

Planting Habitat on Farms

Prepared by:
 Sam Earnshaw
 Community Alliance with
 Family Farmers (CAFF)
 (831) 722-5556
www.caff.org
hedgerows@baymoon.com

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Conservation Practices: Ways Farmers are Using Vegetation

Hedgerows, Grassed Waterways, Filter Strips,
 Riparian Plantings, Windbreaks

Functions:

- Soil erosion control
- Weed control
- Beneficial insect and pollinator habitat
- Wildlife habitat
- Non-point source water pollution reduction
- Air quality and dust control
- Barriers
- Riparian stabilization
- Windbreak and climate modification
- Aesthetic value
- Economic returns
- Increase in local and regional biodiversity

Native Plant Hedgerow



Perennial Grasses In Ditch
for Erosion and Weed Control



Grass Filter Strip between Field and Hedge

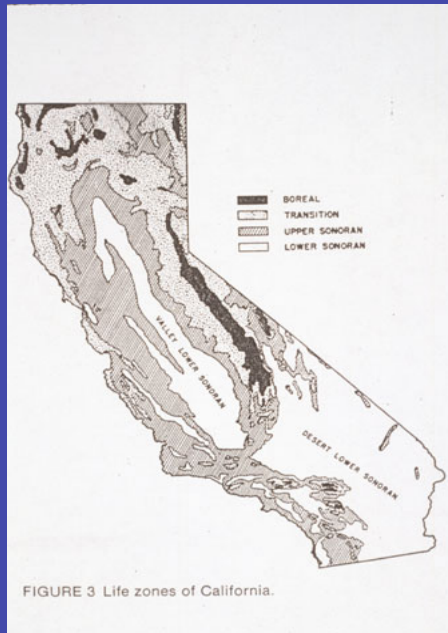


Windbreak, using Redwood, Incense Cedar, Pepper Tree, Giant Sequoia, Soapbark Tree, Strawberry Madrone



Life Zones of California

Elevation
Rainfall
Climate
Biota



Zones

Boreal-alpine
Transition-mountain
Upper Sonoran-foothill
Lower Sonoran-valley

Water Quality Improvements Through Habitat Plantings

Estimates of soil loss prevented by Vegetative Conservation Practices on 2001-2003 CAFF/SWRCB Project

Grassed Waterways

Project Sites:	6
Total Area:	54,100 sq. ft. (1.2 acres)
Tons/Year Prevented (estimate):	232.5 tons
Cubic Yards/Year Prevented (estimate):	172.2 cu. yds.

Hedgerows

Project Sites:	11
Total Area:	129,600 sq. ft. (2.9 acres)
Tons/Year Prevented (estimate):	30.9 tons
Cubic Yards/Year Prevented (estimate):	22.9 cu. yds.

TOTAL ESTIMATED SOIL LOSS PREVENTED/YEAR

from 17 Conservation Plantings:

263.4 Tons/yr. 195.4 Cu. Yds./yr.

NOTE: Estimates of Surface Erosion (Sheet and Rill) were calculated using the Universal Soil Loss Equation, and Gully Erosion (Void calculations greater than rill) were calculated using NRCS procedures as defined in the Soil Loss Prediction for Road-related situations document. These numbers are approximate, calculated with some broad assumptions, and represent an extremely general estimate of how much soil is being prevented from entering the aquatic system.

Hedgerow 7 Years Old: Ceanothus, Coffeeberry,
Baccharis, Elderberry, Toyon



Low growing Ceanothus
C. Yankee Point



Coffeeberry



Toyon - Christmas Berry



Perennial Buckwheat
in Flower



Aster chilensis



Gumplant



Lavatera



Clematis (Vine)

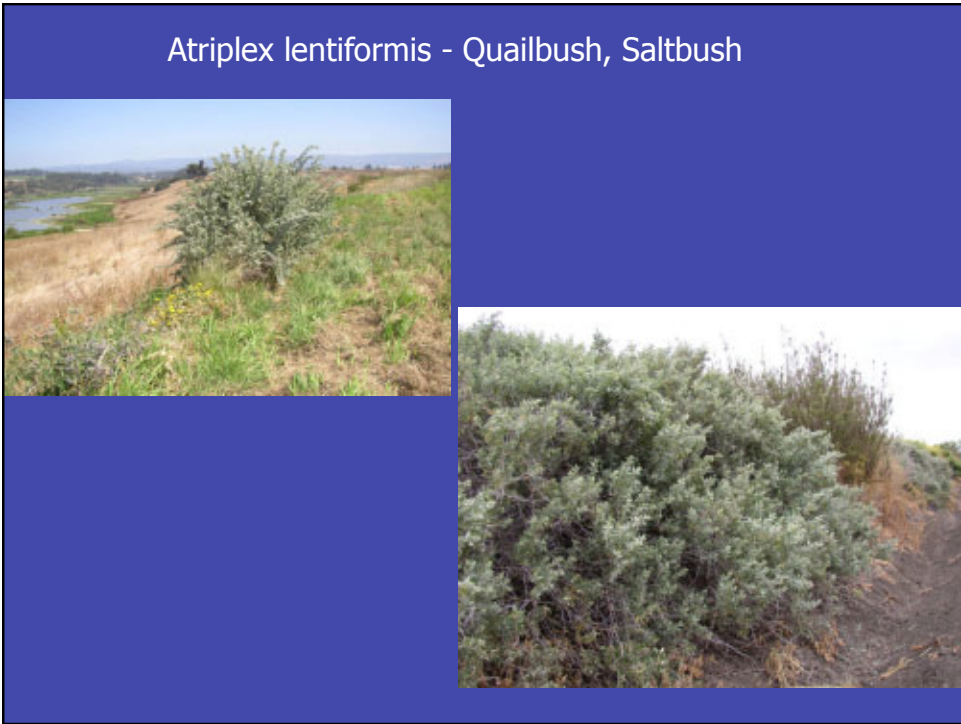


Elderberry



Lizard Tail/
Woolly
Sunflower





Bare Soil, no Habitat in Central Valley



Layout, Compost, Planting
November 2008



Watering in,
with Wand



One Year's Growth





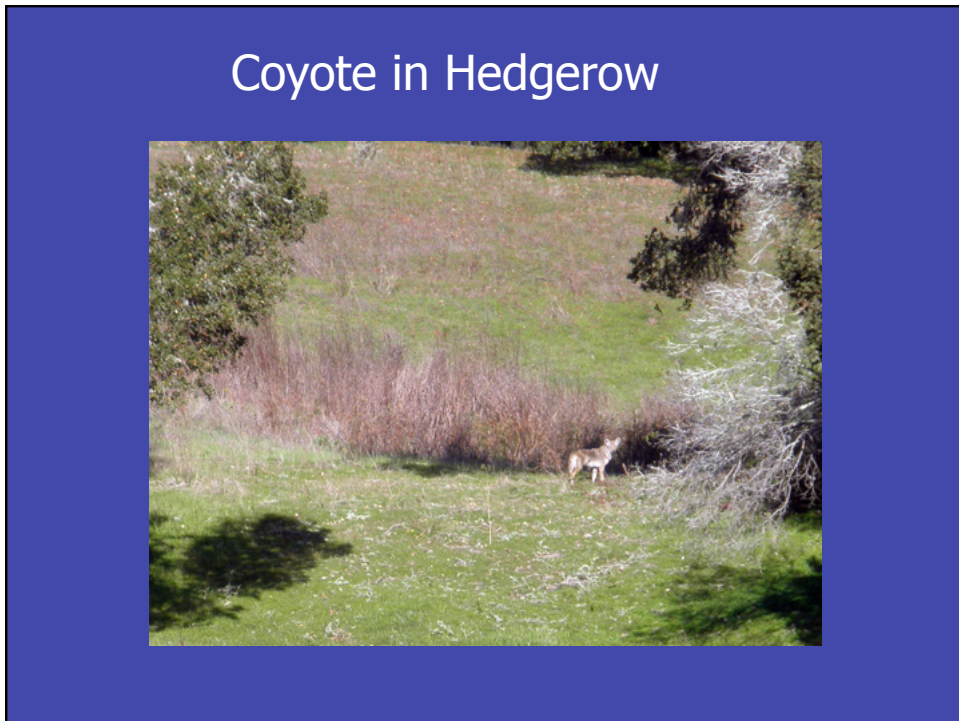


Providing Habitat for Beneficial Insects, Pollinators, and Wildlife; Protecting the Soil



Hedgerows creating habitat





Planning a hedgerow



Starting with Flat Bare Ground



Two years later



Planting bed built up



Planting on a Berm or High Bed



Hedgerow on Strawberry field, 18 months old



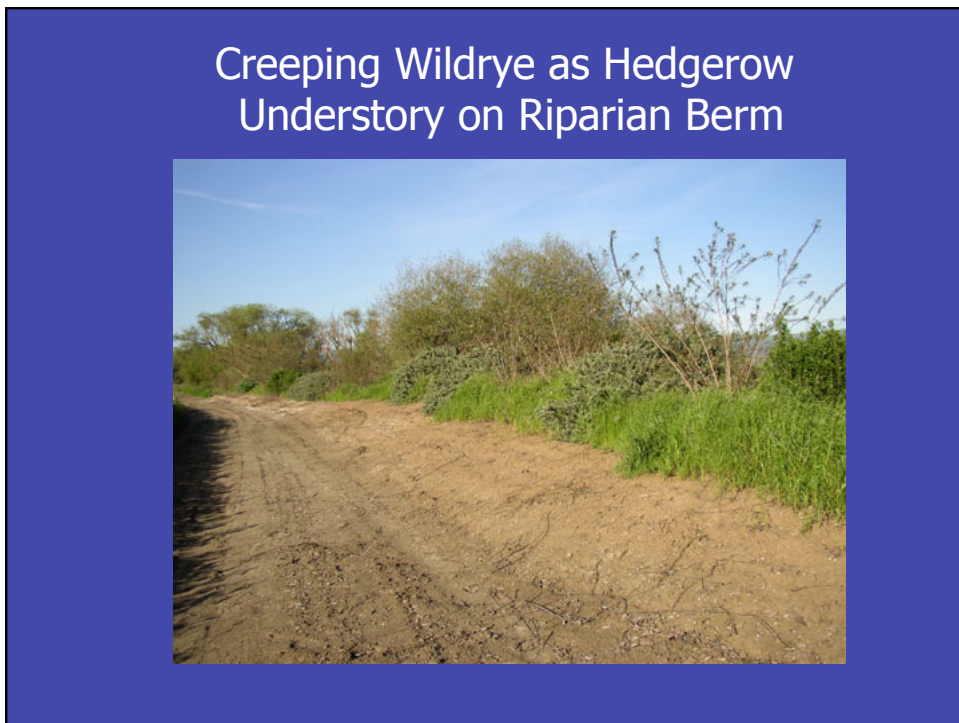
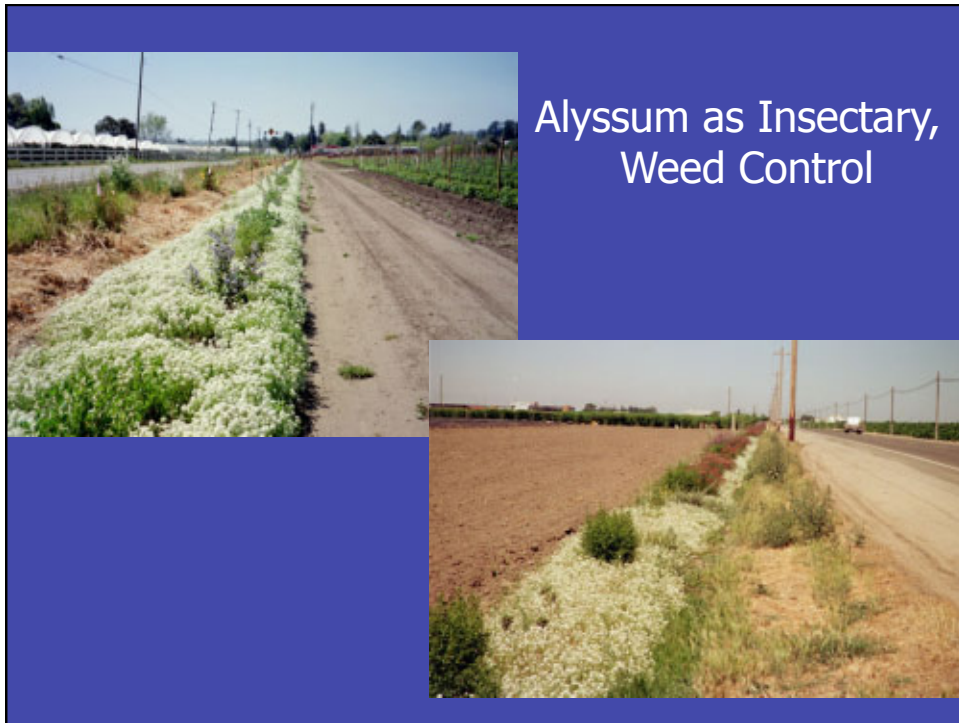


Salinas Valley Hedgerow and Grassed Berm



Short Flowers and Shrubs on Berm: Attract Insects, Replace Weeds and Prevent Erosion





Use of Weed Fabric in Hedgerow



Solarizing beds to kill weed seeds



Using Mulch to Control Weeds And Regulate Moisture



Mulched Hedgerow



Mulching for Weed Control and Retaining Moisture



Mulching for Weed Control and Retaining Moisture



Hedgerows with Mulch



How Not to Mulch









Habitat Needs

Overwintering

Nesting

Shelter

Water

Nectar

Pollen

Alternate Hosts

Alternate Prey

RESEARCH- Insects Associated with Native Hedgerows

From Long, R.F., A. Corbett, C. Lamb, C. Reberg-Horton, J. Chandler, and M. Stimmann. 1998. Movement of beneficial insects from flowering plants to associated crops. California Agriculture. 52(5): 23-26.

Plant species sampled:

- | | |
|------------------|-------------------------|
| California lilac | Ceanothus |
| Buckwheat | Eriogonum fasciculatum |
| Coffeeberry | Rhamnus californica |
| Coyote Brush | Baccharis pilularis |
| Toyon | Heteromeles arbutifolia |
| Elderberry | Sambucus mexicana |



Beneficial Insects

Monitored:

- Minute pirate bug
- Assassin bug
- Soldier beetle
- Green lacewing
- Colops
- Lady beetle
- Damsel
- Hymenoptera
- Hoverflies
- Tachinid flies

Pest Insects Controlled

- Aphids
- Mealy Bugs
- Leaf Hoppers
- Scale
- Mites
- Corn Earworm



- Whitefly
- Thrips
- Squash Bug
- Stink Bug
- Lygus Bug

Beneficial Insects



Beneficial Insects



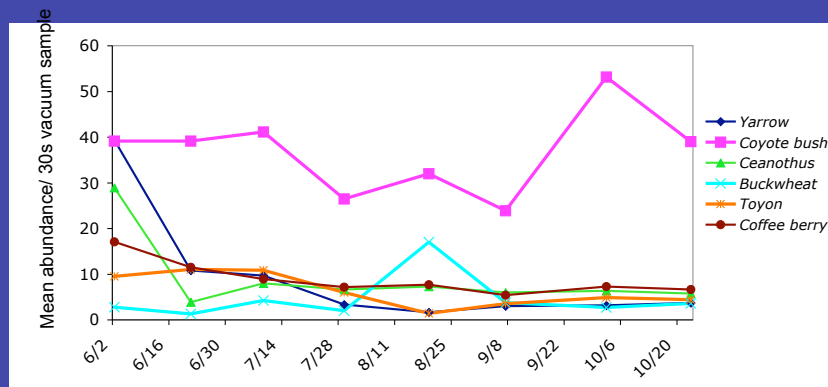
Wasps



Abundance of Wasp Parasitoids



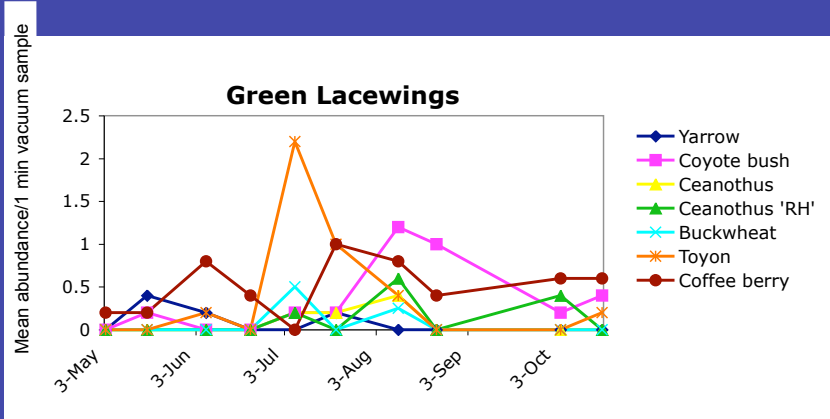
Photos credit: UC IPM website



Means of 5 sites, 2005

Data from Tara Pisani Gareau <tlp19@psu.edu>

Abundance of a Predator



San Juan Bautista site, 2006

Owl Boxes, Used for Rodent Control



Things You Find in Owl Boxes



Birds Eat Pests

Birds Eat Rodents, and
the Following Insects:

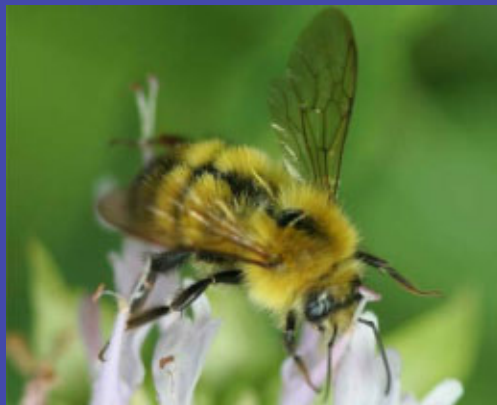
- Caterpillars
- Ants
- Grubs
- Moths
- Grasshoppers
- Leafhoppers
- Aphids
- Snails
- Scale insects
- Sow bugs
- Codling Moth
- Insect eggs



Pollination: Flowers
Attract Bees



Bees Increase Yields



Issues, Problems with Native Plantings

- Pests (insects, rodents, birds) attracted to plantings - Food Safety concerns
- Movement of insects into fields
- Genetic Pollution-not using plants from specific area
- Hosting Diseases: Pierce's Disease, Sudden Oak Death (SOD), Eutypa
- High costs of maintenance

Hedgerow next to Spinach Field in Salinas



Tree Frog in Hedgerow



Gopher Snake in Hedgerow





Now, that's a snake!



John Anderson, with gopher snake



Fence Barrier
Encircling Field







Perennial vs. Annual Roots



From Bare Dirt to Perennial Native Grass

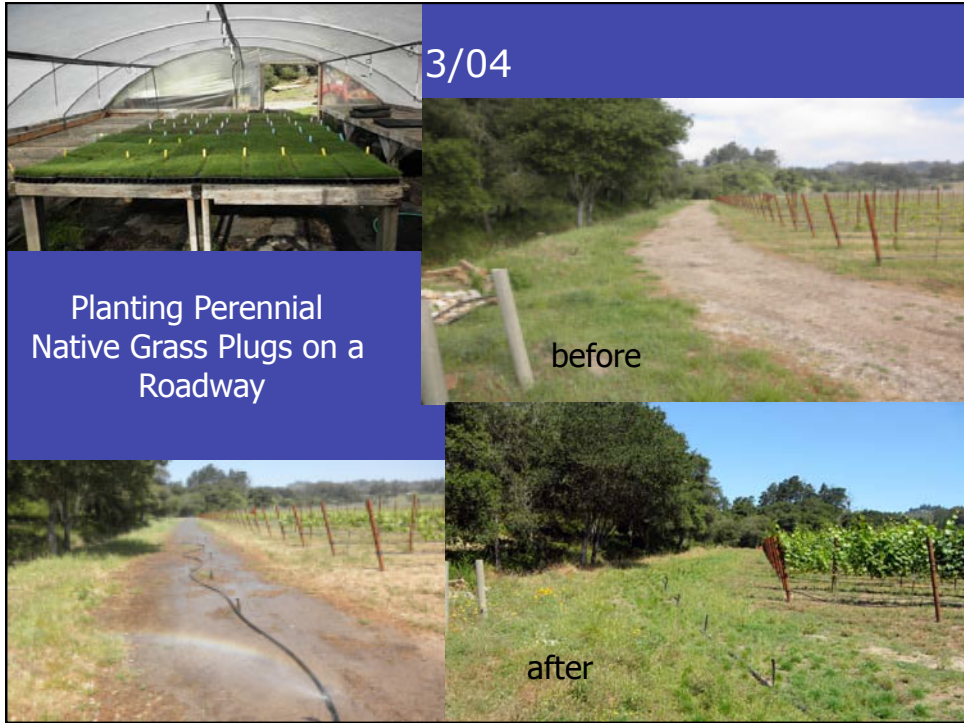


Perennial Grasses Seeded into Waterway



Perennial Grassed Filter Strip







Erosion Control
in Swale with Grasses,
Wetland Plants and
Yarrow



Before



After

Storm Runoff down Swale Jan. 1, 2004



Swale Vegetation Preventing Formation of Gully Erosion 1/02/04 (one day after storm)

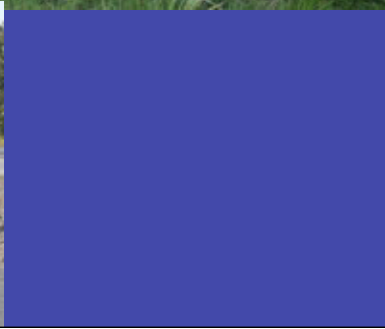


Swale, 3/04





Filter Strip
with Native
Perennial
Grasses



Perennial Grass along
Roadside



Vegetated ditch with weir



Grassed Filter Strip



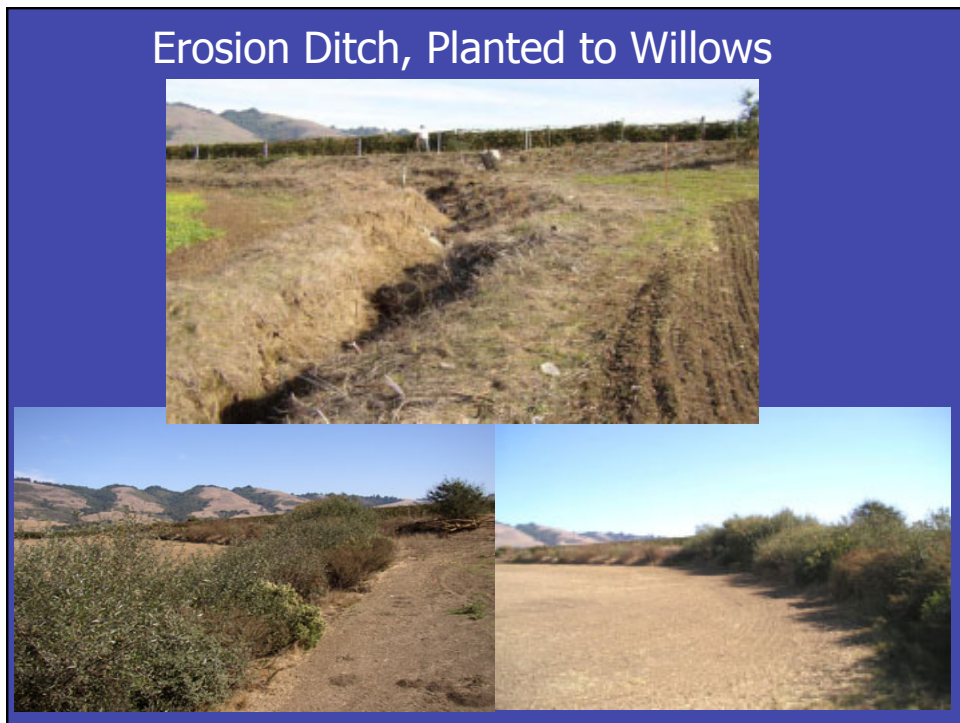


Vegetated Ditch Connecting Habitat: Reservoirs for Beneficial Insects



Erosion Control-
Grass and Shrubs
vs. Bare Soil







Lack of Diversity on Farms
in the Salinas Valley



Diversity within Monocultures:
ALBA Farms in the Salinas Valley



Framework for Setting Research Priorities:**Species Selection**

Functions	Establishment	Problems/Issues
Beneficial insect and pollinator habitat	Site preparation	Attracting/introducing pest insects/vertebrates/pathogens/diseases
Wildlife habitat	Species suitability	Deer or rodent damage
Soil erosion control	Spacings	Possible spread of some seeds into adjacent fields as weeds
Weed control	Irrigation methods	Lack of suitable plant material
Non-point source water pollution reduction	Compost/fertilizer	Inadequate plant densities
Air quality and dust control	Weed strategies	Improper location or spacing
Barriers	Monitoring protocols	Costs
Riparian stabilization		
Windbreak and climate modification		
Aesthetic value		
Economic returns		
Increase in local and regional biodiversity		

Involving School Children in Conservation Plantings





For More Information, Contact Sam Earnshaw
(831) 722-5556 hedgerows@baymoon.com
Resource Guide: Hedgerows for California Agriculture
Available for downloading on www.caff.org