

Factors contributing to observed declines in pheasant harvest and population size in California and strategies for mitigating impacts to wild pheasants:

**Findings from the California pheasant workshop;
Yolo Wildlife Area – April 30 - May 1 2015**

Factors Affecting Pheasant Decline	Possible Actions / Mitigation Strategies
<p><u>Landscape Changes</u></p> <ul style="list-style-type: none"> *Agriculture <ul style="list-style-type: none"> -Clean farming practices -Changes in crop type and distribution *Successional change in historic habitats 	<p>Promote habitat restoration; Work with landowners through educational outreach and departmental programs (PLM) to encourage farming practices that favor pheasants; Experimental removal of trees from CDFW managed lands;</p>
<p><u>Pesticide Application</u></p> <ul style="list-style-type: none"> *Increasing use of Neonicotinoids *Direct effects *Decreased insect forage 	<p>Avoid spraying for public health by more closely controlling the timing and duration of water delivery for cover and forage; educate landowners about risks to wildlife</p>
<p><u>Changes in predator /competitor communities</u></p> <ul style="list-style-type: none"> *Avian *Mammalian 	<p>Reduce trees in historic upland / grassland habitat types. Provide non-linear habitats in managed landscapes</p>
<p><u>Weather / Climate</u></p> <ul style="list-style-type: none"> * Currently, California is in its 4th consecutive year of drought. 	<p>Habitat improvements to provide water; More closely controlling the timing and duration of watering events for cover and forage</p>
<p>Impacts of released farm raised birds on wild populations</p> <ul style="list-style-type: none"> *Genetic mixing *Disease transmission 	<p>Current research to determine the prevalence of disease in wild and pen-reared birds</p>

<p><u>Density Dependence: “Allee Effect”</u></p> <p>-As pheasant populations fall below the threshold for positive population growth, some harvest may become “additive”.</p>	<p>Target site-specific variables that have negative impacts on population growth rate.</p> <p>Improve the quality of existing habitat</p> <p>Experiment with reduced harvest</p>
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1) Landscape Changes

a. Agriculture

i. intensification and “clean farming” practices

1. Larger monocultures; fewer fence rows; laser leveling with larger field size; less edge habitat; less “dirty” (surface) water
2. Post 2006 E.coli outbreak in Southern California, crop producers requires growers to remove habitat within 150 yards of crop (no supporting scientific evidence; possible expansion of practice)
3. Recent change in northern California growing practices to disc fields before the onset of winter: the perception is that a disked field looks better/uses less water

ii. Changes in harvested croplands

1. Overall harvested acreage has remained stable;
2. Decrease in CRP / Farm Bill enrolled lands
 - a. Primarily in the Central California region
3. Increased rice agriculture (especially in north central California)
 - a. Post 1991, more disking and fallowing after harvest, less residual rice straw and less burning of rice straw
4. Increases in orchards / nut tree production (north and central California)
5. Decreases in cereal grain crops (statewide)
 - a. Especially barley
 - b. Sorghum, Winter wheat, Sugar beets
6. Changes in the distribution of harvested cropland
 - a. Decreases in coastal agriculture
 - b. Increases in central valley agriculture

b. Successional changes in managed habitats for wildlife

- i. Proliferation of tree sp. in fertile central valley soils that were once wetland, riparian or grasslands.

2) Pesticide Application: Zn_3P_2 (Zinc phosphide); Neonicotinoids & others

- a. Statewide, total pesticide use has not increased however the chemistry of pesticides has changed.
- b. There has been a major increase in a new class of “neonicotinoid” pesticides since the mid-1990’s
- c. Implications of pesticide application for avian species:
 - i. Lethal effects
 - ii. Sub-lethal effects
 - iii. Reduction in cover for ground nesting birds
 - iv. Reduction in insects for grassland & gallinaceous birds

3) Changes in predator communities

- a. Nest Predators:
 - i. Common Raven - +800% since 1970's
 - ii. Crows - + 100% since 1970's
- b. Raptors:
 - i. Swainson's Hawk - +4000% since 1970's
 - ii. Red-Shouldered Hawk - +1000% since 1970's
 - iii. Coopers Hawk - +100% since 1970's
 - iv. Red Tailed Hawk - +50% since 1970's
- c. Mammals:
 - i. Difficult to quantify but likely significant at local levels
- d. Competitors:
 - i. Turkeys are increasing in all regions of the state
 - 1. Disrupt pheasant breeding behavior
 - 2. Displace pheasants

4) Weather and Climate

- a. Low temperatures and high precipitation during the breeding season lead to favorable conditions for pheasant reproduction;
- b. Current state of drought is certainly a factor impacting success in the short term.

5) Unknown whether the release of game farm pen raised pheasants are impacting the health of wild populations

- a. Game farm birds have low survival in the wild; however it is not known whether infrequent mixing of pen-raised birds with wild birds has negative consequences for the genetic fitness of the population at large.
- b. It is not known, the extent to which game farm birds harbor diseases that are common to the poultry industry and potentially serve as a vector for disease transmission to wild type pheasants

6) Density Dependence- Inverse effects on greater population: "Allee Effect"

- a. As pheasant population density decreases and pheasant habitat becomes more fragmented, the ability of remaining birds to locate and acquire mates decreases, lowering reproductive success.