

**NATURAL RESOURCES CONSERVATION SERVICE**  
**CONSERVATION PRACTICE SPECIFICATION**

**CRITICAL AREA PLANTING**

(acre)  
**CODE 342**

**SCOPE**

This document establishes the technical details, workmanship, and quality and extent of materials required to install the practice in accordance with the Conservation Practice Standard. The information shall be considered when preparing site-specific specifications for the practice.

The site-specific specifications for installing, operating, and maintaining the practice on a specific field or treatment unit shall be documented via the NRCS Hawaii Jobsheet for this practice and given to the client. Other documents such as practice worksheets, maps, drawings, and narrative statements in the conservation plan may be used to plan or design the practice and to prepare the site-specific specifications.

**SPECIES SELECTION**

Refer to Table 1 for adapted plants, seeding or planting rates and rainfall and elevation requirements.

**ESTABLISHMENT**

**Seeding**

**Seedbed Preparation**

Seedbed preparation shall consist of plowing or ripping, followed by disking where soil conditions permit. Prepare a firm seedbed. Use no-till seeding methods and equipment, where practicable. If planting large areas of sloping land and no-till is not possible, establish new plantings in increments or in strips alternating with undisturbed areas to minimize erosion. Soil disturbance should be kept to a minimum.

**Seeding Method**

Seeding may be accomplished by either broadcasting, drilling, or hydroseeding.

Where seed is broadcast, dragging the area with a chain or light plank will help to ensure good soil-seed contact.

Depth of seeding depends on seed size, soil moisture and soil texture. A general recommendation is to plant 1/4-1/2 inch deep on medium - to fine textured soils and 1/2 -1 inch deep on coarse - textured soils. Plant deeper when soil moisture is low and shallow when moisture is abundant. Large seeds are generally planted deeper than small seeds.

Hydroseeded plantings must not be allowed to dry out. Germination and seedling emergence may be low if the mulch/seed mixture is not kept moist. Provide irrigation, as needed, until the plants are well established.

## **Vegetative**

### **Land Preparation and Planting Methods**

Where terrain permits the use of heavy equipment, land preparation will be the same as for seedbed preparation described above. Vegetative material should be evenly distributed on the prepared ground and disked in.

For a more positive placement of the vegetative material, seedbed preparation may be followed by plowing furrows at a maximum depth of 6 inches and a maximum spacing of 3 feet apart. Vegetative material is then placed in the furrows at a maximum spacing of 3 feet between sprigs. Cover the material with soil by disking, or other suitable means, in the direction of the furrow; then compact lightly to ensure good plant-soil contact.

Dense plantings will produce a quicker stand of grass with less weeds. Unless planting material is limited, make the furrows about 3 feet apart or less and place the stolons, sprigs or rhizomes as close as practicable in the furrows.

A mechanical sprig planter may be used, soil conditions and terrain permitting.

Where terrain restricts the use of heavy equipment, the minimum site preparation shall consist of providing 6-inch deep holes at the maximum spacing of 3 feet by 3 feet. Fertilize according to soil test recommendations. Place the recommended amount of fertilizer in each hole and cover with approximately 1 inch of soil. Sprigs should be inserted at least 5 inches in the hole. The sprigs should have a minimum of two nodes. The hole should then be filled with soil and compacted to ensure good plant-soil contact. Leave at least a 1-inch depression in the hole to trap rainwater and other moisture.

Adequate moisture is critical for successful planting. Plant only after the rainy season has begun or provide irrigation until the plants are well established.

Where topography permits, seedbed or site preparation, seeding and vegetative planting shall be cross sloped or on the contour to minimize erosion hazard.

### **Woody Plants**

Dibble tube or potted stock is preferred to bare-root stock. Plant seedlings as deep as they grew in the nursery with roots naturally positioned in an adequately sized planting hole. If the survival rate at the end of a year is less than 80 percent, the dead plants will be replaced as soon as possible.

## **OPERATION AND MAINTENANCE**

### **Unsuccessful Plantings**

In the event of failures, follow-up seeding, sprigging or planting of seedlings will be done as soon as practicable.

### **Protection**

The critical area planting will be protected from traffic, fire and grazing. Refer to practice standard Use Exclusion (472).

### **Fertilization**

The Nutrient Management (590) standard and specification must be used when working with the land user on a fertilizer program.

Fertilizer and other amendments should be applied according to soil test results and recommendations.

### **Mulching**

Materials such as hay, straw or wood chips will be used where appropriate. Apply the mulch by hand, blower or other suitable equipment. If hay or straw is applied with a blower, at least 50% of the stems should be more than 6 inches in length. Apply hay or straw mulch at the rate of 2,000 to 4,000 pounds per acre. Refer to the Mulching (484) standard and specification.

### **Weed Control**

Mechanical mow with a rotary or flail mower or use approved chemicals to control weeds.

When using chemicals, the Pest Management (595) standard and specification must be used when working with the land user on a weed control program.

Cooperators should be aware of and adhere to the provisions of state and federal laws and regulations concerning the use of agricultural chemicals.

### **Spot Control of Undesirable Weeds**

Use appropriate chemicals according to the manufacturer's recommendations, treating individual weeds or patches of weeds carefully, avoiding the desired species.

### **Wick Applications**

Use appropriate chemicals according to the manufacturer's recommendations on weeds that are at least 6 inches taller than the desired species.

**TABLE 1. SPECIES FOR CRITICAL AREA PLANTING\***

Common Name / Cultivar	Scientific Name	Elevation (ft.)	Rainfall (in.) <sup>A/</sup>	Seeding Rate (lbs/PLS/ac) <sup>B/</sup>
<b>Grasses / Non-legumes:</b>				
'aki 'aki <sup>D/</sup>	<i>Sporobolus virginicus</i>	0 - 1,000	30+	<u>C/</u>
Australian saltbush 'Corto'	<i>Atriplex semibaccata</i>	0 - 1,000	20+	20
bahiagrass 'Pensacola' 'Wilmington'	<i>Paspalum notatum</i>	0 - 4,500	40+	40 <u>C/</u>
barley <sup>E/</sup>	<i>Hordeum vulgare</i>	0 - 4,000	40+	100
bermudagrass common 'NK-37'	<i>Cynodon dactylon</i>	0 - 3,000	20-50	35 <u>C/</u>
buckwheat <sup>E/</sup>	<i>Fagopyrum esculentum</i>	0 - 4,000	40+	100
carpetgrass (narrowleaf)	<i>Axonopus affinis</i>	0 - 5,000	50+	40 <u>C/</u>
carpetgrass (broadleaf)	<i>Axonopus compressus</i>	0 - 5,000	50+	<u>C/</u>
centipedegrass	<i>Eremochloa ophiuroides</i>	0 - 2,500	35+	20 <u>C/</u>
dallisgrass	<i>Paspalum dilatatum</i>	0 - 2,500	40+	20
digitgrass 'Mealani' 'Transvala' 'Pangola' (common)	<i>Digitaria decumbens</i>	0 - 2,500	40+	<u>C/</u>
'emoloa	<i>Eragrostis variabilis</i>	0 - 3,000	20+	10
green panicgrass	<i>Urochloa maxima</i> (syn. <i>Panicum maximum</i> var. <i>trichoglume</i> )	0 - 2,500	20-70	20
hairy chess	<i>Bromus catharticus</i>	3,000 - 7,000	40-100	20
kikuyugrass 'Whittet'	<i>Pennisetum clandestinum</i>	0 - 6,000	35+	10 <u>C/</u>
napiergrass	<i>Pennisetum purpureum</i>	0 - 2,500	35+	<u>C/</u>
oats <sup>E/</sup>	<i>Avena sativa</i>	0 - 7,000	40+	70
orchardgrass	<i>Dactylis glomerata</i>	3,000 - 7,000	40-100	20
paspalum 'Tropic Lalo'	<i>Paspalum hieronymii</i>	0 - 3,000	40+	<u>C/</u>
piligrass <sup>D/</sup>	<i>Heteropogon contortus</i>	0 - 2,000	20-50	10

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<b>Grasses / Non-legumes Continued:</b>				
rhodesgrass 'Bell' 'Katambora' 'Nemkat'	<i>Chloris gayana</i>	0 - 3,000	20-40	20
ryegrass, perennial	<i>Lolium perenne</i>	1,500 - 7,000	40+	40
ryegrass, annual <sup>E/</sup>	<i>Lolium multiflorum</i>	0 - 7,000	40+	40
St. Augustinegrass	<i>Stenotaphrum secundatum</i>	0 - 3,000	40+	<u>C/</u>
seashore paspalum 'Tropic Shore'	<i>Paspalum vaginatum</i>	0 - 2,000	40+	<u>C/</u>
stargrass 'Florico' ("Puerto Rican") 'South Point'	<i>Cynodon nlemfuens</i>  <i>Cynodon plectostachyus</i>	0 - 3,000  0 - 3,000	20-80  20-80	<u>C/</u>  <u>C/</u>
wheat <sup>E/</sup>	<i>Triticum aestivum</i>	0 - 4,000	40+	100
<b>Legumes:</b>				
big trefoil  'Grasslands Maku'	<i>Lotus pedunculatus</i>	1,500 - 6,000	50+	25
desmodium 'Kuiaha' 'Greenleaf'	<i>Desmodium aparines</i> (syn. <i>D. intortum</i> )	0 - 2,500	35+	20
dolichos (lablab) 'Rongai'	<i>Lablab purpureus</i>	0 - 4,000	20-60	60
forage peanut	<i>Arachis glabrata</i>	0 - 3,000	50+	<u>C/</u>
forage peanut 'Amarillo' 'Forrajero'	<i>Arachis pintoi</i>	0 - 3,000	50+	20 <sup>C/</sup>
hetero	<i>Desmodium heterophyllum</i>	0 - 2,500	60+	20 <sup>C/</sup>
kaimi clover	<i>Desmodium canum</i>	0 - 3,000	35+	20
nanea <sup>D/</sup>	<i>Vigna marina</i>	0 - 1,000	20+	40 <sup>C/</sup>
siratiro	<i>Macroptilium atropurpureum</i>	0 - 2,500	15-60	40

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<b>Legumes Continued:</b>				
stylo 'Cook' 'Endeavor' 'Oxley' 'Schofield'	<i>Stylosanthes guyanensis</i>	0 - 3,000	60+	25
three-flowered beggarweed	<i>Desmodium triflorum</i>	0 - 2,500	35+	C/
white clover 'Haifa'	<i>Trifolium repens</i>	1,500 - 7,000	35-80	25
'Grasslands Huia' (New Zealand)				
<b>Ornamental Ground Covers:</b>				
'akia <sup>D/</sup>	<i>Wikstroemia uva-ursi</i>	0 - 1,000	20+	C/
cape marigold	<i>Dimorphotheca sinuata</i>	0 - 3,000	20+	C/
carpet bugle	<i>Ajuga reptans</i>	0 - 3,000	30+	C/
chinese jasmine	<i>Jasminum polyanthum</i>	0 - 4,000	35+	C/
coromandel	<i>Asystasia gangetica</i>	0 - 4,000	40+	C/
day lily	<i>Hemerocallis spp.</i>	0 - 4,000	30+	C/
dichondra	<i>Dichondra caroliniensis</i>	0 - 4,000	30+	C/
dissotis	<i>Dissotis plumosa</i>	0 - 2,000	35+	C/
'ilima & 'ilima papa <sup>D/</sup> (flat ilima)	<i>Sida fallax</i>	0 - 1,000	20+	C/
joyweed	<i>Alternanthera amoena</i>	0 - 3,000	40+	C/
lippia	<i>Lippia canescens</i>	0 - 2,500	40+	C/
'ohelo-papa <sup>D/</sup> (wild strawberry)	<i>Fragaria chiloensis</i>	3,500 - 6,000	40+	C/
oyster plant	<i>Rhoeo spathacea</i>	0 - 1,000	30+	C/
pa'u-o-hi'iaka <sup>D/</sup>	<i>Jacquemontia sandwicensis</i>	0 - 1,000	20-40	C/
pink clover	<i>Polygonum capitatum</i>	0 - 4,000	40+	C/
pohinahina <sup>D/</sup> (beach vitex)	<i>Vitex rotundifolia</i>	0 - 1,000	20+	C/
pohuehue <sup>D/</sup> (beach morning glory)	<i>Ipomoea pes-caprae</i>	0 - 1,000	20+	C/
portulaca (moss rose)	<i>Portulaca grandiflora</i>	0 - 4,000	20+	C/
ruellia	<i>Ruellia ciliosa</i>	0 - 4,000	30+	C/
trailing african daisy	<i>Osteospermum fruiticosum</i>	0 - 4,000	40+	C/

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<b>Ornamental Ground Covers Continued:</b>				
trailing gazania	<i>Gazania uniflora leucoleana</i>	0 - 4,000	30+	<u>C/</u>
'uhaloa <sup>D/</sup>	<i>Waltheria Indica</i>	0 - 3,000	20+	<u>C/</u>
waipahu fig	<i>Ficus tikuoa</i>	0 - 2,000	40+	<u>C/</u>
<b>Woody Plants:</b>				
'a'ali'i <sup>D/</sup>	<i>Dodonaea viscosa</i>	0 – 7,000	20+	10 x 10
alahe'e <sup>D/</sup>	<i>Canthium odoratum</i>	0 - 3,000	20+	10 x 10
athel tamarisk	<i>Tamarix aphylla</i>	0 - 600	20+	10 x 10
'aweoweo <sup>D/</sup>	<i>Chenopodium oahuense</i>	0 - 6000	20+	6 x 6
bamboo, clumping	<i>Bambusa sp.</i>	0 - 3,000	60+	6 x 6
bermuda juniper	<i>Juniperus bermudiana</i>	0 - 3,500	40+	10 x 10
bougainvillea	<i>Bougainvillea spp.</i>	0 - 2,500	25+	10 x 10
cook pine	<i>Araucaria columnaris</i>	0 - 3,000	30+	15 x 15
dracaena	<i>Dracaena fragrans</i>	0 - 2,000	60+	6 x 6
dracaena	<i>Dracaena dermensis</i>	0 - 2,000	60+	6 x 6
eucalyptus	<i>Eucalyptus spp.</i>	0 – 6,000	30+	10 x 10
hala <sup>D/</sup>	<i>Pandanus tectorius</i>	0 – 2,000	40+	15 x 15
hau <sup>D/</sup>	<i>Hibiscus tiliaceus</i>	0 – 1,000	30+	10 x 10
hibiscus, native <sup>D/</sup>	<i>Hibiscus spp.</i>	0 – 1,000	30+	6 x 6
hibiscus, chinese	<i>Hibiscus rosa-sinensis</i>	0 – 1,000	30+	6 x 6
kamani <sup>D/</sup>	<i>Calophyllum inophyllum</i>	0 – 2,000	50+	15 x 15
koa <sup>D/ E/</sup>	<i>Acacia koa</i>	500 - 7,000	50+	15 x 15
koai'a <sup>D/ E/</sup>	<i>Acacia koaia</i>	0 – 3,000	30+	10 x 10
kou <sup>D/</sup>	<i>Cordia subcordata</i>	0 - 500	30+	10 x 10
kukui <sup>D/</sup> (candlenut tree)	<i>Aleurites moluccana</i>	0 - 3,000	50+	10 x 10
kulu'i <sup>D/</sup>	<i>Nototrichium sandwicense</i>	0 – 1,000	30+	6 x 6
ma'o <sup>D/</sup> (Hawaiian cotton)	<i>Gossypium sandwicense</i>	0 – 1,000	20+	4 x 4
mamane <sup>D/ E/</sup>	<i>Sophora chrysophylla</i>	1,500 – 8,000	30+	10 x 10
manele <sup>D/</sup>	<i>Sapindus saponaria</i>	0 – 4,000	60+	15 x 15
mangium <sup>E/</sup>	<i>Acacia mangium</i>	0 - 1,000	50+	10 x 10
milo <sup>D/</sup>	<i>Thespesia populnea</i>	0 - 1,000	20+	10 x 10
naio <sup>D/</sup>	<i>Myoporum sandwicense</i>	0 – 7,500	30+	10 x 10
naupaka kahakai <sup>D/</sup>	<i>Scaevola Sericea</i>	0 – 1,000	20+	6 x 6
noni <sup>D/</sup>	<i>Morinda citrifolia</i>	0 – 1,500	30+	10 x 10
norfolk-island pine	<i>Araucaria heterophylla</i>	0 - 3,000	30+	15 x 15
'ohai <sup>D/ E/</sup>	<i>Sesbania tomentosa</i>	0 - 1,000	20+	6 x 6

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Woody Plants Continued:				
'ohi'a lehua <sup>D/</sup>	<i>Metrosideros polymorpha</i>	0 - 8,000	60+	10 x 10
small cone ironwood <sup>E/</sup>	<i>Casuarina cunninghamiana</i>	0 - 3,000	30+	10 x 10
tall erythrina 'Tropic Coral' <sup>E/</sup>	<i>Erythrina variegata</i>	0 - 1,000	50+	6 x 6
ti <sup>D/</sup>	<i>Cordyline terminalis</i>	0 - 4,000	30+	4 x 4
u'ulei <sup>D/</sup>	<i>Osteomeles anthyllidifolia</i>	0 - 4,000	50+	4 x 4
vitex	<i>Vitex trifolia variegata</i>	0 - 4,000	50+	4 x 4
wiliwili <sup>D/ E/</sup>	<i>Erythrina sandwicensis</i>	0 - 2,000	20+	10 x 10

\* This list is not all –inclusive. Other species may be used based on prescriptions by qualified NRCS technical specialists.

<sup>A/</sup> Unless irrigated.

<sup>B/</sup> Pure Live Seed (PLS): The amount of PLS is equal to the percent of purity, multiplied by the percent germination plus hard or otherwise sound seed.

<sup>C/</sup> Species are established with vegetative material. If the material is spread and disked in, use a minimum of 80 bushels of sprigs per acre. For planting sprigs in holes or if using rooted cuttings or seedlings, spacing shall be a maximum of 36 inches apart.

<sup>D/</sup> Native to Hawaii or early Polynesian introduction.

<sup>E/</sup> Use these annuals for rapid cover as a companion plant at 20 to 30 lbs./PLS/ac with a perennial. For rapid temporary cover after land clearing or other disturbance, seed at full rate indicated in table.

<sup>F/</sup> Nitrogen fixing tree.