

Date: 3/1/24

This petition is to request an amendment to provision Chapter W-0 - "General Provisions" 2 CCR 406-0. Specifically: ARTICLE I - GENERAL PROVISIONS #1000 – Protected species.

In regard to possession of captive bred *Heterodon nasicus*, Plains Hognose snake. Per requirement of petition regulations Chapter W-11 the following paper will address the requirements #1114 A) 1-18. This petition proposes de-regulating the species.

CPW is charged with balancing the conservation of our wildlife and habitat with the recreational needs of our state. (<https://cpw.state.co.us/aboutus/Pages/Our-Story.aspx> accessed 11/28/23). Colorado Parks and Wildlife (CPW) seems to have historically used a top-down approach to management of some of the wildlife resources in the state. Via this approach wildlife managers make decisions and take actions unilaterally, and do not appear to take into consideration less diverse stakeholders when balancing conservation goals with regulations. Without incorporating less diverse stakeholders in consideration of some of its wildlife management decisions, many are left out and the evolving tide of needs for regulatory changes are ignored. Current regulations involving reptiles seem to have originated from a broad stroke that delineates herptiles into only two possible and opposite categories. The first is "unregulated". In the unregulated category, possession of the herptile is allowed without restriction or oversight of any kind. On the opposite side there are the "regulated" herptiles. With regulated herptiles, no captive bred specimens are allowed in any form, except by a commercial enterprise. This simplistic and opposing approach was likely initiated with the goal of protecting our native species. However, as *Heterodon nasicus* is neither a species of concern, nor regulated in this manner in any of the surrounding states where it is native, the positive outcome of this law no longer outweighs the negative repercussions on Colorado's reptile loving stakeholders.

I, as a representative of a large and engaged stakeholder population, propose to de-regulate *H. nasicus*. However, I would also like to recommend that in the future, CPW consider Introducing a *Reptile Possessor license* in the future for a multitude of other regulated animals that are widely available in the captive bred market. A *Reptile Possessor license* could allow a possession limit of 5 non-medically significant venomous or non-venomous herptile that are non-CITES listed, to be kept by an individual. This would include captive bred regulated species. This would change the top-down approach to a more inclusive horizontal approach that is in line with both other states and current conservation evidence. It is more inclusive of context, self-organization and the mutual embeddedness of evolutionary history within human practices and their spatialities (Stallins and Kelly 2013).

General overview of the pros/cons to de-regulate *H. nasicus*:

Pros:

1. Increase positive view of ability of stakeholders to communicate and be heard by CPW.
2. Reduce the collection of native species
3. Allow for legal disposition of species that is widely kept by stakeholders that either are unaware of the regulations or that chose to not abide by them. This will greatly reduce "dumping" of these animals when the owners no longer wish to or can (*cannot*) take care of them.
4. Increase non-commercial reptile keepers' comfort in taking their currently illegally possessed reptile to the vet as they won't be afraid of getting turned into CPW
5. Change CO's regulations to be on par with all of the surrounding US states. Having an isolated "island" where captive bred *H. nasicus* are not allowed does not protect its native species from any of the concerns that are listed below.

Harm/Cons:

1. Potential unmonitored dumping of CB unwanted reptiles (this likely already happens) and per research noted below no notable diseases nor impact on native species is likely to occur as the “morphs” that comprise 98.1% of the captive bred stock are unlikely to survive long in the wild.

The Risk Characterization Table below shows a summation of the eighteen criteria used to determine categorized risk levels of captive bred Hognose snakes in Colorado. The Oregon division 56: Noncontrolled Classification of the Oregon Department of Fish & Wildlife for criteria, are used, along with the researched decisions of risk levels (low, medium, or high) that were used in that study.

Table 1. *H. nasicus* de-regulation impact risk levels (low, medium, high).

Delisting Questions #	Criteria	Risk Level	Reasoning
1. Scientific Name/Names	<i>Heterodon nasicus</i>	n/a	n/a
2. Habitat requirements/limitations/survivability	Species invasive history	Low	No articles found on invasive history- animal is native.
3. Potential of sp. To negatively impact/destroy native vegetation	Native sp	Low	Sp will/does not have any impact on vegetation
4. All known diseases	Species potential to pass disease or parasites to native wildlife	Low	No notable diseases or parasites found that are not already found in wild populations
5. Predatory behavior	Impact on native and domestic wildlife	Low	Endemic species. CB animals will not have any increased impact
6. Assessment of potential to destroy/damage ag crops/rangeland	Native sp	Low	Endemic without impact on crops/agriculture; do not consume ecosystem engineers
7. Animals ability to breed with native wildlife	Species potential to hybridize with native wildlife	Hybridization potential – Low Breeding with native wildlife – High (endemic)	No known documentation on hybridizing with any other species.
8. Fecundity and reproductive behavior	Breeds in Spring after brumation	Medium	Native

9. Assessment the competition the sp would have with native wildlife for food/water/space	Species' potential for competition of food, water, shelter, or space with native wildlife	Medium	Native – Captive bred morphs will not survive as well as native animals due to increased predation and decreased fitness
10. Reg status of sp in AZ, NV, UT, WY, NE, KS, OK, NM, ID, MO	Unregulated in all nearby states except OK where a permit is required.	Low	Unregulated in all surrounding states where the animal is already native/permit required for OK for > 1 animal.
11. Regulatory prohibitions of the sp in any city/county in CO	None	n/a	n/a
12. "Weediness" of the Animal	1. Aggressiveness 2. Ability to thrive 3. Ability to disperse 4. Reproductive potential 5. Ability to adapt to other food sources	1. Low 2. High 3. Medium 4. High 5. Low	native
13. CITES listing	Unlisted	Low	Heterodon nasicus listed as least concern in The IUCN Red List of Threatened Species
14. Potential for Illegal trafficking	Commercially bred worldwide	Low	Currently commercially bred and distributed in the North American pet trade in addition to other countries
15. Impacts to Wild populations of the sp if legal possession and trade were allowed	Illegal "dumping" is the main threat to native populations	Medium	sp is native to CO it
16. Assessment of the care and welfare requirements of the sp.	Basic snake Set up	Medium	H. nasicus has basic heat, humidity, and water accessibility requirements.
17. Assessment of danger to humans if an escapes	No known injuries in CO	Low	Native; non dangerous to humans

Detailed responses to items 1-18 of Chapter W-11 #1114, A.

1. Scientific name:

Heterodon nasicus commonly known as Plains Hognose Snake or Western Hognose Snake.

2. Habitat requirements and assessment of survivability in CO native habitats: Native.

Heterodon nasicus is usually found in sandy or gravelly soil areas, such as river floodplains, prairies, scrub and grasslands, farmlands, open woodlands, and semi-arid regions. They have been known to reach elevations of up to 2,500 meters (Golberg 2004). Optimum environmental temperatures range from 31-34°C (Kroll 1973). During summertime, they can invade woodland habitats- move back to grasslands in the fall (Kroll 1973) The species would and does survive in eastern Colorado, but not in Western Colorado/Rocky Mountain regions.

3. Potential of the species to negatively impact or destroy native vegetation: N/A: Endemic

4. All known associated diseases, including zoonotic diseases and parasites:

There are no novel notable diseases or parasites found that are not already present in wild reptile communities. What has been documented is not specific to species or genus, e.g. fly larvae entering a wound, common snake mites found in captive collections (Diclaro 2011) • Trematodes (type of flatworm, flukes) found in lungs will no ill effect to snakes, also common in various snakes (Edgren 1952) 17 • Eimeria coccidia found in captive H. nasicus, host specific, detrimental to host when stressed (Daszak 2011) • In one study, 1 of 4 H. platirhinos snakes was infected with oocysts of C. lampropeltis; prior this type of coccidia was only found in species of milk and king snakes (McAllister 2015) . Due to the amphibian diet, stomach parasites are common (Wenger, 1958, Edgren 1952) One could therefore postulate that Captive bred populations of H. nasicus that feed on commercially available prey have less infectious burden than wild populations. From personal experience there is Cryptosporidium serpentis and varenii are both found in captive bred reptile populations.

Mechanisms for disease emergence are complex, but typically fall somewhere along a gradient between 2 broad categories: (1) introduction of an exotic pathogen into a naïve host population (“novel pathogen hypothesis”) or (2) in situ emergence of a native pathogen due to changes in environmental, host, or pathogen characteristics that alter disease ecology (“endemic pathogen hypothesis”) (Rachowich et al. 2005). In relation to H nasicus as this species is not regulated in any surrounding states (*add comma here*) any and all diseases that are of concern have already been introduced to the native population.

Moreover, current regulations that allow for legal collection, capture and containment, then re-release of wild caught animals may increase disease transmission. “Capturing and releasing animals can result in increased stress. In addition to invasive procedures such as handling, veterinary examination, captivity and transport, translocation also contributes several subtle stressors such as an increase in population size that may intensify conspecific competition, disturbance via repeated monitoring, interruption of social bonds and introduction to a novel environment: (Aeillo 2014)

5. Predatory behavior including assessment of the anticipated effect predation by the species would have on native wildlife and domestic animals:

The snake is endemic and prolific in eastern CO and would not have any impact on native/domestic animals.

6. An assessment of the potential of the species to damage or destroy agricultural crops or rangeland:

N/A. The snake would not damage nor destroy agricultural crops/rangeland.

7. An assessment of the ability of the species to breed with native wildlife and domestic animals:

Hybridization Potential There was only one mention of the hybridization of hognose snakes found in the literature. The literature identified species of the Mexican hognose snake, *H. kenneryli*, as having hybridized within the same genus. However Mexican hognose are not found in CO. It is seen as unlikely that the hognose snake would hybridize with native snakes if released as there are no other species of hognose within Colorado's borders.

8. Fecundity and reproductive behavior:

H. nasicus in CO, breeds after emerging from brumation in the spring. Females lay 2-25 eggs in soil or a burrow. They do not incubate the eggs. Sometimes females can have a second clutch 30 days after the first.

9. Assessment of the competition this species would have with native wildlife and domestic animals for food, water and space:

H. nasicus is native to Colorado. Research has shown that the morphs that are popular in the captive bred market and generally kept by stakeholders do not survive long in the wild and would have little or no ability to compete with native populations.

10. Information about the regulatory status of the species in the following states:

H. nasicus is mainly found in the continental USA. The most significant concentrations are found in: CO, WY, NE KS OK, NM, TX, SD, MT, ND.

Per the petition request it has been found that it is unregulated in all these states with the exception of OK. (Illustration 1A)

1. AZ – **unregulated** <https://www.animallaw.info/administrative/az-exotic-wildlife-article-4-live-wildlife#s406>
2. NV - **unregulated** <https://www.ndow.org/wp-content/uploads/2021/10/Instructions-Possession-of-Live-Wildlife.pdf>
3. UT - unregulated <http://www.uappeal.org/utah.html>
4. WY - **unregulated** <http://www.uappeal.org/wyoming.html>
5. NE - **unregulated** Captive bred, can have 3 wild caught (per email from Saun Dunn Natural Heritage Zoologist with NE Game and Parks Division. <http://www.uappeal.org/nebraska.html>
6. KS - **unregulated** <http://www.uappeal.org/kansas.html>
7. OK - Can have **one captive bred individual without a license**. Need a permit for more than one individual but it is accessible. Reptile & Amphibian Regulations | Oklahoma Department of Wildlife Conservation (wildlifedepartment.com) <https://www.wildlifedepartment.com/hunting/regs/reptile-amphibian-regulations> (Accessed 2/19/24).
8. NM - **unregulated** captive bred. <http://www.uappeal.org/new-mexico.html>
ID - **unregulated** <https://legislature.idaho.gov/statutesrules/idstat/title36/t36ch7/sect36-701/>
9. Montana - **unregulated** <https://fieldguide.mt.gov/speciesDetail.aspx?elcode=ARADB17013>

Despite being unregulated in all but one state, all of the states have statute that prohibit the release of captive bred animals in one way or another. Each state has different wording to try and achieve the same goal. All states also allow the collection of animals from the wild, either with or without a permit. However, CO is the only state in this area that outlaws the possession of captive-bred animals of this species entirely.

11. Information about the regulatory prohibitions of the species in any city or county within CO: None

12. Assessment of the “weediness” of the animal:

- A) Aggressiveness - non aggressive.
- B) Ability to thrive - native so can and does thrive in eastern CO where it already is endemic.
- C) Ability to disperse widely or pioneer - No
- D) Reproductive potential - Endemic, can reproduce where it currently inhabits.
- E) Ability to adapt to other food sources (opportunistic feeding behavior) - No.

13 Cite whether species is listed by CITES:

Heterodon nasicus is not CITES

listed:https://www.speciesplus.net/species#/taxon_concepts?taxonomy=cites_eu&taxon_concept_query=heterodon%20nasicus&geo_entities_ids=&geo_entity_scope=cites&page=1 accessed 12/28/23

14. Assessment of potential for illegal trafficking within the USA and internationally:

The scale of illicit trade is manifestly unknown but is estimated to comprise at least one-quarter of the entire exotic pet trade. (Karesh W.B. 2007) Hognose snakes are present in the North American pet trade (Stallins & Kelley 2013, Kelley 2011) Plains hognose is a commonly bred and kept pet snake in the hobby. From first hand knowledge and experience, there is already a robust illegal trade of captive bred individuals of this species within the state of CO. De-regulating this species would eliminate the illicit trade and open the path to safer care of both the native and the already illegally held captive snakes.

Is the species commercially propagated? Yes. Hip Hogs Ltd and Angry Hogs are the current two commercial entities in Colorado. There are many commercial breeders in other states.

15. Assessment of impacts to wild populations of the species if legal possession and trade were allowed:

Several factors are involved in the reasons for the release of non-native pets; they are mostly related to the biology of the species (e.g., longevity and body size; long-living, large pets are more likely to be released) and socioeconomic factors (number of individuals in the pet market, cost of the pet and cost of the care; commonly sold less expensive species are more likely to be released, as well as those that require expensive long-term care) Species with a high probability of being released were imported at higher quantities over our period of record, have a relatively large adult mass and commanded cheaper retail prices. (Hulme, 2015) The cheapest hognose snake is a “wild type” that sells for around \$150. There are currently 41 “wild type” individuals out of 2300 for sale on Morph Market (the hub for online sales of reptiles worldwide). This constitutes **1.8%** of all captive bred Plains Hognose currently on the market. These “wild type” animals are the few that could have any chance of survival in the wild. From these few, even fewer could actually thrive, procreate and have any impact at all on native species.

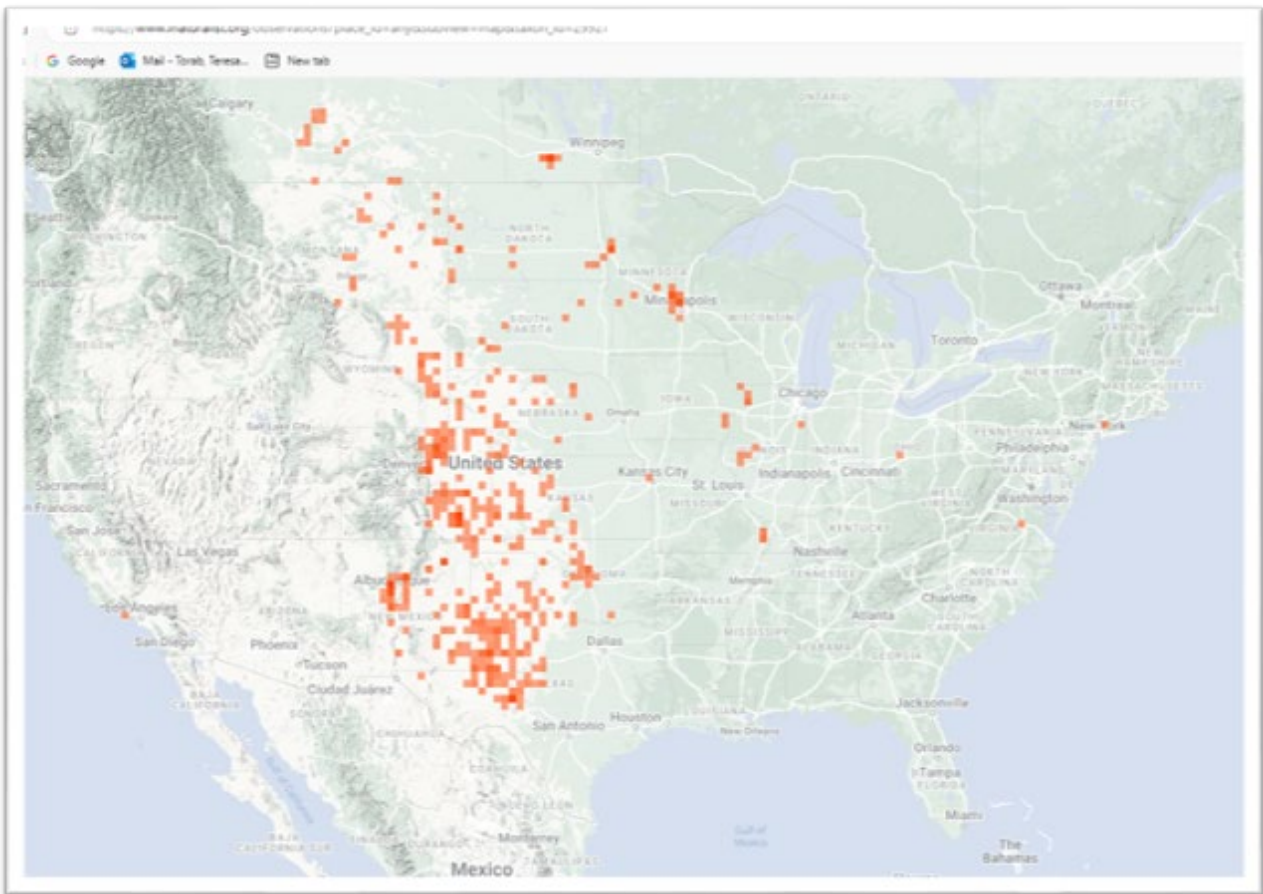
This species is not regulated in any of the states that surround Colorado. Regulating an “island” population of this species does not in any way preserve native species and avoid crossbreeding/outcrossing/reduce disease transmission. It does not positively contribute to the conservation of this native species. A more collaborative approach of licensure without complete deregulation will inform the state of the number of animals in the state and allow for legal and optimal care of these animals that are currently illegally kept anyway.

The majority of captive bred hognose are visual morphological anomalies; ones that express novel colors and markings. Rarity of physical appearance is highly prized and sought after. (Stallins & Kelley 2013). These animals if released into the wild have a very low survival rate.

Legalizing captive bred animals will reduce the collection of native species as most people would rather buy a snake than go collect one. It takes less time and effort and “pretty” morphs are available rather than bland “wild type” animals. Also, it is asserted that “ native reptiles should never be removed from wild habitats; some long-lived species cannot tolerate even the occasional removal of one or two individuals” (Laidlaw, R. 2006). Per a recent study in the Annals of the Association of American Geographers “ 2000 Plains Hognose were collected from specific locations in the states of TX, NM, CO, and MN and sold for about 10 years” (Stallins and Kelley 2013). Even though this practice is illegal in Colorado there is zero ability for CPW to enforce this. If captive hognose were legal in the state there is no doubt that this number would be drastically reduced. This will have a radically positive impact on conserving the native species.

Illustration 1A:

See map below for distribution (inaturalist.org accessed 2/5/24)



16. Assessment of the care and welfare requirements of the species:

Simple enclosures with access to water, hides, heat and lighting with day/night and seasonal cycles is ideal (Healy 2022) As these snakes do not grow to be very large, they are much easier to keep throughout their lives than most boids/pythons. (Clayton 2012)

17. Assessment of the danger this animal poses to humans if it were to escape: Heterodon nasicus is considered non-dangerous/non-medically significant venomous snake. (Weinstein/Keller 2009)

In summary, the main concerns of CPW in regulating this species seem to be the release/dumping of captive bred animals into the wild. The concern is that this may result in disease transmission and genetic dilution. As an “island” of regulation in 1/10 of the area that the snake breeds, this is ineffective and no longer is an effective conservation tactic. De-regulating the species has a multitude of positive outcomes with minimal impact to native species. Alternatively allowing at least for one captive bred individual be legally kept could also be an option.

There are currently over 2500 captive bred individuals for sale on Morph Market (the premier online sale platform for reptiles), this is over a 100% increase from 5 years ago. This is a testament to the robust captive bred market and desire of reptile keepers to be able to have these animals as pets without depleting native populations. (Morph Market accessed 9/12/23)

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A general overview of reference for the future if CPW were to consider the Reptile Possessor license: allowing possession limit of 5 non-medically significant venomous or non-venomous herptile that are non-CITES listed, be kept by an individual. This included captive bred regulated species. The new licensure could use the Illinois herptile act as a model. This license would allow for a nominal yearly fee (\$100) for the layperson to buy/trade/sell/gift this animal. This could be administered via a web page with photos of the animals set up required for licensing. CPW could require a year-end report that includes the animal's disposition which would reduce the release of these animals into the wild. Due to the current regulated status many pet owners are reticent to take their snakes to the vet as they don't want to "get into trouble". This leads to sick and dying animals being released into the wild without oversight.

Benefit: Reduces the rampant illegal importation and keeping of these reptiles by residents.

Increases satisfaction among stakeholders re: CPW in CO and desire to support the organization with the view that Conservation and commercial reptile keeping can reside together in a harmonized way in CO.

Allows CPW to track reptile movements as most residents when allowed a legal option for reptile keeping will do that. This will in turn:

Pros:

1. Reduce the "dumping" of illegally kept reptiles as there would be oversight
2. Increase keepers' comfort in taking their reptile to the vet as they won't be afraid of getting turned into CPW and cited for illegal activity
3. Increase CPW income
4. Increase positive view of ability of stakeholders to communicate and be heard by CPW.
5. Reduce the collection of native species

Harm/Cons:

1. Increase the need for CPW monitoring of increased reptile census
2. CPW will need to devote resources to this new program for site, license and permit reviews.
3. Create new licensure which is time consuming and labor intensive
4. Require increased regulation enforcement with subsequent increased resource allocation

Further ideas and reference:

<https://naturalheritage.illinois.gov/permits/herp-permits.html> The Illinois herptile permit that charges \$250 per permittee could be a model for this license:

<https://naturalheritage.illinois.gov/permits/herp-permits.html>

1. The animal must have a health certificate for importation into CO.
2. Documentation of the purchase of the animal
3. Submission of the dispensation of the animal / bought/sold/gifted/traded must be completed in the Animal Movement form within 10 days of the activity AND
4. Annual reporting of animals on premises.
5. Lost/escaped reptiles must be immediately reported to CPW. CPW reserves the right to inspect the animal at any time.
6. License available online at pet stores and retail shops via website for easy obtainability

Petitioner's Name: Teresa Torab