

Control of captive breeding, ranching and wild harvest
production systems for Appendix-II species

(Discussion paper for Agenda item AC19 Doc. 14)

This document has been prepared by the IUCN/SSC Wildlife Trade Programme from work contracted by the Secretariat to encourage further examination of the conservation impacts and control of *ex situ* and *in situ* production of CITES-listed species.

1. The role of CITES is to regulate international trade where it may be detrimental to the survival of CITES-listed wild species. To fulfil this role, it is important that CITES Authorities can clearly define and control production systems used to produce CITES-listed species for trade to a) ensure that a particular system fits into the overall CITES legal framework and b) to assess the impact of that trade on the survival of the species.
2. For example, where the Convention makes legal exemptions for trade in artificially propagated specimens (see Article VII) the Management Authority needs clear criteria to determine whether a particular production strategy is in accordance with these legal requirements. Furthermore, according to Resolution Conf. 12.3 (on Permits and Certificates), the Management Authority must also report all CITES trade in its Annual Reports, stating amongst other things, the source or broad category of production system from which the specimens derive.
3. Before exports of CITES-listed specimens can go ahead, the CITES Scientific Authority must first determine that the export will not be detrimental to the survival of the species. To make these findings it is important that Scientific Authorities can gauge the impacts of the export on a) the wild population and b) the role of the taxon in the ecosystem. The impact of the export will depend on the method of production. For example, export of specimens produced *ex situ* through artificial propagation may be expected to have little direct positive or negative impact on the wild population, in contrast to specimens collected directly from the wild population (see later paragraphs for more detail on impacts of production systems). In addition Scientific Authorities are also required to monitor exports and if it appears that export levels are likely to be detrimental to the survival of the species then, to limit exports. For these reasons the means of production of specimens in trade should be recorded accurately in quota allocations, on permits and in CITES annual reports to allow harvest impacts to be assessed through the monitoring of annual report data.
4. CITES annual report data are often examined in the significant trade review process, to assess whether or not non-detriment findings are being made appropriately, so it is important that the source code data accurately reflect the production system and its impact on the wild population.

Variety and grouping of production systems - need for guidance for Scientific Authorities?

5. Nowhere in the Convention text or resolutions is the term "wild" defined. By default, "wild" specimens of animals refer to those from any source other than those obtained through captive breeding, production of F1 offspring, or ranching.
6. In reality, there are numerous means of producing "wild" specimens as demonstrated in Doc. AC.16.15 and Doc. PC 11.9.1a; Doc. PC1.19.2 and Doc. PC 12.32. Many specimens produced for trade may not be collected directly from a pristine wild habitat, but may be produced through a variety of methods designed to increase individual survival or population productivity. For example game farming; aquaculture and rearing, which may involve habitat manipulation to increase limiting resources such as food or sites for reproduction; or to reduce competition, such as predator control. In reality, production systems form a continuum ranging from the collection of wild individuals from wild habitats through production of semi-wild/semi-domesticated individuals to multi-generation closed cycle systems that produce virtually "domesticated" individuals.

Differentiating between these overlapping systems can be extremely difficult. Production operations may even “evolve” through the different ‘categories’ as they become more established.

7. Some argue that the current CITES source code provisions, which recognise, specimens taken from the wild (W); three forms of captive bred specimens (C,D, F); and specimens originating from ranching operations (R) do not adequately recognise the potential of other production systems currently classified as wild production to enhance productivity and to provide economic incentives to encourage *in situ* conservation. Consequently, there have been suggestions that CITES consider recognising further production systems. Others argue that it is the job of the Scientific Authority to assess the relative costs and benefits of the array of production systems dependant on specimens from the wild. They argue that CITES Parties should develop guidance for Scientific Authorities on distinguishing between production from a pristine wild habitat and production from a managed wild habitat. As manipulating the wild habitat to increase production of a target species, may have detrimental impacts on the non-target species and it is argued that the Scientific Authority is best placed to judge the relative impacts in making its non-detriment findings.
8. When refining the control of production systems, a primary consideration will be whether or not to maintain the *status quo* in terms of the range of production systems recognized by CITES. Maintaining the current system has the advantage of causing less confusion, but the disadvantage, that the current system appears not to be fully implemented. This raises the question of whether implementation of the current system could be improved by developing guidance for Scientific Authorities on assessing different production systems or whether changes are needed in the numbers of production systems that are recognized by CITES? If any changes are to be made, they should be designed to simplify the system, whilst maintaining conservation safeguards and facilitating the provision of economic incentives to encourage conservation. To ensure adequate control of production systems, the systems must be grouped into defined categories with easily established parameters.

Grouping of Production systems

9. In terms of conservation impacts, production systems can be grouped on the basis of three main characteristics:
 - a) the level of wild collection and its impact on population survival;
 - b) the extent to which wild collection is offset, by enhancing productivity through rearing;
 - c) the extent to which the production contributes economic incentives to encourage conservation.
10. Based on these factors, the following paragraphs argue that production systems can be separated into three broad categories producing: Wild Collected Specimens; Reared Wild Specimens; and Closed-cycle Captive Bred Specimens. Each of these major categories in turn comprises a number of further subdivisions. To encourage dialogue on whether there is any benefit in recognising and defining further production systems under CITES, a range of different production systems are described in the following paragraphs:
 - a) Wild Collected Specimens - where production is based on a high reliance on WILD individuals¹ for trade with frequent removal of individuals from the wild. Wild collection involves the collection and removal of either complete individuals or parts of individuals such as fur, feathers

¹ This type of production system is captured in the current source code: W - Specimens taken from the wild. There is no definition of ‘wild’ in the text of the Convention or Resolutions. By default “W” must currently be applied to all specimens that are not produced through captive breeding/artificial propagation; ranching of species transferred from Appendix I to II; or more general ranching.

or glandular secretions. Intuitively, this type of production should only occur in the range State, however, current CITES practice reports the source of specimens from introduced populations established in non- range States as wild collected e.g. *Chameleo jacksonii* from Hawaii. (Provided that a benefit sharing system is in place, wild collection, is theoretically the production system most likely to generate economic incentives to encourage conservation). Forms of wild collection include:

- i) **Direct take from the wild** - involves harvesting wild individuals that have not been subject to any form of management aimed at enhancing productivity of the population, other than through managing the level of harvest. Such harvests will generally be from natural ecosystems. This is the generally recognised form of direct wild harvest (e.g. *Chlorocebus aethiops* from Tanzania).
 - ii) **Planned wild harvest for pest control or as salvage harvest** – involves harvest of specimens taken during planned pest control measures or from land that is to be cleared of natural vegetation under some form of accepted planning policy e.g. *Papio anubis* and *Crocodilus niloticus* from various African range states. Although this is a wild harvest, some would argue that a planned control or salvage harvest merits a separate identification on permits and in trade statistics as some economic benefit may be derived from trade in specimens that would anyway be lost to the population.
 - iii) **Enhanced wild production from manipulated ecosystems** - involves either the harvest of wild individuals from an ecosystem that is essentially wild but has undergone some intentional modification to increase production of the target taxa. Or the harvest of wild individuals that have adapted to a modified ecosystem, such as species that are commensal with man e.g. *Ptyas mucosus* from oil palm plantations in Indonesia). Intentional ecosystem manipulation may enhance either the carrying capacity of the environment or directly increase the size of the population. Ecosystem manipulation may include:
 - providing specialised habitat niches (e.g. reducing bush cover and encouraging grassland to support greater grazer density);
 - removing competitors or artificially increasing the supply of nutrients (e.g predator removal on game farms); and
 - directly increasing the size of the population or assisting the population to reproduce (e.g. re-stocking of lakes with fish fry; provision of nest boxes for parrots, or egg deposition sites for frogs (often termed parrot/frog ranching).
 - iv) **Managed and unmanaged introduced populations** - involves production of non-native species that have become established and self-sustaining in extensive systems outside the range State. Establishment of the production system requires an initial introduction from the wild, which after the initial establishment then requires no/minimal further augmentation of individuals from the wild population. In effect, these are essentially closed-cycle systems. For example, the harvesting of unintentionally introduced species such as *Chameleo jacksonii* from Hawaii could be classified in this category. However, this form of production is not physically constrained in controlled-conditions *sensu* CITES. Specimens produced in such a way would not be readily distinguishable from wild caught specimens and this might lead to enforcement problems (unless isotope or DNA analysis becomes more generally available).
- b) **Reared Wild Specimens** – where production is also based on a high reliance on wild individuals, but in this case to enhance their survival through REARING² – this includes production systems

² This type of production system is partially captured in the current source code: R -Specimens originating from a ranching operation (N.B. the Plants Committee is addressing this issue and PC Doc. 9.1a considers the establishment of a code for wild transplanted specimens (Wt) particularly for the production of *Galanthus* spp. in Turkey).

in which individuals are regularly taken from the wild to be reared, generally in non-natural conditions before being traded. CITES has recognised this form of production for ranching of animals, restricting collection to the taking of high mortality life stages such as eggs or juveniles for subsequent rearing. There is disagreement whether collection and rearing of reproductive life stages (low mortality life stages) might also be classified under this system. Due to the potentially greater impacts of collecting reproductive life stages such as adults, a REARING system should be restricted to the collection of high mortality life stages.

- i) **Rearing of high mortality life stages in non-natural conditions** – involves production from specimens that have high mortality levels in the wild. The production system relies on enhancing survival of the wild collected individuals through investment in rearing and thus offsetting the natural high mortality. Specimens are regularly and repeatedly taken from the wild for rearing in non-natural conditions in the range State (e.g. species transferred from Appendix I to II for ranching purposes and Appendix II species such as *Python regius* eggs). Because of the dependence on a high level of input of wild individuals, rearing systems for animals often occur in the range State and specimens are generally maintained in intensive conditions i.e. outside the natural ecosystem. But, by linking the production system with the wild habitat and perhaps even maintaining the stock in enclosed semi-natural conditions, economic incentives may be generated to maintain the ecosystem. Currently, CITES does not recognise such a system for Plants.
 - ii) **Rearing of low mortality life stages** – involves production from specimens which have low mortality levels (generally adults) in the wild and that are repeatedly taken from the wild for rearing the progeny in non-natural or enclosed semi-natural conditions in the range State (e.g. gravid *P. regius* or *Malacochersus tornieri* and rearing of juvenile fish e.g. Tuna ranching). Unless there is confidence in the reliability of management control, the removal of adults and other low mortality life stages can be a cause of concern. Due to the dangers associated with removal of low mortality life stages, although arguably compensated by the rearing programme, this production system might be viewed as a transitional system between wild capture and rearing systems. Because of these concerns, it is proposed that this type of production, even though it is a form of rearing, is more akin to the category of *enhanced wild production*.
 - iii) **Rearing of high mortality life stages in natural ecosystems** e.g. **Game rearing/ and restocking** – involves production from populations of animals maintained in captivity in extensive areas of natural habitat in the range State. These populations are supplemented by the repeated introduction of wild stock/ seed/ juveniles (e.g. forms of antelope rearing in southern Africa and forms of clam mariculture, turtle headstarting and fry release). Depending on the degree to which the rearing environment can be classed as “controlled” *sensu* CITES, and the degree of separation from the wild, for CITES purposes, such systems, may more appropriately be considered as forms of *enhanced wild production*. However, in time, these systems may evolve into either closely monitored rearing systems or closed cycle systems.
- c) **Captive production** where production is based on a low reliance on wild individuals for CLOSED CYCLE Propagation³. This generally involves the breeding or propagation of individuals in controlled conditions, with a minimal input of individuals from the wild and hence low direct impact on the wild populations. To qualify as captive bred CITES requires that production of second generation offspring of the taxa be demonstrated. In turn this appears to have led to a

³ This type of production system is currently captured in the following source codes: A - Appendix I species artificially propagated for commercial purposes; C - Appendix I plant species propagated for non-commercial purposes and propagated species included in Appendix II and Appendix III. C - Animals bred captivity in accordance with Resolution Conf. 10.16, as well as parts and products thereof, exported under the provisions of Article VII, paragraph 5, of the Convention (specimens of species included in Appendix I that have been bred in captivity for non-commercial purposes and specimens included in Appendices II and III). F - First generation (F1) animals born in captivity, but which do not fulfil the definition of “bred in captivity” in Resolution Conf. 10.16, as well as parts and products thereof.

code for trade in first generation offspring. If Management Authorities are required only to allow captive exports from closed cycle operations, then, there will be no need for the separate F1 code. Superficially, captive production may also appear to include situations where adults are repeatedly brought into non-natural conditions to exchange gametes. Whilst the physical environment of such production operations may resemble a captive breeding system, biologically and functionally the system is more akin to a form of wild harvest, particularly where a significant proportion of the wild population is collected to support the production system.

- i) **Closed cycle Captive breeding and production of F1 offspring ex situ** – involves production *ex situ* (i.e. in non-natural ecosystems) either in the range State or outside the range States. Establishment of the production system requires an initial take from the wild, which must be non-detrimental to the survival of the wild population, but which after the initial establishment then requires no/minimal removal from the wild population (includes operations producing animals bred or born in captivity, particularly for the *pet trade* and *zoological collections* etc.). This system provides little opportunity to generate direct economic incentives to conserve the wild species and its habitat.
- ii) **Closed cycle production and captive born production in natural ecosystem - Game Farming** – involves production *in situ* in extensive natural ecosystems in the range State generally in fenced areas in private ownership - establishment of the production system requires an initial take from the wild, but after the initial establishment then requires no/minimal removal from the wild population (e.g. game farming for animals such as white rhinos in South Africa; the introduction of *Macaca fascicularis* to Tiwai island in Indonesia).
- iii) **Born in captivity with high reliance on the wild population for adults to provide gametes etc** – The maintenance of the production system requires the repeated introduction of adults that exchange gametes in captivity. The challenge is to ensure adequate control of such systems, so that the collection of adults does not impact the wild population. For this reason it is proposed that such systems be classified as a form of enhanced wild production if the wild collections are likely to significantly impact the wild population. For example, there is significant concern at the lack of spawning stock in the wild Beluga Sturgeon population, so any wild collection and subsequent production in captivity should be carefully monitored. Where the wild collection is of less potential significance to the wild population, a category of closed-cycle breeding might be more appropriate.

Concerns regarding the current CITES definitions and control of production systems

11. Provisions regarding captive production for animals and artificial propagation of plants:
 - a) differ in the level of restriction between plants and animals, requiring demonstration of F2 production for captive bred Appendix I, II and III animals, but not for artificially propagated plants;
 - b) involve three different forms of trade regulation (Article VII para 4 and para 5; and Article IV provisions for captive produced specimens; and
 - c) the definition of *controlled environment* does not apparently recognise the possibility of production in extensive semi-natural surroundings.
12. The term “wild collected” refers to all specimens that do not meet the CITES definitions of captive bred, F1 generation or ranched. Refining the provisions regarding specimens taken from the wild could help in a) recognition of the potential economic incentives for conservation; and b) could avoid instances of over-collection being inferred from reviews of the trade data even when the non-detriment finding was made on the basis that the harvest is rendered sustainable by the increased productivity.
13. This paper proposes that:
 - a) The Animals Committee considers simplifying the provisions relating to captive breeding or artificial propagation by standardizing the regulations for plants and animals as far as possible. And by requiring that such operations operate on a virtually closed system basis to be verified by

the CITES MA on a regular basis, but do not require the need for demonstration of second generation production for animals. This would remove the need for the category of First generation offspring or born in captivity (F).

- b) The Animals Committee considers recognizing the contributions that breeding and rearing in virtually wild conditions in the range states can make to conservation, by reviewing the requirements for ranching and captive breeding to be carried out in controlled conditions. To allow rearing and captive breeding/ artificial propagation can be carried out in extensive conditions. This would require either that the progeny or reared individuals can be marked and traceable in extensive situations or that the operation is carried out within a perimeter enclosure. Such extensive systems would occur in the range State.
- c) The Animals Committee considers adopting the term "Rearing" for both animal and plant systems that rely on rearing high mortality stages (currently known as ranching for animals). Also that CITES considers differentiating species transferred to Appendix II for Ranching/ rearing from other Appendix II rearing operations.
- d) The Animals Committee considers recognizing that certain forms of production may have conservation benefits, but also require oversight to ensure that any harvest is managed appropriately and that such systems be accorded a new category of *enhanced wild production*. This new category would include products from manipulated wild systems as well as products from rearing operations or captive breeding operations that rely on repeated collection from the wild of a high proportion of low mortality stages such as adults and juvenile fish. The Scientific Authority would be expected to indicate whether the manipulation is non-detrimental to the survival of both species and habitat/ ecosystem.