DEPARTMENT OF FOOD AND AGRICULTURE

PROPOSED CHANGES IN THE REGULATIONS

Title 3, California Code of Regulations

Section 4500

Noxious Weed Species

INITIAL STATEMENT OF REASONS/

POLICY STATEMENT OVERVIEW

Description of Public Problem, Administration Requirement, or Other Condition or Circumstance the Regulation is Intended to Address

This regulation is intended to address the obligation of the Department of Food and Agriculture (Department) to protect the agricultural industry from the movement and spread of injurious noxious weeds into and within California.

Specific Purpose and Factual Basis

The specific purpose of section 4500 is to provide authority to the state to regulate the movement of the listed noxious weeds species into or within California.

The factual basis for the determination by the Department that the amendment of this regulation is necessary is as follows:

Invasive weeds have significant effects on the agricultural industry and environment. They can intensify drought impacts, increase fire hazard, decrease rangeland productivity, reduce water resources, raise nursery business costs, and diminish wildland diversity. Alien weeds spread to and invade approximately 700,000 hectares per year of U.S. wildlife habitat.

One such pest weed, introduced in the early 19th century as an ornamental plant, is the European purple loosestrife. Spreading at a rate of 115,000 hectares per year, the weed population changes the basic structure of most of the invaded wetlands. Competitive stands of purple loosestrife have reduced the biomass of 44 native plant species and endangered wildlife such as the bog turtle that depends on these native plants. Loosestrife now occurs in 48 states and costs $45 million per year in control expenses and forage losses. These costs are associated with only a single noxious weed species. As a result, purple loosestrife is already

listed as a noxious weed in Section 4500. Costs and impacts associated with other invasive weeds may be greater or less than this, but will be substantial.

The Department reviews potential invasive weeds and if they pose a substantial threat to the state's agriculture and environment, proposes to add them to Section 4500 as a noxious weed species.

The Department is proposing to add the following 22 non-native invasive plants to Section 4500:

Aeschynomene spp.	joint-vetch
Asphodelus fistulosus	onionweed
Brachypodium sylvaticum	forest false-brome
Centaurea jacea incl C. pratensis	meadow knapweed
Coincya monensis	star mustard
Dittrichia graveolens	stinkwort
Euphorbia dendroides	tree spurge
Fallopia ×bohemica	Bohemian knotweed
Galega officinalis	Goatsrue
Hydrocharis mosus-ranae	Frogbit
Leptochloa chinesis	Chinese spangletop
Limnobium laevigatum	So. American spongeplant
Ludwigia decurrens	winged water-primrose
Ludwigia hexapetala	six-petalled water primrose
Mercurialis ambigua	Spanish mercury
Nymphoides peltata	water shield
Parthenium husterophorus	Santa Maria feverfew
Rhagadiolus stellatus	star endive
Saccharum ravennae	ravennagrass
Salvinia auriculata s.l.	giant salvinia
Tribolium obliteratum	Capegrass
Volutaria canariensis	Canary Island knapweed

As discussed below, preventing the spread of these additional noxious weed species will prevent unnecessary costs to nursery producers, timber producers, water managers, roadside maintenance professionals, and urban landscape managers in addition to protecting the environment.

Currently, the Department maintains a staff that manages regulatory oversight of agricultural pests, including noxious weeds. The addition of these noxious weeds will add an insignificant amount of regulatory action and associated tasks to current duties. Prevention of a widespread invasion by the weeds will more than compensate for any additional regulatory actions.

The proposed noxious species are either never or very rarely sold in the nursery trade. The amount of money spent to purchase plants or seeds in California of the proposed noxious weed species varies from $0-$1000 per year. The present, cumulative cost of the control of a single species, ravennagrass (*Saccharum ravennae*), recommended for addition to the list of noxious weeds species has been more than $300,000. These costs accrued from the management of three limited populations of this plant; if the non-native plant species described below are allowed to artificially establish or spread further, then the costs associated with their management would be much greater.

Drought and fire

Most noxious weeds have a greater ability to utilize limited water than crops and native plants. In this case, effects of drought are amplified in weed-infested areas. For example, yellow star-thistle (an existing listed noxious weed) can grow a three foot long taproot by late spring. This allows yellow starthistle to out-compete shallow-rooted annual species during the drier summer months when moisture availability is limited near the soil surface. Besides the direct loss of this water, a weed population can also negatively impact ground water recharge in those infested areas leading to water loss in the future. All of the proposed noxious weeds will deplete California's water resources.

Loss of structural diversity due to noxious weeds can cause ecosystem instability and the introduction of some species can increase fire frequency. This is particularly true in times of drought. A single large fire can result in the loss of hundreds of millions of dollars in resources.

Certain noxious weeds favor the urban/wildland interface and accumulate fuel that will promote fire. Scotch broom (an existing listed noxious weed) is well known for this, but tree spurge (*Euphorbia dendroides*) is another example and is being proposed to be added to the noxious weed list in this amendment. Star endive (*Rhagadiolus stellatus*), which forms continuous cover under native oaks potentially facilitating the spread of fire, is also being proposed to be added in this amendment. Controlling and preventing such noxious weed infestations improves public health and safety.

Rangeland Weeds

In total, all rangeland weeds cause an estimated loss of $2 billion annually in the United States, which is more than all other pests combined. They impact the livestock industry by lowering yield and quality of forage, interfering with grazing, poisoning animals, increasing costs of managing and producing livestock, and reducing land value. They also impact wildlife habitat and forage, deplete soil and water resources, and reduce plant and animal diversity.

Of the proposed noxious weed species included in this amendment, at least seven, onionweed (*Asphodelus fistulosus),* meadow knapweed (*Centaurea jacea),* goatsrue *(Galega officinalis),* Santa Maria feverfew (*Parthenium hysterophorus),* ravennagrass *(Saccharum ravennae),* cape grass *(Tribolium obliteratum)*, and Canary Island knapweed (*Volutaria canariensis)* are potential noxious weeds of rangelands in California.

Poisonous range plants also have had a significant financial impact on the livestock industry. Direct losses due to poisoning of cattle and sheep in the United States in 1988 were estimated at $169 million with an additional $65 million in indirect losses associated with reduced reproduction and growth rates and lower quality milk or wool. In 1989, estimates of the total loss increased to $340 million. At least three of the species included in the proposed amendment, onionweed (*Asphodelus fistulosus),* goatsrue *(Galega officinalis),* and Santa Maria feverfew (*Parthenium hysterophorus)*, are toxic to livestock.

Several noxious rangeland weeds have been shown to reduce species richness (including threatened and endangered species), plant diversity, and community productivity in a number of

areas. Following management efforts, plant diversity often increases. For example, the number of plant species present in California rangelands increased by 35% following biological control of Saint Johnswort, an existing listed noxious weed.

Many noxious range weeds, particularly broadleaf species, have deep taproot systems and very little surface foliage compared with annual grasses and perennial bunchgrasses. As a result, surface water runoff and stream sediment yields were 56 and 192% higher, respectively, in a spotted knapweed (an existing listed noxious weed) dominated site compared with adjacent native perennial grassland. In addition, water infiltration rates were reduced where spotted knapweed dominated. The deep root systems of noxious weeds allow the plants to actively grow later in the summer compared with native bunchgrasses and forbs. This can influence soil moisture and nutrient availability in the following growing season because the roots of noxious weeds are deeper than native grasses; noxious weeds also contribute less organic matter near the soil surface. Similar effects can be expected from the related meadow knapweed (*Centaurea jacea*) which is being proposed in this amendment.

Aquatic Weeds

Currently, the State of California spends at least $7.5 million annually controlling three species of aquatic weeds. Other aquatic weeds are controlled by agencies such as California State Parks Department and California Department of Fish and Wildlife. The proposed noxious weeds included in the amendment, jointvetch (*Aeschynomene* spp.), Asian spangletop (*Dinebra chinensis)*, bohemian knotweed (*Fallopia ×bohemica*), frogsbit (*Hydrocharis morsus-ranae)*, South American spongeplant (*Limnobium laevigatum)*, winged water-primrose (*-Ludwigia decurrens)*, water primrose (*Ludwigia hexapetala)*, watershield (*Nymphoides peltata)*, giant salvinia (*Salvinia auriculata*), and ravennagrass (*Saccharum ravennae)* are wetland or aquatic weeds. If any of these species were to be introduced or spread, then costs to California would increase in aquatic and wetland cropland, wild land, and recreational areas.

In 2013, the state and the federal government spent approximately $16 million on aquatic weed control in Florida. Despite this large expenditure, hydrilla infestations in just two Florida lakes have prevented their recreational use, causing $10 million annually in losses. The United States invests more than $100 million annually on alien aquatic weed species control.

Of the ten aquatic noxious weed species mentioned above, at least six of these are known weeds of rice. In 2012, there were 556,000 acres of rice planted in California. Weed control in rice can cost as much as $200 per acre. If the introduction and spread of new rice weed increased treatment cost by only 5%, then inaction against this pest would cost at least $2,500,000 per year in California. Even with herbicide treatment, weeds cause the greatest loss of rice acreage productivity. The spread of a new weed of rice in California could reduce yields further and may entail further herbicide treatment, increasing costs and accelerating herbicide resistance in new and existing rice weeds.

Recreational values of aquatic weed control and exclusion vary with the size of the water bodies surveyed. Estimates of annual recreational benefits vary from $500,000 for a small lake to >$100,000,000 for a large reservoir in Alabama. The value of aquatic weed control for recreation in the Delta Region of California likely exceeds the latter value.

Nursery and Urban Planting Weeds

Controlling weeds in nurseries can cost over 7 cents per plant or $80 per acre per year, one of the larger expenses associated with nursery production. Herbicides, the most widely used type of pesticide in the home and garden sectors, accounted for more than $1.5 billion in sales in the United States in 2007. New weeds are not always comparable to existing weeds. Therefore, their success leads to increased costs, lost productivity, and even at times human health problems.

Three species proposed for listing in section 4500 are in this category. Spanish mercury (*Mercurialis ambigua*) exploits mulch as means to move from one landscaped site to another. It is just beginning to expand its range in California.

Santa Maria feverfew (*Parthenium hysterophorus*) is a pantropical weed that often disturbs urban sites and nursery borders. Touching it can lead to contact dermatitis in many individuals and its pollen is highly allergenic.

Giant knotweeds, including bohemian knotweed (*Fallopia ×bohemica*), invade moist disturbed areas and waste ground. Nurseries and neglected gardens are prime invasion sites. Once established, they are difficult to control. In Great Britain, mortgage companies have refused to issue loans for properties infested with giant knotweeds.

Forestry Weeds

Weeds are the most serious pests of timber establishment. Costs of weed control in forests and tree plantations range from $60 to $125 per acre per year. Of the plants proposed for inclusion in section 4500, forest false-brome (*Brachypodium sylvaticum*) and star endive (*Rhagadiolus* stellatus) inhabit forest understories, goatsrue (*Galega officinalis*) colonizes streambanks open to sun, and Spanish mercury (*Mercurialis ambigua*) and tree spurge (*Euphorbia dendroides*) invade recently disturbed forest margins.

The U.S. Forest Service controls weeds on its own land, but it also provides funds to control weeds on public non-federal land and offers cost-shared weed control funds to private landowners. These programs demonstrate the cost effectiveness of preventing the spread of weeds on to forestry lands. Money is saved by controlling weeds on bordering land before they spread to U.S. Forest Service land and negatively impact the forest.

Wildland Weeds

Noxious weeds have many negative effects on wildlands including changing the ecology (e.g., changing the hydrology), displacing or extirpating native species (including threatened and endangered species), supporting non-native organisms, and negatively impacting recreation such as hiking and hunting.

Rare species are particularly vulnerable to the changes brought by non-native plant invaders. The California Natural Diversity Database indicates that 181 of the state's rare plants are threatened by invasive weeds. Threatened and endangered wildlife threatened by weeds include the desert tortoise potentially threatened by Canary Island knapweed (*Volutaria canariensis*) which is being proposed to be added.

Some of the benefits of weed management are difficult to quantify economically, but they are considered significant (e.g., protection or enhancement of sensitive species habitat). Others can be quantified; fire control and rehabilitation of lands invaded by cheat grass was estimated to be $15 million for Idaho alone. A study of the impacts of yellow starthistle in Idaho estimated a total cost of $2.6 million dollars due to reduction in expenditures for hunting and wildlife watching-related economic activities and an increase in the cost of water treatment. About 63% of those were directly associated with losses in direct expenditures on regional goods and services needed for hunting, wildlife watching and water treatment activities; the rest of the cost was the result of secondary effects on the economy.

Habitats potentially suffering impacts from the proposed noxious weeds in wildlands include the desert from Canary Island knapweed (*Volutaria canariensis*), Coastal Scrub from tree spurge (*Euphorbia dendroides*), freshwater marsh from South American spongeplant (Limnobium laevigatum) and sand dunes from dune mustard (*Coincya monensis*).

Roadside Weeds

Roadsides are preferred habitat for many weeds, as the frequent disturbance and stressful conditions often favor weeds over native or horticultural plants. Many agencies and other entities manage weeds of roadsides to control nuisance weeds, maintain a neat appearance, and manage views. Costs associated with roadside weed control are $75 per linear mile for herbicide treatment, over $250 per acre for mowing, and over $1700 per acre for hand pulling. New roadside weeds can appreciably add to that cost. Of the proposed noxious weeds several are known to or are expected to favor roadside habitat. This includes stinkwort (*Dittrichia* graveolens), Canary Island knapweed (*Volutaria canariensis*), meadow knapweed (*Centaurea jacea*), goatsrue (*Galega officinalis*), and Santa Maria feverfew (*Parthenium hysterophorus*).

Economic Impact Analysis

California is home to many non-native plants from around the world. Most of these plants are highly beneficial to our agricultural and cultivated landscapes. Unfortunately, not all non-native plants are beneficial. Some are very harmful and spread rampantly across the landscape. These are called noxious and invasive weeds and are a form of biological pollution. Noxious and invasive weeds spread aggressively and lower agricultural productivity, crowd out native

species, increase fire risk and add to the costs of maintaining roads, parks and waterways. Noxious and invasive weeds infest over 20 million acres in the state and result in hundreds of millions of dollars in control costs and lost productivity. Furthermore, California will be subject to even higher rates of weed introductions as human population and trade globalization continue to increase.

In California, the cost of control, monitoring, and outreach is conservatively estimated to be over $82 million a year (not including indirect costs associated with lost agricultural yields, increased severity of wildfires and floods, loss of productive range and timber lands, reduced land values, damage to infrastructure, and degraded recreational opportunities). All of the proposed noxious weeds would contribute towards significantly increasing these direct and indirect costs.

Anticipated Benefits from This Regulatory Action

Limiting the spread of the relevant weed species by means of classifying them as noxious weeds will provide economic savings to the general public, farmers, ranchers, local governments, state and federal agencies affected and potentially affected businesses, and land management entities, both private and public

In addition, limiting the spread of these proposed noxious weeds will benefit public health and safety, biodiversity, threatened and endangered species, tourism and recreation via enhanced aesthetics and access, water resources, greenhouse gas sequestration (reduction), and ecosystem stability.

Assessment

Based upon the Economic Impact Analysis, the Department has made an assessment that the amendment of the regulation would not (1) create or eliminate jobs within California; (2) create new business or eliminate existing businesses within California; or (3) affect the expansion of businesses currently doing business within California.

The Department is the only agency which can implement a regulation listing noxious weed species. As required by Government Code Section 11346.5(a)(3)(D), the Department has conducted an evaluation of this regulation and has determined that it is not inconsistent or incompatible with existing State regulations.

Estimated Cost of Savings to Public Agencies or Affected Private Individuals or Entities

The Department has determined that the amendment of section 4500 does not impose a mandate on local agencies or school districts and no reimbursement is required under section 17561 of the Government Code.

The Department also has determined that no savings or increased costs to any state agency, no reimbursable costs or savings under Part 7 (commencing with section 17500) of Division 4 of the Government Code to local agencies or school districts, no nondiscretionary costs or savings to local agencies or school districts, and no costs or savings in federal funding to the state will result from the amendment of section 4500.

The cost impact of the changes in the regulations on private persons and businesses are expected to be insignificant.

The Department has determined that the proposed actions will not have a significant adverse economic impact on housing costs or California businesses, including the ability of California businesses to compete with businesses in other states. The Department's determination that the action will not have a significant statewide adverse economic impact on business was based on the following:

Actions based on this regulation taken by the state or local entities likely would result in net savings to the state in reduced productivity losses and control actions due to infestations resulting from these proposed noxious weeds. Effective noxious weed control likely results in increased property values.

Based on the preceding information, it was determined that the amendment of section 4500 does not have a statewide adverse economic impact on a representative business or private party.

Alternatives Considered

The Department must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more

effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

Information Relied Upon

The Department relied upon the following studies, reports, and documents in the proposed amendment of section 4500:

Economic Analysis for Amendment to Add to CCR 4500 Noxious Weed List