

# *Ptyas mucosus – a proposed NDF method for Indonesia (Java)*



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# Acknowledgements

This case study is based on a study funded by the CITES Secretariat.

Study carried out by TRAFFIC Southeast Asia with the IUCN Species Programme.

Data from trader interviews and from samples of harvested specimens supplements literature on this species.

# Oriental Rat Snake *Ptyas mucosus*

## Distribution

Iran to Indonesia.

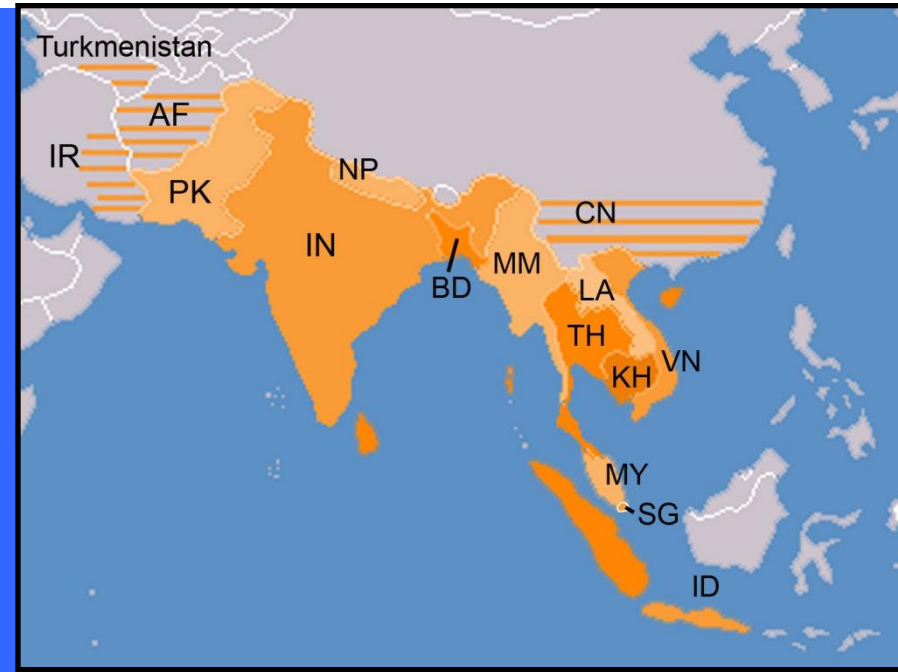
All range States except Turkmenistan are Parties to CITES.

## Population status and threats

Global population – not known

Java or other Indonesian islands – little known about population status, no quantitative data on population changes in Java.

Traders had differing opinions on population status



**Geographical distribution of the Oriental Rat Snake.**

# Management history

- Commercial harvesting of *P. mucosus* began in the late 1970s.
- Listed in Appendix III by India in 1984.
- 1986, Indonesia banned the export of raw *P. mucosus* skins
- Exports declined from ~ 1.9 m skins in 1986 to ~ 600,000 in 1989.
- 1990, *P. mucosus* was listed in Appendix II of CITES.
- 1992, CITES RST - lack of data to ascertain impact of trade. Indonesian MA requested to advise on the scientific basis for harvest quotas and introduce a system to ensure quotas are not exceeded.
- July 1993, the MA indicated that quotas were based on previous trade data and increasing amounts of habitat available through regional development. Not considered to be a scientific basis for the quotas.
- In August 1993 AC Chairman also noted import statistics for *P. mucosus* from Indonesia exceeded exports reported by Indonesia.
- November 1993 Standing Committee recommended import suspension until AC recommendations had been implemented.
- 2005 – SC withdrew import suspension recommendation. Secretariat and SC satisfied with the control measures proposed by the CITES MA.

# UTILIZATION AND TRADE

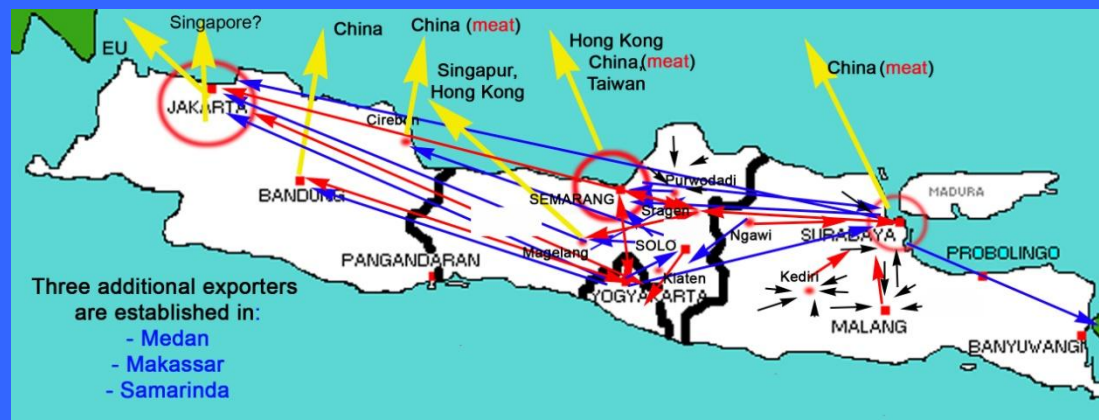
Indonesian harvest and export from Java only.

Harvest quotas set for skin and pet trade for Java.

Wild harvest for legal trade in skins and illegal meat and gall bladder trade, which may be partially a by-product of the skin trade.

Main markets for skins; Europe, Singapore, Hong Kong & Taiwan PoC. Singapore also a re-exporter of skins and processed skins

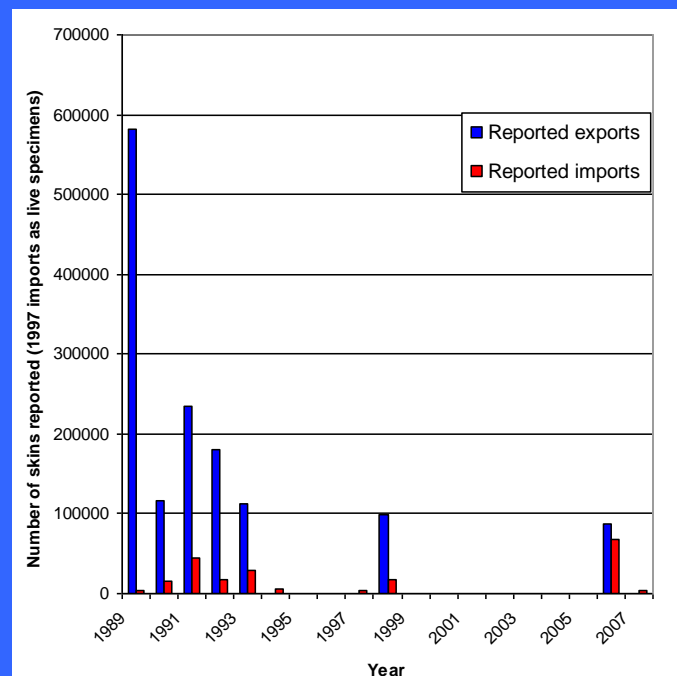
China is believed to be the main market for snake meat.



# Legal trade levels

- Commercial harvesting of *P. mucosus* began in the late 1970s.
- Reported legal trade according to the CITES trade database is summarised in figure.
- Most trade from Indonesia has been in skins.
- 1886 ~1.9m, 1989 ~600,000, 1999 – stockpiled, 2006 below the quota.
- According to Indonesian regulations skins must be tanned before export.

**Figure: CITES reported imports and exports of *Ptyas mucosus* skins from Indonesia (1989 – 2007). Leather products and small numbers of live individuals have been omitted from this graph.**



# Illegal trade

Southeast Asian snake species are commonly found in Chinese food markets

Demand for snake meat in China exceeds local supply during the cold season; additional sources of snakes are required.

Indonesia is one of the major sources supplying the demand from China for Oriental Rat Snakes and other species.

12 year suspension of skins trade triggered the illegal export of meat. Estimates of 50,000 to 100,000 snakes exported annually, (equivalent of 30 to 60 tons meat yr<sup>-1</sup>, 50,000 to 100,000 gall bladders).

According to traders interviewed illegal export of meat and gall has continued since the ban lifted.

Specimens of Oriental Rat Snake traded as the Indo-Chinese Rat Snake *Ptyas korros* (not CITES-listed). Some export of whole (unskinned specimens), meat trade not solely a by-product from the skin trade. Whole frozen snakes are sometimes declared as frozen fish.



# Proposed NDF method

- SPECIES BIOLOGY & ECOLOGY (Species resilience to harvest)
- MANAGING HARVEST
  - Ability to set correct quotas and adaptively manage harvest
  - Conditions of harvest and ability to change these
  - Capacity to control harvest/ trade
- MONITORING IMPACT
  - Species monitoring
  - Harvest monitoring



# SPECIES BIOLOGY & ECOLOGY

## (Species resilience to harvest)

- Medium sized snake reaching about 2.5 m in length and 5-10 cm in girth
- Males longer than females
- Reaches maturity at ~ 9 months ~120 cm for females
- Clutch size average 13
- May lay 2 clutches per year.
- No correlation between body size and clutch size and frequency.
- Widespread – probably most common in Central and East Java, areas with lower rainfall.
- Generalist – thrives in human modified environment
- Unknown density and population trends
- No major additional threats known.

*Current conclusion: It is likely that due to its biology and ecology that the species has a fairly high resilience to harvesting.*

# MANAGING HARVEST

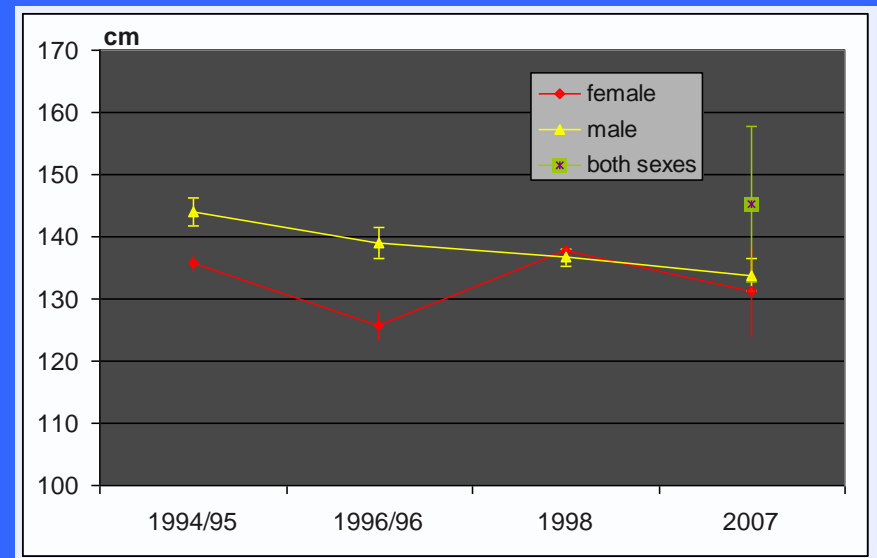
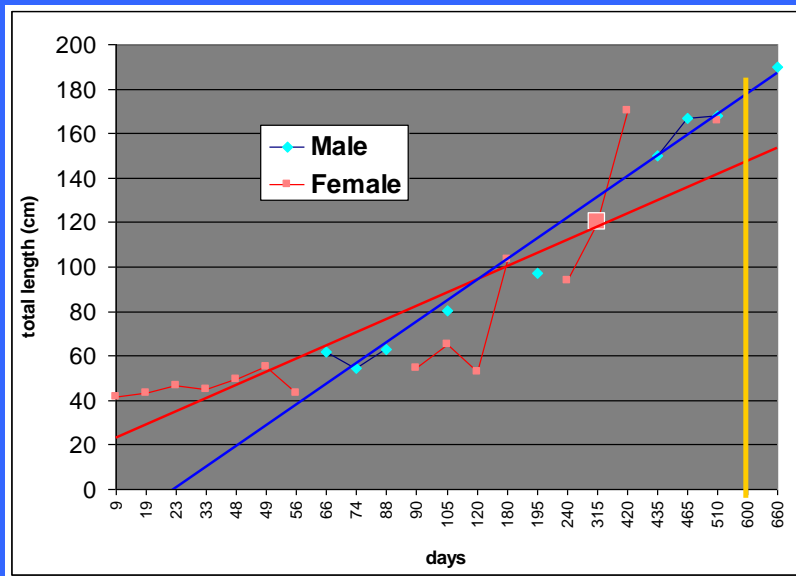
## Ability to set correct quotas and adaptively manage harvest

- Total offtake is unknown
- No quantitative data available for domestic demand but believed to be low. Quotas currently allow for 10% of quota as domestic use.
- Lack of reliable population estimates therefore adaptive management of harvest/export quota systems essential, based on species and harvest monitoring.
- No demand for pet trade; quota not necessary.
- *Export quotas could be set for all products in demand based on the harvest quota for number of specimens.*
- Seasonal restrictions not appropriate - possibly two breeding seasons, harvest takes place around agricultural activities.

# MANAGING HARVEST

Ability to set correct quotas and adaptively manage harvest

- *Size restrictions to ensure specimens have reached maturity and reproduced could be set for export (e.g. minimum 140 cm total snake length).*



# Conditions of harvest and ability to control/change these

- Widespread harvest in natural and agricultural habitat.
- Some dedicated harvesters and some harvesting by farmers
- Dedicated snake harvesters mainly harvest the Oriental Rat Snake during the wet season when snakes are most commonly encountered.
- Farmers harvest out of crop growing season – mainly November to January. Snake capture secondary to farming activities and appears to be carried out in an ad hoc manner.
- Cost of harvesting – low but may be increasing as there is some evidence catch per unit effort (CPUE) is decreasing. Very low for ad hoc harvesting by farm workers
- Species is effectively an open-access resource.
- **Difficult to enforce harvesting restrictions; harvest permit system unlikely to be effective.**

# Capacity to control harvest/ trade

- Not all products in demand are legally exported. Believed illegal meat trade was substantial during the trade ban on skins. Current levels of illegal international trade thought to be high. No effective control measure in place to combat this.
- Difficult, to differentiate between skins and meat of *P. mucosus* and *P. korros* (not controlled under CITES) are of skinned, semi-skinned or whole specimens, usually frozen. Believed some additional harvest of the snakes rather than as a by-product of the skin trade. Increased enforcement is needed to reduce illegal trade.
- Harvest quotas are currently not communicated through the trade chain so a reduction in export quota is unlikely to result in a reduction in harvesting.
- Little is known on harvest areas. *Intensity of collection in different areas should be mapped and monitored to show shifting patterns in harvesting, which could indicate localised depletion.*

# MANAGING HARVEST

## *Current conclusion:*

- Currently insufficient data is available on distribution, population and harvest areas to be sure that a quota is set at a non-detrimental level.
- Quotas should be set and adaptively managed based on field and harvest monitoring.
- Setting export or harvest quotas is unlikely to reduce harvest given the low cost and ad hoc nature of some harvesting (farmers) and apparent illegal trade. But currently there is little knowledge about quotas at harvester and small scale collector level showing poor communication.
- Suggest revising quotas (export quota was reduced by 10,000 for year 2008) until baseline surveys taken place (If quotas were enforceable).

# MONITORING IMPACT - Species

## Species monitoring

Establish ongoing field studies in a sample of harvested and unharvested populations. Currently no reliable baselines from which to monitor change as existing data are from harvested specimens rather than field surveys

- Density estimates and ongoing monitoring should identify changes. ***Continuing decline in density would indicate detrimental harvest and lack of recruitment.***
- Catch per unit effort (CPUE). **Decreasing CPUE would indicate harvest is likely to be detrimental.**
- Size estimates. **Declining average size in the wild could be one possible indication of unsustainable harvest.** Particular attention should be paid to proportion of individuals above the size of maturity and to identify problems with recruitment.
- Sex ratio changes - at sampled sites for times of year. Further information on natural sex ratio and reproductive success/ recruitment under altered conditions of altered sex ratio would be beneficial in adaptively managing the harvest.



# MONITORING IMPACT - Harvest

## Harvest monitoring

Establish harvest monitoring. A year's baseline needed from which to monitor change for the following measures ensuring regular and standard monitoring systems are in place:

- Catch per unit effort (difficult for casual harvesters e.g. farmers). **Continuing decline would indicate that the population was reducing.**
- Sex ratio changes. **An increase in female to male ratio might indicate a reduction in average male size and reduction in differentiation between size of females and males.** *Caution should be taken when comparing sex ratios for different times of year in case of differences in activity levels for each sex through the year.*
- Size differences should be compared by sex against monthly averages.
- Size should be well above size of mature females i.e. above 120 cm. **Ongoing reduction in size of harvested specimens would indicate that the population was reducing.**
- *Harvesting area and pressure should be mapped in order to monitor* **shifting patterns in exploitation which could indicate localised depletion.**

# MONITORING IMPACT

## *Current conclusion:*

Currently no reliable baselines from the field or harvested specimens from which to monitor change.

Sample average size for both male and female (ratio unknown) = 189.51 cm (n= 60), therefore likely to be above the age of maturity. ***If*** this measure was based on a much larger sample of harvested specimens from a representative sample of traders (including illegal traders) it could be concluded that offtake currently allows individuals to grow to maturity and to reproduce before harvest takes place. ***A much larger sample would be necessary to determine non-detriment with any confidence.***

Sampling of size and CPUE (including harvesting area changes) should demonstrate declining population if this is the case.

# RECOMMENDATIONS

- Studies of the species' biology should be carried out throughout the year. Further investigation of reproductive size and reproductive status of harvested specimens would help in confirming the age of maturity to ensure that any minimum catch size is appropriate.
- Establish field and harvest monitoring, including mapping of harvest pressure.
- Consider
  - listing *P. korros* as a lookalike species to aid the control of the meat trade,
  - legalising the meat trade, and trade in gall bladders as a by-products of the skin trade. Quotas equivalent of lower than the skin trade could be set. This may also increase the value to the harvester. Alternatively harvest quota for specimens could be set with no stipulations on export products.
  - Setting minimum size (length for skins and weight for meat) *if there was capacity to enforce these* (TSEA and IRATA concerns).

# Conclusions

Monitoring (field and harvest) crucial in adaptively managing the species' harvest and in allowing a determination that harvesting is not detrimental.

Much information has come from collectors and traders and a strong collaboration with them should help facilitate monitoring as could collaboration with universities.

Proposed method of making a NDF for *Ptyas mucosus* has focused on Java, the main, or possibly only, exporting island of Indonesia. The species occurs on other Indonesian islands, including Sumatra and Sulawesi. In effect a large proportion of the species' range in Indonesia presumably not subject to harvest, although these areas cannot, without human intervention, act as a source if Java were to be acting as a sink.