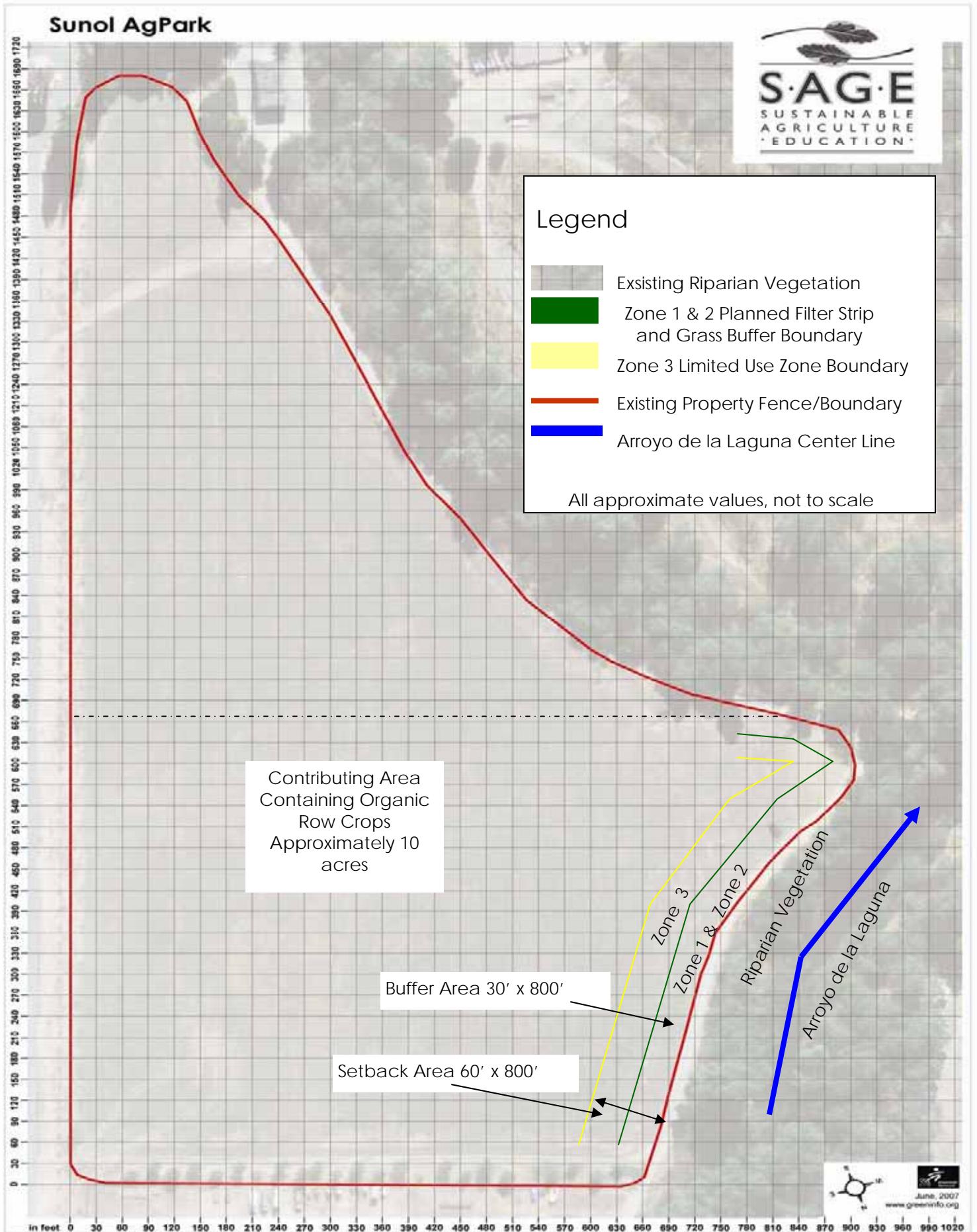
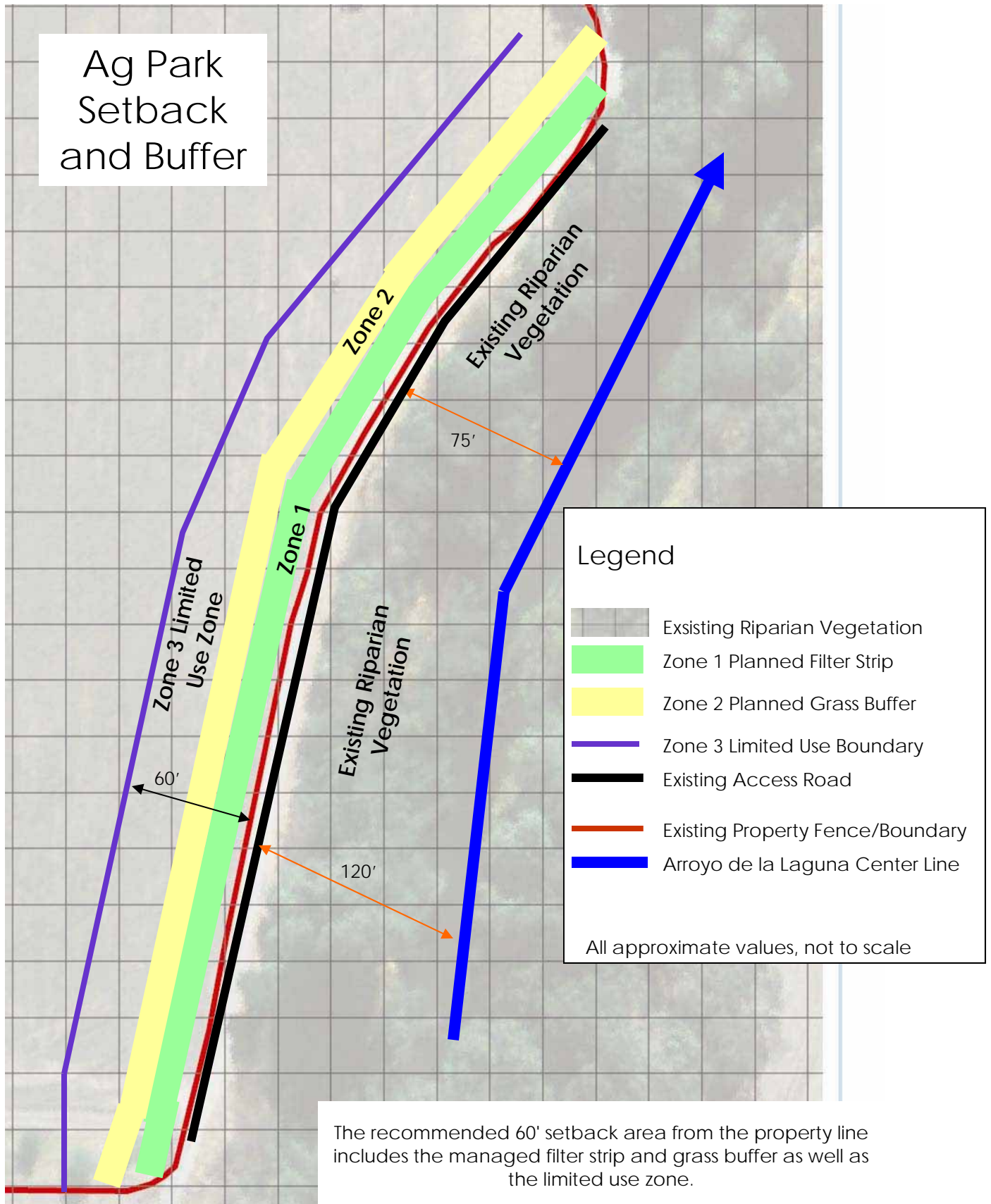


Appendix A

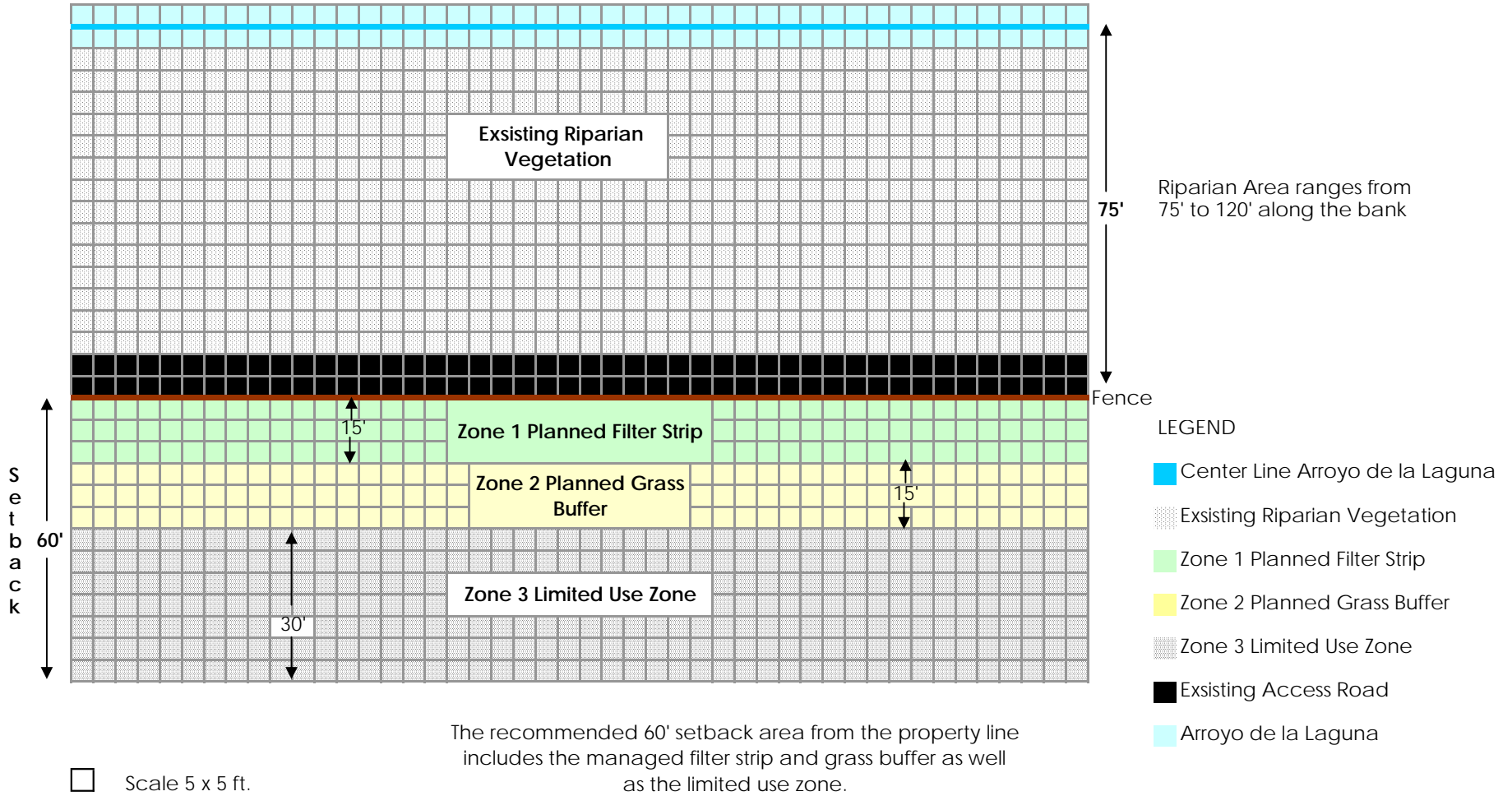


Appendix A



Appendix B

Ag Park Setback and Buffer



Appendix C - Suggested Plant List

Common Name	Scientific Name	Plant Type H-herb T-tree S-shrub G-grass V-vine F-forb	Space Req. wxht	Pollen/Nectar Source				Sun Req.		Watering Needs			Growth Type		
				Bees	Humming birds	Butterflies adult/larvae	Predators	Full Sun	Part Sun	High	Med.	Low	Deciduous	Evergreen	Perennial
Yarrow	<i>Achillea millefolium</i>	S sm.	12-30'x1'-2'	x		A/L	x	x			x				x
Buckeye	<i>Aesculus californica</i>	S lg./ T sm.	15-20'x30'	x		L		x	x		x	x	x		
Milkweed, Narrowleaf	<i>Asclepias fascicularis</i>	F/H		x		A/L	x								
Bush Anemone	<i>Carpenteria californica</i>	S med.	6'x4'	x				x	x	x	x			x	
Ceanothus, California Lilac	<i>Ceanothus spp.</i>	S lg./ T sm.	~8'x12'	x		A/L	x	x	x		x	x		x	
Redbud, Western	<i>Cercis occidentalis</i>	S lg./ T sm.	25-35'x25-35'	x				x	x	x	x		x		
Larkspur	<i>Delphinium sp.</i>	H		x											
Buckwheat, Naked	<i>Eriogonum nudum</i>	S med.		x		A	x	x			x	x			x
Woolly Sunflower	<i>Eriophyllum staechadifolium</i>	S med.	6"-3'x18"-5'	x		A/L	x	x				x			x
Wallflower	<i>Erysimum capitatum</i>				x	L						x			
California Poppy	<i>Eschscholzia californica</i>	F	6-12"x6"	x		L		x					x		x
Flannel Bush	<i>Fremontodendron californica</i>	S lg./ T sm.	20'x12-15'	x				x					x		
Toyon	<i>Heteromeles arbutifolium</i>	S lg./ T sm.	10-20'x10-15'	x			x	x		x	x	x		x	
Western Blue Flax	<i>Linum lewisii</i>	F	2-3'x1'-2'			A		x		x	x				x
Honeysuckle	<i>Lonicera hispidula</i>	V			x	A									
Lupin	<i>Lupinus albifrons</i>	S sm.	3-5'x3-5'	x	x	A/L		x			x	x		x	x
Scarlet Monkeyflower	<i>Mimulus cardinalis</i>				x	A									
Coyote Mint	<i>Mondarella villosa</i>					A									
Penstemon, Foothill	<i>Penstemon heterophyllus</i>	F/S sm.		x	x	L									
Oak, Valley	<i>Quercus alobata</i>	T	70-80'x70-80'			L		x	x			x	x	x	x
Coffeeberry	<i>Rhamnus tomentella, californica</i>	S med./ lg.		x		A/L	x								
California Rose	<i>Rosa californica</i>														
Sage, Cleveland	<i>Salvia clevelandii</i>	S med.	3-5'x1'-2'	x		A	x	x			x			x	
Sage, Black	<i>Salvia mellifera</i>	S med.		x		A	x	x			x				
Elderberry	<i>Sambucus mexicana</i>	S lg./ T sm.	10-30'x10-20'	x		A	x	x	x		x	x	x		
Hedgenettle	<i>Stachys ajugoides var. rigida</i>	F/H		x	x	A									
Johnny Jump-Up	<i>Viola pendunculata</i>	F				L									
Wild Grape	<i>Vitis californica</i>	V	20-30'				x	x		x	x				
California Fuchsia	<i>Zauschneria californica</i>				x										
Filterstrip Grasses															
Blue Wildrye	<i>Elymus glaucus</i>	G				L									x
Red Fescue	<i>Festuca rubra "Molate"</i>	G				L									
Meadow Barley	<i>Hordeum brachyantherum</i>	G													
Creeping Wildrye	<i>Leymus triticoides</i>	G								x					x
Purple Needlegrass	<i>Nassella pulchra</i>	G										x			x
Herbs															
Dill	<i>Anethum graveolens</i>	H					x								
Tarragon	<i>Artemisia dracunculus L.</i>	H					x								
Caraway	<i>Carum carvi L.</i>	H					x								
Cilantro	<i>Coriandrum sativum</i>	H					x								
Lovage	<i>Levisticum officinale</i>	H					x								
Lemon balm	<i>Melissa officinalis</i>	H					x								
Oregano	<i>Origanum vulgare</i>	H	~8'x2'	x			x	x				x			x
Rosemary	<i>Rosemarinus officinalis</i>	H	~2'x3'	x				x				x		x	
Thyme	<i>Thymus millefolium</i>	H	~1'x2'	x			x	x	x	x	x				x

Watering Needs







High- Less than reg. summer watering, tolerates drying of top few inches of soil. May need water every week to 10 days.

Med - Deep soaking every 2-4 weeks.

Low - No water required beyond water that is naturally available.

Appendix C - Filter Strip/Grass Buffer Plant Layout

Legend

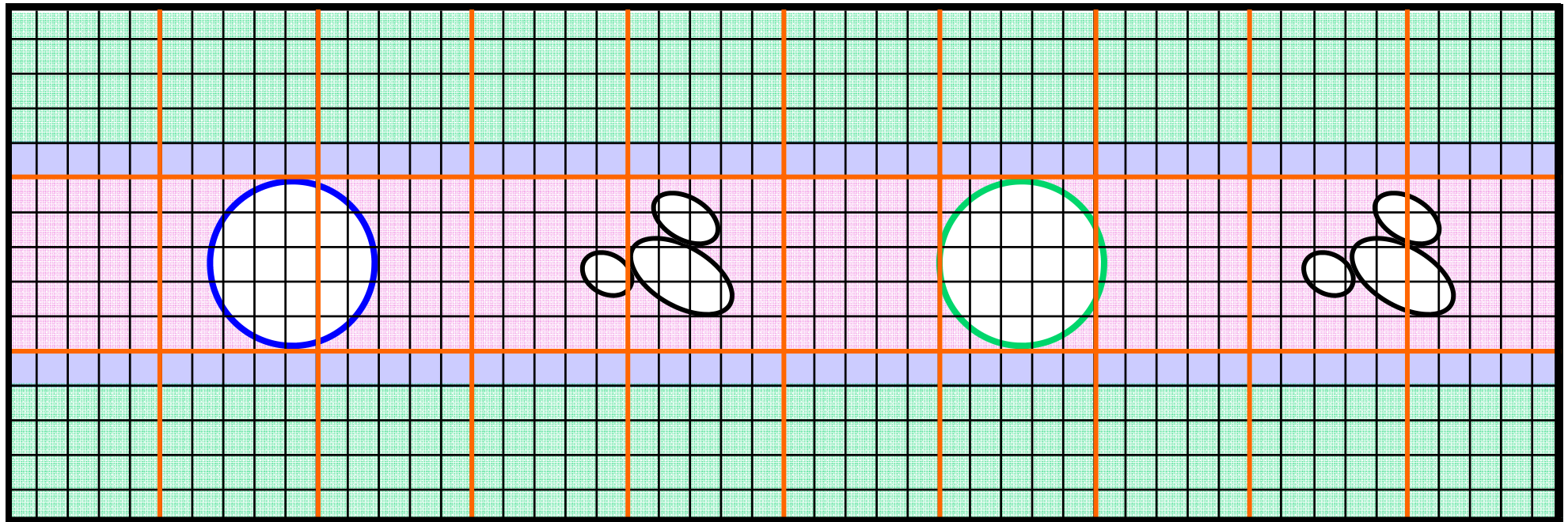
	Tree		Filter strip grasses
	Lg. Shrub/ Sm. Tree		Forbs
	Sm./ Med. Shrub		Herbs

Plant most native forbs, shrubs and trees in the fall. Consult with plant supplier before planting.

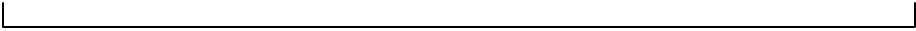
Shrubs and small trees should be planted with enough space for growth.

Perennial forbs and shrubs can be placed between the larger shrubs and trees.

Yolo County Resources Conservation District, Establishing Hedgerows for Pest Control and Wildlife, 1999



12.5', average space required by small shrubs



32', average space required by large shrubs and small trees

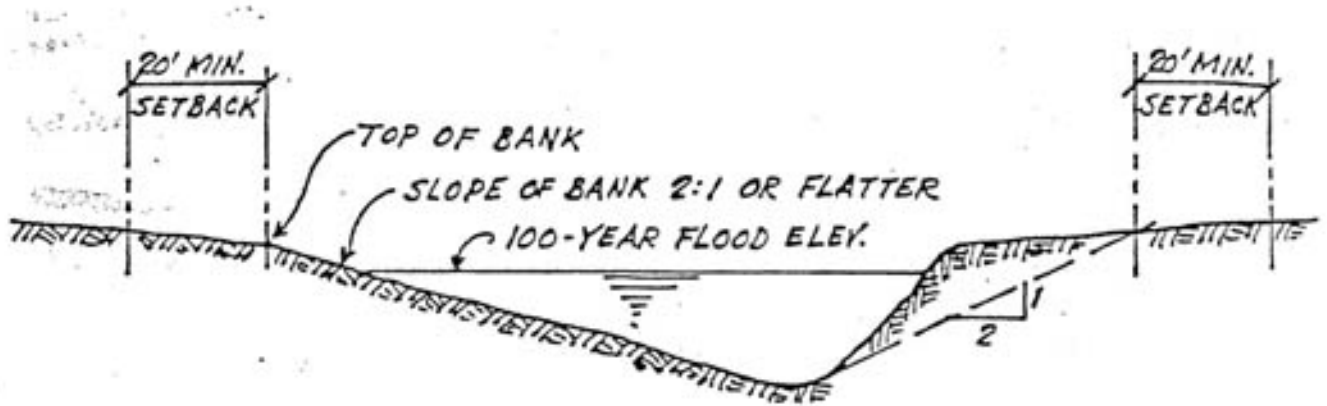
The NRCS funded Filter Strip will contain permanent herbaceous vegetation consisting of grasses and forbs adapted to the soil and climate. The area will continue 15 feet without the presence of trees or shrubs to maintain the required spacing between stems of 1 inch.
NRCS Filter Strip Standard 393

Appendix D

Alameda County Ordinances

Section 13.12.320: Setback Criteria

Section A — Typical where 100-year storm flow is contained within banks of existing watercourse.



<http://www.sanlorenzoexpress.com/fslc/ord13-12-320.htm>

Appendix E

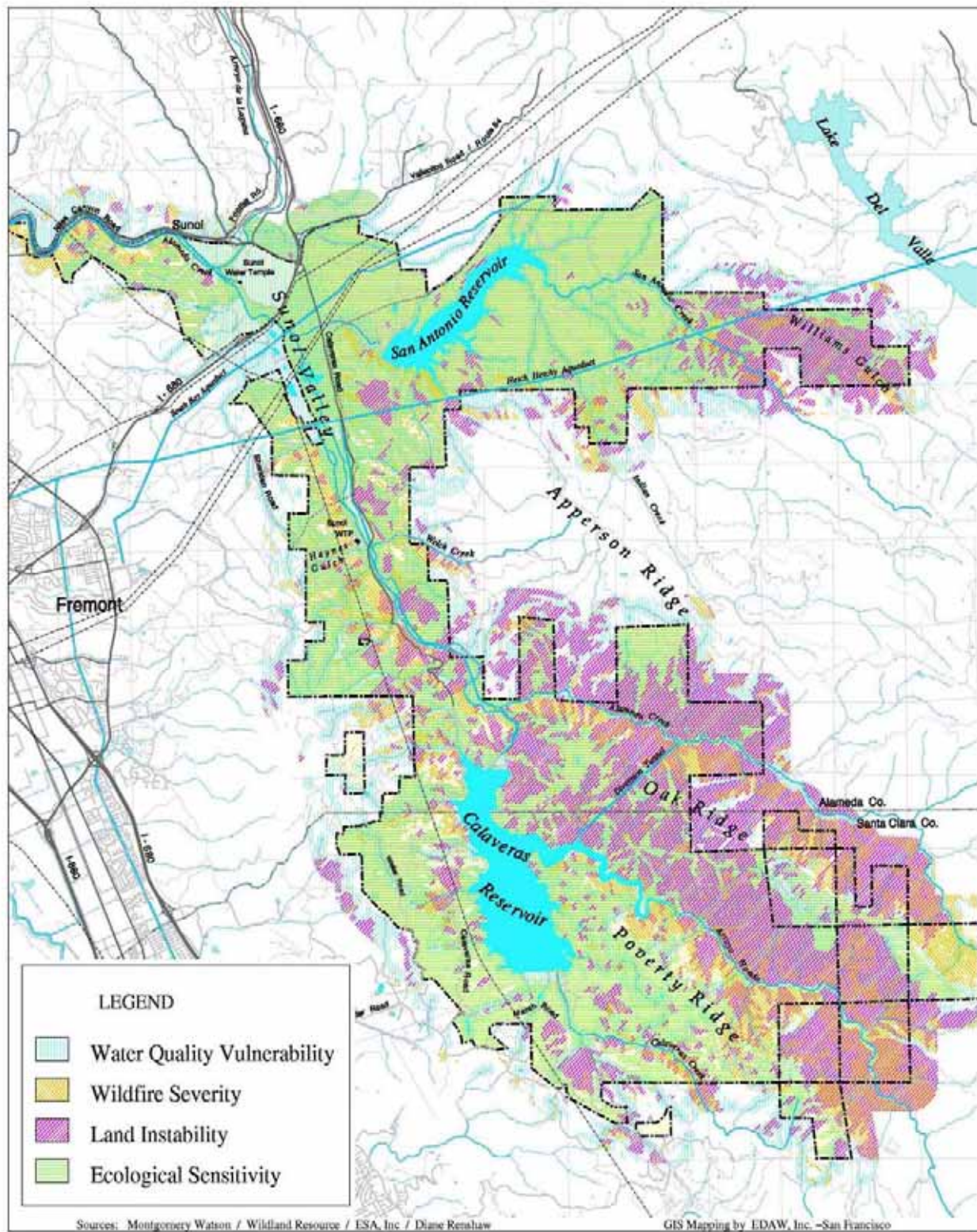


Figure 2-1 Composite High Sensitivity Zones

Feet 0 1000 2000 3000 4000
 Meters 0 1 2 3
 Original Scale 1 : 24,000



Appendix F

NRCS Standards and Specifications

Filter Strip Standard 393

Tree and Shrub and Establishment 614

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

FILTER STRIP

(Ac.)

CODE 393

DEFINITION

A strip or area of herbaceous vegetation situated between cropland, grazingland, or disturbed land (including forestland) and environmentally sensitive areas.

PURPOSE

- To reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in runoff.
- To reduce dissolved contaminant loadings in runoff.
- To serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391.
- To reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in surface irrigation tailwater.
- To restore, create or enhance herbaceous habitat for wildlife and beneficial insects.
- To maintain or enhance watershed functions and values.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies:

- (1) in areas situated below cropland, grazing land, or disturbed land (including forest land)
- (2) where sediment, particulate matter and/or dissolved contaminants may leave these areas and are entering environmentally sensitive areas;
- (3) in areas where permanent vegetative establishment is needed to enhance wildlife and beneficial insects, or maintain or enhance watershed function.

This practice applies when planned as part of a conservation management system.

CRITERIA

General Criteria Applicable to All Purposes

Filter strips shall be designated as vegetated areas to treat runoff and are not part of the adjacent cropland rotation.

Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed.

State listed noxious weeds will not be established in the filter strip and will be controlled if present.

Filter strip establishment shall comply with local, state and federal regulations.

Additional criteria to reduce sediment, particulate organics and sediment-adsorbed contaminant loadings in runoff

Filter strip flow length shall be determined based on field slope percent and length, and filter strip slope percent, erosion rate, amount and particle size distribution of sediment delivered to the filter strip, density and height of the filter strip vegetation, and runoff volume associated with erosion producing events. The minimum flow length for this purpose shall be 20 feet.

Filter strip location requirements:

- The filter strip shall be located along the downslope edge of a field or disturbed area. To the extent practical it shall be placed on the approximate contour. Variation in placement on the contour should not exceed a 0.5% longitudinal (perpendicular to the flow length) gradient.

- The drainage area above the filter strip shall have greater than 1% but less than 10% slopes.
- The ratio of the drainage area to the filter strip area shall be less than 70:1 in regions with RUSLE-R factor values 0-35, 60:1 in regions with RUSLE-R factor values 35-175, and 50:1 in regions with RUSLE-R factor values of more than 175.
- The average annual sheet and rill erosion rate above the filter strip shall be less than 10 tons per acre per year

The filter strip shall be established to permanent herbaceous vegetation consisting of a single species or a mixture of grasses, legumes and/or other forbs adapted to the soil, climate, and nutrients, chemicals, and practices used in the current management system. Species selected shall have stiff stems and a high stem density near the ground surface. Stem density shall be such that the stem spacing does not exceed 1 inch.

Additional Criteria to Reduce Dissolved Contaminants in Runoff

The criteria given in “Additional criteria to reduce sediment, particulate organics and sediment adsorbed contaminant loadings in runoff” also apply to this purpose.

Filter strip flow length required to reduce dissolved contaminants in runoff shall be based on management objectives, contaminants of concern, and the volume of runoff from the filter strip’s drainage area compared with the filter strip’s area and infiltration capacity.

The flow length determined for this purpose shall be in addition to the flow length determined for reducing sediment, particulate organics and sediment-adsorbed contaminant loadings in runoff.

The minimum flow length for this purpose shall be 30 feet.

Additional Criteria to Serve as Zone 3 of a Riparian Forest Buffer, Practice Code 391

Except for the location requirements, the criteria given in “Additional criteria to reduce sediment, particulate organics and

sediment adsorbed contaminant loadings in runoff” also apply to this purpose.

If concentrated flows entering Zone 3 are greater than the filter strip’s ability to disperse them, other means of dispersal, such as spreading devices, must be incorporated.

Additional Criteria to Reduce Sediment, Particulate Organics and Sediment-adsorbed Contaminant Loadings in Surface Irrigation Tailwater

Filter strip vegetation may be a small grain or other suitable annual with a plant spacing that does not exceed 4 inches.

Filter strips shall be established early enough prior to the irrigation season so that the vegetation can withstand sediment deposition from the first irrigation.

The flow length shall be based on management objectives.

Additional Criteria to Restore, Create or Enhance Herbaceous Habitat for Wildlife and Beneficial Insects

If this purpose is intended in combination with one or more of the previous purposes, then the minimum criteria for the previous purpose(s) must be met.

Additional filter strip flow length devoted to this purpose must be added to the length required for the other purpose(s).

Any addition to the flow length for wildlife or beneficial insects shall be added to the downhill slope of the filter strip.

Vegetation to enhance wildlife may be added to that portion of the filter strip devoted to other purposes to the extent they do not detract from its primary functions.

Plant species selected for this purpose shall be for permanent vegetation adapted to the wildlife or beneficial insect population(s) targeted.

If this is the only purpose, filter strip width and length shall be based on requirements of the targeted wildlife or insects. Density of the vegetative stand established for this purpose shall consider targeted wildlife habitat requirements and encourage plant diversity. Dispersed woody vegetation may be used to

the extent it does not interfere with herbaceous vegetative growth, or operation and maintenance of the filter strip.

The filter strip shall not be mowed during the nesting season of the target wildlife.

Livestock and vehicular traffic in the filter strip shall be excluded during the nesting season of the target species.

Additional Criteria to Maintain or Enhance Watershed Functions and Values

Filter strips shall be strategically located to enhance connectivity of corridors and non-cultivated patches of vegetation within the watershed.

Filter strips shall be strategically located to enhance aesthetics of the watershed.

Plant species selected for this purpose shall be for establishment of permanent vegetation.

CONSIDERATIONS

Filter strips should be strategically located to reduce runoff, and increase infiltration and ground water recharge throughout the watershed.

Filter strips for the single purposes of wildlife/beneficial insect habitat or to enhance watershed function should be strategically located to intercept contaminants thereby enhancing air and water quality.

To avoid damage to the filter strip consider using vegetation that is somewhat tolerant to herbicides used in the up-slope crop rotation.

Increasing the width of the filter strip will increase the potential for capturing particulates.

Consider using this practice to enhance the conservation of declining species of wildlife, including those that are threatened or endangered.

Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.

Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.

Select grass species that sequester more carbon.

Increasing the width of filter strip will increase the potential for carbon sequestration.

Cultural Resources

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer.

<http://www.nrcs.usda.gov/technical/cultural.html> is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Based on this standard, plans and specifications shall be prepared for each specific field site where a filter strip will be installed. A plan includes information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

Specifications shall include:

- a) Length, width, and slope of the filter strip to accomplish the planned purpose (length refers to flow length across the filter strip).
- b) Species selection and seeding or sprigging rates to accomplish the planned purpose
- c) Planting dates, care and handling of the seed to ensure that planted materials have an acceptable rate of survival
- d) A statement that only viable, high quality and regionally adapted seed will be used
- e) Site preparation sufficient to establish and grow selected species

OPERATION AND MAINTENANCE

For the purposes of filtering contaminants, permanent filter strip vegetative plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit and remove nutrients and other contaminants that are contained in the plant tissue.

Control undesired weed species, especially state-listed noxious weeds.

Prescribed burning may be used to manage and maintain the filter strip when an approved burn plan has been developed.

Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, reseed disturbed areas and take other measures to prevent concentrated flow through the filter strip.

Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the filter strip.

To maintain or restore the filter strip's function, periodically regrade the filter strip area when

sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed. If wildlife habitat is a purpose, destruction of vegetation within the portion of the strip devoted to that purpose should be minimized by regrading only to the extent needed to remove sediment and fill concentrated flow areas.

Grazing shall not be permitted in the filter strip unless a controlled grazing system is being implemented. Grazing will be permitted under a controlled grazing system only when soil moisture conditions support livestock traffic without excessive compaction.

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

TREE/SHRUB ESTABLISHMENT

(Ac.)

CODE 612

DEFINITION

Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.

PURPOSE

To establish woody plants for forest products, wildlife habitat, long-term erosion control and improvement of water quality, treat waste, increase carbon storage in biomass and soils, renewable energy production, energy conservation, and enhance aesthetics.

CONDITIONS WHERE PRACTICE APPLIES

On any area where woody plants can be grown.

CRITERIA

General Criteria Applicable to All Purposes

Species will be adapted to site conditions and suitable for the planned purpose(s).

Planting or seeding rates will be adequate to accomplish the planned purpose.

Planting dates, and care in handling and planting of the seed, cuttings or seedlings will ensure that planted materials have an acceptable rate of survival.

Only viable, high-quality and adapted planting stock or seed will be used.

Site preparation shall be sufficient for establishment and growth of selected species.

Adequate seed or advanced reproduction needs to be present or provided for when using natural regeneration to establish a stand.

Timing and use of planting equipment will be appropriate for the conditions.

The acceptability and timing of coppice regeneration shall be based on species, age, and diameter.

The planting will be protected from unacceptable adverse impacts from pests, wildlife, livestock damage, or fire.

Each site will be evaluated to determine if mulching, supplemental water or other cultural treatments will be needed to assure adequate survival and growth.

Use locally adapted seed, seedlings or cuttings. Priority will be given to plant materials that have been selected and tested in tree/shrub improvement programs. All plant materials will meet a minimum standard, such as the American Nursery and Landscape Association, Forest Service, or state-approved nursery.

Tree and shrub plantings will be designed so that they do not impact the safe operation of electric and gas line transmission corridors.

Comply with applicable federal, state, and local laws and regulations during the installation, operation and maintenance of this practice.

Additional Criteria for Improving or Restoring Natural Diversity

Species selected will be indigenous to the site and will reflect species composition of the desired stands.

Additional Criteria for Increasing Carbon Storage in Biomass and Soils

For optimal carbon sequestration, select plants that have higher rates of sequestration in

biomass and soils and are adapted to the site to assure strong health and vigor. Plant the appropriate stocking rate for the site.

When using trees and shrubs for greenhouse gas reductions, prediction of carbon sequestration rates shall be made using current, approved carbon sequestration modeling technology.

CONSIDERATIONS

Transmission Requirements.

Clients must be asked to review their land rights documents to determine if there are transmission land rights for a specific parcel where the planting is to be accomplished.

a. Electric Transmission Guidelines

If there are no restrictive easements, plantings will not be accomplished within the following distances from the edge of the transmission line:

Voltage	Distance
70 kv or less:	
Trees which will grow to more than 25 feet in height will not be planted under lines.	
70 kv or less	25 feet
For trees which will grow to more than 25 feet in height.	
115 kv	35 feet
230 kv	50 feet
500 kv	60 feet

b. Underground gas line clearance:

If there are no restrictive easements, plantings will not be accomplished within 20 feet of the center line of the transmission line.

When inter or reinforcement planting, trees should be planted sufficiently in advance of overstory removal to ensure full establishment.

Plans for landscape and beautification plantings should consider foliage color, season and color of flowering, and mature plant height.

Where multiple species are available to accomplish the planned objective, consideration should be given to selecting species which best meet wildlife needs.

Tree/shrub arrangement and spacing should allow for and anticipate the need for future access lanes for purposes of stand management.

Residual chemical carryover should be evaluated prior to planting.

Species considered locally invasive or noxious should not be used.

Species used to treat waste should have fast growth characteristics, extensive root systems, capable of high nutrient uptake, and may produce wood/fiber products in short rotations.

Prescribed burning may be required for natural regeneration of serotinous cone species and for site preparation for other species.

Planting can be done either by machine or by hand. Machine planting will be limited by small areas, steep topography, windfalls, rock outcrop and heavy brush or slash accumulation. Hand planting is adaptable to all areas. Any equipment that can create a suitable planting cavity can be used, e.g., shovel, auger, planting bar.

The location for each planted seedling should take advantage of every moisture conserving and heat-protecting factor available, such as: shade provided from stumps, logs, surface rocks, clods, hummocks, etc.

When selecting species, consideration should be given to esthetic values for recreation areas and borders along through fares or any other public access sites or viewscapes.

Spacing for beatification, recreation and restoration plantings will vary depending on objectives, and site conditions.

Temporary or permanent irrigation may be necessary on some areas and for some species.

When irrigation is planned, have the systems in place prior to planting. To increase survival, irrigate after planting to aid in packing the soil

around the seed or roots and assure enough water to begin growth.

Rooting hormones and fertilizers have not significantly improved success compared to the cost of the materials.

Potential mortality, weed competition, and pest populations may require additional seedlings initially or replanting later.

All sites and all plant species may be subject to unacceptable damages due to browsing, grazing, vandalism or other human impacts. Protection may be required to hold damages to an acceptable level. Planning will include preparing estimates of the occurrence of animal populations, which have the potential of causing damage. Sightings of gopher mounds, animal trails, beaver activity, frequency of scat, and evidence of browsing on native plants will yield data that can help determine the need for plant protection. In urban areas use of signs and/or barriers may be required to reduce damage to an acceptable level.

Harsher sites (warmer, drier) may require additional actions to ensure adequate survival. These actions include the installation of shade cards and/or mulch.

Seedling Selection:

Use published seed zone maps. Use materials from the same seed zone in which the planting is to be done.

Tree stock can generally be 1-0, if it is over 8" and vigorous. However, the harsher the site the more important for 2-0, 2-1, 1-2 stock.

On sites infected with root rots or blue stain reforest the infected area (and 100 feet beyond visibly affected trees or stumps) with species that are immune or resistant and adapted to the site. Areas will be clearly marked to aid planting crews.

White pine blister rust: When white pines are planted no more than 80% will be white pine blister rust resistant.

Additional Criteria For:

Pole Plantings/Cuttings:

When used in highly erodible areas some method of protection should be placed in front

of the pole plantings/cuttings. The toe can be very susceptible to erosive flows and scour. If rock is used to stabilize the area careful application is required. Improperly placed rock can result in erosion problems on the opposite bank and downstream.

Give careful attention to both the upstream and downstream ends of the treatment area to ensure flows do not get behind the treatment. Try to divert flows away from the endpoints by tying into existing features such as trees, rocks, etc. or consider utilizing brush or other suitable revetments.

Forest land:

Planting Dates:

Planting should be made as early possible when soil moisture conditions are sufficient. Fall (November) planting is acceptable provided adequate soil moisture is present at planting time. Avoid fall planting in areas subject to frost heaving. Areas with limited access due to substantial amounts of snow will be later than lower elevation plantings.

Sierra Nevada: Suitable planting dates generally range from December to late April.

Coast Range: December through March

South of the Tehachapi Range: December through March.

Siskiyou: February to April

Trees per Acre:

Coast Redwood Region: 300 to 360 trees per acre

Remainder of Northern California:

Option A. Standard Approach. Planting is dense. This, generally, requires a pre-commercial thinning of residual trees 15 to 30 years after planting.

Option A: 436 to 681 trees per acre.

Option B. High Management Approach (for Class 1 and 2, 3 soils only). Number of trees planted is significantly less and requires:

a. Review the fall following the year of planting. Must be 80% or more survival. If not must be reinforcement planted to bring up to 80% survival the following spring.

- b. Planned treatment to control competing vegetation 12 to 36 months after planting and a follow-up 5 years after the first treatment
- c. Anticipate pruning the lower limbs to reduce loss by fire and to improve quality when stems are 3 to 7 inches in diameter.

Option B: Trees to be planted: 260 or more trees per acre.

Or

All Areas: Stocking meeting the California Forest Practice Rules – Resource Conservation Standards for Minimum Stocking.

Southern California (Southern Region):

Site Class I, II, III (Meyer): 222 - 302 trees per acre

This may require a pre-commercial thinning of residual trees 15 to 30 years after planting.

Site Class IV, V, VI, VII (Meyer): 170 – 222 trees per acre

Requires:

- a. Review the fall following the year of planting. Must be 80% or more survival. If not must be reinforcement planted to bring up to 80% survival the following spring.
- b. Planned treatment to control competing vegetation 12 to 36 months after planting and a follow-up 5 years after the first treatment
- c. Anticipate pruning the lower limbs to reduce loss by fire and to improve quality when stems are 3 to 7 inches in diameter.

All plantings to utilize mats or approved mulch material. Shade cards may be needed on South and Southwest facing slopes.

Fuel break Planting. Between 200 and 225 trees per acre.

Reinforcement or Inter Planting: Between 120 and 225 trees per acre.

Other Plantings:

Pinyon: Between 130 and 200 trees per acre.

Other Species: Species selection and spacing information is contained in the respective MLRA Vegetative Guide in the Field Office Technical Guide.

Christmas trees at spacings no closer than 4x4 feet and no further apart than 8x8 feet. Spacing should fit the cultivation, mowing, spraying, or cultural practices required.

Spacing for Windbreak /Shelterbelt plantings are found in Practice #380 Windbreak/Shelterbelt Establishment.

Spacing for wildlife plantings are found in Practice #645 Wildlife Upland Habitat Management.

Direct Seeding:

All direct seeding of conifers and hardwoods will be by spot seeding. Direct seeding of forestland coniferous and deciduous species will require the review and approval of a NRCS forester.

Softwood Seeding:

Seeding Rates:

Rates of Pure Live Seed shall be as shown.

<u>Species</u>	<u>seeds/spot</u>
ponderosa pine	4 to 8
Jeffrey pine	4 to 8
True Firs	10 to 15
red fir	
Shasta red fir	
white fir	
Coastal Douglas-fir	4 to 8
Inland Douglas-fir	8 to 10

Timing of Seeding:

Just before or right after the first precipitation of the season.

Protective Measures:

Prior to the initiation of seeding the area to be seeded will be evaluated for the potential of seed predation. If the evaluation indicates predation will significantly impact the success of the seeding, the seeding should be postponed until techniques are utilized to decrease predation.

Hardwood Seeding:

Blue Oak

Blue oak will not be recommended for seeding if the soils are less than 20 inches deep, has more than 35 percent clay or a hardpan within 20 inches of the surface, has an average annual rainfall of less than 16 inches, is not present, or has not been historically present in the vicinity of the proposed seeding.

Soils may contain any amount of coarse fragments and should have a high base saturation.

California Black Oak

California black oak will not be recommended for seeding where the soils have a restrictive layer within 40 inches of the surface, are not well drained, the clay content exceeds 35 percent, are compacted, on soils originating from serpentine, or where the average annual precipitation is less than 20 inches. They will do well on medium to coarse textured, deep and well-drained soils.

Do not seed where California black oak is not present or has not been historically present in the vicinity of the proposed seeding.

Canyon Live Oak

Canyon live oak may be recommended for seeding on soils derived from sedimentary, metasedimentary, granitic, serpentine, and perodite parent materials. It may be seeded in soils with a depth of 12 inches or greater and the average annual precipitation must exceed 12 inches. Canyon live oak must be present or have been historically present in the vicinity of the proposed seeding.

Oregon White Oak

Oregon white oak may be recommended for seeding on moderately deep soils of varied parent material, including serpentine. It may also be seeded on flood plains in heavy clay soils and where there is standing water or a shallow water table during a lengthy wet season. Do not seed where it is not present or has not been historically present in the vicinity of the proposed seeding.

Valley Oak

Valley oak will not be recommended for seeding if the soil is less than 60 inches deep,

has an average annual rainfall less than 12 inches, valley oak is not present or have not been historically present in the vicinity of the proposed seeding. Additionally, they will not be seeded when the elevation exceeds 5000 feet in the Coast Range and Southern California, and where the elevation exceeds 2000 feet in northern and central California.

Irrigation is not required for the establishment of valley oak. However, if irrigation is utilized the water applied must be sufficient to wet the soil profile to the depth of the water table or twelve feet, whichever is least restrictive.

Seeding Dates

Acorns will be planted in the fall after the first major rains. The soil profile will have moisture to a depth of at least 2 feet. If there are no major rains they will be planted by the end of December.

Seeding Rates

Acorns may be planted individually or in multiples at each planting site. For acorns to be planted individually the minimum percent acorn germination rate must exceed 95 percent.

Plant acorns on their side a minimum of one inch deep and not more than 2 inches deep. If multiple acorns are planted at a single site they must be a minimum of 4 inches apart.

Protective Measures

Control of Competing Vegetation.

Control of competing vegetation will be accomplished within a 3-foot diameter at a minimum. A 5 to 6 foot diameter area of controlling competing vegetation is preferred. Plant competition may be removed by hand, mechanical or chemical means.^{1/} Mulches (See Practice 484 - Mulching) may be applied to the planting site to control competing vegetation and conserve moisture.

^{1/} Chemical application recommendations and application rates will be made by a licensed applicator, farm advisor, or others licensed to do so in California.

Predation Control

In areas where ground squirrel and/or gopher activity may impact germination and survival, acorns may be enclosed in wire mesh cylinders or baskets (0.5 to 1.0 inch mesh) buried at least 12 inches in the soil and extending at least 12 inches above the ground.

Where rabbits, deer, elk, cattle etc., are expected to pose a hazard above ground protective devices of chicken wire, rigid polypropylene, either mesh or twin walled, will be utilized to protect the emerging oak and first year seedling. Individual protective devices at least 4 feet high will be required to provide protection until the seedlings reach a point where the growing point is not readily browsed. Control may be by a number of protective devices including Chicken wire tree protection, rigid polypropylene - mesh tube tree protection, and rigid polypropylene - twin walled extrusion. Colors may range from white (low light conditions) to brown. Where cavity nesting birds or other wildlife entering the tubes may be a problem the tops of the tubes will be covered with a mesh sleeve to prevent entry.

Cultural Resources Considerations

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer.

<http://www.nrcs.usda.gov/technical/cultural.html> is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species Considerations

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

Plans and specifications will include the following: adapted tree species for the purposes outlined, spacing, planting methods, cultural practices, maintenance requirements, and variations in methods and species between interplanting, underplanting, and planting in open areas. Separate specifications can be prepared for each of these planting methods.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance).

If needed, competing vegetation will be controlled until the woody plants are established. Noxious weeds will be controlled.

Replanting will be required when survival is inadequate.

Supplemental water will be provided as needed.

The trees and shrubs will be inspected periodically and protected from adverse impacts including insects, diseases or competing vegetation, fire and damage from livestock or wildlife.

Periodic applications of nutrients may be needed to maintain plant vigor. Replanting will be required when survival is inadequate.

Supplemental water will be provided as needed.

The trees and shrubs will be inspected periodically and protected from adverse impacts including insects, diseases or competing vegetation, fire and damage from livestock or wildlife.

Periodic applications of nutrients may be needed to maintain plant vigor

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Appendix G

Supporting Documentation

Research around the country is being conducted on how to determine the appropriate buffer size for effective nonpoint source pollution (NPSP) reduction and removal. While the benefits of buffers are well established, how to determine size varies depending on location, local requirements and other parameters.

- Fixed-width setback distances across the US range from 50-200 feet of land depending on the location (i.e. slope, vegetation, stream size) and type of activity (CGER, 2000).
- Size should be determined on a case to case basis (CGER, 2000 and Polyakov et. al., 2005).
- There are several parameters that must be addressed to determine the flow length (width) including: (CGER, 2000 and Fischer, 2001)
 - The purpose of the filter (removal of nonpoint source pollution or developing wildlife habitat)
 - The intensity of the adjacent land use and
 - Characteristics of the site chosen such as slope, soil type, and type of vegetation present.

Many local studies are also being conducted that are determining the efficiency of filter strips and the use of setback/buffers in a variety of situations.

Alameda Watershed Management Plan

In the Alameda Watershed Management Plan (AWMP), SFPUC requires a “300-foot disturbance-free buffer” around all waterbodies and streams, especially those within the “High Water Quality Vulnerability Zones” (AWMP, 2001). Concerns over the effects of grazing on water quality, particularly the pathogen cryptosporidium, led SFPUC to develop reservoir and stream buffers on grazing land to prevent contamination (GRMP, 1997). This 300-foot buffer area adjacent to any waterbody is not available for livestock grazing of any type.

Sonoma County Setback Requirements

Sonoma County Code setback requirements for crops are 25 feet in upland riparian corridors, 50 feet in flatland riparian corridors and 100 feet for the Russian River riparian corridor from the top of bank (SCGP, 2007). Sonoma County uses a setback distance only and does not imply any buffering capacity or maintenance, which greatly increase efficiency of contaminant removal. Sonoma County also has a much higher RUSLE-R factor of 80 to 180, indicating much higher erosion rates and sediment contribution than can be found at the AgPark site.

***Escherichia coli* Retention by Vegetative Buffers in California's Sierra Nevada Foothills**

This study determined that vegetative buffers as small as 1.1 meters (~3.5 feet) were effective at reducing animal agriculture inputs of *E. coli* into surface waters (Tate et al, 2006). The buffers were used to reduce contaminated runoff from 2 meter by 3 meter plots planted on slopes of 5, 20, and 35%. The study concluded that grassland buffers are an effective method to reduce *E.coli* from entering surface water.

UC Cooperative Extension, Central Coast Conservation Practices

A study was conducted to determine the estimated costs and benefits of filter strips for landowners. This study suggested a one half acre filter strip (1300 linear feet with a 16 foot width) be planted downslope of 15 producing acres (Tourte et al, 2003). This study did not elucidate the efficiency of the filter strip but demonstrated the possible benefits that landowners could receive by implementing NRCS practice standards.

Elkhorn Slough Watershed Project

The Elkhorn Slough Watershed is a very important ecosystem locally and has been the focus of extensive conservation strategies to protect the natural land. Program permits through the NRCS and local RCD assisted farmers and land managers with resource enhancement conservation projects. In addition, the Elkhorn Slough Foundation has adopted a 100 meter (328 ft) buffer width from the edges of all sensitive habitats. The buffer size was based upon the US Fish and Wildlife Services Final Determination of Critical Habitat for the California Red- Legged Frog which specifies a 500 meter buffer between intensive agriculture and sensitive areas. The use of the conservation practices through the NRCS has prevented 50% of the soil erosion caused by agricultural irrigation and stormwater runoff into the watershed (Elkhorn Slough Foundation, 2002).

Determining the efficiency of NPSP by filter strips has been well studied in current literature. Many techniques have been developed to calculate efficiency with mixed results.

- The NRCS found that 15 feet is an effective width for sediment removal with very little additional benefit with filters that are more than 30 feet wide.
- A literature review by Polyakov et al demonstrated the use of an area-buffer ratio to evaluate efficiency (2005).
 - An area to buffer ratio of 0.02-0.03 with slopes of 2-4% can produce sediment removal efficiencies of 45-85%.
 - Runoff loading can affect trapping efficiency: high flow tends to reduce efficiency regardless of size whereas low flows result in high trapping efficiency.
 - Nutrient removal rates vary depending on nutrient of interest and type of vegetation present.

Appendix H

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