Written Testimony of Daniel Binford Weaver,
President of the American Beekeeping Federation, Inc.,
presented June 26th, 2007
before the

Subcommittee on Fisheries, Wildlife and Oceans,
COMMITTEE ON NATURAL RESOURCES

Chairwoman Bordallo and Members of the Committee:

Thank you all for the privilege and honor of testifying before the Subcommittee on "The Birds and the Bees: how pollinators help maintain healthy ecosystems."

I am Daniel Weaver, a fourth generation beekeeper, owner and manager of Bee Weaver Apiaries, Inc., and Beartooth Apiaries, LLC; and President of the American Beekeeping Federation, Inc., the nation's oldest and largest organization of apiculturalists and allied industries, with members in all 50 states. Bee Weaver Apiaries of Navasota, Texas, breeds and produces queen honey bees that are sold throughout the United States, and Bee Weaver bees produce honey and pollinate crops in Texas, North Dakota, and California. Beartooth Apiaries and its bees produce honey in Montana and pollinate crops in California and Oregon. More importantly, I represent the American Beekeeping Federation, whose members range from the largest commercial beekeepers to hobbyists with only a few hives.

Pollinators provide vital environmental services in every ecosystem on earth, but our present depth and breadth of knowledge about pollinators does not reflect their indispensable role in world. It is imperative that we accelerate the pace and scope of pollinator research, and using that information, act to protect pollinators and the environment. However, the fragmentary information already available is alarming, and suggests we must move quickly and act now to avoid serious and possibly irreversible damage to pollinator populations and ecosystems. For instance, environmental changes and land use decisions may have adverse consequences for most pollinators. But the regrettable pollinator data deficit, (as highlighted in the October 2006 report of the National Research Council of the National Academies: The Status of Pollinators in North America), precludes a general understanding of the likely effects of environmental change. For many native pollinators, even the most fundamental data on species

distribution and abundance is lacking. Consequently our ability to predict the effects of any given environmental change on the probable abundance of a particular pollinator, and the resultant impact that pollinator's abundance upon the ecosystem is difficult at best.

However, for one pollinator of tremendous importance - honey bees – even the appalling lack of statistical data cannot obscure some obvious trends. The number of managed honey bee colonies in the US has fallen from around 6 million at the end of World War II to as few as 2 million today. This long-term trend has intensified in recent years, largely as a consequence of exotic parasitic mites that have devastated both managed and feral honey bee colonies. If this trend persists then in 25 years few managed honey bee colonies will be left. And this projection is without regard for the mysterious new syndrome, called Colony Collapse Disorder (CCD), which killed or severely weakened hundreds of thousands of hives across the US in the past 6 months. If the cause or causes of CCD are not soon identified and mitigating or therapeutic measures quickly developed, then honey bee populations could further plummet with corresponding adverse impacts on the environment. There are three primary classes of suspects in the search for etiologic agents of CCD. The first category of suspected agents encompasses new pathogens and parasites, or more virulent strains of existing pathogens or parasites. The second group of possible causes may be summarized as environmental toxins, including man-made chemicals like pesticides, fungicides and herbicides. The third class of CCD suspects is management practices implemented by beekeepers. Two of these three classes of possible CCD causes could have serious adverse consequences for native insect pollinators, as well as honey bees. New or more virulent insect pathogens could affect honey bees, native bees and other insect pollinators alike. Likewise, new chemicals or multi-chemical formulations, and more intensively applied chemicals, all could be expected to negatively impact both honey bees and other insect pollinators.

Recommended action:

The American Beekeeping Federation asks that the Committee support authorization and appropriation of additional funding for pollinator research.

Honey bees are responsible for pollination of a tremendous variety of wild plants across our nation, an environmental service of incalculable value; and honey bees also provide pollination for over 15 billion dollars of agricultural crops each year too. Three features distinguish honey bees and make them a signal species that deserves special attention here in the United States, despite their origins in the Old World. First, honey bees are generalists and polylectic – they pollinate many different plants – as opposed to many other pollinators that are monolectic – which pollinate and depend upon only one or a few plant species. In addition, many of the wild plants that honey bees pollinate are native plants of the United States, even though honey bees are only 'naturalized' citizens. Second, honey bees are social, and the efficacy of honey bee pollination may be enhanced by the collective efforts of tremendous numbers of pollen foragers in each hive, and the interactions of pollen foragers facilitating transfer of pollen from different blooms or plants of the same species among foragers within the hive. Third, many honey bee colonies are managed by humans. Honey bee colony population size, together with colony distribution and abundance, as well as total pollination impact, is routinely manipulated and enhanced by beekeeping management practices and movement of hives to specific places at certain times. All of these traits combined make the honey bee the premier pollinating insect and the principal pollinator of most agricultural crops. The importance of honey bees in pollinating native plant communities is not so well established, but likely to be just as significant, and more study is warranted. Please see the list of native California plants visited and presumably pollinated by honey bees compiled by Dr. Eric Mussen of the University of California, Davis, appended to this written testimony.

Interspecific competition among bees, especially between introduced bees and native bees, may sometimes result in short term suppression of native bee abundance or reproductive success, through competition for resources. However, convincing evidence of exotic pollinators exerting population-level effects on native pollinators is lacking. Moreover, honey bees colonized the entire United States more than 100 years ago, and may now be considered part of the natural wildlife in most parts of the US. In my opinion, any sustained adverse impact upon native pollinators caused by honey bees likely occurred long ago.

Despite aspects of biology, apiculture and pollination ecology that distinguish honey bees and some other pollinators, all pollinators share many needs and vulnerabilities. In other words, they have much in common, and both honey bees and other insect pollinators provide pivotal ecosystem services, and they all require certain environmental conditions for survival and success. The most fundamental requirement is the availability of suitable habitat. Plants and pollinators are linked in a complex web of mutual interdependence. Plants benefit from the activity of pollinators; just as pollinators, in turn, rely upon plants for resources, shelter and nest sites. Land use changes have eliminated or greatly reduced pollinator habitat in many parts of the United States. But restoration of habitat would preserve or increase pollinator abundance, probably further regenerating and rehabilitating native plant communities in a positive feedback loop. Moreover, preservation and restoration of habitat for pollinators would be good for all pollinators, benefiting native bees and honey bees too.

Those with responsibility for managing public lands should make pollinator habitat protection and restoration one of their top priorities. Among the more simple and effective management practices to encourage insect pollinator success would be to implement restoration schemes that include applications of seed mixes that incorporate legumes, forbes and grasses, to provide more complete natural mixes of vegetation on public lands.

Recommended Action:

The American Beekeeping Federation urges the Committee to encourage pollinator habitat preservation, restoration and enhancement.

Pollinators and the plants they service are part of a complex dynamic in ecological systems, and perturbations of many environmental network nodes can wreak havoc with the system by impairing the delivery of pollination services. Herbicides may reduce pollinator resources and nest sites, and suppress pollinators indirectly; pesticides may reduce or eliminate pollinators directly through acute lethal effects, or, more subtly, through behavioral or physiological impairment in sublethal doses. Even fungicides that are perceived to be relatively nontoxic to adult honey bees can cause severe immature

honey bee mortality – and similar effects may occur with other bees and insect pollinators too. Consequently, public lands stewards should endeavor to minimize the applications of these compounds; choose the least toxic chemicals; and manage applications that are necessary, so as to mitigate impacts on pollinators. Even this common-sense approach is more easily articulated than implemented, because most fungicides, herbicides and pesticides have unknown sublethal effects on adult honey bees, and are not tested for immature honey bee toxicity at all. This problem is amplified for other insect pollinators, which receive even less attention than honey bees in the process of approval of new compounds by EPA.

Recommended Action:

The ABF recommends that the Committee encourage EPA to more carefully evaluate the impact of registered compounds on pollinators, and rigorously scrutinize new chemicals proposed for registration, to evaluate their effects on pollinators.

The increasing scarcity of pollinator refugia in the fragmented and altered landscapes that routinely accompany increased human population density and intensive land use poses a problem for all pollinators, including honey bees. Therefore, public lands are more important than ever in providing habitat for pollinators. The prevalence of "Roundup Ready" and other herbicide-tolerant, genetically modified crops makes public lands in proximity to agricultural areas critical zones of pollinator-friendly habitat. The importance of these fringe or edge zones of public lands as pollinator habitat should be emphasized. Beekeepers face increasing obstacles in securing suitable areas to place hives with every passing year. The ability to place hives on the public lands near agricultural areas, particularly along the margins of public lands, would provide important assistance to beekeepers and help secure needed pollination services in the transition zones between agricultural or developed land and more natural ecosystems on public land. On public lands where honey bees have traditionally been allowed, recent decisions have dramatically increased fees imposed upon beekeepers for site occupancy. We believe that honey bee occupancy of public lands may be distinguished from grazing

rights or grazing access by herbivores. Honey bees pollinate plants, including native plants, and thus promote plant reproduction, propagation and succession; grazing may have the opposite impact. Also, beekeepers often occupy public lands in an effort to escape the chemical sprays and insults imposed by typical agricultural practices and do not necessarily derive significant amounts of honey or hive products from public land occupancy. Thus honey bees provide a net benefit to the ecosystem, while beekeepers often do not derive significant income from public land occupancy. These differences should justify different cost regimes for use of public lands by apiarists compared to the fees imposed for grazing.

Recommended Action:

The American Beekeeping Federation asks that the Committee take action to encourage pollinator visitation and occupation of public lands. Also, we recommend that beekeepers be given access to some public lands, especially boundary strips or areas adjacent to private agricultural or mining activities, under reasonable terms and conditions.

Summary

Pollinators ensure that plants reproduce and survive to provide food and shelter for the wildlife this Committee is charged with protecting. And management of wildlife habitat to foster healthy and productive pollinator populations will necessarily improve the quality and carrying capacity of that wildlife habitat. In sum, pollinators are essential for preservation and protection of wildlife, and they are rightfully a concern of this Committee and the agencies under its jurisdiction. We implore the Committee to support additional funding for research into pollinator biology and pollination ecology; and pests, pathogens, agrichemicals, GMO crops, environmental change and other factors that can potentially affect pollinator populations. We also ask that this Committee do more to assure the public lands are managed to foster and encourage occupation and visitation by pollinators, and to admit honey bees to public lands, especially in historically utilized areas, zones adjacent to agricultural or mining activities, and boundary areas.

I would like to commend the Committee, this Subcommittee, and its staff for the wisdom and foresight demonstrated in organizing and conducting this hearing into the roles pollinators play in maintaining healthy ecosystems. Because of the attention and action of this Committee, similar hearings and legislative action by other Committees and members of this Congress, pollinators are finally getting the attention and respect that they and their vital ecosystem services deserve.

I would especially like to thank and congratulate Representative Alcee Hastings for his leadership in writing and introducing HR 1709. Congressman Hastings immediately recognized the crisis posed by CCD and pollinator declines. He assessed the situation, reviewed the recommendations of the National Academies report on the Status of Pollinators, determined that the decline in pollinators required immediate action, and decided that more funding for good science should be the cornerstone of this Nation's response. Through the collective efforts of Congressman Hastings and co-sponsors of the his bill, together with members of the Agriculture Committee, especially Subcommittee Chairman Dennis Cardoza, and the work of Senator Barbara Boxer and other co-sponsors of her Senate bill, as well as Senator Max Baucus and co-sponsors of his habitat conservation bill, S. 1406, we will develop the information and provide the resources that will better protect and preserve pollinators in the United States and around the world. This is a global issue, and the United States can assume a leadership role by enacting these important measures without delay.

I also would like to recognize the good work of the Coevolution Institute (CoE). CoE facilitates the North American Pollinator Protection Campaign (NAPPC), a tri-national, public-private collaboration of scientific researchers, managers and other employees of state and federal agencies, private industry and conservation and environmental groups. Many in the beekeeping industry are involved in and supportive of this effort, as honey bees benefit from many of the policies and programs of NAPPC. I am aware that representatives of CoE have supported this Subcommittee in preparing for today's important hearing, and I appreciated collaborating with them in preparing for this hearing.

Thank you for the opportunity to testify, and I stand ready and willing to answer the Committee's questions or provide other assistance as needed. I respectfully ask the

Chair and the Committee for permission to revise and extend these remarks as warranted by new information, or the discovery of inadvertent errors or omissions.

Appendix

Impact of Honey Bees on the California Environment

Eric C. Mussen - Extension Apiculturist, UC Davis - 2/4/02

Conservationists and beekeepers are interested in the interactions of honey bees with nectar and pollen producing plants in California. One polar view is that honey bees are non-native, pollinate mostly introduced "weed" species, and eliminate native pollinators through competition for food. At the other end of the spectrum is the knowledge that honey bees will visit most blooming plants for food and, if nectar is abundant, will produce a honey crop. While honeys vary in color and taste depending upon floral source, any native or introduced nectar and pollen sources that will preserve honey bees throughout the year are likely to be acceptable to the beekeeper.

A number of agencies and organizations are cooperating in an effort to "restore" regions of the California Central Valley to its "original state." The major emphases are 1. replacing non-native vegetation with native plants and 2. encouraging native animals to return to their former ranges. The result has been eviction of beekeepers from apiary locations that have been used for decades as seasonal spots for rebuilding populations following the stresses of commercial pollination or for producing honey.

While removing this non-native pollinator from an environment may sound rational at first, it may not be the best idea. In most cases, it is not the presence of honey bees that has depressed or eliminated the populations of native pollinators. In fact, no studies have shown that honey bees eliminate native pollinators. In some cases the populations of native pollinators have been reduced by honey bee competition, but following removal of honey bees the native bees built back to usual levels in a couple years.

Coincidental with the introduction of non-native plants and honey bees into the environment, natural habitats were altered in many other ways. With honey bees, if we provide them with an adequate hive and food sources, they are likely to survive. However, native pollinators can be very particular about the environment in which they can exist. If their

nesting habitat is disturbed, modified or destroyed, they cannot live in the area, despite an abundance of food plants. In many California locations, it is habitat alteration or destruction, not lack of food, which eliminated the native pollinators.

In cases where habitats are so degraded that some native bee populations have been reduced or eliminated, honey bees may be essential to foster initial re-establishment of native plant populations. Those plants provide food and shelter for wildlife and assist significantly in erosion control. Until the habitat is restored adequately to meet the requirements of native pollinators, it is likely that the presence of honey bees will be much more beneficial than detrimental in keeping the California native plants pollinated and reproducing. Thus, honey bees should be solicited for, not banned from, restoration areas. A list of over 130 native California plants visited, and likely pollinated, by honey bees follows.

California Native Plants Visited (and probably pollinated) by Honey Bees

Excerpted from Nectar and Pollen Plants of California (Bulletin 517) by G.H. Vansell (1941), UC Berkeley plus personnel observations of Dr. Robbin W. Thorp, Emeritus Professor, UC Davis

Updated according to the CalFlora web site – June, 2001 and the Jepson Manual of Higher Plants of California, 1993, edited by James C. Hickman

Alder – *Alnus* spp.

Antelope brush - *Purshia tridentata* (Pursch.) DC.

Arrow-weed – *Pluchea sericea* (Nutt.) Cov.

Asters – *Aster* spp.

Azalea – *Rhododendron* spp.

Barberry – *Berberis* spp.

Beardtongue - *Penstemon* spp.

Blackbrush – *Coleogyne ramosissma* Torr.

Black sage – *Salvia mellifera* Greene

Blue palo verde - *Cercidium floridum* A. Gray

Bluecurls – *Trichostema lanceolatum* Benth.

Box elder – *Acer negundo* L. var. *californicum* Sarg.

Buckwheats – *Eriogonum* spp.

Buffalo berry – *Shepherdia argentea* Nutt.

Burnet – *Sanguisorba* spp.

Button bush – *Cephalanthus occidentalis* L.

Cactus - *Opuntia* spp.

California bay – *Umbellularia californica* Nutt.

California broom – *Lotus scoparius* (Nutt.) Ottley

California buckeye – *Aesculus californica* Nutt.

California coffeeberry – *Rhamnus californica* Esch.

California corn lily – *Veratrum californicum* Durand

California figwort – *Scrophularia californica* Cham. & Schldl.

California hazelnut – *Corylus cornuta* var. *californica* (A. DC.) Sharp

California scale-broom - *Lepidospartum squamatum* Gray

Camas – *Camassia* spp.

Carpet grass – *Phyla* spp.

Cascara sagrada – *Rhamnus purshiana* DC.

Catclaw - *Acacia greggii* A. Gray

Chamise - *Adenostoma fasciculatum* Hook. and Arn.

Checker mallow – *Sidalcea malvaeflora* (DC.) Benth.

Chia - *Salvia columbariae* Benth.

Chinquapin – *Chrysolepis chrysophylla* (Hook) Hjeluq.

Cinquefoil – *Potentilla* spp.

Coffee weed - *Sesbania exalata* (Raf.) Cory

Common cocklebur - *Xanthium stumarium* L.

Common meadowfoam – *Limnathes douglasii* R. Br.

Common rabbit brush – *Chrysothamnus nauseosus* (Pall.) Britt.

Cotton-thorn - *Tetradymia spinosa* Hook. and Arn.

Cottonwood – *Populus* spp.

Coyote brush – *Baccharis pilularis* DC.

Coyote mint – *Monardella villosa* Benth.

Creeping sage – *Salvia sonomensis* Greene

Creosote bush – *Larrea tridentata* (DC.) Cov.

Dalea – *Dalea* spp.

Death-camas – *Zigadenus venenosus* Wats.

Desert peach – *Prunus andersonii* Gray

Dodder – *Cuscuta* spp.

Douglas hawthorn – *Crataegus douglasii* Lindl.

Elderberry – *Sambucus* spp.

Fiddleneck – *Amsinckia* spp.

Fireweed – *Epilobium angustifolium* L.

Flax – *Linum* spp.

Forest clover – *Trifolium breweri* Wats.

Gilia – *Gilia* spp.

Golden fleece – *Ericameria arborescens* (Gray) Greene

Goldenrod – *Solidago* spp.

Grape – *Vitis* spp.

Honey mesquite – *Prosopis glandulosa* Torr.

Honeysuckle – *Lonicera* spp.

Horsemint – *Agastache urticifolia* (Benth.) Ktze.

Hound's tongue – *Cynoglossum* spp.

Jackass clover – *Wislizenia refracta* Englem.

Keckiella - *Keckiella* spp.

Laurel sumac – *Malosma laurina* (Nutt.) Abrams

Lemonadeberry - *Rhus integrifolia* (Nutt.) Brewer and S. Watson

Lily - *Lilium* spp.

Locoweed – *Astragalus* spp.

Lupines – *Lupinus* spp.

Manzanita – *Arctostaphylos* spp.

Maples - *Acer* spp.

Mexican devilweed - *Chlorocantha spinosa* (Benth.) G. Nesom

Milkweed – *Asclepias* spp.

Mistletoe – *Phoradendron* spp.

Mojave stinkweed – *Cleomella obtusifolia* Torr. & Frem.

Mountain misery – *Chamaebatia foliolosa* Benth.

Mule fat - *Baccharis salicifolia* (Ruiz Lopez and Pacon) Pers.

Nightshade (some) – *Solanum* spp.

Oak – *Quercus* spp.

Onion – *Allium* spp.

Our Lord's Candle – *Yucca whipplei* Torr.

Pacific madrone – *Arbutus menziesii* Pursh

Peak rush-rose – *Helianthemum scoparium* Nutt.

Phacelia – *Phacelia* spp.

Poison oak – *Toxicodendron diversilobum* (T. & G.) Greene

Poppy – *Eschscholzia* spp.

Purple sage – *Salvia leucophylla* Greene

Raspberry – *Rubus* spp.

Red maids – *Calandrinia caulescens* H.B. K. var *mensiesii* Gray

Red shank - *Adenostoma sparsifolium* Torrey

Redwood – *Sequoia sempervirens* (Lamb. Endl.

Rocky mountain bee plant – *Cleome serrulata* Pursh.

Sage – *Salvia* spp.

Sagebrush – *Artemisia* spp.

Screw bean mesquite - *Prosopsis pubescens* Benth.

Sea dandelion - *Agoseris* spp.

Serviceberry – *Amelanchier* spp.

Sierra coffeeberry - *Rhamnus rubra* E. Greene

Sierra milkwort – *Polygala cornuta* Kell.

Smartweed – *Polygonum* spp.

Smoke tree - *Psorothamnus spinosus* (A. Gray) Barneby

Snowberry – *Symphoricarpos albus* Blake

Soap plant – *Chlorogalum pomeridianum* (Ker) Kunth

Spanish clover – *Lotus purshianus* (Benth.) Clem. & Clem.

Spikeweed – *Hemizonia* spp.

Spiny cocklebur – *Xanthium spinosum* L.

Spiny redberry – *Rhamnus crocea* Nutt.

Strawberry – *Fragaria* spp.

Sugar bush - *Rhus ovata* S. Watson

Sunflower – *Helianthus* spp.

Tan oak - *Lithocarpus densiflorus* (Hook and Arn.) Rehder.

Tarweed – *Hemizonia* spp.

Toyon – *Heteromeles arbutifolia* (Lindl.) Roemer

Tule mint - *Mentha arvensis* L.

Turkey mullein – *Eremocarpus setigerus* Benth.

Turpentine weed - *Trichostema laxum* A. Gray

Vetch – *Vicia* spp.

Virginia creeper – *Parthenocissus vitacea* (Knerr.) Hitchc.

Wallflower – *Erysimum* spp.

Walnut – *Juglans* spp.

Wax myrtle – *Myrica californica* Cham. & Schldl.

Western false-indigo – *Amorpha fruticosa* L.

Western goldenrod - *Euthamia occidentalis* Nutt.

Western redbud – *Cercis occidentalis* Torr.

White sage – *Salvia apiana* Jepson

Wild lilac – *Ceanothus* spp.

Willow – *Salix* spp.

Wood sorrel – *Oxalis* spp.

Yerba santa – *Eriodictyon californicum* (H. & A.) Torr.

Yellow bee plant - *Cleome lutea* Hook.

Yellow palo verde – *Cercidium microphyllum* (Torr.) Rose & Johnston