prbo
PRBO Conservation Science

Conservation biology of riparian-associated songbirds along California's Central Coast

Thomas Gardali

12 May 2005 – *Ecology and Conservation of Coastal California's Riparian Areas*

PRBO Conservation Science

Presentation Goals

Introductions . . .

- PRBO Conservation Science
- Partners in Flight and the Riparian Habitat Joint Venture
- The Riparian Bird Conservation Plan
- Monitoring tools

Research, monitoring, and recommendations . . .

- Introduce methods
- Provide example results
- Highlight relevance of results

PRBO Conservation Science

PRBO's Mission Statement

Conserving birds, other wildlife and ecosystems through scientific research and outreach.

- Founded as Point Reyes Bird Observatory in 1965
- 63 Staff scientists
- 2 Education and Outreach Staff
- 60 seasonal field biologists
- 12 policy and support staff
- From Alaska to South America, California Current and Antarctica

prbo
PRBO Conservation Science

PRBO Conservation Science

The Conservation Equation

Effective Conservation =

(Science + Conservation Planning + Policy + Education) x Partnerships

Where . . . .

Science = long-term monitoring, research, ecosystem based, multi-species

Conservation Planning = ongoing science based management plans (adaptive)

Policy = Outreach and assistance to policy makers

Education = professional training, field & classroom, teacher resources

Partnerships = joint ventures, Partners in Flight

PRBO Conservation Science

Partners in Flight

•An international initiative coordinating non-game landbird conservation efforts.

•Voluntary, international collaboration of governmental agencies, conservation groups, academic institutions, private businesses and individuals dedicated to "*keeping common birds common.*"

•Works to stop reverse population declines noted in many species of non-game landbirds.

PRBO Conservation Science

California PIF and the Riparian Habitat Joint Venture

- State chapter formed in 1992
- Helping species at risk , but also keeping common birds common
- Identify critical habitats important to birds and work cooperatively to protect and enhance remaining habitat fragments.
- Prioritized riparian habitat and formed the RHJV in 1994

PRBO Conservation Science

Why prioritize riparian habitat for birds?

- Western North America's riparian zones provide critical refuge for landbirds in all stages of their annual cycle.
- Over 50% of riparian species breed primarily or exclusively in deciduous riparian communities.
- Many more use riparian zones for some part of the year.
- Water, abundant food, and the complex structure of its vegetation.

Result = *Many studies have shown that diversity and density of breeding birds is higher in riparian compared to upland zones.*

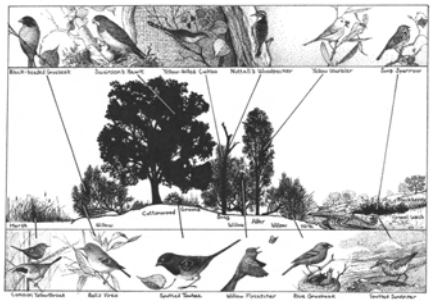
PRBO Conservation Science

The Riparian Bird Conservation Plan

One of the first tasks of the RHJV was to create a science-based Bird Conservation Plan containing specific action items to benefit riparian habitat and the birds and wildlife that depend on it.

PRBO Conservation Science

Riparian Focal Species (not just priority species)



PRBO Conservation Science

Richness of Riparian Focal Species

Bank Swallow
Black-headed Grosbeak
Blue Grosbeak
Common Yellowthroat
Least Bell's Vireo
Song Sparrow
Swainson's Hawk
Swainson's Thrush
Warbling Vireo
Willow Flycatcher
Wilson's Warbler
Yellow-billed Cuckoo
Yellow-breasted Chat
Yellow Warbler

PRBO Conservation Science

The main access point for all data resources: www.prbo.org/cmt.

This site offers "one stop shopping" for field ornithologists:

- data forms
- field protocols
- reference materials
- data entry and query programs

PRBO Conservation Science

Also linked to California Partners in Flight pages www.prbo.org/calpif

Links to data supporting conservation plans

Encourages broad participation

PRBO Conservation Science

Methods

Monitoring

- Mist-netting/Banding
- Nest Monitoring
- Point Count Surveys
- Vegetation Assessment

Research

- Radio Telemetry
- Nest Monitoring, Banding, Vegetation Assessment

PRBO Conservation Science

Methods — *Mist-netting*

- Mist-netting
  - 1966 to present at Palomarin Field Station
  - Capture, mark, measure and release
  - Nets run daily
  - Nets operated year-round

PRBO Conservation Science

Methods — *Nest Monitoring*

- Nest monitoring
  - Use bird behavior to locate nests
  - Check nests every 4 days
  - Use caution when checking nests
  - Determine outcome of nest (i.e., did it fledge or fail?)
  - Vegetation data

PRBO Conservation Science

Methods — *Point Counts*

- Point Count Surveys
  - Permanent survey "points: along a transect (5 min / point)
  - Visual, songs, calls
  - 2 - 3 surveys visits per season
  - Vegetation assessment

PRBO Conservation Science

Methods — *Radio Telemetry*

- Radio Telemetry
  - Locate nests
  - Place tiny (1 gram) transmitters on nestlings
  - Locate fledglings daily with receiver
  - Map locations
  - Take general habitat data

PRBO Conservation Science

Results — *Examples*

- Organized around three species and species diversity:
  - Warbling Vireo, Wilson's Warbler, Swainson's Thrush
  - Species diversity is the number of species weighted by their abundance.
- Types of research and monitoring
- How do these results inform conservation?

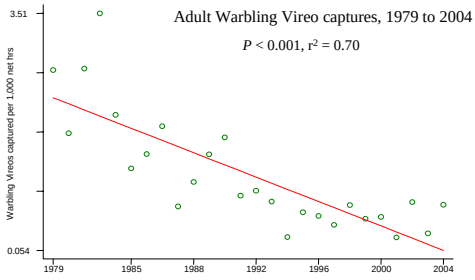
PRBO Conservation Science

The Warbling Vireo

- Neotropical Migrant
- Nests primarily within riparian woodlands
- Places its nest high (~26 feet) in the canopy of deciduous trees

PRBO Conservation Science

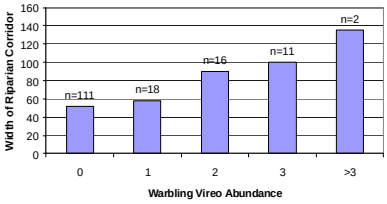
Results — *Trend monitoring*



PRBO Conservation Science

Results — *Habitat Associations*

Riparian Corridor Width



PRBO Conservation Science

Warbling Vireo — *Conservation Planning*

- An important aspect of monitoring programs is to be able to detect changes in population size (i.e., population trends).
- We likely need to pay close attention to Warbling Vireo populations in coastal California and the West.
- Important to have habitat association data; Warbling Vireos are more abundant in (1) wider corridors and (2) in areas with more tree species.
- Sometimes there are more question than answers . . . .

PRBO Conservation Science

The Wilson's Warbler

- Neotropical migrant
- Nests in many habitat types (e.g., riparian and mixed oak-bay woodlands)
- Places nest very low to the ground (~1-2 feet)

PRBO Conservation Science

Sources and Sinks

•Source populations are those where the production of young exceeds adult mortality.

•Sink populations are ones in which young are not produced in sufficient numbers to compensate for adult mortality

PRBO Conservation Science

Sources and Sinks

Components of the Source Sink Equation

Adult Survival

Reproductive Output

Juvenile Survival

PRBO Conservation Science

Sources and Sinks

Conservation Significance of Sources-Sink Dynamics

•Sink populations may be draining source populations that, in turn, could lead to widespread population declines.

•Conservation and restoration efforts should be primarily focused on identifying and maintaining source populations as well as attempting to create conditions whereby sinks can become sources

PRBO Conservation Science

Results — *Nest monitoring*

- We located and monitored 90 nests, 1997 – 2000.
- Most nests were placed in blackberry (68%).
- Eggs were beginning to be laid in mid April.
- The latest young were fledging in early August.

PRBO Conservation Science

Results — *Nest Success*

	Number of Nests	Percent Nest Success
Lagunitas Creek	44	16%
Muir Beach	12	3%
Redwood Creek	34	5%
All sites	90	9%

PRBO Conservation Science

Results — *Population Health*

So, are Wilson's Warblers populations sources or sinks?

Both

Lagunitas Creek likely fluctuates between being a source and as sink

Redwood Creek was always a sink during our study

PRBO Conservation Science

Wilson's Warbler — *Conservation Planning*

- Breeding productivity was very low at Redwood Creek, especially the Muir Beach plot where human habitation was adjacent to plot.
- Breeding productivity was low to moderate at Lagunitas Creek.
- Coastal streams may be acting as sinks that drain the larger population.
- Management activities should focus on way to way to increase reproductive success.

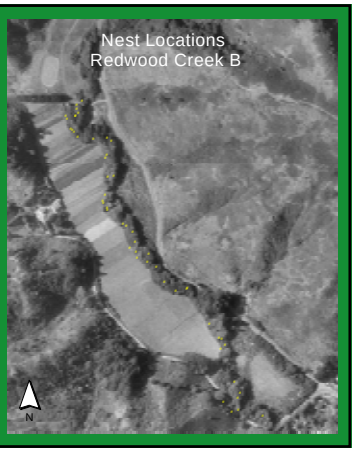
PRBO Conservation Science

The Swainson's Thrush

- Neotropical migrant
- Nest almost exclusively in riparian forests
- Places nests low (~3.5 feet) in understory (shrubs under trees)

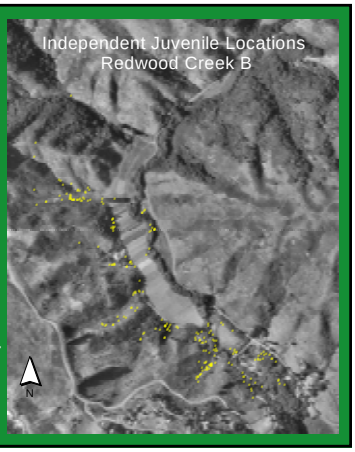
PRBO Conservation Science

- Redwood Creek Nest Locations
- Found a total of 61 nests
- Notice how nests are distributed entirely with the riparian (streamside) habitat



PRBO Conservation Science

- Most young stayed in watershed.
- Most used upland habitats (74% spent ½ of their time there)
- Habitats used were coastal scrub, mixed hardwoods, and riparian.
- They did not use eucalyptus or grasslands.



PRBO Conservation Science

PRBO Conservation Science

Oak Moth Caterpillars

PRBO Conservation Science

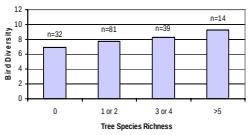
Swainson's Thrush — *Conservation Planning*

- Post-fledging period extended "breeding season" by 1-2 months.
- Juveniles used vegetation types different from nesting adults.
- Fruiting plant species appear to be very important.
- Conservation of Swainson's Thrush breeding habitat must include uplands as well as riparian forests.

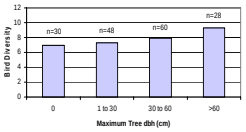
PRBO Conservation Science

Results (Bird Species Diversity) — *Habitat Associations*

Tree Species Richness



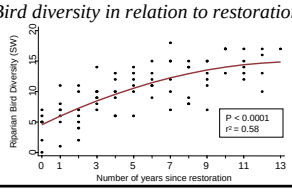
Tree Diameter



PRBO Conservation Science

Results (Bird Species Diversity) — *Evaluating Restoration*

Bird diversity in relation to restoration age



PRBO Conservation Science

Bird Species Diversity — *Conservation Planning*

- Habitat features associated with bird diversity can be incorporated into restoration and management plans.
  - Number of tree species importation
  - Tree size also important
- Bird studies can help to inform and evaluate restoration and management.

PRBO Conservation Science

Is focusing on the riparian corridor enough?

NO, must consider the landscape.

For example . . . . .

Warbling Vireos are negatively impacted by cowbird parasitism

Wilson's Warblers commonly nest in upland habitats

Swainson's Thrush young regularly use uplands during the post-fledging period

PRBO Conservation Science

Contact Information

Tom Gardali
tgardali@prbo.org
415.868.0655 ext.381

PRBO	www.prbo.org
Partners in Flight	www.partnersinflight.org
California Partners in Flight	www.prbo.org/calpif
Riparian Habitat Joint Venture	www.prbo.org/calpif/htmldocs/rhjv


prbo
PRBO Conservation Science