

SAN GERONIMO WATERSHED

Biological Conditions I - Salmonid Presence

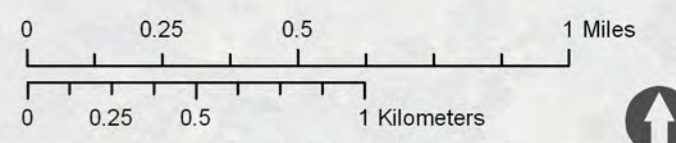


Legend

Fish Presence (Existing Conditions)

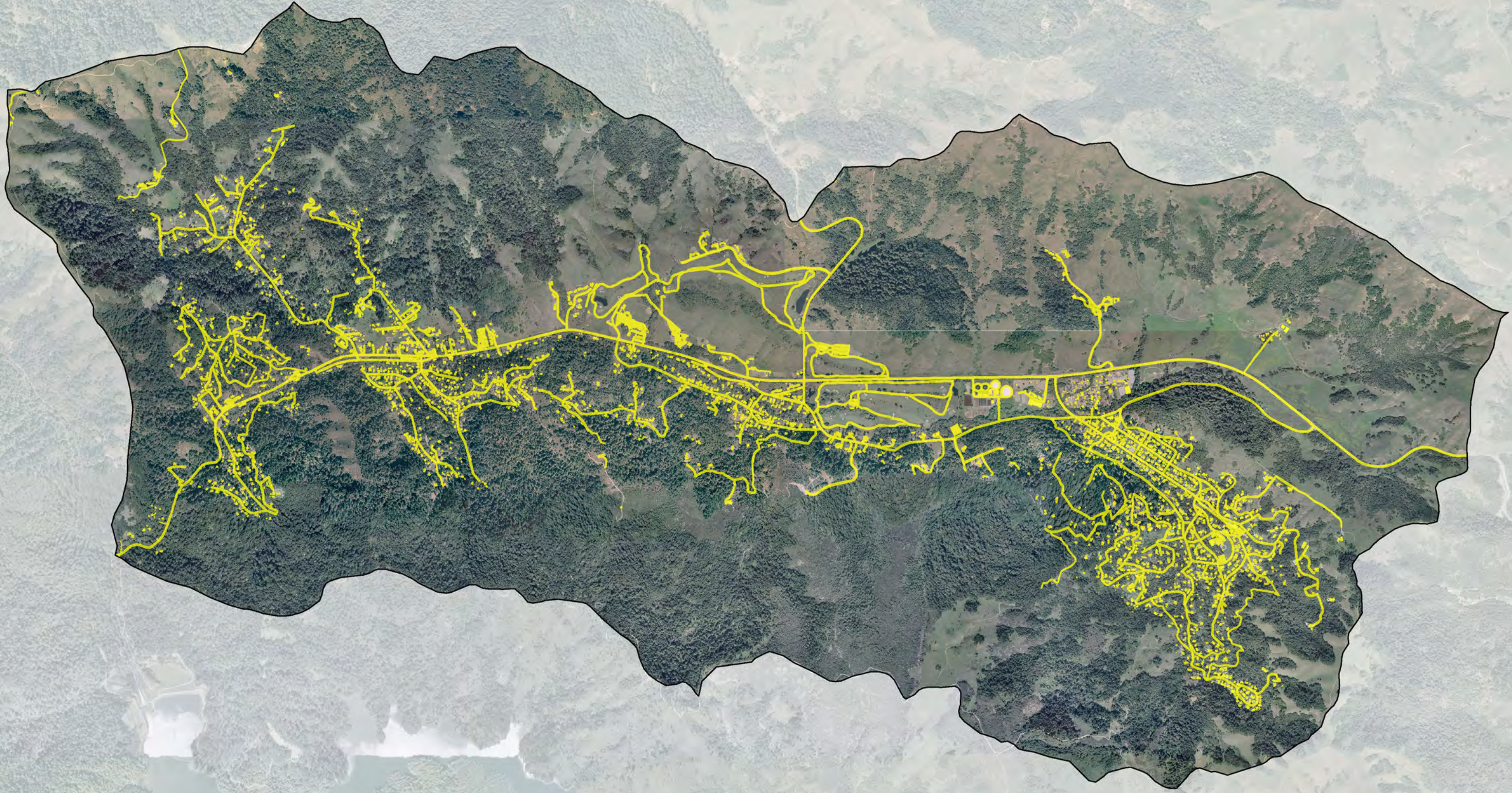
- Steelhead
- Steelhead and Coho
- Steelhead, Coho & Chinook
- County of Marin owned fish passage barrier from *SGV_Fish_Passage_RTA* (Marin DPW pers.comm. 2008)
- Fish passage barrier on private lands digitized from (Walder et al. 2002) and revised by Marin DPW (2008) to remove duplicates.
- Primary Road
- Secondary Road
- Trail


- /● Complete barrier for all life stages of salmon under all flow scenarios
- /○ Partial barrier for some life stages of salmon and/or under some stream flow conditions
- /● Not a barrier to all life stages of salmon under all flow conditions
- /○ Unknown

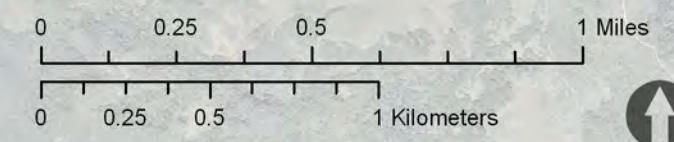


SAN GERONIMO WATERSHED

Human Infrastructure I - Impervious Surfaces



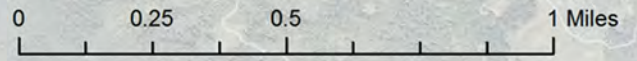
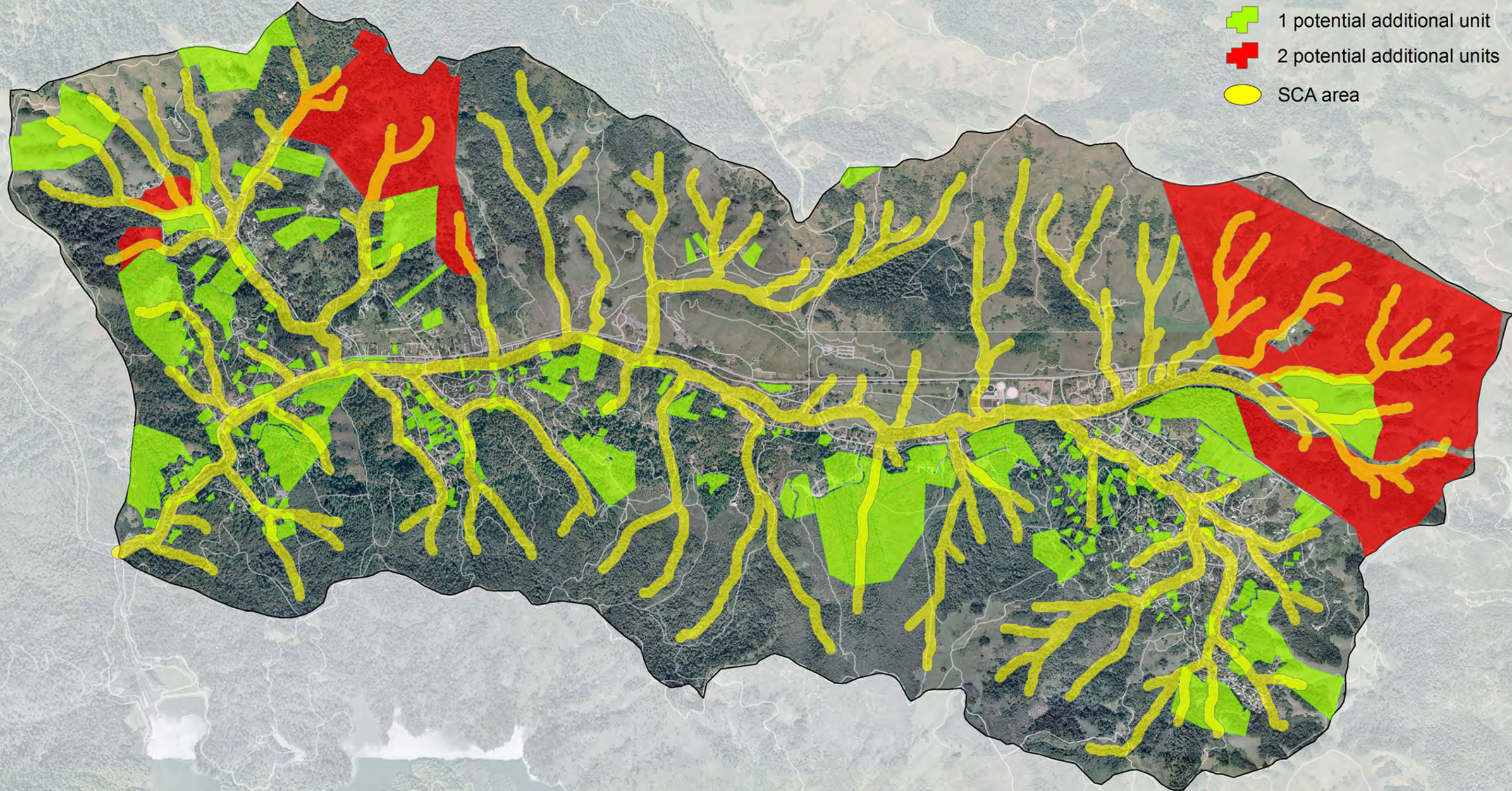
 Impervious Surface



SAN GERONIMO WATERSHED

Potential additional units by parcel*

- Legend**
- 1 potential additional unit
 - 2 potential additional units
 - SCA area



*In accordance to the Mitigated alternative #1 count of housing units (MG1) of the County Wide Plan (CWP).

**SAN GERONIMO
SALMONID
ENHANCEMENT PLAN
PLANTING PLAN
CONCEPTUAL PLAN 1**



CA BAY LAUREL



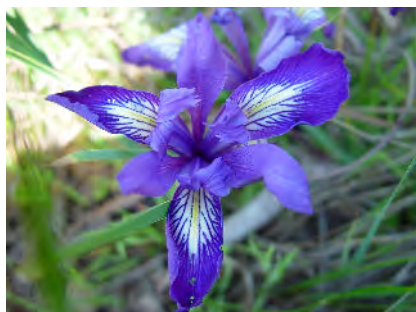
CREeping SNOWBERRY



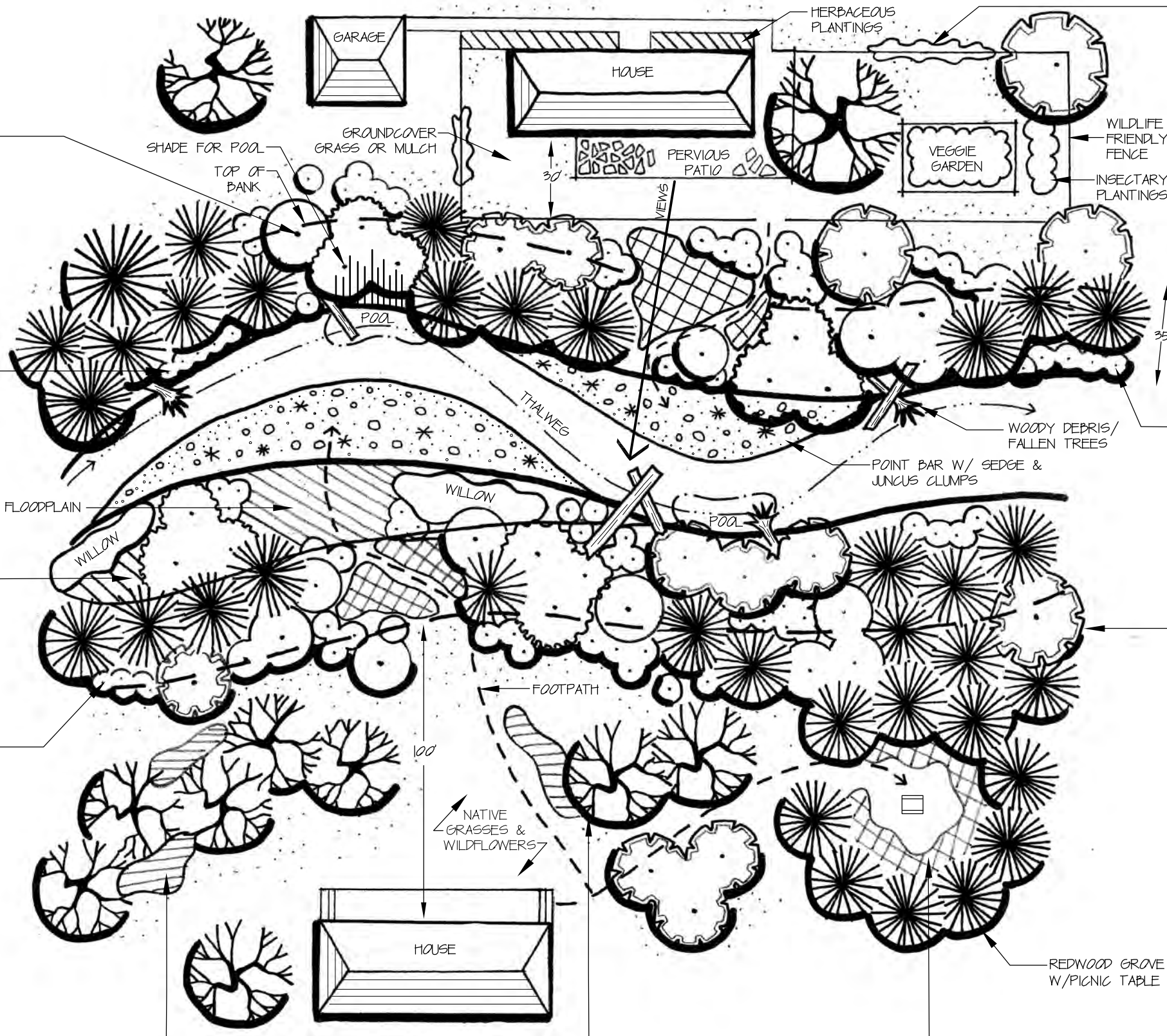
SOFT RUSH



RED FLOWERING CURRANT



DOUGLAS IRIS



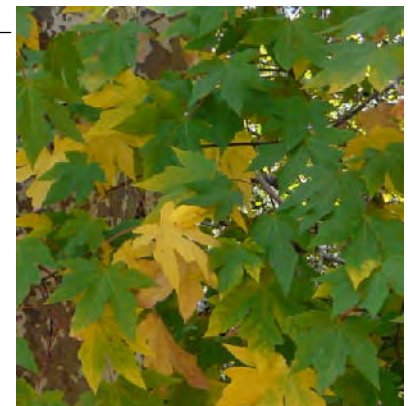
CA PIPEVINE



TWINBERRY (VINE)



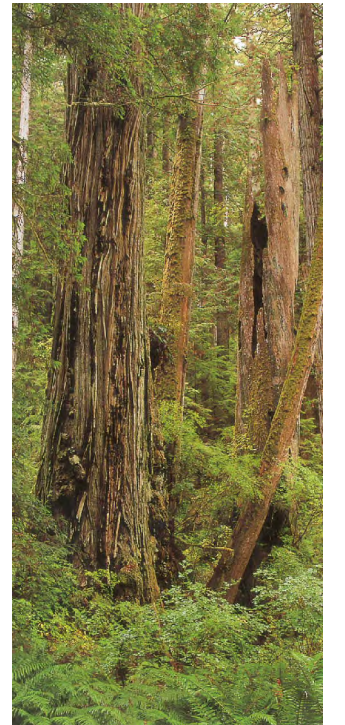
THIMBLEBERRY




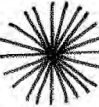


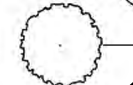

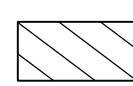
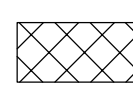
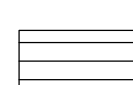
BIG LEAF MAPLE



GIANT CHAIN FERN



LEGEND

-  COAST LIVE OAK/
TAN OAK
-  REDWOOD/
DOUG FIR
-  BIG LEAF MAPLE
-  CA BAY LAUREL
-  WHITE ALDER
-  HAZLENUT
CURRANT
THIMBLEBERRY
SNOWBERRY
-  FLOODPLAIN W/
JUNCUS & SEDGE
-  WOOD ROSE, FERNS
& SNOWBERRY
-  CA ROSE
DOUGLAS IRIS

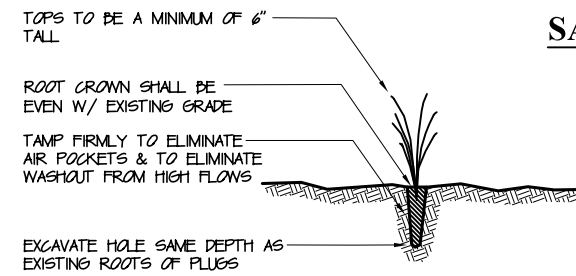
PLANT LIST

Common Name	Scientific Name	Bank Position
TREES		
Alder (white)	<i>Alnus rhombifolia</i>	L
Arroyo willow	<i>Salix lasiolepis</i>	L
Big-leaf maple	<i>Acer macrophyllum</i>	U,M
California bay-laurel	<i>Umbellularia californica</i>	L,M
California buckeye	<i>Aesculus californica</i>	U,M
Coast live oak	<i>Quercus agrifolia</i>	U,M
Douglas-fir	<i>Pseudotsuga menziesii</i>	U,M,L
Oregon ash	<i>Fraxinus latifolia</i>	L,M
Redwood	<i>Sequoia sempervirens</i>	U,M,L
Tanoak	<i>Lithocarpus densiflorus</i>	U,M
Valley oak	<i>Quercus lobata</i>	U
SHRUBS & VINES		
California blackberry	<i>Rubus ursinus</i>	M
Ceanothus	<i>Ceanothus thyrsiflorus</i>	U
Coyote brush (prostrate)	<i>Baccharis pilularis</i>	U
Coffeeberry	<i>Rhamnus californica</i>	U,M
Dogwood	<i>Cornus sericea</i>	L,M
	<i>Sambucus nigra canadensis</i>	U,M,L
Elderberry	<i>canadensis</i>	U,M,L
Hazelnut	<i>Corylus cornuta</i>	M,U
Honeysuckle, CA (vine)	<i>Lonicera hispidula</i>	M,U
Maidenhair fern	<i>Adiantum capillus-veneris</i>	M,L
Monkeyflower	<i>Mimulus spp.</i>	U,M,L
Ocean spray	<i>Holodiscus discolor</i>	U,M
Pipevine, CA	<i>Aristolochia californica</i>	U,M,L
Red-flowering currant	<i>Ribes sanguineum</i>	U,M
Rose, CA	<i>Rosa californica</i>	U
Rose, wood	<i>Rosa gymnocarpa</i>	U,M
Salmonberry	<i>Rubus spectabilis</i>	M
Snowberry (creeping)	<i>Symphoricarpos mollis</i>	M
Thimbleberry	<i>Rubus parviflorus</i>	L,M
Twinberry (vine)	<i>Lonicera involucrata</i>	L,M
Virgin's bower (vine)	<i>Clematis ligusticifolia</i>	L,M
Wild ginger (groundcover)	<i>Asarum caudatum</i>	U,M
HERBACEOUS SPECIES		
Black flowering sedge	<i>Carex nudata</i>	L
California meadow sedge	<i>Carex pansa</i>	U,M,L
Spike rush	<i>Eleocharis macrostachya</i>	Floodplain, L
Giant chain fern	<i>Woodwardia fimbriata</i>	L
Gray rush	<i>Juncus patens</i>	Floodplain, L
Pacific iris	<i>Iris douglasiana</i>	U
Santa Barbara sedge	<i>Carex barbarae</i>	Floodplain, L
Soft rush	<i>Juncus effusus</i>	Floodplain, L
Tall flatsedge	<i>Cyperus eragrostis</i>	Floodplain, L
Western sword fern	<i>Polystichum munitum</i>	L
GRASSES		
Blue wildrye	<i>Elymus glaucus</i>	U,M
California brome	<i>Bromus carinatus</i>	U,M
California fescue	<i>Festuca californica</i>	U,M
Creeping wildrye	<i>Leymus triticoides</i>	U,M
Idaho fescue	<i>Festuca idahoensis</i>	U,M
Meadow barley	<i>Hordeum brachyantherum</i>	U,M
Purple needlegrass	<i>Nassella pulchra</i>	U,M

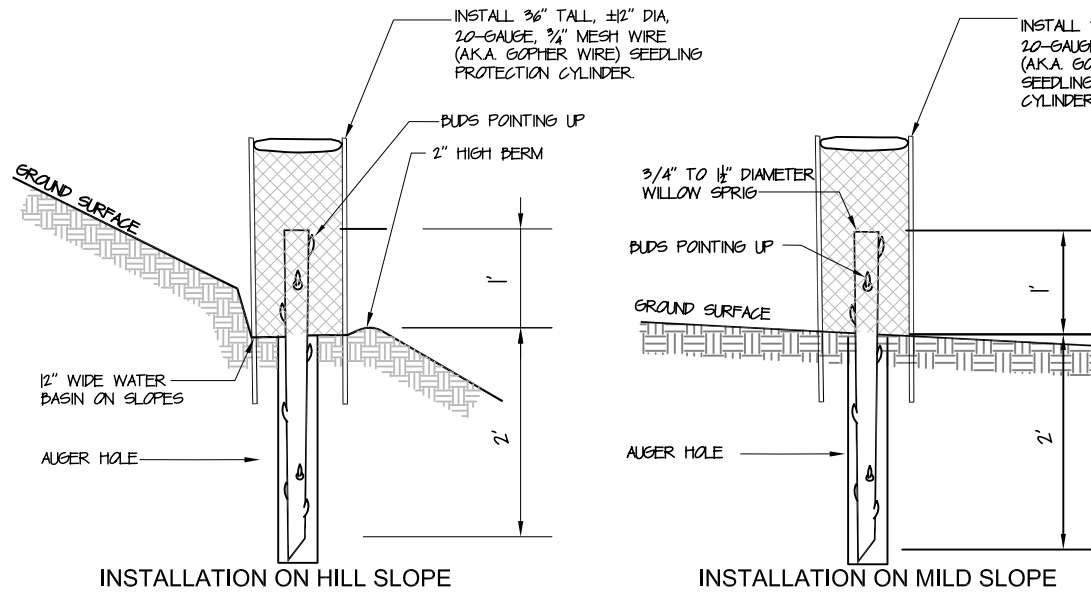
PLANTING NOTES

Planting Position: U = upper bank, M = middle bank, L = lower bank
 Plant trees in clusters of 3-9 each, spaced 15 feet apart.
 Plant shrubs, ferns and vines in clusters of 3 to 9 each, spaced 3 to 6 feet apart (within cluster).
 Plant grass, sedge, and rush 1.5' to 3' on center in clusters.
 Channel floodplain and banks should be planted with seed mix and/or plugs.
Watering: DriWater® gel packs may be used if drip is not feasible. Plants should be watered for establishment period of 3 years.

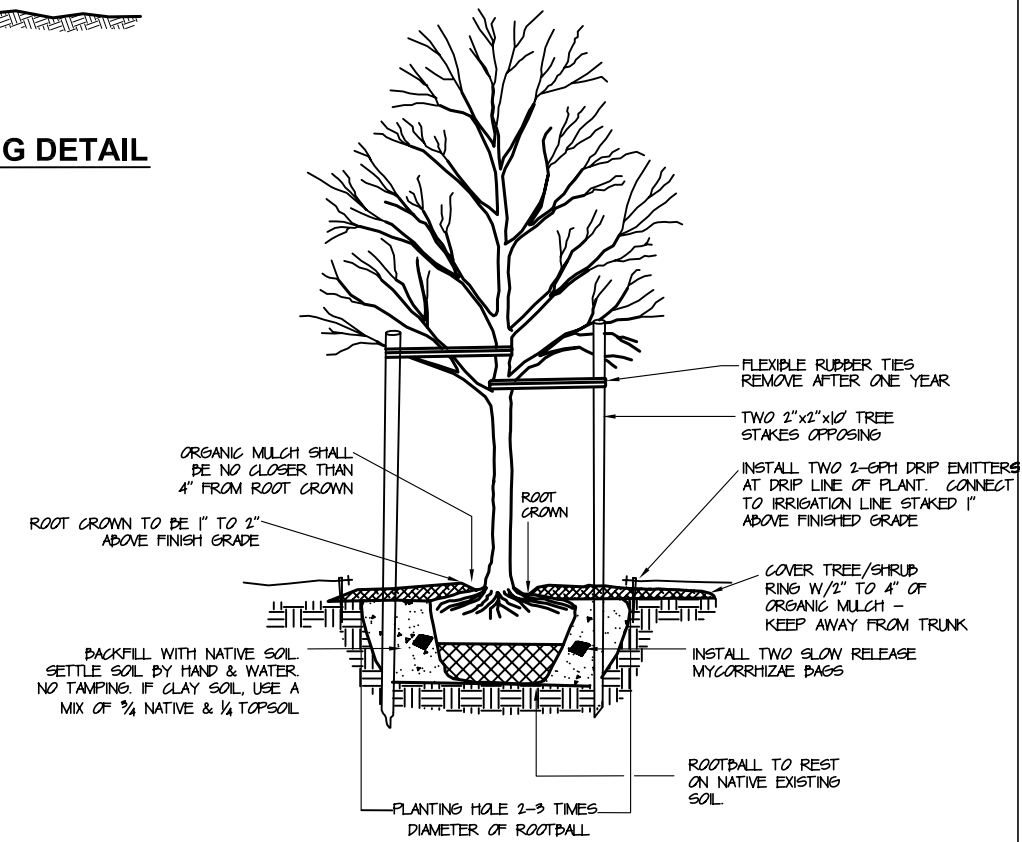
SAN GERONIMO SALMONID ENHANCEMENT PLAN PLANT LIST & PLANTING DETAILS CONCEPTUAL PLAN 1



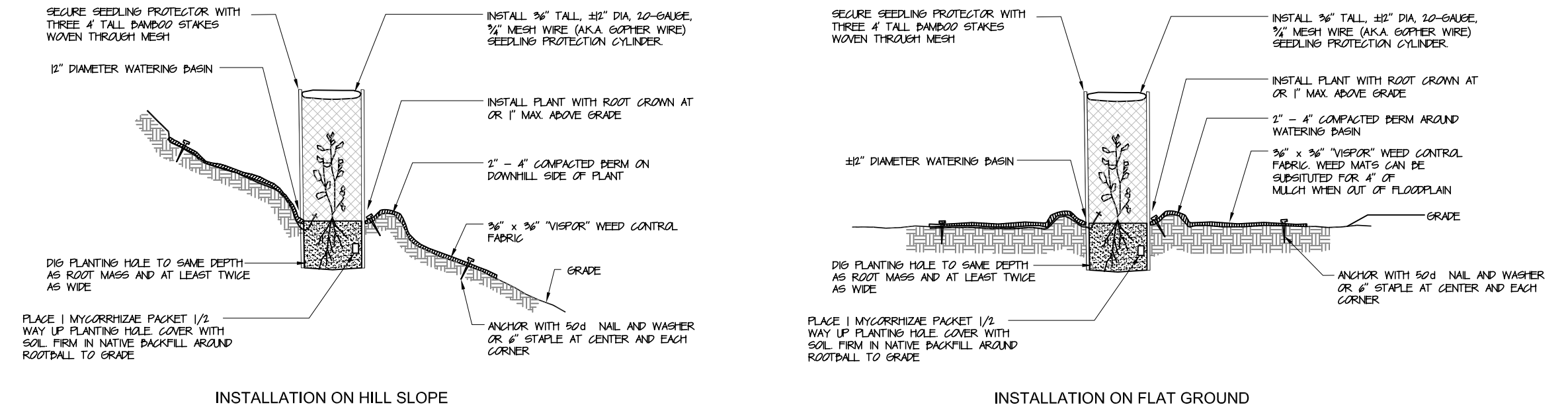
PLUG PLANTING DETAIL



WILLOW STAKE PLANTING DETAIL

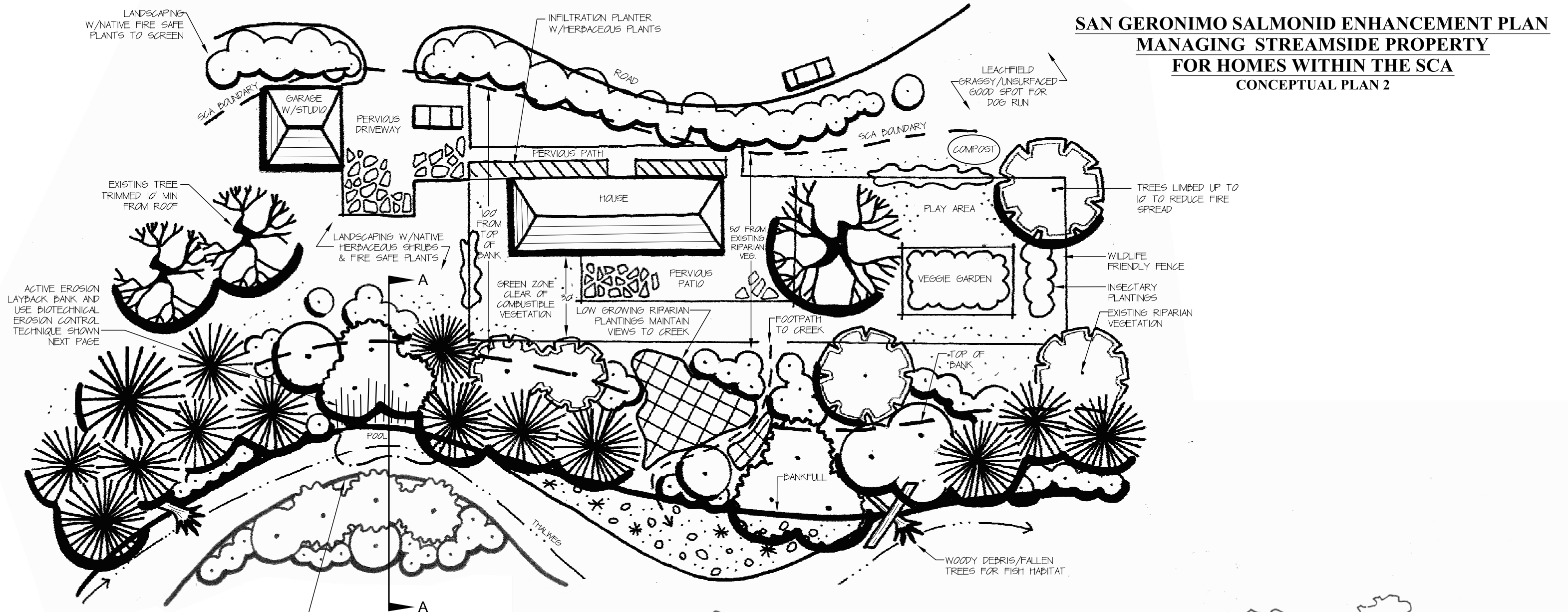


TREE PLANTING DETAIL



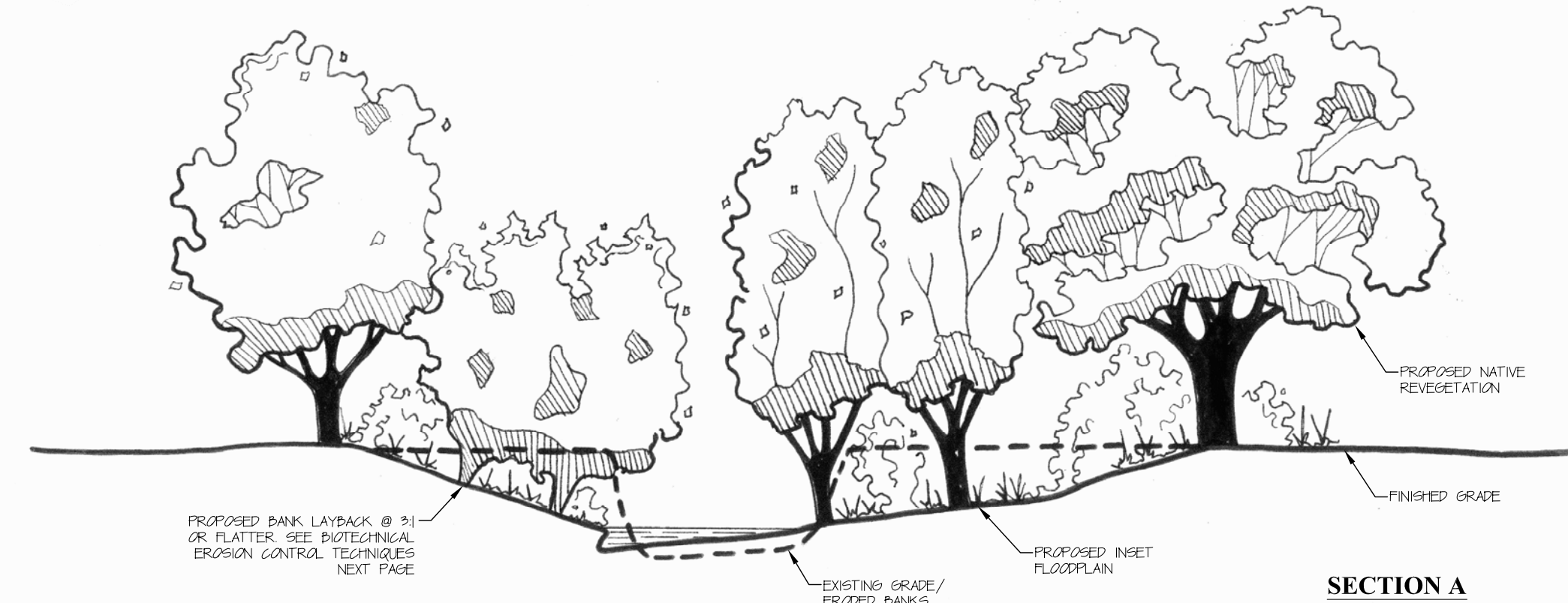
CONTAINER - GROWN PLANTS PLANTING DETAIL

**SAN GERONIMO SALMONID ENHANCEMENT PLAN
MANAGING STREAMSIDE PROPERTY
FOR HOMES WITHIN THE SCA
CONCEPTUAL PLAN 2**



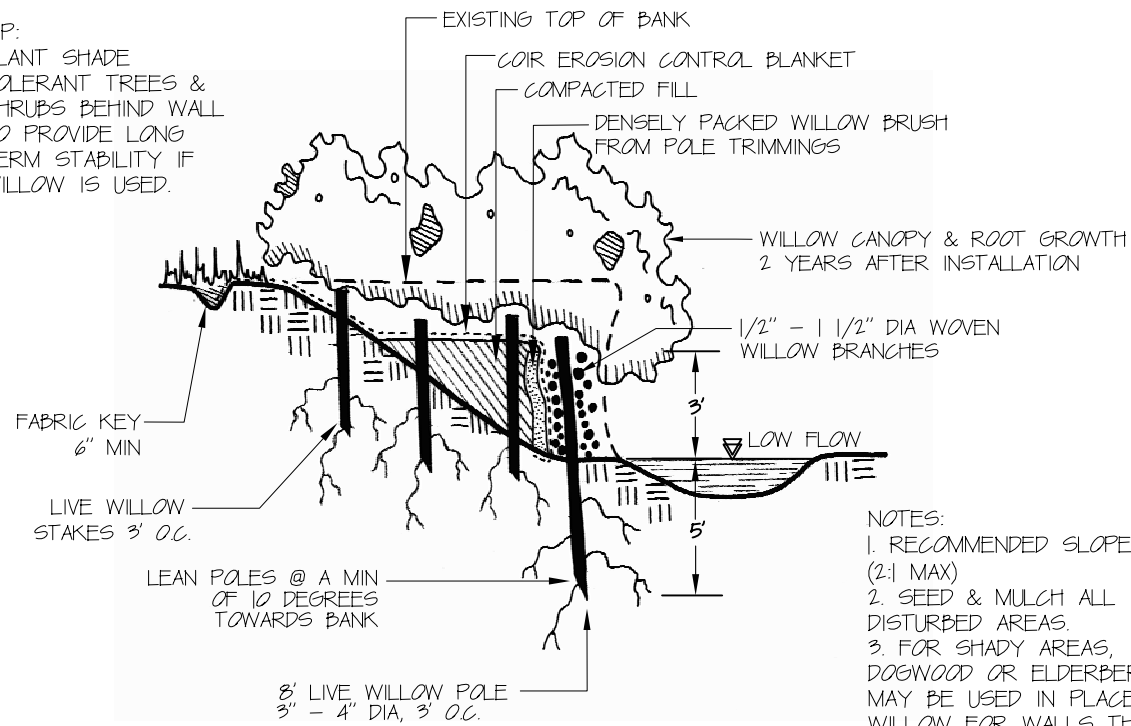
STEEP BANK LAYBACK BANK AND CREATE INSET FLOODPLAIN. SEE SECTION 'A' BELOW

PROPOSED BANK LAYBACK @ 3:1 OR FLATTER. SEE BIOTECHNICAL EROSION CONTROL TECHNIQUES NEXT PAGE



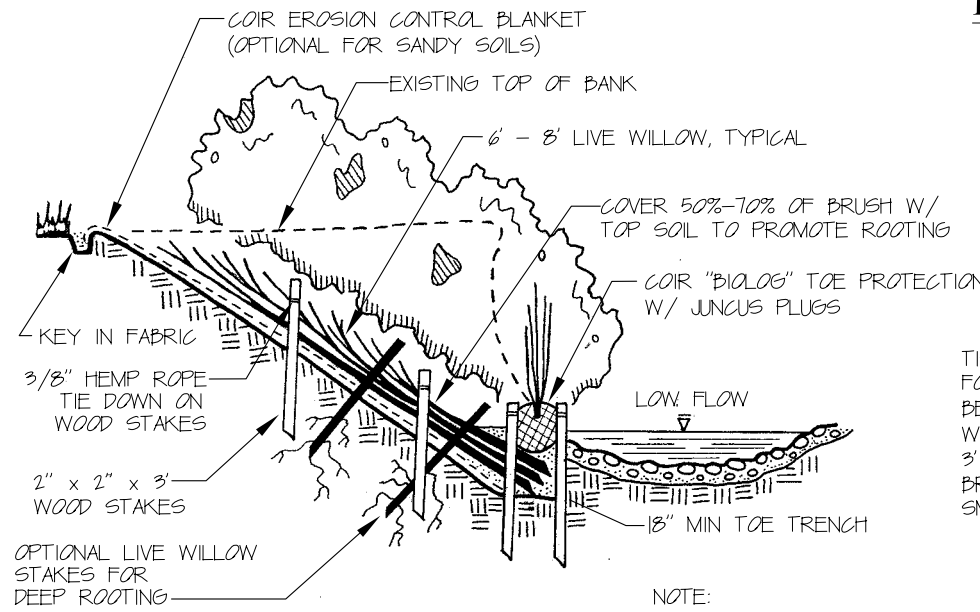
SAN GERONIMO SALMONID ENHANCEMENT PLAN
MANAGING STREAMSIDE PROPERTY
FOR HOMES WITHIN THE SCA
SELECTED BIOTECHNICAL
EROSION CONTROL TECHNIQUES

TIP:
 PLANT SHADE
 TOLERANT TREES &
 SHRUBS BEHIND WALL
 TO PROVIDE LONG
 TERM STABILITY IF
 WILLOW IS USED.



WILLOW WALL (SECTION)
 AFTER INSTALLATION

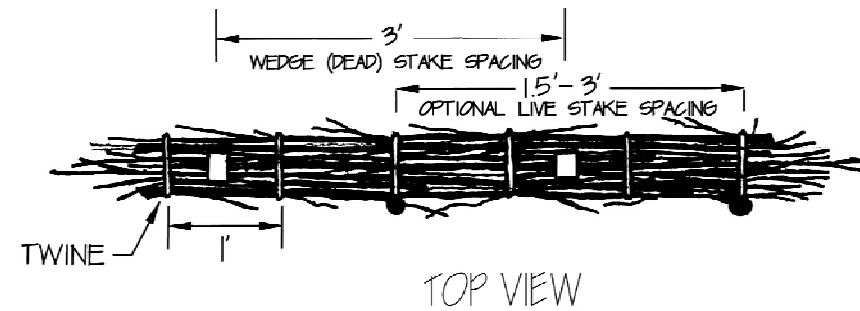
NOTES:
 1. RECOMMENDED SLOPE IS 3:1 (2:1 MAX)
 2. SEED & MULCH ALL DISTURBED AREAS.
 3. FOR SHADY AREAS, DOGWOOD OR ELDERBERRY MAY BE USED IN PLACE OF WILLOW FOR WALLS THAT DO NOT EXCEED 18" IN HEIGHT.



BRUSH MATTRESS (SECTION)
 AFTER INSTALLATION

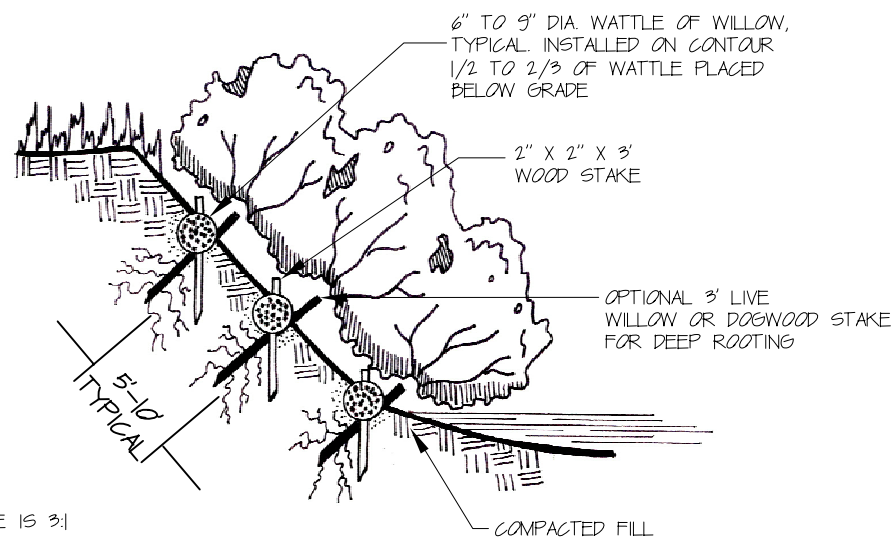
TIP:
 FOR SHADY AREAS DEAD BRUSH CAN BE USED (E.G. DOUG FIR) INTERMIXED W/SHADE TOLERANT PLANTS SPACED 3' ON CENTER, OR LIVE DOGWOOD BRUSH & STAKES CAN BE USED FOR SMALLER REPAIRS.

NOTE:
 1. RECOMMENDED SLOPE IS 3:1 (2:1 MAX)



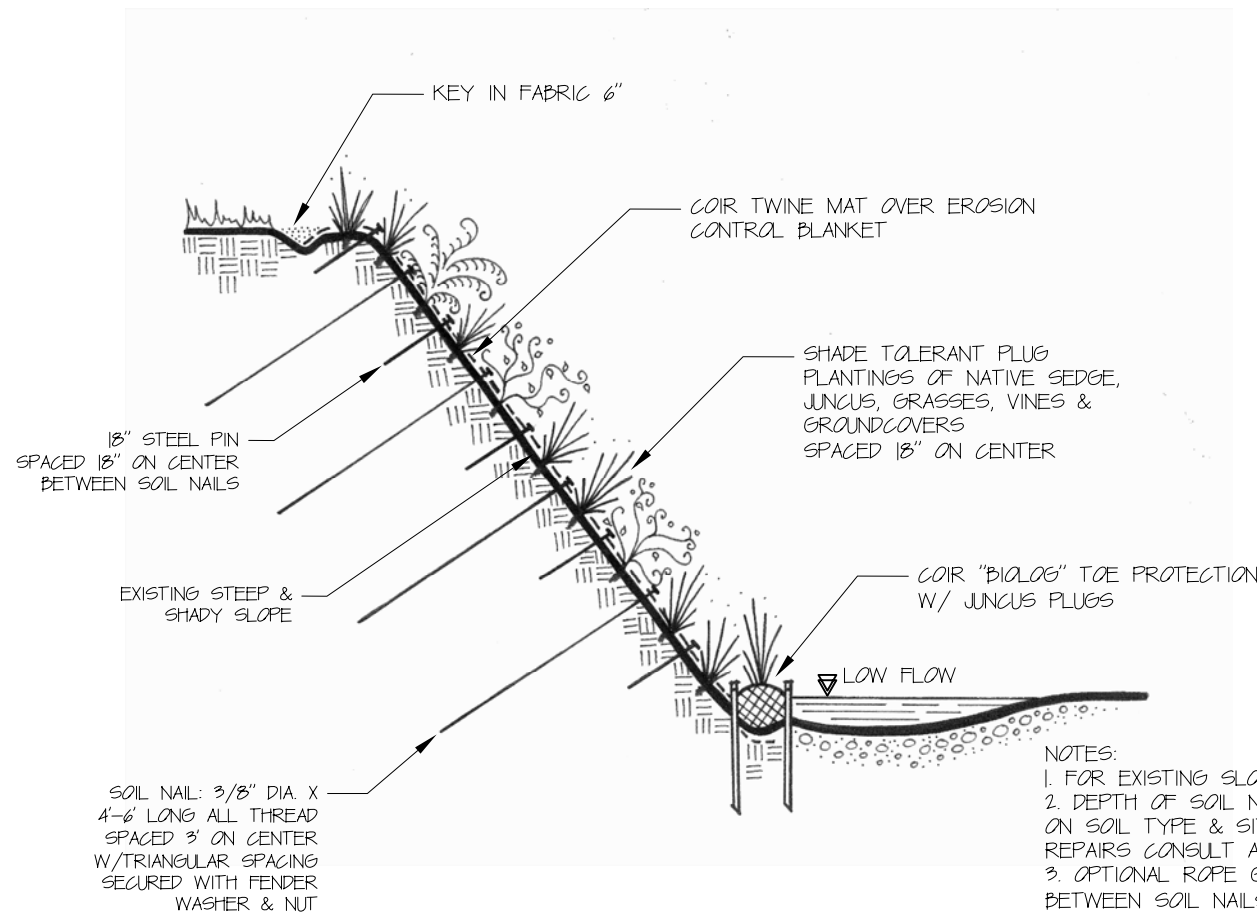
TOP VIEW

TIP:
 FOR SHADY AREAS WATTLES CAN BE BUILT OUT OF BRUSH CUTTINGS THAT WILL NOT RESPROUT (E.G. REDWOOD, DOUG FIR). INSTALL SHADE TOLERANT NATIVE PLANTS 18" TO 36" ON CENTER, ALONG WATTLE - TRY SEDGE OR VINES. WATTLES CAN ALSO BE MADE OUT OF DOGWOOD OR ELDERBERRY IN SHADY AREAS.



WATTLES ON SLOPE (SECTION)
 AFTER INSTALLATION

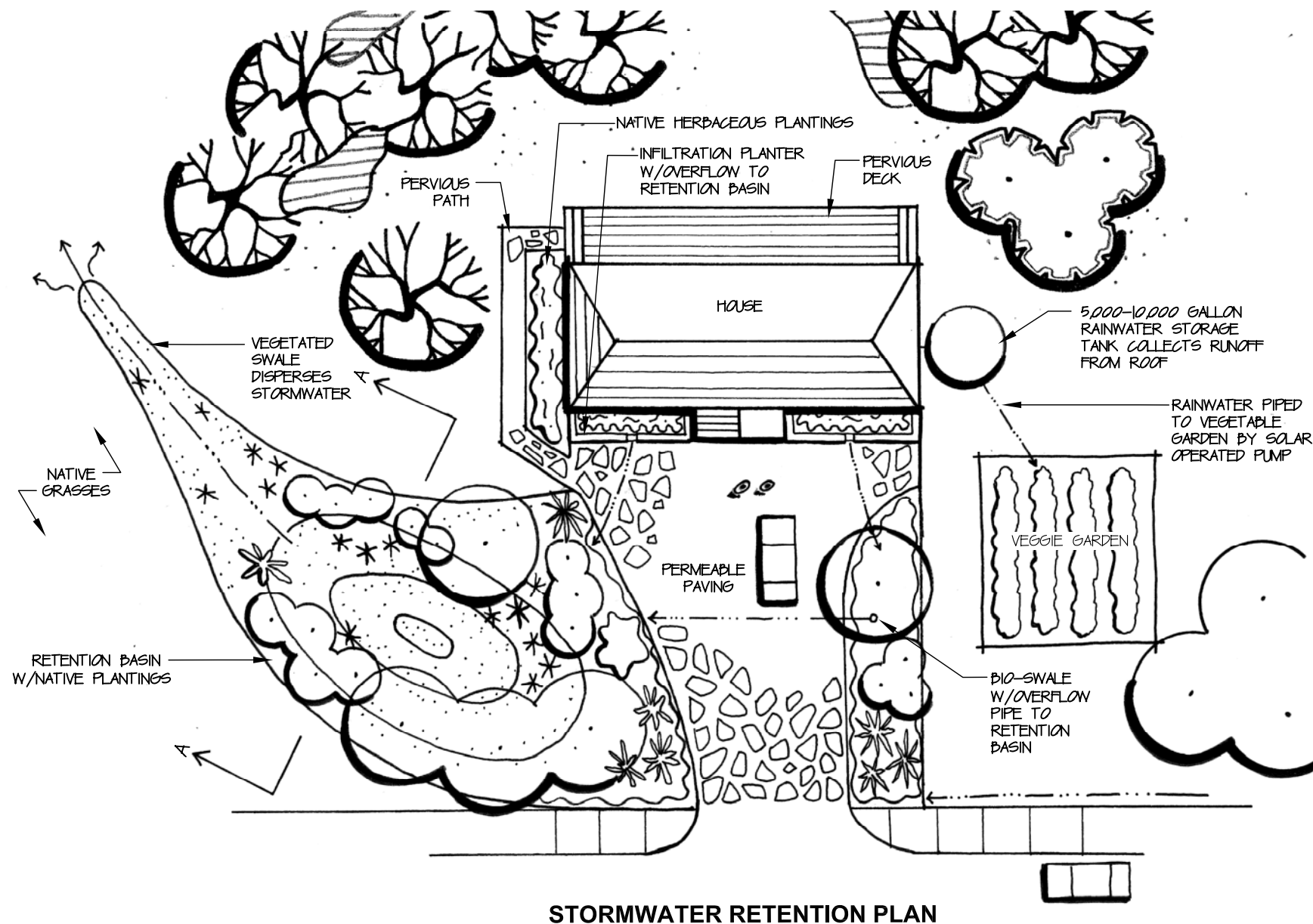
NOTES:
 1. RECOMMENDED SLOPE IS 3:1 (2:1 MAX).
 2. BLANKET OR MULCH CAN BE USED W/SEED IN BETWEEN WATTLES.



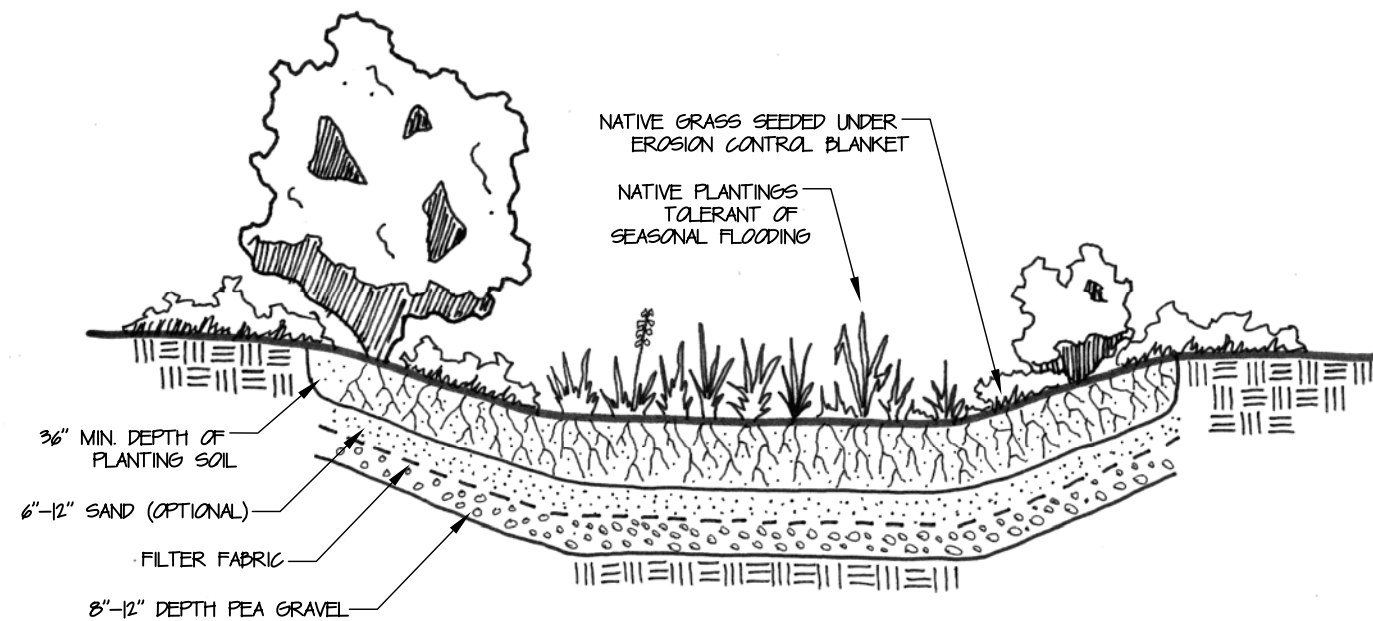
SEEDGE MATTRESS (SECTION)
 AFTER INSTALLATION

NOTES:
 1. FOR EXISTING SLOPES 1:1 OR FLATTER.
 2. DEPTH OF SOIL NAILS CAN VARY DEPENDING ON SOIL TYPE & SITE CONDITIONS. FOR LARGE REPAIRS CONSULT AN ENGINEER.
 3. OPTIONAL ROPE GRID CAN BE INSTALLED BETWEEN SOIL NAILS IN CREEKS W/HIGH VELOCITIES TO BETTER SECURE MAT.

SAN GERONIMO SALMONID ENHANCEMENT PLAN
STORMWATER RETENTION
 CONCEPTUAL PLAN 3



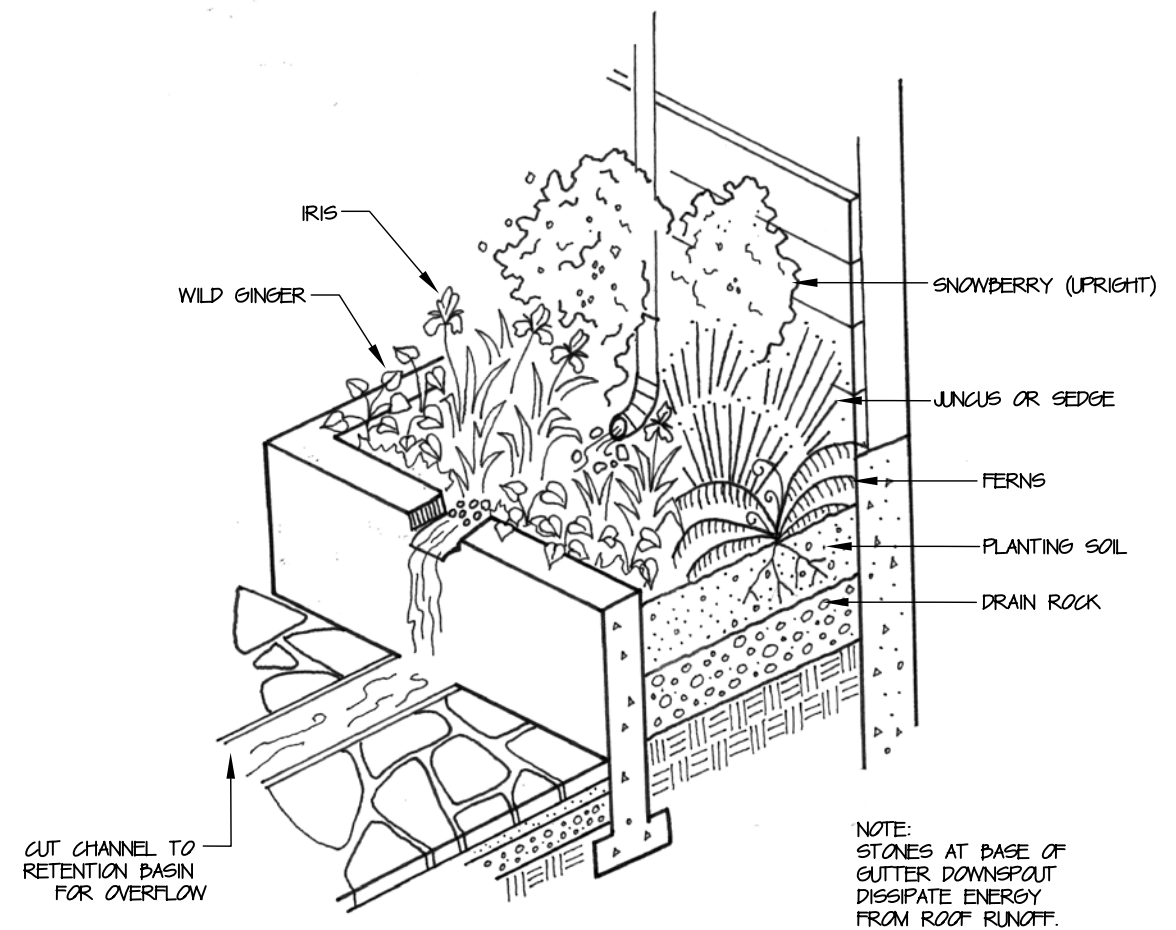
STORMWATER RETENTION PLAN



SECTION A - RETENTION BASIN



RAINWATER STORAGE TANK



NOTE:
 STONES AT BASE OF GUTTER DOWNSPOUT DISSIPATE ENERGY FROM ROOF RUNOFF.

INFILTRATION PLANTER

Slow it, Spread it, Sink it



Figure 1

Homeowners can plant native trees, shrubs, and groundcovers in their yards. Native plants are adjusted to our dry climate, have strong, deep roots to keep soil in place, and help wildlife with food and shelter.



Figure 2

This bioswale drains water from the yard into an area where rocks and water-loving plants keep the area tidy and safe. Engineered to drain water from the backyard area, the bioswale makes water a benefit, rather than a nuisance on your property.

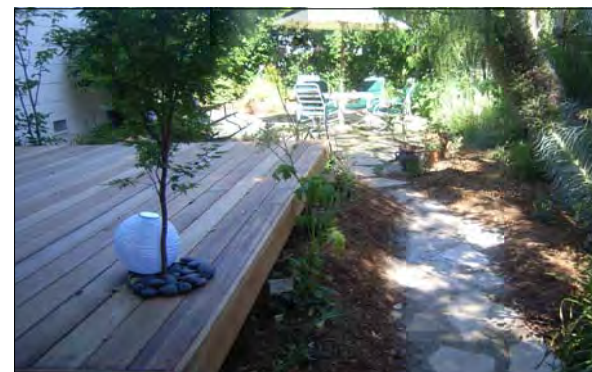


Figure 3

Permeable is functional and beautiful! Allowing water to seep into the ground instead of washing away slows erosion, increases flows throughout the year, and can be easily adapted to fit in with landscaping, recreation, and drainage needs.



Figure 4

Disconnecting your rain gutters to carefully release water your yard or to fill a cistern will keep water from the roof of your home on your property, allowing water to infiltrate into the ground. Water from the cistern can be used to water gardens or the yard instead of using municipal water. It's relatively easy to install and gives you water to reuse.



Figure 5

Stormwater runoff from streets, driveways, and parking lots is a major source of pollution in lakes, rivers, and streams. When permeable pavement is used, however, the water is absorbed by the ground. Permeable pavement also allows a wider range of plant species to thrive alongside driveways, while many porous pavements incorporate plants directly into the surface.

-Stream Conservation Area-

For all Parcels, SCA setback is the greater of:

SCA
setback

100' from top of bank
OR

SCA
setback

50' from woody
riparian vegetation

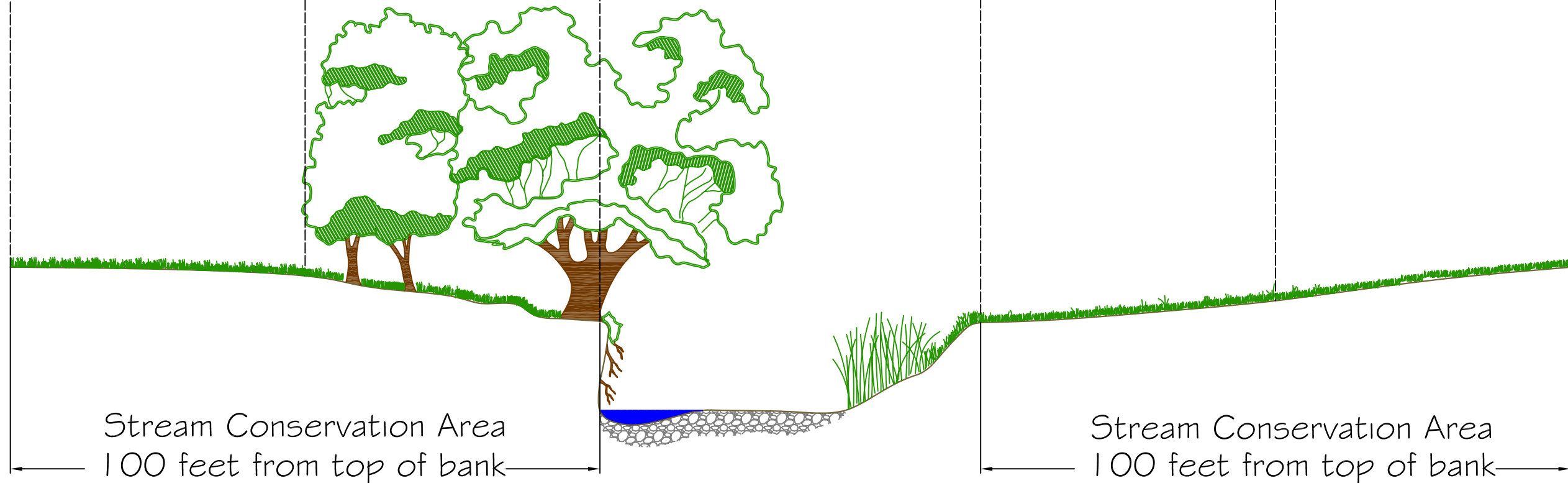
Woody Riparian
vegetation

50' from outer edge of woody riparian vegetation

Designated
Stream Channel

Woody Riparian
vegetation
Absent

50' from woody
riparian vegetation



For all parcels, minimum setback distance is 50 feet from outer edge of woody riparian vegetation but no less than 100 feet from top of bank, unless an exception is allowed because parcel falls entirely within SCA, or development outside SCA is either infeasible or would have greater impacts.

- An additional setback distance may be required, based on the results of a site assessment, if such an assessment is determined to be necessary.
- Regardless of parcel size, a site assessment is required where incursion into an SCA is proposed and where full compliance with all SCA criteria would not be met.

Brush Mattresses #1



Willow can also be used to revegetate bank slopes. These brush mattresses are willow branches that are flat on the ground and pinned in place with rope and pins. The area above and below are planted with other native trees and grasses to add variety, filter sediment, and increase habitat features. Once the trees on top start to grow, they will shade the willow out and stabilize the slope with their roots.

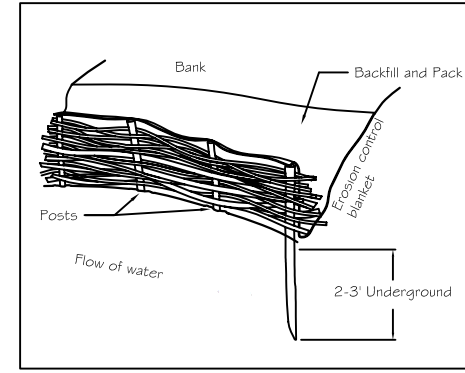
Vegetated boulders #2



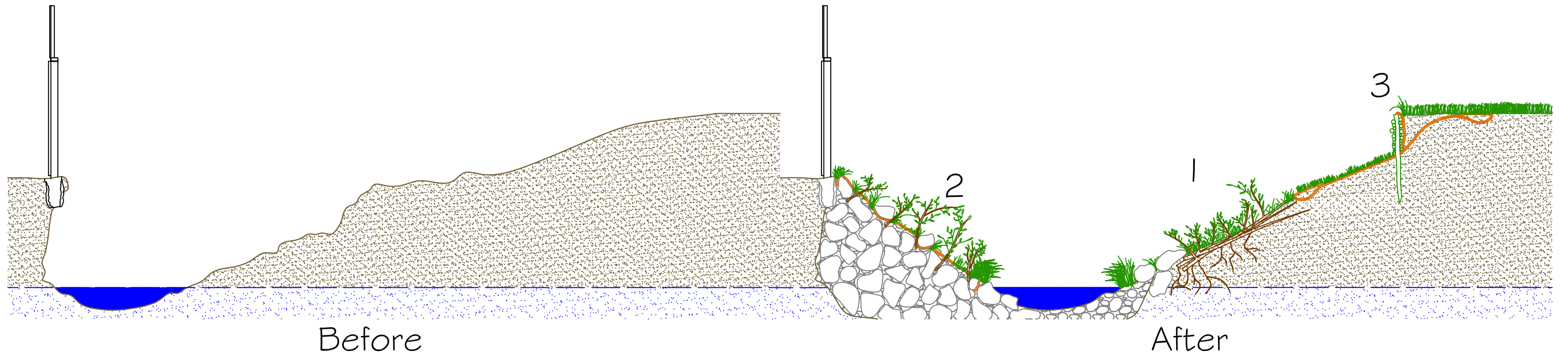
Using native plants as part of the construction for bank stabilization projects provide benefits for fish, but they make permits easier and can keep the project more stable than without vegetation.



Willow walls #3



Willow walls are living retaining walls that can be used in sunny locations in place of traditional concrete or rock. When the back of the wall is in contact with soil, these walls grow into living structures that root and keep soil in place, and they also add habitat, shade, and are naturally adapted to our flood conditions. Get permits before starting any work in or near the creek.



Riparian Buffers Benefit Salmon & Land Owners

