plans, at the risk of causing significant pollution problems in Washington waters.
Dairies also receive significant tax benefits here in Washington specifically tied to equipment, labor and services used to manage the waste that they generate. For example, the state's retail sales and use taxes do not apply to:

> (a) Qualifying livestock nutrient management equipment;
>
> (b) Labor and services rendered in respect to installing, repairing, cleaning, altering, or improving qualifying livestock nutrient management equipment; and
>
> (c)(i) Labor and services rendered in respect to repairing, cleaning, altering, or improving of qualifying livestock nutrient management facilities, or to tangible personal property that becomes an ingredient or component of qualifying livestock nutrient management facilities in the course of repairing, cleaning, altering, or improving of such facilities.[431]

Tax breaks such as these would be more defensible if the exempt practices were not harming the waters of the state.

In 2011, the Washington legislature endorsed a voluntary approach to agricultural pollution by creating the Voluntary Stewardship Program (VSP) "to protect and enhance critical areas on lands used for agricultural activities through voluntary actions by agricultural operators."[432] WSCC administers the VSP, which provides funding to counties "to develop strategies and incentive programs and to establish local guidelines for watershed stewardship programs."[433] While the legislature did not take away Ecology's regulatory authority to prevent nonpoint sources of pollution in enacting this statute, it did exempt decisions made by counties as to whether to participate in the VSP from environmental analysis under the State Environmental Policy Act (SEPA).[434] In addition, the VSP was established "as an alternative to historic approaches [i.e. enforcement] used to protect critical areas."[435] The VSP is designed to:

> (a) Promote plans to protect and enhance critical areas within the area where agricultural activities are conducted, while maintaining and improving the long-term viability of agriculture in the state of Washington and reducing the conversion of farmland to other uses;
>
> (b) Focus and maximize voluntary incentive programs to encourage good riparian and ecosystem stewardship as an alternative to historic approaches used to protect critical areas;
>
> (c) Rely upon RCW 36.70A.060 for the protection of critical areas for those counties that do not choose to participate in this program;

> (d) Leverage existing resources by relying upon existing work and plans in counties and local watersheds, as well as existing state and federal programs to the maximum extent practicable to achieve program goals;
>
> (e) Encourage and foster a spirit of cooperation and partnership among county, tribal, environmental, and agricultural interests to better assure the program success;
>
> (f) Improve compliance with other laws designed to protect water quality and fish habitat; and
>
> (g) Rely upon voluntary stewardship practices as the primary method of protecting critical areas and not require the cessation of agricultural activities.[436]

While the statute states it is not intended to limit existing legal authority,[437] the legislature's inclination to discourage regulatory approaches to agricultural pollution is clear.[438] Counties can opt to use the VSP in lieu of enacting critical area ordinances for agricultural activities pursuant to the GMA.[439] Counties designate watershed groups representing key watershed stakeholders to "develop a work plan to protect critical areas while maintaining the viability of agriculture in the watershed. The work plan must include goals and benchmarks for the protection and enhancement of critical areas."[440]

The VSP does have monitoring and reporting requirements to determine whether protection goals and benchmarks have been met, but failure to meet the goals and benchmarks results in the application of "additional voluntary actions"[441] or continued implementation of the plan. "[A] county or watershed group may request a state or federal agency to focus existing enforcement authority in that participating watershed, if the action will facilitate progress toward achieving work plan protection goals and benchmarks."[442]

Agricultural operators can choose to create individual stewardship plans and if they are consistent with the watershed work plan, the work plan is "presumed to be working toward the protection and enhancement of critical areas."[443]

Significantly, the watershed group is prohibited from mandating application of additional conservation measures even if those measures are necessary.

Instead "[i]f the watershed group determines that additional or different practices are needed to achieve the work plan's goals and benchmarks, the agricultural operator may not be required to implement those practices but may choose to implement the revised practices on a voluntary basis and is eligible for funding to revise the practices."[444]

An agricultural operator can withdraw from the program at any time and has no responsibility to continue implementing conservation practices when the applicable time period expires. The watershed group, not the operator, is held accountable "for any loss of protection resulting from withdrawals."[445]

In 1995, the Washington legislature established technical assistance programs, not simply for agencies charged with protecting water quality, but for any regulatory agency that has the authority to issue civil penalties.[446] The purpose of this chapter reflects the legislature's shift away from a regulatory to a voluntary approach to achieve compliance:

> The legislature finds that, due to the volume and complexity of laws and rules it is appropriate for regulatory agencies to adopt programs and policies that encourage voluntary compliance by those affected by specific rules. The legislature recognizes that a cooperative partnership between agencies and regulated parties that emphasizes education and assistance before the imposition of penalties will achieve

> greater compliance with laws and rules and that most individuals and businesses who are subject to regulation will attempt to comply with the law, particularly if they are given sufficient information. In this context, enforcement should assure that the majority of a regulated community that complies with the law are not placed at a competitive disadvantage and that a continuing failure to comply that is within the control of a party who has received technical assistance is considered by an agency when it determines the amount of any civil penalty that is issued.[447]

While this chapter applies to all state regulatory agencies with civil penalty authority, Ecology gets an honorable mention.[448] Specifically, when Ecology conducts an inspection and finds the entity to be out of compliance with applicable laws and rules, the agency can issue a notice of correction and "[i]f the department issues a notice of correction, it shall not issue a civil penalty for the violations identified in the notice of correction unless the party fails to comply with the notice."[449]

Ecology can issue a civil penalty without first issuing a notice of correction only in limited circumstances.[450] The legislature has therefore made it clear to Ecology that enforcement is to be used as a last resort.

The Public Trust Doctrine in Washington State

The public trust doctrine is an ancient legal doctrine that secures for future generations of citizen beneficiaries a healthful and pleasant environment, and thereby imposes an affirmative and mandatory duty on the state to prevent substantial impairment to the state's essential natural resources, including water.[451] The public trust doctrine is an expression of fundamental constitutional rights held by present and future generations preserved in the Washington state constitution.[452]

The state of Washington has repeatedly reiterated its role as trustee of the state's essential natural resources, including the waters of the state. Under the constitution, "[t]he state of Washington asserts its ownership to the beds and shores of all navigable waters in the state up to and including the line of ordinary high tide, in waters where the tide ebbs and flows, and up to and including the line of ordinary high water within the banks of all navigable rivers and lakes."[453]

The Washington Supreme Court has interpreted this declaration of ownership as having "partially encapsulated"[454] the public trust doctrine.[455] In Washington's seminal public trust case, the court held "that the sovereignty and dominion over this state's tidelands and shorelands, as distinguished from title, always remains in the state and the state holds such dominion *in trust* for the public."[456]

Most recently, a Washington court recognized "the state has a constitutional obligation to protect the public's interest in natural resources held in trust for the common benefit of the people of the state."[457] The state has exerted sovereign dominion and control over a panoply of natural resources, rendering them subject to the public trust doctrine as well. For example, "all waters within the state belong to the public…"[458] The legislature has also declared that "[w]ildlife, fish, and shellfish are the property of the state" and state agencies "shall preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish in state waters and offshore waters…in a manner that does not impair the resource."[459] The public trust obligation includes not only the prevention of substantial impairment to the resource, but the duty to affirmatively protect the resource as well.[460]

Because the duties imposed by the public trust doctrine are constitutionally grounded, state agencies must comply with the mandates of the public trust doctrine when exercising delegated statutory authority. One court recognized that

"Washington courts have found this provision [Wash. Const. art. XVIII, § 1] requires the state through its various administrative agencies, to protect trust resources under their administrative jurisdiction."[461] The legislature has the authority to delegate management responsibility over trust resources to particular state agencies and in fact has done so on a number of occasions. While agencies must comply with the public trust doctrine, the legislature's sovereign trust responsibilities never go away.

The public trust doctrine, therefore, imposes an affirmative duty upon Ecology, as the agency with delegated authority to protect the waters of the state, to take action to prevent substantial impairment of the waters of the state. This should include actions designed to prevent and mitigate nonpoint sources of agricultural pollution. "The public trust doctrine mandates that the state act through its designated agency to protect what it holds in trust," which includes any state waters currently impaired by nonpoint pollution.[462]

Highlight:

Ecology's Use of the Public Trust Doctrine to Protect Washington Waters[463]

Rachael Paschal Osborn, attorney at law

Note: This writing is an excerpt from a memorandum prepared on behalf of the Quinault Indian Nation as part of its comments on the Westway and Imperium Oil Terminal Proposal for Grays Harbor, Washington (November 25, 2015). These comments are illustrative of how Ecology can fulfill its public trust responsibilities as a means to protect water quality.

Through its enabling statute, SEPA and the Shoreline Management Act, the state of Washington, through Ecology, possesses both the authority and the duty to recognize the full scope of climate change impacts on Grays Harbor public trust resources caused by the oil production-to-combustion cycle and that will be represented by the proposed Westway and Imperium Proposals.

Ecology is duty-bound to deny the projects, because permitting them will cause an impairment of public trust resources. The public trust doctrine provides the flexibility to not just consider, but also to *substantively address* the full scope of the issues and concerns associated with the Westway and Imperium Proposals, including:

- The totality of GHG emissions in Washington, and globally that are affecting Grays Harbor and its resources.
- The multiplicity of present and reasonably foreseeable proposed projects that would contribute greenhouse gas emissions, climate change and ultimate harm Grays Harbor, including *all* oil terminals, coal terminals, highway projects that promote automobile combustion, and etc.
- The duty as co-tenant and joint manager with the Quinault Indian Nation to not waste shared public trust resources, e.g. Grays Harbor fisheries.
- The intergenerational impacts to trust resources that will have devastating effects on future generations if not halted.
- The specific impact of climate change on resources that are traditionally protected by the public trust doctrine, including navigation, commerce and especially fisheries and wildlife resources.
- The specific impact of climate change on corollary resources that have not been traditionally called out by the Washington courts, when applying the public trust doctrine, but which public necessity requires protection. These include coastal stability, glacial stability, marine water quality (e.g. acidity, domoic acid), freshwater quality (e.g. temperature), and so forth.

The scope of the state's public trust authority and duties clearly extend to the affected waters and associated resources of Grays Harbor. In addition to its statutory authority, Washington's public trust doctrine protects navigable waterways, as well as the fisheries, wildlife and water quality within those waterways. Moreover, the scope of Washington's public trust application is not fixed and may expand according to public need.[464] While the Washington judiciary has just begun to link the public trust doctrine with the cumulative impacts associated with climate change, the doctrine's qualities of protecting public interests (including intergenerational interests) make it a useful tool where statutory authorities may be limited.

Ecology has yet to take action to address nonpoint source agricultural pollution in a manner that fulfills its fiduciary responsibilities to protect waters of the state on behalf of present and future generations.

Local Government Regulation of Nonpoint Source Pollution

Washington Growth Management Act

Local governments, such as counties and municipalities, also have legal authority that can be used to address nonpoint source pollution. The most significant source of authority comes from the Washington Growth Management Act (GMA).

The legislature enacted the GMA to facilitate comprehensive land use planning, recognizing that "uncoordinated and unplanned growth, together with a lack of common goals expressing the public's interest in the conservation and the wise use of our lands, pose a threat to the environment, sustainable economic development, and the health, safety, and high quality of life enjoyed by residents of this state."[465]

The legislature gives special recognition to the importance of rural lands, finding that "a county should foster land use patterns and develop a local vision of rural character that will," among other things, "permit the operation of rural-based agricultural, commercial, recreational, and tourist businesses that are consistent with existing and planned land use patterns; be compatible with the use of the land by wildlife and for fish and wildlife habitat; foster the private stewardship of the land and preservation of open space; and enhance the rural sense of community and quality of life."[466]

Under the GMA, large or fast-growing cities and counties are required to develop comprehensive plans governing future growth.[467] Other counties can choose to plan under the GMA.[468] As part of the planning process, counties and cities subject to the GMA must enact development regulations designed to protect certain critical areas, commonly known as Critical Areas Ordinances.[469]

"Critical areas" includes "(a) wetlands; (b) areas with critical recharging effect on aquifers used for potable water; (c) fish and wildlife habitat conservation areas; (d) frequently flooded areas; and (e) geologically hazardous areas."[470]

Notably, "[i]n designating and protecting critical areas under this chapter, counties and cities shall include the best available science in developing policies and development regulations to protect the functions and values of critical areas. In addition, counties and cities shall give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries."[471]

The Washington Supreme Court has been called upon to interpret the term "protect" in the GMA.[472] In doing so, the court has held that "the legislature has not imposed a duty on local governments to enhance critical areas, although it does permit it. Without firm instruction from the legislature to require enhancement of critical areas, we will not impose such a duty."[473] Specific measures regulating rural development must "protect critical areas, as provided in RCW 36.70A.060, and surface water and groundwater resources" while at the same time "protect against conflicts with the use of agricultural, forest, and mineral resource lands."[474]

Highlight:

How the GMA Protects Water Quality

Tim Trohimovich, Director of Planning & Law, Futurewise

A "comprehensive plan" is "a generalized coordinated land use policy statement of the governing body of a county or city that is adopted pursuant to [the GMA.]"[475] The comprehensive plan guides the development and adoption of development regulations that regulate land uses and developments.[476] Under certain circumstances, comprehensive plans apply directly to the land uses and developments.[477] GMA comprehensive plans and development regulations must comply with the goals and requirements of the GMA.[478]

The GMA's environment goal directs counties and cities to "[p]rotect the environment and enhance the state's high

quality of life, including air and water quality, and the availability of water."[479]

GMA comprehensive plans are required to have various elements, essentially chapters addressing various topics, including a "land use element designating the proposed general distribution and general location and extent of the uses of land, where appropriate, for agriculture, timber production, housing, commerce, industry, recreation, open spaces, general aviation airports, public utilities, public facilities, and other land uses."[480] "The land use element shall provide for protection of the quality and quantity of groundwater used for public water supplies."[481]

In addition, "[w]here applicable, the land use element shall review drainage, flooding, and storm water runoff in the area and nearby jurisdictions and provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state, including Puget Sound or waters entering Puget Sound."[482]

The rural element applies to lands that are outside urban growth areas, areas designated for cities and towns, and outside agricultural, forest, and mineral resource lands of long-term commercial significance, lands intended for the commercial production of food, fiber, forest products, sand, gravel, and other mineral resources, respectively.[483] As noted above, the rural element must protect "critical areas and surface water and groundwater resources…"[484] Major industrial developments, large industrial sites outside urban growth areas, must also provide for "environmental protection including…water quality…"[485]

Comprehensive plans and development regulations can comply with the environment protection goal and the requirements in a variety of ways that prevent nonpoint sources of pollution. For example, in the *Hirst* decision the Growth Management Hearings Board, a state agency that hears appeals claiming that comprehensive plans and development regulations fail to comply with the GMA, wrote:

> The record shows that the County has many options for adopting measures to reverse water resource degradation in its rural area through land use controls. As is discussed by state agency reports and the county's own comprehensive plan, the county may limit growth in areas where water availability is limited or water quality is jeopardized by stormwater runoff. It may reduce densities or intensities of uses, limit impervious surfaces to maximize stream recharge, impose low impact development standards throughout the rural area, require water conservation and reuse, or develop mitigation options. The county may consider measures based on the strategies proposed in the Puget Sound Action Agenda, the [Water Resource Inventory Area] process, the [Washington State Department of Fish and Wildlife's] Land Use Planning Guide, Ecology's [Total Maximum Daily Load] or instream-flow assessments, or other ongoing efforts. It may direct growth to urban rather than rural areas.[486]

While clean water is not a GMA critical area,[487] measures adopted to protect critical areas, such as buffers to protect fish and wildlife habitats and wetlands, also protect surface and ground water from nonpoint pollution.[488] These buffers and other measures must protect all of the functions and values of critical areas, including water quality.[489]

In 2011, the Washington legislature adopted the Voluntary Stewardship Program (VSP) (discussed below) as an option to the GMA's critical areas regulations for agricultural activities.[490]

The VSP program had a time window in which counties could choose to participate and 28 counties joined the program.[491] The other 11 counties had to review and if necessary update their development regulations to protect critical areas from agricultural activities.[492] The VSP was finally funded for all counties in the 2015-2016 biannual budget.[493]

The VSP counties are to designate a work group that broadly represents in the interests within the affected watersheds including with representatives from agriculture, Native American tribes and nations willing to participate, and the environmental community.[494]

The work group develops a watershed-scale work plan to address the impacts of agricultural activities on critical areas, including water quality that affects these areas, and to maintain economically viable agriculture.[495]

The work plans are to include "measurable benchmarks that, within 10 years after the receipt of funding, are designed to result in (i) the protection of critical area functions and values and (ii) the enhancement of critical area functions and values through voluntary, incentive-based measures…"[496]

The work plans must include benchmarks for participating in the program, a baseline, monitoring, and periodic evaluations.[497] The work plans also designate an entity to

provide technical assistance to help farmers and ranchers prepare individual stewardship plans that contribute to the goals and benchmarks in the work plan.[498]

The work plan is then submitted to the technical panel for approval.[499] The technical panel consists of representatives of the following Washington state agencies: the Department of Fish and Wildlife (WDFW), WDA, Ecology, and WSCC.[500]

If a work plan fails to achieve the benchmarks in five years, the work group must prepare an adaptive management plan.[501]

If the adaptive management plan does not achieve the protection benchmarks 10 years from initial funding, then the county must update critical areas regulations to protect the critical areas.[502] Whether the VSP program will work effectively to protect the environment has been controversial, especially with Native American tribes and nations.

Washington State Conservation Commission

With language eerily reminiscent of the dust bowl that denuded agricultural lands of top soil in the Midwest in the 1920s and 1930s (which is somewhat odd since the dust bowl did not occur in Washington state) the legislature created the WSCC to, among other things, "conserve soil resources" and:

> to provide for the conservation of the renewable resources of this state, and for the control and prevention of soil erosion, and for the prevention of flood water and sediment damages, and for furthering agricultural and nonagricultural phases of conservation, development, utilization, and disposal of water, and thereby to preserve natural resources, control floods, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, preserve wildlife, protect the tax base, protect public lands, and protect and promote the health, safety, and general welfare of the people of this state.[503]

The WSCC is a state agency that consists of 10 members, five of whom are ex officio, two of whom are appointed by the governor, and one of whom is a landowner or farm operator.[504] WSCC assists, guides, reviews, coordinates, facilitates, promotes, and harmonizes the resource conservation programs undertaken by the 46 conservation districts[505] established throughout the state of Washington.[506] The duties of WSCC are quite broad when it comes to conservation activities on agricultural lands and the agency plays a significant role in facilitating the implementation of voluntary incentive programs funded by state, federal, regional, interstate and local public and private agencies.[507]

In creating WSCC, the legislature found that "[a]ctivities and programs to conserve natural resources, including soil and water, are declared to be of special benefit to lands and may be used as the basis upon which special assessments are imposed."[508] "Special assessments to finance the activities of a conservation district may be imposed by the county legislative authority of the county in which the conservation district is located for a period or periods each not to exceed ten years in duration."[509] In addition, WSCC must work with conservation districts to require water quality and habitat protection grant recipients to incorporate environmental benefits into the project requirements and "to develop uniform [outcome-focused] performance measures"[510]

WSCC manages the agricultural conservation easements program "to help keep farmers in farming and farmland in agriculture"[511] as well as the Conservation Assistance Revolving Account "to make loans to landowners for projects enrolled in the conservation reserve enhancement program and the continuous conservation reserve program."[512] "Loans to landowners [which are interest-free] shall be for costs associated with the installation of conservation improvements eligible for and secured by federal farm service agency practice incentive payment reimbursement. Loans under this program promote critical habitat

protection and restoration by bridging the financing gap between project implementation and federal funding. WSCC shall give loan preferences to those projects expected to generate the greatest environmental benefits and that occur in basins with critical or depressed salmonid stocks."[513]

Conservation districts, which are formed by the WSCC, [514] constitute governmental subdivisions of the state of Washington which function as "a public body corporate and politic exercising public powers," with the power to sue and be sued.[515] Conservation districts have the authority to conduct research and assist private landowners with conservation measures, including the ability to "cooperate or enter into agreements with, and within the limits of appropriations duly made available to it by law, to furnish financial or other aid to any agency, governmental or otherwise, or any occupier of lands within the district in the carrying on of preventive and control measures and works of improvement for the conservation of renewable natural resources within the district."[516] Conservation districts provide technical assistance to landowners and implement a number of the voluntary incentive programs.

The legislature gave conservation districts explicit legislative authority to "develop and maintain a list of best management practices that qualify for the exemption" from taxation created under state law for "[a]ll improvements to real and personal property that benefit fish and wildlife habitat, water quality, or water quantity" that are "included under a written conservation plan approved by a conservation district."[517] In response to a public records request for the list of approved BMPs, the Conservation Commission stated, "this agency does not retain these lists."[518]

The legislature found that "it is the goal of the state of Washington to preserve and restore the natural resources of the state and, in particular, fish and wildlife and their habitat. It is further the policy of the state insofar as possible to utilize the volunteer organizations who have demonstrated their commitment to these goals. To this end, it is the intent of the legislature to minimize the expense and delays caused by unnecessary bureaucratic process in securing permits for projects that preserve or restore native fish and wildlife habitat."[519]

To fulfill that finding, WSCC is authorized to "develop, in consultation with other state agencies, tribes, and local governments, a consolidated application process for permits for a watershed restoration project developed by an agency or sponsored by an agency on behalf of a volunteer organization."[520]

Highlight:

Farm Plans: Agriculture's Dirty Little Secrets

Dan Snyder, attorney, Law Offices of Charles M. Tebbutt

One of the most significant roles of conservation districts is the development of farm plans on behalf of private landowners. Farm plans are created for "the purpose of conserving, monitoring, or enhancing renewable natural resources. Farm plans include, but are not limited to, provisions pertaining to: (a) Developing and prioritizing conservation objectives; (b) Taking an inventory of soil, water, vegetation, livestock, and wildlife; (c) Implementing conservation measures, including technical assistance provided by the district; (d) Developing and implementing livestock nutrient management measures; (e) Developing and implementing plans pursuant to business and financial objectives; and (f) Recording, or records of, decisions."[521]

Notably, under Washington state law, farm plans are exempt from disclosure under the Public Records Act "unless permission to release the farm plan is granted by the landowner or operator who requested the plan, or the farm plan is used for the application or issuance of a permit" on the theory that farm plans contain "financial, commercial, and proprietary information." [522] However, farm plans that are developed under the state water quality law (RCW 90.48) must be disclosed under the Public Records Act, with only the following information subject to redaction:

> The following information in plans, records, and reports obtained by state and local agencies from dairies, animal feeding operations, and concentrated animal feeding operations, not required to apply for a national pollutant discharge elimination system permit is disclosable only in ranges that provide meaningful information to the public while ensuring confidentiality of business information regarding: (1) number of animals; (2) volume of livestock nutrients generated; (3) number of acres covered by the plan or used for land application of livestock nutrients; (4) livestock nutrients transferred to other persons; and (5) crop yields. The department of agriculture shall adopt rules to implement this section in consultation with affected state and local agencies.[523]

The importance of farm plans cannot be overstated. They provide the blueprint for how farms must operate to protect and conserve our shared natural resources and minimize nonpoint source pollution. Plans describe, among other things, the size and infrastructure of a farm; identify the land owned or leased, crops grown, fertilizer requirements for those crops, and fertilizer application schedules; provide irrigation management techniques and irrigation schedules; and provide information to the farmer on recommended and/or required conservation practices, including how to implement them. While debate exists about whether certain conservation practices reflect modern-day scientific understanding, no one disputes that farm plans are a necessary and desired component for stewardship of the land.

Unlike other sources of pollution, however, which must provide detailed information about their facilities to regulators and the public alike, agricultural operations have received beneficial treatment from the Washington legislature by prohibiting concerned citizens' access to farm plans. Without access to such plans, citizens who suspect a farm is violating their plan or polluting environmental resources are left without a means of investigation or redress. Consequently, many farms are able to operate without any meaningful oversight, applying excess fertilizer to their crops and contributing to surface and ground water contamination while simultaneously reaping the economic benefit of avoiding compliance with their farm plan. This lack of transparency is one of the central problems in addressing agricultural nonpoint source pollution, for farm operations have been given unequal footing among the other polluting industries in Washington.

The EPA recently determined that the types of information contained within farm plans that is protected from disclosure under Washington's Public Records Act should be disclosed to the public. EPA found that three Washington dairies' "Dairy Nutrient Management Plans," a type of farm plan, along with records relating to soil sampling, manure sampling, and manure applications, did not contain the type of "confidential business information" that would prevent the records from being disclosed to the public.[524] How this decision will interact with future records requests under the Washington Public Records Act has yet to be tested.

The confidentiality of farm plans, like section 1619 of the Farm Bill, makes it difficult for citizens and regulators to resolve pollution problems coming from agriculture. If the agricultural industry truly believes they are operating in a manner protective of water quality and salmon habitat, it should stand up and support removing the shroud of secrecy currently authorized under state and federal law.

In many particulars the legal structure to eliminate water pollution is complicated; made even more so when the pollution source concerns agriculture. But the Congressional goal to “eliminate the discharge of pollutants by 1985” originally announced in 1972, and reiterated in 1977,[525] is simple and should not be lost amongst the complexity. We cannot forget that our Congressional forefathers gave us the statutory tools to solve the pollution problems of today with the technological innovations of tomorrow. It is up to us to implement those tools regardless of the challenges we face. As the Father of the CWA, Sen. Edmund S. Muskie, said in 1972:

> It is imperative that we attempt to stop pollution and to restore the quality of our environment. I suggest that we begin by adding to our approach some humble ideas about ourselves and our place upon the planet.
>
> It may be, as some argue, that man is the most adaptable of Earth's creatures. It may be that he can remain essentially the same, changing only slightly as he adjusts to higher levels of pollution.

But what we do not know, and what we cannot predict accurately, are the long-range effects upon man of prolonged exposure to bigger and bigger doses of pollution. Man, no less than the peregrine falcon and the mountain lion, is an endangered species.

He is also the principal danger to himself, the principal polluter of his environment. Foul air, dirty water, ravaged land, are more than complex problems in resource management.

What must be managed, and properly managed for our own protection, are our activities within our environment.

There is another humble idea that should be added to our approach: We live today in what an engineer might call a closed system. Some of our resources, once used, cannot be replaced. Others of our resources are renewable, but finite. No one is likely to invent more clean water, more clean air, more arable land.[526]

Photo: Manure pile in Yakima County, Wash. (Socially Responsible Agriculture Project)

Photo: CAFO manure risk factor – cows in stream (Washington Department of Ecology)

Photo: Cow standing in manure (CARE Washington State)

Photo: Dairy CAFO manure spray (CARE Washington State)

Voluntary Incentive Programs: Random Acts of Conservation

Voluntary Incentive Programs: **"Random Acts of Conservation"**[527]

Agricultural nonpoint source pollution is considered the nation's most persistent and challenging water quality problem due to our lack of effective measures to control nonpoint source pollution in general.[528] Ecology currently reports that "[a]ccording to the national water quality inventory, more diffuse "nonpoint sources" of pollution – such as runoff, erosion, and stream modification caused by agricultural practices–are now identified as the leading source of stream pollution in the U S. Washington state water quality data and studies mirror national reports, and indicate that activities on some agricultural lands are a significant source of pollution."[529] In spite of these findings, agriculture continues to be largely exempt from direct regulation under many federal and state environmental laws.[530] Instead, a multitude of voluntary incentive programs administered by various federal, state and local agencies pay billions of dollars to subsidize the cost of best management practices (BMPs, largely designed by NRCS) have been the preferred approach to address unsustainable farming practices and resulting pollution.[531] With the quality of our water and aquatic habitats continuing to worsen in the Puget Sound region, the reliance on a voluntary approach to mitigate agricultural pollution may be inadequate and a return to greater regulatory enforcement needs to be pursued.[532]

For at least the past 10 years, the main strategy for addressing water quality issues in Washington state has been to encourage voluntary compliance with water laws by supporting the implementation of a panoply of undefined BMPs. Federal, state, and local agencies administer numerous voluntary incentive programs that provide financial incentives and technical assistance to landowners in an attempt "to improve the quality of surface water runoff, while ensuring that working farmland can be maintained and agriculture in the Puget Sound remains economically viable."[533]

These incentive-based programs are currently implemented in an "opportunistic" manner–that is, "the landowner seeks out the conservation district [or other program operator] for information and assistance. These entities do not target their service delivery to specific locations in an effort to address specific resource concerns in a focused approach with the ultimate goal of improving the overall resource conditions."[534]

Many projects are funded on a piecemeal basis taking into account the priorities of the funding agency, availability of funds, ease of implementation and buy-in by landowners rather than needs outlined in management plans or specified by water quality agencies.[535] The GAO estimated 66 percent of federal expenditures for habitat restoration were distributed directly to local, non-federal entities for salmon recovery management.[536] These decentralized administrative units then select and fund projects with little comprehensive planning or post-project monitoring, let alone any accountability to ensuring that the habitat improvement goals are accomplished.

The 2015 report card for the Puget Sound action agenda reported only 52 percent of planned projects are currently on track and that the estimated cost of the entire program is $790 million biennially, with a funding gap of approximately $570 million.[537] Ecology is on track with or has completed only 21 out of 45 projects listed (not on target for 53 percent of projects).[538] Not surprisingly, results from a trend analysis of 14 major rivers at their most downstream sites suggest that the water quality index target set by the Puget Sound Partnership is not likely to be reached by 2020.[539]

When confronted with the notion of using a regulatory as opposed to a voluntary approach to reducing agricultural pollution, agencies often highlight the economic importance of agriculture in their publications, illustrating recalcitrance towards using a regulatory approach to change the

behavior of such an economically influential industry.[540] For example, in a report on managing Washington's coastal health, Ecology recognizes "Washington agriculture is a multi-billion dollar sector of the state's economy and Washington's leading employer. It is one of the central elements of economic development for rural counties and in urban counties' rural areas. Washington continues to be a leader in many areas of agricultural production."[541] While agriculture is of course a powerful economic engine, efforts must be taken to ensure that agricultural operations are operated in a manner that protects and preserves water quality. Despite the listing of the Chinook salmon under the ESA more than a decade ago, and acknowledgment that our agricultural land use practices and handling of pollutants negatively impacts water quality and salmon, state and federal policies and regulations still include regulatory exceptions that hinder efforts to recover Puget Sound and its salmon populations.[542]

The assessment of voluntary incentive programs is not novel. In 2007, the GAO published a report, *USDA Should Improve Its Management of Key Conservation Programs to Ensure Payments Promote Environmental Goals*.[543] In analyzing the effectiveness of the Environmental Quality Incentives Program (EQIP) and the Conservation Security Program (CSP) administered by the NRCS, the GAO found that "NRCS's process for providing EQIP funds to states is not clearly linked to the program's purpose of optimizing environmental benefits; as such, NRCS may not be directing funds to states with the most significant environmental concerns arising from agricultural production."[544] The same year, the William D. Ruckelshaus Center was asked engage with agency staff, environmental organizations, and agricultural interests "to coordinate the fact-finding research and facilitate the discussions" as part of the process to create the Voluntary Stewardship Program.[545] As part of this work, the Ruckelshaus Center created an incentives matrix identifying the voluntary incentive programs for agricultural landowners in Washington state.[546] The matrix specifies factual information such as program name, number of recipients, and amount of dollars awarded, but purposefully did not critique the effectiveness of the programs.[547]

In 2015, the WSCC published a report on the effectiveness of voluntary incentive programs for salmon recovery. The report roughly listed key criticisms of voluntary incentive programs, including the lack of consistent reporting on implementation, no monitoring of results, a lack of regulatory backstops, and implementation without an understanding of the resource objectives.[548] In November 2015, the Less is More Coalition released a groundbreaking report analyzing the more than $16.8 million in federal subsidies given to polluting Concentrated Animal Feeding Operations in Ohio, southern Michigan and eastern Indiana.[549]

Like many states, Washington continues to support and implement myriad federal and state programs that provide incentives for voluntary efforts to reduce nonpoint source water pollution by private landowners. It is challenging to find and track them all because they are so diverse in size and form. Aside from state and federally administered programs, each county also has its own programs designed to improve water quality and restore salmon habitat. For example, Skagit County alone has over nine individual programs addressing water quality and salmon enhancement. The total funding allocated to each program is also difficult to quantify. Funding quantities overlap between programs, and some funding is allocated annually and some for periods of 3-5 years. Our research indicates a *minimum* of $340 million allocated annually to federal, state, and county run voluntary incentive programs implemented in Washington state.

In 2014, the WSCC commissioned a private entity to report on the effectiveness of voluntary incentive programs in Washington.[550] The report highlights the countless shortfalls of the programs

and identifies many areas of improvement needed before the programs could be considered effective.[551] Though the parties consulted in the report agreed that under "very specific circumstances" the programs can be effective for achieving resource objectives, these limited circumstances are uncommon and insufficient as seen by our continued failure to improve the overall quality of our waters.[552] According to one legal scholar:

> [V]oluntary efforts have to play a part and many producers are adopting practices like cover crops. Still, there's no reason to think a purely voluntary approach would work. Speed limits aren't voluntary. Alcohol limits for drivers aren't voluntary. We use regulations as a major part of how we structure society. How about a regulation that says you're responsible for the quality of water that leaves your farm?[553]

Unlike regulatory programs, voluntary incentive programs "lack an easily accessible, retrievable body of information that practitioners can consult and rely upon to support their implementation efforts." [554] Implementation information that does exist for voluntary incentive programs is often "anecdotal, poorly organized, and haphazard," with "documentation that is not readily retrievable."[555] Voluntary incentive programs are not centrally implemented and are managed differently across each region and by each agency making communication difficult and practically infeasible.[556] Furthermore, many programs have requirements that change from year to year. Understanding the changing scope, applicability, requirements, and availability of funding for each program is challenging.[557]

Some stakeholders now describe voluntary incentive programs as "random acts of conservation," reflecting the ad hoc basis in which the implementation of restoration and conservation projects are managed.[558] There is general agreement that setting clear, discrete objectives is necessary for voluntary incentive programs to work, however, in the majority of circumstances, in can be difficult to get agreement on the objectives.[559]

The need to recruit voluntary landowner participation results in the goals and definitions of success for the programs focusing on participation, rather than ecological objectives.[560] Agencies worry that if the allocated funds are not utilized during a fiscal year the funds will not be allocated again the following year. This concern promotes poor decision-making when authorizing projects and allocating funding.[561] Ultimately, accountability, monitoring and follow-through are necessary for voluntary incentive programs to be effective.[562]

However, many programs do not collect data necessary to determine effectiveness or may not allow disclosure of data that would be required to evaluate effectiveness.[563]

In 2008, EPA documented nearly $5 billion in water quality infrastructure needs for Washington Clean Watershed Needs Survey,[564] a 12 percent increase from the $4.7 billion in needs documented in 2004.[565] Most recently, in 2012, EPA documented $4.1 billion in water quality infrastructure needs.[566] The EPA commented on both the confusion resulting from the many programs and their ineffectiveness:

> In Washington, numerous state agencies offer differing direction on the implementation of nonpoint source pollution control measure to landowners, potentially creating conflict and incongruent information…Washington has many programs designed to address some segment of the nonpoint problem, but these efforts are generally not coordinated and are not

> necessarily designed to achieve compliance with WQS.[567]

Many projects funded by the voluntary incentive programs described herein are required to be monitored, however monitoring is often inconsistent and it is unclear in reports if original state objectives are met.[568] Most importantly, however, there is virtually no analysis as to whether the activities funded are improving water quality and restoring salmon runs.

Washington Voluntary Incentive Programs: Paying the Farmer Not to Pollute

The voluntary incentive programs described below are those programs identified as being implemented in the Puget Sound region of Washington state as of fiscal year 2015 and are used to address agricultural nonpoint source pollution directly or indirectly. While all efforts were made to compile an exhaustive list of voluntary programs, there are likely programs that are not included on this list given the sheer number of programs currently being implemented throughout the state of Washington. In addition, there are several grant programs implemented by counties and municipal governments, which were not included.

Federal – USDA Natural Resources Conservation Service
USDA NRCS – Conservation Stewardship Program

NRCS administers the Conservation Stewardship Program (CSP) under the authority of the 2008 Farm Bill.[569] CSP provides government funding to agricultural producers to improve natural resource conditions including soil quality, water quality, water quantity, and habitat quality by paying private landowners to adopt conservation activities or maintain existing systems. Private landowners and Native American tribes are eligible to apply for funding.[570] The CSP was originally authorized under the Food Security Act of 1985 (16 U.S.C. 3830 et seq.), as amended by the 2002 Farm Bill. The program was a $2 billion entitlement program for farm and ranch conservation practices.[571] As part of the 2014 Farm Bill, Congress reauthorized CSP and capped enrollment at 10 million acres for each fiscal year from 2014 through 2022. However, the 2014 Farm Bill only provided funding through fiscal year 2018. Current total authorized funding is $9 billion for fiscal years 2014 to 2018. In recognition of CSP's "unique opportunities in the context of USDA's programs, the secretary of agriculture's vision for CSP is:

> 1. To identify and reward those farmers and ranchers meeting the very highest standards of conservation and environmental management on their operations;
>
> 2. To create powerful incentives for other producers to meet those same standards of conservation performance on their operations; and
>
> 3. To provide public benefits for generations to come."[572]

The USDA has provided a detailed explanation of the economic reasons for the program:

> Two instances of market failure in the agricultural sector regularly occur. First, agricultural production creates negative externalities that are borne by third parties outside of commodity markets. For example, nonpoint sediment runoff from agricultural lands can carry nutrients into surrounding streams causing degradation of that water resource. Due to market failure, such third-party costs are not fully internalized by the agricultural producers that till their lands and apply fertilizer. As a consequence, protective conservation activities may not be employed efficiently across the landscape.

> Second, agricultural production generates positive externalities. Society benefits, for example, from carbon stored in forestry and rangeland operations. Because markets typically do not exist for those beneficial ecosystem goods and services produced in the agricultural sector, producers will produce less than socially optimal amounts.
>
> Even though CSP is a transfer program (meaning that payments are made from taxpayers to eligible farmers). CSP can help correct for some of those market failures. CSP-eligible conservation activities can mitigate negative externalities, generate positive externalities, or both. Conservation activity payments provide the needed financial incentive to spur producers to take actions. Such efforts also support NRCS' strategic objective of getting and keeping more conservation on the ground for the purposes of maintaining productive farms and ranches, eliminating and reducing impairments to water bodies, helping prevent the designation of additional water bodies to the 'impaired' list, and decreasing threats to 'candidate' and threatened/endangered species.[573]

Washington state received approximately $17 million for CSP-funded projects in 2013 implemented in several different counties.[574] For example, in Skagit County in 2014, 10 CSP payments totaling $55,668 were made to producers for conservation practices related to waste storage, waste transfer and nutrient management.[575] The agency does not disclose what conservation practices were actually implemented or where they were implemented.[576] CSP provides payments in five-year contracts with the potential for a one-time renewal option of an additional five years.[577] Applicants work with local NRCS offices to develop conservation plans, apply for financial assistance, and determine eligibility for assistance. NRCS then ranks the applicants according to local resource concerns to determine if they are eligible to receive funding.[578] Only entities with an average adjusted gross income of less than $900,000 are eligible for funding.[579] The NRCS Washington office has identified animals, plants, soil erosion, water quality, and water quantity as priority resource concerns for fiscal year 2015.[580]

> There are two possible types of payments under the CSP:
>
> "(1) Annual payment for installing and adopting additional activities, and improving, maintaining, and managing existing activities;" and
>
> "(2) Supplemental payment for the adoption of resource-conserving crop rotations."[581] Payment is distributed to participants on an annual basis to fund the proposed and existing activities, foregone income, and maintenance costs.[582] The NRCS prepares a CSP conservation activity list so that producers can "identify new activities [they] may be interested in to install or adopt."[583] For example, one enhancement activity is called "land application of treated manure" and "is for the use of manure that has been treated to reduce both odors and pathogens prior to land application. Acceptable practices include controlled temperature anaerobic digestion (mesophillic or thermophillic), composting and chemical treatment. Waste treatment lagoons and injection of manure alone do not qualify as acceptable practices."[584]

Though NRCS is required to evaluate the effectiveness of implemented plans[585], there is no consistent monitoring conducted to ensure that implemented activities are properly maintained.[586] Indeed, the public is not able to know where a conservation practice was implemented, what practice was implemented, or whether the

conservation practice achieves its intended conservation goal. There is no requirement for the participant to maintain the conservation activity after the contract expires.[587] According to USDA:

> Most of this rule's impacts consist of transfers from the federal government to producers. Although these transfers create incentives that very likely cause changes in the way society uses its resources, we lack data to estimate the resulting social costs or benefits.[588]

In response to a FOIA request, the NRCS did not provide the contracts with the producers or other information regarding how or where the money was spent, citing section 1619 of the Farm Bill.[589] Instead, the agency provided a summary table of aggregated information showing the county where the practice was implemented, the number of acres subject to the contract, the title of the conservation practice, and the amount of money provided.[590]

In both 2006 and 2008 OMB identified CSP as "results not demonstrated" because it is so difficult to estimate the environmental benefits from the program's activities.[591] A 2010 OIG report stated, "[w]e have identified significant control deficiencies in the Conservation Stewardship Program…we found a significant number of instances where NRCS' state and local staff either did not comply with established procedures or relied on other parties—including producers/landowners—to ensure compliance."[592]

An audit of the program found cases where NRCS permitted producers to misrepresent their farm operations to gain additional payments and receive CSP benefits in excess of payment limits.[593] NRCS failed to verify a producer's agricultural operations against easily accessible data that the producers had provided to FSA, relying solely on producers' own certifications of their operations.[594]

USDA NRCS – Regional Conservation Partnership Program

The NRCS administers the Regional Conservation Partnership Program (RCPP) under authority of the 2014 Farm Bill.[595] The program finances the partnering of local leaders and private agricultural landowners in designing "conservation solutions."[596] Selected partners work with NRCS to collaboratively develop projects with RCPP funding.[597] Eligible partners include agricultural or silvicultural producer associations, [598] farmer cooperatives or other groups of producers, state or local governments, Indian tribes, municipal water treatment entities, water and irrigation districts, institutions of higher education, and conservation nongovernmental organizations.[599] Participants eligible to enter into conservation program contracts or easement agreements include producers and private agricultural landowners.[600] Projects funded through the RCPP aim to restore natural resources such as water quality, soil quality, and wildlife habitat by implementing conservation solutions on participant land.[601]

Up to $100 million in mandatory RCPP funding is available per fiscal year, though it varies depending on Congressional appropriations.[602] For the 2014-15 fiscal year, Washington state received $23 million in RCPP funding for five projects.[603] Washington state has proposed to match the funding with $4 million in state funds.[604] One project provided $9 million in funding to the WSCC for work to improve water quality and habitat around Puget Sound for at-risk species, including Chinook salmon.[605] The funding is be utilized to provide voluntary incentives for farmers to reduce runoff that impacts water quality and shellfish beds within the Skagit and Snohomish Conservation Districts.[606]

As part of the application process, RCPP partners develop project plan proposals that must include specific natural resource conservation objectives. NRCS selects the projects to receive funding after

evaluating applications against four criteria: solutions, contributions, innovation, and participation.[607] NRCS and the entity receiving the RCPP funding enter into a MOU outlining the partnership with NRCS and describing the work to be done.[608]

In response to a FOIA request, NRCS produced the MOUs for the RCPP-funded projects in Washington state. Invoking the FOIA exemption that allows an agency to redact confidential business information,[609] NRCS redacted the address and contact information for the recipient organization, as well as the money the recipient organization is contributing to the project. For example, in 2014 Trout Unlimited received $1.9 million to implement the Upper Columbia Irrigation Enhancement Project, "a cooperative effort to build energy efficiency improvements with large irrigators and irrigation districts to modernize water delivery infrastructure with the goal of increasing flows in Upper Columbia tributaries by over 50 cfs."[610] The MOU outlines the obligations of Trout Unlimited and NRCS and contains a very detailed statement of work, plan of work and budget sheet.[611]

Once a project is implemented, NRCS relies on the partners to conduct effectiveness monitoring of individual projects.[612] Applicants are required to identify monitoring methods to track the success of practices and outcomes and RCPP states it is "open to reasonable methods of measurements," and identifies no mandatory effectiveness monitoring requirements of its own for the projects it funds.[613] When asked about examples of these "reasonable methods" of monitoring, a NRCS state resource conservationist did not know what they were.[614] Current RCPP projects receive five-year agreements. After the agreement expires the various conservation practices implemented are expected to be maintained for the lifespan assigned to the practice.[615]

Highlight:

Holy Cow! Conservation Easements Gone Wild!

Note: While there are many conservation benefits associated with conservation easements, their success largely depends on diligent maintenance by the easement holder. Unfortunately, there are situations where this doesn't occur and the conservation benefits paid for with taxpayer dollars are eliminated. An anonymous individual reported the following information about an NRCS-funded conservation easement in Skagit County:

> Attached is a photo of a manure cannon operating next to Nookachamps Creek in Skagit County. The photo was taken on November 4th of last year, during a wet week, and I would assume long after the recommended season on manure spreading was closed.

> This reach of the Nookachamps [where the conservation easement is located] is 303d listed for dissolved oxygen. I have pictures of dairy cows along the creek [within the conservation easement].
>
> The purpose of the easement is to preserve "conservation values" such as wetlands, fish and wildlife habitat, and farmland productivity. The NRCS paid more than $300k ($941 per acre) for this easement in 2001, but I don't detect any efforts at fish habitat preservation. The farm has a lot of potential for habitat, but as you can see there's no riparian buffer whatsoever.
>
> From the air photos one can see the vestiges of the valley-bottom wetlands in the pasture, through which the straightened Nookachamps channel has been cut. These wetlands flood frequently in the winter, and have lots of cow manure. No mystery why the reach is on the 303d list, but I can't get an answer why the easement isn't enforced.[616]

This example makes it clear that purchasing conservation easements is only the first step toward protecting salmon habitat. Continued maintenance, monitoring and enforcement are also necessary.

USDA NRCS – Environmental Quality Incentives Program

The NRCS administers EQIP under the authority of the 2014 Farm Bill.[617] EQIP was first authorized by the Federal Agriculture Improvement and Reform Act of 1996 (1996 Farm Bill), and was reauthorized and amended by the 2014 Farm Bill. In order to simplify the management of multiple overlapping programs, the 1996 Farm Bill consolidated the Agricultural Conservation Program, the Great Plains Program, the Water Quality Incentives Program, and the Colorado River Salinity Program into one conservation cost-share program: EQIP.[618] The 2008 Farm Bill authorized over $7 billion in funding for EQIP for fiscal years 2008 to 2012.[619] The 2014 Farm Bill authorized $8 billion in funding for the program for fiscal years 2014 to 2018.[620]

EQIP provides payments to private agricultural landowners based on the estimated incurred cost of conservation practice implementations designed, in part, to protect water quality.[621] This voluntary program provides financial assistance to help plan and implement conservation practices that address natural resource concerns on private agricultural land.[622] Additionally, a stated purpose of EQIP is to help producers meet federal, state, and tribal environmental regulations.[623] This is an important and unique aspect of EQIP because it contemplates the use of both a regulatory and voluntary approach as a means to address agricultural pollution. Most other voluntary incentive programs, with the exception of the Conservation Reserve Program are not designed to achieve compliance with water quality laws. The OIG determined that EQIP is NRCS's largest voluntary incentive program, receiving $3.5 billion from 2009 to 2011 for practices implemented nationwide.[624] The Washington State NRCS office received approximately $17.3 million in funding for EQIP in 2014.[625]

Agricultural producers, owners of non-industrial forestland, and tribes are eligible to apply for EQIP funding.[626] NRCS ranks applications for EQIP funding based on factors relating to environmental benefits and cost effectiveness.[627] These factors include the number of listed resource concerns addressed, whether the project addresses fish and wildlife concerns, whether the applicant has previously had an EQIP contract, and how quickly the practices will be implemented.[628]

EQIP is designed to provide payments for up to 75 percent of the incurred costs resulting from the approved conservation practices and activities.[629] NRCS has set rates it provides for each type of practice and landowners are free to negotiate with technical service providers to set the final price of the work.[630] EQIP will also provide payments for up to 100 percent of foregone income from implementing the conservation practices and activities.[631]

Foregone income is calculated based on the lost net income to the farmer from the resulting change in land use or land taken out of production due to an implemented conservation practice.[632] The payment scenarios for foregone income are developed at a regional scale.[633]

There are a variety of EQIP initiatives that are funded, including an energy initiative, organic initiative, conservation activity plans, National Water Quality Initiative (to improve water quality and aquatic habitats in impaired streams, by helping "producers implement conservation and management practices through a systems approach to control and trap nutrient and manure runoff"), among others.[634]

A landowner's contract term depends on the assigned lifespan of the specific conservation activity. The lifespan of the implementation of management plans is one year. The lifespans of structural practices and improvements vary and some have a lifespan of up to 15 years in

length.[635] The contract between NRCS and the landowner spans the length of the project lifespan. NRCS is supposed to visit each site at the end of the contract to certify that the sponsored practices are implemented correctly before payment is made to the landowners.[636] However, OIG found that state offices did not make on-site visits for 139 of 424 practices to ensure they were compliant.[637] Instead, the state offices "allowed contractors and participants to self-certify."[638]

Once the contract length expires, NRCS does not require additional monitoring of the project or conduct visits to the property to ensure practices are in working order for their intended lifespan.[639] During investigatory visits, OIG found non-maintained practices for which participants continued to be paid.[640]

Through EQIP, agricultural producers can obtain technical and financial assistance, which funds on-site assessments, site-specific practice and management plans (or conservation activity plans), engineering designs, installation of conservation practices (including manure management practices, efficient irrigation upgrades, streamside buffers, etc.).[641] NRCS maintains a comprehensive practice payment list that identifies the practices and associated payment rates for each EQIP sign-up option.[642] For example, a double flexible membrane, with Geoweb and drain can be installed on a manure lagoon for $14.31 per square yard.[643] In one of the more controversial provisions of EQIP, program funds can be used by industrial agricultural operations to build waste lagoons as a "conservation practice,"[644] even though the science clearly demonstrates that all manure lagoons leak and pollute waters of the state.[645] Indeed, one operation in Whatcom County received $243,790.80 to implement some conservation practice related to its waste storage lagoon.[646] It is unknown what this money was used for, or where it went because that information was withheld from public disclosure pursuant to section 1619 of the Farm Bill.

After the contract expires, the private landowner is under no responsibility to maintain the conservation practice. Often local NRCS offices do not take action to identify projects that are known to be significantly behind schedule as non-compliant with their contracts.[647] OIG reported that NRCS' controls over EQIP need to be strengthened to meet its goal of building practices that will address pressing environmental concerns.[648] OIG found that the allocation method did not adequately consider environmental concerns at the state level.[649]

Only the number of acres enrolled in the program is reported as a means to measure the success of the program.[650] There is no information available about the environmental benefits of the projects being implemented and paid for and there are no established effectiveness monitoring requirements for EQIP projects.[651] The OIG has found that "[w]ithout effectiveness monitoring controls to address these issues, NRCS may not be effectively obtaining the environmental benefits that are expected of EQIP practices."[652]

FOIA requests for information on the amount of funding received by EQIP participants were at first denied by NRCS. Ultimately, NRCS provided a document with an aggregate of information including: the County in which the project was funded, the number of contract acres, the NRCS standard for which the money was provided to achieve, a general description of the practice implemented (e.g. irrigation water management, cover crop, waste storage facility, nutrient management, etc.), and the amount of money provided to the farmer.[653] The actual location of the practice implemented, and the impact on water quality or benefit to salmon habitat was not disclosed.

Federal – USDA FSA

USDA FSA – Conservation Reserve Program

The USDA Farm Service Agency (FSA) administers the CRP,[654] funded through the

Commodity Credit Corporation (CCC).[655] The program provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands, and assistance in complying with Federal, state, and tribal environmental laws.[656] CRP also acts as an umbrella program to several more specific voluntary initiative programs, some discussed below.

The CRP authorized USDA to enter into contracts with farmers who would agree to remove certain land from production for 10 years, in return for annual rental payments from the government. There are seven objectives of the program:

(1) Reduce water and wind erosion;

(2) Protect our long-term capability to produce food and fiber;

(3) Reduce sedimentation;

(4) Improve water quality;

(5) Create better habitat for fish and wildlife through improved food and cover;

(6) Curb production of surplus commodities, and;

(7) Provide needed income support for farmers.[657]

There have been many critiques of CRP over the years. Some entities, including the GAO have suggested that the objectives of the program should be narrowed to those directly related to conservation to improve the efficiency of the program.[658] Additionally, the program is costly,[659] does not always protect the most valuable land, and only postpones environmental problems for the duration of the 10-year contract.[660] The land can be put into production again once the 10-year contract expires.

Private landowners may apply for yearly rental payments in exchange for removing environmentally sensitive land from agricultural production and for planting beneficial species instead.[661] The contracts for land enrolled in CRP are 10 to 15 years in length.[662] A CRP participant may request early termination of all or any part of the eligible acreage at any time.[663] Because the payments under the contract are rental payments to the owner, once the contract expires or is terminated, the payments cease and the participant is free to return the land to production.[664] In 2012, for example, approximately 92,000 acres exited the CRP program in Washington state and were free to return to production.[665] Between 2007 and 2014 over 17.1 million CRP acres nationwide expired and were not reenrolled into the program.[666] The Congressional Research Service reports the number of environmental benefits gained under CRP could be lost if the land is returned to production.[667]

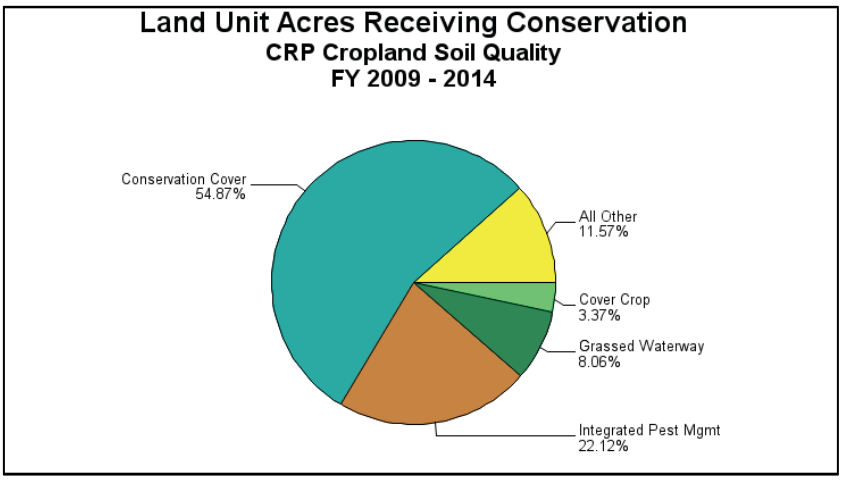


Figure 4: CRP practices related to cropland soil quality management

Participation in this program is largely dependent upon the farm economy. For example, CRP saw enrollment decline in 2008 due to rising crop prices.[668] High market prices encourage landowners to bring land back into crop production. The incentive for enrollment returned

again due to the current decline in crop prices beginning in 2014.[669] This trend suggests the program places conservation efforts at the whim of the economic market and that landowners are only utilizing the program when it is in their best economic interest to do so, a common problem with voluntary incentive programs.

The program is currently funded by Congress through 2018. In 2012, approximately $1.8 billion was distributed nationally through CRP, with $87.8 million going to Washington State.[670] The Washington State Conservation Commission estimates that the future liability for CRP rental payments through 2020 will average $1.7 billion annually.[671]

FSA does not report that it conducts effectiveness monitoring of CRP-funded projects.[672] Instead, FSA estimates the reduction of nitrogen, phosphorous, and bacteria to the water based on the recorded acres of land enrolled in the program and the implemented conservation activities reported for each acre.[673] This approximation is on one 2007 study identifying amounts of pollutants that are reduced by certain conservation activities.[674] At no time during the life of the contract does the FSA measure the actual reductions around the properties, let alone the conservation values associated with the project.

USDA FSA – Conservation Reserve Enhancement Program

The USDA FSA administers CREP, a "voluntary land retirement program,"[675] which is a part of the Conservation Reserve Program (CRP) at the national level. In Washington state, the WSCC oversees the implementation of CREP contracts.[676] "CREP addresses high-priority conservation issues of both local and national significance, such as impacts to water supplies, loss of critical habitat for threatened and endangered wildlife species, soil erosion, and reduced habitat for fish populations such as salmon."[677] Due to the partnership with state government, CREP relies on states to conduct any effectiveness monitoring of the projects.[678]

> *"For the landowner, CREP is not just a cost-effective way to address rural environmental problems and meet regulatory requirements; it can provide a viable option to supplement farm income as well."*
> *- NRCS CREP overview document*

The vast majority (93 percent) of CREP projects implement the riparian forest buffer practice, with a minimum buffer width of 35 feet.[679] However, on a voluntary basis, 80 percent of existing CREP contracts have riparian buffer widths of 100 feet or greater.[680] WSCC found that "[r]iparian buffers that are 100 feet or wider are able to provide a wide array of functions. Literature values indicate that high levels of shade (50-100 percent) are achieved with these widths."[681]

CREP enrollment is at an all-time low. The number of CREP contracts authorized in 2014 was the lowest since 1999.[682] In the past two years more stream miles have retired from the program than the entire amount of miles gained in new and renewed contracts in the past five years. [683] Seventy contracts are set to expire in 2015, the most of all previous years to date. [684] In Washington, cumulative acreage enrolled in CREP in Washington state is on a downward trend and enrollment is expected to continue to decline. [685]

WSCC reports a need for additional efforts to increase CREP participation and proposes marketing CREP in areas with water quality problems and conducting monitoring and analysis to show the "value-added benefits of CREP." [686] The Commission correctly states, "[m]onitoring is an important component of habitat restoration. Without it, there can be no knowledge of what's been done, where it has been done, and no measurement of success in the investments and techniques."[687]

Federal – Environmental Protection Agency
EPA – National Estuary Program

The EPA administers the National Estuary Program (NEP) under the authority of section 320 of the Clean Water Act.[688] The program requires states to develop plans for attaining or maintaining water quality in an estuary,[689] including for the protection of populations of shellfish, fish, and wildlife, and the control of point and nonpoint sources of pollution to supplement existing controls of pollution.[690]

NEP establishes a "non-regulatory program" designed to protect estuaries and provides funding from EPA grants to state governments, who can leverage additional funding through mechanisms such as state appropriations, fines, license plate revenues, and membership appeals.[691] From 2003-2013 nationwide, NEP leveraged $4.2 billion from $230 million in EPA grants.[692] There are 28 estuaries in the U.S. that are designated as estuaries of national significance and receive funding through this program.[693] The program covers the entire region of the estuary, as well as the contributing watersheds.

Each NEP must develop and implement conservation and management plans "that contain actions to address water quality and living resource challenges and priorities."[694] Washington has two estuaries designated under the NEP, the Puget Sound and the Lower Columbia Estuary Partnership.[695] In Washington state the Puget Sound Partnership is the state agency that serves as the administrator for the Puget Sound NEP and coordinates recovery efforts for the Sound.[696]

EPA conducts a program evaluation for each NEP and has created guidance that "includes performance measures, describes a process for conducting site visits, and provides a feedback look which helps ensure that recommendations for improvement are implemented."[697] Each established NEP is expected to develop specific environmental indicators to determine the estuary's health and gauge how it changes over time.[698] For each indicator, goals and objectives are established that reflect the priorities of local stakeholders.[699] The Clean Water Act also requires the EPA to report to the public and Congress periodically on the condition of the nation's NEPs.[700]

The Puget Sound Partnership (PSP) is a Washington state agency,[701] which is funded in part through the NEP. The partnership works collaboratively with various levels of government, tribes, business, and citizen groups to coordinate efforts designed to protect and restore Puget Sound.[702] Since 2010, PSP has received about $115 million from the EPA, making up only a small part of the overall funding it claims it needs to carry out its work. [703] "For the 2015-17 biennium, the partnership has a budget of $18.8 million, including $9.9 million from the [EPA], $7.5 million from the state of Washington, and $1.4 million from [NOAA]."[704] The partnership estimated that implementing the 2014-16 Puget Sound Action Agenda will cost $875 million.[705]

The NEP funds a vast array of different kinds of projects, many targeted to reduce agricultural pollution. For example, Whatcom Conservation District, Whatcom Farm Friends, and the Washington Department of Fish & Wildlife received $358,471 to "establish a system that will provide incentives to landowners to restore agricultural lands in northern Whatcom County by marketing the services that intact streams and riparian areas provide such as protecting habitat and improving water quality.[706] A private entity, A Rocha USA, "a family of Christian conservation organizations," whose mission is "to inspire, equip and engage Christians and all who will work with us to steward the Earth where they live" [707] received a $170,000 NEP grant to implement the Whatcom Clean Water Program Best Management Practices Project.[708] The project was designed to establish a "store front" to work with landowners to install eligible BMPs in Whatcom County.[709] The eligible BMPs include

cattle exclusion fencing with 35-foot minimum buffers from surface waters, off-stream watering facilities; and livestock feeding facilities.[710]

EPA – Clean Water Act Section 319

EPA administers funding appropriated by Congress under section 319 of the CWA and oversees each state's obligations to develop nonpoint source management programs under CWA § 319(b).[711] The funds allocated under section 319 may be used to implement state nonpoint source pollution programs including non-regulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, and water quality goals.[712]

EPA is authorized by CWA § 319(h)(10) to request certain information to determine continuing grant eligibility and performance.[713] The grant from EPA to states requires a 40 percent state match.[714] States are required to submit draft work plans to the appropriate EPA regional program staff.[715] EPA then works closely with the state to provide input as the state develops the grant work plan.[716]

Once states submit final work plans and grant applications to the EPA, each EPA region will review the plans to determine if it meets all the requirements.[717] These requirements include identifying explicit short- and long-term objectives to protect and restore water quality, strengthening working partnerships with appropriate entities, and use of a periodic feedback loop to evaluate progress and apply adaptive management.[718] If the grant meets the requirements EPA will award the grant to the state.[719]

EPA relies on two quantitative national program measures to monitor the program on a national level.[720] The first tracks the estimated annual load reductions of nitrogen, phosphorous, and sediment achieved by CWA § 319-funded projects.[721] The second tracks the number of water bodies identified by states as being primarily NPS-impaired that have been partially or fully restored as a result of restoration efforts.[722] Under CWA § 319(h)(8), the EPA has an obligation to determine if states meet the schedule of goals outlined in their NPS management programs and is prohibited from awarding grants in the absence of such a determination.[723]

EPA – Coastal Zone Management Grants

The Coastal Zone Management Program (CZM) was created by the federal Coastal Zone Management Act of 1972, and is implemented by NOAA.[724] The program assists states in adopting state-level management programs in order to meet federal goals of protection, restoration, and appropriate development of coastal zone resources.[725] The states are given discretion to adapt federal goals to particular state circumstances.[726] A state CZM program must identify enforceable state laws that outline permissible land uses and water uses within the coastal zone.[727]

There are several grant programs offered through the Coastal Zone Management Act, including section 306 grants allocated to coastal states to administer the state's management program; coastal resource improvement grants (section 306A); protecting coastal waters grants (section 6217); coastal zone enhancement grants (section 309); and others.[728]
Washington established the first federally approved CZM program in 1976, based largely on Washington's Shoreline Management Act of 1971.[729] To qualify for funding from EPA, Ecology adopted, and EPA approved, a Washington state Coastal Zone Management Program document that "explains Washington's Coastal Zone Management Program and how the Department of Ecology administers the program."[730] This document has not been updated since 2003.[731] Ecology is responsible for allocating funding to 15 coastal communities in the state which front on salt water.[732]

Ecology passes approximately 20 percent of its federal CZM funds, or approximately $425,000 annually, to local governments, including Whatcom, Skagit, and Snohomish counties in northern Puget Sound.[733] The recipient local governments must provide a match of 50 percent of the funds awarded.[734] These grants overlap with funds for the development of local Shoreline Master Programs. The funding goes to urban waterfront planning, special area management plans to resolve critical shoreline management concerns (i.e. estuarine water quality, urban runoff control, etc.), and geographic areas presenting difficult management problems or unique opportunities.[735] The program also funds local education efforts to help shoreline landowners protect their property and to monitor county beaches.[736] The CZM programs have identified a "lack of consistent resources for gathering better data on a range of coastal hazards…e.g. monitoring…" due to a need for increased capacity.[737] Ecology anticipated the program receiving $2.7 million in funding from 2011-2015.[738]

EPA – Pollution, Identification, & Control

The Washington state Department of Health (DOH) and Ecology work together to administer funding from the EPA (through the National Estuary Program) for 13 Pollution, Identification, and Control (PIC) programs in the Puget Sound region.[739] These programs are largely run at the county level with support from DOH and Ecology.[740] The goal of the program is to assist local communities with "monitoring water quality to identify pollution sources and providing outreach, technical assistance, incentives and enforcement to reduce pollution from onsite sewage systems and farms."[741] "More than $7.2 million in NEP funds are supporting pollution identification and correction programs in Puget Sound."[742] For example, Whatcom County Public Works has been awarded $464,000 to work "with the Whatcom Conservation District, Planning Department, Washington Departments of Agriculture and Ecology and other partners to engage landowners in finding solutions to livestock and OSS [onsite sewage system] pollution. The conservation district is providing risk assessments for farmers to help them make changes to protect water quality."[743]

Highlight:

Clean Samish Initiative

Zyanya Breuer, University of Washington School of Law, Class of 2016

The Washington DOH first closed Samish Bay in Skagit County to recreational and commercial shellfish harvesting over 20 years ago due to high levels of water contamination.[744] DOH determined the level of bacterial pollution in the bay was so high that shellfish harvested from the area were "poisonous to people."[745] To address the problem, the county created the Clean Water District (CWD) program in 1995, designating a shellfish protection district for Samish Bay.[746]

"From 1999-2005, Skagit County monitored water quality through the Baseline and Samish Bay Watershed Quality Monitoring Projects. This monitoring revealed fecal coliform pollution in the Samish basin and elsewhere in the county."[747] In 2005 the county created the Clean Water Program (CWP) "to address and deal with nonpoint pollution and enhance Skagit County's water quality with special attention paid to reducing fecal coliform pollution, educating the public, controlling storm water pollution, and developing a water monitoring plan."[748] This program was funded by county property taxes.[749]

Despite the creation of CWP and other programs, nonpoint source pollution in Skagit County continues to present a serious health and ecological threat to the community. Ecology states, "[a]lthough the load carried by the [Samish] river appears to have decreased over the past five years, there is still too much pollution in the watershed and shellfish bed closures are still a problem."[750] A recent report describing "insights from Samish basin" suggests that agricultural pollution in the form of manure runoff is largely to blame: "Fecal contamination increases dramatically after storm events suggesting that surface water run-off moves manure from farms and fields into streams."[751] "Fencing out livestock from streams and tributaries keeps the livestock out of the watershed, but fecal contamination can still occur due to the proximity of the animal waste to water, especially during the most

intense rain events. Manure spreading during the wet season increases the chance of fecal contamination due to runoff and because the ground is saturated."[752]

Over 20 years after the first shellfish bed closures, there are now multiple programs (including a TMDL for bacteria pollution approved by EPA in 2009) that provide voluntary incentives to private property owners to reduce nonpoint source pollution, restore salmon habitat and reopen commercial and recreational shellfish beds. Ecology initiated the Clean Samish Initiative in 2009 as a partnership between Washington state's departments of Agriculture and Health, Skagit County's departments of Health, Planning, and Public Works, the Skagit Conservation District, tribal governments, and nonprofit organizations all working to clean up pollution in the Samish River and the streams that flow into Samish Bay.[753] Under the Clean Samish Initiative, partners support restoration projects, provide voluntary incentives to landowners to reduce pollution from septic systems and small farms, monitor water quality and sources of pollution, and develop outreach education campaigns in Skagit County.[754]

Over the past several years the main response to the continued pollution is to increase monitoring efforts along the various polluted water bodies.[755] Monitoring is designed to allow the regulatory agencies to respond quickly when contamination levels rise and initiate shellfish bed closures when necessary, as well as pinpoint the greatest sources of pollution. Despite Puget Sound Partnership's call for an increased enforcement effort, the Clean Samish Initiative emphasizes that enforcement is only used as a last resort.[756] Instead, the focus is on referring polluting properties to the Skagit Conservation District for technical assistance or enrolling them in the Natural Resources Stewardship Program.[757] The CSI produces public service announcements and educational material focused on informing citizens about cleaning up after their dogs, not littering, and using port-a-potties when recreating outdoors.[758]

A recent survey commissioned by CSI reports that septic inspection compliance appears to be high, with 95 percent of property owners reporting they have had an inspection within the last three years.[759] Over half of those who have had an inspection said that the primary reason they did so was because regular inspections are required for their area.[760] Forty-four percent of livestock owners with fencing estimated their fencing was less than 35 feet from water, less than optimal for an effective stream buffer.[761] Seventy-five percent of these landowners said they would not consider moving the fencing.[762] Without the threat of enforcement (because livestock owners are routinely offered voluntary compliance options), livestock owners appear to be less likely to implement BMPs that are necessary to prevent runoff pollution on a voluntary basis.

As part of the Clean Samish Initiative, WSDA conducted monitoring of fecal coliform levels in water upstream and downstream of dairy application fields. As an Ecology Water Quality Program employee recently stated, "the numbers are high."[763] The concentrations of fecal coliform downstream of dairy application acreage can be staggeringly high, reaching 34,000 CFU/100ml, far over the water quality standard of 100 CFU/100ml.[764] Yet we continue to see the Clean Samish Initiative focus on public outreach with Bigfoot-themed commercials[765] and reassure landowners that the county will help them reduce their pollution without formal compliance actions, hassle, or cost.[766] There is little, if any, information about the industrial agricultural operations contributing to the pollution problem.

On average, the county spends approximately $1.4 million annually to administer Clean Water Program and CSI programs.[767] Costs incurred from 2010-2014 to clean up the Samish basin reached nearly $7 million, 40 percent of which went to programs designed to address on-site septic systems and 2.5 percent of which went to clean water enforcement.[768]

Funding comes from EPA grants through the Pollution, Identification, and Correction Project and matching funding; from the Clean Water Program tax-supported fund; and from the Puget Sound Partnership (likely NEP dollars).[769] In spite of the significant amount of financial resources provided to the CSI, the pollution problem continues. A report issued in 2014 found "levels of fecal coliform bacteria still exceed state water quality standards at many sites. Shellfish beds in Samish Bay are still subject to frequent closures, especially during high rainfall."[770]

State – Department of Ecology
Ecology – Water Quality Trading Framework

Starting in 2010, Ecology produced a draft Water Quality Trading Framework.[771] Ecology describes the framework as follows:

> Trading relies on the fact that many different facilities and activities–such as businesses and industries, wastewater treatment facilities, urban stormwater

> systems, and agricultural sites may discharge the same pollutant into a water body, yet each may face substantially different costs to control that pollutant. The use of trading allows pollution reduction activities to be assigned a water quality improvement value in the form of credits. These credits can then be traded in a local market to achieve cost-effective water quality improvements. The objective of a water qualitytrading program is to facilitate economic exchanges that demonstrably reduce pollution and clean up polluted surface waters more quickly.[772]

Water quality trading is similar to cap-and-trade for carbon emissions.[773] Facilities that may engage in water quality trading include agricultural sites,[774] industries, wastewater treatment facilities, and urban storm water systems.[775]

Ecology drafted a framework for water quality trading in 2010, however no trades have yet occurred in Washington state because of a lack of interested credit purchasers, making the program inactive at this time.[776]

In the 2013-2014 legislative session, House Bill 2454 was introduced directing the Washington Conservation Commission and Ecology, to explore whether there are potential buyers and sellers for an effective water quality trading program in watersheds where TMDLs have been established.[777] The bill was signed into law in 2014.[778]

The legislation found "that water quality trading is, and should remain, a voluntary option that regulated point sources can use to meet the discharge limits in their national pollutant discharge elimination system" permits.[779] A final report on the Commission's findings must be delivered to the legislature by October 31, 2017.[780] At least one Ecology employee with significant water quality experience has concerns that a water quality trading system will not solve the nonpoint source pollution problem:

> Yes, I have seen [an announcement about a water quality trading program], and I can't decide if it's going to cause trouble or if it's just nothing. I'm starting to conclude that trading is more trouble than it's worth, and also that it is unhelpful in that it distracts people from the real issue, which is that nonpoint sources are not carrying their weight in terms of pollutant reduction and that what's really needed is nonpoint authority and the political room to use it.[781]

Ecology – Washington State Water Pollution Control Revolving Fund Program

Ecology administers the Washington State Water Pollution Control Revolving Fund Program in Washington state.[782] EPA distributes capitalization grants to the states annually according to a formula established by the CWA.[783] The funds are required to be matched with 20 percent state funds and are loaned to public bodies and repaid to the fund with interest.[784]

According to Ecology, "the revolving fund continues to revolve and grow, and more money becomes available to fund water quality projects."[785] Today the majority of the funds consist of repaid principal and interest.[786] Since the program was created, Ecology has funded $1.4 billion worth of water quality improvement projects.[787] For fiscal year 2016, Ecology estimates there will be $90 million available for revolving fund loans.[788]

Counties, cities, special purpose districts, and tribes are eligible to apply for loans for a term of up to 20 years.[789] Projects that receive funding through the revolving fund include wastewater facility preconstruction and construction, stormwater facilities, large onsite sewage systems, nonpoint source planning and implementation,

low-impact development techniques planning and implementation, and onsite sewage repair and replacement.[790] Revolving fund loans can be used to match centennial and CWA § 319 grants.[791]

To assess the success of the program, Ecology tracks the number of projects implemented annually, which is reported by EPA.[792] Ecology is not required to monitor the effectiveness of each project; instead recipients are expected to submit quarterly progress reports.[793] Water quality monitoring is an optional best management practice for which recipients can receive funding.[794]

Ecology – Centennial Clean Water Grant Program

Ecology administers the Centennial Clean Water Grant Program, funded by the Washington State General Fund, the State Building Construction Account and State and Local Toxics Account.[795] The Centennial program provides grants to eligible public bodies for wastewater infrastructure and NPS pollution prevention projects for the purpose of improving water quality.[796] The grants are available to local governments, special purpose districts, and Indian tribes.[797] Eligible projects for nonpoint source pollution include "stream restoration and buffers, agricultural [BMPs], [on-site sewage system] repair and replacement, stormwater activities, and protection of drinking water sources."[798]

For the 2016 fiscal year, Ecology proposes granting $25 million from the Centennial Clean Water Program, $8.3 million of which will be set aside for nonpoint source pollution activities.[799] For nonpoint source activity projects, there is a requirement to match the eligible costs at 25percent.[800]

A $281,250 grant to the Skagit County Natural Resource Stewardship Program is an example of a Centennial Clean Water Program grant.[801] This grant went to fund a voluntary incentives program for the installation of riparian buffers, livestock exclusion fencing, livestock bridges, and work to restore the Samish river and its tributaries that are impaired for temperature, dissolved oxygen, or fecal coliform, largely due to agricultural pollution.[802]

Another example is the $144,575 Centennial Clean Water Program grant to the Snohomish Conservation District in 2013 for the purpose of implementing BMPs to improve water quality of freshwater inputs to South Skagit Bay. [803] The Snohomish Conservation District received funding to implement riparian planting and BMPs recommended in the 2012 Puget Sound Action Agenda, including restoring three acres of riparian habitat, installing 2,000 feet of exclusion fencing, enrolling two acres of land into CREP, performing vegetation monitoring of all sites, coordinating two neighborhood events, producing one article relating to water quality improvement, producing one media news release outlining the efforts the community is taking to improve water quality and highlighting individual projects, and sending five informational mailings to landowners.[804]

Ecology – CWA Section 319 Nonpoint Source Grant Program

In Washington, Ecology administers the CWA § 319 Nonpoint Source Grant Program.[805] Ecology offers $250,000 and $500,000 grant limits, and requires a 25 percent match by the receiving entity.[806] For the 2016 fiscal year, Ecology plans to administer $1.5 million in grants and loans from CWA § 319 federal funding.[807] From January 2011-February 2015, Ecology funded 100 projects totaling $31,339,188.[808]

Ecology provides funding to counties, cities, special purpose districts, tribes, and nonprofit organizations to support implementation of agricultural BMPs, education, water quality monitoring, riparian habitat restoration, and TMDL plan development and implementation.[809]

The nonpoint source activities that can be paid for with section 319 funds include agricultural BMP design and implementation, irrigation efficiency projects, Ecology-approved demonstration projects, groundwater protection, lake restoration, public outreach and education, TMDL support, water quality monitoring and watershed planning and implementation.[810]

"All proposed nonpoint source activity projects must implement an element of a state or local plan directed at addressing water quality issues (e.g. watershed management plan, nonpoint source pollution control plan, TMDL)."[811] The CWA section 319 program is the only voluntary incentive program that specifies and defines the eligible BMPs "that address or correct water quality degradation through facility- or activity-focused projects."[812]

Ecology mandates that "projects or project components that do not have a direct water quality benefit are not eligible for funding."[813] To ensure that is the case, "Ecology requires applicants with projects that implement BMPs to collect and report data to estimate load reductions of nitrogen, phosphorus, and sediments; Ecology must report these reductions to EPA annually."[814]

Ecology requires special conditions for nonpoint source pollution control activity projects, including a conservation easement or landowner agreement that is signed before planning and installing a BMP on private property.[815]

The agreement must include, among other things, a 10-year maintenance agreement that is attached to the land and "allowance of inspection of the project area by the recipient and by Ecology staff as determined by the agreement."[816]

This is one of the few voluntary incentive programs that provides the public with extensive information documenting the water quality benefits of the project funded. Ecology conducts regular site inspections as well as an end-of-project site visit and documents, with photographs, the work that was done.[817]

Ecology – Public Participation Grants

The Department of Ecology administers the public participation grants program (PPG), a competitive grant program designed to help educate people and encourage Washington citizens to engage in waste cleanup issues.[818] The program provides funding to non-profit organizations and citizen groups to facilitate public participation in the investigation of contaminated sites, implement waste reduction and prevention projects, and improve state or local solid waste or hazardous waste management plans.[819] The funding for the grant comes from a tax on commonly used hazardous substances such as motor oil, pesticides, and solvents.[820] Ecology is required to set aside at least one percent of the revenues collected form the tax for the PPG program.[821] The state plans to allocate more than $3.9 million to the PPG Program for the two-year cycle that runs from 2015 to 2017.[822] Ecology can fund a project up to $120,000 and there is no matching requirement.[823]

The program does not specifically address nonpoint sources of agricultural pollution, and mainly targets solid and hazardous waste such as electronic waste (commonly called e-waste).[824] Nowhere in the program guidelines are agricultural waste or livestock pollution mentioned.[825] However, manure that is over-applied to fields can constitute solid waste for purposes of state and federal law. Thus, industrial agriculture activities could be eligible for funding under this program.

Grant funds can be used to "encourage public involvement to eliminate or reduce wastes" and one example is a project to introduce biochar technology designed to convert agricultural waste into a charcoal-like soil amendment.[826]

Projects in Whatcom and Skagit counties have been funded to educate the public about the clean up of local waterways and bays.[827] Whatcom and Skagit counties have received $685,000 in PPGs since 2005.[828]

Ecology – Shorelands & Environmental Assistance Program

Ecology administers several grant opportunities under the Shorelands & Environmental Assistance Program (SEA).[829] The objectives of the grants include: implementation of on-the-ground restoration or enhancement projects that address water quality issues, fish and wildlife habitat needs, protection and restoration of Puget Sound, development of flood hazard management plans and projects, development of shoreline master programs, and implementation of plans for healthy watersheds.[830]

Ecology – Coastal Protection Fund – Terry Husseman Account

The Washington state legislature created the coastal protection fund, which now includes a sub-account called the Terry Husseman Account (THA).[831] Payments from penalties issued for water quality violations of the Water Pollution Control Act[832] fund THA.[833] Grants from THA are issued to eligible entities to support locally sponsored projects to restore and enhance the natural environment and typically focus on water quality issues and fish and wildlife habitat protection.[834]

Counties, cities, municipalities, special purpose districts, tribes, and state agencies (excluding Ecology) are eligible to apply for THA grants.[835] Grantees may receive up to $50,000 and are not required to match the funding.[836] Ecology provides no assistance for project development, design, or implementation.[837] The grant recipient is responsible for all aspects of the project.[838]

From 2010 to 2015 Ecology's Northwest regional office issued about $558,958 in funding for THA grants.[839] Of this amount, $21,000 was issued to Skagit County for "reducing fecal coliform from recreational users-portable toilets," and $6,508 was awarded to Whatcom County for land acquisition of 65 acres of wetlands in the headwaters of the Samish River to preserve habitat for rearing Coho salmon and cutthroat trout, and other species.[840] The grant agreements are publicly available and grantees must comply with Ecology-specific conditions for data standards and data sharing, development of a quality assurance project plan if the project involves the collection of environmental measurement data, and coordination with Ecology's geographical information system (GIS).[841] In addition, "[g]rant recipients are expected to consider the necessity of a [State Environmental Policy Act] process in the early stages of planning or scope development."[842]

Ecology – Shoreline Master Program Grants

Ecology administers the Shoreline Master Program (SMP) grants under the Shoreline Management Act (SMA).[843] SMA requires local governments to develop and update local SMPs.[844] Ecology supports this process by providing grants to the counties to complete local updates.[845] The grants are funded through the Environmental Legacy Stewardship Account[846] and are awarded to Washington towns, cities and counties eligible required to undertake comprehensive SMP plan updates.[847] To date, Skagit County has received $737,727 and Whatcom County has received $730,000 in SMP grants to assist the counties in the process of updating and implementing their SMPs.[848] The grant agreements are all publicly available.

Recreation and Conservation Office – Aquatic Lands Enhancement Account

The Recreation and Conservation Office (RCO) administers the aquatic lands enhancement account (ALEA), which is funded entirely by money raised by the Washington state Department of Natural Resources from activities on Washington shorelines, such as leases to marinas on state-owned waterfront sites and the sale of harvest rights for geoduck clams.[849] ALEA grants may be used to buy, improve, or protect aquatic lands for the purpose of re-establishing naturally, self-sustaining ecological functions, including restoration of shorelines for salmon habitat.[850]

Local agencies, state agencies and tribes are eligible for the grants.[851] Eligible restoration projects include planting native vegetation, altering or removing structures, and other projects that would make the site a predominantly natural ecosystem.[852] Applicants must provide at least a 50 percent match for each project funded and local agencies must fund at least 10 percent of the total project cost using non-state, non-federal dollars.[853]

RCO inspects completed projects before finalizing the grant agreement and only then transfers the funding.[854] This program has rigorous inspection requirements: "RCO has a policy to inspect completed projects to compare actual conditions to the terms and conditions of the project agreement. An inspection may be done at any time during the life of an RCO funded project."[855]

Notably, "RCO expects that [the funded] project will continue to function as originally funded in perpetuity–that is, forever. Changes may be made only with the approval of RCO."[856] "Use of RCO grants creates a condition under which funded property and structures become part of the public domain in perpetuity."[857] The RCO provides the following example of "major element changes" that requires a project amendment:

> RCO funds a project to improve riparian conditions by fencing out cattle and planting trees and shrubs. The final project results in fencing and shrub planting, but no trees. Lack of "trees" as a project element results in poor shading and therefore water temperature goals are compromised, but no fish are lost.[858]

Approximately $5 million is available biennially for ALEA grant funding.[859] This appears to be the only voluntary incentive program that funds conservation projects that are supposed to last in perpetuity.

Recreation and Conservation Office – Farmlands Preservation Account

RCO administers the farmlands preservation account (FPA)[860] as part of the Washington Wildlife and Recreation Program (WWRP).[861] FPA is one of 11 categories within WWRP.[862] WWRP allocates approximately $55 million biennially to the various accounts, and the funding for the FPA accounts for approximately two percent of the entire WWRP budget, receiving over $2 million biennially.[863] Conservation districts, local and state agencies, and nonprofit organizations focused on farmland preservation and riparian protection may apply for funding under this program.[864]

The purpose of the program is to purchase agricultural conservation easements on farmland to ensure the land remains available for agricultural practices.[865] The secondary program goal is to enhance or restore ecological functions on farmland preserved by the account.[866] However, a project is not required to include a plan to enhance or restore the ecology of the land to be eligible for funding.[867] Eligible projects include ecological enhancement or restoration activities, such as installing fences to keep livestock out of riparian areas and planting riparian buffers.[868] Stewardship practices that benefit fish and other wildlife habitat only earn a

possible 14 percent on the evaluation criteria for a proposed project.[869]

The Washington Wildlife & Recreation Coalition[870] has secured over $17.8 million from the state to fund 49 Farmland Preservation projects in Washington, largely concentrated in the Puget Sound region.[871] The coalition has an interactive map that allows you to see where the projects are implemented, how much money was received, and who received the money.[872] The information on the farmland preservation activities compiled on the coalition's website is perhaps the most comprehensive inventory of any voluntary incentive program described herein.

Recreation & Conservation Office – Estuary & Salmon Restoration Program

The Washington Recreation and Conservation Office (RCO) offers grants "to protect and restore the Puget Sound near-shore."[873] The program is managed by WDFW, in partnership with RCO and the Puget Sound Partnership.[874] Funding for these grants come from the state building construction fund and federal dollars from NOAA's Community Based Restoration Program and USFWS.[875] Projects funded include near-shore restoration and protection activities designed to restore ecosystem function, such as restoration of salmon habitat and estuaries, removing or breaching dikes, and decommissioning roads.[876] ESRP is used to fund projects "that address the root causes of habitat loss and degradation, thereby ensuring long-term sustainability and productivity for salmon and all wildlife."[877] Local, state, and federal agencies, Indian tribes, academic institutions, private institutions and nonprofit organizations are all eligible to apply for funding.[878] There is a 33 percent match requirement that must come from non-state funds and there is approximately $10 million biennially available for eligible projects.[879]

Salmon Recovery Funding Board – Salmon Recovery Grants

In 1999 the Washington state legislature created the Salmon Recovery Funding Board (Board), which is made up of five citizens appointed by the governor and five state agency directors.[880] The Board provides salmon recovery grants to fund "projects that protect existing, high quality habitats for salmon, and that restore degraded habitat to increase overall habitat health and biological productivity" and "feasibility assessments to determine future projects and for other salmon related activities."[881] The funding for salmon recovery grants comes from the sale of state general obligation bonds and the federal Pacific coastal salmon recovery fund, managed by NOAA.[882] Additional state funding comes from the Puget Sound acquisition and restoration fund.[883] Local and state agencies, special purpose districts, tribes, private landowners, nonprofit organizations and regional fisheries enhancement groups are all eligible to receive grants through this program.[884] There is a 15 percent match requirement and grants are capped at $200,000.[885] There is approximately $18 million in funding available for salmon recovery grants.[886]

Projects eligible for funding include acquisition of land, restoration projects such as in-stream fish passage, in-stream diversion removal, in-stream habitat enhancement, and riparian and upland habitat enhancement.[887] Controlling livestock traffic within riparian corridors is an activity that can be funded with salmon recovery grants.[888] "Acquisition projects must be operated and maintained forever. Restoration projects must be operated and maintained for 10 years after construction is completed."[889] Applications are reviewed to ensure that the proposed project is "technically sound" and "provides a benefit to salmon."[890]

WDFW – Regional Fisheries Enhancement Groups

WDFW oversees the Regional Fisheries Enhancement Group program that was created in 1990.[891] There are 14 groups in the state, each coordinating thousands of volunteer hours and hundreds of restoration projects to improve salmon habitat.[892] Funding for the program comes from a USFWS grant, state commercial and recreational fishing license fees, and excess egg and carcass sales administered by WDFW.[893] In 2015, the program received nearly $2.2 million in funding sources.[894] Since 1995, $192.7 million has been invested in salmon restoration activities in Washington state through the Regional Fisheries Enhancement Group.[895]

The funding is largely used for riparian habitat restoration and invasive species removal efforts.[896] The annual reports for the program do not discuss water quality or the challenges to salmon recovery due to water pollution.[897] The program's effectiveness monitoring efforts include the monitoring of vegetation growth and habitat quality after the projects by "trained citizen scientists."[898] The program also tracks the number of volunteer hours, miles of restoration, and investment into the projects.[899]

However, the annual report does not provide any information on the monitoring of the health of salmon populations affected by the restoration projects, nor does it mention whether populations are growing or declining within the regions where the enhancement groups have focused their efforts.[900]

Recent monitoring reports available on the websites for the Skagit Fisheries Enhancement Group and Nooksack Salmon Enhancement Association show that local salmon populations have not been growing, and in some cases appear to be declining.[901]

State – Washington State Conservation Commission

Under the guidance of the WSCC, conservation districts provide voluntary incentive-based programs to encourage private landowners to implement conservation projects on their property.[902] Projects include providing voluntary services such as technical assistance, financial assistance, and operational oversight for implementing agricultural BMPs.[903] The WSCC voluntary incentive programs related to improving water quality are the Voluntary Stewardship Program, the Water Quality Implementation Grants Program, and the Livestock Technical Assistance Program. The WSCC also administers CREP and EQIP projects under guidance of the USDA, as discussed above.

The WSCC claims it has no regulatory authority over the conservation districts and the programs are all strictly voluntary for the districts to manage and for landowners to voluntarily participate in.[904] However, under the Dairy Nutrient Management Act, the WSCC has a number of regulatory responsibilities related to pollution from industrial agriculture facilities such as CAFOs.[905] For example, the WSCC is charged with developing the document that contains "the elements that a dairy nutrient management plan must contain to gain local conservation district approval."[906]

The 2015 annual report for WSCC indicates it plans to allocate $79.2 million in funding to the conservation districts from 2015-2017.[907] The WSCC contends that current state funding represents only 43.7 percent of the funding necessary for the conservation districts and WSCC to carry out the conservation program delivery needed in Washington state, and a shortage of technical assistance is becoming common.[908] Yet, the 2015 annual report announces its spending and funding nearly tripling from $28.9 million from 2013-2015 to $83.6 million from 2015-2017.[909] The WSCC

releases little information regarding effectiveness monitoring for its voluntary incentive programs, other than CREP.

WSCC – Livestock Technical Assistance Program

The WSCC administers the Livestock Technical Assistance Program (LTAP) to provide technical assistance (TA) to small- and large-scale agricultural producers. The program issues grants to the conservation districts (CDs) to fund staff and technical service providers who give assistance to landowners and write and update nutrient management plans for livestock facilities.[910] According to the WSCC, the program "provides resources that prevent environmental impacts due to livestock operations. From small farms to large dairies, this program helps livestock owners develop nutrient management plans and install practices that protect water quality."[911] WSCC states, "for many farm owners, implementing nutrient management practices as part of their farm plan occurs only as funding and time become available, which may take years."[912]

The amount of money each CD gets for technical assistance programs varies significantly between CDs. In FY 2014 and 2015, Whatcom Conservation District was awarded $201,028[913] for livestock technical assistance activities.[914] Whatcom CD received significantly more money than all of the other CDs across the state, with the South Yakima Conservation District getting the second-highest amount at $80,000.[915] It is notable that both these CDs provide livestock technical assistance in areas that have the most significant groundwater contamination in the state, primarily caused by industrial agriculture. The other CDs that perform livestock technical assistance work received anywhere from $380 (Whitman CD) to $26,700 (Skagit CD).[916] Whatcom CD also received the highest amount of "shellfish funding" for livestock technical assistance, receiving $176,258.38, with the second highest amount ($26,700)[917] going to Skagit County.[918] The WSCC claims that 150 landowners were assisted, and 40,200 acres were protected or enhanced within the Whatcom CD between 2011 and 2013 by the program.[919] However, there appears to be no effectiveness monitoring methods established to ensure nutrient management plans are being continually implemented effectively or if the program is having a positive impact on the surrounding water quality or shellfish or salmon habitat. This problem is exacerbated by the fact that it is impossible to decipher what conservation practices were actually implemented through the technical assistance program because that information is not available to the public.

There are many ways that a farm can receive technical assistance. For example, the WSDA Dairy Nutrient Management Program can refer dairies to their local CD to receive technical assistance with updating nutrient management plans, developing soil sampling regimens, and instruction on how to maintain nutrient application records. WSDA often informs the dairy of the operational problems and then it is up to the dairy to contact the conservation district for assistance.

WSDA nutrient management technical assistance referral forms are publicly available so it is possible to ascertain what technical assistance is being offered and to whom, but it is impossible to verify whether the technical assistance was provided or whether the conservation practices recommended were ever implemented. Alternatively, farmers can voluntarily request technical assistance or can be referred for assistance by other agencies.

It is difficult to track the amount of money that is given to individual conservation districts for technical assistance. For example, it appears that Whatcom CD was awarded approximately $132,000 for technical assistance work in fiscal years 2015-2017, including projects to protect surface & ground water from nonpoint [pollution] through a program of individual assistance,

workshops, public outreach & collaboration with governmental, tribal & other agencies. Resource concerns to be addressed include: nutrient, pathogens, sediment & fecal coliform contamination of the Nooksack River & its lowland tributaries; California, Dakota & Terrell Creeks; & Sumas River. Particular emphasis will be shellfish harvest areas (Portage Bay, Drayton Harbor & Birch Bay) & areas with nitrate impaired aquifers (North County).[920]

As part of a request for additional monies for high priority unfunded work, Whatcom CD requested $970,550.00 for fiscal years 2015-17 for technical assistance for nutrient management technical assistance, 78 percent of which was for salaries and benefits and 4 percent for goods and services.[921] The Whatcom CD acknowledges that it does not track the water quality improvements associated with its technical assistance work, rather:

> [The] district will track number of contacts made, technical assistance provided, plans written, referrals received, referrals completed and cost-share installed in the district database. District will track the number of BMPs as cost-share is installed by producers in database. District will also capture BMPs installed, such as manure storage units, etc. District will continue to be the "go to" resource for addressing nutrient management; using farm plans, BMPs and the Applied Risk Management (ARM) system. We will continue to be a leader in this area in our region and with other conservation districts. It should be noted that the average dairy has 372 milking cows. This is equivalent to the effluent flow from a city with the population of 6,500 people. The facilities are quite extensive and the land base complex. Since operations have typically changed so much from what was represented in the first plans, updates are virtually a new plan.[922]

When deciding who gets technical assistance, remarkably the Whatcom CD does not prioritize those facilities with documented pollution problems. Rather, the CD prioritizes new dairy farmers, farmers that receive digestate, producers who either have or don't have EQIP or other cost share contracts and finally producers who voluntarily request assistance.[923] Nonetheless, the Whatcom CD sought an additional $244,900 for non-CREP riparian restoration activities, including work identified in the WRIA 1 Salmon Recovery Plan to "not only save local Salmon populations from extinction but then to also restore the stocks to sustainable levels."[924]

Whatcom CD tracks the progress of this work solely by the number of landowner visits, public presentations, presentation participants, funding applications submitted, projects funded, projects planned, designed and engineered, and projects implemented.[925]

WSCC – Voluntary Stewardship Program

The Volunteer Stewardship Program (VSP) is administered by the WSCC and is an opportunity for counties to participate in a watershed-based, collaborative stewardship planning process. The WSCC explains that the program is "alternative approach for counties to address growth management requirements for agricultural activities" and was created to encourage the use of incentive-based practices to protect critical areas.[926]

Counties can opt into the program, and 28 counties chose to participate.[927] Once in, the county designates a priority watershed and a lead organization to coordinate a work plan. In many cases, the lead organization is the local conservation district.[928] The work plans identify critical areas on agricultural lands, outreach plans to contact landowners, and incentive programs to implement conservation projects on the critical areas.[929] In 2014 the program requested approximately $7.1 million in state funding.[930]

Inspiration for Change

> *"Reversing the decline of an ecosystem requires changes to laws and regulations that are unpopular. Many of the decisions necessary to protect and restore an ecosystem require actions that may require significant sacrifices or seem too costly to one segment of our population, even when these actions may benefit the whole. Balancing ecosystem recovery needs with competing demands for services—health, transportation, education, social welfare—especially in lean economic times will require our decision makers at all government levels to make unpopular decisions now if we are to save Puget Sound for future generations."*
>
> Puget Sound Partnership
> 2013 State of the Sound 24 (2013)

This report documents the pollution problems caused by nonpoint sources of agricultural pollution and discusses the billions of dollars that are being spent on voluntary incentive programs designed to facilitate the recovery of salmon in the Puget Sound basin. In Washington, there has been a shift away from a regulatory approach to agricultural pollution towards a massive investment in voluntary programs purportedly designed to mitigate the pollution problem by paying farmers not to pollute. But is this a wise investment? This question becomes increasingly important given the consistently degraded waters of Puget Sound, the failure of salmon populations to recover to sustainable levels, and the challenging reality of climate change and ocean acidification now upon us.

Robert Lackey, a well-respected professor of fisheries, warns us that if we continue to ignore this science, wild salmon recovery efforts will fail.[931] According to Prof. Lackey, "[u]ntil society collectively addresses these realities, the billions of dollars being spent to recover wild salmon could be considered "guilt money"—modern-day indulgences—a tax that society and individuals willingly endure to alleviate collective and individual remorse for the continued decline of wild salmon populations."[932]

While the causes for the decline of wild salmon in the Pacific Northwest are well documented and numerous, Prof. Lackey and others call into question the foundational principle of many of the voluntary incentive programs described in this report; namely, whether simply educating people about pollution will lead to voluntary changes in behavior: "Lack of long-term success in salmon recovery is not due primarily to lack of scientific knowledge. For conservation policy issues (as well as many other policy issues), results of psychological studies demonstrate that increasing knowledge through education does not lead to change in human behavior."[933]

In 2010, Gov. Gregoire convened the "Three Directors Talks" between the heads of the WSDA, Ecology and the WSCC to facilitate the Gov.'s "commitment to clean drinking water for people, and clean water for fish, shellfish, recreation, and other uses essential to Washington's quality of life…while maintaining a 'robust agricultural way of life.'"[934]

In a joint report to the governor, the three agencies explained that the coordination among federal, state, and local groups charged with managing water quality impacts from agricultural lands has been neither systematic nor consistent.[935] The report expressed a need to establish regular responses to polluting conditions because the agencies found it difficult to ensure progress of different management actions.[936]

The directors stated that there are currently insufficient funds designated to carry out water quality regulatory work, and yet an estimated $70 million is invested annually into supporting implementation of BMPs, most of which are not designed to protect water quality.[937] A far greater

amount of money is paid out through the voluntary incentive programs discussed in this report. The directors explained that money can be put to better use if the wide-spread effort is more organized and targeted because "[t]he agencies believe that there is considerable room for coordination and collaboration for a more targeted investment."[938] But how do we get there?

Washington's exclusive reliance on voluntary incentive programs to address nonpoint sources of agricultural pollution has not worked to restore native salmon populations in Puget Sound. Based on the continued decline of water quality and loss of productive salmon habitat, this report finds that a simple yet effective regulatory compliance enforcement program led by Ecology is desperately needed to achieve the long-established water quality standards intended to protect Puget Sound salmon.

"In order to restore substantial, sustainable runs of wild salmon, we cannot be under the illusion that what scientists and technocrats are doing now–as expensive and socially disruptive as it is–will sustainably increase wild salmon runs over the long term."[939] The time has come to rethink our significant investment in voluntary incentive programs and explore and implement more traditional, regulatory approaches to prevent nonpoint sources of agricultural pollution to restore salmon runs. The salmon, the people, communities and future generations that depend upon healthy and sustainable wild salmon populations and clean water in Puget Sound, deserve no less.

To put the state on a path towards restoring wild salmon runs in Puget Sound, this report makes the following recommendations that can only be implemented by leaders courageous enough to recognize that policy change demands immediate, bold, and decisive action:

1. Establish Mandatory, Science-Based Agricultural Best Management Practices

Washington finds itself in the unique position of authorizing or utilizing a significant amount of government money to pay farmers to implement BMPs purportedly designed to address nonpoint sources of agricultural pollution. However, there is no uniform set of science-based BMPs that have been defined to protect water quality or comply with Washington state water quality standards.

Many programs (especially those funded through the Farm Bill) fund the installation and implementation of BMPs that are based upon NRCS standards, which Ecology and others have explicitly found do not protect water quality. Other programs use an unidentified suite of BMPs, which are not disclosed to the public due to section 1619 of the Farm Bill and state law confidentiality provisions. Therefore, there is an immediate need for Ecology, as the state agency charged with protecting the waters of Washington, to develop science-based BMPs that are designed to prevent nonpoint sources of agricultural pollution.

As discussed above, Ecology has committed to starting this process as part of its Nonpoint Source Pollution Prevention Plan. To contribute to that effort, we have enlisted the help of several scientific experts to develop model agricultural BMPs to serve as an example of what Ecology can and should produce to protect Puget Sound from nonpoint sources of agricultural pollution. The model BMPs are attached in Appendix A of this report. The BMPs should be designed and approved by scientists, and should not be thwarted by the agricultural industry or political bullying.

The development of science-based BMPs is only the first step. There needs to be a regulatory mechanism by which these science-based BMPs are implemented and enforced. First, the agencies that fund the voluntary incentive programs can

and should commit to conditioning the receipt of government dollars on utilization of the Ecology-approved, science-based BMPs.

Second, with established science-based BMPs, Ecology should utilize its existing statutory enforcement authority to ensure compliance with science-based BMPs, providing clarity to producers and protection for water quality.

To do so, it will be imperative that the Legislature provide adequate funding to Ecology so that the agency can enforce compliance with science-based BMPs. Finally, Ecology can and should utilize its rulemaking authority to promulgate a regulation mandating compliance with the science-based BMPs as a means to fulfill its statutory obligation to protect water quality for present and future generations.

2. Enact New Legislation Mandating Scientifically Supported BMPs

As discussed above, there is a significant need for Ecology to develop a set of science-based BMPs to address nonpoint sources of agricultural pollution. However, BMPs are not worth the paper they are written on if there is no legal mechanism designed to ensure their implementation. Therefore, *additional statutory authority for Ecology is necessary to require landowners receiving government funding to implement specific science-based BMPs to prevent pollution, protect water quality, and restore salmon and shellfish habitat.*

For example, in January 2016, Rep. Derek Stanford[940] introduced House Bill 2352, An Act Relating to Riparian Restoration and Planting on Farmlands.[941] The bill seeks to amend RCW 79A.15.130, the law that establishes the state's habitat conservation account[942] and farmlands preservation account[943] as a means to fulfill "the policy of the state to acquire as soon as possible the most significant lands for wildlife conservation and outdoor recreation purposes before they are converted to other uses, and to develop existing public recreational land and facilities to meet the needs of present and future generations."[944]

The bill clarifies that the money from the farmlands preservation account can be used for riparian restoration and planting activities (i.e. buffers) as a means to enhance and restore ecological function.[945] The bill also adds federally recognized tribes to the list of qualifying entities eligible to acquire property through the program.[946]

Most importantly, the bill mandates that projects funded by the farmlands preservation account must meet the following criteria: "Projects with salmon habitats must restore or provide riparian buffers consistent with the national marine fisheries service buffer guidance. In allotting funds for acquisition projects with salmon habitats, the board must require the projects to include riparian buffers consistent with the national marine fisheries service buffer guidance."[947]

As of this writing, this bill has not been passed by the Washington legislature, but it can and should be used as a model to ensure that the voluntary incentive programs are legally required to implement science-based BMPs that are designed to actually/effectively protect and enhance water quality.

3. Utilize Existing Statutory Authority to Eliminate Nonpoint Source Pollution

Ecology has a significant amount of statutory authority to protect the waters of Washington from nonpoint sources of agricultural pollution, including its "potential to pollute authority." Yet, this authority is sparingly used to the detriment of Puget Sound salmon and shellfish. *Because of the continued degradation of our waters, it is time for the pendulum to swing back towards a regulatory approach to the agricultural pollution problem.*

The legislature has provided Ecology with the statutory tools it needs to enforce water quality laws; it is time the agency puts those tools to work. Where the legislature has failed, however, has been in not providing Ecology with adequate funding or support to protect the waters of the state. As trustee of our state's common natural resources, it is incumbent upon the legislature to display the leadership and courage to prioritize the quality of our waters, while simultaneously encouraging only sustainable agricultural practices.

4. Repeal Section 1619 of the Farm Bill

Section 1619 of the Farm Bill stands in the way of successful efforts to recover Puget Sound salmon and should be repealed. Because of this statute, it is impossible for the public to obtain information on what BMPs are being paid for by government dollars, where the BMPs are being implemented, whether the BMPs are being maintained, or whether the BMPs have any benefit to water quality or salmon habitat.

Given the consistently degraded state of many waters that feed Puget Sound, the shroud of secrecy needs to be lifted from the programs that use section 1619 as a shield to preventing the public from ascertaining how tax payer dollars are being used to pay farmers not to pollute.

5. Repeal Farm Plan Confidentiality Provisions

Farm plans are not subject to public disclosure under the Washington Public Records Act. This makes it difficult, if not impossible, to ascertain whether farms are implementing science-based BMPs needed to protect water quality in and around farm property. This is a significant barrier to correcting many known pollution problems occurring on agricultural lands in the Puget Sound basin. EPA has concluded that dairy nutrient management plans, a type of farm plan, do not contain confidential business information, the disclosure of which would be detrimental to the farm operator. Therefore, *the legislature should repeal those provisions of Washington law that prevent disclosure of farm plans under the Washington Public Records Act and other sources of law.*

6. Fund Conservation Practices that Last In Perpetuity

Many of the voluntary incentive programs fund conservation practices for a short amount of time, typically 5-10 years. This short time span does very little to ensure restoration of salmon for our young and future generations.

Only the RCO embraces and utilizes the concept of "perpetual conservation," and the agency should be applauded for this smart and bold conservation strategy. *Given the importance of maintaining healthy salmon populations now and for future generations, all programs should investigate the efficacy of funding conservation measures that will ensure conservation benefits in perpetuity, which the RCO defines simply and elegantly as "forever."*

7. Trim the Fat! Consolidate Voluntary Incentive Programs

As is abundantly clear from the voluminous description of programs contained in this report, there are too many different voluntary incentive programs, with differing goals, standards, and outcomes. *While voluntary incentive programs can contribute to the recovery of Puget Sound, the programs should be consolidated and implemented by an agency with expertise in ensuring compliance with water quality standards, namely the Washington Department of Ecology.*

Consolidating the programs in this fashion will ensure that there are consistent requirements and

expectations and a much better mechanism to evaluate the effectiveness of the different programs.

The most comprehensive and transparent voluntary incentive programs analyzed as part of this report are the four funding programs administered by Ecology's Water Quality Program (Centennial Clean Water Program, Clean Water Act Section 319 Nonpoint Source Grant Program, Washington State Water Pollution Control Revolving Fund Program and the Stormwater Financial Assistance Program).

This program is the unsung hero of the vast voluntary incentive program world. All information about these programs was publicly available and the programs contain detailed monitoring requirements that can be used to gauge the success of the projects funded. If consolidation of programs is not possible, Ecology's program should serve as a model to other agencies administering voluntary incentive programs.

8. Gov. Inslee Should Convene an Independent Science Panel on Salmon Recovery

Under state law, the governor has the authority to ask the Washington Academy of Sciences to establish an independent science panel "to help ensure that sound science is used in salmon recovery efforts."[948] The panel may only "review, investigate, and provide its findings on scientific questions relating to the state's salmon recovery efforts" and does not review individual projects, habitat project lists, or make policy.[949]

Given that Ecology has recognized that the BMPs based on NRCS standards funded by many voluntary incentive programs are not designed to meet state water quality standards, the governor should convene an independent science panel to ensure that the billions of dollars spent on voluntary programs in this state are being used to fund agricultural conservation practices based in sound science.

This issue falls squarely within the authority of the governor's salmon recovery office that is authorized to provide recommendations to the legislature regarding "the need to expand or improve non-regulatory programs and activities."[950] The governor should convene an independent science panel forthwith. Now is the time to do everything possible to restore and protect the wild salmon that call Puget Sound home. Our children are depending on us.

"I tell my people to get ready. Get your smokehouses back in shape. Don't forget the ceremonies. That guy, the salmon, he's coming back."

- Billy Frank Jr.[951]

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The inspiration for this white paper came from the treaty tribes of Western Washington who have fought to protect their treaty rights and to ensure that salmon will be in Puget Sound for generations to come. Thank you Billy Frank, Jr. for showing me what a true leader looks like, God dammit!

As co-managers of the Puget Sound salmon, I look to the tribes and the Northwest Indian Fisheries Commission for guidance as to what needs to be done to save our treasured salmon. The tribal and NWIFC staff are not only scientific and policy experts on the state of Puget Sound salmon, but are fearless and understand that preserving salmon for future generations is a cultural imperative.

A special thank you goes out to Todd Bolster, Jim Weber and Larry Wasserman who alerted me to the impact of agricultural pollution on salmon and our state's curious dependence on voluntary incentive programs.

Finally, this report is dedicated to my family: my children, William and Vianne, who have taught me about the need to protect future generations while having a very good time. My father, Professor William H. Rodgers, Jr., one of the founders of the field of environmental law who has taught the subject at the University of Washington School of Law, and other places, for the last 50 years. My dad taught me the importance of documenting the world of environmental law, especially the scandal, corruption and controversy. Last but not least, my partner, Charlie Tebbutt, who has enforced environmental laws against polluting industrial agricultural operations for the last 20 years, inspired me to fight for citizens' rights to a healthy environment and taught me to live and litigate with strength, passion, enthusiasm, and good humor.

Endnotes:

[1] A Report from the Treaty Indian Tribes in Western Washington, Treaty Rights at Risk: Ongoing Habitat Loss, the Decline of the Salmon Resource, and Recommendations for Change (July 14, 2011) at 6.
[2] *Id.* at 7.
[3] Washington Department of Fish & Wildlife, Low Returns of Coho May Hamper Salmon Fisheries (March 1, 2016), *at* http://wdfw.wa.gov/news/mar0116a/ (last visited March 20, 2016).
[4] 33 U.S.C. § 1251(a)(1).
[5] Washington State Departments of Agriculture, Ecology, and Washington State Conservation Commission, 3DT BMP: Recommendations to the Directors Implementation Approach, Draft V1 (2013) at 1.
[6] Puget Sound Partnership, Monitoring Results for Conditions at all Monitored Swimming Beaches in Puget Sound 2004-2014, *at* http://www.psp.wa.gov/vitalsigns/swimming_beaches_indicator1.php (last visited March 8, 2016); Puget Sound Partnership, Shellfish Beds, *at* http://www.psp.wa.gov/vitalsigns/shellfish_beds_reopened_indicator1.php (last visited March 8, 2016).
[7] RCW 43.21A.010 (Department of Ecology was created to fulfill the state's sovereign responsibility to uphold the "fundamental and inalienable right of the people of the state of Washington to live in a healthful and pleasant environment and benefit from the proper development and use of [the state's] natural resources." Ecology is also given the responsibility to "plan, coordinate, restore and regulate the utilization of our natural resources in a manner that will preserve our clean air, our pure and abundant waters, and the natural beauty of the state.").
[8] Ecology, Marine Water Condition Index, Ecology Publication No. 12-03-013 (May 2012) at 7 (The Marine Water Condition Index was created by Ecology in 2011 "as a dashboard indicator of Puget Sound health by the Puget Sound Partnership Leadership Council. We designed the index to detect subtle changes in ambient water quality that occur on large spatial and temporal scales. The goal of the index is to provide a framework that links changes in local water quality and physical conditions to a larger context of oceanic water quality and natural variability.").
[9] *Id*. at 77.
[10] The Puget Sound Partnership is the state agency "created to oversee the restoration of the environmental health of Puget Sound by 2020." RCW 90.71.210.
[11] Puget Sound Partnership, 2015 State of the Sound Report on the Puget Sound Vital Signs (2015) at 9.
[12] Puget Sound Partnership, 2015 State of the Sound Report to the Governor and Legislature (2015) at 40.
[13] Puget Sound Partnership, 2015 State of the Sound Report to the Governor and Legislature (2015) at 11.
[14] National Marine Fisheries Service (NMFS), Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007) at IV; EPA, National Coastal Condition Report II, Chapter 6: West Coastal Condition (2005) at 198; EPA, Volunteer Estuary Monitoring: A Methods Manual (2002) at 2-6.
[15] EPA, Volunteer Estuary Monitoring: A Methods Manual (2002) at 2-1; NOAA, Estuaries of the United States Vital Statistics of a National Resource Base (1990) at 54.
[16] Nisqually tribal member and environmental leader who dedicated much of his life fighting to protect salmon, and Native American treaty rights to fish for salmon, in the Puget Sound basin.
[17] EPA, Volunteer Estuary Monitoring: A Methods Manual (2002) at 2-1.
[18] *Id.* at 2-3.
[19] *Id.* at 2-3.
[20] *Id.* at 2-3.
[21] *Id.* at 2-6; Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-8; 3B-3 – 3B-22.
[22] Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-8.
[23] EPA, National Estuary Program Coastal Condition Report, Chapter 6: West Coast (2007) at 323.
[24] Puget Sound Partnership, 2015 State of the Sound Report on the Puget Sound Vital Signs (2015) at 67.
[25] Treaty Indian Tribes in Western Washington, Treaty Rights at Risk: Ongoing Habitat Loss, the Decline of the Salmon Resource, and Recommendations for Change (July 2011), *at* http://nwifc.org/w/wp-content/uploads/downloads/2011/08/whitepaper628finalpdf.pdf (last visited February 1, 2016).
[26] *Id*. at 6.
[27] *Id*. at 2 (stating that treaty rights are at "grave risk" "caused by a lack of coordinated federal leadership, a failure to exercise authorities and the disparate application of salmon conservation measures.").
[28] *Id*. at 5.

[29] Puget Sound Partnership, 2013 State of the Sound Vital Signs, Water Quality (2013) at 122.
[30] Puget Sound Partnership, 2015 State of the Sound Vital Signs (2015) at 40.
[31] Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-9.
[32] Washington State Recreation and Conservation Office, Salmon Species Listed Under the Federal Endangered Species Act, at http://www.rco.wa.gov/salmon_recovery/listed_species.shtml (last visited January 4, 2015).
[33] NMFS, Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007).
[34] Puget Sound Partnership, 2014-15 Action Agenda (May 2014).
[35] Lackey, Robert T., *Wild salmon recovery and inconvenient reality along the west coast of North America: indulgences atoning for guilt?*, WIREs WATER (2015).
[36] Puget Sound Partnership, 2009 State of the Sound (2009) at 19; *see also* Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015) ("We have estimated the historic biomass of salmon returning to the Pacific Northwest (Washington, Oregon, Idaho, and California) to be 160-226 million kg. The number of fish now returning to these rivers has a biomass of 11.8-13.7 million kg.").
[37] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007) at 180.
[38] Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-9.
[39] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007); Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-9; Gresh, T., J. Lichatowich, and P Schoonmaker, *An estimation of historic and current levels of salmon production in the Northeast Pacific ecosystem: Evidence of nutrient deficit in the freshwater systems of the Pacific Northwest*, 1 FISHERIES 25, 15-21 (2000); Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-9.
[40] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007) at 21.
[41] Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-9.
[42] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007) at 21; Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).
[43] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007); Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-9.
[44] *Id.*; Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015) ("up to 40% of the carbon in a coho smolt can come from nutrients derived from decaying carcasses of the previous generation of salmon").
[45] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007); Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015) (an experiment tested the benefits of enhanced nutrient input into a salmon-rearing stream. Two streams were monitored. Scientists added salmon carcasses to one stream and nothing to the other and evaluated the juvenile salmon population in both streams. Both the size and density of juvenile fish in the experimental stream were greatly enhanced, as were survival rates.).
[46] Gresh, T., J. Lichatowich, and P Schoonmaker, *An estimation of historic and current levels of salmon production in the Northeast Pacific ecosystem: Evidence of nutrient deficit in the freshwater systems of the Pacific Northwest*, 1 FISHERIES 25,15-21 (2000); *see also* Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).
[47] Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).
[48] Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).
[49] Washington Department of Fish and Wildlife, *Pacific Salmon and Wildlife-Ecological Contexts, Relationships, and Im- plications for Management*, Special Edition Technical Report (2000); Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).
[50] Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007).

[51] Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015) (it is worth noting that grizzly bears have since gone extinct in Washington State).
[52] Washington Department of Fish and Wildlife, *Pacific Salmon and Wildlife-Ecological Contexts, Relationships, and Im-plications for Management*, Special Edition Technical Report (2000).
[53] For a legal definition of nonpoint source pollution, see pp 17-18.
[54] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028, (August 2014) at 16.
[55] Puget Sound Partnership, 2015 State of the Sound Vital Signs (2015) at 73; *see also* Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 16..
[56] Puget Sound Partnership, 2015 State of the Sound Vital Signs (2015) at 73.
[57] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 16.
[58] In February 2014, as a strategy to mitigate pollution from commercial and recreational boats operating in Puget Sound, Ecology issued a draft petition to EPA to establish a No Discharge Zone for all inland marine waters of Puget Sound, Lake Washington, and water bodies that connect Lake Washington to Puget Sound. Ecology, Puget Sound No Discharge Zone, *at* http://www.ecy.wa.gov/programs/wq/nonpoint/CleanBoating/ndzstatus.html (last visited Dec. 31, 2015). Ecology received more than 26,000 comments on the draft petition and is currently deciding whether to submit a final petition to EPA. *Id.*
[59] Washington Department of Health, NEP Pathogen Grant Implementation Strategy 2012 Work Plan (June 15, 2012) at 1.
[60] Ecology, Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Ecology Publication No. 15-10-015 (July 2015) at 5.
[61] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 16.
[62] *Id.* at 16, 24 ("EPA guidance and data demonstrate the awareness at the national level that NPS pollution is a serious and widespread problem.").
[63] EPA, Nonpoint Pointers: Nonpoint Source Pollution: The Nation's Largest Water Quality Problem, Pointer No. 1 (March 1996) at 1.
[64] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 24; EPA, National Water Quality Inventory: Report to Congress, 2004 Reporting Cycle: Findings (January 2009) (Forty percent of assessed impaired river miles were affected by agriculture and over thirty-five percent of assessed impaired estuaries were affected by pathogens, such as bacteria from sewage and livestock runoff.).
[65] Ecology, Managing Washington's Coast: Washington State's Coastal Zone Management Program, Publication 00-06-129 (2001) at 91; EPA, National Water Quality Inventory: Report to Congress at 24 ("In the 2000 National Water Quality Inventory, states reported that agricultural nonpoint source (NPS) pollution was the leading source of water quality impacts on surveyed rivers and lakes, the second largest source of impairments to wetlands, and a major contributor to contamination of surveyed estuaries and ground water."); Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 84 ("Agricultural areas have consistently been cited as a significant source of impairment in freshwaters nation-wide").
[66] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 84.
[67] Whatcom County Water Quality Program, *at* http://www.whatcomcounty.us/1072/Water-Quality (last visited January 13, 2015).
[68] Ecology, Managing Washington's Coast: Washington State's Coastal Zone Management Program, Ecology Publication No. 00-06-129 (2001) at 91; Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 84.
[69] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 84.
[70] WSDA & Ecology, Surface Water Monitoring Program for Pesticides in Salmon-Bearing Streams, 2009-2011 Triennial Report (February 2013) (conducting a multi-year monitoring program since 2003 to characterize pesticide concentrations in selected salmon-bearing streams during periods of pesticide-use

and runoff in Washington); *see also* EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993) at 2-7.

[71] Ecology, River and Stream Water Quality Monitoring Report, Water Year 2008, Ecology Publication No. 09-03-041 (August 2009) at 35; Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (November 2011) at 81; Ecology, River and Stream Water Quality Monitoring Report, Water Year 2013, Ecology Publication No. 14-03-047 (November 2014) at 57.

[72] EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993), at 2-5.; USDA, Nitrogen in Agricultural Systems: Implications for Conservation Policy (September 2011) at 3.

[73] Ecology, Focus on Nutrients and Puget Sound, Ecology Publication No. 11-03-034 (June 2011); EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993) at 2-5.

[74] EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993) at 2-5; USDA, Nitrogen in Agricultural Systems: Implications for Conservation Policy (September 2011) at 3.

[75] Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 3C-46.

[76] Ecology, Nitrogetn in the Puget Sound Ecosystem, *at* http://www.ecy.wa.gov/programs/eap/Nitrogen/Trends.html (last visited January 4, 2016).

[77] "Several monitoring programs indicate declining pH in the marine waters of the Pacific Northwest." Ecology, Approach for Simulating Acidification and the Carbon Cycle in the Salish Sea to Distinguish Regional Source Impacts, Ecology Publication No. 14-03-002 (January 2014) at 5.

[78] California Ocean Science Trust, *Ocean Acidification in the Pacific Northwest* (May 2014), *at* http://westcoastoah.org/wp-content/uploads/2014/06/OA18PNWFacts14V4.pdf?utm_source=OAH+Subscriber+Public+Newsletter&utm_campaign=e0f9076906-West_Coast_OAH_Product_Release6_12_2014&utm_medium=email&utm_term=0_e74af6963b-e0f9076906-101492161 (last visited July 2, 2014).

[79] *Id.*; Elspeth Dehnert, Acid Oceans Can Be Fought At Home, Scientific American, June 5, 2014, *at* http://www.scientificamerican.com/article/acid-oceans-can-be-fought-at-home/?utm_source=OAH+Subscriber+Public+Newsletter&utm_campaign=e0f9076906-West_Coast_OAH_Product_Release6_12_2014&utm_medium=email&utm_term=0_e74af6963b-e0f9076906-101492161 (last visited July 9, 2014).

[80] *Id.*

[81] *See, e.g.*, David L. Mackas & Paul J. Harrison, *Nitrogenous Nutrient Sources and Sinks in the Juan de Fuca Strait/Strait of Georgia/Puget Sound Estuarine System: Assessing the Potential for Eutrophication*, 44 Estuarine, Coastal and Shelf Science 1 (1997); Ecology, Puget Sound Dissolved Oxygen Model Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (2011*)*.

[82] See Ecology, Puget Sound Dissolved Oxygen Model Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (2011) at 56, Fig. 28.

[83] United States Geological Survey (USGS), E.L. Inkpen & S.S. Embrey, *Nutrient Transport in the Major Rivers and Streams of the Puget Sound Basin*, USGS Fact Sheet 009-98.

[84] Robert Howarth et al., *Sources of Nutrient Pollution to Coastal Waters in the United States: Implications for Achieving Coastal Water Quality Goals*, 25 ESTUARIES 656 (2002).

[85]*See* Ryan P. Kelly & Margaret R. Caldwell, *Ten Ways States Can Combat Ocean Acidification (And Why They Should)*, 37 HARVARD ENVTL. L. REV. 57, 62 (2013) (emphasis added) ("To better address the acidifying ocean, states and regional bodies could redefine the existing technology-based discharge standard for a subset of point sources that most strongly contribute to ocean acidification…such as pulp mills, *concentrated animal feeding operations*, and sewage outflows…"); Wei-Jun Cai et al., *Acidification of subsurface coastal waters enhanced by eutrophication*, 4 Nature Geoscience, 766 (2011) ("[I]f human actions (for example, agricultural practices) can be taken to reduce acidification, seafloor carbonate mineral undersaturation may be less severe.").

[86] WSDA, Ecology, Surface Water Monitoring Program for Pesticides in Salmon-Bearing Streams, 2009-2011 Triennial Report (February 2013) at 16.

[87] *Id.* at 16.

[88] *Id.* at 128.
[89] *Id.* at 128.
[90] *Id.* at 16.
[91] *Id.* at 135.
[92] Washington Department of Health, Sanitary Survey of Portage Bay (August 19, 1997).
[93] Ecology, Managing Washington's Coast: Washington State's Coastal Zone Management Program, Ecology Publication No. 00-06-129 (2001) at 90.
[94] Washington Department of Health, Tracking Fecal Coliform Pollution Trends in Puget Sound Shellfish Growing Areas Using The Fecal Pollution Index (FPI), *at* http://depts.washington.edu/uwconf/psgb/proceedings/papers/p2_deter.pdf (last visited January 4, 2016).
[95] Wasowski, Ronald et al, *A Multi-Year Longitudinal Study of Water Quality Parameters in Four Salmon-Bearing and Recreational Streams on Mount Hood, Oregon*, *PLoS ONE* 8.8 (2013).
[96] *Id.*
[97] *Id.*
[98] Puget Sound Partnership, 2014-15 Action Agenda (May 2014) at 2-15.
[99] Puget Sound Partnership, 2014-15 Action Agenda (May 2014), at 2-15.
[100] *Id.*
[101] *Id.*
[102] Department of Health, NEP Pathogen Grant Implementation Strategy 2012 Work Plan (June 15, 2012) at 1.
[103] Washington Department of Health, Sanitary Survey of Portage Bay (August 19, 1997); Letter from Lummi Indian Nation to EPA Region 10 Administrator re: Nooksack River Basin Water Quality and the Closure of Tribal Shellfish Beds in Portage Bay – Request for Additional EPA Actions (October 10, 2014).
[104] Puget Sound Partnership, Samish Basin: Keeping Shellfish Beds Open (October 2014) at 1; Skagit County Public Works Department, Clean Water Skagit County 2013 Annual Report (2013) at 4.
[105] Northwest Treaty Tribes, Dairy Farm Pollution Costs Lummi Nation (January 16, 2015), *at* http://nwtreatytribes.org/dairy-farm-pollution-costs-lummi-nation/ (last visited January 4, 2016).
[106] EPA, National Summary of State Information, National Probable Sources Contributing to Impairments, http://ofmpub.epa.gov/waters10/attains_nation_cy.control#prob_source (last visited January 4, 2016).
[107] Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (November 2011) at 81; *see also* Davidson, E.A., et al., Issues in Ecology, Excess Nitrogen in the U.S. Environment: Trends, Risks, and Solutions, Ecological Society of America (Winter 2012), at 15 (Livestock manure had the single largest source share percentage aside from natural sources of nitrogen in the Washington basins, contributing 18.4%); Puget Sound Partnership, 2014-15 Action Agenda (May 2014), at 3C-40.
[108] Washington Department of Health, Sanitary Survey of Portage Bay (August 19, 1997).
[109] *Id.*
[110] Puget Sound Partnership, 2014-15 Action Agenda (May 2014), at 3C-40.
[111] *Id.*
[112] USDA NRCS Washington State Office, Spokane, State Resource Assessment 2011: Priority Resource Concerns, Washington State (August 2011), *available at* http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_034618.pdf (last visited January 18, 2016) at 16-27, 52.
[113] *Id*. at 23, 53.
[114] EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993) at 2-7.
[115] WSDA, Washington Dairies and Digesters (October 2011), *at* http://agr.wa.gov/fp/pubs/docs/343-washingtondairiesanddigesters-web.pdf (last visited January 4, 2016).
[116] *Id.*
[117] USDA, Nitrogen in Agricultural Systems: Implications for Conservation Policy (September 2011) at 14; USDA Economic Research Service, *Manure Management for Water Quality: Costs to Animal Feeding Operations of Applying Manure Nutrients to Land*, Agricultural Economic Report No. 824 (2003), *at* http://www.ers.usda.gov/publications/aer824 (last visited February 7, 2016); USDA Economic Research Service, *Confined Animal Production and Manure Nutrients*, Agricultural Information Bulletin No. 771 (2001), *at* http://www.ers.usda.gov/publications/ aib771/ (last visited February 7, 2016).

[118] WSDA Dairy Lagoon Inspection Forms (on file with author).
[119] Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (November 2011) at 83.
[120] EPA, Estimated Animal Agriculture Nitrogen and Phosphorous from Manure, *at* http://www2.epa.gov/nutrient-policy-data/estimated-animal-agriculture-nitrogen-and-phosphorus-manure (last visited January 4, 2016); *see also* USDA, Nitrogen in Agricultural Systems: Implications for Conservation Policy (September 2011) at 3 ("Agriculture is the predominant source of reactive nitrogen emissions into the environment.").
[121] EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993) at 2-5.
[122] Ecology has defined the term "agronomic rate" to mean the "[r]ate at which a viable crop can be maintained and there is minimal leaching of chemicals downwards below the root zone. Crops should be managed for maximum nutrient uptake when used for wastewater treatment." Ecology, Guidance on Land Treatment of Nutrients in Wastewater, With Emphasis on Nitrogen, Ecology Publication No. 04-10-081 (November 2004).
[123] Ecology, Nitrogen Dynamics at a Manured Grass Field Overlying the Sumas-Blaine Aquifer in Whatcom County, Ecology Publication No. 14-03-001 (March 2014); USDA, Nitrogen in Agricultural Systems: Implications for Conservation Policy (September 2011) at 3; *CARE, et al. v. Cow Palace LLC, et al.*, No. 13-CV-3016-TOR (Order Re: Cross Motions for Summary Judgment) (January 14, 2015) (finding that a large Dairy CAFO in the Lower Yakima Valley caused and contributed to contamination of local drinking water wells with nitrates, along with the presence of other contaminants, constituting an imminent and substantial risk to human health and the environment).
[124] Ecology, Nitrogen Dynamics at a Manured Grass Field Overlying the Sumas-Blaine Aquifer in Whatcom County, Ecology Publication No. 14-03-001, Ecology Publication No. 14-03-001 (March 2014) at 4.
[125] USDA, Nitrogen in Agricultural Systems: Implications for Conservation Policy (September 2011) at 3.
[126] *Id.* at 7.
[127] *Id.* at 7.
[128] EPA, Estimated Animal Agriculture Nitrogen and Phosphorous from Manure, www.epa.gov/nutrient-policy-data/estimated-animal-agriculture-nitrogen-and-phosphorous-manure (last visited February 4, 2016).
[129] Ecology, Quality Assurance Project Plan, Washington Nitrate Prioritization Project, Ecology Publication No. 14-10-005 (January 2014).
[130] Ecology, River and Stream Water Quality Monitoring Report, Water Year 2008, Ecology Publication No. 09-03-041 (November 2009) at 35; Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (November 2011) at 81; Ecology, River and Stream Water Quality Monitoring Report, Water Year 2013, Ecology Publication No. (November 2014) at 57.
[131] Ecology, Nitrogen in the Puget Sound Ecosystem, *at* http://www.ecy.wa.gov/programs/eap/Nitrogen/UpstreamSourcesViaRivers.html (last visited February 1, 2016); Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology publication No. 11-03-057 (November 2011) at 34.
[132] Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. (November 2011) 81; Ecology, Nitrogen in the Puget Sound Ecosystem, *at* http://www.ecy.wa.gov/programs/eap/Nitrogen/UpstreamSourcesViaRivers.html (last visited February 1, 2016) (4,180 kilograms/day).
[133] Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (November 2011) at 81.
[134] Ecology, Control of Toxic Chemicals in Puget Sound, Phase 3 Data and Load Estimates, Ecology Publication No. 11-03-101 (April 2011).
[135] Ecology, Sumas-Blaine Aquifer Nitrate Contamination Summary, Ecology Publication No. 12-03-026 (June 2012, rev. February 2013) at 5.
[136] *Id.* at 7.
[137] Ecology, Focus on Groundwater Quality in Whatcom County, Ecology Publication No. 12-03-005 (May 2012).

[138] Ecology, Quality Assurance Project Plan, Washington Nitrate Prioritization Project, Ecology Publication No. 14-10-005 (January 2014).
[139] EPA, Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters, EPA doc. 840-B-92-002 (January 1993) at 2-7.
[140] "Examples of nonpoint fecal pollution are failing on-site sewage systems, improper management of animal waste, or any fecal pollution that finds its way to a creek, river, or storm drain and eventually ends up in marine waters." Ecology, Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Ecology Publication. No. 15-10-015 (July 2015) at 3.
[141] Ecology, Managing Washington's Coast: Washington State's Coastal Zone Management Program, Ecology, Publication 00-06-129, 2001 (2011) at 90; Puget Sound Partnership, 2009 State of the Sound (2009).
[142] *Id.*
[143] Ecology, Assessment of Nonpoint Pollution in Washington State, Publication No. 14-03-028 (August 2014) at 29.
[144] Kate Field, Oregon State University, Molecular Source Tracking Report for Skagit County, Washington (August 2011) at 1.
[145] *Id*. at 8.
[146] Washington Department of Health, Sanitary Survey of Portage Bay (August 19, 1997) (In 1997, the majority of farms inspected received warning letters for various discharge violations.).
[147] Lummi Indian Nation, Nooksack River Water Quality and Portage Bay Shellfish (September 19, 2002).
[148] Whatcom County Public Works, Summary Report: Tracking Reports and Projects of Potential Pollution Sources in the Drayton Harbor Watershed 1991-2003 (Feb. 24, 2004).
[149] WA Department of Health, NEP Pathogen Grant Implementation Strategy 2012 Work Plan (June 15, 2012) at 1, 6.
[150] Whatcom County Public Works, Compliance & Referral Workgroup Meeting Notes (Feb. 13, 2014).
[151] Letter from WSDA to Unidentified Dairies in the Kamm Creek Watershed (June 1, 2014).
[152] "The Washington Shellfish Initiative began in late 2011. The first state initiative in the nation, it was launched following the start of NOAA's National Shellfish Initiative. This effort supports the long-term goal of enhancing shellfish resources in coastal waters." Draft Washington Shellfish Initiative – Phase II Updates (December 23, 2015).
[153] *Id.* at 4.
[154] Whatcom County Water Quality Program, Key Sources of Pollution, *at* http://www.whatcomcounty.us/1072/Water-Quality (last visited January 13, 2015).
[155] Ecology, Control of Toxic Chemicals in Puget Sound, Phase 3 Data and Load Estimates, Ecology Publication No. 11-03-101 (April 2011) at 66.
[156] *Id.*
[157] *Id.*
[158] Ecology, Puget Sound Dissolved Oxygen Model, Nutrient Load Summary for 1999-2008, Ecology Publication No. 11-03-057 (November 2011) at 81.
[159] Draft Agricultural Runoff Subgroup Report to the SWG, Recommendations for Regional Stormwater Monitoring (March 20, 2014) (on file with author).
[160] Ecology, Clean Water and Livestock Operations: Assessing Risks to Water Quality, Ecology Publication No. 15-10-020 (June 2015); Ecology, Assessment of Nonpoint Pollution in Washington State, Ecology Publication No. 14-03-028 (August 2014).
[161] *Id.*
[162] The phrase "Big Dumb Buffers" was coined by Jay Gordon in 2013 when he was Executive Director of the Washington State Dairy Federation. *See* Email from Washington State Dairy Federation to agency staff re: FW: busting out of 1 size fits all… (Oct. 8, 2013). The agricultural industry vehemently opposed the Tribes' efforts to get voluntary incentive program funding conditioned on compliance with scientifically-supported buffers. *See, e.g.,* A Joint Plea to the Washington Congressional Delegation from the Major Agricultural Associations in Washington State (June 7, 2013) ("Requiring large buffers as a condition of participating in federal programs will result in limiting participation to only those who no longer have an interest in the economic viability of productive farmland.").
[163] A more in- depth discussion of the importance of riparian vegetation on salmon habitat and populations can be found in Spence et al (1996). Spence, B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki.

1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR. (Available from the National Marine Fisheries Service, Portland, Oregon.)

[164] "Ecology has increased the minimum requirements for riparian buffers to protect and restore salmon fisheries and achieve water quality standards. These requirements apply to funding for projects that address nonpoint pollution problems, including Section 319 grants, Centennial Clean Water Fund grants or loans, and the Water Pollution Control State Revolving Fund loans. In response to tribal concerns, the U.S. Environmental Protection Agency (EPA) and the National Oceanographic and Atmospheric Administration (NOAA) notified the Department of Ecology that it must take additional actions to protect salmon and salmon habitat. The EPA is requiring Washington State to include conditions on federal pass-through grants to be consistent with National Marine Fisheries Service (NMFS) buffer guidance to help protect and recover Washington's salmon runs. Ecology is attaching the special conditions to grant funds to increase levels of riparian protection to both protect and restore salmon fisheries and help achieve water quality standards." Ecology, Funding Guidelines, State Fiscal Year 2016, Water Quality Financial Assistance, Ecology Publication No. 14-10-045 (August 2014) at Appendix G.
[165] Puget Sound Partnership, 2014-2015 Action Agenda 3C-44 (May 2014), *at* http://www.psp.wa.gov/2014_action_agenda_download.php (last visited January 18, 2016) (emphasis added).
[166] *Id.* at tasks C.1.6.3 and C.3.2.
[167] Puget Sound Partnership, Show Me Data, *at* http://psp.wa.gov/gis/NEPAtlas/ShowMeData (last visited January 18, 2016).
[168] Ecology, Compliance and Enforcement Data, *at* http://www.ecy.wa.gov/services/enforce/data.html(last visited Jan. 24 2016).
[169] Ecology, Email from Ecology employee to Zyanya Breuer re: FW: Interest in enforcement data (January 6, 2016) (Ecology estimating enforcement actions for 2014 and 2015 using the Docket Management System) (on file with author).
[170] Ecology, Email from Andy Wargo, Water Quality Inspector, Washington State Dept. of Ecology, Bellingham Field Office to Zyanya Breuer re: enforcement actions in and around Skagit County (December 15, 2015) (on file with author).
[171] Samish Basin: Keeping Shellfish Beds Open (October 2014).
[172] *Id.*
[173] Ecology, Compliance and Enforcement Data, *at* http://www.ecy.wa.gov/services/enforce/data.html (last visited Jan. 24 2016) (highlight added) (note that enforcement totals for programs other than water quality have not declined in recent years).
[174] The Clean Samish Initiative, *at* http://www.skagitcounty.net/Departments/PublicWorksCleanWater/cleansamish.htm (last visited January 4, 2015).
[175] *See, e.g.*, The Clean Samish Initiative, *at* http://www.skagitcounty.net/Departments/PublicWorksCleanWater/cleansamish.htm (last visited January 4, 2015).
[176] *Id.*; Skagit County Clean Water, Don't Be A Squatter, Save Our Clean Water, *at* https://www.youtube.com/watch?v=F6Y-ZmjZP_Q&feature=youtu.be (last visited February 2, 2016).
[177] Skagit County Clean Water, Environmental Canine Services Sewage Detection, *at* http://www.skagitcounty.net/Departments/PublicWorksCleanWater/crush.htm (last visited Jan. 4, 2015).
[178] "How Big is Your Footprint – A Community Workshop About Water Quality," Coastal Volunteer Partnership at Padilla Bay, November 10, 2015, Sedro Woolley Community Center; *see also* Skagit County Democrats, Action Newsletter – November 9, 2015, *at* http://www.skagitdemocrats.org/?page_id=2831 (Describing the upcoming community meeting: "The intent of the workshop is to focus attention on local water quality conditions, and the types of chemical and bacterial pollution that impact our waters, especially those coming from failing septic systems. Coupons for $25 off inspection and pumping services from several certified inspectors in Skagit County will be available at the workshop."); Skagit County Public Works Department, Clean Water Skagit County 2013 Annual Report (2013) at 16.
[179] Samish Basin: Keeping Shellfish Beds Open (October 2014).
[180] Ecology, Focus on Groundwater Quality in Whatcom County, Publication No. 12-03-005 (May 2012).

[181] EPA, Yakima Dairies Consent Order Update (December 2014) at 9.
[182] Notably the rate of septic systems inventory is one of four indicators already meeting or nearly meeting 2020 targets set by the Puget Sound Partnership. Puget Sound Partnership, Report on the Puget Sound Vital Signs (2015).
[183] Washington State Department of Agriculture, Quality Assurance Project Plan, Addendum One – Monitoring Fecal Coliform Bacteria Dairy Nutrient Management Plan (August 2015).
[184] *See* Prest, V., and K. McLain, 2014. Quality Assurance Project Plan: Monitoring Fecal Coliform Bacteria Dairy Nutrient Management Program. Prepared for the Washington Departments of Health and Department of Ecology (April 2014).
[185] Lummi Indian Business Council, Nooksack River Basin Water Quality and the Closure of Tribal Shellfish Beds in Portage Bay, Letter to EPA Region 10 (September 3, 2014).
[186] Ecology, Clean Water and Livestock Operations: Assessing Risks to Water Quality, Ecology Publication No. 15-10-020 (June 2015).
[187] *See, e.g.*, Testimony of Steve George Before the Washington House of Representatives Agriculture and Natural Resources Committee (Nov. 19, 2015) *at* http://www.tvw.org/index.php?option=com_tvwplayer&eventID=2015110036 (last visited January 4, 2015) (testifying about the preliminary draft of Ecology's CAFO Discharge Permit and stating that a goal of the Lower Yakima Valley Groundwater Management Area "is to implement voluntary practices first as they have been shown to meet goals faster and be less expensive.").
[188] William H. Rodgers, Jr., "Deception, Self-Deception, and Mythology: The Law of Salmon in the Pacific Northwest," 26 Pacific Law Journal No. 3 821, 827 (April 1995) (According to evolutionary biologist Robert Trivers, "[s]elf-deception…is a powerful force in the service of deception, put another way, the best liars are true believers, which means they are not deceivers as normally defined by law because there is no intent to transmit inaccurate information to the audience. They tell the truth as they misperceive it.").
[189] *Id*. at 828-29 (citations omitted).
[190] S. Rep. No. 414, 92nd Cong., 1st Sess. 64, *reprinted in* 1972 U.S.C.C.A.N. 3668, 3709 ("This section [§ 301] clearly establishes that the discharge of pollutants is unlawful. Unlike its predecessor program which permitted the discharge of certain amounts of pollutants under the conditions described above, this legislation would clearly establish that no one has the right to pollute—that pollution continues because of technological limits, not because of any inherent right to use the nation's waterways for the purpose of disposing wastes.... The Committee believes it is important to clarify this point: no one has the right to pollute.").
[191] This legal responsibility is known as the Public Trust Doctrine and is discussed at pp 41-43.
[192] 33 U.S.C. §407 (emphasis added).
[193] *See, e.g.*, *Exxon Shipping Co. v. Baker*, 554 U.S. 471, 479, 128 S. Ct. 2605, 2613, 171 L. Ed. 2d 570 (2008) (Exxon pleaded guilty to violations of the Refuse Act).
[194] 33 U.S.C. § 407.
[195] Rodgers, Environmental Law § 4.1.
[196] 33 U.S.C. §§ 1342, 1362(14) (2013).
[197] Prior to the enactment of the CWA, President Nixon directed the executive branch to establish a Refuse Act permit program by Executive Order 11754. Richard G. Hildreth, *Federal Control of Water Pollution: The Refuse Act Permit Program*, 27 The Business Lawyer, 567 (1972).
[198] RCW 90.48.160; Washington State Attorney General Opinion, Offices & Officers – State – Pollution Control Commission – Adoption of Water Quality Standards for Waters of the State, AGO No. 4 (February 18, 1969).
[199] 33 U.S.C. § 1251(a)(1).
[200] S. Rep. No. 414, 92nd Cong., 1st Sess. 64, *reprinted in* 1972 U.S.C.C.A.N. 3668, 3709.
[201] It is important to recognize that nonpoint source pollution is not "exempt" from the Clean Water Act. Instead, "the Clean Water Act certainly cannot be read as encouraging nonpoint source pollution even if it does not expressly forbid it under Section 301. The goal of 'swimmable/fishable' water by 1983 presupposes control of both point and nonpoint sources." Rodgers, Environmental Law, § 4.9(B).
[202] 33 U.S.C. § 1362(14) (2013) (emphasis added).
[203] Rodgers, 2 Environmental Law at § 4.10.
[204] EPA, What Is Nonpoint Source Pollution?, *at* http://water.epa.gov/polwaste/nps/whatis.cfm (last visited June 22, 2015).

[205] 33 U.S.C. § 1251(a)(6).
[206] 33 U.S.C. § 1311(b)(1)(a).
[207] Rodgers, 2 Environmental Law at § 4.2.
[208] *See, e.g.*, *Comm'y Ass'n for Restoration of the Environment et al. v. Cow Palace, LLC et al.*, No. 2:13-cv-03016-TOR (E.D. Wash.) (Proposed Amicus Curiae Brief of *Amici* National Cattlemen's Beef Association, American Bureau Federation, Washington Cattlemen's Association and Washington Cattle Feeders Association) (filed Dec. 2, 2014) (illustrating the agricultural industry's collusive efforts to ensure that CAFO manure managed in a way that pollutes the groundwater is not subject to regulation under the Resource Conservation and Recovery Act and falsely claiming that "*Amici's* members operate livestock feeding operations that manage manure and wastewater under nutrient management plans developed under the auspices of the Clean Water Act."). Notably, on January 14, 2015 the Eastern District of Washington rejected Industry's amicus brief that advocated Industry-wide evasion of environmental law on the grounds that the amicus brief "offers no additional legal or other substantive information or perspective that has not already been presented to, or previously decided by, the Court in this litigation or that is particularly helpful to this Court's pending determination." *Id*. (Order Denying Amicus Curiae Brief) (Jan. 14, 2015).
[209] Rodgers, 1 Environmental Law at § 3.25(A).
[210] 33 U.S.C. § 1342(b)(1)(B) (permits must be "for fixed terms not exceeding five years.").
[211] 33 U.S.C. § 1342(o) ("In the case of effluent limitations…a permit may not be renewed, reissued, or modified…to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.").
[212] Senator Edmund S. Muskie, *The Meaning of the 1977 Clean Water Act*, EPA Journal, *at* http://www2.epa.gov/aboutepa/meaning-1977-clean-water-act (last visited February 3, 2016).
[213] Pub. L. No. 95-217, 91 Stat. 1566 (1977).
[214] Rodgers, 2 Environmental Law § 4.2(C).
[215] 33 U.S.C. §407 (2013).
[216] *Ctr. for Biological Diversity v. U.S. Envtl. Prot. Agency*, 90 F. Supp.3d 1177, 1183 n.2 (2015) (quoting *Pronsolini v. Nastri*, 291 F.3d 1123, 1126-27 (9th Cir. 2002)).
[217] 33 U.S.C. § 1288.
[218] 33 U.S.C. § 1281(b).
[219] 33 U.S.C. § 1281(c) (emphasis added).
[220] 33 U.S.C. § 1288(b)(2)(F).
[221] 33 U.S.C. § 1313.
[222] Ecology, Water Quality Assessment Categories, *at* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html (last visited January 13, 2016).
[223] 33 U.S.C. §§ 1313(d)(1)(A), (C).
[224] EPA, Implementing Clean Water Act Section 303(d): Impaired Waters and Total Maximum Daily Loads (TMDLs), *at* http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/overviewoftmdl.cfm(last visited January 13, 2016).
[225] 33 U.S.C. § 1313(d)(1)(C).
[226] EPA, Guidelines for Reviewing TMDLs Under Existing Regulations Issued in 1992, *at* http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/final52002.cfm (last visited November 7, 2015).
[227] 40 C.F.R. § 130.2(g-i).
[228] *Id.*
[229] *San Francisco Baykeeper v. Whitman*, 297 F.3d 877, 880 (9th Cir. 2002).
[230] *Friends of the Wild Swan, Inc. v. U.S. Envtl. Prot. Agency*, 130 F. Supp.2d 1184, 1189 (D. Mont. 1999) ("If the EPA disapproves of the WQLSs identified and/or the TMDLs developed, the EPA inherits a mandatory duty to identify appropriate WQLSs and develop TMDLs compatible with the state's water quality standards within 30 days from the date of the disapproval.").
[231] Government Accountability Office, Clean Water Act: Changes Needed If Key EPA Program is to Help Fulfill the Nation's Water Quality Goals, GAO-14-80 (December 2013).
[232] *Id.*
[233] *Id.* at 2.
[234] 33 U.S.C. § 1329(a).
[235] 33 U.S.C. § 1329(b)(2)(A).
[236] 33 U.S.C. § 1329(b)(2)(B).

[237] 33 U.S.C. § 1329(d).
[238] 33 U.S.C. § 1329(d)(2)(A)-(D).
[239] 33 U.S.C. § 1329(d)(3).
[240] This provision should be read to include Indian Tribes and Indian Tribal organizations with expertise in protecting water quality, such as the Northwest Indian Fisheries Commission in Washington state.
[241] 33 U.S.C. § 1329(e).
[242] WAC 173-201A-510.
[243] WAC 173-201A-020.
[244] Ecology, Clean Water Practices for Livestock Grazing, Internal Draft (February 12, 2010).
[245] *Id.* at 10.
[246] Email from Josh Baldi to Ecology Director Ted Strudevent (February 18, 2010) (on file with author).
[247] *See, e.g.*, Letter from Richard Yoder, Chair Whatcom County CD to Ron Juris, Chair Eastern Kickitat Conservation District, re: Resisting Ecology's Attempt to Assume Control over Conservation Districts (February 18, 2010) (on file with author). *See also* email from George Boggs (Whatcom County CD) to John Larson (WACD) & Ron Schultz (noting that letters were sent out to all conservation districts requesting resistance to Ecology's proposed guidance on BMPs) (February 19, 2010) (on file with author).
[248] *Id.*
[249] Email from John Larson, Executive Director, Washington Association of Conservation Districts to 'all-districts' re: Ecology Grazing Manual (February 19' 2010) (on file with author).
[250] Email from Josh Baldi to Director Ted Sturdevant (February 18, 2010) (on file with author).
[251] Memorandum from Melissa Gildersleeve, Ecology to Water Quality BMP Work Group, re: NRCS Standards and Washington's Water Quality Standards (August 16, 2010) (on file with author).
[252] *See* letter from Billy Frank Jr., to Mark Clark, WSCC, Dan Newhouse, Director, and Ted Sturdevant, Director Ecology, re: Follow up request for member tribes to participate in the "three directors talks" (March 2, 2012) (on file with author).
[253] *Id*.
[254] *See* Letter from Directors of WSDA, WSCC, and WDOE, to Governor Gregoire (January 11, 2013) (Letter accompanying January 11, 2013 Draft of 3DT BMP Implementation Approach) (on file with author).
[255] *Id*. at 1.
[256] *See* Draft 3DT BMP Implementation Approach (January 11, 2013) at 9.
[257] The document does not identify an analytical framework for determining buffer widths, modeling techniques employed to determine practice effectiveness, or literature reviews of peer-reviewed science.
[258] Memorandum from Melissa Gildersleeve, Ecology to Water Quality BMP Work Group, re: NRCS Standards and Washington's Water Quality Standards (August 16, 2010) (on file with author).
[259] 33 U.S.C. § 1329(h).
[260] 33 U.S.C. § 1329(h)(1).
[261] 33 U.S.C. § 1329(h)(5).
[262] 33 U.S.C. § 1329(i).
[263] 33 U.S.C. § 1330(a)(1).
[264] 33 U.S.C. § 1330(b)(4).
[265] 16 U.S.C. § 1455b, *et seq.*
[266] Coastal Zone Act Reaturhoziation Amendments of 1990, *at* https://coast.noaa.gov/data/Documents/OceanLawSearch/CoastalZoneActReauthorizationAmendmentsof1990.pdf (last visited January 8, 2016).
[267] 16 U.S.C. § 1455b(g)(5).
[268] Ecology, Washington State's Plan To Control Nonpoint Pollution, *at* http://www.ecy.wa.gov/programs/wq/nonpoint/NPSplan.html (last visited January 5, 2016).
[269] Ecology, Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Ecology Publication No. 15-10-015 (July 2015) at 2.
[270] *Id.* at 52.
[271] *Id.* at 83.
[272] 33 U.S.C. § 1329(a).
[273] *Id.* at 27.
[274] Email from Melissa Gildersleeve to Bruce Wishert, *et al.* re: Ecology work to articulate Agriculture

BMPS that meet Water Quality Standards (September 25, 2015) (on file with author) ("The final Nonpoint Plan that was submitted to EPA includes a commitment over the next year to develop a process to identify best management practices (BMPs) for agriculture that, if implemented, would meet our state water quality standards. We would design the process over this next year and then the following years implement that process to identify BMPs. This work is the result of EPA comments to us regarding the need to identify agricultural Best Management Practices that meet water quality.").

[275] Email from Jo Henszey to Ecology, Re: EPA Comments on Washington's Draft Water Quality Management Plan to Control Nonpoint Sources of Pollution (June 17, 2015).

[276] EPA, NOAA, Washington's Coastal Nonpoint Pollution Control Program, Nonpoint Source Management Program, and Federal Trust Obligations to Tribes, Letter to Ecology (April 23, 2013).

[277] Email from Jo Henszey to Ecology, Re: EPA Comments on Washington's Draft Water Quality Management Plan to Control Nonpoint Sources of Pollution (June 17, 2015) (on file with author).

[278] Letter from NOAA to Ecology, Re: Comments on Washington's Draft Water Quality Management Plan to Control Nonpoint Sources of Pollution (June 4, 2015) (on file with author).

[279] Puget Sound Partnership Blog, Congressman Heck Introduces PUGET SOS Act in the U.S. House of Representatives, at http://www.psp.wa.gov/blog/?p=539 (last visited November 3, 2015).

[280] Congressional Puget Sound Recovery Caucus, *at* http://dennyheck.house.gov/sites/dennyheck.house.gov/files/PUGET SOS One Pager.pdf (last visited Nov. 3, 2015).

[281] *Id.*

[282] *Id.*

[283] Pub. L. 99-198 (1985).

[284] *See* H.R. Rep. No. 271, 99th Cong., 1st Sess., pt. 1, at 78 (1985), reprinted in 1985 U.S.C.A.N.N. 1103, 1182 (discussion by the the House Agriculture Committee on attempts to implement "major soil conservation measures" in the 1981 Farm Bill).

[285] Linda A. Malone, *A Historical Essay on the Conservation Provisions of the 1985 Farm Bill: Sodbusting, Swampbusting, and the Conservation Reserve*, 34 KAN. L. REV. 577, 581 (1986).

[286] *Multi Ag Media LLC v. USDA*, 515 F.3d 1224 (D.C. Cir. 2008).

[287] 7 U.S.C. § 8791.

[288] 5 U.S.C. § 552(b)(3).

[289] 7 U.S.C. § 8791. According to a presentation to the EPA, geospatial data does not include unmarked aerial photos. EPA, 2011 State Nutrient Reduction Workshop, Section 1619 of the Food, Conservation, and Energy Act Presentation, (June 13-15, 2011), *at* http://www.epa.gov/region5/agriculture/pdfs/nutrientworkshop/21wilson.pdf (last visited February 3, 2016).

[290] *Id.*

[291] 7 U.S.C. § 8791(b)(4)(B). *See also* Memorandum from Boyd K. Rutherford, USDA Assistant Secretary for Administration, to Agency FOIA Officers (July 30, 2008), *at* http://www.sej.org/sites/default/files/USDA1619Memo073008.pdf (last visited February 3, 2016); NRCS, 1619 Talking Points, *at* http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1166474.pdf (last visited February 3, 2016).

[292] 7 U.S.C. § 8791(b)(4)(A). *See also* EPA, 2011 State Nutrient Reduction Workshop, Section 1619 of the Food, Conservation, and Energy Act Presentation, (June 13-15, 2011), *at* http://www.epa.gov/region5/agriculture/pdfs/nutrientworkshop/21wilson.pdf (last visited February 3, 2016).

[293] NRCS FOIA Presentation (Feb 25 2011), *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/mn/contact/ ?cid=stelprdb1166464 (emphasis original) (last visited February 3, 2016); *see also* NRCS 1619 Talking Points, *at* http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1166474.pdf (last visited February 3, 2016; Memorandum from Boyd K. Rutherford, USDA Assistant Secretary for Administration, to Agency FOIA Officers (July 30, 2008), *at* http://www.sej.org/sites/default/files/USDA1619Memo073008.pdf (last visited February 3, 2016).

[294] *See* USDA Section 1619 Cooperator Memorandum of Understanding, *at* http://water.epa.gov/polwaste/nps/upload/template-usda-section1619-cooperator-memo-understanding.pdf (last visited February 3, 2016).

[295] *Id.*

[296] Between 1995 and 2012, USDA disbursed approximately $39 billion in conservation payments alone. Environmental Working Group, "Farm Subsidies: The United States Summary Information," *at* *http://farm.ewg.org/region.php?fips=00000* (last visited September 1, 2015).
[297] *See* Adena R. Rissman, *Evaluating Conservation Effectiveness and Adaptation in Dynamic Landscapes*, Law & Contemp. Probs., Fall 2011, at 145, 169-70.
[298] *Multi Ag Media LLC v. Department of Agriculture*, 515 F.3d 1224 (D.C. Cir. 2008). *See Ctr. for Biological Diversity v. U.S. Dep't of Agric.*, 626 F.3d 1113, 1117 (9th Cir. 2010) ("To the extent Section 8791 was a reaction against *Multi Ag Media LLC v. U.S. Dep't of Agric.*, 515 F.3d 1224 (D.C.Cir.2008), that suggests it was intended to prohibit disclosure of GPS data like that at issue here, because *Multi Ag* required the release of a database used with GPS technology.); EPA, 2011 State Nutrient Reduction Workshop, Section 1619 of the Food, Conservation, and Energy Act Presentation, (June 13-15, 2011), *at* http://www.epa.gov/region5/agriculture/pdfs/nutrientworkshop/21wilson.pdf (last visited February 3, 2016) (Section 1619 exists "at least in part, because of the D.C. Circuit decision *Multi Ag Media LLC v. Department of Agriculture*, which held that the public interest in disclosing certain information outweighed the privacy interests of agricultural producers under FOIA Exemption 6.").
[299] *Multi AG Media LLC v. Dep't of Agric.*, No. CIV.A. 05-01908 HHK, 2006 WL 2320941, at 1 (D.D.C. Aug. 9, 2006).
[300] *Id.*
[301] *Multi Ag Media LLC v. Department of Agriculture*, 515 F.3d at 1232 (quoting *Dep't of Air Force v. Rose*, 425 U.S. 352, 361 (1976)).
[302] *Id.* at 1226.
[303] USDA, USDA 2007 Farm Bill Proposals (2007), *available at* http://www.usda.gov/documents/07finalfbp.pdf (last visited January 13, 2016).
[304] HR 2419, 110th CONGRESS, 1st Session, December 14, 2007.
[305] United States Senate Committee on Agriculture, Nutrition, and Forestry, Joint Explanatory Statement of the Committee of Conference, *at* http://www.ag.senate.gov/download/?id=be76a229-fbc0-4310-b0a2-2a80988eb4bd, at 30 (last visited January 13, 2016).
[306] Senator Tom Harkin, New from Senate Agriculture, Nutrition and Forestry Committee, Farm Bill: Investments for the Future (May 8, 2008).
[307] 154 Cong. Rec. H3784-01, 2008 WL 2051167.
[308] *Id.*
[309] 154 Cong. Rec. H3801-03, 2008 WL 2051173.
[310] 154 Cong. Rec. H4402-02, 2008 WL 2129940.
[311] *Id.*
[312] Renee Johnson, *The 2008 Farm Bill: Major Provisions and Legislative Action*, CONGRESSIONAL RESEARCH SERVICE (November 6, 2008).
[313] USDA Freedom of Information Act Annual Report FYs 2008, 2009, 2010, 2011, 2012, 2013, 2014. *See* Table 2.
[314] Letter from Washington Conservation Commission to Breuer re: Public Records Request (July 24, 2015) (on file with author).
[315] USDA Freedom of Information Act Annual Report FYs 2008, 2009, 2010, 2011, 2012, 2013, 2014. For example, other statutory bases for denying a FOIA request include but are not limited to: planning and soliciting public contracts in 41 U.S.C. §3303; the confidentiality of information provision in the 2008 Farm Bill, 7 U.S.C. § 2276; the dairy promotion program, 7 U.S.C. § 4501-4514; alternative dispute resolution, 5 U.S.C. §§ 571- 578; Agricultural Trade Act of 1978; the Federal Crop Insurance Act, 7 U.S.C. § 1502(c); the Food Stamp Program, 7 U.S.C. §§2011-2036; The National Defense Authorization Act of 1977; the confidentiality of information for archaeological resources, 16 U.S.C. § 470hh; the confidentiality of information for significant caves, 16 U.S.C. § 4304; and the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §136. *See also* Rena Steinzor & Yee Huang, *Going Dark Down on the Farm: How Legalized Secrecy Gives Agribusiness a Federally Funded Free Ride*, CENTER FOR PROGRESSIVE REFORM, Briefing Paper No. 1213, 4 (September 2012).
[316] *Multi Ag Media LLC v. Department of Agriculture*, 515 F.3d at 1232.
[317] *Id.* at 1231.
[318] *Id.* at 1232 (citing 5 U.S.C. App. 3 § 2); *see also* 7 C.F.R. § 2610.1(b).

[319] U.S. Gov't Accountability Office (GAO), *Farm Bill: Issues for Consideration* 14-18, GAO-12-338SP (April 2012); U.S. GAO, *Farm Programs: Direct Payments Should be Reconsidered* 13, GAO-12-640 (July 2012) (the USDA paid $10.6 billion from 2003-2011 to producers who did not, in a given year, plant any of the crop for which they had base acres).
[320] *See* USDA, Geospatial Data Gateway, *at* https://gdg.sc.egov.usda.gov/(last visited September 1, 2015) ("Welcome to GDG. The Geospatial Data Gateway (GDG) is the One Stop Source for environmental and natural resources data, at anytime, from anywhere, to anyone.").
[321] *Ctr. for Biological Diversity v. U.S. Dep't of Agric.*, 626 F.3d 1113, 1115 (9th Cir. 2010).
[322] *Id.*
[323] *Id.*
[324] *Id.* at 1118.
[325] National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) Reporting Rule, 76 FR 65431-01.
[326] *Id.*
[327] *Id.*
[328] Email from Chuck Timblin to George Boggs re: 12 assessments and 1 dairy plan (May 22, 2015) (on file with author).
[329] RCW 90.64.
[330] Email from George Boggs to Virginia Prest re: Fwd: 12 assessments and 1 dairy plan (May 22, 2015) (on file with author).
[331] Jamie Henneman, *Ecology Sends Flurry of Pollution Letters to Landowners*, THE INDEPENDENT, Jan. 7, 2015, *at* http://www.chewelahindependent.com/news/local-news/1226-ecology-sends-flurry-of-pollution-letters-to-landowners (last visited January 7, 2016).
[332] U.S. Envt'l Protection Agency, Office of the Inspector General, *EPA Needs a Better Strategy to Identify Violations of Section 404 of the Clean Water Act*, Report No. 10-P-0009 (October 26, 2009) at 9.
[333] *Id.*
[334] *Id.*
[335] U.S. Gov't Accountability Office (GAO), *Farm Bill: Issues for Consideration*, GAO-12-338SP (April 2012) at 18.
[336] *Id.*
[337] U.S. Gov't Accountability Office (GAO), *Nonpoint Source Water Pollution: Greater Oversight and Additional Data Needed for Key EPA Water Program*, GAO-12-335 (May 2012) at 47.
[338] *Id.*
[339] *Id.*
[340] *Id.*
[341] Though the appropriations expire, the 2008 Farm Bill includes no sunset provision for section 1619. 7 U.S.C. § 8791. The 2014 Farm Bill neither amends nor repeals section 1619. H.R. 2642, 113th Cong. (2nd Sess. 2014).
[342] H.R. Rep. No 113-333, at 395 (2014) (Conf. Rep.) *at* https://www.congress.gov/113/crpt/hrpt333/CRPT-113hrpt333.pdf (last visited February 3, 2016).
[343] *See Audubon Soc. of Portland v. U.S. Natural Res. Conservation Serv.*, No. 03:10-CV-01205-HZ, 2012 WL 4829189 (D. Or. Oct. 8, 2012); *Mitchell v. U.S. Dep't of Agric. Farm Serv. Agency*, No. 13-CV-500-BBC, 2014 WL 7240671 (W.D. Wis. Dec. 17, 2014).

[344] NRCS, About NRCS, at http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/about/ (last visited January 8, 2016).
[345] NRCS, History of NRCS, at http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/about/history/ (last visited January 8, 2016).
[346] NRCS, Washington Nutrient Management (590) Standard Key Messages (undated) (on file with author).
[347] Letter from Ecology to EPA Region 10 re: Rule-Making and State Technical Standards for Concentrated Animal Feeding Operations (CAFOs) (Oct 8, 2010); *see also See, e.g.*, Email from Melissa Gildersleeve (Ecology) to Water Quality BMP Work Group (August 16, 2010) (on file with author) ("Based on information from the water quality BMP talks, Ecology's review of the NRCS technical guidance, and

Ecology's experience in working with this issue, we find that NRCS does not have performance standards that ensure that a producer will comply with Washington state water regulations.").
[348] Email from Melissa Gildersleeve (Ecology) to Water Quality BMP Work Group (August 16, 2010) (on file with author).
[349] *Id.*
[350] For a full list of all NRCS standards *see* http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849 (last visited January 8, 2016).
[351] NRCS Conservation Practice Standard 590, Nutrient Management.
[352] *Id.*
[353] *Id.* at 3.
[354] *Id.* (emphasis added).
[355] Letter from Ecology Director Maia Bellon to Astor Boozer, NRCS, re: Update of Field Office Technical Guide (FOTG) 590 for Nutrient Management (May 9, 2014) (on file with author).
[356] NRCS Washington Nutrient Management (590) Standard Key Messages (on file with author).
[357] Letter from Ecology Environmental Assessment Program/Groundwater Unit to WA State Conservation Commission (May 12, 2014) (on file with author).
[358] *Id.*
[359] Letter from NRCS to Ecology Director Maia Bellon (August 18, 2014) (on file with author).
[360] *Id.*
[361] Merriam-Webster defines concurrence as "the state of agreeing with someone or something," not "working closely with." Merriam-Webster Dictionary, *at* http://www.merriam-webster.com/dictionary/concurrence (last visited January 14, 2016).
[362] Email from Laurie Crowe, District Coordinator, Livestock Nutrient Management Program Specialist, South Yakima Conservation District, to Dairy Producers re: 590 specification (January 23, 2014) (on file with author) ("I have confirmation from our local NRCS that the December 590 Nutrient Management Standard has been pulled temporarily from the internet due to pressure from the Dairy Federation. Our local NRCS suggests that you all do a call-in campaign to voice your concerns to the State NRCS Office and even call the Nation[al] NRCS Office.").
[363] *See also Friends of Pinto Creek v. U.S. E.P.A.*, 504 F.3d 1007, 1014 (9th Cir. 2007) ("The EPA has the responsibility to regulate discharges from point sources and the states have the responsibility to limit pollution coming into the waters from non-point sources."); *Pronsolino v. EPA*, 291 F.3d 1123, 1128 (9th Cir. 2002) (Referring to the establishment by states of TMDLs, the court held "The upshot of this intricate scheme is that the CWA leaves to the states the responsibility of developing plans to achieve water quality standards if the statutorily-mandated point source controls will not alone suffice, while providing federal funding to aid in the implementation of the state plans.")
[364] RCW 90.48.010 (emphasis added).
[365] SB 294 (approved by the Governor March 16, 1945), Section 20.
[366] RCW 90.48.140.
[367] RCW 90.48.260.
[368] RCW 90.48.030.
[369] RCW 90.48.080.
[370] RCW 90.48.160.
[371] Ecology, Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Ecology Publication No. 15-10-015 (July 2015) at 7.
[372] The term "waters of the state" includes "lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington." RCW 90.48.020. While Attorney General for the state of Washington, former Senator Slade Gorton wrote a legal opinion finding that the term "waters of the state" "is all-inclusive." Washington State Attorney General Opinion, Offices & Officers – State – Pollution Control Commission – Adoption of Water Wuality Standards for Waters of the State, AGO No. 4 (February 18, 1969).
[373] 33 U.S.C. § 1342(l)(1).
[374] Clean Water Rule: Definition of Waters of the United States, 80 Fed. Reg. 37,054 (June 29, 2015).
[375] *See, e.g., North Dakota, et al. v. U.S. Envtl. Protection Agency*, 2015 WL 7422349 (D. N. D. Nov. 10, 2015) (slip op.).

[376] *United States v. Robison*, 521 F.Supp.2d 1247, 1249 n.5 (N.D. Ala. 2007) ("I will not compare [the *Rapanos* decision] to making sausage because it would excessively demean sausage makers.").
[377]
[374] *Id.*
[379] *Id.*
[380] 33 U.S.C. § 1342(l)(1).
[381] EPA, Clean Water Act Exclusions and Exemptions Continue for Agriculture, *at* http://www.epa.gov/sites/production/files/2014-03/documents/cwa_ag_exclusions_exemptions.pdf(last visited January 11, 2016).
[382] *Id.*
[383] EPA & Department of the Army, Memorandum Withdrawing Interpretive Rule (January 29, 2015), at http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/cwa_guide/memo_withdrawing_ir.pdf (last visited January 11, 2016).
[384] RCW 90.48.120. *See also Lemire v. Dep't of Ecology*, 309 P.3d 395, 401- 402, 178 Wash. 2d 227, 239-241, (2013) (en banc) (holding that the Department of Ecology acted within its authority in issuing administrative order pursuant to Water Pollution Control Act requiring livestock rancher to address conditions that resulted in substantial potential for nonpoint source pollution on his property. "Ecology has broad authority to regulate any person causing the discharge of matters into waterways that cause or tend to cause pollution… We hold that Ecology did not exceed its authority when it ordered Lemire to comply with regulations concerning nonpoint source pollutant discharge into Pataha Creek.").
[385] *See, e.g., Waterkeeper Alliance Inc. v. EPA*, 399 F.3d 486, 505-06 (2d. Cir. 2005).
[386] Ecology, Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Ecology Publication No. 15-10-015 (July 2015) at Appendix B (Letter from Ron Lavigne, Assistant Attorney General).
[387] 178 Wn.2d 227, 309 P.3d 395 (2013).
[388] *Id*. at 230.
[389] *Id.*
[390] *Id*. at 235.
[391] *Id.* at 230.
[392] *Id.*
[393] *Id*. at 233 (citing RCW 90.48.120).
[394] *Id*. at 236.
[395] *Id*.
[396] *Id*. at 242.
[397] *Id.*
[398] *See* HB 2472 (2014); HB 2478 (2014); SB 6087 (2014); SB 6288 (2014).
[399] Ecology, Agriculture & Water Quality Advisory Committee, *at* http://www.ecy.wa.gov/programs/wq/nonpoint/Agriculture/AgWQAC.html (last visited February 3, 2016).
[400] Ecology, Clean Water and Livestock Operations: Assessing Risks to Water Quality, Ecology Publication No. 15-10-020 (June 2015).
[401] *Id.*
[402] *Id.* at §1362(6).
[403] 33 U.S.C. § 1362(14).
[404] 40 C.F.R. § 412.31(a).
[405] *Alt v. United States Envtl. Protection Agency*, 979 F. Supp.2d 701, 707 (N.D. W.V. 2013) ("In 1987, Congress amended § 1362(14) to add [the agricultural stormwater] exemption to the statutory definition of point source." "Nowhere did Congress define the term 'agricultural stormwater' nor did the EPA promulgate any regulations defining the term.").
[406] *CARE v. Sid Koopmans Dairy*, 54 F.Supp.2d 976, 981-82 (E.D. Wash. 1999) ("The agricultural stormwater discharge and return flows from irrigated agriculture exemption in 33 U.S.C. § 1362(14) does not act to relieve CAFO farmers from responsibility for over applications and misapplications of CAFO animal wastes to fields in amounts or locations which will then discharge into the waters of the United States.").
[407] 40 CF.R.§ 122.23(e).
[408] RCW 90.48.450.

[409] RCW 90.48.260.
[410] RCW 90.64; Memorandum of Understanding Between the Washington State Department of Agriculture and the Washington State Department of Ecology Related to The State of Washington's efforts to protect water quality related to livestock activities under the authority of Chapter 90.48 RCW, Water Pollution Control Act and Chapter 9064 RCW, Dairy Nutrient Management Act (October 30, 2009), *at* http://agr.wa.gov/fp/pubs/docs/2009_MOUwithAppendices.pdf (last visited January 13, 2016).
[411] RCW 90.64.005.
[412] Because of the horrific water quality conditions in the Nooksack River Basin primarily due to the discharges of manure from dairy CAFOs, on October 10, 2014, the Lummi Indian Nation formally asked the EPA to rescind EPA's delegation to Ecology of NPDES permit authority related to CAFOs. On December 9, 2014, the EPA responded by stating that "CWA Section 402(c)(3) and (4) does not allow for the withdrawal of only the CAFO portion of a state's NPDES permit program. Instead, the entire NPDES program may be withdrawn if the Administrator determines that the state no longer complies with the requirements of the federal regulations and fails to take corrective actions." Letter from Dennis McLerran, Regional Administrator EPA Region 10 to Merle Jefferson, Executive Director of Lummi Natural Resources Department (Dec. 9, 2014).
[413] On November 15, 2011, Ecology and WSDA entered into a Memorandum of Understanding outlining how the two agencies will work together "to assure water quality compliance related to livestock activities." *See* Memorandum of Understanding Between the WA State Department of Agriculture and the WA State Department of Agriculture (Nov. 15, 2011), *at* http://www.ecy.wa.gov/programs/wq/permits/cafo/docs/11152011MouEcyWsda.pdf (last visited Dec. 11, 2014); RCW 90.64.120; RCW 90.64.901.
[414] RCW 90.64.023(1).
[415] *Id.*
[416] RCW 90.64.026.
[417] The Conservation Commission has created a short, one-page "Approval Checklist" that sets forth the minimum requirements for a Dairy NMP. *See* WSDA, Minimum Elements of A Dairy NMP, *at* *http://agr.wa.gov/FoodAnimal/Livestock-Nutrient/DairyNutrientMgmtPlans.aspx* (last visited Dec. 11, 2014); RCW 90.64.026(2).
[418] Letter from Ecology to EPA re: Rule-Making and State Technical Standards for Cocentrated Animal Feeding Operations (CAFOs) (October 8, 2010).
[419] *Mehrig v. KFC Western, Inc.*, 516 U.S. 479, 483 (1996).
[420] *Comm'y Ass'n for Restoration of the Envt. et al. v. Cow Palace, LLC et al.*, No. 13-CV-3016-TOR (Order Re: Cross Motions for Summary Judgment) (Jan. 14, 2015) at 109.
[421] Id. at 27; 29 ("Although Defendants dispute the rate of seepage and nitrate accumulation around and beneath the lagoons, the parties do not genuinely dispute that both events are occurring."); 29 (Defendants' own expert testified "that he has never seen a study showing 'there is no seepage from a lagoon.'"); 94
[422] *Id.* at 94.
[423] *Id*. at 93. *See also* RCW 90.64.026(3) (stating that "in developing the elements that an approved dairy nutrient management plan must contain" the methods and technologies must be those developed by the NRCS, or alternative standards that "meet the standards and specifications of (a) The [NRCS]; or (b) a professional engineer with expertise in the area of dairy nutrient management.").
[424] *Id*. at 94.
[425] *Id*. at 88.
[426] *Id*. at 97 ("there can be no genuine dispute that the nitrates beneath the crop root zones at the Dairy will continue to migrate through the vadose zone to the underlying aquifer."); 98 ("As such, given the highly mobile nitrates found below the crop root zones as well as the highly permeable soils underlying the Dairy, the nitrates will migrate to the aquifer with water, be it from rainfall, snowmelt, irrigation practices, or more liquid manure to help transport it."); 100 ("Accordingly, a reasonable trier-of-fact, given the evidence presented, could come to no other conclusion than that the Dairy's operations are contributing to the high levels of nitrate that are currently contaminating – and will continue to contaminate as nitrate present below the root zone continues to migrate - the underlying groundwater.").
[427] WSDA Livestock Nutrient Management Program Inspection Report for Cow Palace Dairy (June 21, 2007).
[428] *Id*. at 3.

[429] *Id*.
[430] Email from Michael Isensee (WSDA) to Dan Noteboom Dairy, re: Complaint re manure spreader/application (September 22, 2015) (on file with author).
[431] RCW 82.08.890; RCW 82.12.890 (same).
[432] RCW 36.70A.705(1).
[433] RCW 36.70A.705(2)(b).
[434] RCW 43.21C.030(2).
[435] RCW 36.70A.700(2)(b).
[436] RCW 36.70A.700.
[437] RCW 36.70A.702(5).
[438] RCW 36.70A.705(1) ("The program shall be designed to protect and enhance critical areas on lands used for agricultural activities through voluntary actions by agricultural operators.").
[439] RCW 36.70A.710(1)(a).
[440] RCW 36.70A.715; RCW 36.70A.720(1).
[441] RCW 36.70A.720(2)(b)(iv).
[442] RCW 36.70A.720(3).
[443] RCW 36.70A.750(1).
[444] RCW 36.70A.750(2).
[445] RCW 36.70A.760.
[446] RCW 43.05; RCW 43.05.010("'Regulatory agency" means an agency as defined in RCW 34.05.010 that has the authority to issue civil penalties. The term does not include the state patrol or any institution of higher education as defined in RCW 28B.10.016.").
[447] RCW 43.05.005.
[448] RCW 43.05.060.
[449] RCW 43.05.060(3).
[450] RCW 43.05.070.
[451] *See Caminiti v. Boyle*, 107 Wn.2d 662, 670, 732 P.2d 989 (1987)*; Ill. Cent. R.R. v. Illinois*, 146 U.S. 387, 453 (1892) (prohibiting government management of trust resource in a way that results in "substantial impairment of the public interest in" the resource)
[452] *Citizens for Responsible Wildlife Mgmt. v. State*, 124 Wn.App. 566, 577, 103 P.3d 203 (2004) (Quinn-Brintall, C.J., concurring) ("But the sovereign's duty to manage its natural resources recognized in the public trust doctrine is not time limited, and the primary beneficiaries of the sovereign's exercise of its public trust are those who have not yet been born or who are too young to vote. Thus, the sovereign authority to regulate natural resources is circumscribed by its duty to manage natural resources well for the benefit of *future* generations. And when the sovereign exercises this authority, by executive order, legislative enactment or public initiative, the tenets of the public trust doctrine must be satisfied.").
[453] Wash. Const. art. XVII, § 1.
[454] Use of the term "partially encapsulated" infers that the public trust doctrine exists in other parts of Washington law as well.
[455] *Rettkowski v. Ecology*, 122 Wn.2d 219, 232, 858 P.2d 232 (1993).
[456] *Caminiti v. Boyle*, 107 Wn.2d 662, 669, 732 P.2d 989 (1987) (emphasis added).
[457] *Foster et al. v. Ecology*, No. 14-2-25295-1 SEA (Order Affirming The Department of Ecology's Denial of Petition for Rulemaking) (King County Superior Court) (November 19, 2015) at 8.
[458] RCW 90.03.010.
[459] RCW 77.04.012.
[460] *See, e.g., Postema v. Pollution Control Hearings Bd.*, 142 Wn.2d 68, 94-95, 11 P.3d 726 (2000) (quoting RCW 90.54.020(3)(a)) ("Ecology is required to protect surface waters in order to preserve the natural environment, in particular 'base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values.'").
[461] *Foster et al. v. Ecology*, No. 14-2-25295-1 SEA (Order Affirming The Department of Ecology's Denial of Petition for Rulemaking) (King County Superior Court) (November 19, 2015) at 7; RCW 34.05.570(4).
[462] *Foster et al. v. Ecology*, No. 14-2-25295-1 SEA (Order Affirming The Department of Ecology's Denial of Petition for Rulemaking) (King County Superior Court) (November 19, 2015) at 8.

[463] This writing is an excerpt from a memorandum prepared by attorney Rachael Paschal Osborn on behalf of the Quinault Indian Nation as part of their comments on the Westway and Imperium Oil Terminal Proposal (November 25, 2015) (on file with author).
[464] *Orion Corp*., 109 Wn.2d 621 (1987); *Weden v. San Juan County*, 135 Wn.2d 678 (1998).
[465] RCW 36.70A.010.
[466] RCW 36.70A.020.
[467] RCW 36.70A.040(1).
[468] RCW 36.70A.040(2).
[469] RCW 36.70A.060; RCW 36.70A.170(1)(d); *Swinomish Indian Comm'y, et al. v. W. WA Growth Mgmt. Hearings Bd., et al.*, 161 Wn.2d 415, 421, 166 P.3d 1198 (2007) ("The requirement to 'protect' critical areas is part of the GMA's larger purpose of requiring comprehensive land use planning within the state of Washington.").
[470] RCW 36.70A.030(5).
[471] RCW 36.70A.172(1). The Supreme Court has held that "the GMA does not require the county to follow BAS [best available science]; rather it is required to 'include' BAS in its record. RCW 36.70A.172(1). Thus, the county may depart from BAS if it provides a reasoned justification for such a departure." *Swinomish Indian Comm'y, et al. v. W. WA Growth Mgmt. Hearings Bd., et al.*, 161 Wn.2d 415, 430-31, 166 P.3d 1198 (2007). The GMA is one of a few laws in Washington law that requires inclusion of best available science. *See* RCW 79.13.620 (stating that ecosystem standards for state-owned agricultural and grazing lands are "not intended to prescribe practices, but "land managers are encouraged to use an adaptive management approach in selecting and implementing practices to work towards meeting the standards based on the best available science and evaluation tools."); RCW 76.09.370 (forest practice rules should include an adaptive management process that "shall incorporate the best available science and information…"); RCW 76.09.350.
[472] *Swinomish Indian Comm'y, et al. v. W. WA Growth Mgmt. Hearings Bd., et al.*, 161 Wn.2d 415, 166 P.3d 1198 (2007).
[473] *Id*. at 430.
[474] RCW 36.70A.070(5)(c)(iv) and (v).
[475] RCW 36.70A.030(4).
[476] RCW 36.70A.040(3); (4); (5); RCW 36.70B.040(1).
[477] RCW 36.70B.040(1).
[478] RCW 36.70A.290(2).
[479] RCW 36.70A.020(10).
[480] RCW 36.70A.070(1)
[481] RCW 36.70A.070(1).
[482] *Id.*
[483] RCW 36.70A.070; .030(2); .030(8); .030(11).
[484] RCW 36.70A.070(5)(c)(iv).
[485] RCW 36.70A.365(2)(d); .367(3)(e).
[486] *Hirst v. Whatcom County*, Case No. 12-2-0013, Final Decision and Order (June 7, 2013), at 43 of 51, 2013 WL 3449928, at 24, *reversed in part and affirmed in part Whatcom Cty. v. W. Washington Growth Mgmt. Hearing Bd.*, 186 Wn. App. 32, 344 P.3d 1256 (2015*) review granted sub nom. Hirst v. W. Washington Growth Mgmt. Hearing Bd.*, 183 Wn. 2d 1008, 352 P.3d 188 (2015). Growth Management Hearings Board decision *at* http://www.gmhb.wa.gov/LoadDocument.aspx?did=3321 (last visited March 16, 2016).
[487] RCW 36.70A.030(5).
[488] *See Whidbey Envtl. Action Network [WEAN] v. Island Cty.*, 122 Wn. App. 156, 170 – 72, 93 P.3d 885, 892 – 93 (2004) *review denied Whidbey Environmental Action Network v. Island County*, 153 Wn.2d 1025, 110 P.3d 756 (2005).
[489] *Id.* at 122 Wn. App. at 174 – 75, 93 P.3d at 894.
[490] RCW 36.70A.710(1)(a).
[491] RCW 36.70A.710(1)(b); Washington State Conservation Commission, *Voluntary Stewardship Program (VSP)* webpage accessed on Jan. 19, 2016 *at* http://scc.wa.gov/voluntary-stewardship-program/.
[492] RCW 36.70A.710(6)(a).
[493] Washington State Conservation Commission, *Voluntary Stewardship Program (VSP)* webpage.

[494] RCW 36.70A.715(3).
[495] RCW 36.70A.720(1).
[496] RCW 36.70A.720(1)(e).
[497] RCW 36.70A.720.
[498] RCW 36.70A.720(1)(f) & (g).
[499] RCW 36.70A.725.
[500] RCW 36.70A.703(11).
[501] RCW 36.70A.720(2)(a)(iii) & (iv).
[502] RCW 36.70A.720(2)(c)(iii).
[503] RCW 89.08.010(3), (4).
[504] RCW 89.08.030; Washington State Conservation Commission, Annual Reports & Work Plans, *at* http://scc.wa.gov/plans-reports/ (last visited January 7, 2016).
[505] RCW 89.08.080 ("To forma conservation district, twenty percent of the voters within the area to be affected may file a petition with the commission asking that the area be organized into a district.").
[506] RCW 89.08.070(1)-(3).
[507] RCW 89.08.070.
[508] RCW 89.08.400(1).
[509] RCW 89.08.400(2).
[510] RCW 89.08.520.
[511] RCW 89.08.530 (*see* Notes: intent-2002 c 280).
[512] RCW 89.08.550(1).
[513] RCW 89.08.550(2).
[514] RCW 89.08.080 ("To form a conservation district, twenty percent of the voters within the area to be affected may file a petition with the commission asking that the area be organized into a district.").
[515] RCW 89.08.220(11).
[516] RCW 89.08.220(4).
[517] RCW 84.36.255(1).
[518] Letter from Karla Heinitz, Public Records Officer to Andrea Rodgers, re: Public Records Request (2016-01) (February 19, 2016) (on file with author).
[519] RCW 89.08.450.
[520] RCW 89.08.470(1).
[521] RCW 89.08.560(2).
[522] RCW 42.56.270(17)(a).
[523] RCW 42.56.610; RCW 90.64.190 (same).
[524] Letter from EPA Region 10 to Lori Terry Gregory re: George DeRuyter and Son Dairy, LLC FOIA Request EPA-R-10-2013-003302 Final Determination Concerning Confidentiality (July 18, 2014).
[525] Senator Edmund S. Muskie, *The Meaning of the 1977 Clean Water Act*, EPA Journal, *at* http://www2.epa.gov/aboutepa/meaning-1977-clean-water-act (last visited February 3, 2016).
[526] *Id.*
[527] ICF International, WSCC, Effectiveness of Voluntary Incentive Programs in Washington and Potential Next Steps, Draft (June 2014) at 18.
[528] U.S. Environmental Protection Agency, National Water Quality Inventory: 2004 Report to Congress (2000), *at* http://www.epa.gov/sites/production/files/2015-09/documents/2009_01_22_305b_2004report_2004_305breport.pdf (last visited Jan. 6, 2016) at 2, 10, 25 (identifying agricultural activities as a major top source of river impairment); U.S. Environmental Protection Agency, National Water Quality Inventory: 1998 Report to Congress (2000) at ES-3, *at* http://www.epa.gov/sites/production/files/2015-09/documents/1998_national_water_quality_inventory_report_to_congress.pdf (last visited Jan. 24, 2016) (identifying nonpoint source pollution as the leading cause of water quality impairments); Office of Technology Assessment, Targeting Environmental Priorities in Agriculture: Reforming Program Strategies (1995) at 11, *at* https://www.princeton.edu/~ota/ns20/year_f.html (last visited Jan. 24 2016).
[529] Ecology, Clean Water on Agricultural Lands, Landowner Practices Can Cause Pollution, *at* http://www.ecy.wa.gov/programs/wq/nonpoint/Agriculture/agcausepollution.html (last visited January 14, 2016).
[530] *See, e.g.*, U.S. Government Accountability Office, Clean Water Act: Changes Needed if Key EPA

Program Is to Help Fulfill the Nation's Water Quality Goals, GAO 14-80 (December 2013) at 60 ("Specifically, the Clean Water Act addresses nonpoint pollution through largely voluntary means and EPA does not have direct authority to require landowners to implement activities to reduce nonpoint source pollution."); Ford Runge, Environmental Protection From Farm to Market, in Thinking Ecologically: The Next Generation of Environmental Policy 200 (Marian R. Chertow & Danial C. Esty eds., 1997); J.B. Ruhl, Farms, Their Environmental Harms, and Environmental Law, 27 Ecology L.Q. 263, 293-316 (2000); Jim Chen, Get Green or Get Out: Decoupling Environmental from Economic Objectives in Agricultural Regulation, 48 Okla. L. Rev. 333, 350-51 (1995); Margaret Rosso Grossman, Agriculture and the Environment in the United States, 42 Am. J. Comp. L. 291 (1994 Supp.).

[531] Douglas R. Williams, When Voluntary, Incentive-based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution, 9 Wash. U. J.L. & Pol'y 21, 23 (2002); *See* Robin Kundis Craig, Local or National? The Increasing Federalization of Nonpoint Source Pollution Regulation, 15 J. Envtl. L. & Litig. 179, 190-91 (2000) (quoting Office of Water, U.S. Envtl. Protection Agency, Section 319 Success Stories 1 (Nov. 1994) ("'[U]nder the Clean Water Act, nonpoint source control is largely voluntary, not regulatory as is point source control."'); James Boyd, The New Face of the Clean Water Act: A Critical Review of the EPA's New TMDL Rules, 11 Duke Envtl. L. & Pol'y F. 39, 66 (2000) ("To date, state initiatives [to control nonpoint source pollution] have relied heavily on voluntary, unenforceable measures, particularly with regard to agricultural runoff."); Debra L. Donahue, The Untapped Power of Clean Water Act Section 401, 23 Ecology L.Q. 201, 283 (1996) ("Nonpoint source pollution control ... consists largely of vague plans and voluntary programs."); David Zaring, Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future, 20 Harv. Envtl. L. Rev. 515, 528 (1996) ("[T]he programs in place to reduce nonpoint source pollution remain completely voluntary.").

[532] *See* Envtl. Law Inst., Putting the Pieces Together: State Nonpoint Source Enforceable Mechanisms in Context 1, *at* http://www.eli.org/research-report/putting-pieces-together-state-nonpoint-source-enforceable-mechanisms-context(June 2000) (concluding "paying landowners not to pollute… relying on voluntary adherence to BMPs has proven to be an incomplete strategy in many cases. Gradually, states are turning to enforceable mechanisms…").

[533] Puget Sound Partnership, 2014-15 Action Agenda (May 2014), at 3C-40; Puget Sound Partnership, Puget Sound Action Agenda, C3. Agricultural Runoff, Draft (Dec 2011), at 195.

[534] Puget Sound Partnership, Puget Sound Action Agenda, C3. Agricultural Runoff, Draft (Dec 2011), at 195.

[535] Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).

[536] Barnas, K.A., et al., *Is habitat restoration targeting relevant ecological needs for endangered species? Using Pacific Salmon as a case study*, ECOSPHERE (July 2015).

[537] Puget Sound Partnership, Puget Sound Action Agenda Summary Report Card,September 18, 2015.

[538] Puget Sound Partnership, Puget Sound Action Agenda Summary Report Card, September 18, 2015.

[539] Puget Sound Partnership, 2013 State of the Sound Vital Signs, Water Quality (2013).

[540] *See* Department of Ecology, Managing Washington's Coast: Washington State's Coastal Zone Management Program (2001), at 71; Department of Ecology, Clean Water and Livestock Operations: Assessing Risks to Water Quality (June 2015); Puget Sound Partnership, 2014-15 Action Agenda (2014), at 4-45; NMFS, Shared Strategy Development Committee, Puget Sound Salmon Recovery Plan (January 2007), at 447.

[541] Department of Ecology, Managing Washington's Coast: Washington State's Coastal Zone Management Program (2001), at 71.

[542] Puget Sound Partnership, 2013 State of the Sound (2013) at 24.

[543] GAO, USDA Should Improve Its Management of Key Conservation Programs to Ensure Payments Promote Environmental Goals (January 2007).

[544] GAO, USDA Should Improve Its Management of Key Conservation Programs to Ensure Payments Promote Environmental Goals (January 2007).

[545] William D. Ruckelshaus Center, Voluntary Stewardship Program, *at* http://ruckelshauscenter.wsu.edu/projects/past-projects/voluntary-stewardship-program/ (last visited February 7, 2016).

[546] William D. Ruckelshaus Center, Incentives Matrix (January 8, 2009) (on file with author).

[547] *Id.* ("This paper is not intended to express judgment about adequacy of policies or programs discussed, but to summarize the facts and highlight items that would appear to be of interest and relevance to the SSB 5238 Committee.").
[548] Washington State Conservation Commission, Voluntary Incentive Programs: Are they Effective Tools for Salmon Recovery?, Salmon Recovery Conference (May 27, 2015).
[549] Follow the Manure: Factory Farms and the Lake Erie Algal Crisis (November 17, 2015), *at* http://www.sierraclub.org/michigan/follow-manure-factory-farms-and-lake-erie-algal-crisis (last visited January 13, 2015).
[550] WSCC, Effectiveness of Voluntary Incentive Programs in Washington and Potential Next Steps, Draft (June 2014), at http://www.psp.wa.gov/downloads/incentives_meeting/Tech Memo_Effectiveness of VIPs and Next Steps_Draft -- 06112014 %281%29.pdf (last visited January 18, 2016).
[551] ICF International, WSCC, Effectiveness of Voluntary Incentive Programs in Washington and Potential Next Steps, Draft (June 2014).
[552] ICF International, WSCC, Effectiveness of Voluntary Incentive Programs in Washington and Potential Next Steps, Draft 15 (June 2014) ("Geographically focused, outcome-oriented VIP programs are exceptions and not the norm."). *See also* Washington State Conservation Commission, Voluntary Incentive Programs: Are they Effective Tools for Salmon Recovery? Salmon Recovery Conference (May 27, 2015) (A successful voluntary incentive program would need to maintain the following characteristics: Clear, tangible objectives; baseline data and performance monitoring; flexible, performance-based BMP implementation; clear, sensible, science-based rational for objectives, metrics, and BMPs; accountability).
[553] Neil Hamilton, Director of the Agricultural Law Center at Drake University, quoted in "Des Moines Case Has 'Changed the Conversation' on Water Quality," *at* http://www.agriculture.com/news/policy/des-moines-case-has-chged-conversation_4-ar52329 (last visited March 10, 2016).
[554] ICF International, WSCC, Effectiveness of Voluntary Incentive Programs in Washington and Potential Next Steps, Draft 10 (June 2014).
[555] *Id.* at 10.
[556] *Id.*
[557] *Id.* at 12.
[558] *Id.* at 18.
[559] *Id.* at 25.
[560] *Id.* at 26.
[561] *Id.* at 27.
[562] *Id.* at 26.
[563] *Id.*
[564] "The U.S. Environmental Protection Agency (EPA), in partnership with the States, conducts the Clean Watersheds Needs Survey (CWNS) to identify and document the cost of the capital needs required to meet the water quality and water-related public health goals of the Clean Water Act. The CWNS is required under section 205(a) of the Clean Water Act and section 516(b) of the Water Quality Act of 1987, which amended the Clean Water Act." Ecology, Clean Watersheds Needs Survey 2012, *at* http://www.ecy.wa.gov/programs/wq/funding/Res/RptsSur/SummaryCWNS2012.pdf (last visited January 18, 2016).
[565] U.S. EPA, Washington Clean Watersheds Needs Survey 2008, *at* http://www.epa.gov/sites/production/files/2015-06/documents/wa08_0.pdf (last visited January 18, 2016).
[566] EPA, Clean Watersheds Needs Survey 2012, Washington, *available at* http://www.epa.gov/sites/production/files/2015-10/documents/cwns_fs-wa.pdf (last visited January 18, 2016).
[567] EPA, Approval of the Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution (August 21, 2015) (on file with author).
[568] RCW 43.41.260(1) ("The office of financial management shall assist natural resource-related agencies in developing outcome-focused performance measures for administering natural resource-related and environmentally based grant and loan programs. These performance measures are to be used in determining grant eligibility, for program management and performance assessment."); RCW 89.08.520(2)(a) ("The [Washington Conservation] commission shall also develop appropriate outcome-focused performance measures to be used both for management and performance assessment of the grant program.").

[569] USDA, NRCS, 2014 Farm Bill – Conservation Stewardship Program – NRCS http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/csp/?cid=stelprdb1242683 (last visited Jan. 24 2016); 16 U.S.C.A. § 3838e (2014).
[570] USDA, NRCS, 2014 Farm Bill – Conservation Stewardship Program – NRCS http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/csp/?cid=stelprdb1242683 (last visited Jan. 24 2016).
[571] H.R. 2646, described in 33 Env't Rptr. 991 (May 3, 2002).
[572] Conservation Security Program: Proposed Rule, 69 Fed. Reg. 1 (January 2, 2004) (to be codified at 7 C.F.R. pt. 1469).
[573] USDA, Regulatory Impact Analysis for the Conservation Stewardship Program (September 10, 2014) at 9.
[574] Natural Resources Conservation Service, Conservation Stewardship Program (CSP) – Farm Bill Report (FY 2009 through FY 2014), Financial Information, *at* http://www.nrcs.usda.gov/Internet/NRCS_RCA/csv/fb08_cp_download_cstp.csv (last visited January 24, 2016).
[575] NRCS, CStP Program Information (on file with author).
[576] *Id.*
[577] USDA, NRCS, Regulatory Impact Analysis for the Conservation Stewardship Program (September 2014), http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1264037&ext=pdf (last visited Jan. 24 2016).
[578] USDA, NRCS, 2014 Farm Bill – Conservation Stewardship Program – NRCS http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/csp/?cid=stelprdb1242683 (last visited Jan. 24 2016).
[579] NRCS, Conservation Stewardship Program Self-Screening Checklist, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/programs/financial/csp/ (last visited January 18, 2016).
[580] NRCS- Washington State, Conservation Stewardship Program – FY 2015, Geographic Priority Areas – Priority Resource Concerns, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/programs/financial/csp/ (last visited January 18, 2016).
[581] 2014 Washington Conservation Stewardship Program (CSP), *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wa/programs/farmbill/?cid=nrcs144p2_036157 (last visited January 14, 2016).
[582] USDA, NRCS, 2014 Farm Bill – Conservation Stewardship Program – NRCS http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/csp/?cid=stelprdb1242683 (last visited Jan. 24 2016).
[583] 2014 Conservation Stewardship Program Conservation Activity List, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wa/programs/farmbill/?cid=nrcs144p2_036157 (last visited January 14, 2016).
[584] *Id.* at 9.
[585] USDA, NRCS, Title 180 – National Planning Procedures Handbook, Amendment 5, § 600.29 (January 2013) ("Evaluate the effectiveness of the implemented [conservation] plan to ensure that it is functioning as planned and achieving the objectives… Onsite visits are a required part of this process.").
[586] Telephone Interview with Bonda Habets, State Resource Conservationist, NRCS (July 1, 2015) (Stating that USDA is not performing checks on activities after installment in Washington. Because the USDA has been downsizing they do not have time to go check on the projects after installment.); USDA, Office of Inspector General, Natural Resources Conservation Service's Oversight and Compliance Activities (February 2013), at 3 (reports that NRCS is not consistently performing field visits "that would ensure the conservation agreement is followed."); USDA, Regulatory Impact Analysis for the Conservation Stewardship Program (September 10, 2014) (report includes no mention of any monitoring requirements).
[587] Telephone Interview with Bonda Habets, State Resource Conservationist, NRCS (July 1, 2015) (Stating that USDA is not performing checks on activities after installment in Washington. Because the USDA has been downsizing they do not have time to go check on the projects after installment.)
[588] USDA, Regulatory Impact Analysis for the Conservation Stewardship Program (September 2014) at 4.
[589] NRCS Response to Request for Clarification re: FOIA Request No. 2015-NRCS-04641-F (August 26, 2015) (on file with author).
[590] NRCS, CStP Program Information (on file with author).

[591] USDA, Office of Inspector General, Management Challenges (August 2010) at 7, *at* http://www.usda.gov/oig/webdocs/MgmtChallenges2010.pdf (last visited January 4, 2016).
[592] *Id.* at 19.
[593] *Id.*
[594] *Id.*
[595] Agricultural Act of 2014, H.R. 2642, 113th Congress (January 3, 2014).
[596] USDA, NRCS, News Release, Agriculture secretary announces funding for 115 Projects (January 15, 2015), *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/releases/?cid=STELPRDB1268008 (last visited January 4, 2016).
[597] USDA, NRCS, 2014 Farm Bill Regional Conservation Partnership Program, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farmbill/rcpp/?cid=stelprdb1242732 (last visited January 24, 2016).
[598] Though no agricultural associations received funding under RCPP from 2014-2015, the Washington NRCS office states it has "a working relationship with many agricultural organizations in WA." Email with Bonda Habets, State Resource Conservationist, NRCS Spokane Office, July 17, 2015.
[599] NRCS, Regional Conservation Partnership Program, Eligible Partners, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/ (last visited January 18, 2016).
[600] *Id.*
[601] USDA, Strengthening Conservation with Regional Partnerships, RCPP Fact Sheet *at* http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/ (last visited January 18, 2016).
[602] USDA, NRCS, RCPP Frequently Asked Questions, http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farmbill/rcpp/?cid=stelprdb1254188 (last visited Janary 24, 2016).
[603] The five projects funded during the 2014-15 fiscal year are: the Upper Columbia Irrigation Enhancement Project, the Confederated Tribes of the Colville Reservation Water Quality and Habitat Improvement Project, the Precision Conservation for Salmon and Water Quality in the Puget Sound, the Palouse River Watershed (WRIA 34) Implementation Partnership, and the Yakama Nation On-Reservation Lower Yakima Basin Restoration Project. USDA, News Release, "Washington State Receives $23 million for Innovative Conservation Program," ***at*** http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wa/newsroom/releases/?cid=STELPRDB1268245 (last visited January 18, 2016).
[604] USDA, News Release, "Washington State Receives $23 Million for Innovative Conservation Program," *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wa/newsroom/releases/?cid=STELPRDB1268245 (last visited January 18, 2016).
[605] The Nature Conservancy, Puget Sound Restoration Gets a Boost from USDA (January 15, 2015), *at* http://www.washingtonnature.org/fieldnotes/puget-sound-restoration-usda (last visited January 24, 2016); Washington State Conservation Commission, 2015 Annual Report (2015), *at* http://scc.wa.gov/wp-content/uploads/2015/12/AnnualReport_Final_WEB_2015.pdf (last visited January 24, 2016).
[606] The Nature Conservancy, Puget Sound Restoration Gets a Boost from USDA (January 15, 2015), *at* http://www.washingtonnature.org/fieldnotes/puget-sound-restoration-usda (last visited January 24, 2016).
[607] USDA, RCPP Frequently Asked Questions, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/or/home/?cid=stelprdb1254188 (last visited January 24, 2016).
[608] *See, e.g.*, Memorandum of Understanding for Partnership Between the USDA Natural Resources Conservation Service (NRCS) and the Yakama Nation, RCPP Tracking #14-C-WA-502, WA Agreement #MOU-A-0546-15-002 (March 3, 2015).
[609] 5 U.S.C. § 552(b)(4).
[610] USDA, Notice of Grant and Agreement Award, NRCS-ADS-093 (December 2014) (on file with author).
[611] *Id.*

[612] USDA, RCPP Frequently Asked Questions, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/or/home/?cid=stelprdb1254188 (last visited January 24, 2016).
[613] *Id.*
[614] Email from Bonda Habets, State Resource Conservationist NRCS Spokane Office, re: Response, to Zyanya Breuer (July 17, 2015) (on file with author).
[615] *Id*. For example, management practices have a lifespan of one year, while structural practices have longer lifespans. A waste treatment lagoon has a lifespan of fifteen years. After the lifespan expires the operation and maintenance of the practice is up to the producer. Telephone Interview with Bonda Habets, State Resource Conservationist, NRCS (July 1, 2015); USDA, NRCS, Conservation Practice Units, *at* http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1076947.pdf (last visited January 24, 2016).
[616] Email from Anonymous to Anonymous re: Manure (January 14, 2016) (on file with author).
[617] Agricultural Act of 2014, H.R. 2642, 113th Congress (January 3, 2014).
[618] Federal Agriculture Improvement and Reform Act of 1996, Pub. L. No. 104-27, §§ 1240 to 1240H, 110 Stat. 888 (1996). The earlier Water Quality Incentives program is discussed in § 5:25.
[619] Food, Conservation, & Energy Act of 2008, Pub. L. No. 110-246, 122 Stat. 1651 (2008).
[620] Agricultural Act of 2014, H.R. 2642, Pub. L. 113-79 (2014).
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[643] *Id.*
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[645] *See, e.g.*, Ecology, Preliminary Draft Concentrated Animal Feeding Operation General Permit (Aug. 11, 2015) ("Ecology has determined that if the CAFO has a lagoon that does not have a double geomembrane liner with a leak detection system between the liner layers that it is discharging to groundwater." Lagoons that don't have double liners "are known to leak, which in certain areas is a discharge.").
[646] EQIP Program Information received in response to FOIA request to NRCS (on file with author). Relying on section 1619 of the Farm Bill, NRCS would not disclose what this money was used for or who received it, only that it was used to fund implementation of a BMP to comply with NRCS Standard 313, which is designed "to temporarily store wastes such as manure, manure processing derivatives, leachate, wastewater, and contaminated runoff from agricultural sources in a manner which safeguards the environment." NRCS Conservation Practice Standard 313 (Waste Storage Facility), *at* https://efotg.sc.egov.usda.gov/references/public/wi/313.pdf (last visited January 6, 2016).
[647] *Id.*
[648] *Id.*
[649] *Id.* at 4.
[650] USDA, NRCS, Washington State Resource Assessment Accomplishment Report, 2012-2014.
[651] Telephone Interview with Tracy Hanger, Conservation Agronomist, NRCS (June 30, 2015).
[652] USDA Office of Inspector General, Environmental Quality Incentives Program (July 2014).
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[654] USDA, NRCS Conservation Reserve Program, *at* http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/?cid=stelprdb1041269 (last visited January 18, 2016).
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[656] *Id.*
[657] 7 C.F.R. § 704.1 (b)(1-7)(1990). *See* Conservation Reserve Program, 52 Fed. Reg. 4265 (1987) (discussion of comments made in response to proposed regulation at 7 C.F.R. § 704.1).
[658] *See generally* Steven J. Taff & C. Ford Runge, Wanted: A Leaner and Meaner CRP, CHOICES, First Quarter 1988; U.S. Gen. Accounting Office, Report to the Chairman, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, *Conservation Reserve Program Could be Less Costly and More Effective*, (1989) (The GAO was critical that USDA placed too much emphasis on meeting the enrollment target of 40-45 million acres at the expense of the other objectives of the program such as improved water quality. The GAO concluded that the USDA emphasized enrolling acres to meet its goal by lowering standards for tree

acres, and failing to target highly erodible land, thereby decreasing the effectiveness of the program with regard to water quality and other objectives. In addition, the GAO criticized the USDA for paying rents in excess of the prevailing local cash rental rates in many parts of the country.). *See also* Raymond J. Watson, Jr., *Conservation Reserve Program: What Happens to the Land After the Contracts End?*, 14 N. Ill. U. L. Rev. 733, 788 (1994).

[659] Washington farmers received $289,500 in CRP dollars in 2009, $300,900 in 2010, $1.4 million in 2011, 1.7 million in 2012, $942,800 in 2013, and $368,900 in 2014. NRCS Conservation Programs, Conservation Reserve Program (CRP), *at* http://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_crp.html (last visited February 3, 2016). "In 2014 CRP changed from a reimbursable to a direct program. Before FY 2014, CRP only includes reimbursable technical assistance funds used to plan and apply conservation practices. Data shown here do not include financial obligations made by the Farm Service Agency to landowners." *Id.* Washington farmers received $368,900 in technical assistance in 2014 through the CRP. *Id.*

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[668] USDA, Office of Inspector General, Commodity Credit Corporation's Financial Statements for Fiscal Years 2014 and 2013, 06401-0004-11, 40 (November 2014), *at* http://www.usda.gov/oig/webdocs/06401-0004-11.pdf (last visited January 18, 2016).

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[679] Carol Smith, Ph.D., Washington State Conservation Commission, 2013 Implementation and Effectiveness Monitoring Results for the Washington Conservation Reserve Enhancement Program (CREP): Buffer Performance and Buffer Width Analysis (December 2013), *at* http://scc.wa.gov/wp-content/uploads/2014/02/CREP-Effectiveness-Monitoring-report-2013.pdf(last visited January 18, 2016) at 25
[680] *Id.*
[681] *Id.* at 25-26.
[682] Washington State Conservation Commission, Implementation Monitoring Report for the Washington Conservation Reserve Enhancement Program (CREP) for Federal Fiscal Year 2014 4 (January 2015).
[683] *Id.* at 12.
[684] *Id.* at 13.
[685] *Id.* at 9.
[686] *Id.* at 13.
[687] *Id.* at 3.
[688] 33 U.S.C. § 1330.
[689] "Estuary means all or part of the mouth of a river or stream or other body of water having unimpaired natural connection with open sea and within which the sea water is measurably diluted with fresh water derived from land drainage." 33 U.S.C. § 1254.
[690] 33. U.S.C. § 1330(a)(2)(A) (States nominate an estuary for "the attainment or maintenance of that water quality in an estuary which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife and allows recreational activities" which require "the control of point and nonpoint sources of pollution to supplement existing controls of pollution[.]").
[691] EPA, Estuaries, *at* http://www.epa.gov/owow_keep/estuaries/fund.html (last visited January 18, 2016); EPA, Financing Strategies Used by the National Estuary Program, *at* http://www.epa.gov/nep/financing-strategies-used-national-estuary-program (last visited January 18, 2016).
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[694] *Id.*
[695] EPA, Information About Local Estuary Programs, *at* https://www.epa.gov/nep/information-about-local-estuary-programs (last visited March 16, 2016).
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[697] EPA, Progress Evaluation of the National Estuary Program, *at* http://www.epa.gov/nep/progress-evaluation-national-estuary-program (last visited January 18, 2016).
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[708] Ecology, NEP Grant Funding Agreement Between Ecology & A Rocha USA, Grant Agreement Number G1300129, Whatcom Clean Water Program BMP Project Management (on file with author).
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[711] EPA, Nonpoint Source Program and Grants Guidelines for States and Territories (April 2013), *at* http://www.epa.gov/sites/production/files/2015-09/documents/319-guidelines-fy14.pdf (last visited January 25, 2016).
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[737] *Id.* at 24.
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Skagit County Public Works Department, Clean Water Skagit County 2013 Annual Report 4 (2013) ("Enforcement is only used when attempts at voluntary compliance have been unsuccessful.").
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[773] EPA, Wetlands and Water Quality Trading: Review of Current Science and Economic Practices with Selected Case Studies 1 (July 2007), http://permanent.access.gpo.gov/lps101197/www.epa.gov/ada/download/reports/600R06155/600R06155.pdf (last visited January 27, 2016).
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[780] RCW 89.08.600(3).
[781] Email from Elaine Snouwaert (Ecology) to Helen Bresler (Ecology) re: Water Quality Trading (December 5, 2013) (on file with author). Other Ecology staff have similarly expressed concerns with the viability of water quality trading as well: "[A]fter my initial research about trading I'm not feeling very hopeful it's something that can really work but time will tell."). Email from Helen Bresler (Ecology) to Elaine Snouwaert (Ecology) re: Water Quality Trading (December 5, 2013) (on file with author).
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[792] *See* EPA, Clean Water SRF Program Information for the State of Washington (November 2014), *at* http://www.epa.gov/sites/production/files/2015-04/documents/washington.pdf (last visited January 24, 2016).
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[808] *Id.* at 24.
[809] *Id*. at 25, 26-28.
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[811] *Id.* at 12.
[812] *Id*. at 51.
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Appendix A: Science-Based Best Management Practices

What Are BMPs, and Why Are Science-Based BMPs needed?

Agricultural best management practices (BMPs) include farm management and operational techniques, soil and water conservation practices, and other actions that serve as tools for environmental protection in a particular geographic region. Generally, BMPs are designed to reduce or prevent the movement of agricultural pollutants—including manure nutrients, pesticides, fertilizer, sediment, and other material—from farmed land to surface water and groundwater. BMPs can also be used as operational controls to protect places critical to ecosystem health, such as streams, wetlands and riparian areas. Examples of agricultural BMPs include guides for calculating agronomic land-applications of manure and restrictions on direct access by cattle to water bodies through use of proper fencing. By being required to implement a suite of BMPs, a farmer may be able to significantly reduce the negative impacts that some farm practices may have on the surrounding environment.

While BMPs are intended to mitigate or prevent certain harmful effects agricultural pollutants may have on water quality, BMPs should *not* be thought of as "fixes" for restoring a degraded watershed to full ecosystem health. Depending on the conditions within a given watershed, including the degree of current degradation and pollutant loading, it may be many years before the implementation of BMPs results in a noticeable improvement in conditions. It is best to consider BMPs as a combination of practices that, when implemented together, provide varying degrees of environmental protection and lead to a resilient and sustainable agricultural system.

Any given BMP is likely to be most effective when used in conjunction with a regulatory approach to addressing the source of pollution. Farmers, and agency officials charged with regulating agriculture and protecting water quality, should avoid adopting an 'a la carte' approach (selecting just one or two single practices on a voluntary basis). Instead, farmers should be required to implement as many practices that are needed to eliminate the sources of pollution that are degrading water quality or negatively impacting ecosystem health. The efficacy of BMPs increases when the practices are implemented by groups of farmers throughout a given watershed. If some farmers maximize use of BMPs, while their neighbors implement few or no best practices, the overall protection of the environment is not as robust as it would be if BMPs were fully embraced and widely adopted by all farmers in an area. For that reason, it is important for the regulatory agency with responsibility to facilitate the restoration of the watershed to conduct oversight of BMP implementation on a watershed basis. Finally, it is imperative that regulators "enforce" not only the adoption and implementation of BMPs, but require continued monitoring and follow-up to ensure that the practices adopted are having the desired effect.

Our Approach

We consulted with scientific experts in the fields of soil science, hydrogeology, engineering, and fish biology to develop six model BMPs recommended for industrial agricultural operations in Western Washington. The scientific experts drew upon existing practice standards from the Natural Resources Conservation Service (NRCS), scientific literature, and their own professional judgment and experience to create BMPs that are truly science-based and offer greater ecosystem benefits than many of the existing BMPs that are being implemented today. The six model BMPs include:

1. Field Management (includes land application of manure and irrigation management)
2. Waste Storage
3. Composting
4. Riparian Areas
5. Stream Crossings
6. Groundwater Monitoring

The inclusion of groundwater monitoring on this initial list of BMPs is especially important because it provides a feedback mechanism that informs the farmer and the regulatory agency about how effectively the operational practices are reducing and preventing pollution to area ground waters. Local, state, and federal agencies, tribal entities, and conservation groups already engage in regular and routine surface water monitoring in many of the surface waters that feed Puget Sound. Frequent, widespread groundwater monitoring throughout the Puget Sound Basin, on the other hand, is not currently occurring. By regularly monitoring the quality of area ground water on or near agricultural lands, the farmer and regulatory agencies will be provided with information to help understand whether and to what extent a BMP is reducing or preventing pollution from entering an aquifer. One can monitor progress over time and make any necessary adjustments to practices in order to further reduce and eliminate pollution contributions.

The model BMPs are designed to be general guidelines that must be adjusted to adapt to site-specific circumstances. In drafting these model BMPs, we aspired to create recommendations that are science-based and that prioritize compliance with water quality standards above other considerations. That is because, as the EPA and Ecology have recognized, no agricultural BMPs have been designed to achieve compliance with state water quality standards. At a minimum, we hope that these BMPs provide a starting point for an important conversation about improving agricultural conservation practices that are known to contribute to the degradation of Puget Sound and to impair important salmon habitat. Ideally, we hope that the recommendations in these models are ultimately embraced and adopted by the agricultural community, and those that regulate this community, so Puget Sound's waterways are better protected and salmon can once again flourish in this remarkable estuary in harmony with sustainable agricultural practices.

BEST MANAGEMENT PRACTICE: FIELD MANAGEMENT (Manure Application and Irrigation)

Dr. Byron H. Shaw, Ph. D

I. Purpose

The purpose of this BMP is to control and limit the impacts of manure runoff and leaching to Washington's surface and ground waters. The purpose of this BMP is also to achieve compliance with applicable Washington State and federal water quality laws and recommended water quality criteria.

II. Manure Applications

This management standard applies to all applications of manure to agricultural fields. The core purpose of manure applications is to fertilize crops with required nutrients at a rate that is as close as possible to a crop's ability to use those nutrients. This will reduce or prevent excess nutrients from running off fields and into surface waters or leaching through soils and into groundwater.

A. Environmental Considerations

- Manure applications should only occur at times when the currently growing crop can make use of the nutrients contained within the manure, or shortly before new crops are to be planted. Many crops go dormant during winter months, while other crops, like alfalfa, uptake nutrients best when applied through multiple, smaller applications during the growing season. As a result, winter applications are **strongly** discouraged. Only apply manure in winter if storage lagoons are near capacity and in consultation with a certified agronomist and approved by the state regulatory agency. Ensure that lagoons are properly drawn down the subsequent year for adequate storage.

- It is the responsibility of the farmer to ensure that manure is applied in a manner that prevents runoff to surface waters or leaching to groundwater. Applications should not take place when the following field or weather conditions are present:

    - The field is frozen or snow-covered. Winter applications should be avoided at all costs due to the strong likelihood that 1) the field will be incapable of absorbing the liquid nutrients, and 2) the crop is unlikely to make use of nutrients applied during winter. Snow melt and early spring rains are likely to cause runoff of much of the applied nutrients. **Plan accordingly to ensure adequate storage during winter months!**

    - The field is saturated, either due to a prior manure application, precipitation, or irrigation. Over-saturated fields may show "ponding," or soils may be very wet. Moisture sensors should be used to determine field moisture conditions (see discussion in Section III A, below).

    - Before rainfall is predicted, during, or shortly after precipitation events.

- There are areas that can easily convey runoff and manure pollutants to nearby surface waters. This includes tile drains, waterways, intermittent streams, irrigation ditches, and culverts. There should be and vegetative buffers within at least 50 feet of these conveyance features. Manure should not be applied in these buffer areas.

- Pay close attention to all applicable riparian and stream setbacks when identifying fields for manure application. Manure must not be allowed to enter or flow into riparian areas. For additional information on minimum buffer widths, see BMP: Riparian Areas & Buffers in this appendix.

- Manure applications are most effective when the soil has capacity to absorb the liquid and nutrients contained within the manure. Applications should occur when the soil has a moisture content between 25 and 75 percent of its field capacity, or close thereto. Soil moisture content can be measured by using a number of commercially available sensors and other devices.

B. <u>Agronomic Rate</u>

All manure and fertilizer applications must be made in accordance with the "agronomic rate." The agronomic rate is a rate of manure application that provides an amount of nutrients to a given crop that is as close as possible to the crop's ability to uptake the nutrients applied when nutrient sources are already present or will become present during the growing season. Manure applications that supply excess nutrients to crops can result in nutrient runoff and leaching into the waters of the state.

To calculate an agronomic rate, a farmer should obtain the following information **before** applying manure:

- The present nutrient levels in the soil. An agronomist or certified laboratory personnel should take composite soil samples at one-, two-, and three-foot depths. Composite samples should include at least 8 samples at each depth per each five-acre field area. For example, a 20-acre field should have 32 individual sites sampled into four composite samples for each depth. Sampling parameters must include nitrate, ammonium, phosphorus, potassium, organic matter, and pH. Sampling must occur prior to any manure application and the results used in making new applications; if double-cropping, take soil samples after each harvest and before applying any additional manure. There will be instances where present soil nutrient levels and anticipated credits from organic matter, past manure applications, or crop residues are adequate to fertilize a crop or at least meet part of the crop needs. In these situations, reduced application rate or no manure or fertilizer application should be made. Additionally, nutrients contained within manure release over time, making it even more important to accurately gauge the soil's present nutrient content before applying more. The nutrient budget attached hereto takes this into account by requiring farmers to use first, second, and third-

year manure credits for consecutive applications. Ammonia that has volatilized from manure applications may also be atmospherically re-deposited onto fields. This is another reason why current soil sampling analyses are vital for proper nutrient planning.

- Take all appropriate nutrients additions into account. For instance, legume crops can add nutrients back into the soil through decomposition. Organic matter mineralization will add approximately 20 to 40 pounds per acre per year of plant available nitrogen per percentage of organic matter in the soil.

- The present nutrient levels in the manure to be applied. Nutrient levels can vary widely between storage impoundments and sources of manure (e.g., solid, compost, liquid) and at different times of the year. It is imperative to know the actual nutrient content of the manure that is to be applied in order to calculate an agronomic rate. A certified technician and laboratory should take composite samples of the source of the manure that is to be applied shortly prior to application. Sampling parameters must include total nitrogen, nitrate and ammonium nitrogen, total phosphorus, potassium moisture content and organic matter.

- The amount of nutrients the crop is expected to use as fertilizer and remove with crop harvest. Farmers should review their harvest records to determine the average yield for the past five years for the crop in question. The NRCS 590 standard states that reasonable yield goals should be used in making fertilizer recommendations. These are difficult to state but either a 3-5 year average or a county yield average should be used. The yield of the crop will determine how many nutrients the crop requires for fertilization. Application rates should be as close as possible to the amount of nutrients a reasonable yield for the crop is expected to uptake based on that average. Alternatively, farmers may make use of tissue analyses during the middle of the season to determine whether a crop needs additional fertilization.

- Fertilizing to maximum yields possible should be avoided as this results in large amounts of excess nutrients in most years that leach or runoff to water resources and are costly to farmers.

- Once the information identified above has been obtained, farmers should make use of the nutrient budget attached hereto. See Sample Nutrient Budget in Section IV. The budget takes into account the present soil nutrient levels, the amount of nutrients contained within the source manure, and the amount of nutrients needed by the crop being grown. It also takes into account the amount of nutrients likely to become available from organic mater mineralization or previous crop residues. For instance, if a field's soil already has or will have 120 lbs./ac nitrate throughout the top three feet of the soil column, and the crop planted requires 200 lbs./ac nitrate for sufficient fertilization, then the budget will recommend that the farmer apply no more than 80 lbs./ac nitrate onto the field.

- Use of the nutrient budget should be field-specific, and farmers should keep a budget for each field to which manure is applied.

- Maintain nutrient budget information for at least five years for each field. This will allow the farmer to make adaptive changes that maximize the use of manure nutrients while minimizing and eliminating environmental impacts.

- Crop harvest records and nutrient analyses should supplement soil data in determining nutrient removal from each field.

- If the soil test results for a field vary significantly there may be a need to subdivide the field for management purposes or at least modify the manure application on certain parts of fields. These concepts of precision agriculture should be used when possible.

- Volatilization leaching and runoff losses need to be minimized to use manure nutrients in an agronomic and environmentally sound manner. Incorporation of applied manure during or soon after application is the best means of insuring efficient use of these nutrients.

C. <u>Equipment and Maintenance</u>

- Use the most efficient type of manure spreading equipment for the job. Manure spreader calibration data should be kept and done each season to make sure application rates are accurately known. University Extension Publications should be used to calibrate spreaders.

- Always ensure that manure-spreading equipment is properly calibrated and maintained. Follow the manufacturer's recommendation concerning scheduled maintenance and upkeep.

- Flow meters should be installed on all liquid application equipment.

D. <u>Record-Keeping</u>

- Maintain contemporaneous records about manure applications. Records should include:

  - The volume in gallons or tons per acre of manure applied on a specific day or days.

  - Records of any nutrient additions separate from manure.

  - The weather conditions 24 hours prior to and during application.

  - Soil tests showing a need for manure application that are field-specific.

- Manure tests showing the nutrient content of the manure applied.
- Crop records showing that the planted crop is expected to removce the nutrients applied.
- Copies of the completed nutrient budget attached hereto.
- Tissue analyses, if this method is used to gauge a crop's need for additional fertilization.
- Yield data and nutrient analysis to determine the actual amount of nutrients removed by each crop from each field.

- Also maintain records of all exports of manure to third-party recipients. This includes all exports of solid and liquid manure. Ensure that the recipient of the manure has an agronomic need for the manure to be applied by requesting and retaining copies of recent soil sampling records from the recipient. Also provide a manure nutrient analysis of the manure being exported for the recipient to use in making nutrient application decisions.

E. <u>Prohibitions</u>

- Stop manure applications immediately if any of the following are observed:
  - Ponding of manure water in fields. This condition indicates that the soil in the field has reached its holding capacity and can no longer absorb more manure or manure nutrients.
  - Run-off of manure water. Surface waters will be impacted by manure that is allowed to run-off the field.
  - Any discharges to surface waters, ditches, canals, culverts, or other conduits.
- Carefully observe manure applications on fields that have slopes exceeding 6%.
- Do not apply if soil sampling does not show a present need for additional manure applications. Applications beyond what a crop can use are not agronomic and may result in environmental degradation.
- Do not apply manure to areas that are within a riparian area or other type of setback or buffer as listed is section A above.

III. <u>Irrigation Water</u>

This management standard applies to the application of irrigation water to agricultural fields. Where irrigated fields are present, it is vital that farmers apply sufficient water to the crop while minimizing the loss of excess water. Excess irrigation water can cause manure nutrients such as nitrate to move deeper

into the soil profile, where it will eventually discharge to groundwater. Over-irrigation can also result in surface runoff and contamination of surface water. Consequently, proper irrigation management is a necessary tool for environmental protection.

A. Amount and Timing of Water Delivery

- Irrigation water should only be applied to irrigated fields when the crop needs it. Moisture sensors should be used to determine if the soil needs water, and when there is too much water in the soil creating a risk of leaching. It is recommended that irrigation occur when the soil is halfway between wilting point and field capacity. Irrigating to field capacity in the upper two feet of the soil will help prevent leaching losses. This will vary widely depending on soil type. Soils should not be irrigated when rainfall is predicted, before harvest when plants will not use water, or during dormant seasons when no plants are present.

B. Equipment and Maintenance

- Use the right type of irrigation equipment. Replace rill irrigated fields with pivot systems, which are far more efficient at delivering water to crops. Low flow drop nozzle irrigation or drip irrigation is preferred to normal high-pressure sprinkler systems.

- Always ensure that irrigation equipment is properly calibrated and maintained. Follow the manufacturer's recommendation concerning scheduled maintenance and upkeep.

IV. Sample Nutrient Budget

The nutrient budget must include realistic annual yield goals and associated estimates of nutrient requirements for nitrogen, phosphorous, and potassium. Nutrient removal for specified crops and yields will be based on estimated values contained in Chapter 6, Agricultural Waste Management Field Handbook ("Role of Plants in Waste Management"), or specific data for the 3-5 year average on the farm.

The following table may serve as a basic nutrient budget for use in planning for manure application. Remember, you should use a separate budget for each field or part of field, and maintain the records for at least five years.

Field Name or Identification: _____

Crop year: _____

Soil sample results (pounds per acre):

	Ammonium	Nitrate	Phosphorus	Potassium
1st ft. (0"-12")				
2nd ft. (12"-24")				
3rd ft. (24"-36")				
Field Total				

Total pounds of available nitrogen, nitrate plus ammonium: _____
Estimated nitrogen release from organic matter mineralization (percent organic matter times 30 pounds): _____
Credit from past manure applications (second year manure credits increase by 10 percent over first year; third year credits increase an additional 5 percent): _____
Credit from past crop residues (use Extension guides for credits for alfalfa or other legume residues): _
_____
Atmospheric deposition (estimates of about 10 pounds per acre per year but may vary geographically): _
_____
TOTAL NUTRIENTS LIKELY TO BE AVAILABLE DURING GROWING SEASON:

Ammonium	Nitrate	Phosphorus	Potassium

Nutrient needs based on crop to be grown and reasonable yield goal times. Include nutrient content from past analysis or USDA crop nutrient removal tool. Pounds per acre need – nutrient already available = nutrient application need for the crop.

Pounds per acre need	Nutrient already available	Application need

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BEST MANAGEMENT PRACTICE: COMPOSTING

Water and Environmental Technologies

I. Purpose

The purpose of this BMP is to control and limit the impacts of composting operations to Washington's surface and ground waters and comply with applicable state and federal water quality laws.

II. Definitions

Composting: an aerobic, biological decomposition process to transform solid manure and bedding material into stable, biologically stable organic soil-like or humus-like material. (Government of Alberta, 2010)

Composting facility/operation: a structure or device to contain and facilitate the controlled aerobic decomposition of manure or other organic material by microorganisms into a biologically stable organic material that is suitable for use as a soil amendment. (Natural Resources Conservation Service, 2010)

Surface waters: ponds, reservoirs, streams, irrigation ditches, wetlands, and all waters of the state as defined by RCW 90.48.020.

Open channel storm water conveyance and storage structures: drainage ditches, detention/retention ponds, and swales.

Closed conduit storm water conveyance structures: culverts, pipes, and drain tiles.

Negative aeration: using pumps to suck air through the pile.

Wind-row: consists of placing the mixture of raw materials in long narrow piles. Wind-rows aerate primarily by natural or passive air movement. (Misra, Roy, & Hiraoka, 2003)

Finished compost: will no longer heat up, even after mixing. The initial ingredients are no longer recognizable, and what is left is an earthy smelling substance similar to a rich organic soil. (Trautmann & Richard, 1996)

Unfinished compost: using unfinished compost as a soil amendment may stress plants, causing them to yellow or stalling their growth. This is because the decomposition process is continuing near the plant roots and the microorganisms in the compost are competing with the plants for nitrogen. (University of Florida, 2011)

Malodors: an offensive odor. (Merriam-Webster, 2015)

Phytotoxicity: poisonous to plants. (Merriam-Webster, 2015)

III. Siting and Design of Composting Operations

Composting operations must be properly designed and sited to eliminate impacts to the environment to the maximum extent practicable. The following are recommended:

A. Environmental Considerations

- Composting operations must be located outside the 100-year floodplain.

- Composting operations locations must consider the prevailing wind direction.

- Composting operations must be located a minimum of 100 feet from surface water and open channel structures, and closed conduits and storm water conveyance/storage structures.

  Note: Diverting stormwater from roof surfaces (i.e., structures in Confined Animal Feeding Operations-CAFOs) using gutters and downspouts reduces the amount of water that needs to be managed by half. If clean storm water is diverted, the expense associated with lagoon storage construction and maintenance is reduced (Higgins, Wightman, & Lehmkuhler, 2013)

- Composting operations must be located a minimum of 100 feet from water wells and public water supply reservoirs.

- Composting operations must be located on an impervious surface (i.e., concrete) if located outdoors and preferably under a protective cover to prevent the migration of manure nutrients to surface water and groundwater.

- Composting operation area must be graded to provide positive surface drainage to detention/retention structures.

  Note: A minimum 2 percent slope is needed to provide drainage and avoid ponding; a slope greater than 6 percent should be avoided because runoff is difficult to control. (Higgins, Wightman, & Lehmkuhler, 2013)

- Composting operations benefit from aeration (routine or intermittent use) and negative aeration to reduce odors. (Marcillac, Stewart, Elliott, & Davis, 2011) (Nicoletti & Taylor, 2005)

- Compost piles must be kept moist.

  Note: Keeping compost piles wet reduces dust production potential. Manure dust can contain microbes and pathogens that can be detrimental to human health. (Marcillac, Stewart, Elliott, & Davis, 2011)

B. Design Considerations

The compost process should have the following:

- Moisture content between 40 and 65 percent; (Government of Alberta, 2010)

- Carbon to nitrogen ratio needs to range from 20:1 to 40:1; (Augustin & Rahman, 2010)
  Note: Adding carbon (straw or wood chips) if the C:N ratio is below 20:1 can help alleviate odors. (Augustin & Rahman, 2010)

- Oxygen content greater than 10 percent; (Government of Alberta, 2010)

- pH between 6.5 and 8; (Government of Alberta, 2010) and

- Temperature between 55°C/131°F and 60°C/140°F. (Government of Alberta, 2010)

If compost wind-rows are utilized they should have the following characteristics:

- 10 to 12 feet wide and 4 to 6 feet high. (Augustin & Rahman, 2010)

  Note: The dimensions are dictated by the length of the pad and size of the turning implement. (Augustin & Rahman, 2010)

- Wind-rows should be turned every 10 to 14 days. (Augustin & Rahman, 2010)

- Wind-rows should be parallel to surface slope. (Augustin & Rahman, 2010)

  Note: This prevents the windrow from blocking runoff and allows implement access to the pad. (Augustin & Rahman, 2010)

IV. Monitoring, Reporting, Record Keeping, Operation and Maintenance

Monitoring, reporting, and record keeping must comply with local, state, federal, and tribal laws and regulations. A monitoring plan will address sampling methods and holding times, required parameters, reporting requirements, and records maintenance.

An Operations and Maintenance Plan is required.

- Composting operations must be inspected on a routine basis (e.g., monthly) and after a significant storm event (e.g., ½-inch of rainfall) by trained personnel using a checklist.

- Inspections tasks include measuring and recording moisture levels, oxygen content, pH levels, and temperature. The use of a meter and a probe-type thermometer to measure parameters is recommended. Levels/contents should be accessed at various locations and depths.

  Alternatives to using a meter include:

Moisture level-The wet rag test is simple and effective. Squeeze the compost and feel for moisture. If water drips out, then it is too wet. If the compost feels like a wrung-out wet rag, the compost has sufficient moisture. (Augustin & Rahman, 2010)

Oxygen Content-A rotten egg odor may indicate the pile contains less than five percent oxygen. (Augustin & Rahman, 2010)

- Develop a plan if parameters are outside recommended ranges.

Alternatives include:

If compost is too dry, add water by spraying directly on the pile. (Augustin & Rahman, 2010)

If the Carbon to Nitrogen ratio is unbalanced, industry calculations can be used to determine proper mixing ratios. (10)

If the oxygen content is low:

1) Turn the pile mechanically to increase the oxygen content/aerobic conditions,
2) Alternate layers peat moss, wood chips or some type of material, with six- to 12-inch layers of compost, to increase porosity and add a perforated pipe to the pile to allow airflow, and
3) Aerate using fans that force air through perforated pipes. (Augustin & Rahman, 2010)

When internal temperature is below 43°C/110°F, turn the compost pile. (Augustin & Rahman, 2010)

When internal temperature exceeds 71°C/160°F, beneficial microbes can be destroyed, lessening the microbial activity and slowing down the composting process. Remedies to promote cooling include: adding a carbon source, making the pile smaller, and inserting holes in the pile. (Augustin & Rahman, 2010)

V. Use and Transfer of Compost to Third Parties

- Determine the nutrient content of the finished compost by sending samples to a certified laboratory. Sampling parameters, at a minimum, include nitrate, phosphorus, and potassium. *Note: The use of unfinished compost as a soil amendment may stress plants, causing them to yellow or stalling their growth. Samples should be tested as soon as possible or kept in cold storage until they can be sent to a laboratory for analysis.* (Augustin & Rahman, 2010) *Comply with laboratory recommended holding times.*

- Provide the nutrient content when selling or transferring finished compost to third parties. This allows the recipient to make proper determinations regarding agronomic application rates.

- Avoid spilling compost during handling and transportation to minimize nuisance and safety problems. (Agricultural Best Management Practices Task Force, USDA Natural Resources Conservation Service (NRCS), & New Hampshire Department of Agriculture, 2011)

- Do not apply compost on frozen soil. (Agricultural Best Management Practices Task Force, USDA Natural Resources Conservation Service (NRCS), & New Hampshire Department of Agriculture, 2011)

- Calibrate spreader prior to applying compost. (Augustin & Rahman, 2010)

- Properly store compost (on impervious surface or under a protective cover) when field application is not suitable.

  Note: The process of piling finished compost prior to field application is called curing. Applying immature compost can cause issues that include malodors, insect swarms, nitrogen immobilization and phytotoxicity. To assess compost maturity, operators can send samples to laboratories, check the pile temperature to ensure that it is near the ambient temperature, and use kits that give colorimetric readings of carbon dioxide and ammonia emissions. (Augustin & Rahman, 2010)

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BEST MANAGEMENT PRACTICE: RIPARIAN AREAS & BUFFERS

Rowan J. Baker, fish biologist (ret.)

I. Introduction And Relationship Between Riparian Areas And Water Quality

Riparian areas serve important functions related to protecting water quality and promoting habitat for fish and aquatic life. Useful summaries of these functions, recommended buffer widths, and other recommendations for riparian areas in lower gradient, marine-influenced areas, like coastal Puget Sound, may be found in:

- Brennan, J. (Washington Sea Grant), H. Culverwell, R. Gregg, and P. Granger. Protection of Marine Riparian Functions in Puget Sound, Washington. Washington Department of Fish and Wildlife 2009. Seattle, WA: 2009.
- FEMAT (Forest Ecosystem Management Assessment Team). 1993. Forest ecosystem management: An ecological, economic, and social assessment. U.S. Departments of Agriculture, Commerce, and Interior. Portland, Oregon.
- May, C.W. 2003. Stream-riparian ecosystems in the Puget Sound lowland eco-region – a review of best available science. Watershed Ecology, LLC, 2003.

Riparian areas perform the following valuable functions related to water quality and fish habitat:

- Reduce or prevent nutrients (at CAFOs, this is generally nitrogen and phosphorus), and other organic material, and pesticides from reaching adjacent waters by providing additional absorption opportunities.
- Reduce or prevent pesticides from reaching adjacent waters by trapping and degrading pesticide runoff
- Control erosion and sediment, improving stability of stream banks, which minimizes turbidity and alterations to the channel.
- Establish or protect aquatic habitat and passageways for fish and other aquatic life.
- Establish or protect riparian habitat, including nesting areas and pollen/nectar availability for pollinators, thus providing a food source for aquatic species and improving the overall health of the local system.
- Control water temperatures to improve the habitat for fish and other aquatic species by providing a source of shade, regulating stream flow, maintaining the channel width-to-depth ratio, and impacting microclimate.[1]
- Establish, restore, or maintain the health of riparian plant communities by preserving or restoring native vegetation.
- Increase water storage on floodplains, and increase net carbon storage in biomass and soil.

II. Definitions

Riparian: of or relating to the interface between land and rivers and streams.

Riparian area: transitional zones between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. They include those portions of terrestrial ecosystems that influence exchanges of energy and matter with aquatic ecosystems (i.e., zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines.[2] Agricultural or industrial management documents may also refer to this area as a "buffer," although the two terms should not be considered fully interchangeable (see below).

Buffer: management term for a separation zone between a water body and a land use activity for the purposes of protecting ecological processes; in this BMP, the buffer is an exclusion area between the edge of a CAFO operation and a water body within which certain practices or human disturbances are not allowed.

III. Applicability

This BMP specifically applies to medium-sized or large-sized CAFOs – as defined by 40 C.F.R. § 122.23 – in Western Washington, but the underlying principles and guidelines may be of use in other geographic areas where CAFOs operate near bodies of water. Additionally, in order to achieve maximum efficacy, the recommended practices outlined in this document should be implemented in connection with other relevant agricultural BMPs, including, for example, proper land-application of manure and groundwater monitoring.

Without adequate buffers and healthy riparian areas, CAFOs have the potential to significantly impact water quality in adjacent water bodies, including both in the short-term (e.g., the direct introduction of pollutants to surface waters) and long-term (e.g., channel widening, altered floodplains, lowered water tables, loss of pools, and thermal impacts to biota).

IV. Minimum Recommended Buffer Width And Features

As a general rule, a larger buffer is always more protective of water quality than a smaller buffer. Minimum buffer widths serve as a baseline or "floor," and should be increased when there is greater potential for runoff and pollution or when special circumstances dictate. For example, extremely sensitive wetland areas require larger riparian buffers to protect them from disturbances that may pose a lesser threat to an area with fewer groundwater or surface water connections.[3] Further, climate change impacts will generally add stressors that, when combined with long-term and pervasive impacts of livestock grazing, suggest the need for more aggressive management to eliminate livestock impacts through exclusion of livestock form large areas.[4] Over time, regular inspection and water quality monitoring can help you to assess the effectiveness of your buffer at protecting riparian area functions and water quality, and determine whether the buffer width should be increased.

Brennan, et al. examined 11 studies on riparian areas and reported that effective (defined as between 80 and 99 percent reduction of pollutants) buffer widths varied from 25m to 550m for water quality, with total pollutant removal effectiveness as a function of buffer width (the larger the buffer, the greater its effectiveness in performing a water quality function).[5] Brennan states that if one were to select a standard of 80 percent effectiveness for all water quality functions included in all 11 studies and

situations reviewed, one would need buffers of 109m (608 ft.).[6] Thus, the current approach of setting a small minimum buffer (e.g., 35 feet) and recommending upward adjustments based on various land activities is likely to fall far short of what is needed to best protect water quality and fish habitat.

At medium and large CAFOs in lowland marine or estuarine influenced zones, such as the Puget Sound area, the greater of the following minimum buffer widths should be used:

- A 280-foot buffer width, as measured from the farthest edge of the stream at flood stage, or from the outer edge of the floodplain—whichever results in the largest width of the buffer—to the edge of the CAFO operation (the "CAFO operation" includes areas where animals are kept confined, buildings and structures, waste storage impoundments, and fields where manure is applied), **or**
- A buffer that is at least equal to the footprint (width) of the CAFO operation (a 1:1 ratio).

This recommended width is based on consideration of the functions outlined in Section I, *supra*, and assumes that the buffers are continuous and that the overall human impact on the landscape is low, *e.g.*, few or no roads or stream crossings within the drainage and no barriers to upstream or downstream fish movement. Lowlands and estuarine areas need larger buffers generally due to physical setting and stream order.[7] CAFOs, given their high livestock abundance and high nutrient concentrations relative to many of the other land uses studied in the relevant literature, also need larger buffers than may apply to other land uses. Excess nutrient loadings of phosphorus and nitrogen, the accumulation of those nutrients over time, and potential for long term geomorphic alteration of streams and floodplains are especially problematic at areas near CAFO facilities; accordingly, a healthy, functional riparian area protected by a buffer of adequate width should be an important aspect of any agricultural management recommendations.

The effectiveness of concurrent use of multiple (suites of individual) BMPs has rarely been tested or systematically evaluated.[8] Thus, the precautionary approach of utilizing a larger buffer based on the greatest minimum width needed to effectively protect and achieve the desired function – in general for CAFOs in this setting, that function is phosphorus removal – is the best approach to protect aquatic life and promote water quality. This approach, rather than setting a smaller minimum buffer and adjusting upward based on the presence of additional stressors or loading sources, is the safest way to ensure that the buffer is accomplishing the desired goals of water quality and habitat protection.

The following general guidelines should also be incorporated into your buffer and riparian area:

- Only native vegetation should be used, and the location and layout of plant life should complement existing natural features. Non-native vegetation may compromise the health of the riparian ecosystem.
- Inspect the riparian area on a regular basis to evaluate its health. Check for signs of pest disturbance or poor plant health.
- The riparian area and buffer should remain continuous throughout the watershed. Take care to ensure that there are no significant breaks or gaps in the vegetation adjacent to or near source areas, as those breaks may provide a conduit for pollution to enter the adjacent water body and reduce the overall effectiveness of the riparian area at achieving desired functions.

- The riparian area or buffer should be adjusted for steep slopes, as very steep slopes cannot effectively remove contaminants.[9]
- Access to and use of the riparian area should be restricted. Consider posting signs to notify people of the need to avoid entering the area, and consider installing fencing to exclude vehicles and livestock. Ensure that all applicable laws and regulations are followed when posting signs and installing fencing, including any laws and regulations pertaining to critical habitat or nesting areas that may be cleared to allow for the construction of a fence. Fences should be positioned between the edge of the riparian area and the upland fields, taking care to limit disturbances to natural barriers and landscape features. You may wish to mark the fence for enhanced visibility. Like the buffer and riparian area itself, any fences, signs, and gates should be inspected regularly for signs of wear and tear or damage.

V. Conclusion And Caveats

Although buffers may serve to prevent or reduce the volume of pollutants reaching surface waters or aquatic habitats, it should be noted that the use of buffers, absent other operational or environmental changes, will not necessarily restore an already-degraded area to full health. Implementing a BMP where none existed previously may mitigate damage or minimize some continuing harm, but should not be considered a fully corrective measure, especially if that BMP is not implemented as part of a larger suite of improved practices.

Further, while the practice outlined above provides a reliable general starting point for minimum buffer width, you should consider the specific conditions of your site and any special circumstances that may warrant a departure upward in terms of the appropriate riparian area size at your facility.

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BEST MANAGEMENT PRACTICE: STREAM CROSSINGS

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I. Introduction And Relationship Between Stream Crossings And Water Quality

The very presence of a stream crossing or culvert impacts water quality and aquatic habitat, even where fish may be able to migrate under a bridge or through a culvert successfully. These impacts can extend upstream and downstream as well. The installation of a permanent stream crossing may impair water quality by removing riparian vegetation, and consequently reduces the ability of riparian areas to perform important functions related to water quality. *See, e.g.*, BMP: Riparian Areas & Buffers in this compendium. Stream crossings may also directly impair water quality by contributing to erosion and providing a conduit for direct introduction of pollutants into the stream or river.

Further, the presence of a permanent stream crossing can impact fish spawning areas. Salmon and trout, of particular relevance to the Pacific Northwest, require specific spawning conditions related to water depth, velocity, substrate size, gradient, accessibility, and space, and all salmonids require cool, clean water in which to spawn. Stream crossing installation can degrade or eliminate spawning habitat by replacing natural gravel used for spawning with a pipe or other artificial material, by realigning or shortening the natural channel, leading to bed instability and reduced spawning opportunities, by scouring downstream riffles and gravel bars if flow velocity is increased through the culvert, and by releasing or directing sediment onto the spawning gravel.

Some additional potential impacts of culverts and stream crossings include:

- Impaired water quality. Stream crossings
- Direct instream and riparian habitat loss,
- Barriers to fish passage,
- Upstream and downstream channel impacts,
- Ecological connectivity,
- Channel maintenance,
- Construction impacts, and
- Risk of effects from crossing failure during flooding or other extreme weather event.

Because permanent stream crossings impact fish habitat so directly, their use should be avoided. If a stream crossing is absolutely necessary, however, you may be able to minimize some of the impacts listed above by implementing the Best Management Practices (BMPs) recommended below. The use of BMPs in connection with stream crossings will reduce the negative impacts caused by the crossing while allowing you to access another area of land.

II. Definitions

Stream crossing: a stabilized area or structure constructed across a stream, river, or other waterbody that enables travel for people, livestock, equipment, or vehicles.

Culvert: any structure, other than a full-span bridge or tide gate, that is constructed to convey water beneath a roadway, and shall also include associated fishways or passage structures, and bridges or stream crossings built to replace any culverts. A culvert is a type of stream crossing.

III. Applicability

This BMP specifically applies to medium-sized or large-sized CAFOs – as defined by 40 C.F.R. § 122.23 – in Western Washington, but the underlying principles and guidelines may be of use in other geographic areas where CAFOs operate near bodies of water. Additionally, in order to achieve maximum efficacy, the recommended practices outlined in this document should be implemented in connection with other relevant agricultural BMPs.

Stream crossings at CAFOs have the potential to significantly impact water quality in adjacent water bodies, including both in the short-term (e.g., the direct introduction of pollutants to surface waters and the direct impairment of fish passage and fish habitat) and long-term (e.g., removal of riparian area resulting in diminished riparian function, erosion and channel widening).

IV. Stream Crossings – Recommendations

A. Crossing Location

Because the very presence of a stream crossing will impact the area, careful consideration should be given to whether a permanent stream crossing is necessary to achieve the desired operational goal, and the use of stream crossings should be minimized. A sizeable riparian area should exist between any portion of the CAFO operation and a stream or river, but you should confirm that the crossing will not be adjacent to active production areas, such as corrals, animal feeding areas or pens, calving areas, or any other heavy use or high concentration areas. The following areas are NOT appropriate for stream crossings:

- Spawning areas in streams or critical habitat sites,
- Areas where the channel grade or alignment changes abruptly, where overfalls are present, where tributaries enter the stream, or whether other signs of instability are evident or the channel would require significant realignment, as it is important to ensure that the streambed around a potential crossing site is stable,
- Cool shady areas that may encourage livestock to linger or slowly cross the water body,
- Conduits for surface runoff, as the presence of a crossing would likely exacerbate erosion, and
- Sensitive areas or areas with known water quality problems.

B. Crossing Construction

You should ensure that all applicable local, state, and federal laws, statutes, and ordinances are followed through the entirety of the crossing design, construction, and operation process. WAC 220-110-070 and 220-110-080 are two state regulations that must be followed when planning for, designing, and constructing new culverts and crossings. You should also consult with an experienced engineer who can design and install a crossing that will result the least impact to water quality and preserve the greatest

amount of riparian and aquatic habitat. In addition to consulting with an expert, the following general guidelines are recommended:

- Crossing widths should be minimized, as well as the number of permanent crossings installed.
- Direct 90 degree crossing angles are preferable to oblique angles of installation, and the crossing should .
- Take care to stabilize banks around the crossing and incorporate any mitigating measures to reduce or prevent erosion. Avoid disrupting the natural course of the stream channel.
- Crossings must be capable of withstanding at least 100 year floods. Additionally, as climate change impacts lead to more frequent extreme weather events – for example, today's "100-year floods" are beginning to occur on a more frequent basis – crossings may need to be retrofitted or replaced.
- Crossings must be designed and constructed by an experienced engineer and construction team in accordance with sound engineering and construction principles and as required by applicable local, state, and federal laws and regulations.
- The particular crossing style should be selected in consultation with an experienced engineer and consider fish passage needs, potential erosion, stream type, expected precipitation and flooding occurrences. Generally, crossings with a large amount of impervious surface area should be avoided. Bridge-style or semi-culvert style crossings are the best suited for fish passage.
- The timeframe selected for construction of a crossing should not interfere with species migration schedules. Consult with an expert familiar with the area species so that the construction schedule does not disturb important spawning or migration.

C. Crossing Maintenance and Access Control to Stream Crossings

- Monitoring and inspections. Crossings should be monitored regularly to check for excess sediment or signs of damage, especially after storms or floods. Additionally, the riparian area in which the crossing is situated should be monitored for signs of negative impacts from the crossing. Any observed damage to the crossing, or any signs of wear that indicate potential structural integrity issues should be documented and addressed promptly.
- Access Control. Restrict the ability of livestock to access the crossing through the use of proper fencing. Consider posting signs or other markers to enhance visibility. Ensure that all applicable laws and regulations are followed when posting signs and installing fencing, including any laws and regulations pertaining to critical habitat or nesting areas that may be cleared to allow for the construction of a fence. Like the stream crossing itself, any fences, signs, and gates should be inspected regularly for signs of wear and tear or damage.

V. Conclusion

Although a stream crossing that is properly sited, constructed, and maintained may lessen impacts to water quality and fish and riparian habitat, the mere existence of a crossing will affect the surrounding area. The most protective option is to avoid installing a permanent crossing of any kind.

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BEST MANAGEMENT PRACTICE: GROUNDWATER MONITORING

Water and Environmental Technologies

I. Introduction

The Washington State Department of Ecology has determined that "[d]irect monitoring of water quality at the water table [groundwater monitoring] was the only accurate and reliable method for tracking effects of manure management on groundwater nitrate." (Carey & Harrison, 2014) Direct groundwater monitoring is the only available way to determine the amount, or concentration, of nitrate reaching the water table, and - because there is no reliable substitute - is therefore an essential component of evaluating the effectiveness of a manure management program. *Id*. at xxvii.

Groundwater monitoring is needed to detect whether nitrate from agricultural waste storage and treatment facilities has impacted the aquifer (i.e., drinking water source). EPA has set a Maximum Contaminant Level (MCL) of 10 ppm or 10 mg/L for nitrates in drinking water. Groundwater monitoring provides a method to evaluate whether manure management practices (i.e., lagoon storage or land application of manure) is impacting area groundwater and provides a measurement of the level of impact. Nitrate detection is needed because nitrates are highly mobile in soil, (Hribar & Schultz, 2010) the cleanup of nitrate-contaminated groundwater is complex, aquifer recovery is slow, and Confined Animal Feeding Operations (CAFOs) are usually located in rural areas where the drinking water supply is the shallow aquifer.

II. Purpose

The purpose of this BMP is to detect, monitor, and prevent nitrates from impacting Washington's ground waters due to manure storage and handling at agricultural facilities.

III. Definition

Monitoring well: A monitoring well is a well drilled at a specific location on or off a site at which ground water can be sampled at selected depths and studied to determine the direction of ground water flow and the types and quantities of contaminants present in the ground water (Environmental Protection Agency (EPA), 2015).

IV. Groundwater Monitoring Goals and Objectives

The goals and objectives of groundwater monitoring include the following:

1. Develop a groundwater Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) that complies with all local, state, federal, and tribal laws and regulations.
2. Establish core and supplemental lists of groundwater quality parameters and sampling frequencies based on constituents that are: a) most hazardous to public health and the environment (i.e., nitrate); b) most indicative of impacts from agricultural waste storage and treatment facilities; and, c) most likely to appear first at the monitoring sites.
3. Choose groundwater monitoring locations to insure early detection of potential impacts from agricultural waste storage and treatment facilities in areas of greatest environmental sensitivity.

4. Establish a reporting system that presents the data, compares results to standards and thresholds, and provides spatial and temporal trend analysis.

V. Conditions Where Practice Applies

Because groundwater monitoring is unique in its ability to deliver accurate information about water quality impacts as a result of manure management practices, this practice applies to any medium-sized or large-sized CAFO as defined by 40 C.F.R. § 122.23, any other facility deemed to be a contributor of contaminants to groundwater pursuant to state or federal law, or any other facility required to obtain permit coverage pursuant to state or federal law.

VI. Components of a Groundwater Monitoring Plan

A. Initial Investigation and Data Review

A licensed environmental specialist will review available data and/or conduct a site investigation of the natural, man-made, surface, and subsurface features. Then a conceptual hydrogeologic model of the site will be developed, the direction of groundwater flow estimated, and areas to monitor identified. Specific tasks include:

- Identify and describe soil conditions that may affect groundwater flow in the area of interest.
- Identify and describe man-made features (i.e., structures for storm water run-on and run-off, tile lines, subsurface/surface drains (including tile drains), irrigation ditches/wells, water supply wells, septic drain fields, infiltration strips, quarries, mines, or other water control/management features) that could alter natural flow paths.
- Identify and map vicinity surface waters (ponds, reservoirs, streams, and wetlands).
- Identify and map the locations of existing vicinity wells and review well log reports.
- If sufficient data are available, map the potentiometric surface to determine the hydraulic gradient and groundwater flow direction at the facility.
- Identify and describe seasonal changes in the potentiometric surface, groundwater flow direction, and surface water features.

B. Monitoring Network Design and Layout

A licensed environmental specialist should select the well locations and well depths based on the site investigation results. Generally, monitoring wells will be located along the flow paths of potential contaminant sources including waste storage lagoons, manure application fields, animal pens, and compost areas. Additional wells may be required to assess potentiometric surface elevation, hydraulic gradient, flow direction, and seepage velocity.

C. Well Installation, Protection, and Development

It is recommended that a licensed environmental specialist investigate, site, install, monitor, and maintain monitoring wells. Installation methods will be based on the site-specific conditions identified during the investigation, will conform to Washington State Department of Ecology Well Installation Requirements and EPA Suggested Practices (Aller, et al., 1991), and other applicable laws or regulations. The

installation equipment must be capable of creating a stable, open, vertical borehole for monitoring well installation.

Construction materials must prohibit pollutant transmission to groundwater (i.e., free of contaminants and non-reactive). Well screens must be machine-made and joint threaded, rather than glued or solvent-welded joints, and should generally be placed at strategic depths to maximize the likelihood of detecting contaminants originating from nearby surface sources. Well materials should be of adequate strength to withstand installation and well development.

Measures should be employed to protect the well from damage due to extreme weather events, frost action, surface drainage, animal or equipment traffic, and limited visibility, and should conform to relevant state or local standards and/or ASTM standards.

Siting and installation will include a minimum buffer zone radius of 30 feet around each monitoring well. This buffer zone must be fenced or otherwise protected from motor vehicle and livestock access. Surface grading must provide positive surface drainage away from the well-head. Storage, handling, mixing, or application of manure or other fertilizers, pesticides or other agricultural chemicals and/or cleaning of equipment must be conducted outside the buffer zone.

Monitoring wells must be developed to improve the hydraulic connection between the target hydrogeologic unit and the well screen. Measures must be taken to minimize the interference of sediment with water quality samples and to restore disturbances caused by the installation process. The development method should conform to relevant ASTM standards based on the physical characteristics of the target hydrogeologic unit and the selected drilling method.

A professional land surveyor registered in the State of Washington will survey new wellheads to determine their horizontal locations with respect to the North American Datum 1983 (NAD 83) and vertical elevations with respect to the North American Vertical Datum 1988 (NAVD 88).

D. Groundwater Monitoring Procedures

The groundwater Sampling and Analysis Plan (SAP) will identify field procedures including: groundwater level measurement techniques, sample collection methods, sample identification protocol, sample preservation, sample holding times, analytical methods, and sample shipping and handling procedures. Proper monitoring procedures depend on site-specific conditions and will be selected by the environmental specialist based on the results of the site investigation.

E. Reporting and Record Keeping

Reporting and record keeping must comply with all local, state, federal, and tribal laws and regulations. The monitoring plan should clearly identify the report frequency, contents, and record keeping requirements.

A response plan should address procedures if an exceedance or unusual sampling data are found. The response plan may involve further investigation and temporary/permanent changes to operational practices.

F. Inspection and Maintenance

Groundwater monitoring wells and their associated buffer zones must be inspected on a routine basis (i.e., monthly) and after a significant storm event (i.e., ½-inch of rainfall) by trained personnel using a checklist. Inspections must ensure the buffer area remains free of debris or other material that could potentially damage and/or contribute pollutants to the well. The environmental specialist and pertinent local or state agencies will be notified if well damage is observed. A follow-up plan will specify well repair or well abandonment options.

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