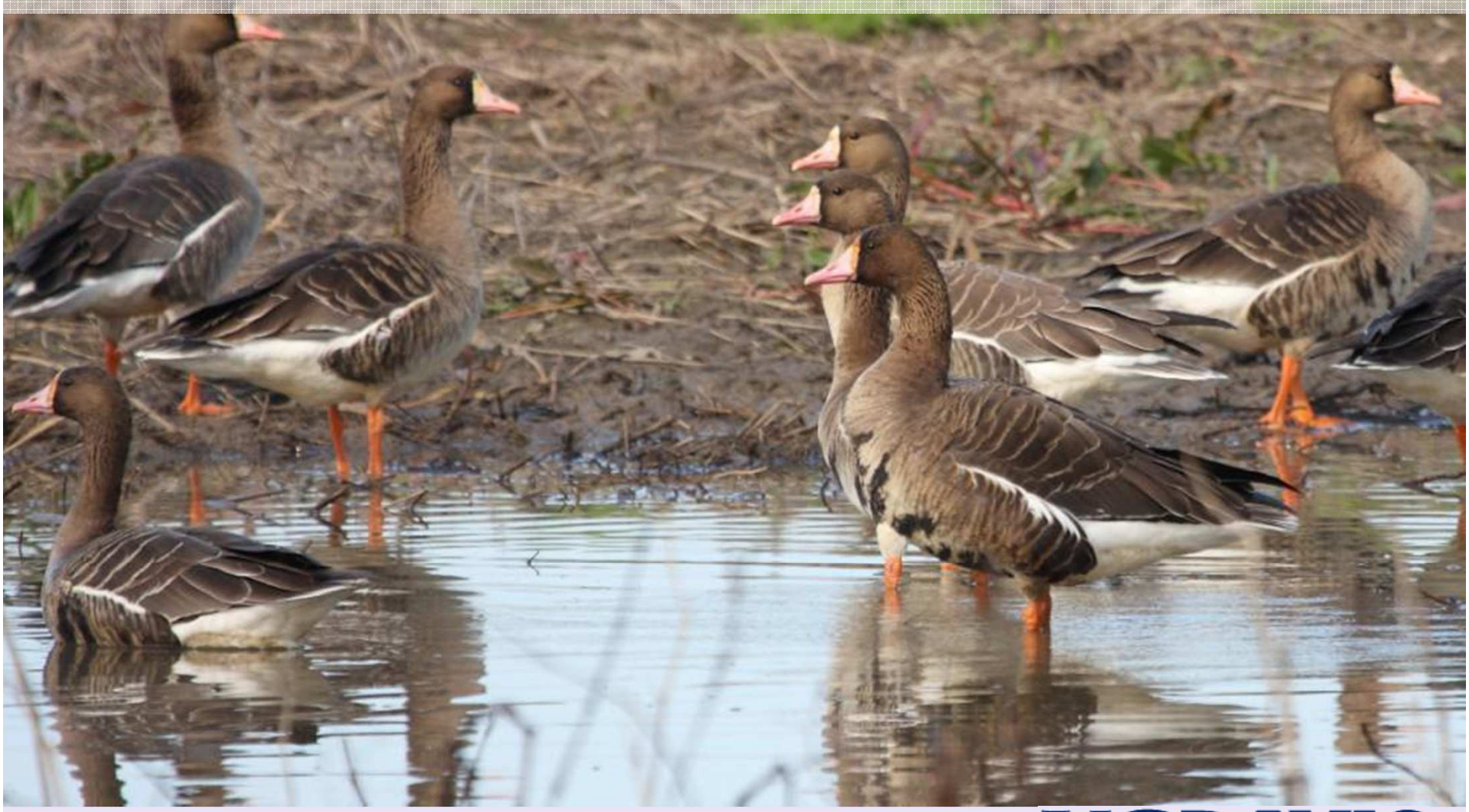
Body Condition of Pacific Greater White-fronted Geese in California



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California's Central Valley

- **Critical habitat for wintering & migrating waterfowl**
  - 80% of Pacific Flyway (20% of N.A.)
  - Historically 20-40 million waterfowl annually
  - Dropped to 3 million by 1990
  - Currently 5-7 Million
- **Wetlands lost**
  - 90% by 1990
  - 300,000 of 4 Million acres remained

Klamath Basin

- Water issues of epic proportion!
- Klamath Basin has lost 75% of original 185,000 acres of wetlands
- Supports 80% of Pacific Flyway's Waterfowl Population During Migration
  - Nearly 6 million waterfowl

Joint Ventures

- **Product of NAWMP**
  - Central Valley Joint Venture 1988
  - Intermountain West Joint Venture 1994
  - Arctic Goose Joint Venture 1989

- **Goals: Protect, restore and enhance wetland habitat, secure water**

Photo By Robert Campbell

Habitat Changes over the past 30 Years

- **Central Valley Joint Venture (CVJV):**
  - Restored 114,000 acres of wetland and riparian habitat
  - Enhance 50,000 - 70,000 acres of wetland habitat annually
- **Rice Straw Burning Reduction Act 1991**
  - 200,000 acres of flooded rice habitat

How have these changes affected birds?

- Has survival or body condition improved?
- Have movement or distribution patterns changed?
- Are all species affected equally or some more than others (e.g. ducks vs. geese)?
- What are the effects of changes outside the Central Valley (Klamath Basin)?

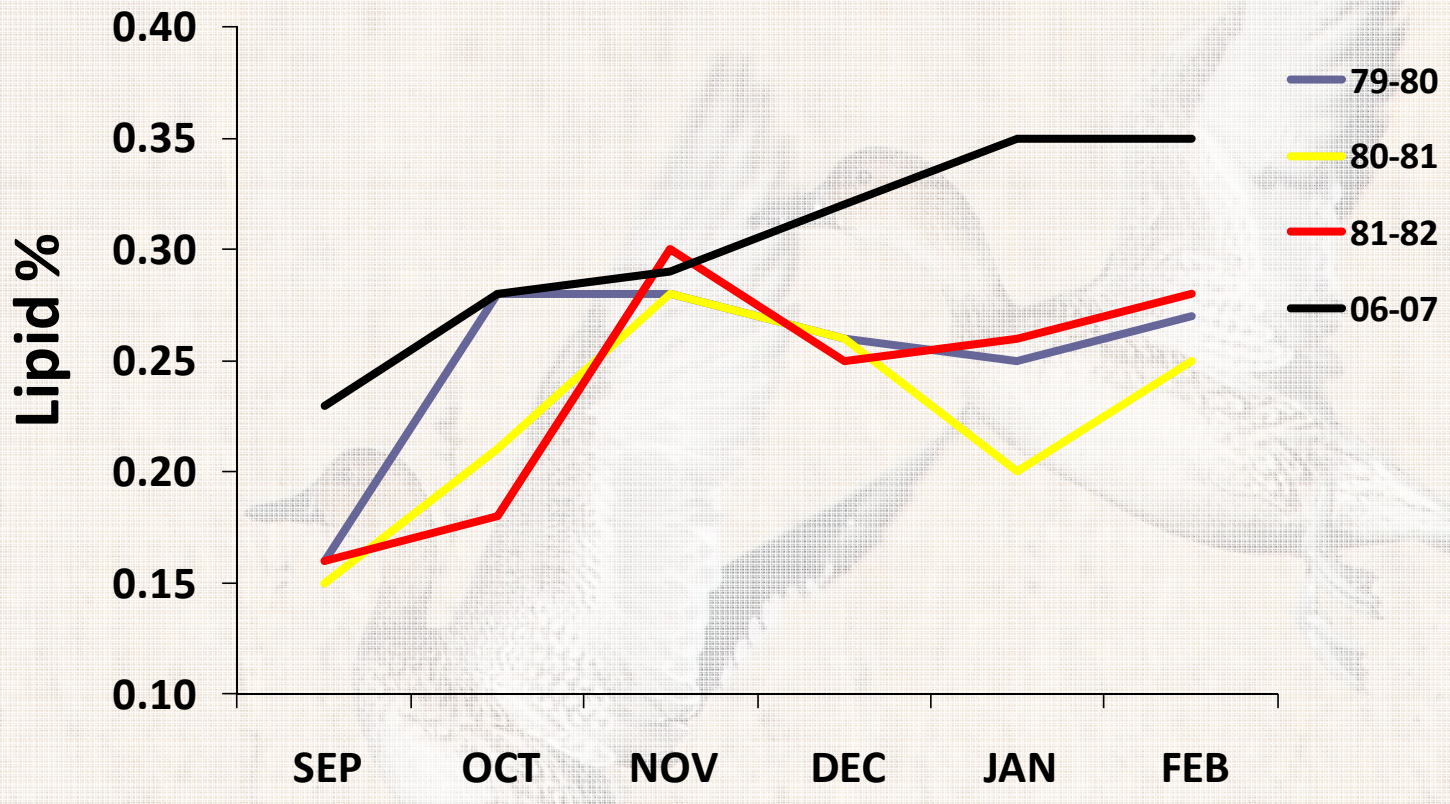
What do we know?

- Recent study on Pintail,Wigeon and Shoveler (2006-07)
  - Body condition of these species has improved since 1980's

❖More so for NOPI

  - More dependent on moist soil seeds/habitat

Adult female pintail lipid%…then and now



Doug Thomas 2009

What about geese?

White-fronts in particular:

- Autumn migration changes in Klamath Basin
- Habitat use in the Sacramento Valley
- The population has increased dramatically
- **WHY?**

Body condition data is necessary to help paint the picture…

- Craig Ely study prior to recent changes therefore opportunity to compare

Goals

- **Assess body condition of white-fronted geese in Sacramento Valley and in the Klamath Basin**
- **Direct comparison to data from 1979-80**
  - Directly measure effects of habitat changes on reserve tissues of white-fronted geese
  - Evaluate patterns of distributional changes
  - Provide basis for habitat management decisions

Study Area

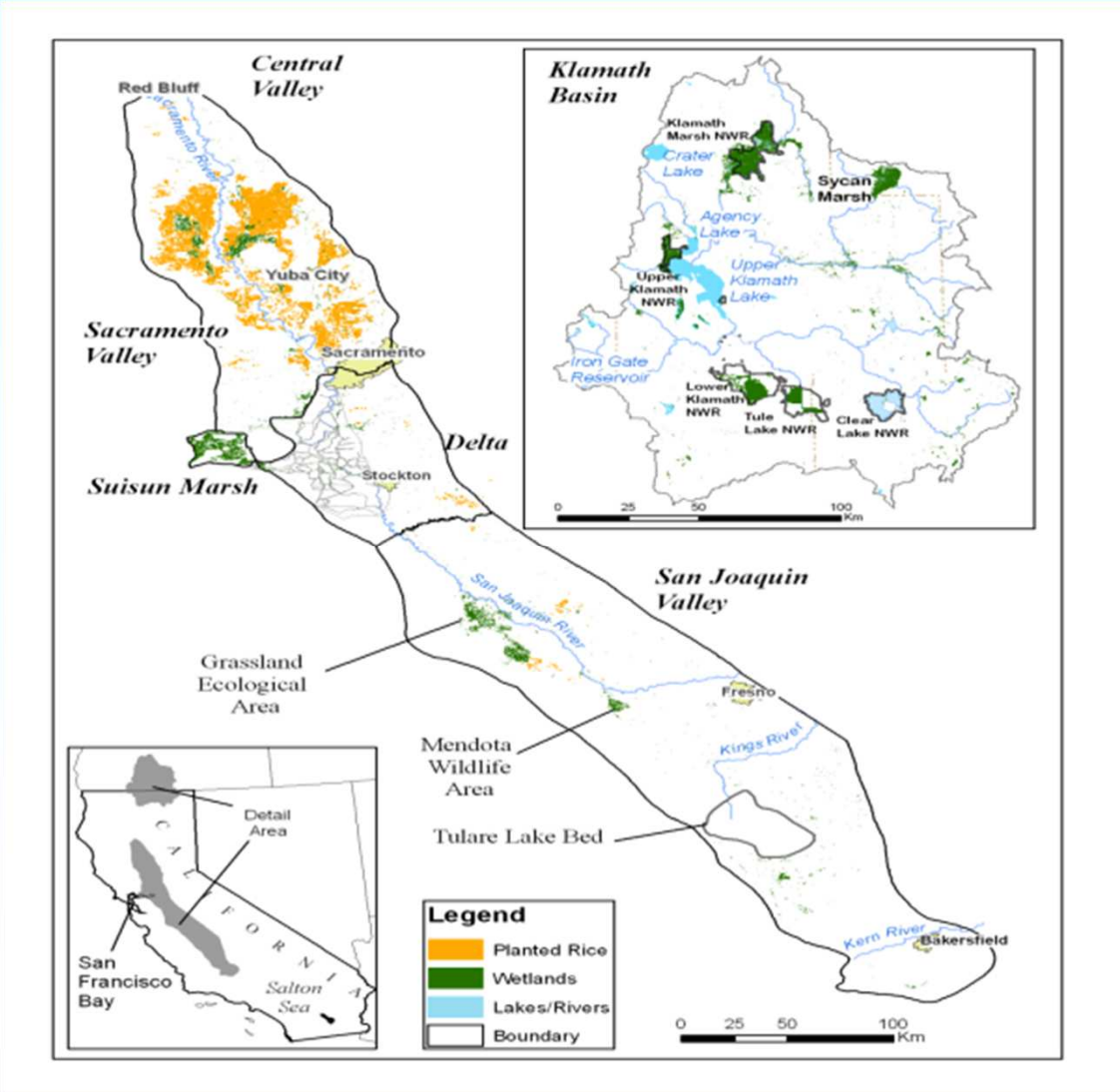


Figure by Joe Fleskes

Outline

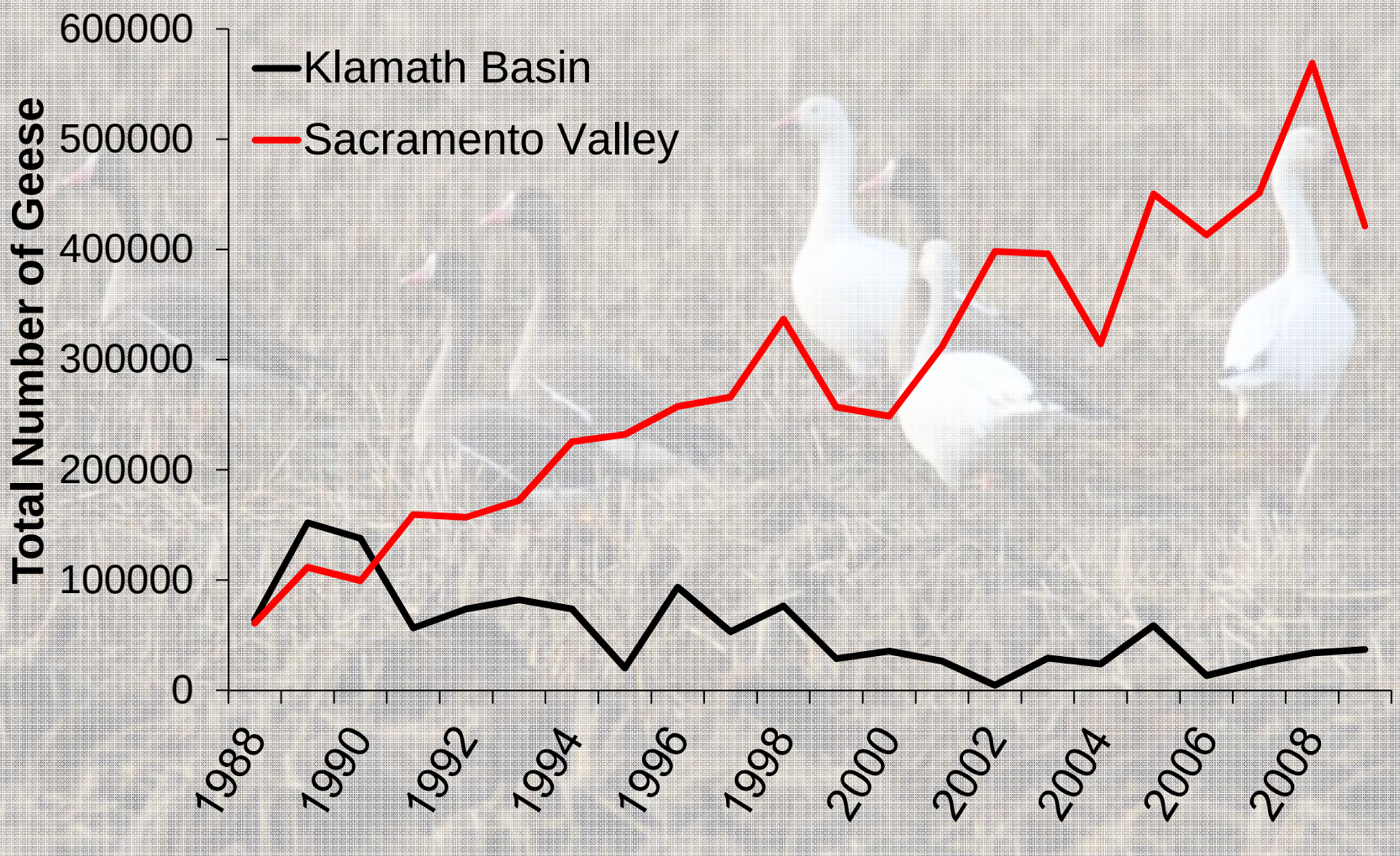
- Autumn (Klamath)
  - Distribution & habitat
  - Condition
- Winter (Sac Valley)
  - Habitat and habitat use
  - Condition
- Spring (Klamath)
  - Condition

❖ 2000 + miles between California and the Y-K Delta

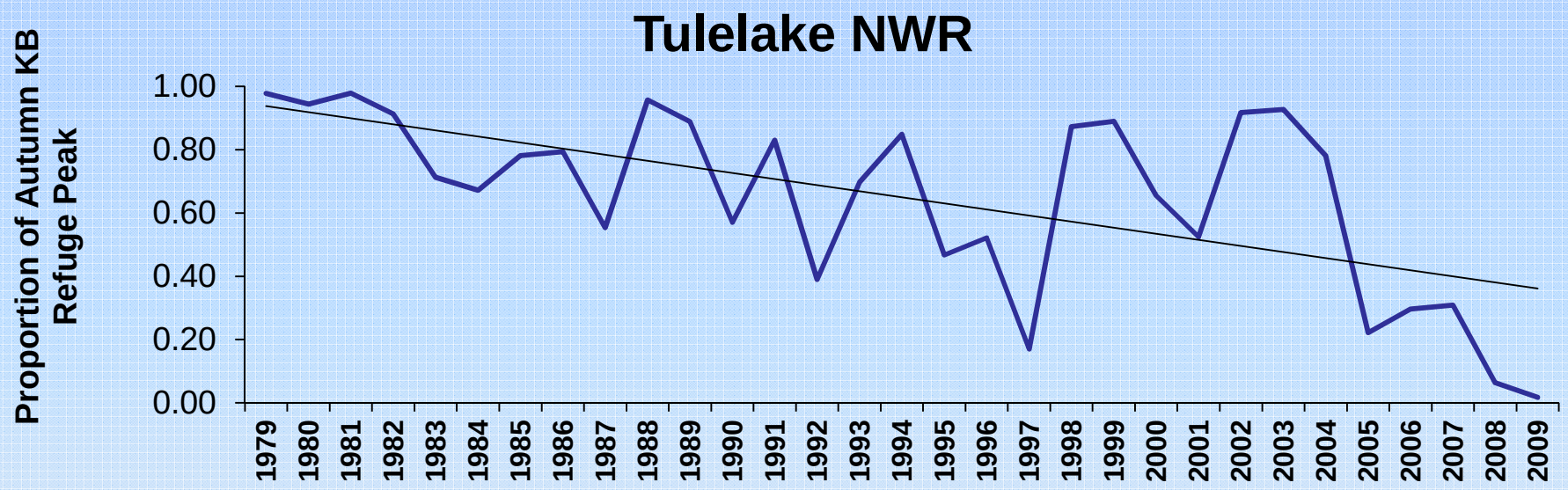
Autumn

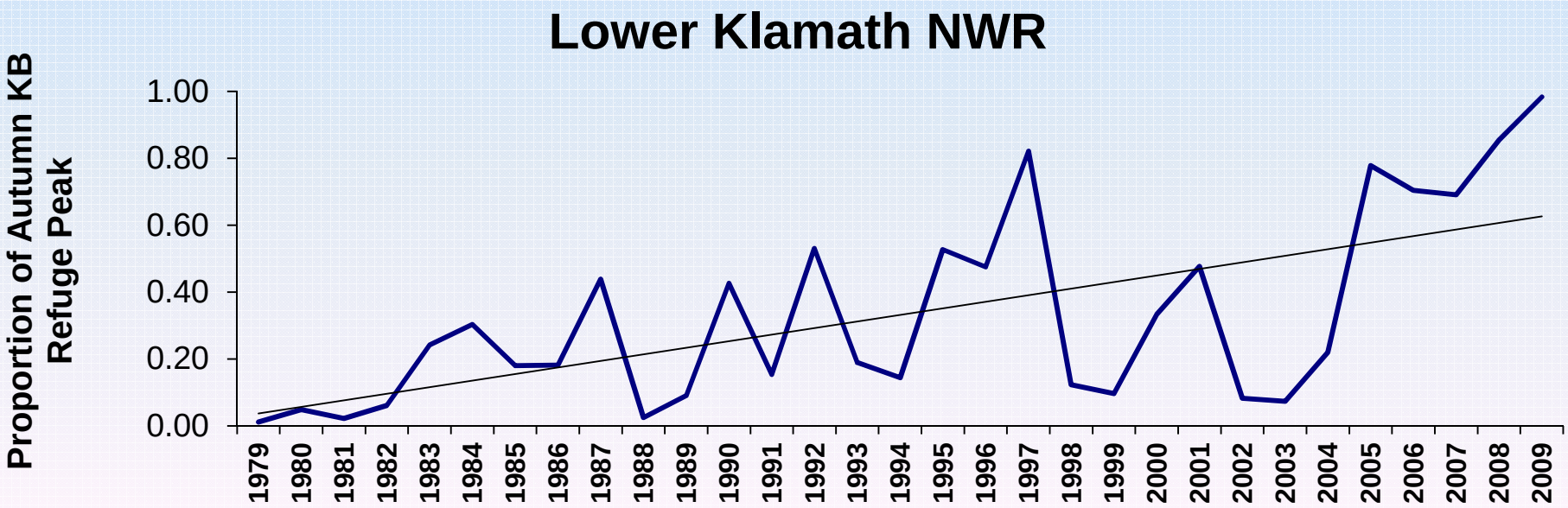
- Klamath Basin historical stopover site
  - 100% of GWFG used KB in Autumn
    - 90% + of activity is on FWS refuges
  - Changes to agriculture
  - Changes in goose use between refuges

Late October Coordinated Survey

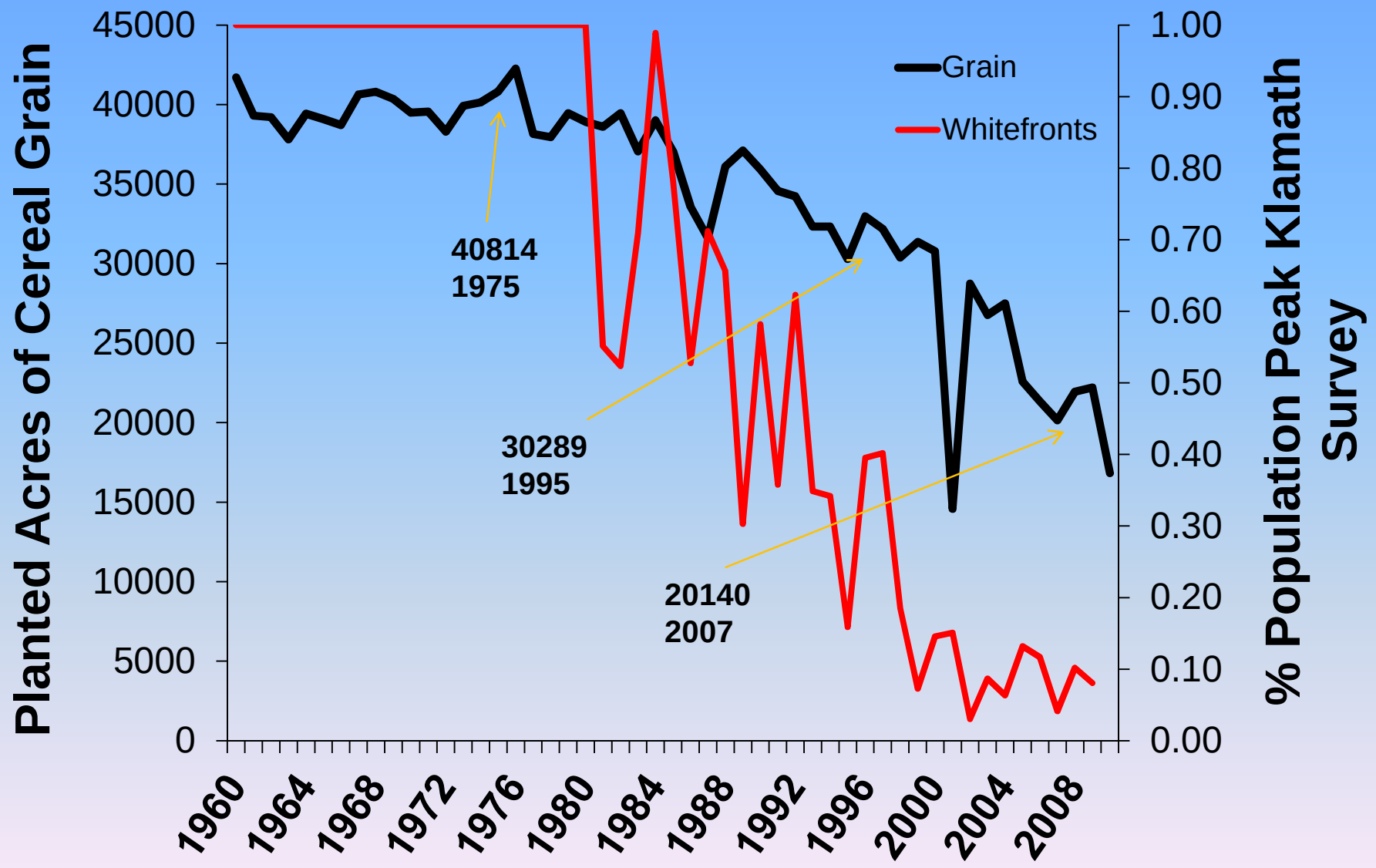


Change in Use Klamath Basin NWR's

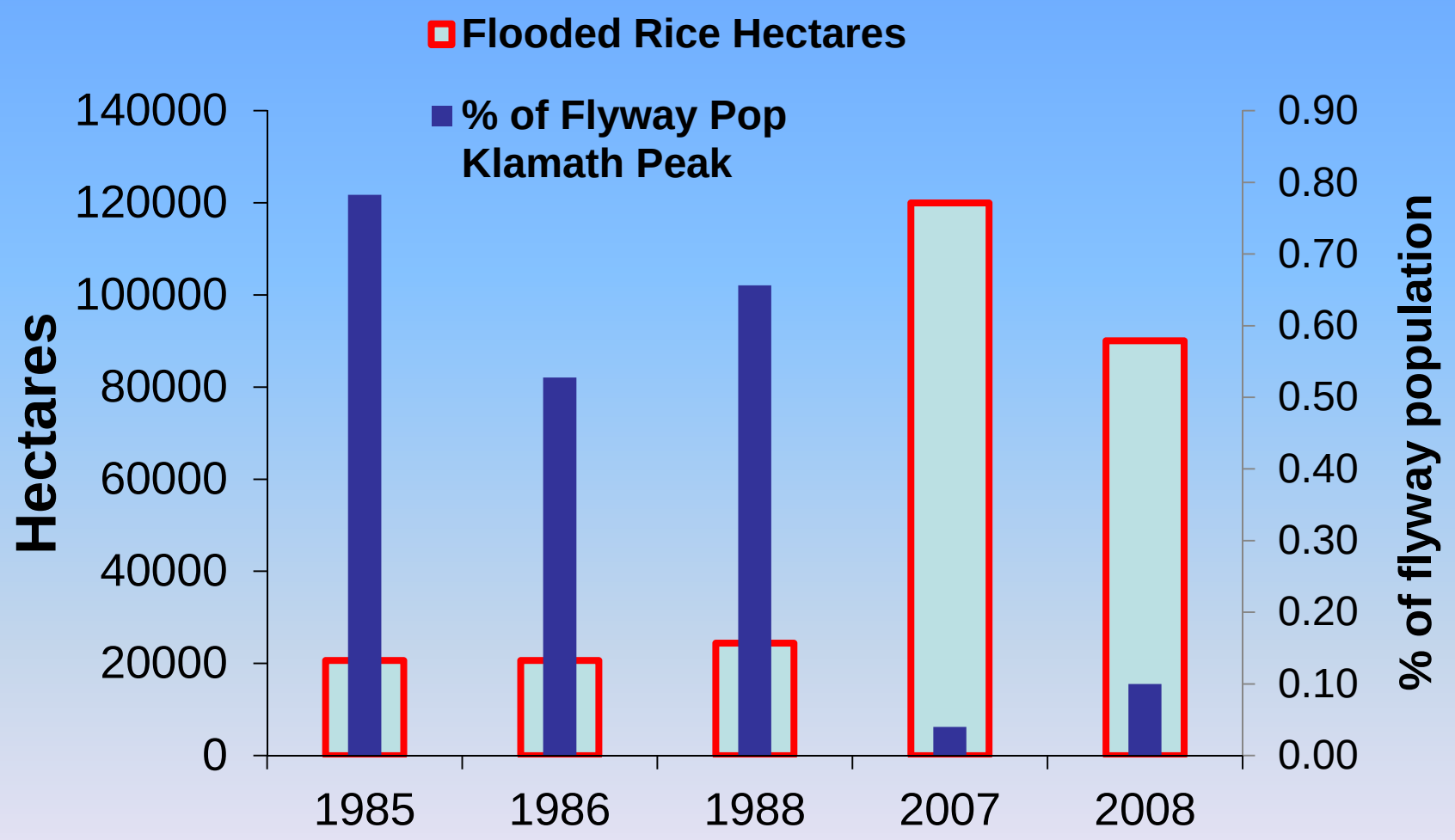




Agricultural and Goose Survey Changes
Tulelake Area of K.B.



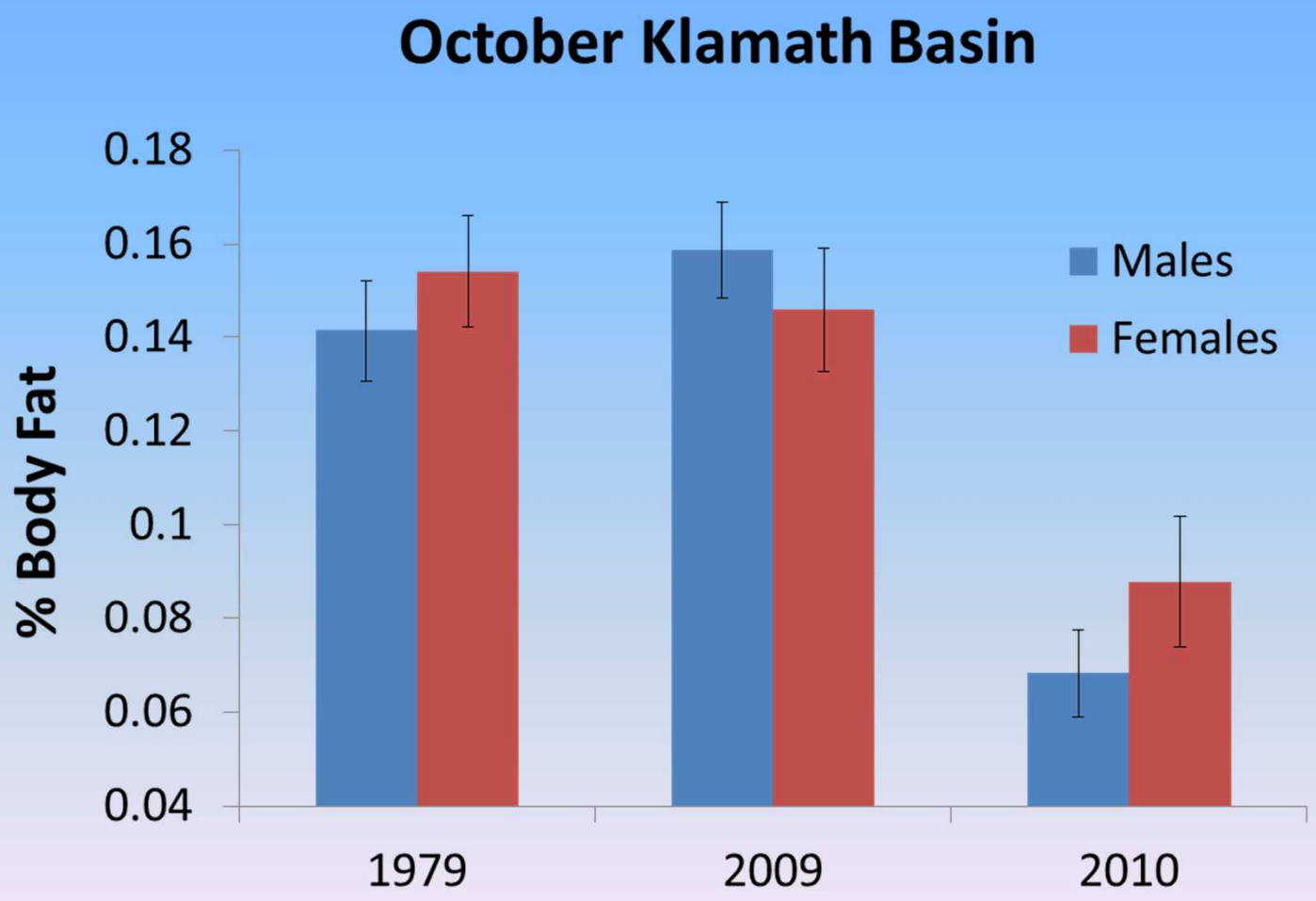
Flooded Rice vs Klamath Peak



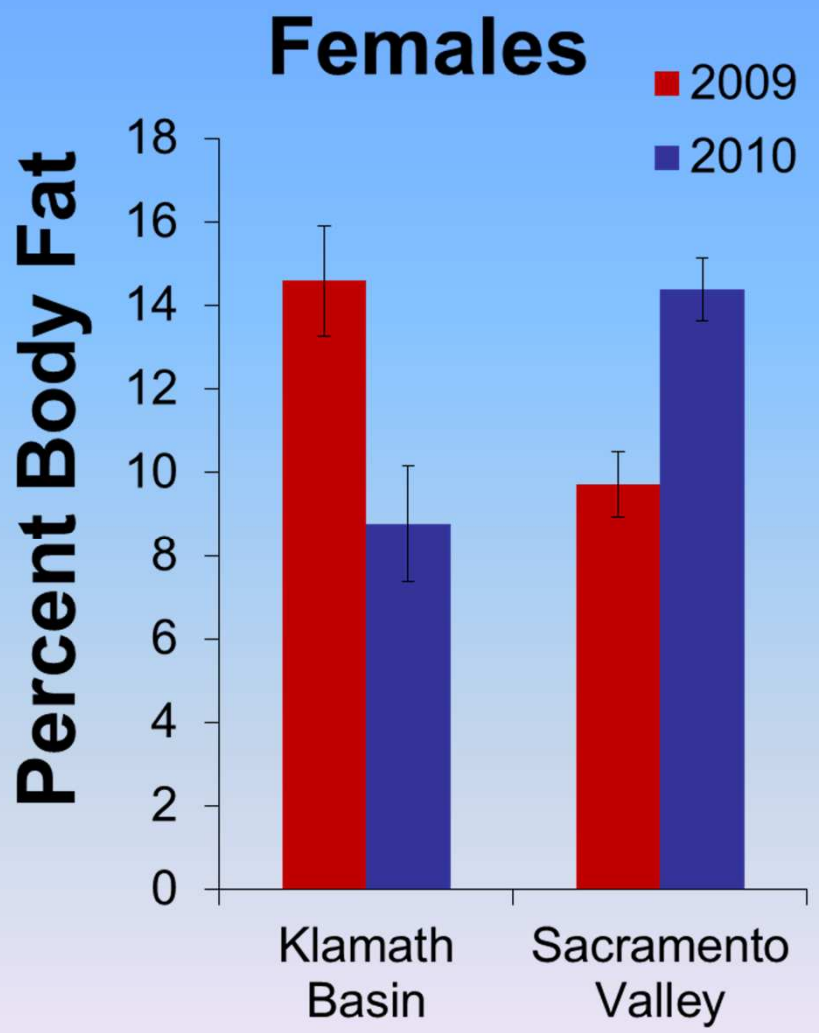
Important Points

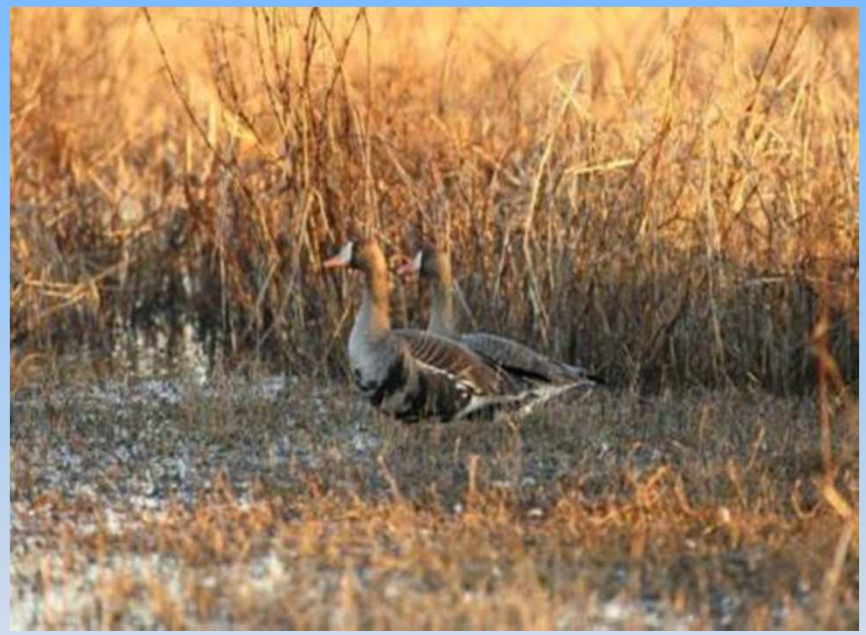
- Distributional change in fall migration
  - ✓ Currently 10% use in the Klamath Basin in Fall
  - ✓ Near 100% historic
- Decrease in the use of Tulelake NWR
- Decrease in cereal grain planting
  - ✓- 50% around Tulelake NWR
  - ✓- 50 % Klamath Basin wide
- Increase in post harvest rice flooding
  - ✓+ 400%!

Body Condition Between Study Years



Body Condition Between Areas



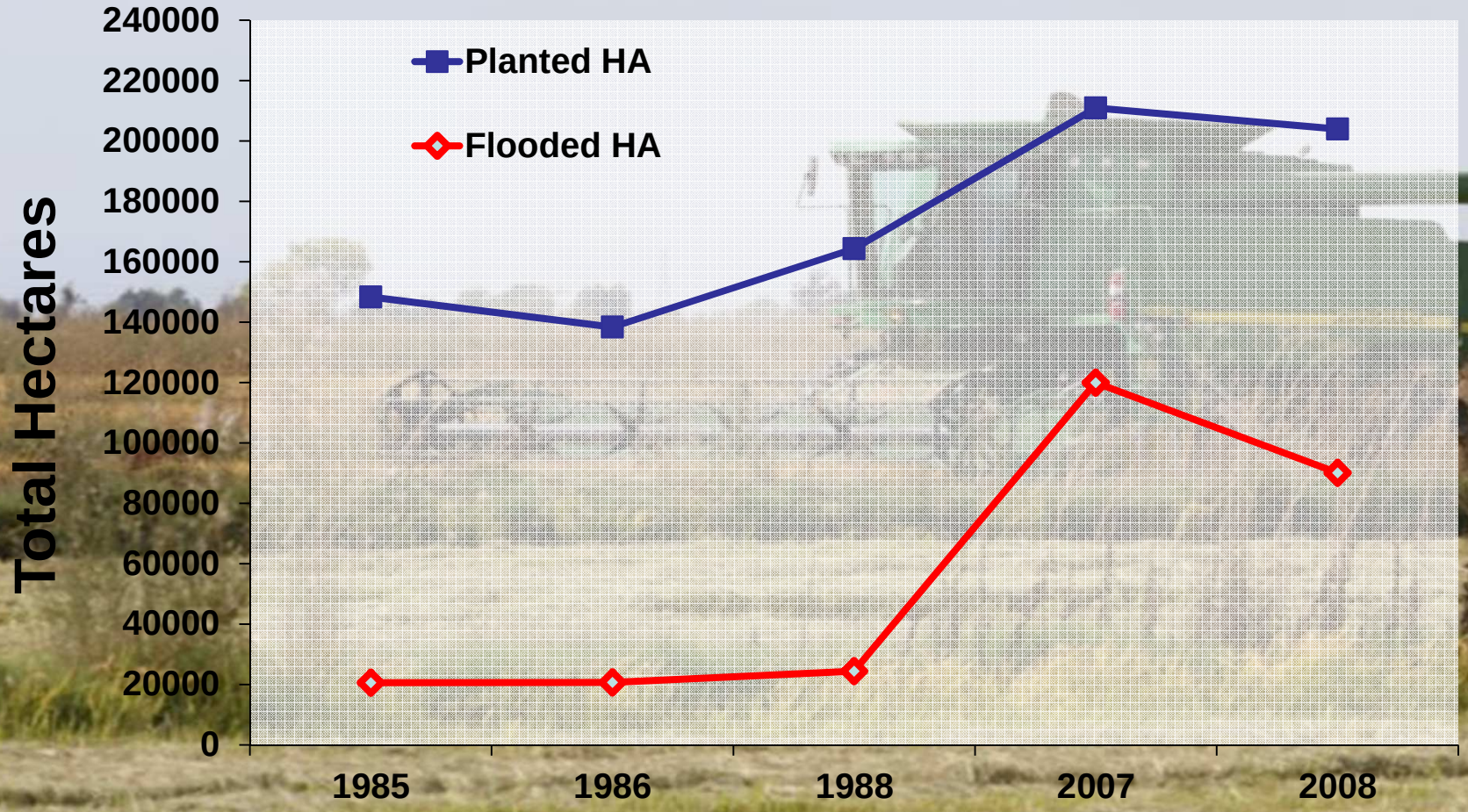


Winter

- Sacramento Valley
  - Longest duration of annual cycle
  - Area of large scale habitat changes
    - Burn Ban
    - Wildlife Management Areas
      - Increase in size and quality
      - Central Valley Joint Venture

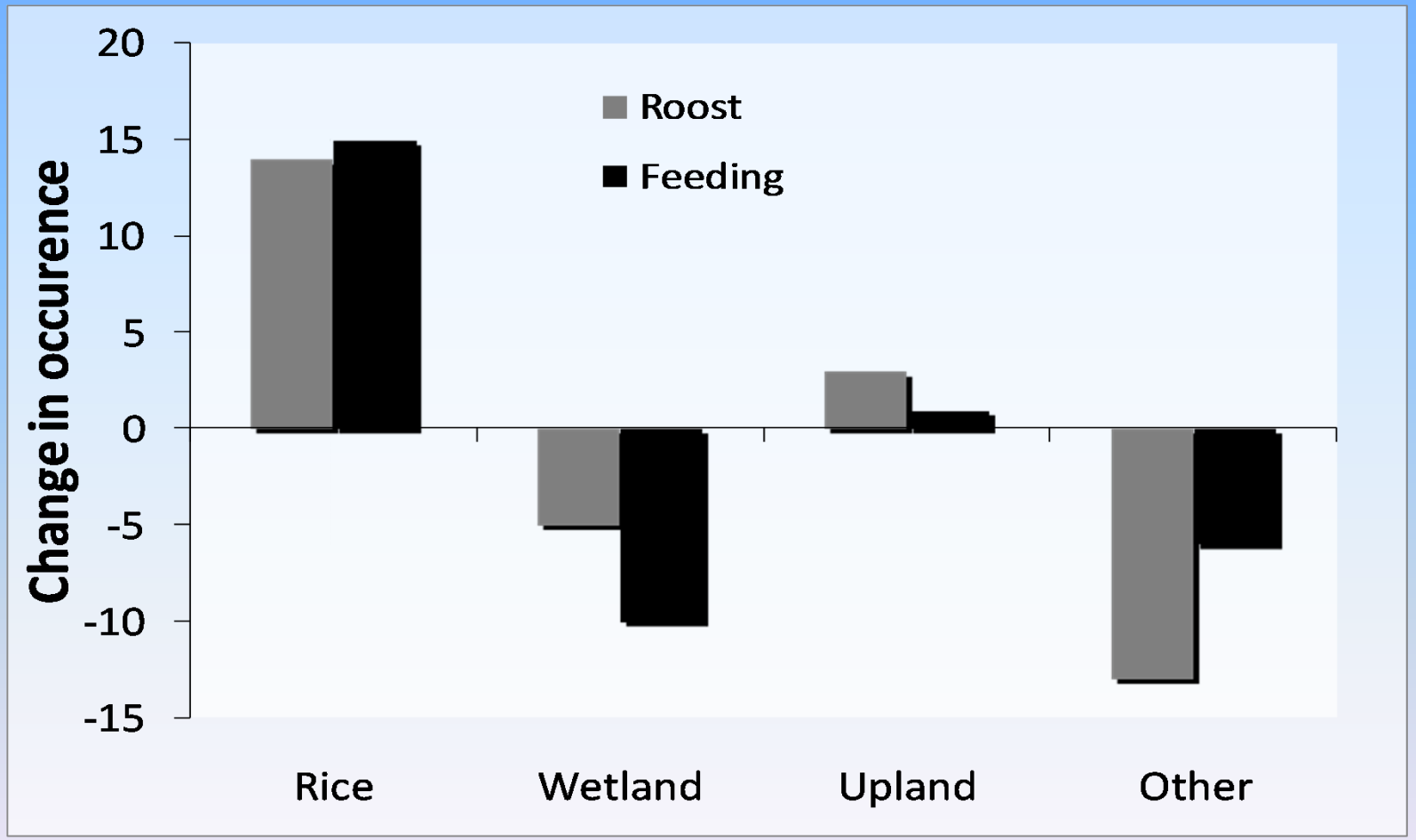
Photo By Robert Campbell

Changes in Rice Farming



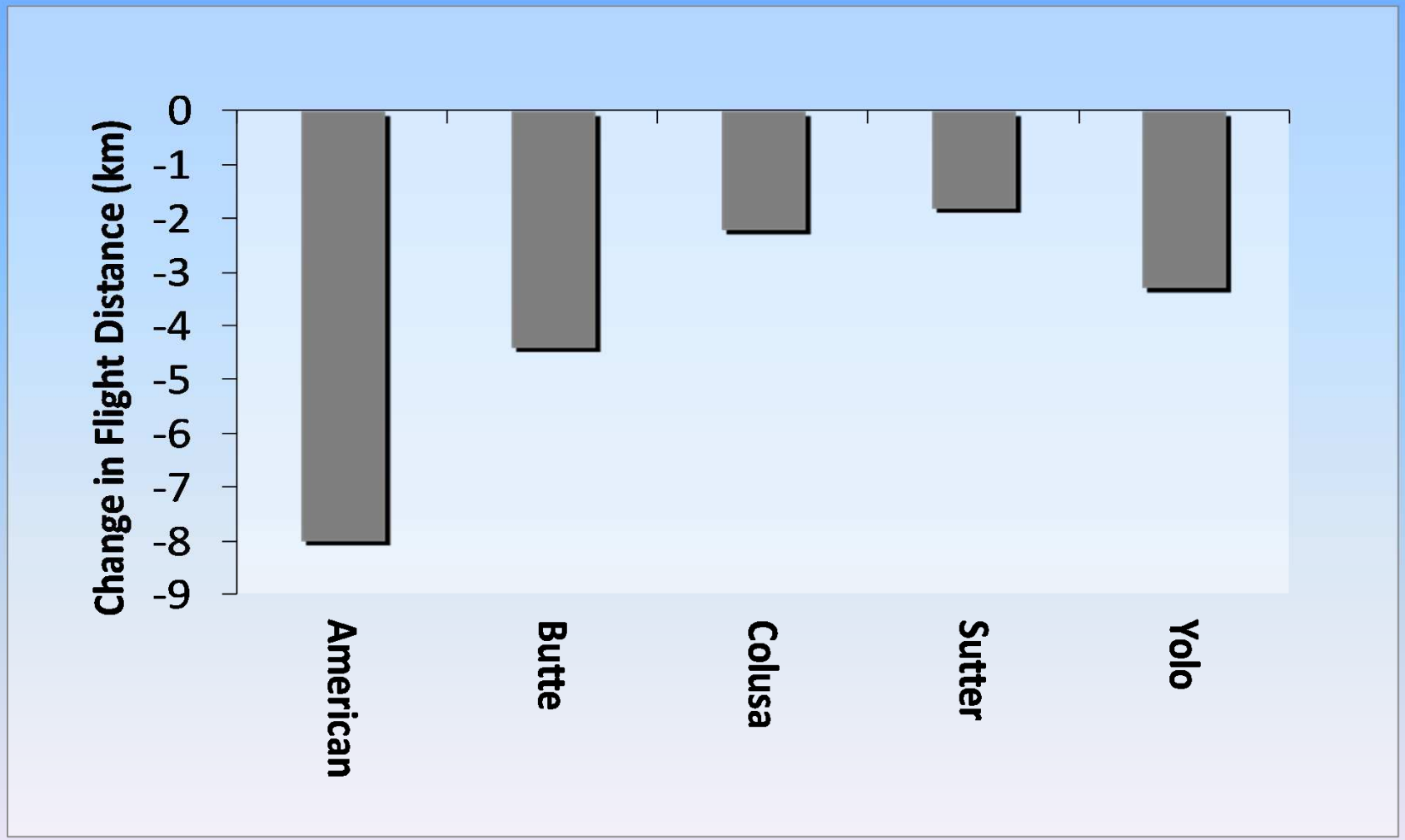
❖ Data from Miller et al 2010

Change in habitat use



❖ Data from Ackerman et al 2006

Change in flight distances

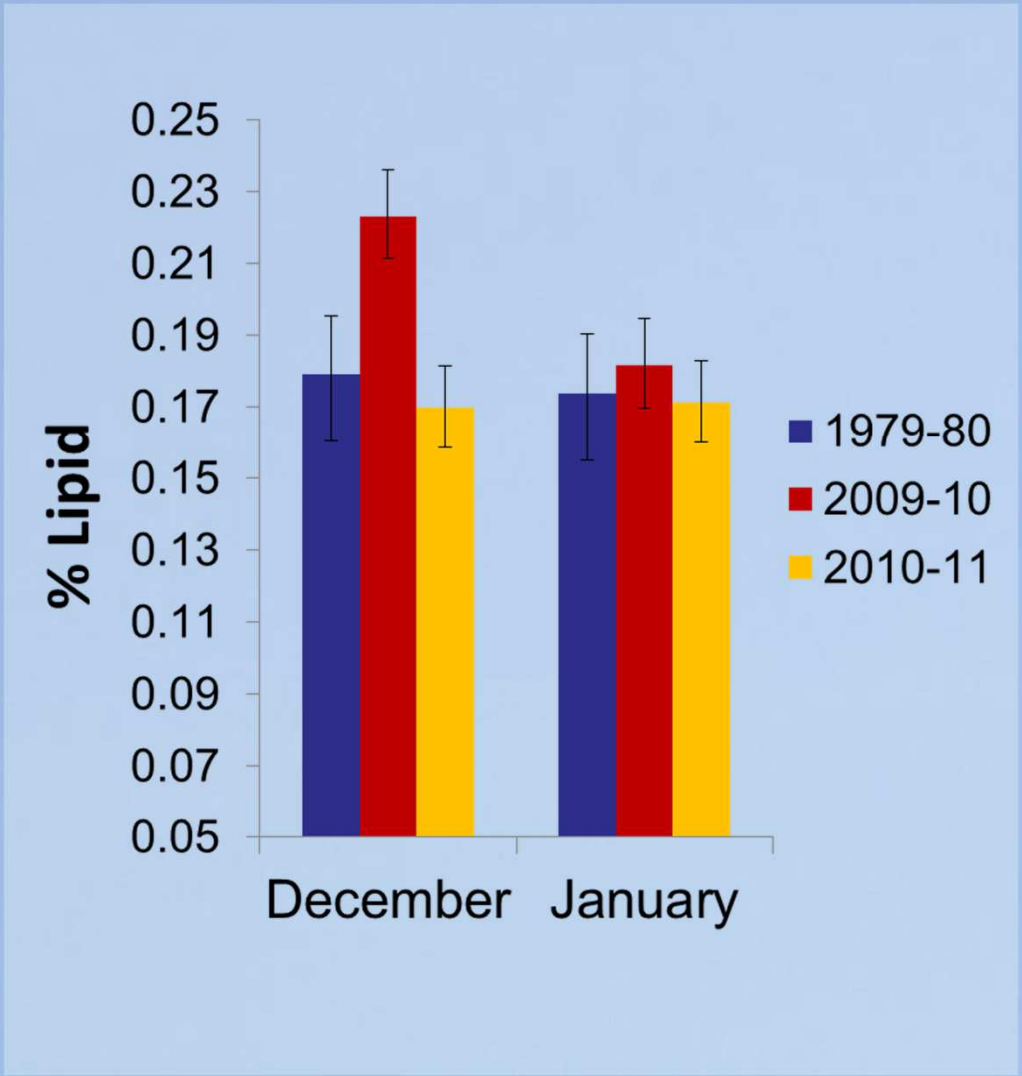


- Data from Ackerman et al 2006

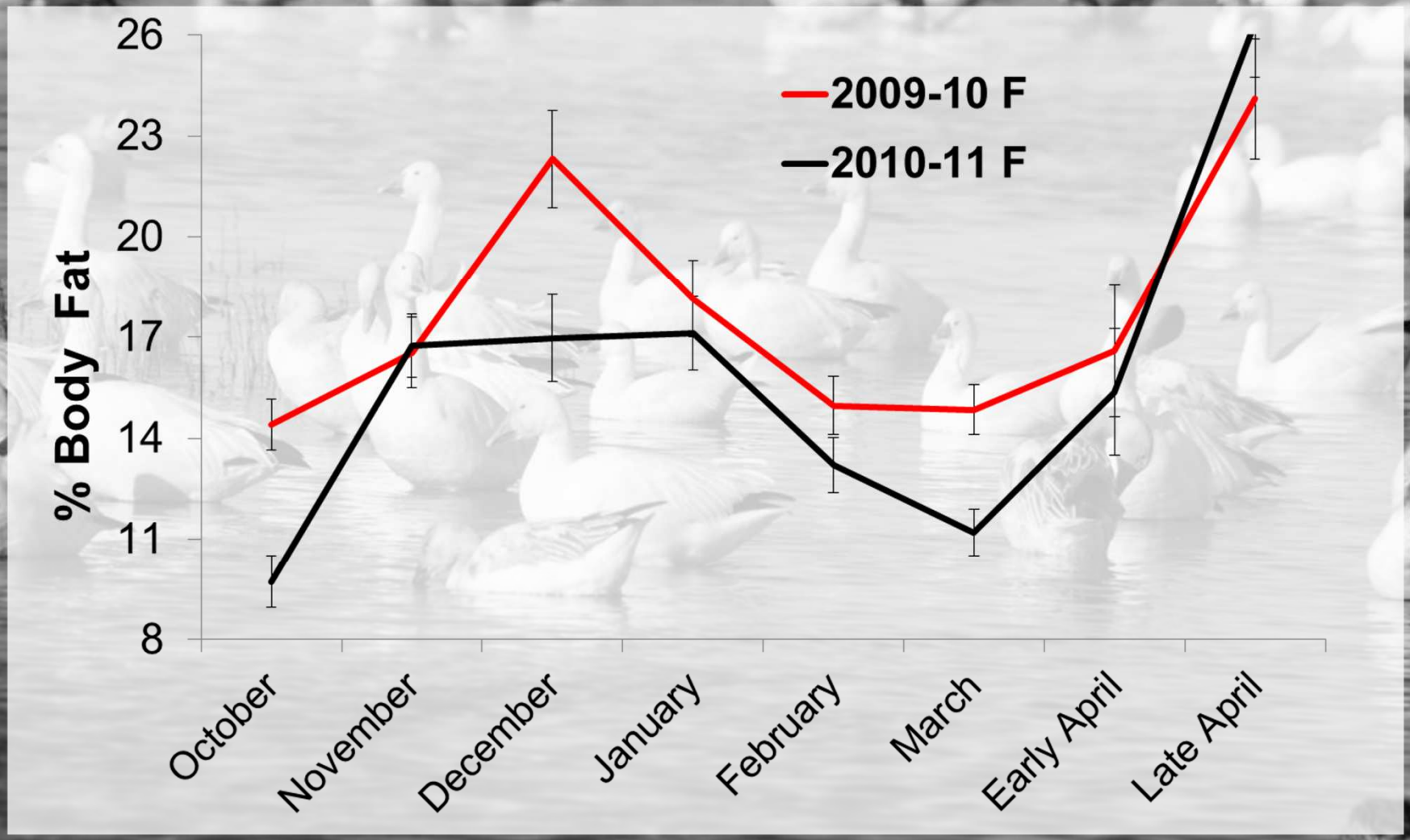
Important Points

- Increase in rice planting
  - ✓ Average was 150,000 HA now 207,000 HA (+37%)
- Increase in rice flooding
  - ✓ Average was 20,000 HA now 110,000 HA (+450%)
- 15 % increase in use of flooded rice habitat
- Decrease in roost to forage flights
  - ✓ Energetic savings

Body condition then and now



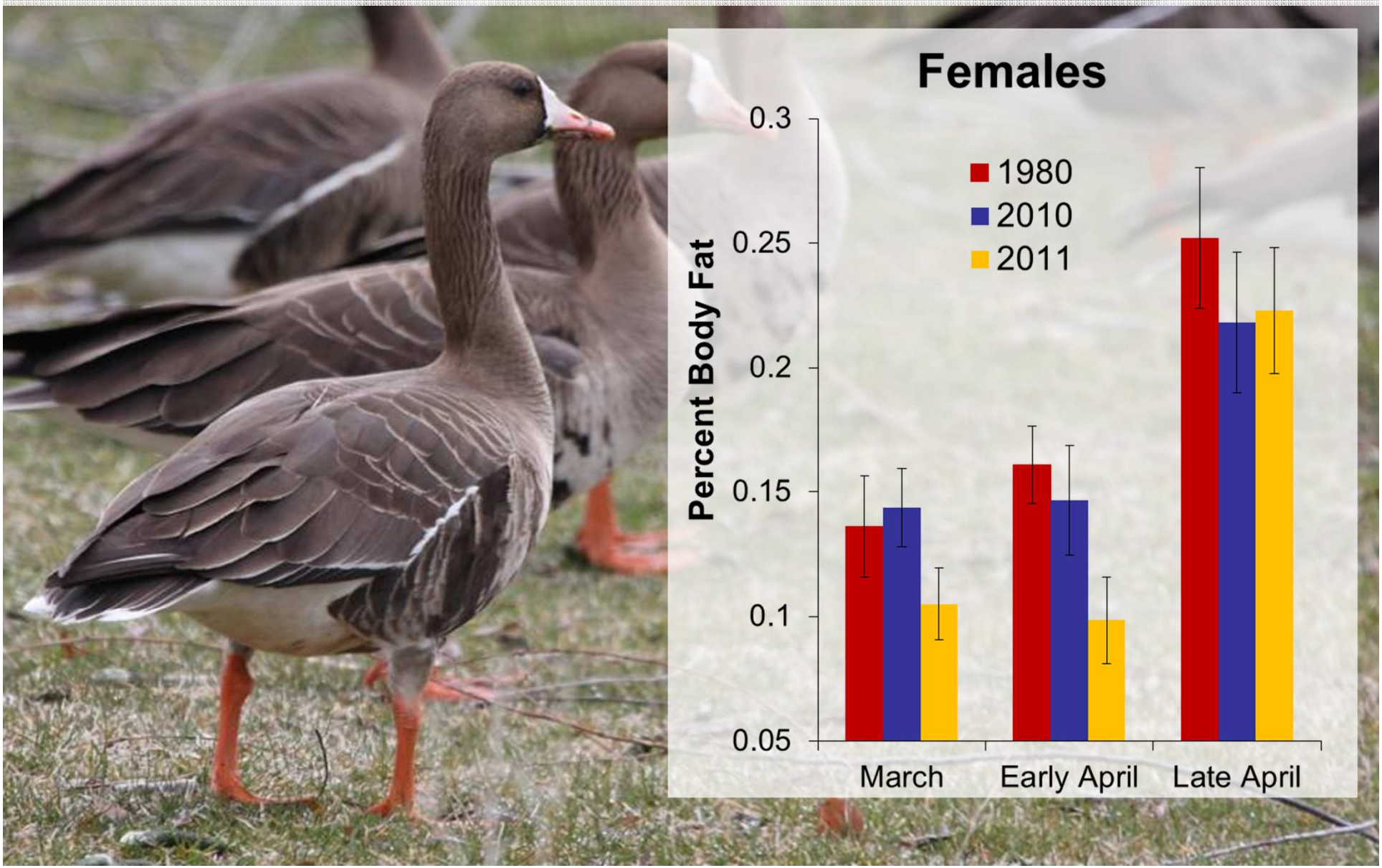
Current Lipid Trends in the Sacramento Valley: Females



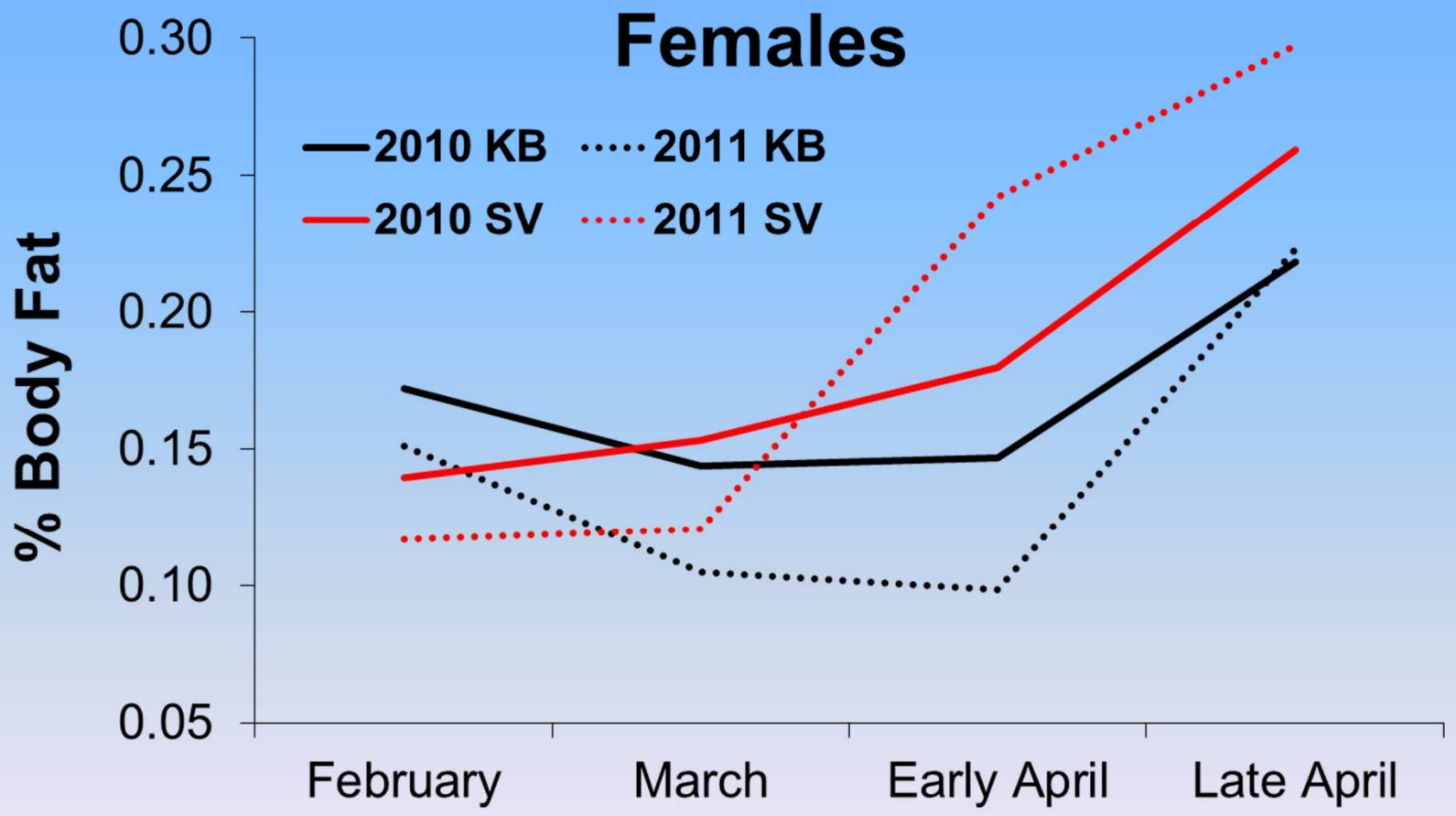
Spring

- **Critical** period for acquisition of reserves prior to migration
- Klamath Basin gets majority of use
  - Some may leave from the Sac Valley
  - Private properties in K.B. important
- Diet changes from seeds to green forage

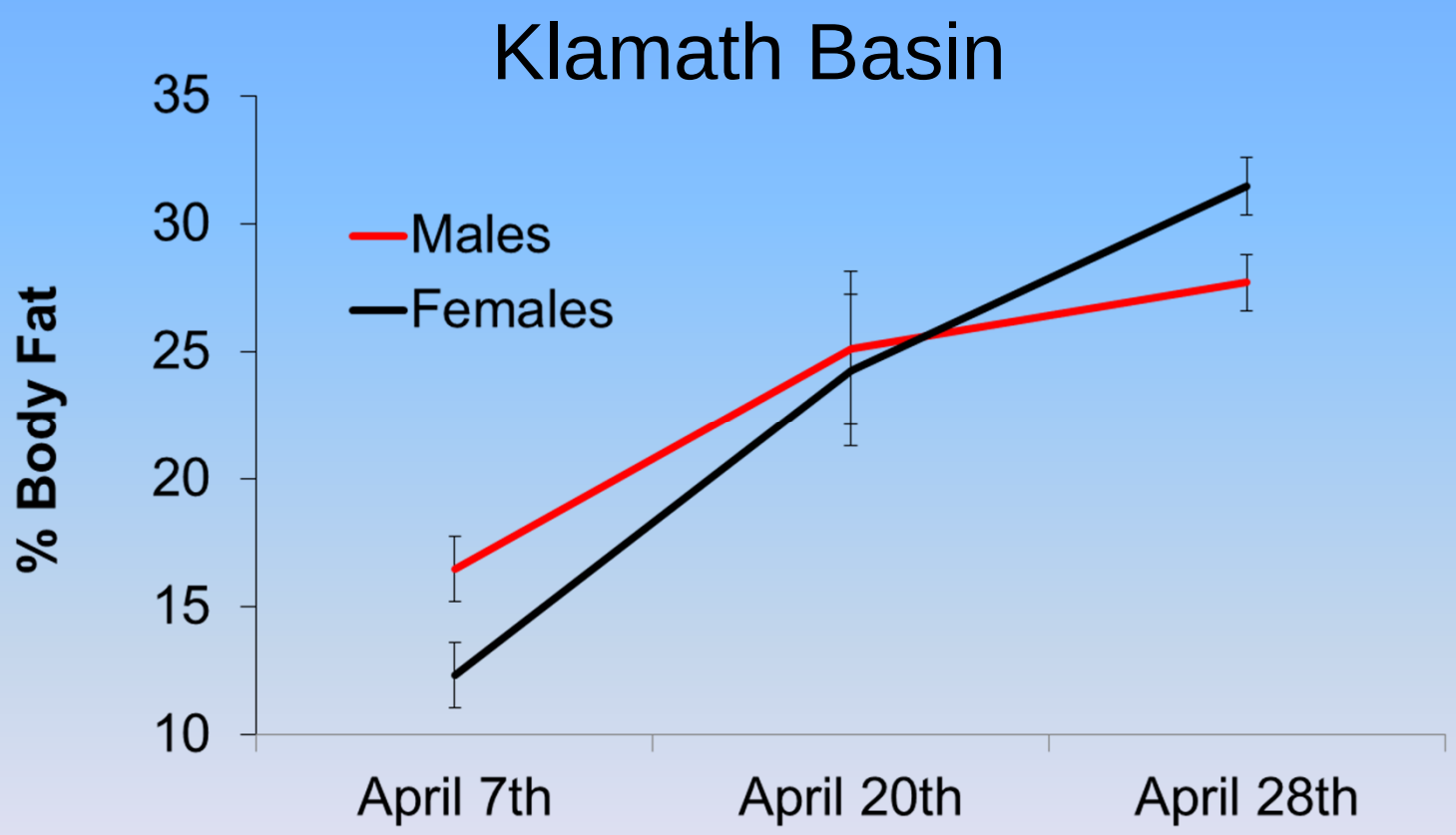
Klamath Spring Body Condition



Sacramento Valley Vs. Klamath Basin Spring



Just A Thought



Take Home

- Fall distribution changes
  - Decrease in food resources in K.B.
  - Increase of rice flooding in S.V.
- Body condition in the Sacramento Valley
  - Greater than 30 than years ago
  - Decreased roost to forage flights
- Late spring body condition in the Klamath Basin
  - Lower than 30 years ago
  - Collection Timing?
  - Other?

Thank you !

2010 Federal Duck Stamp