



THE HUMANE SOCIETY
OF THE UNITED STATES



HUMANE SOCIETY
INTERNATIONAL

Celebrating Animals | Confronting Cruelty



HUMANE SOCIETY
LEGISLATIVE FUND™

February 12, 2018

Interim Director Joe Stohr
Office of the Director
Washington Department of Fish and Wildlife
PO Box 43200
Olympia, WA 98504-3200

Chief Steve Bear
Enforcement
Washington Department of Fish and Wildlife
Natural Resources Building
1111 Washington St. SE
Olympia, Washington 98501

Via U.S. mail

Re: Request for Enforcement of the Washington Animal Trafficking Act

Dear Interim Director Stohr and Chief Bear,

The Humane Society of the United States (HSUS), Humane Society International (HSI), and Humane Society Legislative Fund (HSLF) are writing to request immediate enforcement action by the Washington Department of Fish and Wildlife (WDFW) for a violation of the Washington Animal Trafficking Act (WATA or the Act).¹ Pembient, Inc., a for-profit company incorporated in the state of Washington,² is in the process of manufacturing horns from biological materials derived from rhinoceros and has offered to sell, and may have completed sales, of these horns. HSUS, HSI, and HSLF are deeply concerned that the trade in such synthetic rhinoceros horns will further imperil rhinoceros populations by increasing demand for rhinoceros products – thereby incentivizing poaching of wild rhinoceroses and trafficking of their parts – and by complicating

¹ WASH. REV. CODE ANN. §§ 77.08.010, 77.15.135.

² *Corporations*, SECRETARY OF STATE, <https://www.sos.wa.gov/corps/> (search “Pembient” in the Simple Business Search) (last visited Feb. 7, 2018).

efforts to prosecute poachers and traffickers. Accordingly, we strongly urge WDFW to investigate this matter and take immediate enforcement action against Pembient for any violations of the WATA.

Pembient's Activities

Pembient is a for-profit company incorporated in Washington (Unified Business Identifier Number: 603461427) and with a place of business in King County, Washington.³ The company aims to create synthetic rhinoceros horns that are “genetically identical to real ones on the ‘macroscopic, microscopic, and molecular’ level.”⁴ To do so, the company appears to be employing two approaches: one using 3D-printing and one using stem cells.⁵ Under the former approach, rhinoceros genes that code for keratins, the fibreless proteins found in rhinoceros horns, are inserted into a host organism.⁶ This creates a genetically modified organism that secretes keratins, which are mixed together and then put through a 3D-printing process to make a solid horn.⁷ To date, Pembient has produced small pieces of horn using this process and is working to produce larger pieces of horn “employ[ing] a tissue engineering approach based on stem cells.”⁸ The company has not provided additional details on the stem cell production process, but the process generally involves inducing a rhinoceros stem cell to generate keratin cells that, in turn, can be programed to grow into a horn.⁹ In the fall of 2016, the company’s CEO, Matthew Markus, anticipated that high-fidelity prototypes of the horns would be created within two years.¹⁰

Ultimately, Pembient has stated its intention to introduce its synthetic horns into the marketplace by selling them to carvers and artisans in Asia.¹¹ Because the company intends for its synthetic horns to be indistinguishable from real rhinoceros horns, it assumes that some of these horns will enter the illegal rhinoceros horn market because wild traders will try to pass them off as real horns.¹² In addition, Pembient has suggested it may leave synthetic horns in the wild for poachers to find and introduce into the illegal trade in rhinoceros horns.¹³ Pembient’s theory, which has been

³ *Id.*; *PembiCoin Initial Coin Offering*, PEMBIENT, <https://www.pembient.com/pembicoi/> (last visited Feb. 7, 2018).

⁴ Jeremy Berke, *A Biotech Startup is Trying to End Poaching by Flooding the Market with Fake Rhino Horns*, BUS. INSIDER (Nov. 19, 2017, 6:36 PM), <http://www.businessinsider.com/biotech-startup-trying-to-stop-rhino-poaching-2016-9> (quoting Matthew Markus, Pembient CEO and cofounder).

⁵ *PembiCoin Initial Coin Offering*, PEMBIENT, *supra* note 3.

⁶ *Artificial Rhino Horn Will Stamp Out Poaching Trade, Says Biologist*, CBCRADIO (Oct. 6, 2016), <http://www.cbc.ca/radio/asithappens/as-it-happens-thursday-edition-1.3794162/artificial-rhino-horn-will-stamp-out-poaching-trade-says-biologist-1.3794165> [hereinafter *CBCRadio Interview*].

⁷ *Id.*

⁸ *PembiCoin Initial Coin Offering*, PEMBIENT, *supra* note 3.

⁹ REGULATING “BIOENGINEERED” WILDLIFE PRODUCTS UNDER CITES: INTERPRETING THE PHRASE “READILY RECOGNIZABLE” 3 (2016) [hereinafter REGULATING “BIOENGINEERED” WILDLIFE PRODUCTS] (document submitted by the United States of America in relation to an agenda item for the 17th meeting of the CITES Conference of the Parties), available at <https://cites.org/sites/default/files/eng/cop/17/InfDocs/E-CoP17-Inf-22.pdf>.

¹⁰ Matt McGrath, *Synthetic Rhino Horns Ready ‘In Two Years’*, BBC NEWS (Oct. 5, 2016), <http://www.bbc.com/news/science-environment-37505880>.

¹¹ Berke, *supra* note 4.

¹² Olivia Trani, *Synthetic Rhinoceros Horns Spark Economic Debate on Conservation*, INSIDE SCI. (Aug. 4, 2017, 11:30 AM), <https://www.insidescience.org/news/synthetic-rhinoceros-horns-spark-economic-debate-conservation>.

¹³ *Id.*

widely criticized by conservation biologists and organizations,¹⁴ is that introducing its synthetic horns into the market will create market uncertainty and undermine the exclusivity of rhinoceros horn consumption, thereby reducing poaching of the animals.¹⁵

Recently, Pembient undertook a crowdfunding campaign to support its activities.¹⁶ Participants in the campaign used ether, a type of cryptocurrency, to buy PembiCoins, another type of cryptocurrency created by Pembient.¹⁷ Each PembiCoin is a “token that allows its holder to take delivery of one gram of biofabricated horn in the year 2022.”¹⁸ The agreement created through the purchase of PembiCoin is governed by and construed in accordance with the laws of the state of Washington.¹⁹

The Washington Animal Trafficking Act

Recognizing that “the trafficking of animals threatened with extinction continues to grow at an alarming pace,” more than 70% of Washington voters enacted the WATA (Initiative 1401) to expand State authority to regulate the markets for such animals at a local level.²⁰ Because “[t]he most effective way to discourage the illegal trafficking in animal species threatened with extinction is to eliminate markets and profits,”²¹ the Act prohibits a person from selling, offering to sell, purchasing, trading, bartering for, or distributing any covered animal species part or product.²² Covered animal species include “any species of elephant, rhinoceros, tiger, lion, leopard, cheetah, pangolin, marine turtle, shark or ray” that is listed on Appendix I or Appendix II of the Convention of International Trade in Endangered Species of Wild Flora and Fauna (CITES) or that is listed as critically endangered, endangered, or vulnerable on the International Union for Conservation of Nature and Natural Resources’ (IUCN) Red List of Threatened Species.²³

Among the animal species protected by the Act, the world’s rhinoceros species face a particularly dire situation. There are five species of rhinoceros; three are listed as critically endangered (the last classification before extinction) on the IUCN Red List,²⁴ and one is listed as vulnerable.²⁵ The fifth species is listed as near threatened but is further divided into two subspecies, the northern white rhinoceros, which is listed as critically endangered, and the southern white rhinoceros, which is listed as near threatened.²⁶ Similarly, the southern white rhinoceros subspecies is listed as

¹⁴ See Request for Enforcement from HSUS & HSI to U.S. Fish and Wildlife Service (Feb. 23, 2016); Petition from Center for Biological Diversity & WildAid to U.S. Department of Interior (Feb. 10, 2016), available at https://www.biologicaldiversity.org/species/mammals/pdfs/Cultured_Rhino_Horn_APA_Petition_2_10_16.pdf.

¹⁵ Trani, *supra* note 12.

¹⁶ *Pembicoin Initial Coin Offering*, PEMBIENT, *supra* note 3.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ See 2016 Wash. Sess. Laws 5, available at <http://leg.wa.gov/CodeReviser/documents/sessionlaw/2016pam1.pdf>.

²¹ *Id.*

²² WASH. REV. CODE ANN. § 77.15.135(1).

²³ § 77.08.010(11).

²⁴ R. Emslie, *Diceros bicornis*, IUCN RED LIST (2012), <http://www.iucnredlist.org/details/6557/0>; N.J. van Strien et al., *Dicerorhinus sumatrensis*, IUCN RED LIST (2008), <http://www.iucnredlist.org/details/6553/0>; N.J. van Strien et al., *Rhinoceros sondaicus*, IUCN RED LIST (2008), <http://www.iucnredlist.org/details/19495/0>.

²⁵ B.K. Talukdar et al., *Rhinoceros unicornis*, IUCN RED LIST (2008), <http://www.iucnredlist.org/details/19496/0>.

²⁶ R. Emslie, *Ceratotherium simum ssp. cottoni*, IUCN RED LIST (2011), <http://www.iucnredlist.org/details/4183/0>; R. Emslie, *Ceratotherium simum ssp. simum*, IUCN RED LIST (2011), <http://www.iucnredlist.org/details/39317/0>. All

threatened by similarity of appearance under the Endangered Species Act, and all other species of rhinoceros (including the northern white subspecies) are listed as endangered.²⁷ Further, nearly all rhinoceros species are listed on Appendix I of CITES, with a few southern white rhinoceros populations listed on Appendix II.²⁸

One of the main reasons for rhinoceroses' tenuous status is that these animals are poached throughout their range in Africa and Asia.²⁹ Notably, the number of rhinoceroses killed by poachers has risen exponentially in parts of Africa – where the majority of the world's remaining rhinoceroses are found – during the past decade. For instance, only 13 of these animals were killed in South Africa in 2007, but 1,054 were killed in that country in 2016.³⁰ This means that in 2016, on average, about three rhinoceroses were killed in South Africa every day.³¹ And, in 2015, 80 rhinoceroses were poached in Namibia (an increase from 25 in 2014 and two in 2012) and 50 were killed in Zimbabwe (more than twice as many as in 2014).³² Across the entire African continent, the total number of rhinoceroses poached in 2015 was the highest in two decades.³³ These animals are being killed for their horns, which are in demand in Vietnam and China.³⁴ In light of the high levels of poaching wild rhinoceroses face, it is imperative that WDFW take swift action to address any violations of the WATA that relate to these animals.

Pembient's Activities Violate the Plain Meaning of the WATA

The WATA prohibits a person from selling, offering to sell, purchasing, trading, bartering for, or distributing a part or product of any covered animal species, including rhinoceros species.³⁵ Using Pembicoins, Pembient offered to sell – and may have sold – synthetic rhinoceros horns made using parts from a rhinoceros species, which constitutes a violation of the WATA.

As an initial matter, all rhinoceros species are considered “covered animal species” under the WATA. Any rhinoceros species listed on Appendix I or II of CITES is covered under the Act.³⁶ Nearly all rhinoceros species are listed on Appendix I of CITES, although a few populations of

species of rhinoceros except the white rhinoceros qualify as “covered animal species” under the WATA based on their IUCN listing. *See* § 77.08.010(11). And, as discussed below, all rhinoceros species – including the white rhinoceros – are considered “covered animal species” because of their inclusion on CITES Appendices I and II. *See id.*

²⁷ 50 C.F.R. § 17.11.

²⁸ *Appendices*, CITES, <https://cites.org/eng/app/appendices.php> (last visited Feb. 7, 2018).

²⁹ *See generally Rhino Poaching Statistics*, POACHING FACTS, <http://www.poachingfacts.com/poaching-statistics/rhino-poaching-statistics/> (last visited Feb. 7, 2018). *See also Asian Rhinoceroses*, TRAFFIC, <http://www.traffic.org/asian-rhinos/> (last visited Feb. 7, 2018).

³⁰ *Poaching Statistics*, SAVE THE RHINO, https://www.savetherhino.org/rhino_info/poaching_statistics last visited Feb. 7, 2018).

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ TOM MILLIKEN, TRAFFIC INT'L, ILLEGAL TRADE IN IVORY AND RHINO HORN: AN ASSESSMENT TO IMPROVE LAW ENFORCEMENT UNDER THE WILDLIFE TRAPS PROJECT 23 (2014), *available at* <http://www.wwf.se/source.php/1579944/W-TRAPS-Elephant-Rhino-report.pdf>. *See generally* VIET. CITES MGMT. AUTH. & HUMANE SOC'Y INT'L, VIET NAM RHINO HORN DEMAND REDUCTION CAMPAIGN REPORT 2013-2016 (discussing HSI's efforts to reduce demand for rhinoceros horns in Vietnam), *available at* http://www.hsi.org/assets/pdfs/vn_rhino_horn_campaign_2016.pdf.

³⁵ §§ 77.08.010(11), 77.15.135(1).

³⁶ § 77.08.010(11).

southern white rhinoceros are listed on Appendix II.³⁷ Therefore, while it is not clear which species of rhinoceros is/are the source of the DNA and stem cells Pembient is using to manufacture its synthetic horns,³⁸ the company must be using material from a covered species since all rhinoceros species are listed on Appendix I or II of CITES.³⁹

Further, synthetic horns constitute a part or product of a covered rhinoceros species, which the WATA defines as “any item that contains, or is wholly or partially made from” a covered species.⁴⁰ Whether Pembient is using 3D-printing or stem cells to create its synthetic horns, these horns are made from a covered species and are thus a part or product under the WATA. If the company is using 3D-printing to make the horns, as it suggests, that requires using rhinoceros genes that code for keratin in the production process.⁴¹ These genes are most likely created by extracting the DNA sequence that codes for keratins from rhinoceros DNA replicated from an original specimen.⁴² This sequence is added to a host organism, which produces keratin that is put through a 3D-printing process to create solid horns.⁴³ Accordingly, any synthetic horns made through this 3D-printing process are made using rhinoceros DNA. Furthermore, if the company is creating horns through the stem cell process, it is most likely using actual rhinoceros stem cells to generate keratin cells that are grown into a horn; thus, the resulting horn is made from a covered species.⁴⁴

Finally, Pembient has offered to sell its synthetic rhinoceros horns – and may have completed such a sale – thus violating the WATA’s prohibition on the sale of a part or product of a covered species.⁴⁵ On August 23, 2017, Pembient opened an Initial Coin Offering (ICO) – a type of

³⁷ *Appendices*, CITES, *supra* note 28.

³⁸ Pembient seems to have access to both white and black rhinoceros DNA. The company appears to have accessed the white rhinoceros genome online and used that to create synthetic DNA. See Matt Pembient, Comment to *We’re the Founders of Pembient, a Start-Up That’s Bioengineering Rhinoceros Horns to Fight Poaching*, REDDIT (June 22, 2015, 20:04:50), https://www.reddit.com/r/IAMa/comments/3appoo/were_the_founders_of_pembient_a_start_up_thats/. In addition, Pembient is working with professors at the University of Washington, who have obtained a black rhinoceros foot from the University’s Museum of Natural History and have used samples from that foot to sequence its’ genome. See Pembient, *Back on Track*, EXPERIMENT (Sept. 6, 2017), <https://experiment.com/u/YAxP8g>. It is not clear which species of rhinoceros Pembient is using to source its stem cells or how the company has obtained access to these stem cells. See *PembiCoin Initial Coin Offering*, PEMBIENT, *supra* note 3 (“depending on how we source the stem cells we use, the Fish and Wildlife Service (FWS) might exercise control over the horn we deliver”).

³⁹ See § 77.08.010(11).

⁴⁰ § 77.08.010(12).

⁴¹ *CBCRadio Interview*, *supra* note 6.

⁴² In theory, Pembient could use actual or synthetic DNA as the source of the DNA sequence for these keratins. See REGULATING “BIOENGINEERED” WILDLIFE PRODUCTS, *supra* note 9, at 2. The company appears to be relying on a previously sequenced white or black rhinoceros genome (or both), which means it is likely using these genomes to manufacture synthetic DNA. See Matt Pembient, *supra* note 38; Pembient, *supra* note 38. However, the company also makes reference to using wild horns from black rhinoceroses in its 3D-printing process, so it could be using actual DNA as well. See Matt Pembient, *supra* note 38. Regardless of whether Pembient is using actual rhinoceros DNA or synthetic DNA in its 3D-printing process, it is using rhinoceros genes and, therefore, the horns are “wholly or partially made” from a covered species.

⁴³ *CBCRadio Interview*, *supra* note 6.

⁴⁴ See REGULATING “BIOENGINEERED” WILDLIFE PRODUCTS, *supra* note 9, at 3.

⁴⁵ See § 77.15.135(1). The Act includes a handful of exceptions to this prohibition, but none apply here. See § 77.15.135(2), (3). The only potentially relevant exception is the one allowing for intrastate sale of a covered species part or product if such sale is “expressly authorized by federal law or permit.” § 77.15.135(2)(e). However, there is no such federal authorization. Neither the Endangered Species Act, 16 U.S.C. § 1531 et seq., nor the Rhinoceros and Tiger Conservation Act, 16 U.S.C. § 5301 et seq., expressly allow for the trade in synthetic rhinoceros horns, and the

crowdfunding campaign – through which the company offered Pembicoins for sale.⁴⁶ A buyer transfers ether, a type of cryptocurrency that can be obtained through a cryptocurrency exchange, to the ICO address.⁴⁷ Provided enough ether is raised to create the ICO’s minimum offering of Pembicoins, each buyer receives a share of the Pembicoins created through the ICO that is proportional to his ether contribution.⁴⁸ Each Pembicoins a buyer receives is a “token that allows its holder to take delivery of one gram of biofabricated horn in the year 2022.”⁴⁹ The ICO, then, is an offer for sale of synthetic rhinoceros horn because a person who transfers ether to the ICO address expects to obtain Pembicoins, which will allow the holder to obtain synthetic rhinoceros horn in 2022. It is not clear whether Pembient has actually issued any Pembicoins yet.⁵⁰ If it has done so, the company has engaged in a sale of a part or product of a covered species: at its essence, an issued Pembicoins is simply a placeholder for the synthetic horn to which the coin holder is entitled. In fact, the company has characterized Pembicoins in exactly this way, promoting its ICO as “offering an alternative, biofabricated horn that is *ownable now* but deliverable in the future.”⁵¹ Yet, even if the company has not issued any Pembicoins, the ICO itself is a violation of the WATA since it is an offer to sell Pembicoins and, accordingly, an offer to sell a part or product of a covered species.

Pembient’s Activities Undermine the Purpose of the WATA

In addition to violating the plain meaning of the WATA, Pembient’s activities undermine critical conservation efforts. Indeed, the U.S. Fish and Wildlife Service (FWS) has expressed its “grave concerns” about the impacts that trade in synthetic horns might have on the poaching of wild rhinoceroses.⁵² Specifically, introducing synthetic horns into the market can increase demand for wild horns and, correspondingly, the poaching of wild rhinoceroses and trafficking of their parts.

U.S. Fish and Wildlife Service has not issued Pembient any type of permit to engage in such trade. Rather, the agency has expressed its “grave concerns” about the impacts that trade in synthetic horns might have on the poaching of wild rhinoceroses. *See* Letter from Timothy J. Van Norman, Chief, Branch of Permits, U.S. Fish & Wildlife Service, to Charles Murray (Aug. 23, 2016), *available at* https://experiment-uploads.s3.amazonaws.com/file-attachments/5332/HWRo6uQ5SCUiu7xLrFyN_Denial%20Letter.pdf.

⁴⁶ *Pembicoins Initial Coin Offering*, PEMBIENT, *supra* note 3.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ Pembient’s website indicates it will release a full accounting of the results of an ICO on its blog. *Pembicoins Initial Coin Offering*, PEMBIENT, *supra* note 3. As of the date of this letter, it has not yet provided a reconciliation for the August 23, 2017 ICO. *See Blog*, PEMBIENT, <https://www.pembient.com/blog/> (last visited Feb. 12, 2018). However, Pembient has stated that ICO participants will receive their Pembicoins about 14 business days after completion of the ICO. *Pembicoins Initial Coin Offering*, PEMBIENT, *supra* note 3. More than 14 business days have elapsed since the closing of the ICO on October 22, 2017, so presumably Pembicoins have been delivered to the ICO participants. *See id.*

⁵¹ *Should We Farm and Auction Horn*, PEMBIENT, <http://mailchi.mp/pembient/pembicoins-biofabricated-horn-on-the-blockchain> (emphasis added) (last visited Feb. 7, 2018). *See also Envision a World Without Poaching . . . Uber Disrupts Transportation, Airbnb Disrupts Hotels, Amazon Disrupts Food, Pembient Disrupts Wildlife Poaching!*, REDZONE PODCAST (JAN. 5, 2018) (interview with Matthew Markus, Pembient CEO, in which he describes the ICO as a “prepaid forward contract” and says the idea underlying the ICO is “I’ll give you some money, and then you give me a product at some point in the future”), *recording and transcript available at* <http://www.redzonetech.net/podcast/matthew-markus/#more-32414>.

⁵² Van Norman, *supra* note 45.

Furthermore, because Pembient aims for its horns to be indistinguishable from wild horns, introduction of these horns can create significant enforcement problems for wildlife officials.

The sale of Pembient's synthetic horns threatens to undermine the WATA's purpose of discouraging illegal trafficking in covered rhinoceros species by "eliminate[ing] markets and profits" because the sale of synthetic horns could increase demand for wild rhinoceros horns.⁵³ Pembient has argued (and has mischaracterized studies in doing so) that by introducing its synthetic horns into the market, both overtly and covertly, it can create market uncertainty and undermine the exclusivity of rhinoceros horn consumption, thereby reducing poaching of the animals.⁵⁴ However, this theory overlooks the fact that the rhinoceros horn market in Vietnam, the largest consuming country, is already flooded with fake horns – estimates suggest that up to 90% of the rhinoceros horn products available to Vietnamese consumers are fake.⁵⁵ There is no evidence that these fakes have reduced rhinoceros poaching since the number of rhinoceroses poached in South Africa has exceeded 1,000 for the past four years, and poaching has increased dramatically in other African countries in recent years.⁵⁶

Even more concerning than the fact that Pembient's plan is likely to fail is that introduction of synthetic horns into the marketplace risks increasing demand for wild horns, which would increase rhinoceros poaching. Pembient intends to sell its horns to Asian carvers and artisans, and its CEO envisions a future where a broad range of products, such as eyeglass frames, could be made from synthetic rhinoceros horn.⁵⁷ Moreover, Pembient's website touts the unique benefits of using rhinoceros horns for carving, highlighting the fact that these horns are solid (unlike other animals horns, which are hollow) and thus can be used to carve larger objects than other types of animal horns.⁵⁸ However, the introduction of a rhinoceros horn substitute, which purports to have the same benefits as natural rhinoceros horns, is likely to stimulate demand for the original product rather than eliminating the market for it. This is particularly true in consuming countries, such as Vietnam, where rhinoceros horns are often viewed as luxury items or status symbols.⁵⁹ Given the luxury status of the horns, existing consumers are unlikely to make the shift to synthetic horns, which will be viewed as inferior because of their lower costs.⁶⁰ Rather, Pembient's marketing of its horns will probably attract new customers, who would not have otherwise purchased rhinoceros

⁵³ See 2016 Wash. Sess. Laws 5.

⁵⁴ Trani, *supra* note 12.

⁵⁵ MILLIKEN, *supra* note 34, at 21; TOM MILLIKEN & JO SHAW, TRAFFIC INT'L, THE SOUTH AFRICA-VIET NAM RHINO HORN TRADE NEXUS: A DEADLY COMBINATION OF INDUSTRIAL LAPSES, CORRUPT WILDLIFE INDUSTRY PROFESSIONALS AND ASIAN CRIME SYNDICATES 129 (2012), available at <http://www.traffic.org/publications/the-south-africa-viet-nam-rhino-horn-trade-nexus-a-deadly-co.html>.

⁵⁶ *Poaching Statistics*, SAVE THE RHINO, *supra* note 30. When asked about the number of fake horns already on the market, Matthew Markus, Pembient's CEO, cites his belief (without supporting evidence) that consumers will eventually have technology to differentiate these fakes and only Pembient's horns will be able to trick consumers. Jacob Roberts, *Can Biotech Save the Rhino*, CHEMICAL HERITAGE FOUND.: DISTILLATIONS (Winter 2017), <https://www.chemheritage.org/distillations/magazine/can-biotech-save-the-rhino>. Given the risks associated with introducing synthetic horns into the market as outlined in this letter, Pembient's insistence on introducing synthetic horns into the marketplace to address a problem that does not yet exist is incredibly reckless.

⁵⁷ Berke, *supra* note 4; Roberts, *supra* note 56.

⁵⁸ *Conservation*, PEMBIENT, <https://www.pembient.com/conservation/> (last visited Feb. 7, 2018).

⁵⁹ See MILLIKEN & SHAW, *supra* note 55, at 134-37.

⁶⁰ See Berke, *supra* note 4 ("[b]ecause the fake horns are much cheaper to produce, they could be sold at a lower cost").

horns, to the market. At least some of these new users will eventually shift their consumption to wild horns since the more expensive wild horns will confer the luxury status that the synthetic horns will not.⁶¹ Indeed, Pembient's efforts run counter to the recommendations of a recent study that found the most effective mechanism to protect rhinoceroses is demand management through consumer behavior modification (rather than providing a mechanism for legal trade); put another way, the study concluded it was necessary to change the perceptions of consuming horns from reflecting "status symbol to pariah."⁶²

In addition to potentially increasing demand for wild horns and thereby increasing poaching, the sale of synthetic horns – which Pembient says will be identical to natural horns on the 'macroscopic, microscopic, and molecular' level⁶³ – will raise serious enforcement problems. If officials cannot quickly and easily determine whether a product contains real or synthetic rhinoceros horns, they will be unable to prosecute individuals for possession of rhinoceros horns or products made from them. Indeed, the federal Endangered Species Act specifically contemplates such a problem: Congress included a "similarity of appearance" clause that allows for regulation of a species when it so closely resembles a listed species that it would be difficult to distinguish between the two species and listing the similar species would facilitate enforcement of protections for the already listed species.⁶⁴ FWS recently used this clause to list the southern white rhinoceros as threatened, noting that it was infeasible for enforcement officials to visually distinguish between its horns and those of other listed sub-species.⁶⁵ When the southern white rhinoceros was not listed, individuals were "able to purposefully or accidentally misrepresent that specimens of endangered rhino [were] specimens" of southern white rhinoceros.⁶⁶ Similarly, Congress passed the 1998 Rhinoceros and Tiger Conservation Act to address the serious enforcement problems associated with determining whether products labeled as containing rhinoceros or tiger parts actually contained parts from these animals (as opposed to a placebo or substitute product).⁶⁷ Although it would be possible to determine if products contained actual rhinoceros horns or tiger bones through DNA testing, such testing is "prohibitively expensive and

⁶¹ In addition to being used as status symbols in Vietnam, consumers believe the horns can treat life-threatening diseases (such as cancer), cure hangovers, cure impotence, and treat high fevers in children. MILLIKEN & SHAW, *supra* note 55, at 15. Although Pembient plans to insert intact horns into the market to be used for carving, these horns could be purchased for medicinal uses and thereby have secondary effects on this market. Indeed, it is not uncommon for wildlife products to be identified for one use when, in reality, they are destined for another. For instance, there is evidence that Asian nationals – especially from Vietnam – undertook "pseudo-hunts" of white rhinoceroses in South Africa, not to obtain trophies as indicated on their hunting permits but rather to acquire horns for commercial trade purposes. *Id.* at 52-53. Similarly, Pembient's synthetic horns could easily be purchased under the guise of being used as a carving medium and then ground up and inserted into the medicinal market. Additional influx of horns in this market could help to perpetuate the myth that rhinoceros horns have curative properties.

⁶² See Douglas Crookes & James Blignaut, *Debunking the Myth that a Legal Trade Will Solve the Rhino Horn Crisis: A System Dynamics Model for Market Demand*, 28 J. FOR NATURE CONSERVATION 11, 16 (2015), available at https://www.researchgate.net/profile/Douglas_Crookes/publication/281447928_Debunking_the_myth_that_a_legal_trade_will_solve_the_rhino_horn_crisisA_system_dynamics_model_for_market_demand/links/55e80c8808ae3e1218421dcd.pdf.

⁶³ Berke, *supra* note 4 (quoting Matthew Markus, Pembient CEO and cofounder).

⁶⁴ 16 U.S.C. § 1533(e).

⁶⁵ See generally Endangered and Threatened Wildlife and Plants; Listing the Southern White Rhino (*Ceratotherium simum simum*) as Threatened, 79 Fed. Reg. 28847-01 (May 20, 2014) (codified at 50 C.F.R. pt. 17).

⁶⁶ Endangered and Threatened Wildlife and Plants; Listing the Southern White Rhino (*Ceratotherium simum simum*) as Threatened, 78 Fed. Reg. 55649-01, 55655 (Sept. 11, 2013) (codified at 50 C.F.R. pt. 17).

⁶⁷ See H.R. Rep. No. 105-495, at 4-5 (1998).

time consuming,” making enforcement infeasible in practice (and necessitating a prohibition on sale of products labeled or advertised as containing rhinoceros or tiger ingredients).⁶⁸

Despite the enforcement problems that introducing similar products into a market creates, Pembient concedes that it aims to make its synthetic horns indistinguishable from natural rhinoceros horns.⁶⁹ This means officials will be unable to visually distinguish between real horns and Pembient’s horns, and poachers and traffickers could take advantage of this loophole by simply claiming the horns they are carrying are synthetic horns. In response to these enforcement concerns, Pembient has suggested that it may include a DNA watermark on its horns or create a database, accessible to law enforcement officials, that includes the genetic code for every synthetic horn it manufactures.⁷⁰ However, these “solutions” would still require officials to genetically test every horn – or any product purporting to contain rhinoceros horn – to determine whether the horn is synthetic or natural, which would be expensive and time-consuming. From a pragmatic perspective, even if Pembient’s horns *could* be distinguished from wild horns, it is unlikely that they *would* be distinguished in practice. Thus, if Pembient is allowed to introduce its synthetic horns into the market, enforcement will be difficult because officials will not have an efficient, practical means of distinguishing between real and synthetic horns. This will not only complicate international and federal enforcement efforts but will also undermine the WATA’s efforts to expand the State’s ability to regulate the market for trafficked animal parts at the local level.⁷¹

Therefore, for the above reasons, HSUS, HSI, and HSLF respectfully request that WDFW take immediate action to investigate Pembient’s activities and prosecute any violations of the WATA. Failure to do so will significantly undermine conservation efforts by creating enforcement problems and possibly increasing demand for rhino-horn products. In addition, it will set a dangerous precedent – if its rhinoceros horn plan is successful, Pembient plans to move to creating synthetic elephant tusks, tiger bones, and pangolin scales, which will undermine conservation efforts directed towards those species.⁷²

Sincerely,



Anna Frostic
Managing Attorney, Wildlife Litigation
The Humane Society of the United States
afrostic@humanesociety.org
(202)676-2333



Teresa M. Telecky, Ph.D.
Senior Director, Wildlife Department
Humane Society International

⁶⁸ See *id.* at 4.

⁶⁹ *CBC Interview*, *supra* note 6 (interview with Matthew Markus, Pembient CEO, in which Markus describes the company’s efforts to create a product that is “indistinguishable from rhino horn”). See also Roberts, *supra* note 56 (discussing Pembient’s efforts to create “horns that are indistinguishable from the real thing”).

⁷⁰ Roberts, *supra* note 56; Matthew Markus, *Why Pembient is Confident in Biofabricated Rhino Horn*, SOSV (Jan. 22, 2016), <https://sosv.com/why-pembient-is-confident-in-synthetic-rhino-horn/>.

⁷¹ See 2016 Wash. Sess. Laws 5.

⁷² See Trani, *supra* note 12.

Margaret Robinson

Margaret Robinson
Litigation Fellow, Wildlife Litigation
Humane Society of the United States

Keisha Sedlacek

Keisha Sedlacek
Senior Regulatory Specialist, Federal Affairs
Humane Society Legislative Fund