

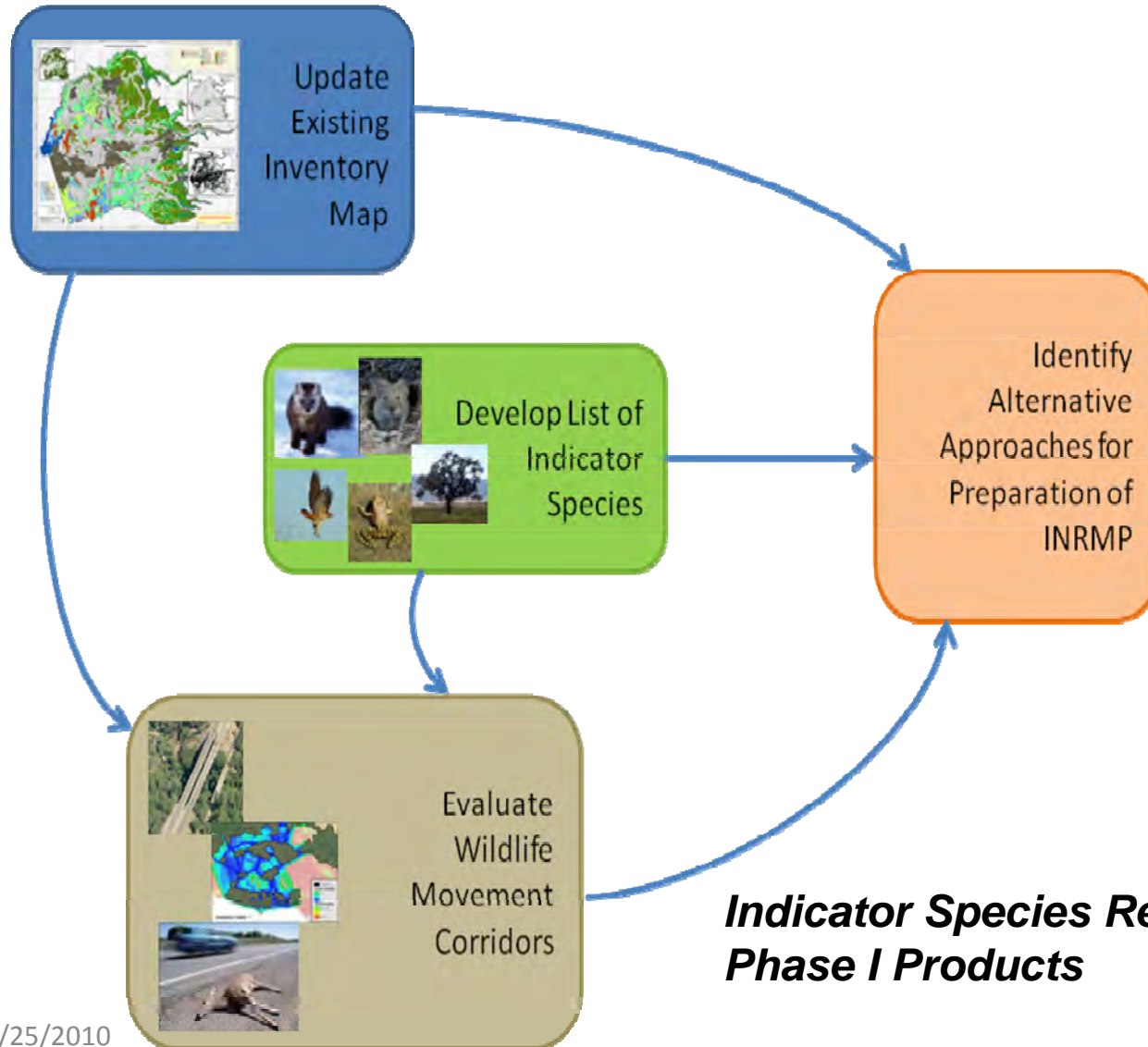


Indicator Species



Sierra Ecosystem
Associates

INRMP Phase I Products



Indicator Species Relationship to Final INRMP

Indicator Species



- A. Habitat Inventory
- B. Habitat Protection Strategy
- C. Mitigation Assistance
- D. Habitat Acquisition
- E. Habitat Management
- F. Monitoring
- G. Public Participation
- H. Funding

Indicator Species

indicator species tell us something about the biological conditions in an area and how those conditions change

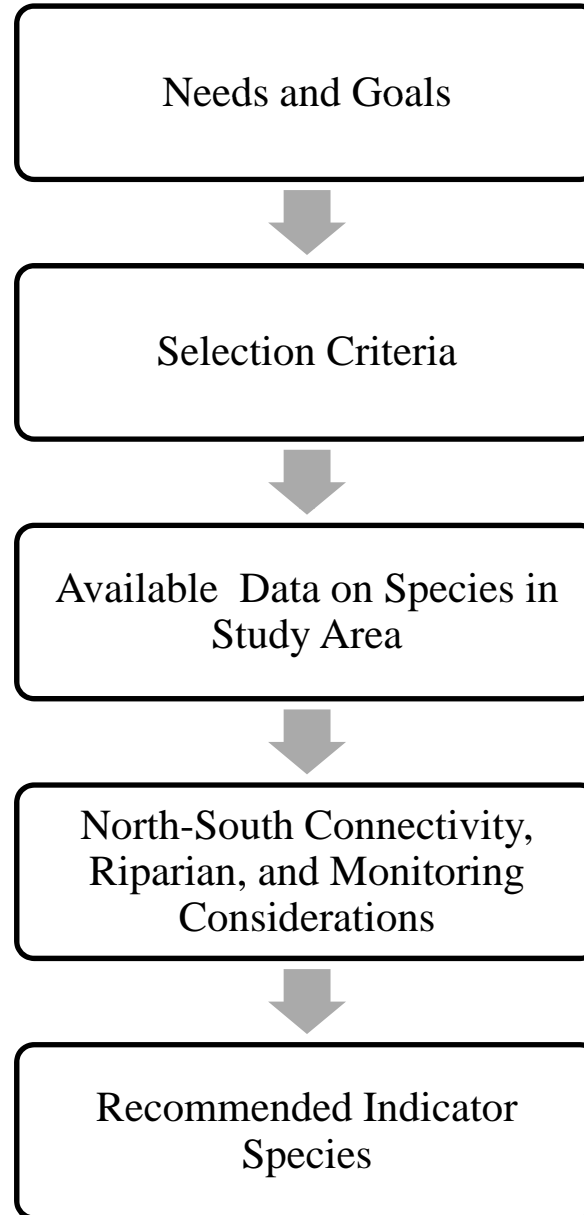
What Are They Needed For?

General: For analyzing habitat quality, extent of usable habitat, and connectivity

Specific:

- To indicate biological condition of habitats and landscape
- To represent other species
- To measure ecological impacts of land use and transportation
- Concerns about their well-being (T&E spp.)
- Narrow habitat needs
- Loss of specific habitat types
- Important to ecosystem structure and function

Process



Criteria Used for Selection

- Data available for their distribution
- Wide-ranging (travel extensively across landscape)
- Umbrella for other species (others covered through their conservation)
- Regulatory concern
- Strongly interactive with other species (e.g., predators)
- Ecosystem engineer (can transform waterways and landscapes)
- Sensitive to fragmentation (negatively impacted by land-use and transportation)
- Sensitive to change in hydrology
- Ecologically limited (e.g., sensitive to change in fire patterns, habitat loss, dispersal needs)

Taxonomic Diversity

Amphibians and Reptiles

Foothill Yellow-Legged Frog

Western Pond Turtle

Western Spadefoot Toad

California horned lizard

Aquatic Organisms

Benthic macroinvertebrates

Rainbow Trout

Mammals

Large Mammals

Mountain Lion

Black Bear

Mule Deer

Meso-carnivores

Bobcat

American Marten

Ringtail

American Badger

Small Mammals

California Meadow Vole

Taxonomic Diversity

Birds

Riparian Birds

Black-headed grosbeak

Bullock's Oriole

Wetland Birds

Red-winged blackbird

Grassland Birds

Lark sparrow

Lawrence's goldfinch

Shrub-lands

Sage sparrow

Fox Sparrow

Oak woodlands

Acorn Woodpecker

Band-tailed pigeon (ISAC)

Black-headed grosbeak

Lawrence's goldfinch

Lewis's woodpecker

Mixed conifer forests

Lewis's woodpecker

White-headed woodpecker

Plants

Oaks as a group

Valley Oak

Red Hills Soaproot

Nissenan manzanita

Pleasant Valley mariposa lily

Habitat Diversity

Aquatic Habitat

Foothill Yellow-Legged Frog
Western Pond Turtle
Benthic macroinvertebrates
Rainbow Trout

Riparian & wetland habitat

Riparian birds

Black-headed grosbeak

Bullock's Oriole

Plants

Valley (White) Oak

Meso-carnivores

Ringtail

Bobcat

Large Mammals

Mule deer

Mountain lion

Wetland Birds

Red-winged blackbird

Song sparrow

Wetland Amphibians

Western Spadefoot Toad

Habitat Diversity

Oak woodland

Large Mammals

Mountain Lion

Black Bear

Mule Deer

Meso-carnivores

Bobcat

Ringtail

Badger

Small Mammals

Meadow vole

Birds

Acorn Woodpecker

Band-tailed pigeon (ISAC)

Black-headed grosbeak

Bullock's Oriole

Lawrence's goldfinch

Lewis's woodpecker

Plants

Oaks

Mixed conifer forests

Birds

Lewis's woodpecker

White-headed woodpecker

Large Mammals

Mountain Lion

Black Bear

Mule deer

Meso Carnivores

Marten

Bobcat

Habitat Diversity

Grassland

Ungulates

Mule Deer

Meso-carnivores

Badger

Small Mammals

Meadow vole

Birds

Lark sparrow

Lawrence's goldfinch

Herpetofauna

Western spadefoot toad

Shrublands

Birds

Sage sparrow

Fox sparrow

Ungulates

Mule Deer

Herpetofauna

Horned lizard

Monitoring Feasibility

- Ongoing monitoring in the County for many birds, several mammals, Foothill Yellow Legged Frog
- Cooperative monitoring could be arranged with CDFG, USFS, Breeding Bird Survey, and others
- Assemblages very cost-efficient (benthic macroinvertebrates, birds, small-medium sized mammals)

Suggested Monitoring Groups for Recommended Indicator Species

Suggested species to be monitored under the INRMP	
1	Foothill Yellow Legged Frog*
2	Western Pond Turtle
3	Western Spadefoot Toad
4	California horned Lizard
5	Mule Deer *
6	Mountain Lion*
7	Black Bear*
8	Bobcat*
9	American marten*
10	Ringtail*
11	Badger*
12	Meadow Vole

Species or Groups of Species Currently Monitored By Other Programs:

- All Birds (Breeding Bird Survey)
- Nissenan Manzanita
- Pleasant Valley Mariposa Lily
- Oaks
- Benthic macroinvertebrates
- Rainbow Trout

*Possibilities for collaborative efforts: FRAP, CDFG, USFWS, USFS, BLM, EID, SMUD