

Food Safety, Conservation and Public Health

October, 2011

Background:

Fueled by a series of leafy-greens-related *E. coli* outbreaks in California, widespread changes to on-farm agricultural practices are dramatically changing the dynamics between farming and nearby natural lands, leading to significant impacts on conservation values. These changes appear to stem in large part from proprietary corporate food safety standards demanded by bagged salad processors and retail buyers such as chain grocers and fast food outlets. Wildlife has been identified in corporate food safety standards as a primary risk factor, and many new on-farm practices are expressly intended to reduce or eliminate the presence of wildlife and potential habitat from proximity to farms. As a result, discontinuing conservation practices and creating changes on a farm such as the clearing of bare-dirt buffers may actually increase the risk of food-borne illness and undermine other public health goals. These food safety requirements are expanding to other crops well beyond California and food safety legislation working its way through Congress could exacerbate this problem if these conflicts are not addressed.

Implications for Biodiversity and Agricultural Sustainability:

Required food safety practices reported by landowners and regulatory agencies include the destruction of water features, the use of poison to eliminate rodents, birds and amphibians and extensive use of fencing along waterways, natural lands and farm fields to exclude wildlife which can significantly disrupt wildlife movement corridors (Table 1). These changes represent a large step backward in terms of voluntary resource conservation efforts developed over the past 25 years, often with federal financial support through the Farm Bill, Natural Resource Conservation Service, and other public investments. Growers have reported through formal surveys and interviews with researchers that some corporate food safety requirements put them under pressure to contravene environmental laws intended to protect natural resources, including the Clean Water Act and the Endangered Species Act.

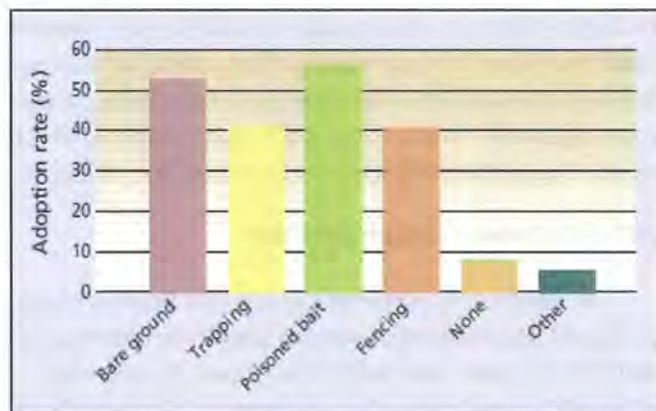


Table 1. Percentage of grower respondents who indicated they adopted mitigation measures targeting wildlife (Beretti and Stuart, 2008)

Implications for Public Health:

In addition to the negative consequences for ecological health, it is likely that some food safety management practices designed to reduce the risk of pathogens in produce may in fact *increase* public health risks associated with air and water quality. Discouraging best agriculture conservation practices such as windbreaks, hedgerows and vegetated buffers can lead to increased pesticide drift and particulate

matter in the air as well as nitrate and sediment loading in waterways—all which are documented to lead to adverse human health risks.

The “Safe and Sustainable” Report:

In response to an outcry from produce growers and conservation organizations that new standards were resulting in serious ecological and public health risks, The Nature Conservancy, in collaboration with Georgetown University, Pew Charitable Trust and a multi-sector array of academics, conservationists and agricultural stakeholders, produced a report titled “Safe and Sustainable: food safety and ecological health in California’s Central Coast.” The report examines the scientific basis for these concerns and the food safety requirements driving them. The key findings of the report can be summarized as follows: *“Growers report yielding to tremendous pressure from auditors, inspectors, and other food safety professionals to change on-farm management practices in ways that not only generate uncertain food safety benefits, but also create serious environmental consequences. Many growers and a wide consortium of regional experts believe that “co-management” for food safety and environmental protection represents the optimal path forward, albeit one that faces several key obstacles.”*

Critical Next Steps for Co-Management—Corporate Outreach:

The findings of the “Safe and Sustainable” report show that the most critical next step for advancing a co-management approach and reducing the potentially harmful consequences of current food safety requirements is engaging corporate food safety and sustainability leaders to re-align corporate standards. According to surveys and interviews conducted for the report, much of the pressure growers feel can be attributed to a small group of major corporations. Working with these corporations to adopt principles of co-management may significantly reduce pressure growers feel, and reinforce the importance of managing farms to ensure safe food while simultaneously conserving soil, water, air, wildlife and other natural resources that are essential for ecological and human health. The Nature Conservancy’s next step in addressing the conflict is to engage in a corporate partnership strategy to help incorporate principals of “co-management” into a company’s own standards through a collaborative, science based process and then use this partnership as a model within the industry.

Food Safety Modernization Act Rules

In addition to corporate policy, the federal policy rules currently being developed to implement the Food Safety Modernization Act will also have a profound impact on the future of on-farm practices. It is essential that these rules fully incorporate the principals of “co-management” in order to avoid significant risks to public health and the environment. Once well-crafted food safety rules are in place, extensive training from ‘farm to fork,’ including food safety auditors, food service and retail produce buyers and consumers, will be essential for consistent and effective implementation. The US Department of Agriculture, Natural Resources Conservation Service, Environmental Protection Agency, US Fish and Wildlife Service and National Marine Fisheries Service possess critical, relevant expertise and resources, and should be fully engaged at an *early stage* in the development, review and implementation of the federal food safety regulations. Such rules should be adaptive and contain robust mechanisms for incorporating new science-based information, standards and practices as they become available.

For further information:

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Recommended Agencies to Review Food Safety Modernization Act Rules:

Below is a list of recommended federal agencies that should be involved in the review process of the Food Safety Modernization Act to evaluate possible impacts of the rules on environmental and human health issues. The Nature Conservancy would be happy to provide contact information for individuals within each agency who are knowledgeable on “co-management” and the potential conflicts between food safety, public health and the environment.

US Department of Agriculture, Natural Resources Conservation Service:

To evaluate impacts of food safety practices on conservation objectives in agricultural landscapes.

US Fish and Wildlife Service:

To evaluate impacts of food safety practices on natural habitat and protected species.

Natural Marine Fisheries Service:

To evaluate the impacts of food safety practices on migratory fish that may result from reduced water quality, poor stream bank protection and compromised riparian habitat

Environmental Protection Agency:

To evaluate how the food safety requirements may interact with the Clean Water Act, Clean Air Act and Endangered Species Protection Act

Human Health Services:

To examine issues related to air and water quality, pesticide drift and drinking-water contamination.



**COMMENTS FOR FDA DOCKET (FDA-2010-N-0085)
SUBMITTED BY THE NATURE CONSERVANCY
JULY 23, 2010**

OVERVIEW

The materials presented here are a response to a FDA request for comments as it researches a federal produce safety rule (Open Docket FDA-2010-N-0085). Agency personnel charged with writing the new rule have indicated a need for detailed information about how new food safety guidelines may create unintended consequences to the natural resource base upon which agricultural production and human health rely. Specifically they have requested a review of ways in which food safety rules might reduce incentives to participate in resource conservation practices or place pressure on growers and/or landowners to contravene existing laws intended to protect natural resources and human health.

As presented in depth in the *Safe and Sustainable: Co-managing for Food Safety and Ecological Health in California's Central Coast Region* report cited below, on-the-ground farm management practices have changed in response to food safety concerns. Particularly since the spinach-related outbreak in 2006 traced back to the region, fresh produce growers in California's Central Coast report being pressured by auditors, inspectors, and other food safety professionals to modify management activities in order to reduce the presence of wildlife. Surveys and interviews have indicated that crops which are not produced for the "fresh" market, but which are cooked prior to consumption are also being impacted by these same pressures. Growers report use of lethal and non-lethal wildlife deterrents and removal of non-crop (e.g. natural) vegetation and engineered and natural water-bodies in proximity to farms, apparently in response to a presumption that wildlife in proximity to farm fields may act as a vector for pathogens, leading to increased food safety risk.

These pressures have resulted in changes to agricultural management practices, including impacts on efforts to conserve soil, wildlife, and water. Produce growers report that they are increasingly caught in an untenable position – forced to choose between meeting their natural resource conservation goals and legal obligations, or meeting the food safety guidelines or requirements of their auditors and buyers. The drivers behind much of this pressure are detailed in *Safe and Sustainable*. The decisions made by FDA have the potential to provide critical guidance for avoiding these conflicts, or, if they are not addressed, to compound them. Diverse stakeholders representing growers, buyers, non-profit groups, university and extension researchers, food safety professionals and government agency personnel, have demonstrated firm commitment to work collaboratively to find effective ways to address these conflicts productively.

The Nature Conservancy and over 35 diverse expert advisors contributing to the *Safe and Sustainable* report support pursuing co-management as a way to reconcile conflicts between food safety and natural resource protection. Co-management is defined as an approach to minimize microbiological hazards associated with food production while simultaneously conserving soil, water, air, wildlife, and other natural resources. It is based on the premise that farmers desire to produce safe food and be good land stewards, and can do both while still remaining economically viable. Suggested co-management principles include being science-based, adaptable, collaborative,

commodity-specific, and site-specific. Significant obstacles to successful co-management are also noted in the report. The material contained herein, including detailed review of specific examples of conflict, is intended to further the FDA's understanding of the conflict which currently undermines co-management efforts.

No published data, to our knowledge, demonstrates that removal of vegetation or water-bodies reduces food safety risk. Likewise, while some wildlife may carry pathogens of concern, available data do not indicate that current strategies of elimination and exclusion of all wildlife effectively reduce risk. Until the relationship, if any, between wildlife presence in proximity to farm fields and pathogenic outbreaks is better understood, food safety requirements should be carefully crafted to avoid impacts to sensitive wildlife populations and their habitat, as well as to conservation practices that support human health through protection of water, soil, air quality, and other ecosystem services.

In particular, removal of natural habitat (such as riparian vegetation) or vegetative conservation practices (such as grassed waterways) that support healthy ecosystem functions should be avoided to the fullest extent possible. Likewise, where exclusion of certain animals, such as feral pigs, from fields is deemed necessary, control methods should avoid direct or indirect impacts on other species, including disruptions to wildlife use of or access to key habitat features such as water sources and wildlife corridors. Decisions regarding whether and under what conditions wildlife exclusion from fields is necessary should be risk-based and well supported by available science.

Development of food safety program elements that have the potential to affect ecosystem health should involve multidisciplinary teams that include expertise in the full range of affected natural systems, such as resource conservation practitioners, ecologists, wildlife biologists, water quality managers, agronomists and others as appropriate to the situation. Working at a landscape approach, such as the watershed scale, may also be most effective. The Nature Conservancy also contributed to and supports the co-management principals incorporated into the California Roundtable on Agriculture and Environment's recommendations in January, 2010 which are available at http://foodsystemalliance.org/uploads/CRAE_FDA_fv_principles_0510.pdf.

Once food safety rules are in place, extensive training and outreach from 'farm to fork,' notably including food safety auditors, food service and retail produce buyers and consumers, will be essential for consistent, effective implementation. The US Department of Agriculture, Natural Resources Conservation Service possesses critical relevant expertise and resources, and should be fully engaged in both the development and implementation of federal food safety regulations.

In response to food safety-related conservation concerns raised on California's Central Coast in the past several years, a number of agricultural industry, resource agency, NGO, academic and science experts have come together to address opportunities and challenges related to co-management. One such group is the Farm Food Safety and Conservation Network; another is the technical advisory committee for the Safe and Sustainable report. Members of both of these diverse groups could provide valuable expertise to FDA as it moves forward with its rule-making; many participated in the development of the attached materials. For more information regarding these groups or the materials contained in these comments, please contact Liz Spence, the Monterey Project Manager at The Nature Conservancy of California at lspence@tnc.org.

MAIN MESSAGES

Several key points are well supported by the materials reviewed:

1. As a result of concerns regarding the potential role of wildlife as a vector for pathogens, food safety requirements imposed through industry-led efforts have led to decreased tolerance by auditors, brokers and buyers to have non-crop vegetation and water bodies near fresh produce production blocks; many conservation practices include non-crop vegetation and/or water bodies and discontinued use is reported;
2. Clearing of vegetation along stream corridors and other water bodies throughout the Central Coast of California has been reported by growers, and corroborated in an analysis of aerial imagery conducted for a portion of the Salinas Valley. The vegetation changes were detected from USDA National Agriculture Inventory Program (NAIP) images of the area available for two years: 2005 and 2009. Changes detected indicate loss of several important habitat types along and adjacent to Salinas River, including wetlands, and increased bare/sparsely vegetated ground;
3. Management for food safety concerns has led to confirmed violations of existing law;
4. Removal of riparian and wetland vegetation is of particular concern in severely fragmented habitat such as is found in the valleys of the Central Coast of California, and has potential to sever key animal movement corridors, increasing pressure on local populations of sensitive and wide-ranging species;
5. EPA requirements currently in development which direct growers to use conservation practices to reduce pesticide impacts may increase conflicts between food safety requirements and pesticide use labeling requirements;
6. Failure to recognize ecosystem services of sustainably managed crop land may lead to compromised public health in dimensions other than pathogen risk.

KEY SOURCES OF INFORMATION

Scientists, academics and natural resource organizations and agencies have pursued various avenues of inquiry to document food safety pressures growers face, management decisions made to address these pressures, and likelihood of conflict with existing law. Through a collaborative process involving numerous sources, The Nature Conservancy has developed the enclosed materials, which summarize key points from the following seven types of information:

1. Quantitative and qualitative data of grower reported actions in response to food safety;
2. Summary of key federal, state and local laws relevant to food safety management practices;
3. Preliminary analysis of vegetative cover change in the riparian zone of the Salinas River;
4. Examples of conflicts with existing law for which food safety is a known motivating factor for the actions in question;
5. Demonstration of the importance of habitat preservation in endangered species protection;
6. Description of changes in pesticide labeling in response to increased pressure on U.S. Environmental Protection Agency (EPA) to protect endangered species;

7. Ecosystem services of on-farm conservation practices removed in response to food safety concerns.

Documentation to substantiate the key findings is presented in the remainder of this document.

A brief overview of the key points is provided below, with full details provided in a series of Supplementary Materials that follow. The extensive volume and scope of material relevant to this discussion make an exhaustive presentation here impossible, given limitations of time and resources. The examples and detailed coverage of select elements of the discussion presented here were chosen to illustrate key points germane to challenges of co-managing for food safety and ecological health. As requested by FDA staff, specific attention was given to ways in which the promulgation of a new fresh produce food safety rule might lead to actions that contravene existing law.

SUMMARY OF FINDINGS THAT SUPPORT MAIN MESSAGES

1. Documentation of Changes in On-Farm Management in Response to Food Safety

A full description of the evidence demonstrating the changes in grower management may be found in *Safe and Sustainable: Co-managing for Food Safety and Ecological Health in California's Central Coast Region*, a detailed case study in which a 2007 grower survey, a 2009 grower survey and grower interviews spanning 2007-2009 are summarized. These surveys and interviews were intended to capture information about on-farm responses to food safety concerns. Details from them are presented in Supplementary Materials Section A.

Survey and interview data consistently document the exclusion and elimination of wildlife, removal of non-crop vegetation and removal of water bodies in response to food safety concerns. From this information, it is possible to predict areas of likely conflict with existing law, since management of wildlife, vegetation and water bodies are all subject to oversight by a range of federal, state and local regulatory agencies. Supplementary Materials Section B summarizes a selection of relevant law at federal, state and local levels.

2. Quantitative Documentation of Changes in Vegetation Along Salinas River

In response to FDA's request for quantitative data corroborating reports of grower actions in surveys and interviews, The Nature Conservancy engaged a highly qualified contractor, Aerial Information Services, to conduct a preliminary analysis of 2 sets of publically available aerial photographs--from 2005 and 2009--to assess whether and to what extent measurable changes to vegetation, in particular anthropogenic clearing or conversion of natural or 'non-crop' habitat, could be observed along an approximately 57 mile length of the Salinas River lying between King City and the mouth of the river at the Monterey Bay.

Images flown in 2005 for the National Agriculture Inventory Program (NAIP) were used to create a baseline map of existing terrestrial vegetation within the study area. Change was detected by comparing new images from a 2009 NAIP update. The primary goal of TNC's comparison of the two sets of data was to assess whether material changes to the river floodplain through either anthropogenic change (e.g. agricultural management or flood control activities) or through natural fluvial events were apparent. While it is not possible to determine the specific purpose of anthropogenic disturbance (i.e. whether vegetation was removed due to food safety concerns or other reasons) the comparison of aerial imagery demonstrates measurable reduction in non-crop vegetation in a manner consistent with the results of the interviews and surveys presented in *Safe and Sustainable*.

From this data it is evident that bare ground, a management strategy that growers report using to reduce likelihood of animal presence near production blocks, is almost exclusively created from uncultivated land, meaning the removal of a variety of vegetation types, including natural habitat. Ground newly designated as sparsely vegetated or bare ground in the 2009 imagery is exclusively from non-crop vegetation types. The cleared areas include potential habitat for nesting birds (many of which are federally protected) and several species listed under the Endangered Species Act that occur locally.

Of particular note, approximately 36% of vegetation mapped in 2005 within the study area as wetland habitat (“undifferentiated marsh (cattail and bulrush)” and “sedge-rush-wet grasses (salt grass) meadow”) was determined in the 2009 imagery to be lost to either anthropogenic or fluvial processes, with 6.5% converted to bare/sparsely vegetated ground as a result of anthropogenic activities. These areas and their vegetation can be particularly valuable for ecosystem services, and removal of this type of vegetation often requires permits from a range of agencies (see Supplementary Materials Section B).

Changes in vegetation type and density data, paired with information from grower surveys and interviews, reflect a pattern of vegetation changes that are consistent with actions growers report as a result of food safety requirements. A summary of key findings of the preliminary vegetation change analysis is presented in Supplementary Materials Section C.

3. Management for Food Safety Concerns Has Led to Legal Challenge

Two specific examples from the California Central Coast region illustrate how growers have come into conflict with existing law as they address food safety concerns. In both cases, growers were cited for unpermitted dredge and/or fill activities of a federal waterway; in each case growers cited food safety concerns as motivation for actions that contravene the federal Clean Water Act. In one case the grower also noted removal of vegetation near the waterway in response to concerns that it might support rodent populations, which s/he notes to be of food safety concern. In the second case, the grower notes that unpermitted water diversion and fill activities were meant to prevent the flow of potentially contaminated water from surrounding uplands from crossing a production lot. Documentation provided in Supplementary Materials Section D presents details of these two cases. In a third example of a similar violation, staff members of the Central Coast Regional Water Quality Control Board pursuing the case report that the grower involved has cited food safety concerns as a motivating factor for the actions that led to the violation notice.

Description of a lawsuit threatened by a grower to protest the enforcement of laws that s/he feels interfere with the need to address food safety risks provides additional documentation of the legal ramifications of evolving food safety guidelines. In this case, a grower with deer pressure in a leafy greens crop requested and obtained a series of depredation permits from the California Department of Fish and Game (CDFG). After 40 deer were taken at that location, CDFG indicated that further depredation permits would not be issued and the grower threatened a lawsuit challenging CDFG’s refusal to grant additional depredation permits. Available details of this case are provided in Supplementary Materials Section D. A fourth example of concern about the legality of management actions apparently associated with food safety concerns occurs in Caltrans challenge of grower clearing in Caltrans Right-of-Ways without a permit. A letter documenting these concerns is included in Supplementary Materials Section D.

4. Loss of Essential Wetland and Riparian Habitat

While wildlife movement corridors are often not formally protected, they are essential for many wildlife species. In the extremely fragmented Central Coast landscape, riparian vegetation provides essential linkage between habitat, without which many species will be challenged to successfully mate, shelter, and find food. Like removal of riparian vegetation, installation of wildlife exclusion fencing is another management strategy to reduce animal incursion that is likely to reduce animal access to important movement corridors. How fencing is installed (around field perimeters vs. between habitat areas) can influence the impact on wildlife use of existing habitat.

In addition to its importance as terrestrial habitat, riparian vegetation plays a critical role in protecting aquatic habitat as it stabilizes banks, reduces sediment load, maintains cooler water temperatures essential for protected salmonids in the region, decreases movement of pollutants, nutrients and sediments into surface waters, provides large wood essential in stream bed to optimize salmonid habitat, provides organic matter essential for stream ecology, decreases peak flow and enhances groundwater recharge.

As such habitat continues to disappear and/or deteriorates due to a variety of reasons, it is reasonable to anticipate that additional sensitive species may eventually receive legal protection at the state or federal level. To the extent that such future listings occur, growers will likely face increased risk of legal conflict between resource management and food safety activities. Details of laws and ordinances protecting riparian vegetation are found in Supplementary Materials Section B.

Supplementary Materials Section E summarizes information regarding the importance of riparian habitat for wildlife movement corridors in fragmented landscape, the importance of these movement corridors for species survival, and the historic trends of disappearance of riparian habitat nationwide. The critical importance of habitat preservation in endangered species protection is evident in the frequent listing of habitat destruction and deterioration as a threat to a wide range of endangered species, including many who rely on water resources that riparian vegetation protects.

5. Direct Impacts on Protected Species

Use of materials to kill and/or discourage use of water bodies by aquatic species (e.g. application of copper sulfate) may have a direct lethal effect on multiple threatened, endangered or otherwise protected species. Detection of such take is extremely difficult, particularly with limited enforcement personnel, but given the reports of the use of copper sulfate by growers to control frog presence in farm water bodies, and the presence of several protected aquatic species in the Central Coast region, which are known to use ponds and other waterbodies in proximity to production fields, conflict is very likely to occur in some settings. See Supplementary Materials Section A for grower comments and survey results relevant to copper sulfate use to control frogs and tadpoles.

To the extent that reduced tolerance for non-crop vegetation may lead to impacts to riparian habitat and water quality, federally protected species and designated Critical Habitat may be compromised. Language in the Endangered Species Act (ESA) notes that actions that "may affect" or are "likely to adversely affect" listed species and their Critical Habitat are prohibited, absent ESA take exemption (e.g. ESA sections 4,7, or 10). See Supplementary Materials Section B for relevant language.

6. EPA Pesticide Labeling Changes Likely to Create New Challenges

Current efforts by the EPA to update both pesticide labeling requirements and Endangered Species Bulletins will guide growers to mitigate potential impacts of pesticide applications on endangered species with various conservation practices. Among the changes already evident is specific language on pesticide labels directing growers to use landscape features such as tree lines (to reduce drift) and vegetation strips (to reduce movement in surface run off) to reduce adverse impacts on endangered species in the growing environment. Use of vegetative buffers and the presence of robust riparian vegetation is likely to be a central feature of these newly specified mitigation requirements. To the extent that growers are unable to maintain these features due to food safety concerns, increased risk of violations due to use inconsistent with pesticide labeling is possible. Additional detail of these changes and anticipated impact is provided in Supplementary Materials Section F.

7. Undermining Ecosystems Services

Federal agencies are tasked with monitoring public health in numerous dimensions, of which pathogen risk in fresh produce is only one. Ensuring that public trust resources such as soil, air and water are sustainably managed is a critical mandate for the federal government. Avoidance of pathogenic contamination of fresh produce, and the devastating health risks that may result, particularly for the elderly, very young, or immuno-compromised members of the public, is clearly a compelling public health mandate for both regulatory agencies and the growers of fresh produce; so too is protection of the air, water and soil resources upon which current and future generations must rely for their own health and prosperity.

While public health risks associated with removal of conservation practices removed because of food safety concerns are much harder to quantify than acute effects of pathogen contamination of food, they are no less real. On-going conservation efforts address issues such as marine fisheries (seafood) affected by compromised water quality and sediment loads, diminished and contaminated ground water supplies, eroded and depleted soil resources, and compromised air quality. These impacts all directly affect the availability of safe supplies of food, water and clean air for the public. Supplementary Materials Section G presents a figure summarizing the ecosystem services provided by a natural resource base managed for multiple objectives.

While many of the more damaging ecological impacts of food safety management in California were reported to be a result of proprietary food safety programs, there were significant impacts from programs more similar to the types of guidelines that FDA is likely to propose in the new rule. During a Stakeholder Discussion Series of meetings organized by the Georgetown Produce Safety Project in New York, Ohio, Georgia, Maryland and California in Spring 2010 it was evident that knowledge of and sensitivity to food safety impacts on the ecological health of the farming environment varied widely across regions. This suggests that without extreme caution in crafting the language of the guidelines and training the food safety auditors and growers, the kind of adverse effects of food safety management on conservation efforts noted in California is likely to be repeated or even amplified nationwide. If this is the case, the adverse impact on ecosystem services that well-managed farm land provides are at risk on a national scale.

To see the entire comments including supplemental Materials go to:

http://www.wildfarmalliance.org/Press%20Room/TNC_comments_to_FDA.pdf