



## Scientist Letter of Support for Colorado House Bill 24-1117

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We, the undersigned scientists, are writing to show our support for [Colorado House Bill 24-1117](#), which would allow Colorado Parks and Wildlife to manage and conserve rare native plants and native invertebrates including pollinating insects such as monarchs, other butterflies, bumble bees and other important insect species.

Colorado Parks and Wildlife (CPW) is vital to the management and conservation of the state's wildlife. Conservation actions by CPW can effectively recover vulnerable wildlife populations, circumventing the need to list species under the federal Endangered Species Act. Yet, CPW currently does not have the authority to manage monarchs, other pollinators such as bees, or other invertebrate animals except mollusks and crustaceans. CPW also does not currently have the management authority to study and conserve native plants. This bill provides the ability for CPW to focus efforts on research, monitoring and conservation of invertebrates and rare plants. Specifically, the bill adds rare plants and invertebrates to the species that CPW may conserve, protect and perpetuate under the current "Nongame, Endangered, or Threatened Species Conservation Act", which is renamed the "Nongame, Endangered, or Threatened Wildlife and Rare Plant Conservation Act".

### **Why this bill is important**

Invertebrates, including butterflies and bees, and native plants, are at the heart of a healthy environment. Most flowering plants require pollination (Ollerton et al. 2011), usually by insects, and those plants then produce many of the fruits, vegetables, nuts, and seeds that both humans and wildlife depend on. Moreover, insects and other invertebrates form an irreplaceable link in both aquatic and terrestrial food webs, with the vast majority of birds, bats and freshwater fish relying on invertebrates as food. Invertebrates also provide crucial ecosystem services; in addition to pollinating plants, they clean our streams and rivers by filtering water, help recycle plant, animal, and human waste, and regulate other species, including important agricultural pests. Losey and Vaughan (2006) found insects are worth more than \$57 billion (\$80 billion 2023 valuation) each year to the U.S. economy and are crucial for many of Colorado's most famous crops from Rocky Ford cantaloupes to Palisade peaches (Armstead et

al. 2023). This bill will add rare native plants and native invertebrates to the species that may be studied and conserved by CPW, allowing Colorado to both lead and engage in conservation efforts to protect and recover those plant and invertebrate species.

### **Monarch butterflies, pollinating insects, and other invertebrates are all in decline**

Studies from around the world and in Colorado are showing that invertebrates are declining and this puts many ecosystems and agricultural systems at risk. The United Nations Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services found that more than 40% of invertebrate pollinator species globally may face extinction in the coming decades (IPBES 2016). Wagner et al. (2021) reported in the *Proceedings of the National Academy of Sciences* that, where studied, insect abundance is declining on average 1% to 2% per year. Here in Colorado, even within some of our most protected areas, insect biomass has declined by ~47% and abundance by ~61.5% over the last 35 years, primarily as a result of human environmental and climate change factors (Dalton et al. 2023). These declines are occurring across the western US as well as in Colorado. Monarch butterflies exemplify the importance of invertebrate conservation with both the migratory eastern and western populations occurring in Colorado, and the western population declining by over 90% across its entire range (Pelton et al. 2019). A study in the journal *Science* by scientists at the University of Nevada Reno found that butterfly populations in Colorado and across the West are declining at a rate of 1.6% each year, which means that ***butterfly abundance is declining by approximately 25% every 20 years*** (Forister et al. 2021). Native pollinating insects are particularly vulnerable, with a quarter of all North American bumble bees now considered Threatened on the IUCN Red List of Threatened Species (Cameron and Sadd 2020) and 37% of assessed bee species are at risk of extinction (NatureServe 2023). Colorado is home to 24 bumble bee species, more than a fifth of which have been petitioned or are under review by the United States Fish and Wildlife Service (USFWS) for listing under the Endangered Species Act (Armstead et al. 2023). The western bumble bee in particular, has declined by 57% from its known range in just the past two decades, driven primarily by increasing heat and drought across the west in combination with neonicotinoid pesticide use, with expected declines of up to 97% by 2050 (Janousek et al. 2023). Overall, this means fewer insects to pollinate plants, for birds and fish to eat, and for all of the other services that insects provide. Moreover, the true scope of declines for the vast majority of invertebrates is unknown, as they have not been studied, underscoring the need for investing in research and monitoring at the state level.

### **Rare plants are becoming even rarer with consequences for invertebrates and wildlife**

Biodiversity loss is not limited to invertebrates. Plants are the foundation of terrestrial ecosystems, making up 80% of all terrestrial biomass (Bar-On et al. 2017), yet worldwide and in Colorado they are also in decline. A study in the journal *Science*, found that globally 36.5% of plant species are now exceedingly rare, driven primarily by human land-use and climate change (Enquist et al. 2019). In the US, a new report from NatureServe found that in addition to 40% of animals, 34% of plants and 41% of all ecosystems are at risk of range-wide collapse and extinction (NatureServe 2023). Currently, 16 rare plant species in Colorado are listed as either federally threatened or endangered under the Endangered Species Act, with several currently under review. Without management and conservation, many more rare plant species may require federal protections. Moreover, declines in plants are associated with concurrent declines in their pollinators (Biesmeijer et al. 2006), and likely have many unknown consequences for native ecosystems.

**Proactive conservation can help these animals and plants and maintain the services they provide**

If we hope to stem declines in insect and native plant diversity and safeguard the services that invertebrates and plants provide, governments must take steps to manage and conserve them. Protecting vulnerable species and restoring and enhancing habitat, especially for imperiled species, are proactive approaches that have been shown to recover populations of pollinators and other insects (Forister, Pelton & Black 2019). Providing CPW with the authority to study and conserve native rare plants, monarchs, other butterflies, bumble bees and other important invertebrates, as they do with mammals, birds, amphibians, and other wildlife, is the first step in ensuring that these critical foundations of our environment do not become endangered and that society can retain the vital services they provide. Many scientists stand ready to help the state if this bill passes.

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