WHOLESALE SUCCESS

Risk Assessments & Land Use

PREPARE YOUR MATERIALS:
1. Your Farm Map

www.onfarmfoodsafety.org
www.familyfarmed.org
FAMILYFARMED USDA USDA is an equal opportunity provider.

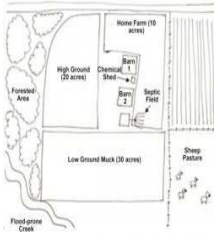
Land Use Risk Assessment & Conservation Co-Management B

1. Source: What and where are the potential contamination risks?

2. Pathways: How can the contaminants move?

3. Risk Mitigation: What systems and practices can minimize risk?

Basic Features



- Farm name, location
- Date/or update of map
- Crop production areas with ID
- Greenhouses and high tunnels
- Postharvest and storage areas
- Buildings and infrastructure
- Roads and driveways
- Water sources: wells, irrigation hydrants, ponds, canals, and streams
- Water Deliver Systems: Irrigation pipes, valves, gates, reservoirs, returns
- Indicate directions, N, S, E, W

Sources

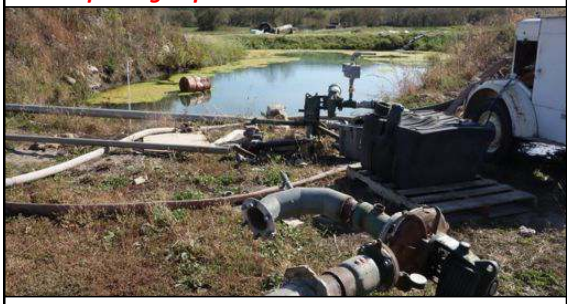
MAP IT!

- Domestic animal areas: feeding, grazing, travel lanes
- Areas pets frequent
- High levels of wild animal activity (i.e. nesting or feeding)
- Manure storage, compost production and storage
- Green waste piles
- Produce cull sites
- Gasoline storage, chemical, fertilizer, and pesticide storage
- Recent history of landfill, industrial activities, heavy metals
- Areas for washing equipment and animals
- Human sanitation facilities, septic leach fields, trash
- Worker break areas, parking & visitor access areas

INCLUDE NEIGHBOR'S LAND IN PATHWAY SHED

Survival & Reproduction
- Pooled Water
- Indicate time of year

Sediments and algae blooms can be a key site for pathogen persistence in water bodies.



Biofilms can provide protection from environmental stress and predation by other microbes

Prepared and Presented by Atina Diffley,
Organic Farming Works LLC

Field and Land Risk Assessment

B

Date completed:
Signature of Person Who Completed It:
Chart the issues you have identified with your drawings and maps.

Location	Potential Contaminant: Chemical, Physical, Biological	Pathways: Air, Water, Animals, Humans, Equipment	Risk Assessment: Likeliness	Risk Assessment: Severity	Action

Study your map for potential sources of contaminants.

Fill in potential risks here.

Contamination Pathways: ANIMALS

- Draw migratory bird routes and paths of wild animals
- Indicate domestic animal movement

Contamination Pathways: AIR

Use arrows to show air movement

Contamination Pathways: WATER

- Indicate sloping land that water will run off

Animals on hillside above crops may increase risk when rain carries pathogens into crop fields.

Contamination Pathways: WATER

Where is the water from?

Animals Higher in Watershed

Animals overly impacting streams can result in polluted water downstream on the farm.

Contamination Pathways: EQUIPMENT

-Indicate Major Equipment Pathways

Contamination Pathways: PEOPLE

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Next to the potential sources of pathogens you've identified list the pathways the contaminant could take to your produce, water, or produce contact surfaces.

RISK ASSESSMENT: Prioritize

EXAMPLE RISK		Probability: Very High	High	Medium	Low	Very Low
Conse-quence	Very High	Very High	Very High	Very High	High	High
	High	Very High	High	High	Medium	Medium
	Medium	High	High	Medium	Medium	Low
	Low	High	Medium	Medium	Low	Very Low
	Very Low	Medium	Low	Low	Very Low	Very Low

Listeria Example

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Low
Medium
High

Actions To Minimize Risk

Location	Potential Contaminant: Chemical, Physical, Biological	Pathways: Air, Water, Animals, Humans, Equipment	Risk Assessment: Likeliness	Risk Assessment: Severity	Action

Co-Management:
<u>Practices & Systems</u> that minimize microbiological hazards associated with food production while also conserving and protecting soil, water, air, wildlife, and other natural resources.

California's Salinas Valley—the nation's salad bowl, is also the heart of the leafy green food safety crisis.

Tree lines that served as windbreaks and habitat for beneficial insects and rodent-eating raptors in the past were rapidly removed because of the unfounded fear that native birds are significant vectors of E. coli 0157.

The Produce Rule and Domestic and Wild Animals

PR Guidance: *Farms are not required to exclude animals from outdoor growing areas, destroy habitat, or clear borders around growing or drainage areas. Nothing in the rule should be interpreted as such.*

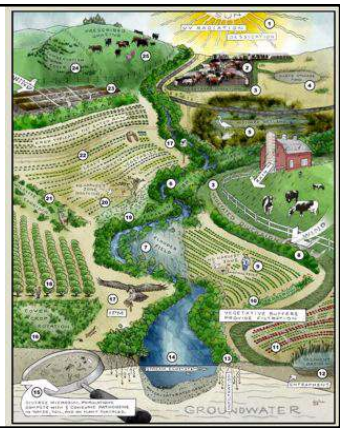
Predatory animals, such as hawks, or owls, can manage rodents and squirrels and can be good for food safety.

- A crop should not be planted directly under a raptor nest box, or roost.
- Farm activities should not carry -predator feces into produce areas

Biodiversity Loss May Increase Pathogen Prevalence

- A study conducted in California suggests that a reduction in rodent species diversity may cause increased pathogen prevalence in the individuals that remain.
- Other research shows that biodiversity loss frequently increases disease transmission.

Healthy Diverse Ecosystems Help Keep Pathogens in Check



Vegetation's Filtering Capacity

MAP IT

UC Davis researchers found grass and wetlands can filter up to 99% of E coli during rain events.

Map Riparian Vegetation

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Contamination Pathways: WATER-Rain

Potential Risk: Animals on hillside above crops may increase risk when rain carries pathogens into crop fields.

MAP IT

Possible Strategies
- Diversion Ditch
- Grass strips

Vegetation's Filtering Capacity

Windbreaks and hedgerows reduce the potential of dust-borne pathogen movement from contaminated areas.

MAP IT

S. Earnshaw

Contamination Pathways: AIR

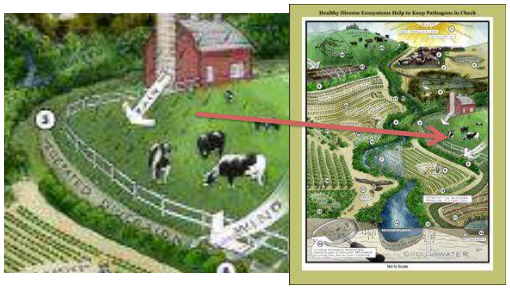
How can vegetation reduce these risks?

Crop Placement

Crops should not be planted near, down wind, or down water of manure piles or other sources of contamination.

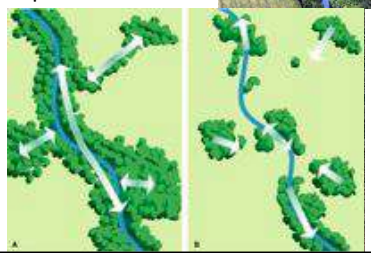
Map Compost Making Area and Windbreak

1a. Map Prevailing Wind Direction, Pathogen Source and Windbreak



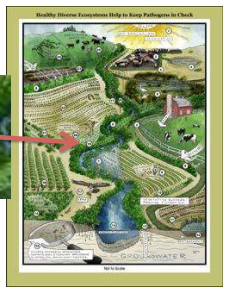
Wildlife Corridors

Allow wildlife to access resources without having to walk across crop fields or leave their preferred habitat



Encourage Raptors to Deter Pests on the Farm Contaminating Crops

2c. Map Areas of Overhanging Vegetation

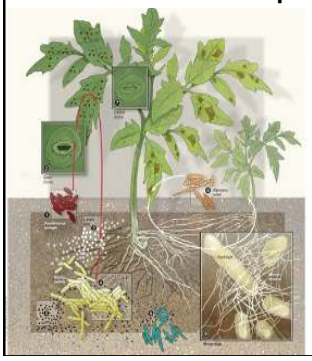


Factors in Survival of Human Pathogens

- **Direct Sunlight**: UV rays and drying can decrease pathogens
- Pathogens persist longer **in cool/moist conditions**
- **Freezing** by itself does not completely kill pathogens (E coli 015 stored at -80° to preserve viability)
- **Rapid freeze-thaw cycles** can cause rapid death of pathogens in soil
- **Desiccation** in dry soils, wind, sun

Source: Wild Farm Alliance
A Farmer's Guide to Food Safety and Conservation

Non-Pathogenic Beneficial Microbes Generally Prevail if Diverse Populations are Present



- Outcompete the pathogens for food, water, and space
- Kill and consume the pathogens
- Make conditions unfavorable by tying up critical growth nutrients

Soil Management Affects the Survival of Human Illness Pathogens

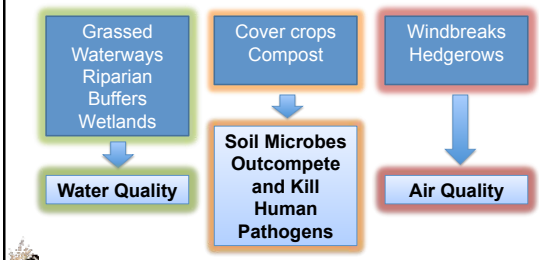
Microbial diversity helps to reduce pathogen survival

- Cover crops significantly reduced e-coli in a field with raw dairy manure solids
- E-coli declined faster in organic systems than non-organic

A.D. van Diepeningen, O.J.de Vos, and A.H.van Bruggen 2005

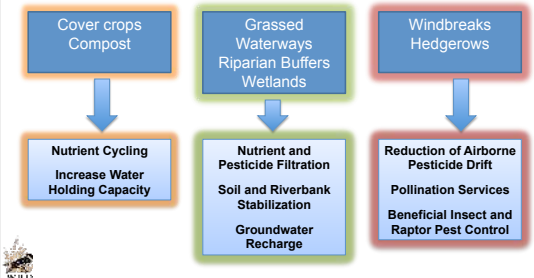
Farm Conservation Practices That Support Public Health – Specifically Food Safety

MAP IT



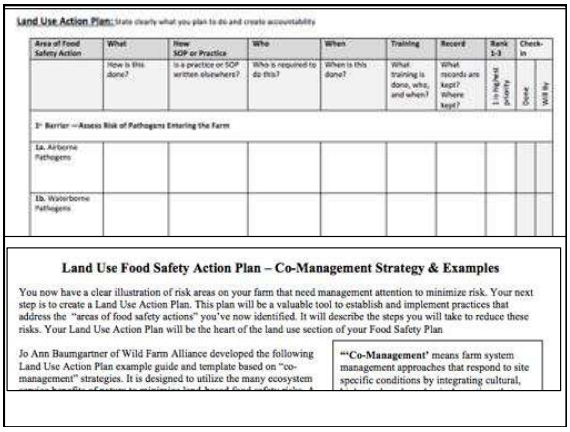
Farm Conservation Practices That Support Public Health – More Generally– Food Quality & Environment

MAP IT



MAP IT: Conservation Habitat to Reduce Risk

- Vegetated Water Diversion Ditches
- Grass Water Way
- Sediment Basin
- Hedgerows And Windbreaks
- Riparian Vegetated Areas
- Grass Filter Strip Beside Fields Or Water Or Roads
- Wetlands
- Forestlands



Land Use Action Plan: State clearly what you plan to do and create accountability

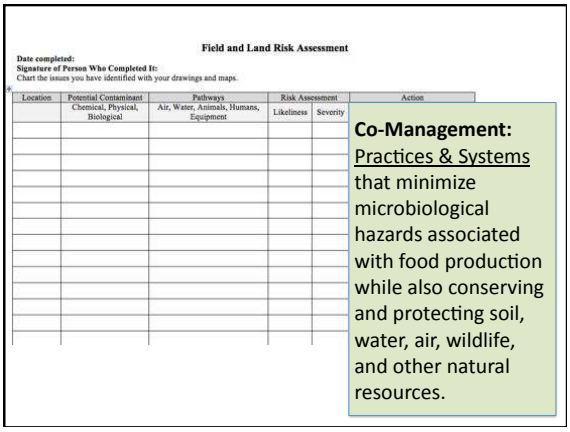
Area of Food Safety Action	What	How SOP or Practice	Who	When	Training	Record	Rank 1-3	Check-in	
	How is this done?	Is a practice or SOP written elsewhere?	Who is required to do this?	When is this done?	What training is done, who, and when?	What records are kept? Where kept?	1 is highest priority	Done	Will By
I° Barrier —Assess Risk of Pathogens Entering the Farm									
1a. Airborne Pathogens									
1b. Waterborne Pathogens									

Land Use Food Safety Action Plan – Co-Management Strategy & Examples

You now have a clear illustration of risk areas on your farm that need management attention to minimize risk. Your next step is to create a Land Use Action Plan. This plan will be a valuable tool to establish and implement practices that address the "areas of food safety actions" you've now identified. It will describe the steps you will take to reduce these risks. Your Land Use Action Plan will be the heart of the land use section of your Food Safety Plan.

Jo Ann Baumgartner of Wild Farm Alliance developed the following Land Use Action Plan example guide and template based on "co-management" strategies. It is designed to utilize the many ecosystem

"'**Co-Management**' means farm system management approaches that respond to site specific conditions by integrating cultural,



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Co-Management:
Practices & Systems that minimize microbiological hazards associated with food production while also conserving and protecting soil, water, air, wildlife, and other natural resources.

The Produce Rule On Domestic and Wild Animals

PR: *"take all measures reasonably necessary to identify and not harvest produce that is likely to be contaminated"*

Difference In Ease Of Control

You've Identified a risk. How will you mitigate it?

Domestic Animals

- Avoid direct contact with animals other than working animals.
-Take steps to minimize the likelihood of contamination when in direct contact with working animals
- Take steps to minimize animal feces getting on produce and contact surfaces

- **USE A SOP**
- **TRAIN**
- **MONITOR**
- **CORRECT**

Working Animals? Develop SOPs: Train animal handlers.
- Is edible portion in the field? How close to harvest?
- To do if animal poops in the field near or on produce
- Practices to complete after handling animal: Handwashing, cleaning and sanitizing tools

USE A SOP & TRAIN/MONITOR/CORRECT

You've Identified a risk. How will you mitigate it?

Pet Or Working Domestic Animal?

Working dogs and cats are not prohibited in PR Audits? Pick your battles.

- **SOP**
- **Train**
- **Monitor**
- **Correct**
- **Audits**

Visitor's PETS should be left at home

Animals, Domestic Or Wild In Produce Fields.

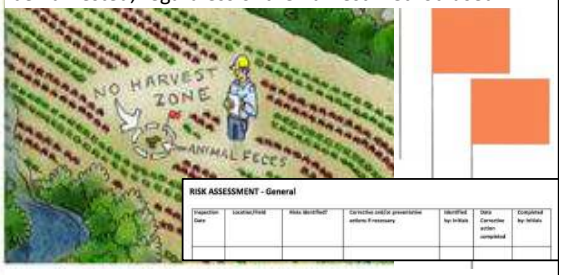
Although the Produce Rule does not require establishing waiting periods between grazing and harvest, the FDA encourages farmers to voluntarily consider applying such intervals as appropriate for the farm's commodities and practices.

Be aware, that most audit programs do require waiting periods or have specific standards.

Number of Animals

High concentrations of wildlife in the growing and harvesting environment increase risk.

MONITOR: Immediately prior to harvest: PR requires farms to visually examine the growing area and produce to be harvested, regardless of the harvest method used.



PR does not require documentation on monitoring.
Many 3rd party audits do require documentation.

Immediately Prior To Harvest

1. MONITOR for fecal contamination & signs of animal activity (trampling, rooting, feeding, tracks, broken fence)

2. ASSESS risks and decide if the crop or a portion of the crop can be safely harvested

3. CORRECT: Make Decisions About Harvest
- Do not harvest any produce that may be contaminated
- Determine if no-harvest buffer zones around the contamination are sufficient to reduce risk to allow harvest of the uncontaminated produce
- Suggested no-harvest buffer zones vary from a 0-25 foot radius, depending on the crop, climate, contamination event, and harvest equipment

CORRECT: **Make Decision:** What to do with the contamination
- Remove, leave, bury, or other
- Consider risks that could result from these actions (e.g., cross-contamination of equipment with feces)

During The Growing Season

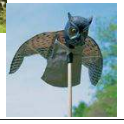
PR also requires assessments during the growing season.

If significant evidence of potential contamination by animals is found, take measures reasonably necessary
- Monitor for feces and evidence of intrusion
- Evaluate the risk of fecal contamination on produce
- Deter

Fence Or Net

Visual Deterrent Or Noise

Decoy



Trap

Tactile Repellent

WORKER TRAINING

Workers must receive training to:
- Recognize and not harvest contaminated produce
- Inspect and correct problems with harvest containers and equipment or report issues to a supervisor, so they do not become a contamination source

Workers must:
- Take measures to not harvest contaminated produce
- Wash hands after handling animal feces or any time hands may be contaminated

Workers should:
- Report food safety concerns to a supervisor

Prepared and Presented by Atina Diffley,
Organic Farming Works LLC

THANK-YOU

- **Evaluations**

www.atinadiffley.com
www.familyfarmed.org