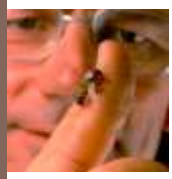
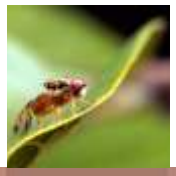
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE












Protecting California from Biological Pollution

January 2004

TABLE OF CONTENTS

PROTECTING CALIFORNIA FROM BIOLOGICAL POLLUTION

JANUARY 2004

Arnold Schwarzenegger
Governor

A.G. Kawamura
CDFA Secretary

PRODUCED BY:

CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

1220 N Street
Sacramento, CA 95814

(916) 654-0433

This report is submitted pursuant to the Supplemental Report of the 2003 Budget Act (Item 8570-002-0001):

Pest Prevention Funding Alternatives. The department shall, on or before January 10, 2004, submit to the budget and fiscal committees of both houses and the Legislative Analyst's Office, a report detailing a means of funding the department's invasive pest and disease exclusion, eradication, and control efforts, including those for the Mediterranean Fruit Fly Exclusion Program, that reduces the state's General Fund costs.

EXECUTIVE SUMMARY 1

THE CHALLENGE 2

The modern availability and ease of interstate and international movement of people and commerce has and will continue to increase California's risk exposure for biological pollution and thus increase the costs of battling these outbreaks after they are already here.

- THE CONCEPT OF BIOLOGICAL POLLUTION 2
- BIOLOGICAL POLLUTION: THREATS FACING CALIFORNIA 2
  - Recent Outbreaks 3
  - Continuing Risks 4
    - Animal Pest and Disease Threats 4
    - Plant Pest and Disease Threats 5
    - Weed Pest Threats 7

THE SAFEGUARD 8

California has built a network to keep biological pollution from entering or becoming established in the state. Using this network to its full potential mitigates the impacts of biological pollution on California's human health, commerce, and environment.

- EXCLUSION VS. ERADICATION – THE SOCIETAL COSTS 8
  - The Mediterranean Fruit Fly – A Case Study 8
- MITIGATING SOCIETAL COSTS – THE MODERN EXCLUSION PROGRAM 9
- CALIFORNIA'S BIOLOGICAL POLLUTION EXCLUSION AND ERADICATION NETWORK 10
  - The Network – Four Integral Parts 10
    - Exclusion: Closing Pathways for Introduction 10
    - Local Surveillance and Detection: State/County Cooperation 11
    - Diagnostics: California's Laboratory System 12
    - Eradication and Control: Rapid Detection and Response 12

RECOMMENDATION 14

General Fund dollars are the most appropriate source of funds and provide the most legally sound method for funding CDFA's biological pollution exclusion and eradication network. By investing additional General Fund dollars in this network, the state can save money by decreasing the frequency of plant and animal pest and disease outbreaks.

APPENDIX 1: INCREASED FEDERAL FUNDING 17

APPENDIX 2: SPECIAL FUND REINVENTION – ASSESSMENT ON ALL TRAVEL AND COMMERCE 19

EXECUTIVE SUMMARY

A safe food supply is a precious commodity. The California Department of Food and Agriculture (CDFA) is required by law to uphold many different responsibilities – including a core charge for the exclusion of plant and animal pests and diseases. The early identification and the prevention of entry of pests and diseases is one of our most significant challenges. Failure to meet this challenge presents one of the greatest threats to public health and safety and California's environment.

This *challenge* (page 2) is exacerbated by increasing dependence upon international, interstate and intrastate travel and commerce, which continuously expose California's population, environment and economy to biological pollution – the unintended introduction of exotic and invasive strains and species.

Pest and disease battles, which the state has had to mount, include outbreaks of red imported fire ant, bovine tuberculosis, exotic Newcastle disease, hydrilla, gypsy moth, Mexican fruit fly, Asian longhorned beetle, sudden oak death and caulerpa.

Public health and safety demands availability of safe food and fiber. The state's General Fund investment provides a network of *safeguards* (page 8) to help protect the state's environment and $1.45 trillion economy from future outbreaks.

California's legislators are to be thanked for requiring that adequate safeguards remain in place to ensure future outbreaks are prevented and, if introduced, eradicated before epidemic conditions are reached. But those public health and safety safeguards require funding to remain active.

In order to balance the state budget deficit, legislators have asked whether General Fund dollars required to support these necessary safeguards can be obtained from other sources such as the federal government and/or industry assessments. We have explored those options and offer the following *recommendations* (page 14) for further consideration by budget negotiators.

> General Fund dollars are the most appropriate source of funds and provide the most legally sound method for funding CDFA's biological pollution exclusion and eradication network. By investing additional General Fund dollars in this network, the state can save money by decreasing the frequency of plant and animal pest and disease outbreaks.

First, greater federal funding for the program (Appendix 1, page 17) would be difficult to obtain due to the uncertainty associated with receiving and maintaining congressional appropriations. If federal funding were to become available, it may come at the expense of federal bio-terrorism, food stamp or other special-assistance programs.

Second, an assessment (Appendix 2, page 19) to address program costs to parties with the potential for introducing such biological pollution into the state would require congressional authority to assess all commerce. Moreover, substantial time and funding would be required to create a constitutionally valid system to track all commerce.

Therefore, the Department of Food and Agriculture recommends the California Legislature retain important safeguards designed to prevent biological pollution through ongoing support from the state's General Fund. The direct funding approach is consistent with the constitutionally defined functions provided by the Department and avoids potential international, interstate and intrastate lawsuits that would seek reimbursement for any assessed funds.

This General Fund investment ultimately reduces potential for unknown expenses required to eradicate future outbreaks that reach epidemic proportions. Increasing demand for imports can be met only if necessary safeguards remain in place to ensure that public health and safety is protected.

THE CHALLENGE

The modern availability and ease of interstate and international movement of people and commerce will continue to increase California's risk exposure for biological pollution and thus increase the costs of battling these outbreaks after they are already here.

THE CONCEPT OF BIOLOGICAL POLLUTION

Exotic and invasive strains and species constitute a form of biological pollution that threatens America's people, commerce and environment to the tune of $100 billion annually.[1]

With today's increasing movement of people and commerce, our environment is at serious risk from the unintentional introduction of exotic and invasive strains and species. These range from plants and animals to insect pests and various diseases. Invasive species are considered the second greatest threat to biological diversity (after habitat loss) and are a leading factor in listings under the Endangered Species Act. Ecologists increasingly refer to this collection of invasive organisms as "biological pollution," a significant threat to California's human health, commerce, and environment.

BIOLOGICAL POLLUTION: THREATS FACING CALIFORNIA

Working with our agency partners, CDFA has direct responsibilities to protect our state from biological pollution. We undertake these activities, not just for the benefit of agriculture, but to protect all Californians, all California industries, and all of California's precious natural resources. Indeed, California would still face a significant biological pollution challenge if agriculture in the state was eliminated and replaced by foreign imports.

Today, we work to eradicate the red imported fire ant, a scourge to wildlife and urban environments. We protect public health and safety and the food supply from animal diseases with human impacts, such as bovine tuberculosis and bovine spongiform encephalopathy (BSE or mad cow disease). We fight invasive aquatic weeds such as caulerpa, hydrilla, and water hyacinth. We combat terrestrial weeds, such as yellow starthistle, that displace native habitats, contribute to forest fires, and harm wildlife. We have successfully eradicated dozens of infestations of gypsy moth that threaten our forest resources, and have devoted many hours to defeating threats to urban landscapes, ranging from the ash whitefly and red gum lerp psyllid to the Japanese beetle.

These invasive pests and diseases share three things in common:

- They came to California from other areas of the globe;
- Their new home has many of the attributes of their native environments, but typically none of their enemies, making them powerful foes against our native species, and
- The international movement of people and products brought them here.

[1] David Pimentel, et al., "Environmental and Economic Costs Associated with Non-Indigenous Species in the United States," Paper presented at the annual meeting of the American Association for the Advancement of Science, Anaheim, California, January 1999.

BIOLOGICAL POLLUTION:

Recent Outbreaks

A backyard chicken exhibits END symptoms.

In 2003, California faced three major pest and animal disease outbreaks.

State law places a duty on CDFA to eradicate plant and animal pest and disease outbreaks. By eradicating these outbreaks quickly, we have protected California's human health, commerce, and environment and mitigated the potential for liability due to breach of this statutory duty.

Mexican Fruit Fly:
Eradication Cost $15 million
Total Potential Impact $1.9 billion

In November 2002, the most significant Mexican fruit fly infestation in California history was detected in the Valley Center area of San Diego County. As a result, CDFA and the United States Department of Agriculture (USDA) established a 130-square mile quarantine zone to prevent further spread of this pest. This quarantine restricted the ship-ment of Mexican fruit fly host products and cost producers approximately $12 million in crop losses. Eradication of this outbreak cost approximately $15 million, which was split equally by CDFA and USDA.

Bovine Tuberculosis:
Eradication Cost $12.7 million
Total Potential Impact $6 billion

Carcass inspection reveals symptoms of bovine TB.

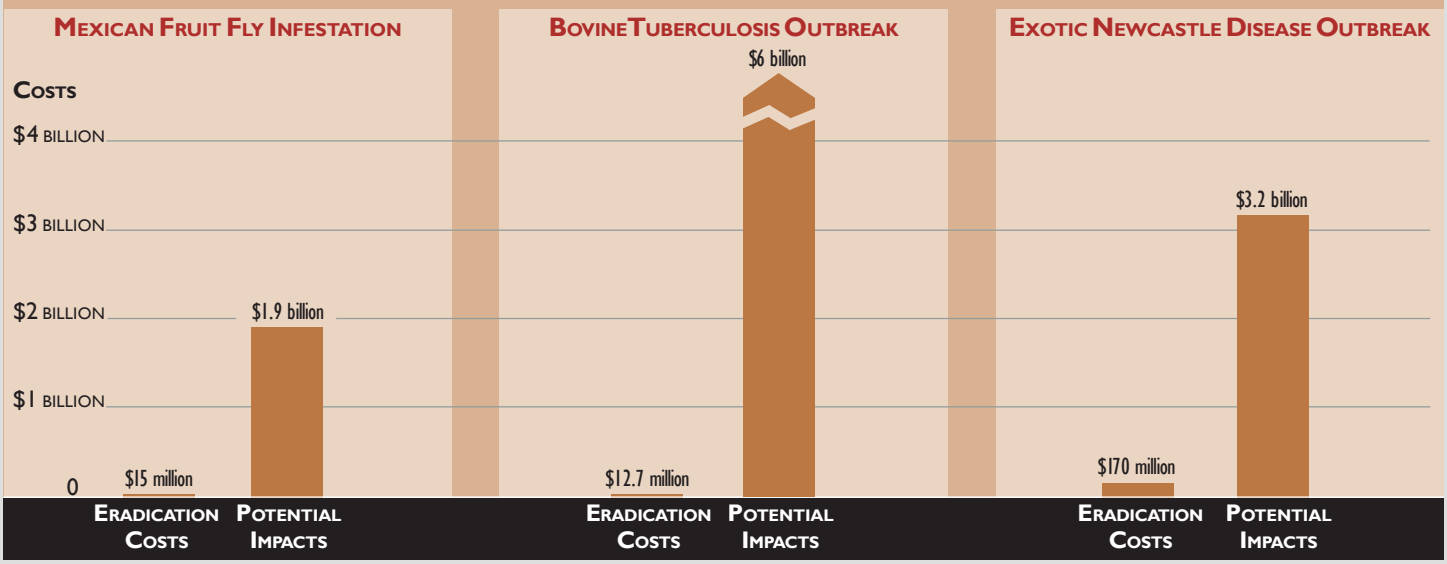
Bovine tuberculosis, a chronic lung disease that can affect most mammals, was confirmed in two Tulare County dairy herds and at a Fresno meat processing facility in 2003. Presence of this disease anywhere in the state presents a public health threat and the loss of our TB-Free designation by USDA severely hinders the ability of the $6 billion beef and dairy industries to market or transport animals. In response to this outbreak, CDFA and USDA have undertaken a testing and eradication program that, to date, has cost $12.7 million and requires the work of approximately 30 field personnel who have tested over 500,000 cattle in 375 herds in the Central Valley. Because of this outbreak, the earliest California can expect to regain our TB-Free designation is 2005.

Exotic Newcastle Disease:
Eradication Cost $170 million
Total Potential Impact $3.2 billion

Exotic Newcastle disease is the most contagious and fatal viral disease known to affect birds. On October 1, 2002, the disease was discovered in backyard poultry in Southern California. At its height, this project grew to include three incident command posts and 1,400 employees who conducted extensive surveillance, enforced strict quarantines on infected and exposed birds, and humanely destroyed infected flocks. After a massive effort by local, state, and federal officials, quarantines were lifted in September 2003, once again allowing the free movement of show birds, poultry and poultry products.

In all, 920 infected flocks were identified and 3.2 million birds were destroyed at a cost of over $3.6 million for the state and $166.4 million for USDA ($170 million total).

Costs vs. Potential Losses: The Value of Emergency Response



CONTINUING RISKS

The modern availability and ease of interstate and international travel of citizens and products by truck, rail, seaports, and airports increase the incidence of biological pollution being introduced into California. Plant and animal pests and diseases are among the biggest challenges facing the public and environmental health of our state. Indeed, experts agree that California's exclusion efforts should be increasing to keep pace.

Animal Pest and Disease Threats

California's outbreak of exotic Newcastle disease in poultry cost $170 million and resulted in the largest animal disease eradication campaign in the United States in the last 30 years. Although animal disease outbreaks are less frequent than plant pest and disease outbreaks, their impacts are typically larger in scope and the disease is often times more difficult to contain and trace. For these reasons, experts have identified fast moving viral diseases in animals, such as foot and mouth disease, as especially threatening mechanisms for terrorist activities in the United States.

The positive finding of BSE (or mad cow disease) in a single cow in Canada serves as an example of the enormous impacts animal diseases can have on commerce, human health, and public confidence in the food supply. Canada's losses thus far have been estimated at $3 billion. But, these losses are nothing compared to those that will accrue in the United States following the subsequent finding of BSE in a single cow in the state of Washington on December 23, 2003.

Almost immediately after USDA's announcement of the find, beef prices at the Chicago Mercantile Exchange

Although the discovery of mad cow disease in Washington will have economic impacts in the billions of dollars, human lives have been protected because of the exclusion, detection, and testing network maintained by USDA and the states.

As the United Kingdom's recent experience with foot and mouth disease illustrated, failure to prepare for major disease outbreaks results in astronomical response costs and delayed economic recovery.

The International Office of Epizootics (OIE) is an intergovernmental organization that creates and publishes a list of animal diseases that have serious socioeconomic and public health consequences. **Fourteen of the fifteen diseases on this list are foreign to the United States,** making potential introduction a serious concern for California.

Current "List A" Diseases:

Foot and mouth disease
Swine vesicular disease
Peste des petits ruminants
Lumpy skin disease
Bluetongue
African horse sickness
Classical swine fever
Newcastle disease
Highly pathogenic avian influenza
Vesicular stomatitis
Rinderpest
Contagious bovine pleuropneumonia
Rift Valley fever
Sheep pox and goat pox
African swine fever

dropped dramatically, stocks of companies marketing beef products (McDonald's, Wendy's, and Tyson Foods as examples) dropped up to 10%, and nine countries, including some of California's largest trading partners, banned imports of all U.S. beef and beef products. Although this single finding will have economic impacts in the billions of dollars, human lives have been protected because of the exclusion, detection, and testing network maintained by USDA and the states.

State and federal investment in early detection networks also protects California's wildlife population from animal diseases. Tuberculosis, brucelosis, chronic wasting disease (the BSE equivalent in wild deer and elk), avian influenza, and foot and mouth disease are just a few examples of the animal diseases that have been known to affect both domesticated and wild animals. In fact, Wisconsin has been forced to institute an aggressive eradication program to combat chronic wasting disease in deer. As part of this program, the state identified a 411 square-mile area and has set out to eliminate all of the deer in that zone. Without these drastic steps, state officials believe the disease would continue to spread among the wildlife in that area and beyond.[2]

Plant Pest and Disease Threats

When exotic insect pests are excluded from the state, all of society benefits in the form of lower food costs, increased recreational value of public and private lands, and protection of urban landscapes. A 2000 study estimated that economic costs to the U.S. of exotic pest invasions is $100 billion per year, which does not include the costs of displacement of native species or native ecosystems.[3]

One pest that CDFA continually battles is the **European gypsy moth.** This pest spreads from the infested Eastern United States to uninfested areas by hitching on cars, recreational vehicles, firewood, nursery stock, children's outdoor toys and outdoor household furniture. From 2000 to 2002, the Department intercepted gypsy moth-infested cargo 89 times at our border inspection stations and held 11,382 potentially infested shipments.

When populations of gypsy moth reach outbreak proportions, this pest can completely defoliate oak, apple, crabapple, poplar, beech, willow, birch, and hawthorn trees over a wide geographic area. In California, where we are focused on eradicating this pest, it has been reintroduced and successfully eradicated 24 times at a total cost of just under $1 million. In contrast, in the eastern United States, where they have given up on eradication and are attempting to control the pest, annual expenditures have exceeded $35 million since 1980. This estimate is conservative as it does not include losses in timber, recreation, and real estate values or disruptions to forest ecosystems.

Eradication vs. Control:

In California, where we are focused on eradicating the gypsy moth, it has been reintroduced and successfully eradicated 24 times at **a total cost of just under $1 million.** In contrast, in the eastern United States, where they have given up on eradication and are attempting to control the pest, **annual expenditures have exceeded $35 million**

When populations of the gypsy moth reach outbreak proportions, this pest can completely defoliate oak, apple, crabapple, poplar, beech, willow, birch, and hawthorn trees over a wide geographic area.

[2] Scott Hassett, Secretary, Wisconsin Department of Natural Resources.

[3] David Pimentel, et al., "Environmental and Economic Costs Associated with Non-Indigenous Species in the United States," Paper presented at the annual meeting of the American Association for the Advancement of Science, Anaheim, California, January 1999.

The Asian longhorned beetle damages hardwood trees. Infested trees become unsightly, drop dead branches, and eventually die.

The Asian longhorned beetle has proven to be one of California's more recent insect scourges. This pest feeds on over 100 species of hardwood trees and its estimated potential impact is $41 billion in damage to the forest products, commercial fruit and tourism industries.

This beetle is not known to naturally occur in the state and showed up in three California warehouses inside untreated wood pallets from China. Because of California's biological pollution exclusion/eradication network, we have been far more successful in combating this pest than some other states. For example, as of May 2002, the states of New York and Illinois, in cooperation with USDA, have spent over $30 million to eradicate this pest. In 1998 alone, New York City was forced to remove 5,700 trees and the city of Chicago removed almost 700 trees infested by the Asian longhorned beetle.

Red Imported Fire Ant (RIFA)

California continues to battle infestations of the **Red Imported Fire Ant** to avoid the fate suffered by other states. In Texas, these ants have killed two people. Estimated damages and control expenditures there exceed $1.2 billion annually. More than half this amount is due to control activities within the cities of Austin, Dallas, Fort Worth, Houston, and San Antonio.

Swarms of the aggressive red imported fire ant (RIFA) can be deadly, both to people and livestock.

Sudden Oak Death

The dying crown of a coast live oak (above), drooping branch tips (right) and "weeping bark" (below, right) are symptoms of sudden oak death, a fungus that has claimed more than 100,000 trees in California since its discovery in 1995.

Sudden oak death, a devastating fungus disease first discovered in 1995, has killed more than 100,000 oak species in 12 coastal California counties (10,000 in Marin County alone and virtually all of the tan oaks in Big Sur). According to the U.S. Forest Service, Sudden Oak Death has altered California's forest ecosystem for many years to come. Because so little is known about this disease, and its ever-expanding host range, the impact on forests, urban environments, and nurseries cannot be measured, but the potential impact is staggering.

Weed Pest Threats

Weeds are found virtually everywhere in our state; they grow in our yards, they line roads and waterways, they thrive in wide-open spaces, and cities and counties now include weed abatement in their annual budgets. Yet most people are unaware of the danger weeds can pose to our productivity and our natural environment. There are over 1,200 persistent weed species already in California, of which approximately 200 species are so destructive they can and have transformed natural ecosystems and working landscapes. It is estimated that economic losses and costs related to weeds throughout the U.S. are $33.2 billion every year.

Weeds are especially detrimental to the environment as they can hinder beneficial uses of land and water delivery systems, alter patterns of erosion, jeopardize the safety of humans and property due to their extreme flammability, and harm animals that encounter them due to their poisonous nature.

One of the most persistent noxious weeds in California is the **yellow starthistle.** The dense, matted growth of this weed reduces biodiversity and habitat and displaces native species and forage plants. Range animals will not eat the plant once spines begin to develop, and it is poisonous to horses. The starthistle's deep taproot depletes moisture in the lower layers of the soil and the competition for deep water hinders the establishment of oaks. To combat this pest, CDFA has implemented a biological control program that restrains the spread of this weed pest by using five different insect species that feed on starthistle seeds.

Hydrilla, a serious aquatic weed problem, has been detected in 28 locations in 17 counties throughout California and almost all of these infestations can be attributed to infested marine equipment or other human activity. California's largest single hydrilla eradication project is at Clear Lake in Lake County. In 1994, over 200 acres of this lake were infested with hydrilla. Over the past decade, CDFA has invested over $10 million in battling this infestation while keeping the lake open for recreational and other activities. The result – in 2003, only a single new plant was detected.

One of the most persistent noxious weeds in California is the **yellow starthistle.**

HYDRILLA: BEFORE & AFTER

Some of California's most serious weed problems occur in our waterways, lakes and streams. The aquatic plant **hydrilla** is considered one of the most serious aquatic weed problems in the world and CDFA maintains an intensive program to survey and eradicate this aquatic weed pest. It can quickly take over lakes and streams, crowding out native animals and plants and blocking hydroelectric plants, while impeding water flow and delivery. Its rapid growth and ease of spread by boats makes it critical to detect early and eradicate. Based on estimates from USDA, the permanent establishment of hydrilla in the Sacramento/San Joaquin Delta would result in $200 million in annual losses.[4]

[4] CDFA Plant Health and Pest Prevention Services, 2003.

THE SAFEGUARD

California has built a network to keep biological pollution from entering or becoming established in the state. Using this network to its full potential mitigates the impacts of biological pollution on California's human health, commerce, and environment.

EXCLUSION VS. ERADICATION: SOCIETAL COSTS

The impacts of disasters and emergencies in one sector of California's economy, or one area of the state, are rarely confined to that industry or area alone. Often, the ripple effect is felt by all of California's citizens, industries, and resources. These impacts are commonly referred to as "societal costs" and the fires of Southern California provide a recent example.

With losses being pegged in the billions of dollars, these fires resulted in 22 deaths, burned over 700,000 acres, destroyed almost 4,000 homes and buildings, and have led to mudslides and other disasters which have claimed additional human lives. Certainly, the lasting environmental impacts and their effects on California residents are unquantifiable. But, as people begin to rebuild their homes and businesses, the fire's economic impacts will be felt throughout the state in the service, insurance, and construction industries.

As if it weren't enough that the hillsides of Southern California were stripped and blackened by the recent fires, additional lives were lost when heavy rains caused mudslides. The moral of the story: although an emergency's initial damage can be startling, its long-term, societal costs can be even worse.

Similarly, broad outbreaks of plant and animal pests and diseases can have staggering initial impacts and lasting societal costs, such as the erosion of public confidence in the safety of our food supply. For discussion purposes, we offer an analysis of the impacts of the Mediterranean fruit fly.

The Mediterranean Fruit Fly: A Case Study

Staggering Initial Losses and High Ongoing Costs

If California were to become generally infested with the Medfly, annual losses would be measured in the billions of dollars. Part of this would be due to direct damages to food from the insect, but most of the financial impacts would accrue from trade losses as impacted products would be quarantined and their movement restricted. This would result in lost jobs and economic activity in the commercial transportation and related industries, such as truckers, ports, airports, petroleum suppliers, mechanics, and others.

In the months and years following a sudden and broad infestation, ongoing control costs would also be significant. A University of California study examining a representative sample of Medfly-vulnerable commodities concludes that:

- Consumers could expect to pay substantially higher food costs.
- Our state would stand to lose approximately $538 million in output, $259 million in total income, $283 million in gross state product, and 7,900 jobs.

- A general infestation would impose up to $341 million in additional production costs on California agriculture.
- Post-harvest pesticide treatments would become necessary for fresh produce shipped out of California in order to comply with quarantine requirements. Total post-harvest treatment costs for those commodities analyzed are estimated at $169 million.
- Packing, treatment, and shipping facilities would need to be upgraded to have fly-excluding equipment at an estimated cost of $12.3 million.
- Transportation to special treatment facilities would be required in many cases at an estimated cost of $8.8 million annually.
- Construction of additional fumigation treatment chambers and cold storage facilities is estimated at over $100 million.

These cost estimates are conservative because the study analyzed only a small sample of susceptible crops and assumed no reduction in production yield or interruption to market activity.[5]

Mitigating Societal Costs: The Modern Exclusion Program

Rather than risk a broad infestation and its use of chemicals to stop new Medfly infestations, our state has developed a unique, environmentally friendly approach: CDFA raises millions of sterile male Medflies and releases them within the high-risk area where introductions have historically been detected. These sterile flies mate with any wild, fertile female Medflies that have been introduced into the area. Reproduction is curbed because the eggs resulting from this pairing with a sterile male will not hatch.

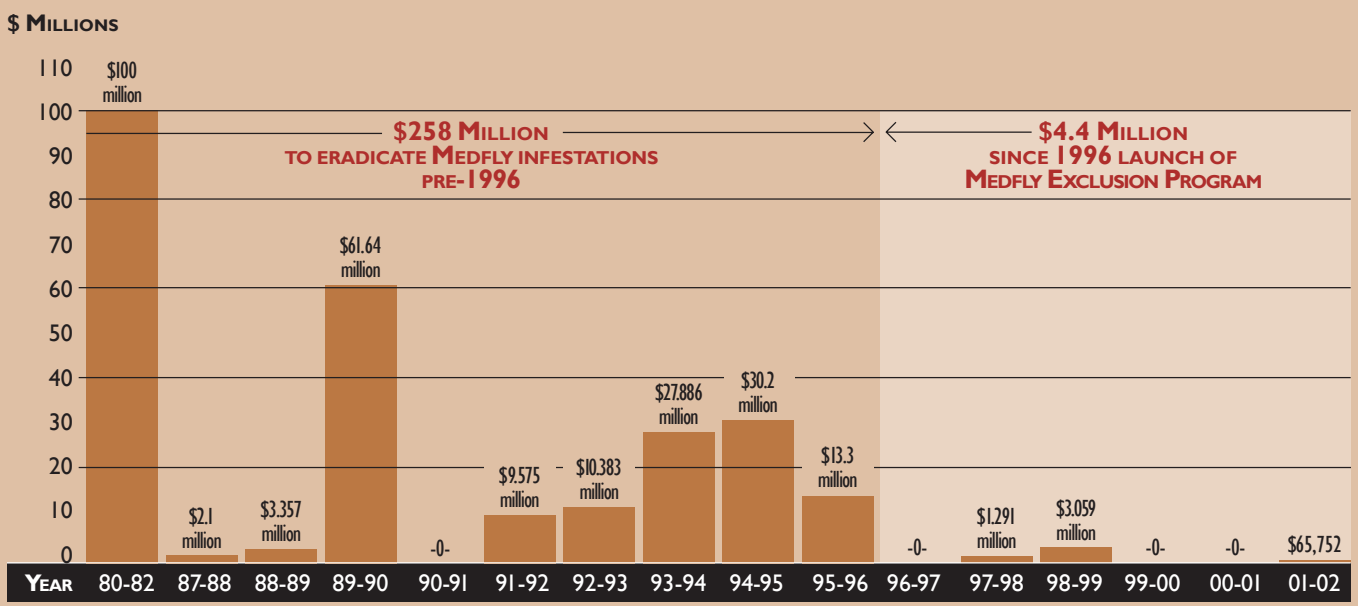
Medfly maggots tunnel through the pulp of fruit, rendering it unfit for consumption.

Every dollar spent on early intervention against exotic and invasive species, on average, prevents $17 in later expenses.[65]

[5] Jerome Siebert, "Update on the Economic Impact of Mediterranean Fruit Fly on California Agriculture," Subtropical Fruit News 7, no.6, 1999.

[6] Congressional Office of Technology Assessment, "Harmful Non-Indigenous Species in the United States," 1993.

The Value of Pest Exclusion: Medfly Eradication Costs 1980-2002



Source: California Department of Food and Agriculture, Division of Plant Health and Pest Prevention Services.

California's Biological Pollution Exclusion and Eradication Network

- **Exclusion –** Inspects shipments with the potential to introduce or spread biological pollution entering by land, sea or air at unloading and transfer sites within the state and at our 16 border inspection stations.
- **Local Surveillance and Detection –** Ensures that we are able to detect, eradicate or control small infestations before they become widely established and uses veterinarians and producers for local surveillance of animal diseases.
- **Diagnostics –** State-of-the-art diagnostics laboratories for identifying insects, plant diseases, weeds, seeds, animal diseases, food safety threats, and other harmful agents.
- **Eradication and Control –** Uses emergency response teams to eradicate and control pest and animal disease outbreaks when they are small and controllable.

Because of this program, CDFA has reduced the societal costs of Medfly exclusion and eradication to a fraction of its potential short- and long-term impacts (see graph on page 9). In the years since aerial releases of millions of sterile flies began, new infestations of wild fertile flies in the release zone dropped from an average of seven per year to just three over the past six years. The most recent wild Medfly detection in California was a female that was shown to have mated with a sterile male – the exact result the exclusion program is meant to generate.

California's Biological Pollution Exclusion and Eradication Network

CDFA manages programs for excluding, detecting, eradicating and controlling harmful animal diseases, insects, weeds, plant diseases, and rodents. Our biological pollution exclusion and eradication network is comprised of a series of complementary federal and state laws and regulations that restrict entry and movement of products capable of harboring biological pollution. This network is comprised of four interdependent parts that create a shield protecting California's human health, commerce, and environment.

The Network: Four Integral Components

Exclusion: Closing Pathways for Introduction

Interception of quarantined pests at points of entry is our primary defense against the introduction and spread of biological pollution. If allowed to enter and become established within the state, impacts from these pests and diseases would include increased food and fiber costs, increased pesticide use, and damage to native species of plants and animals, forests, watersheds, lakes, rivers, and water delivery systems.

California's sixteen border inspection stations prevent the entry and permanent establishment of biological pollution and are located on the major highways entering the state via Oregon, Nevada, and Arizona. In 2002, over 33 million vehicles passed through the border agricultural inspection stations, including six million trucks and more than 800,000 recreational vehicles.

The effectiveness of the border inspection stations depends on their ability to operate as a part of California's biological exclusion network. The stations function in several important capacities including:

- **Preventing the entry of pest infested commodities –** In 2002, 63,527 shipments of prohibited commodities were intercepted and destroyed or shipped back out-of-state.
- **Enabling the quarantine enforcement work of county agricultural commissioners –** Shipments that require inspection are either inspected at the station or are identi-

fied by border station personnel for inspection at their destination by local county agricultural commissioners. Loads cannot be unsealed at their destination until the commissioner or his or her representative is present to inspect the shipment.

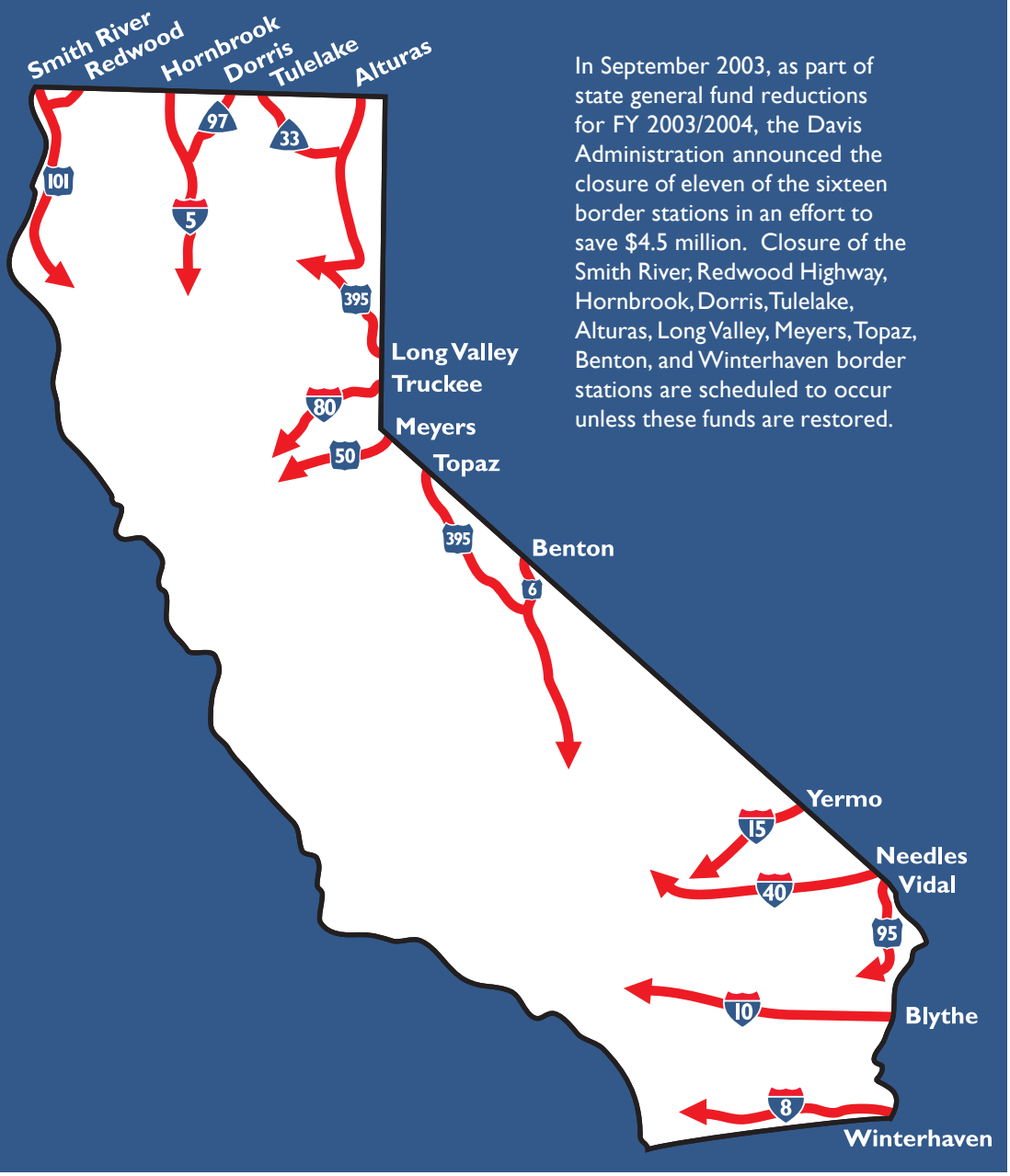
- **Deterrence** – Many shippers, travelers, and newly arriving residents are aware of California's border inspection stations and do not ship or carry with them commodities that are prohibited or restricted by quarantines.
- **Cooperation with other agencies** – In addition to enforcing agricultural quarantines, border station staff work cooperatively with several other branches of CDFA and also provide an invaluable infrastructure that could be used by law enforcement, health services, or Cal Trans for activities associated with homeland security, Amber Alerts, and natural disasters.

Local Surveillance and Detection: State/County Cooperation

CDFA's interior detection program is designed to ensure that we are able to detect and eradicate or control small infestations and disease incursions before they become widely established. We work with other state departments of agriculture, foreign plant protection agencies, and industry to ensure that all commercial products and visitors entering the state are in compliance

In 2002, 63,527 shipments of prohibited commodities were intercepted and destroyed or shipped back out-of-state.

California's Border Stations



In September 2003, as part of state general fund reductions for FY 2003/2004, the Davis Administration announced the closure of eleven of the sixteen border stations in an effort to save $4.5 million. Closure of the Smith River, Redwood Highway, Hornbrook, Dorris, Tulelake, Alturas, Long Valley, Meyers, Topaz, Benton, and Winterhaven border stations are scheduled to occur unless these funds are restored.

As part of its local surveillance and detection system, CDFA manages insect trapping programs that deploy more than 100,000 traps statewide each year.

A study published by the Agricultural Issues Center in 1999 estimates that the total direct and indirect losses in California alone from a foot and mouth disease outbreak would reach $13.5 billion.[8]

with the requirements of our quarantine laws and regulations. We also conduct maritime inspections for quarantine pests following clearance by the USDA and provide training and direction to county agricultural commissioners who inspect products at interior terminal destination points. Part of this effort includes managing insect pest trapping programs that deploy more than 100,000 traps statewide each year.

Since government alone cannot provide surveillance for all of California's animals, CDFA not only relies on our county counterparts, but also the citizens of California. The local animal monitoring system includes a volunteer army of statewide producers and their veterinarians acting as the eyes and ears for the entire state. We also rely on county agriculture commissioners to monitor livestock movements and conduct surveillance if an animal disease outbreak occurs in any part of the state. As an example, in an effort to stay ahead of the southern California exotic Newcastle disease outbreak in 2003, CDFA trained surveillance teams in several Central Valley counties and established an incident command post in Modesto.

Diagnostics: California's Laboratory System

Any exclusion or eradication program must be based on strong scientific principles in order to protect public health and the environment while successfully mitigating the societal costs of biological pollution.

CDFA's plant diagnostics laboratory system provides professional plant pest diagnostic support for CDFA, USDA, county departments of agriculture, universities, other state agencies, and the general public. The program features one of the largest, most valuable collections of biological literature of any governmental agency and contains more than 60,000 scientific volumes, nearly two million insect specimens, a nationally recognized seed collection, and 50,000 plant specimens in the botany laboratory's herbarium.

Filling a similar role for animal diseases and food safety is the California Animal Health and Food Safety Laboratory System. This lab is the backbone of California's warning system to protect the health of humans, livestock, and poultry from animal diseases. An aggressive California partnership protects food with the laboratory as the hub of surveillance to prevent human exposure to toxic chemicals and food borne pathogens in animal products through food safety investigations and monitoring activities.

Eradication and Control: Rapid Detection and Response

Early recognition through adequate surveillance for biological pollution is critical for an effective response. When a new pest or disease is within a defined population, multiple eradication options are available. But, if the biological pollutant is not recognized until it has become widespread, the ability to control or eradicate the disease or contaminant becomes, at best, difficult and, in some instances, impossible.

As an example, if foot and mouth disease, one of the most highly contagious animal diseases known to man,[7] were introduced into commercial livestock, the exponential spread would

[7] Al Donaldson, Foot and Mouth Disease: The Principal Features. Irish Vet 5, 1987.

[8] Javier M. Ekboir, Potential Impact of Foot and Mouth Disease in California, Agricultural Issues Center, University of California, 1999.

be catastrophic. A study published by the Agricultural Issues Center in 1999 estimates that the total direct and indirect losses in California alone would reach $13.5 billion.[9] Because this disease spreads so rapidly, the cost of control and eradication increases $1 million to $2 million every hour a response is delayed or the disease goes undetected.[10]

Similarly, actions taken during the first hours of an outbreak will have the greatest impact on eradication success. Government inquiries into the foot and mouth disease outbreak in the United Kingdom in 2001 have concluded that, although agricultural movement restrictions were placed on livestock within three days after the first reported case, this was considerably too late and contributed immensely to the difficulty of containing and eradicating the disease.[11] Indeed, history has demonstrated that the public does not forgive a lack of response preparedness, especially when those with a duty to protect them understand what measures should be taken to reasonably mitigate risk.

Although each eradication campaign is unique, the department continually strives to use the most scientifically advanced methods for eradicating pests while minimizing environmental and societal costs. The Department uses integrated pest control programs that use natural enemies along with other tools to control invasive, exotic pests. These programs provide economic and environmental benefits that are non-polluting, cost-effective, sustainable, and, in some instances, permanent. Strategic use of biological control promotes a more judicious and effective use of herbicides and pesticides, which reduces agricultural runoff and increases safety for agricultural workers and the environment.

Because foot and mouth disease spreads so rapidly, the cost of control and eradication increases $1 million to $2 million every **hour** a response is delayed or the disease goes undetected.[10]

As an example, in 1988, the ash whitefly invaded California and quickly became a serious pest of several commonly planted urban trees. In fact, the swarms of flies were so thick in some urban neighborhoods, they posed a health threat due to breathing impairment. To combat this pest, CDFA imported a single species of parasitic wasp from Europe. Within two years of its release, this wasp greatly reduced the ash whitefly population. Today, although both insects are still present in California, they are difficult to detect in previously heavily infested ash and ornamental pear trees. A cost benefit analysis of this program shows that each dollar invested in the development of this biological control program returned $265 in saved eradication and product loss costs.

The ash whitefly invaded California in 1988 and quickly became a serious pest of several commonly planted urban trees. Adult whiteflies filled the air in some neighborhoods to such an extent that they posed a health threat due to breathing impairment.

[9] Javier M. Ekboir, Potential Impact of Foot and Mouth Disease in California, Agricultural Issues Center, University of California, 1999.

[10] Mark C. Thurmond, UC Davis, School of Veterinary Medicine, Homeland Security Symposium, 2003.

[11] Dr. Iain Anderson, Foot and Mouth Disease: Lessons to be Learned Inquiry Report, July 22, 2002.

RECOMMENDATION

General Fund dollars are the most appropriate source of funds and provide the most legally sound method for funding CDFA's biological pollution exclusion and eradication network. By investing additional General Fund dollars in this network, the state can save money by decreasing the frequency of plant and animal pest and disease outbreaks.

The Legislature asked the Department to review funding for our invasive pest and disease exclusion, eradication, and control efforts. Specifically, the Legislature asked CDFA to focus on three issues:

1. Obtaining increased federal funding,
2. Assessing parties with the potential for introducing and spreading biological pollution into California, and
3. A balance of the funding from the above two proposals with a reduced, yet still present, General Fund commitment.

After thorough analysis and for the reasons explained below, the most appropriate course of action to save state General Fund dollars in the long term would be to increase and maintain state General Fund investment in CDFA's biological exclusion and eradication network.

IMPORTED RISK:
COMMERCIAL & PEDESTRIAN CROSSINGS ALONG THE CALIFORNIA–MEXICO BORDER

California's southernmost border serves as the gateway for visitors and agricultural and commercial products from Mexico and South America. These countries often have plant, animal, and insect pests and diseases in epidemic proportions that can be introduced to the state by both legal and illegal commercial movement and human activity. Compared to figures from 1995, along this border California now takes in:

- **365,000 more commercial trucks**
- **1,400,000 more bus passengers**
- **8,934,000 more pedestrians**
- **17,800,000 more personal vehicle crossings**
- **39,000,000 more personal vehicle passengers**

THE RISING TIDE OF RISK

With each additional ship, plane, train, truck, bus, car and person entering the state, California's exposure to biological pollution increases substantially. Unfortunately, California is losing the battle against biological pollution because funding has not kept pace with our risk exposure. Indeed, after increasing during the 1990s, the past four years CDFA's biological pollution exclusion and eradication network has absorbed baseline reductions of 256 positions and $16.8 million. Meanwhile, in the years since 1990 the following factors have substantially increased the risk of biological pollution:

POPULATION:
4.1 million more

INSPECTION TRAFFIC:
6.3 million more vehicles

GROSS STATE PRODUCT:
$555 billion more

IMPORTS:
$130 billion more

As previously noted, in 2003, California saw its largest and most diverse pest and animal pest and disease outbreaks in years. On their own, an outbreak of Mexican fruit fly, bovine tuberculosis, or exotic Newcastle disease would have been significant. But California experienced all three simultaneously and was forced to expend thousands of hours of human resources and millions of additional dollars to eradicate them. The reason for this convergence of scourges can be explained simply: Baseline funding for our biological pollution exclusion and eradication infrastructure has not kept pace with California's increasing risk exposure.

California's biological pollution exclusion and eradication program is a synergistic network in which the whole is worth more than the sum of its parts. This system is scientifically structured such that each component of the network (Exclusion, Local Surveillance and Detection, Diagnostics, and Eradication and Control) is dependent on the strength of the others for the entire network to work to its greatest efficiency. When one part is weakened, the network is breached and additional pressure is placed on the other components to make up the difference. Thus as California's risk exposure increases, additional resources need to be added to the system.

California's biological pollution exclusion and eradication network has not kept pace with the increased risks caused by the ease of today's interstate and international movement of people and commerce. Since 1993, the value of United States imports has doubled to approximately $42 billion. On the export side, the federal government's efforts to reduce international trade barriers have increased California's exports by 68 percent. From 1980 to 2000, there was a 127 percent increase in international passenger arrivals. Volumes of air cargo are doubling every five to six years and an increasing percentage of this cargo consists of perishable commodities such as cut flowers, fruits and vegetables.

During this same period, California's general fund commitment to our biological pollution exclusion and eradication network has increased by 18 percent. Indeed, after increasing during the 1990s, the past four years the network has absorbed baseline reductions of 256 positions and $16.8 million. In FY 2003/2004 alone, CDFA's biological pollution exclusion/eradication network was cut by $9.4 million and lost 74 inspectors and animal health professionals. The FY 2004/2005 budget proposes another $3 million in biological pollution exclusion/eradication cuts.

Compounding this state action has been the reduction of funds and resources expended by the federal government to detect and exclude biological pollution at California's international borders, ports, and airports. Federal agricultural border inspectors are now under the supervision of the Department of Homeland Security and USDA is proposing new regulations that could reduce the amount of federal monies available to states to combat outbreaks of biological pollution (discussed further in Appendix 1, page 17). Indeed, USDA has stated that the "current cadre of veterinarians and animal health professionals (employed by USDA) is clearly

In FY 2003/2004 alone, CDFA's biological pollution exclusion and eradication network was cut by $9.4 million and lost 74 inspectors and animal health professionals.

Baseline funding for our biological pollution exclusion and eradication infrastructure has not kept pace with California's increasing risk exposure.

The past 8 years have seen a dramatic increase in U.S. imports, and there is no reason to think that the arrival of harmful invasive species has not increased apace."[12]

[12] Peter T. Jenkins, "Paying for Protection from Invasive Species." Issues in Science and Technology, Fall 2002.

An Ounce of Prevention

By making an investment in exclusion activities, the societal costs of outbreaks of biological pollution can be mitigated to a fraction of their potential impacts on the state's general fund and California's 34 million people and $1.4 trillion economy.

insufficient to handle the increased workload associated with trade obligations, emergencies, and already apparent future demands."[13]

To provide California with the greatest level of protection against plant and animal pests and diseases that can adversely impact human health, commerce, and California's precious natural resources, a baseline of funding and activities needs to be maintained. At this baseline, California's efforts match our risk exposure. Although we are still vulnerable to biological pollution, the state can confidently affirm that we have put forth our best efforts. Anything below this baseline and the costs of eradication of biological pollution that will invade the state becomes overwhelming. **Put simply: an ounce of prevention is worth a pound of cure.**

Obviously, we will never be able to ensure the absolute exclusion of harmful biological pollution. Indeed, university officials, government experts, agriculture and environmental industry representatives, and CDFA professionals and scientists have difficulty in determining the total cost of a seamless exclusion and eradication network. But, by making an investment in exclusion activities, the societal costs of outbreaks of biological pollution can be mitigated to a fraction of their potential impacts on the state's general fund and California's 34 million people and $1.4 trillion economy.

[13] Ron DeHaven, Deputy Administrator of Veterinary Services, USDA.

APPENDIX I

Increased Federal Funding

Although California should be responsible for maintaining an infrastructure sufficient to assist in early detection and eradication of biological pollution, eradication efforts for plant and animal pests and diseases, which have severe socio-economic impacts at the national level, should be funded at the national level. In attaining additional federal funding, California can look either to USDA for increased support or to Congress itself.

To secure Congressional funds, either through an appropriations bill rider or a direct federal appropriation, California would need to create a broad coalition which includes the support of government officials and environmental and agriculture industry representatives. This could be accomplished by framing the threat of biological pollution as a homeland security issue and attempting to identify opportunities for direct federal appropriation.

Receiving a direct Congressional appropriation would require significant effort and financial resources on the part of CDFA and would take many years to materialize. During the interim period, California would most certainly be inundated with biological pollution and the impacts of our inaction on California's human health, commerce, and environment would, in most cases, be permanent or take decades to reverse.

Perhaps the option with the best opportunity to attain more timely federal funding would be to solicit USDA. Two recent actions at the federal level bolster California's case that USDA should play a larger role in funding biological pollution exclusion programs: the movement of agriculture inspectors to the Department of Homeland Security and regulatory changes that will place a greater financial burden on states for funding eradication programs.

Traditionally, USDA's Animal and Plant Health Inspection Service (APHIS) has inspected all international planes, trains, ships, and passengers for biological pollution. They have done so through the Agricultural Quarantine Inspection (AQI) program, which has dwindled to only 50 inspectors at California's international borders, airports, and ports.

Beginning March 1, 2003, approximately 2,600 employees from the AQI force became part of the Department of Homeland Security's Bureau of Customs and Border Protection. Although creating a consolidated border inspection organization may allow for increased information sharing and streamlined services, many fear that the search for harmful pests and animal diseases by APHIS inspectors will be secondary to the search for undocumented immigrants and weapons of mass destruction. Indeed, previously there were 490 APHIS inspectors along California's international borders. Today, there are 50. This shift places significant pressure on California's internal detection and emergency response teams to find the biological pollutants missed by federal inspectors.

Compounding this movement of inspection personnel are proposed regulatory changes in the formula used to determine the federal share of the costs of emergency eradication projects. The

Obtaining federal funding would require significant effort and resources on the part of CDFA, would take many years to materialize, and its reliability as a continuing funding source is questionable.

Any redirection of funds by USDA to California for pest exclusion would be to the detriment of other beneficial programs like farm environmental conservation measures, food safety protections, and nutrition and food assistance programs for children and mothers.

new regulations establish a federal share baseline of 50% of the costs for the emergency operation, which can be adjusted up or down based on a variety of factors.

The impact of this new formula is best served by using California's recent outbreak of bovine tuberculosis as an example. For this outbreak, the federal government picked up about 92% of the eradication costs totaling approximately $12 million. California's share was substantially less at about $1 million. Under the new regulations being proposed by USDA, California's new financial obligation would be $6 million, or an increase of 600%. When taking into account the small size of this outbreak and the expediency in which it was contained, one can readily see that a larger eradication program would increase state costs dramatically.

On its face, this proposed rule seems to suggest USDA is attempting to reduce their costs and, as such, is indicative of the challenge California faces in attaining additional federal funds. Although USDA has seen modest growth in its budget since 2001, these increases have been in programs for important farm environmental conservation measures, food safety protections, and nutrition and food assistance programs for children and mothers. Traditional commodity subsidy programs, California's best source for redirected funds, have been decreasing during this same period. Any redirection of funds by USDA to California for pest exclusion would be to the detriment of other programs and would be challenged both politically and in the courts by the impacted groups.

APPENDIX 2

Special Fund Reinvention – Assessment on All Travel and Commerce

In 1989, a large Medfly infestation occurred in southern California. The ensuing eradication program cost the state approximately $60 million and led to the introduction of the California Airport and Maritime Plant Quarantine, Inspection, and Plant Protection Act.

The Act required CDFA to establish a program for the inspection of foreign conveyances (planes and ships) entering California through airport and maritime facilities, maintain inspection stations at these facilities, and disseminate information to the users of these facilities about California's pest control requirements. These efforts were funded through a service charge on each air carrier and commercial marine carrier engaged in foreign commerce and collected approximately $4.3 million annually.

In December 1991, the Pacific Merchant Shipping Association sued CDFA in a California state court alleging that the program violated the Commerce Clause of the U.S. Constitution because it imposed a discriminatory and unreasonable burden on marine carriers that was not imposed upon domestic interstate commerce (trucks). The California Supreme Court agreed, struck down the program, and ordered CDFA to refund $22.5 million to maritime and airline carriers.

Based on this ruling from the court, any new program would be tremendously challenging to craft and administer. To avoid a Commerce Clause challenge, as well as address other United States constitutional issues, international trade agreements, and federal law preemption, California could either establish an assessment on all commerce in the state or get Congressional authority to impose a fee on foreign commerce.

Assessment on All Commerce

Any new state program, enacted without Congressional authority, would have to address interstate and intrastate movements of all commercial products (not just agricultural) that have the potential to introduce or spread biological pollution. This would include both interstate and intrastate movement of products.

Interstate Shipments

In 2002, over 6 million commercial trucks entered California through our border inspection stations. This is in addition to the 1 million commercial vehicles that entered California through USDA border inspection stations along the U.S./Mexico border. Currently, USDA collects an inspection fee of $4.75 on all commercial vehicle arrivals.

Without Congressional authority, California's program would be limited solely to domestic air and maritime cargo and commercial vehicles entering the state along our borders with Oregon, Nevada, and Arizona. In order to create a constitutionally valid program, each of these commercial vehicles would have to be charged an inspection fee through an elaborate tollbooth or electronic collection system.

A constitutionally valid assessment program would have to address interstate and intrastate movements of all commercial products (not just agricultural) that have the potential to introduce or spread biological pollution.

Intrastate Shipments

This area presents one of the most significant challenges, not only from a constitutional standpoint, but also from a commercial and administrative perspective. California has a variety of quarantines in place to reduce the spread of invasive species already present in some areas of the state, but not in others. With the help of our county counterparts each of these shipments is inspected either at its origination point or at its destination.

Based on the court's decision, any new state program would be required to charge a fee on all commercial shipments moving from a quarantined area to a non-quarantined area within the state. This would be extremely difficult to create and administer in a $1.45 trillion economy and would still be heavily challenged in the courts.

Conclusion

Given California's dependence on imports from other states and movement of products from north to south and vice versa, one of the most significant questions raised by this approach is reciprocity. In essence the question becomes: If we place this fee upon all intrastate and interstate commerce, what are the consequences?

Congressional Authority

Congressional authority could be specifically crafted to apply to foreign commerce and exclude interstate and intrastate commercial shipments. Currently, USDA collects inspection fees on every commercial truck, train container, aircraft, and marine vessel entering California from a foreign location. This program currently collects approximately $200 million annually for pest exclusion activities and its infrastructure provides a mechanism for adding fees for California pest exclusion/eradication activities.

As with attaining a direct federal appropriation, this would require significant effort and resources on the part of CDFA and would take many years to materialize. Additionally, the state would be guaranteed court challenges by domestic companies involved in foreign commerce and reciprocal trade barriers by America's trading partners.

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Protecting California from Biological Pollution

January 2004