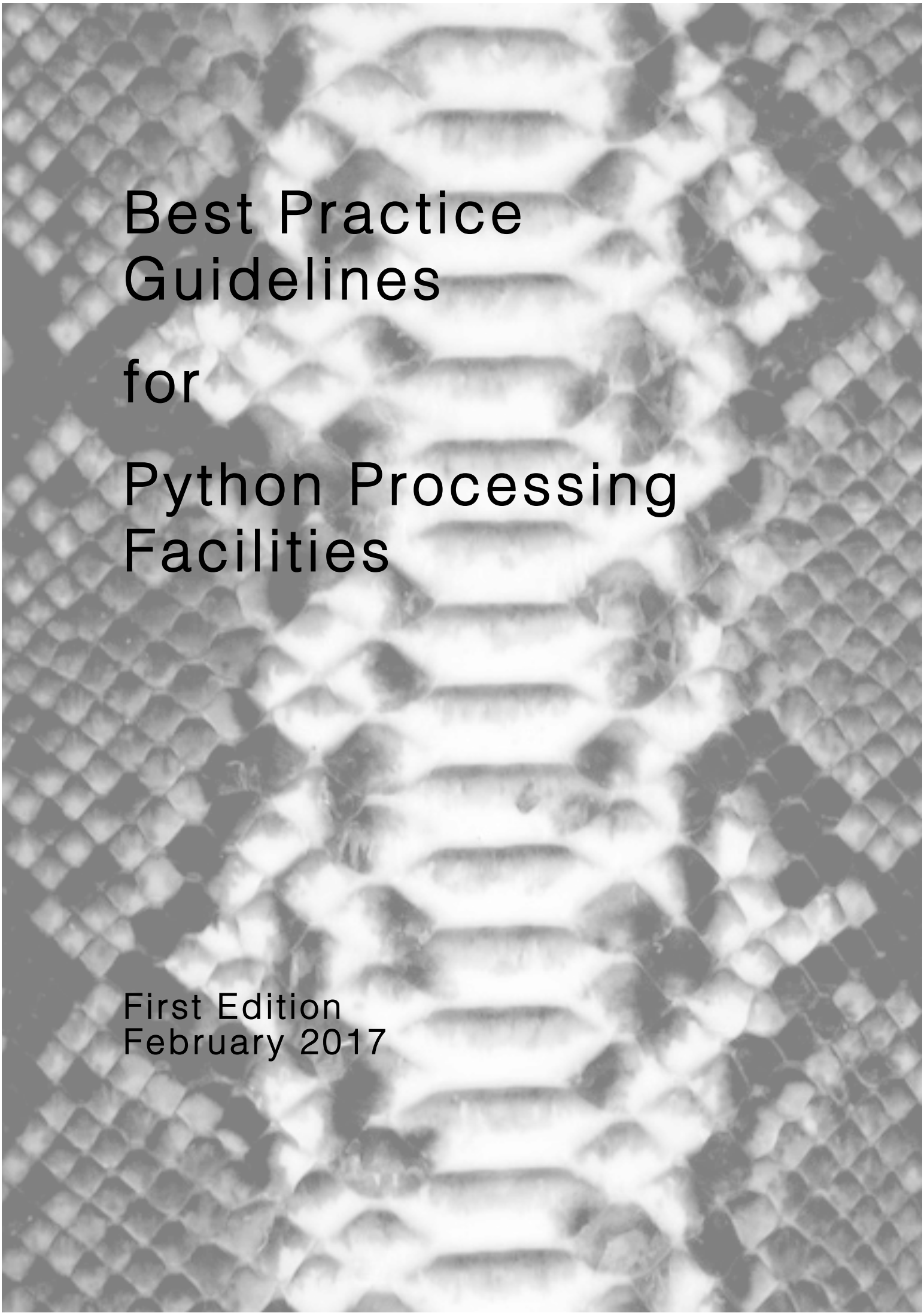

Best Practice Guidelines for Python Processing Facilities

First Edition
February 2017

Authored by Jessica A. Lyons[1,2], Paolo Martelli[3] and Daniel J. D. Natusch[1,2,4]

Author affiliations:

[1]IUCN/SSC Boa & Python Specialist Group
[2]Resource Development Limited, Australia
[3]Ocean Park Corporation, Aqua City, Hong Kong
[4]School of Life and Environmental Sciences, University of Sydney, Australia

Acknowledgements

We are grateful to the industry representatives who provided comment, input and support that contributed to the development of these Guidelines. Many thanks to Steve Gorzula and Chad Montgomery of the IUCN SSC Boa and Python Specialist Group for reviewing this document and offering comments that improved an earlier version of this work.

The Python Conservation Partnership financially supported Edition 1 (2017) of these Standards.

Suggested citation:

Lyons, J. A., Martelli, P., Natusch, D. J. D. (2017) Best Practice Guidelines for Python Processing Facilities – First Edition. Compiled by the IUCN/SSC Boa & Python Specialist Group.

TABLE OF CONTENTS

1. Introduction

In recent years (since 2011), concerns have been raised about the welfare implications for reptiles (specifically pythons) utilised for the skin trade (Natusch et al. 2016). In 2013, guidelines on how to humanely kill reptiles were developed by an Expert Panel for the Swiss Federal Veterinary Office (2013). These guidelines were submitted to the World Organization for Animal Health (OIE) for adoption as standards.

Within the python skin industry, there is a recognised need for minimum acceptable standards for the operation of python processing facilities. The present document provides guidelines for implementing best practice in order to achieve those minimum standards.

The Guidelines are intended for incorporation into existing procedures at python processing facilities and to provide support towards demonstrating regulatory requirements in the Industry. The Guidelines provide information for proprietors, managers and staff responsible for the care and management of pythons at processing facilities. They also contain information to assist in the implementation of best practice.

The Guidelines were developed with the support of representatives from industry, science, policy, animal welfare, and others, such as supply chain persons. The Guidelines are based on current knowledge and technology and should be reviewed periodically to account for advances in the understanding of python physiology and behaviour, technological changes, husbandry, and welfare.

The Guidelines cover principles for best practice from the transporter at the point of receival (from hunters and suppliers), to the point of humane slaughter at the python processing facility.

Purpose

The purpose of this document is to establish a high standard of operational procedures at python processing facilities. This includes safety and hygiene, staff competency and considerations for the safety and welfare of pythons and staff at these facilities. This document is accompanied by audit guidelines to ensure that a high standard is implemented, maintained, and verified at python processing facilities.

These Guidelines also aim to:

- Set an industry standard by defining minimum acceptable python management practices.
- Clearly define python welfare standards for incorporation into relevant industry quality assurance programs.
- Promote the humane and considerate treatment of pythons at processing establishments.
- Provide information to support good husbandry and management practices that deliver acceptable python welfare outcomes.
- Define duty of care and associated responsibilities for persons managing pythons at processing facilities.
- Provide assurance to the general community that effective python welfare standards for the processing industry are in place
- Demonstrate that these standards are being met.

Scope and aims

The Guidelines apply from the point of receival from the transporter to the point of humane killing at the python processing facility. The Guidelines apply to python species currently in trade, whether they are wild or captive-bred, including:

- **Reticulated python (*Python reticulatus*)**
- **Burmese python (*Python bivittatus*)**
- **Blood python (*Python brongersmai*)**
- **Bornean short-tailed python (*Python breitensteini*)**
- **Sumatran short-tailed python (*Python curtus*)**

These Guidelines recognize that facilities processing pythons vary considerably, from high-investment industrial-scale abattoirs, to smaller home-based operations. The capacity to implement best practices will undoubtedly vary among facilities, as will the capacity to undertake research and development, and be aware of and implement new technologies.

Moreover, the Guidelines accept that best management practices will evolve and be updated over time, as the scientific community and industry learn more about the husbandry and welfare needs of pythons. Therefore, these Guidelines are not intended to be overly prescriptive. Instead, they offer guidance for the implementation of better management practices for the improvement of python welfare and husbandry for processing facilities of all types.

It should also be noted that python welfare considerations go beyond the scope of this document; proprietors and managers of python processing facilities should strive to improve the welfare of pythons brought to their facilities by hunters, suppliers (e.g., small scale farmers or collection agents) and other persons. For example, providing clean bags to collect pythons, informing hunters, suppliers and other persons how to suitably transport pythons, and if traps are used to harvest pythons from the wild, they should be shaded or positioned to avoid exposure to direct sunlight, checked early in the day and at least daily (to avoid predation and exposure).

Application

Python processing facilities have a responsibility to ensure welfare outcomes are of a high standard. This is achieved via incorporation of these Guidelines within facilities' management systems and procedures, which should include:

- A demonstrated commitment by the proprietor to this objective;
- Welfare considerations for management of pythons;
- Verification and review of all practices that impact python welfare; and
- A requirement for feedback to hunters, transporters and staff on compliance with animal welfare outcomes.

Specifically, these standards are designed to achieve the following fundamental aspects of python welfare:

1. Freedom from hunger and thirst,
2. Freedom from discomfort
3. Freedom from pain, injury and disease
4. Freedom to express normal behavior
5. Freedom from fear and distress

The Guidelines are presented in two sections:

Section 1 defines six standards, each with specific outcomes and principles that detail how the intended outcomes can be achieved. These standards and principles are the minimum requirement for best practice at python processing facilities.

Section 2 contains guidance on best practice to assist the proprietor and manager(s) of python processing facilities to implement the standards. The Guidelines provide specific details on the activities and procedures that assist in meeting the standards. The Guidelines are based on other standards, codes of practice and guidelines for the welfare of similar animals and current scientific literature.

Related documents

These Standards should be read in conjunction with:

- *Instructional Manual on the Humane Killing of Pythons*;
- *Instructional Poster on the Humane Killing of Pythons*; and
- *Best Practice Guidelines for Python Captive Breeding and Rearing Facilities*.

For further information please contact the IUCN/SSC Boa & Python Specialist Group.

2. The Standards

Summary of the Standards

Standard 1: Design and maintenance of facilities and equipment

Facilities and equipment are designed and maintained to ensure minimal interference and stress is incurred by pythons

Standard 2: Staff competency

Staff responsible for handling, restraint and humane killing of pythons are competent[1] and have been inducted in procedures at the python processing facility

Standard 3: Safety and hygiene

High levels of safety and hygiene are maintained at the python processing facility

Standard 4: Management protocols and planning to minimise stress and injury of pythons

Procedures for the management of pythons are developed and include prevention and mitigation of possible risks to python welfare

Standard 5: Humane killing procedures

Handling, restraint and killing procedures for pythons are conducted in a humane and effective manner

Standard 6: Monitoring for assessment of harvest and trade sustainability

Procedures are in place to gather information for the assessment of ongoing sustainability of harvest and trade of wild populations of pythons

[1] A person is deemed competent for a task when they can demonstrate current knowledge, skills, attitude, and behaviour to undertake the task.

Standard 1:
Design and maintenance of facilities and equipment

Outcome

Facilities and equipment are designed and maintained to ensure minimal interference and stress is incurred by pythons

Principles

P1.1. The area of the python processing facility should be sufficient to accommodate the maximum number of pythons held at any one time.

P1.2 The python processing facility is fenced to prevent access of unauthorised vehicles, persons and animals.

P1.3 Designated areas of the python processing facility are clearly marked and signposted for their specific task.

P1.4 Design and layout of the python processing facility takes into account protection of pythons from predators and the weather.

P1.5 Equipment for the humane killing of pythons is available at the processing facility.

P1.6 Equipment for the humane killing of pythons is maintained and stored appropriately.

P1.7 The designated killing area is designed to allow unobstructed operation to mitigate injury to staff and pythons.

P1.8 Flooring in walkways and work areas is constructed to minimise slipping, falling and injury of staff.

Standard 2:
Staff competency

Outcome

Staff responsible for handling, restraint and humane killing of pythons are competent[2] and have been inducted in procedures at the python processing facility

Principles

P2.1 Proprietor(s), manager(s) and staff are aware of, and keep up-to-date information on current national legislation at the python processing facility.

P2.2 Proprietor(s) and manger(s) ensure there is effective communication, and supervision of, staff throughout the risk management process.

P2.3 Staff responsible for the handling, restraint and humane killing of pythons are experienced and assessed on a regular basis for competency.

P2.4 Records are kept at the python processing facility on staff and their training and assessment activities.

P2.5 Inexperienced (new) staff undergoes induction in current procedures at the python processing facility, and are trained and monitored under supervision until deemed competent.

[2] A person is deemed competent for a task when they can demonstrate current knowledge, skills, attitude, and behaviour to undertake the task.

Standard 3:
Safety and hygiene

Outcome

High levels of safety and hygiene are maintained at the python processing facility

Principles

P3.1 The policy objective for the python processing facility includes safety and hygiene and a demonstrated commitment of the proprietor and manager(s) to this objective.

P3.2 A system is in place to assure periodical or continuous cleaning of the python processing facility and equipment.

P3.3 Cleaning facilities and products are available at the python processing facility for staff use.

P3.4 Care is taken to minimise python meat contamination, if utilised for human consumption.

P3.5 Liquid and solid waste are screened and disposed of in a safe and environmentally responsible manner.

P3.6 Staff have a high standard of personal hygiene when working at the python processing facility.

P3.7 Protective clothing is provided for staff at the python processing facility.

P3.8 Protective clothing is only used at the python processing facility, is cleaned thoroughly after use, and is in good working order.

P3.9 At least one first aid kit is provided at the python processing facility.

P3.1 A system is in place to ensure the first aid kit(s) are maintained for effective operation.

Standard 4:
Management protocols and planning to minimise stress and injury of pythons

Outcome

Procedures for the management of pythons are developed and include prevention and mitigation possible risks to python welfare

Principles

P4.1 The policy objective for the python processing facility includes python welfare and a demonstrated commitment of the proprietor(s) and manager(s) to this objective.

P4.2 Arrangements with suppliers and transporters include provisions regarding python welfare and feedback on adverse outcomes is provided accordingly.

P4.3 Pythons are transported to the processing facility in a suitable manner.

P4.4 Pythons are assessed upon arrival at the processing facility, and any weak, ill or injured pythons are identified and the appropriate action is promptly taken.

P4.5 Pythons are handled, restrained and moved throughout the processing facility in a calm manner.

P4.6 Upon arrival at the processing facility, pythons are kept in bags for no more than one week before being humanely killed.

P4.7 Bags containing pythons are tagged and or/labeled.

P4.8 Procedures are in place to ensure effective communication between the proprietor, manager(s) and staff.

Standard 5:
Humane killing procedures

Outcome

Handling, restraint and killing procedures for pythons are conducted in a humane and effective manner

Principles

P5.1 Instructions on how to humanely kill pythons are clearly displayed in the designated killing area.

P5.2 Standard Operating Procedures (SOPs) are in place that ensures pythons are handled and restrained with minimal stress and duration prior to being humanely killed.

P5.3 SOPs are in place that ensures pythons are killed humanely by competent staff, using the appropriate equipment (a hammer or equivalently suitable tool), by blunt force trauma (a blow to the head that destroys the brain).

P5.4 SOPs are in place that ensures pythons are killed effectively by pithing and/or decapitation at the position of the brain immediately after the stunning/killing blow is administered (to confirm death).

Standard 6:
Monitoring for assessment of harvest and trade sustainability

Outcome

Procedures are in place to gather information for the assessment of ongoing sustainability of harvest and trade of wild populations of pythons

Principles

P6.1 Records are kept on all transactions relating to live pythons and python skins.

P6.2 Records are kept on the size of live pythons purchased by the processing facility (snout-to-vent length [SVL] and/or mass).

P6.3 Records are kept on the length of dried python skins sold by the processing facility.

P6.4 Proprietor(s) and manager(s) allow regular and unrestricted access to the facility by regulatory bodies.

3. Implementation of the Standards

Best practice is defined as commercial or professional procedures that are accepted or prescribed as being correct or most effective. In the table below, best practice describes how outcomes of the Standards can be achieved based upon its principles. Best practices also describe the actions and procedures needed to be undertaken to demonstrate that the outcomes of the Standards are being met.

Implementation of Standard 1: *Design and maintenance of facilities and equipment*

Principle reference	Principle	Best practice
P1.1	The area of the python processing facility should be sufficient to accommodate the maximum number of pythons held at any one time.	Pythons kept at the python processing facility have sufficient area to be comfortable until being humanely killed. This means that pythons are held individually within bags, preferably in a holding room, have enough area to loosely coil inside their bag without being crushed, and bags are not piled or stacked on top of one another.
P1.2	The python processing facility is fenced to prevent access of unauthorised vehicles, persons and animals.	A barrier (greater than 1 m in height) must enclose the perimeter of the python processing facility. The barrier should contact the ground and be high enough to prevent access of unauthorized vehicles, persons and animals. The barrier may be constructed from materials such as brick, iron or chain linked fencing.
P1.3	Designated areas of the python processing facility are clearly marked and signposted for their specific task.	Designated areas of the python processing facility are clearly marked and sign posted. Examples of designated areas include: • Proprietor and management office; • Areas for smoking, eating and drinking; • Toilets, showers and sinks; • Storeroom(s) for staff protective clothing; • Storeroom(s) for cleaning products and equipment; • Python holding room(s); • Designated killing area; and • Waste collection area.
P1.4	Design and layout of the python processing facility takes into account protection of pythons from predators and the weather.	Pythons are kept in a dry, predator proof area in an appropriate temperature range (22-30˚C). A suitable area may be a lockable holding room with ventilation, roof insulation and a temperature gauge. Python holding rooms should be free from rain, sun, drafts, and excessively damp conditions (e.g. presence of mold).

P1.5	Equipment for the humane killing of pythons is available at the processing facility.	Hammers (or equivalently suitable tools) for humanely killing pythons are available at the python processing facility.
P1.6	Equipment for the humane killing of pythons is maintained and stored appropriately.	Hammers (or equivalently suitable tools) are checked routinely to be operational (e.g. at the commencement of each workday). Hammers (or equivalently suitable tools) are thoroughly cleaned, disinfected and stored in a clean, dry area after each workday.
P1.7	The designated killing area is designed to allow unobstructed operation to mitigate injury to staff and pythons.	The designated killing area is a large open space (at least 4 m^2) ideally located next to the python holding room(s). The designated killing area is free from all non-essential equipment.
P1.8	Flooring in walkways and work areas is constructed to minimise slipping, falling and injury of staff.	Flooring is impervious and constructed of concrete slab, cement or tiles. Flooring constructed of concrete slab or cement may have groves in a 'diamond' pattern to minimise slipping, falling and injury of staff. If possible, the floor should slope sufficiently towards a drain to allow cleaning with water.

Implementation of Standard 2: *Staff competency*

Principle reference	Principle	Best practice
P2.1	Proprietor(s), manager(s) and staff are aware of, and keep up-to-date information on current national legislation at the python processing facility.	Pythons should be kept and treated humanely in accordance with the current relevant national legislation. Python processing facilities should be authorised to purchase and process pythons and comply with requirements in accordance with the current national legislation.
P2.2	Proprietor(s) and manger(s) ensure there is effective communication, and supervision of, staff throughout the risk management process.	Pythons are potentially dangerous animals. The proprietor(s) and manager(s) should ensure there is effective supervision of staff throughout the induction and training process.
P2.3	Staff responsible for the handling, restraint and humane killing of pythons are experienced and assessed on a regular basis for competency.	Competent staff are available to carry out tasks at the python processing facility, such as handling, restraint and humane killing of pythons. At least one staff is highly experienced or has completed training in the handling, restraint and humane killing of pythons. All staff responsible for the handling, restraint and humane killing of pythons are competent to routinely

		inspect and identify signs of stress, disease and injury in pythons and take action as necessary. Staff are regularly assessed to ensure they are competent and on-going training needs of staff are regularly identified and addressed.
P2.4	Records are kept at the python processing facility on staff and their training and assessment activities.	Each staff has a record file that is kept up to date and includes information such as: • Contact details; • Emergency contact details; • License numbers (if applicable); • New staff induction checklist; and • Experience, training and assessment activities undertaken.
P2.5	Inexperienced (new) staff undergoes induction in current procedures at the python processing facility, and are trained and monitored under supervision until deemed competent.	A system is in place that ensures staff receives instruction and training in the handling, restraint and humane killing of pythons. Inexperienced (new) staff are not permitted to handle, restrain or humanely kill pythons without the direct supervision of competent staff. All staff must have completed an induction checklist before commencing employment. An example induction checklist accompanies this document. The induction checklist should be submitted to the proprietor(s) and/or manager(s) and be kept in staff records. Direct supervision of inexperienced (new) staff by competent staff occurs for tasks such as restraint, handling and humane killing of pythons until competency is demonstrated. Where staff is observed undertaking these tasks incorrectly, corrective action is taken *immediately*.

Implementation of Standard 3: *Safety and hygiene*

Principle reference	Principle	Best practice
P3.1	The policy objective for the python processing facility includes safety and hygiene and a demonstrated commitment of the proprietor(s) and manager(s) to this objective.	The python processing facility has a policy statement for safety and hygiene. A policy statement demonstrates that the proprietor(s) and manager(s) have made a commitment to providing an environment that promotes good standards for safety and hygiene and a system is in place to review operating procedures. An example policy objective for safety and hygiene may include: • Considers safety and hygiene an integral part of the success of the python processing facility and is committed to providing and maintaining a safe and healthy working environment for staff and pythons; • Will, as far as reasonably practicable, eliminate or, where this is not reasonably practicable, manage safety, hygiene and hazards to prevent all injuries, illnesses and dangerous incidents; • Is committed to creating a working environment that supports and encourages injury prevention and healthy lifestyle; and

		• Considers staff wellbeing, safety and injury prevention to be vital to the ultimate success of the python processing facility's operations and productivity and is an integral part of management's responsibilities.
P3.2	A system is in place to assure periodical or continuous cleaning of the python processing facility and equipment.	The python processing facility and equipment is cleaned on a periodical or continuous basis to maintain a high standard of safety and hygiene. For example, the designated killing area is thoroughly cleaned after use each workday. This may include washing walls and floors, applying disinfectant (such as household bleach prepared solution of 0.15% or 1:30 dilution of sodium or calcium hypochlorite), and left for at least 15 minutes before rinsing thoroughly with water. Equipment used for humanely killing pythons are cleaned and disinfected using the same technique. Chemicals and procedures for their use should comply with national agricultural and environmental legislations and guidelines.
P3.3	Cleaning facilities and products are available at the python processing facility for staff use.	Staff has access to cleaning facilities and products to wash their hands and arms before, during and after work at the python processing facility. Staff has access to cleaning equipment and products to periodically or continuously clean the python processing facility and equipment. Cleaning equipment may include disposable gloves and a high-pressure cleaner (such as an air compressor). Cleaning products may include liquid hand soap/sanitizer, household bleach and sodium or calcium hypochlorite.
P3.4	Care is taken to minimise python meat contamination, if utilised for human consumption.	Equipment used to process python carcasses are thoroughly cleaned before and after use. Python carcasses are processed while hanging (without touching the ground), or on a clean surface, such as a table or cutting board, to minimise contamination. Python meat is stored in clean bags and frozen if not sold immediately. If frozen, the date it was processed and frozen is clearly labeled on the bag.
P3.5	Liquid and solid waste are screened and disposed of in a safe and environmentally responsible manner.	Liquid waste includes blood and urine. Solid waste includes faeces and python tissue. Liquid and solid waste are not disposed of directly into water bodies, such as lakes, creeks, rivers, streams that may cause environmental and health contamination. Liquid and solid waste is disposed of to minimise pests (insects, rodents and other animals) that may carry disease. Liquid and solid waste may be screened and collected for further use (i.e., animal feed and/or fertilizer). Some examples of safe waste collection for further use or disposal include the following: • Python blood will coagulate into a solid mass that may block up drains. Blood may be collected and

		used for animal feed and/or fertilizer; • Drains with vertical sieves should be used to screen meat or skin trimmings, bones and other solid waste that may block up drains (to be ground and used for stock feed production, fertilizer and/or disposal; and • Grease traps should be installed in drains to screen for fat that may block up drains. Fat will rise to the surface and can be removed and disposed when it solidifies. Solid waste is disposed of using simplified degradation systems, such as composting, digestion and wet rendering.
P3.6	Staff have a high standard of personal hygiene when working at the python processing facility.	Salmonella and a host of other pathogens can be transmitted between reptiles and humans. Handling protocols should include hand washing between and immediately after handling pythons. Other ways for staff to improve personal hygiene may include, but are not limited to: • Keep fingernails short and clean; • Tie up long hair; • Wash hands and arms thoroughly and frequently with an anti-bacterial liquid soap and warm water; • Wash hands immediately after using the bathroom; • Wash hands and arms immediately after contact with python meat, offal, blood or dirt and change contaminated (soiled) clothing; • Never spit cough or sneeze near python meat if for consumption; • Report any case of illness or injury immediately; • Do not smoke, eat or drink in any area where pythons are killed; • Use showers daily, especially after work at the python processing facility; • Don't litter – put rubbish in the bin; • Maintain your protective clothing as clean as you can; and • Cover minor cuts and abrasions with waterproof dressings and protective gloves or finger guards if only finger is cut.
P3.7	Protective clothing is provided for staff at the python processing facility.	Protective clothing, such as gumboots, waterproof aprons and thick gloves to prevent injury from accidental python bites or hammer blows are provided at the python processing facility for staff use. Protective clothing should minimise contact with python meat, offal, blood or dirt to prevent disease.
P3.8	Protective clothing is only used at the python processing facility, is cleaned thoroughly after use, and is in good working order.	Protective clothing does not have holes, is thoroughly cleaned after each use and must be left at the python processing facility (unless being cleaned off-site).
P3.9	At least one first aid kit is provided at the python processing facility.	At least one first aid kit is provided at the python processing facility. All staff must be able to access a first aid kit. A first aid kit should be immediately identifiable and be kept in a prominent, accessible location to be retrieved promptly when required. A first aid kit should contain an inventory list of the contents so that items may be replaced when necessary. A first aid kit should provide basic equipment for administering first aid

		for injuries including: • Cuts, scratches, punctures, grazes and splinters • Muscular sprains and strains • Minor burns • Amputations and/or major bleeding wounds • Broken bones • Eye injuries
P3.10	A system is in place to ensure the first aid kit(s) are maintained for effective operation.	Regular checks (after each use or, if the first aid kit is not used, at least once every 12 months) are conducted to ensure the first aid kit contains a complete set of the required items (an inventory list in the first aid kit should be signed and dated after each check). Contents of the first aid kit are checked to be in good working order (i.e., contents have not deteriorated, are within their expiry dates and sterile products are sealed and have not been tampered with).

Implementation of Standard 4:
Management procedures and planning to minimise stress and injury of pythons

Principle reference	Principle	Best practice
P4.1	The policy objective for the python processing facility includes python welfare and a demonstrated commitment of the proprietor(s) and manager(s) to this objective.	A policy statement demonstrates that the proprietor(s) and manager(s) have made a commitment to providing an environment that promotes good standards for python welfare and a system is in place to review operating procedures. The proprietor(s) and manager(s) have a responsibility to care for the welfare of pythons under their supervision and the python processing facility has a policy statement for python welfare. An example policy objective for python welfare may include: • Operating procedures for the management of pythons; • Operating procedures for monitoring activities that may impact on python welfare; and • An annual review process.
P4.2	Arrangements with suppliers and transporters include provisions regarding python welfare and feedback on adverse outcomes is provided accordingly.	Arrangements with suppliers and transporters detail expectations in relation to handling, restraint and transportation of pythons. For example, pythons are handled minimally and transported in a suitable manner (see P4.3 for detail on what is a “suitable” manner). Feedback is provided to suppliers and transporters on adverse python welfare outcomes and non-conformances. Records of this communication are kept at the python processing facility. There is zero tolerance for abuse of pythons. If cruelty of pythons is observed, it is addressed *immediately*. Steps are taken to ensure that any required corrective actions are taken to avoid repeat occurrences.
P4.3	Pythons are transported to the	Travel to the python processing facility may impose some stress on pythons. Persons transporting pythons

	processing facility in a suitable manner.	should consider stress and injuries associated with transport. A suitable manner to transport pythons ensures that: • Pythons are handled as minimally as possible and moved in a calm manner that minimises stress and injury (i.e., no jerky movements, throwing, etc.); • The python's head is not taped or tied; • Pythons are individually held in suitable sized bags, preferably cotton, such that they have sufficient space to loosely coil inside the bag; • Bags should be knotted or tied at the end to ensure the python does not escape. Ensure that no part of the python's body is caught or tangled in the bag when the bag is closed and tied; • Bags are free of loose thread or other imperfections that may enable an python to become entangled or injured; • Bags are kept dry and out of direct sunlight and away from hot surfaces, as pythons can overheat quickly (i.e., if transported in a truck, they should be suitably covered to protect them from weather); • Bags are not piled/stacked on top of each other; they may be placed in separate rigid cardboard shelving units or containers; • Pythons are well secured from escape or movement about the vehicle during travel; and • Pythons showing signs of severe injury and/or are very emaciated are humanely killed as soon as possible. Bags intended for re-use are thoroughly cleaned and disinfected or sterilized. The International Air Transport Association (IATA) *Live Animal Regulations* is a good source of information on container designs and appropriate animal densities within containers.
P4.4	Pythons are assessed upon arrival at the processing facility, and any weak, ill or injured pythons are identified and the appropriate action is promptly taken.	Procedures are in place to inspect pythons upon arrival at the processing facility by competent staff. Pythons deemed to be weak, ill or injured are humanely killed as soon as possible.
P4.5	Pythons are handled, restrained and moved throughout the processing facility in a calm manner.	Pythons are handled as minimally as possible, preferably not at all, before being humanely killed. If pythons do need to be handled, restrained and moved, this must be achieved in a calm manner that minimises stress and injury (i.e., no jerky movements, throwing, etc.). More than one staff may be required to handle, restrain and move larger pythons (> 3 m).
P4.6	Upon arrival at the processing facility, pythons are kept in bags for no more than two weeks before being humanely killed.	Procedures should be in place to identify the length of time a python has been kept since arriving at the processing facility (e.g., marking or tagging of bags with date of arrival and other relevant information). Pythons kept for more than one week at the processing facility require access to clean water (e.g., pythons that require longer times to shed their skin; difficulties in skin shedding may result from insufficient humidity and suboptimal temperatures. Maintaining pythons at 75% humidity or greater and temperatures of 30 - 35°C is recommended to assist this process; Ewert 2004). Pythons must not be kept for more than two weeks.

P4.7	Bags containing pythons are tagged and/or labeled.	Bags containing pythons should be appropriately tagged and/or labeled to facilitate monitoring of the welfare of pythons being kept at processing facilities. Tags should specify information such as species and date of arrival at the facility, to ensure pythons are humanely killed in a timely manner (within two weeks of arrival).
P4.8	Procedures are in place to ensure effective communication between the proprietor, manager(s) and staff.	Procedures should be established to assure effective communication between the proprietor, manager(s) and staff. Everyone should be sufficiently informed about the operation of the python processing facility. This may include a staff meeting with the proprietor and manager(s) once every few months or a notice board for important announcements, training, introduction of new staff and operating procedures at the processing facility. All staff should complete an induction checklist and be aware of operating procedures at the python processing facility. For example, the attainment of a good hygiene and cleaning standards depends on the knowledge of hygiene and cleaning techniques, including personal hygiene. Another example is that staff is aware of operating procedures for handling, restraining and humanely killing pythons.

Welfare considerations and signs of stress in pythons

Process	#	Welfare considerations
Transport	1	• Vehicle design, cleanliness, maintenance and condition • Transport duration • Surveillance of pythons • Handling, restraint and movement of pythons • Contingencies for emergencies • Humane killing en route or upon arrival to python processing facility • Demonstrated staff competencies
Arrival at python processing facility and unloading	2	• Maintenance and design of facilities • Unloading snakes • Humane killing upon arrival • Operation, maintenance and cleaning of facilities and equipment • Demonstrated staff competencies
Holding room	3	• Maintenance and design of facilities • Protection and shelter • Surveillance of pythons • Operation, maintenance and cleaning of facilities and equipment • Contingencies for daily management and emergencies • Demonstrated staff competencies
Movement to the designated killing area	4	• Operation, maintenance and cleaning of facilities • Handling, restraint and movement of pythons • Demonstrated staff competencies
Stunning and killing	5	• Operation, maintenance and cleaning of facilities and equipment for stunning and killing • Effective humane killing procedures • Maintenance and design of designated killing area • Demonstrated staff competencies

Physical signs of illness/injury	Physical signs of stress
• Gaping (sitting with open mouth) for long periods of time • Increased or thickened saliva • Paling of the tissues inside the mouth • Prolonged eversion of hemipenes or cloacal tissue after defecation • Swelling of body • Loss of muscle tone/strength • Tremors or shakiness • Difficult or failure to right itself • Scabs or blisters • Head raised upright for prolonged periods (stargazing) • Sneezing and signs of fluid around the nostrils • Excessive shedding • Poor appetite • Diarrhea, particularly if accompanied by atypical odor • Blood in feces	• Poor appetite • Regurgitation • Aggressive behavior (e.g., excessive hissing, striking) • Wounds around the nose and mouth from excessive striking • Excessive activity – constant moving around the enclosure • Consistent clustering in one part of the enclosure (e.g. warm/cool end) • Poor shedding cycles • Note: below 10°C pythons experience extreme cold stress and are no longer able to function normally (e.g., move to warmer part of the enclosure).

Implementation of Standard 5: *Humane killing procedures*

Principle reference	Principle	Best practice
P5.1	Instructions on how to humanely kill pythons are clearly displayed in the designated killing area.	An instructional poster on how to humanely kill pythons has been developed for use specifically at python processing facilities. This instructional poster should be displayed at all times in the designated killing area. An instructional manual accompanies this poster and staff responsible for the handling, restraint and humane killing of pythons must have access to, and have read it.
P5.2	Standard Operating Procedures (SOPs) are in place that ensures pythons are handled and restrained with minimal stress and duration prior to being humanely killed.	Pythons should only be removed from their bag if they are to be handled, restrained and killed humanely without delay. Two or more staff may be required to handle, restrain and humanely kill larger pythons (> 3 m in length). Pythons should be restrained by firmly grasping behind the neck to position the head for the stunning and killing blow with a hammer or other suitable implement.
P5.3	SOPs are in place that ensures pythons are killed humanely by competent staff, using the appropriate equipment (a hammer, or equivalently suitable tool), by blunt force trauma (a blow to the head that destroys the brain).	A two-sided hammer (or equivalently suitable tool)) is appropriate equipment used to humanly kill pythons. One side of the hammer is blunt to apply blunt force trauma (destruction of the brain by a stunning and killing blow). The other side of the hammer is pointed to pith the brain (to confirm death).
P5.4	SOPs are in place that ensures pythons are effectively pithed immediately after the stunning and killing blow is administered (to confirm death).	Confirmation of death is accomplished by using an additional method (pithing) performed after the loss of consciousness and death. Pythons are inspected to ensure they do not regain consciousness after being stunned and killed. If there are signs of consciousness at any stage after the stunning and killing procedure the python should be pithed immediately.

Implementation of Standard 6:
Monitoring for assessment of harvest and trade sustainability

Principle reference	Principle	Best practice
P6.1	Records are kept on all transactions relating to live pythons and python skins.	Examples of transactions include buying, transportation and selling of pythons (live and skins). Records the name of hunter and date of acquisition, location and habitat (if possible) where harvested from, buying and selling price, etc.
P6.2	Records are kept on the size of live pythons (snout-to-vent length [SVL] or mass).	Upon arrival at the python processing facility, pythons are measured (SVL in cm) and/or weighed (g or kg). This information is recorded and kept at the python processing facility for later collection by regulatory authorities to inform on the sustainability of harvest and trade of wild pythons.
P6.3	Records are kept on the length of python skins.	Once air-dried, the length of python skins (cm) is recorded. This information is recorded and kept at the python processing facility for later collection by regulatory authorities to inform on the sustainability of harvest and trade of wild pythons.
P6.4	Proprietor(s) and manager(s) allow regular and unrestricted access to the facility by regulatory bodies.	Proprietor(s) and manager(s) allow regulatory bodies and scientists' access to their facilities for the purpose of independent monitoring and data collection for the assessment of harvest sustainability.

4. Appendices

Literature cited

Baier, J. (2006). *Amphibians*. In: American Association of Zoo Veterinarians (ed.), Guidelines for euthanasia of nondomestic animals. American Association of Zoo Veterinarians. pp. 39–41.

Baier, J. (2006). *Reptiles*. In: American Association of Zoo Veterinarians (ed.), Guidelines for euthanasia of nondomestic animals. American Association of Zoo Veterinarians. pp. 42–45.

Burns, R. (1995). *Considerations in the euthanasia of reptiles, fish and amphibians*. Presented at the Joint Conference of the American Associations of Zoo Veterinarians, Wildlife Disease Association and the American Association of Wildlife Veterinarians. pp. 243–249.

Burns, R., McMahan B. (1995). *Euthanasia methods for ectothermic vertebrates*. In: Bonagura, J. D. (ed.), Continuing Veterinary Therapy XII. WB Saunders Co., Philadelphia, USA. pp. 1379–1381.

Expert Panel (2013). *Analysis of humane killing methods for reptiles in the skin trade*. Swiss Federal Veterinary Office, Berne, Switzerland.

Franke-Whittle, I. H., Insam, H. (2013). Treatment alternatives of slaughterhouse wastes, and their effect on the inactivation of different pathogens: A review. *Critical Reviews in Microbiology*, *39*(2): 139–151.

Jörg-Peter, E., Cooper, J. E., Langton, T., Matz, G., Reilly, K., Schwantje, H. (2004). *Species specific provisions for Reptiles: Background information for the proposals presented by the Group of Experts on Amphibians and Reptiles (PART B)*. Presented at the 8th Meeting of the Working Party Strasbourg, 22-24 September by the Working Party for the Preparation of the Fourth Multilateral Consultation of Parties to the European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes (ETS 123). Available at: http://www.coe.int/t/e/legal_affairs/legal_co-operation/biological_safety_and_use_of_animals/laboratory_animals/GT%20123_(2004)_15_PartB_Reptiles.pdf

Lance, V. A. (1992). *Evaluating pain and stress in reptiles*. In: Schaeffer, D. O., Klienow, K. M., Krulisch, L. (eds.), The Care and Use of Amphibians: Reptiles and Fish in Research. Scientists Center for Animal Welfare, Maryland, USA. pp. 101–106.

Mann, I. (1983). *Guidelines on small slaughterhouses and meat hygiene for developing countries*. World Health Organization, Geneva. pp. 106. Available at: http://www.who.int/iris/handle/10665/66404

Moberg, G. P. (1985). Biological response to stress: Key to assessment of animal wellbeing? In: Moberg, G. (ed.), Stress in Animals. American Physiological Society, Maryland, USA. pp. 2751. doi: 10.1007/978-1-4614-7544-6_3.

Moore, I. T., Jessop, T. S. (2003). Stress, reproduction, and adrenocortical modulation in amphibians and reptiles. *Hormones and Behaviour*, 43: 39–47.

Warwick, C., Arena, P., Lindley, S., Jessop, M., Steedman, C. (2013). Assessing reptile welfare using behavioural criteria. *In Practice*, *35*: 123–31.

Definitions and acronyms

CITES (Convention on the International Trade of Endangered Species of Wild Fauna and Flora) An international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Competency A person is deemed competent for a task when they can demonstrate current knowledge, skills, attitude and behaviour to undertake the task. Note: Evidence of competency is considered to include 1) on-the-job training (including induction training) for the tasks required, 2) demonstration of relevant/previous experience, 3) formal or recognised training, 4) records of training/supervision and/or sign off by supervisor.

Euthanasia Derived from the Greek terms *eu* meaning good and *thanatos* meaning death. The term is usually used to describe ending the life of an individual animal in a way that minimizes or eliminates pain and distress. A good death is tantamount to the humane termination of an animal's life.

Humane killing Actions undertaken to euthanase an animal that results in rapid loss of consciousness and death of the animal that avoids or minimises pain and distress.

Injury Any wound or damage to the body resulting from an event in the work environment.

Processing Facility Premises used for the slaughter of snakes and production of meat or meat products for human and/or animal consumption.

Standard Operating Procedures (SOPs) Detailed instructions for carrying out specific, repetitive tasks. For example, SOPs may describe how equipment will be used, how measurements will be taken or how operating procedures are undertaken.

Stress A response that activates behavioural, physiological and/or psychological coping mechanisms.

Unconsciousness Loss of individual awareness. Occurs when the brain's ability to integrate information is blocked or disrupted.

Verification The application of methods, procedures and other evaluations, in addition to monitoring, to determine compliance.