

**California Wildlife Habitat Relationships System**  
**California Department of Fish and Game**  
**California Interagency Wildlife Task Group**

---

**IRRIGATED HAYFIELD**      E. Lee Fitzhugh and Ronald F. Schultze

## Vegetation

**Structure--** Except for 2 to 6 months initial growing period, depending on climate, and soil, this habitat is dense, with nearly 100 percent cover. Average height is about 0.46 m. (1.5 feet) tall. Planted fields generally are monocultures ( the same species or mixtures or a few species with similar structural properties). Structure changes to a lower stature following each harvest, grows up again and reverts to bare ground following plowing or discing. Plowing may occur annually, but is usually less often. Layering generally does not occur in this habitat. Unplanted "native" hay fields may contain short and tall patches. If not harvested for a year, they may develop a dense thatch of dead leaves between the canopy and the ground.

**Composition--** This habitat includes alfalfa fields and grass hayfields. (Cereal grain fields, whether harvested for hay, grain or straw, should be classified as IGR or DGR.) Alfalfa usually exists unplowed for approximately 3 years or more, followed by a cereal grain crop, vegetables, potatoes or tomatoes for 1-4 years before being planted to alfalfa again. Most hay fields in the warmer parts of California are monocultures of alfalfa. In cooler areas, both alfalfa and introduced grass hay are common and are regularly irrigated. Occasionally, "native" hay fields are irrigated to enhance their productivity. Native hay fields may include introduced grasses and forbs, but they are managed less intensively and contain a variety of naturally-occurring graminoids and forbs as well. Alfalfa fields generally will be monocultures except for weeds and small inclusions of roads and ditches. Roads will be mostly barren, while ditchbanks, if vegetated, will support plants similar to those found in FEW. The mixture of grasses and forbs (mostly legumes) varies according to the region of the state (climate, soils), seed mixture used, tillage, irrigation, years since initial planting, and weed control.

**Similar Habitats--** Designation of a grassy hayfield as IRH depends more on management of the site than on plant composition. Hayfields are irrigated, intensively mowed and managed, whereas the same vegetation, allowed to grow in a more natural state might be a sedge, wet meadow, or perennial grassland habitat. Similar CWHR habitats are FEW, PAS, PGR, and WTM. The primary difference is that IRH is irrigated and occasionally plowed, mowed, and planted. PAS may also have these characteristics, but is more intensively grazed than IRH. Montane "native hay" pastures that are irrigated, mowed, and grazed belong in IRH if they are allowed to regrow so that by the end of the growing season and through the winter they have a substantial height of vegetation. Otherwise, they belong in the PAS type.

**Other Classifications--** Except in the case of "native hay," agricultural habitats are included only in the U.S. (UNESCO) Vegetation Cover Classification System (USVCCS). IRH would include at least three USVCCS formations corresponding to close-grown herbaceous crops in annual and perennial temperate grassland or forb vegetation categories. IRH could include 10 of the sedge and meadow series of Sawyer and Keeler-Wolf (1995). Most rushes (*Cyperus* spp.) are included by Sawyer and Keeler-Wolf (1995) in their sedge types. Spikerush (*Eleocharis* spp.), which they treat separately, is more typically a FEW species, but may occur as inclusions in a larger "native hay" IRH stand.

## Habitat Stages

**Vegetation Changes--** In warmer areas and on better soils, alfalfa is part of a regular 7-8-year crop rotation. In this setting, alfalfa renews soil nitrogen, improves tilth, and can reduce disease and weeds in the vegetable and grain parts of the rotation. Alfalfa is present for 4 years and is not plowed or disked during this time. Alfalfa also is grown where climate or soil is less adaptable to other crops. An Alfalfa-grain or Alfalfa-potato rotation is common in the Great Basin areas. Alfalfa fields may be plowed every 3-6 years, removing some weedy growth, and replanted to alfalfa. In both alfalfa and grass-hay, tall and short stages are dictated by management more than by plant growth. Grass hayfields vary from annually-planted introduced grasses in warm climates to naturally-occurring perennial grasses and sedges in colder climates. Mixtures of annual and perennial, native and introduced species are common. In some "native" hay fields there can be relatively long periods of continuous inundation, on the order of one or more months, usually in winter or spring. Cattails or bulrushes may invade, but they are controlled by management. Vegetation changes are possible given management direction.

**Duration of Stages--** Growth begins during February in Central Valley alfalfa fields. Alfalfa harvesting occurs 3-4 times per season in intermountain areas, 6-8 times in the Central Valley, and 8-9 times in the Imperial Valley. In the Imperial Valley and the Central Valley, harvesting occurs about monthly during most of the season. At high elevations native hay usually is harvested in June, but later harvesting occurs where owners or managers are concerned about bird nesting. Plowing or discing is infrequent.

## Biological Setting

**Habitat--** In most areas, rotational field crops, vineyards, or orchards will grow on adjacent areas. Natural plant communities that may occur adjacent to IRH include many flat-land, deep-soil communities from sagebrush and annual grassland to desert grassland, alkali desert scrub or creosote desert scrub, depending on the location. At higher elevations, IRH may be adjacent to coniferous forest types. This habitat sometimes exists where soil, water, or climatic conditions limit growth of other crops. If abandoned, alfalfa fields will be replaced naturally by invasive exotic plants, which may be different

from those that occupied the site before tilling. Imperial Valley and Central Valley fields occupying alkaline soils, if abandoned, could revert to patchy saltgrass, salt-tolerant shrubs, and unvegetated alkaline flats. Abandoned intermountain alfalfa fields may revert to cheatgrass and Russian thistle, while native hay fields will develop a dense thatch and decadent plants.

**Wildlife considerations--** This habitat provides a high quality seasonal resource for blackbirds, deer, doves, egrets, elk, foxes, garter snakes, gophers, gopher snakes, hawks, king snakes, owls, pronghorn, sandhill cranes, voles, waterfowl, and others. However, where harvesting is constant, reproduction values for ground-nesting species are reduced to zero. If rotational cropland is adjacent, this habitat can provide cover during seasonal discing and planting on the rotated fields.

## Physical Setting

This habitat occurs in variable climates, from hot and dry to cool and wet to cold and snowy. IRH requires relatively flat topography that allows irrigation or water-spreading. Soils are highly variable but usually more than 1 meter (3.3 feet) deep and often of alluvial origin.

## Distribution

This habitat is found throughout California from below sea level to about 2100 m.(7,000 feet). Typical examples are found in Imperial Valley and Modoc County, representing different extremes, and in San Joaquin County, representing a more central form. Agricultural databases that could be used to represent abundance and distribution do not define IRH as we do, and can provide misleading estimates. However, our best estimate, based on a Natural Resources Conservation Service (NRCS 1997) tabulation of Agricultural Commissioners' crop reports for 1996 is that California supports more than 405,000 ha.(1,000,000 acres) of hayfields.

## Literature Cited

NRCS. Unpublished. Crop residue management survey: worksheet for 1997, based on Agricultural Commissioners' Agricultural Crop Reports for 1996. USDA, Natural Resources Conservation Service, Davis, CA.