# WCS Afghanistan Biodiversity Conservation Project

## Field Report No 6 (Wildlife Immobilization)

Funded by USAID – From the American People

# Chemical restraint of Afghan mammals
# A document for Afghan veterinarians

Dr Stéphane Ostrowski
Afghanistan Ecosystem Health Project Manager, WCS
February 2007

The present document lists the most common wild mammal species encountered in Afghanistan and the drug combinations used for their clinical examination or for minor surgical procedures.

**Species** — Species are sorted by order, family and scientific name. When available, common names in Dari and Pashto are provided (*Mammals of Afghanistan*, Habibi, 2003).

**Body mass** — Average body masses are provided for adult specimens. They are derived from the literature (especially from the *Handbook of Wildlife Chemical immobilization*, Kreeger, 1999 and the *New Encyclopedia of Mammals*, McDonald, 2001) and from measurements I have made in Western Asia since 1996.

**Drugs** — Provided drugs are suitable under most circumstances to achieve tranquilization and safe handling of wild animals. Two drugs are usually combined for the chemical restraint of animals. They should be administered in the same syringe intramuscularly (IM)[1]. Dosages of drug combinations provided in Tables 1 and 2 are either derived from the *Handbook of Wildlife Chemical Immobilization* (Kreeger, 1999) or are extrapolated from dosages reported in the literature for close species and adjusted when necessary according to my personal field experience. Although I believe they would be the best choice for artiodactyls, I did not include opiate derivatives (etorphine, fentanyl, carfentanil) in the tables as these drugs and their antagonists (diprenorphine, naloxone, naltrexone) are difficult to obtain and are very dangerous to use. Table 1 summarizes proposed drug combinations for chemical restraint of the most common species of wild mammals in Afghanistan, while Table 2 focuses on intramuscular dosages of ketamine-xylazine combination for rodents weighing less than 1 kg. Table 2 provides average values, and several species may require much higher dosages. More work is needed to adjust dosages of this drug combination to the large variety of rodent species occurring in Afghanistan.

**Antagonists** — If the recommended drugs can be antagonized, the appropriate antagonistic drug is mentioned and dosage is provided. Antagonists are given intravenously (IV) unless otherwise stated.

**Further reading** — I recommend reading the *Handbook of Wildlife Chemical Immobilization* (Kreeger, 1999) for further information concerning remote delivery procedures, precautions of use, drug side effects, and emergency procedures. Two copies of Kreeger's book are available for in-house consultation at the WCS main office, Ansari square St 3, right side, Shar e-Now, Kabul.

[1] Tiletamine + zolazepam combination (Telazol, Zoletil) is sold as ready-to-use preparations.

Table 1 — Proposed drug combinations for chemical restraint of the most common species of wild mammals in Afghanistan

| Order | Family | Scientific name | Common name | Name in Dari | Name in Pashto | Average adult body mass | Drugs (combinations and dosages) | Antagonists |
|---|---|---|---|---|---|---|---|---|
| Insectivora (insectivores) | Erinacidae (hedgehogs) | *Hemiechinus auritus* | Long–eared hedgehog | Khar pushtak gush daraz | Auzd gwazey jeshgey | 0.2–0.5 kg | 5 mg/kg ketamine + 0.2 mg/kg medetomidine | 0.1 mg/kg atipamezole IM |
| | | *Hemiechinus megalotis* | Afghan hedgehog | Khar pushtak afghany | Afghani jeshgey | ? | 5 mg/kg ketamine + 0.2 mg/kg medetomidine | 0.1 mg/kg atipamezole IM |
| | | *Paraechinus hypomelas* | Brandt's hedgehog | Khar pushtak kochak | Kuchney jeshgey | 0.5–1 kg | 5 mg/kg ketamine + 0.2 mg/kg medetomidine | 0.1 mg/kg atipamezole IM |
| Chiroptera (bats) | | | | | | <0.1 kg | 10 mg/kg ketamine + 2 mg/kg xylazine | No reversal |
| Primates | Cercopithecidae (old world monkeys) | *Macaca mullata* | Rhesus monkey | Shadey | Bezow | 5–8 kg | 5 mg/kg Telazol/Zoletil* | No reversal |
| Carnivora (carnivores) | Felidae (cats) | *Caracal caracal* | Caracal | Peshak qarah kol | – | 7–15 kg | 6.5 mg/kg Telazol/Zoletil* | Not reported |
| | | *Felis bengalensis* | Leopard cat | Peshak jangali | – | 3–7 kg | 6.6 mg/kg Telazol/Zoletil* | Not reported |
| | | *Felis silvestris* | Wild cat | Peshak dashti | – | 2–7 kg | 10 mg/kg ketamine + 0.05 mg/kg medetomidine or 5 mg/kg Telazol/Zoletil* | 0.3 mg/kg atipamezole ½ IV + ½ IM or all IM no reversal for Telazol/Zoletil) |
| | | *Felis manul* | Pallas's cat | Peshak kohi | – | 2–5 kg | 8 mg/kg ketamine + 0.05 mg/kg medetomidine | 0.3 mg/kg atipamezole ½ IV + ½ IM or all IM |
| | | *Panthera pardus* | Leopard | Palang | Praang | 35–60 kg | 3 mg/kg ketamine + 0.07 mg/kg medetomidine or 6 mg/kg Telazol/Zoletil* | 0.35 mg/kg atipamezole ½ IV + ½ IM no reversal for Telazol/Zoletil) |
| | | *Uncia uncia* | Snow leopard | Palang barfie | Gharanie prang | 25–75 kg | 3 mg/kg ketamine + 0.08 mg/kg medetomidine or 4 mg/kg Telazol/Zoletil* | 0.4 mg/kg atipamezole ½ IV + ½ IM no reversal for Telazol/Zoletil) |
| | Canidae (dogs) | *Canis lupus* | Wolf | Gurg | Leva/Shormos | 15–35 kg | 10 mg/kg ketamine + 2 mg/kg xylazine | 0.15 mg/kg yohimbine or 0.2 mg/kg atipamezole |
| | | *Canis aureus* | Jackal | Shagal | Chagal/Sor landai | 7–15 kg | 10 mg/kg Telazol/Zoletil** | Not reported |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Carnivora (carnivores) | Canidae (dogs) | *Vulpes cana* | Blanford's fox | Robah khakey | | 1–1.5 kg | 12 mg/kg ketamine + 0.05 mg/kg medetomidine<br>or 10 mg/kg Telazol/Zoletil* | 0.3 mg/kg atipamezole<br><br>no reversal for Telazol/Zoletil* |
| | | *Vulpes corsac* | Corsac fox | Robae karsak | – | 2.5–5 kg | 12 mg/kg ketamine + 0.05 mg/kg medetomidine<br>or 10 mg/kg Telazol/Zoletil* | 0.3 mg/kg atipamezole<br><br>no reversal for Telazol/Zoletil* |
| | | *Vulpes rueppelii* | Sand fox | Robah dashty | – | 1.2–2.6 kg | 12 mg/kg ketamine + 0.05 mg/kg medetomidine<br>or 10 mg/kg Telazol/Zoletil* | 0.3 mg/kg atipamezole<br><br>no reversal for Telazol/Zoletil* |
| | | *Vulpes vulpes* | Red fox | Robae surkh | Srah geydarah | 3–6.5 kg | 12 mg/kg ketamine + 0.05 mg/kg medetomidine<br>or 10 mg/kg Telazol/Zoletil* | 0.3 mg/kg atipamezole<br><br>no reversal for Telazol/Zoletil* |
| | Hynaenidae (hyenas) | *Hyena hyena* | Striped hyena | Kaftaar | Kozh | 25–45 kg | 5 mg/kg Telazol/Zoletil<br>or 10 mg/kg ketamine + 1 mg/kg xylazine | no reversal for Telazol/Zoletil*<br>0.11 mg/kg yohimbine or 0.2 mg/kg atipamezole |
| | Herpestidae (mongooses) | *Herpestes auropunctatus* | Small Indian mongoose | Mush khurma | Mush khurma | 1.1–2.4 kg | 4 mg/kg ketamine + 6.5 mg/kg xylazine | 0.5 mg/kg atipamezole IM |
| | Mustelidae (mustelids) | *Lutra lutra* | Common otter | Sage abi | – | 3–14 kg | 50 mg/kg ketamine + 3 mg/kg xylazine | 0.125 mg/kg yohimbine |
| | | *Martes foina* | Stone marten | Dala khafaq | – | 0.5–2 kg | 4 mg/kg Telazol/Zoletil l* + 3 mg/kg xylazine | Not reported |
| | | *Mellivora capensis* | Ratel | Samur | – | 3–6 kg | 8 mg/kg ketamine + 0.5 mg/kg xylazine<br>or 2.2 mg/kg Telazol/Zoletil* | 0.3 mg/kg atipamezole<br><br>no reversal for Telazol/Zoletil* |
| | | *Mustela erminea* | Ermine | Mosh tazy | – | 0.05–0.35 kg | 5 mg/kg ketamine + 0.1 mg/kg medetomidine | 0.5 mg/kg atipamezole IM |
| | | *Mustela nivalis* | Weasel | Raasu | – | 0.05–0.35 kg | 5 mg/kg ketamine + 0.1 mg/kg medetomidine | 0.5 mg/kg atipamezole IM |
| | Ursidae (bears) | *Ursus arctos* | Brown bear | Khers nasvary | Kher yezh | 100–325 kg | 8 mg/kg Telazol/Zoletil*<br>or 2 mg/kg Telazol/Zoletil* + 0.06 mg/kg medetomidine<br>or 11 mg/kg ketamine + 11 mg/kg xylazine | no reversal for Telazol/Zoletil*<br>0.3 mg/kg atipamezole<br><br>0.125 mg/kg yohimbine |
| | | *Ursus thibetanus* | Asiatic black bear | Khers siyah | Thour yezh | 65–90 kg (f)<br>110–150 kg (m) | 4.4 mg/kg Telazol/Zoletil* | No reversal |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Artiodactyla (artiodactyls) | Bovidae (bovids) | *Capra falconeri* | Markhor | Ahu markhur | Mar khura | 32–40 kg (f)<br>80–110 kg (m) | 1.7–2.3 mg/kg xylazine + 3.1–4.3 mg/kg ketamine | 10–15 mg/animal atipamezole (2/3 IV + 1/3 IM) |
| | | *Capra ibex* | Siberian ibex | Ahu rung | Mugley | 30–50 kg (f)<br>80–100 kg (m) | 1.7–2.3 mg/kg xylazine + 3.1–4.3 mg/kg ketamine | 10–15 mg/animal atipamezole (2/3 IV + 1/3 IM) |
| | | *Gazella subgutturosa* | Goitered gazelle | Ghazal | Oseye | 15–25 kg | 7 mg/kg ketamine + 8.5 mg/kg xylazine | 0.05 mg/kg methoxy–odazoxan (RX821002A) |
| | | *Ovis ammon polii* | Marco Polo's sheep | Ahu marco polo/qashqar | Marco polo gertsa | 80–120 kg (m) | 1.7–2.3 mg/kg xylazine + 3.1–4.3 mg/kg ketamine | 10–15 mg/animal atipamezole (2/3 IV + 1/3 IM) |
| | | *Ovis orientalis* | Urial sheep | Ahu nekhsheyr/mel | Sra gertsa | 36–87 kg (m) | 1.7–2.3 mg/kg xylazine + 3.1–4.3 mg/kg ketamine | 10–15 mg/animal atipamezole (2/3 IV + 1/3 IM) |
| | Suidae (pigs) | *Sus scrofa* | Wild boar | Khuge | Sarkuzy | 50–200 kg | 3 mg/kg Telazol/Zoletil* + 1.6 mg/kg xylazine | 10–15 mg/animal atipamezole<br>no reversal for Telazol/Zoletil* |
| Rodentia (rodents) | Sciuridae | *Marmota caudata* | Long–tailed marmot | Vondok/Tabarghan | – | 2.5–5 kg | 3–10 mg/kg xylazine + 15–20 mg/kg Telazol/Zoletil* | 1–2 mg/kg atipamezole<br>no reversal for Telazol/Zoletil* |
| | Hystricidae (porcupines) | *Hystrix indica* | Crested porcupine | Jarah | Skon | 10–25 kg | 7.5 mg/kg Telazol/Zoletil* | No reversal |

*Brand denominations of Telazol™ and Zoletil™ are for US and Europe, respectively. It is an association of tiletamine and zolazepam chlorhydrates at equal mg/mg ratio. Thus 5 mg of Telazol/Zoletil represents 2.5 mg of tiletamine plus 2.5 mg of zolazepam.

Table 2 — Intramuscular dosages of ketamine-xylazine combination for rodents weighing less than 1000 g. For animals weighing less than 250 g, a 10 to 20-fold dilution in sterile water of the ketamine-xylazine combination is required for a precise administration of the drugs.

| Body mass (gram) | Dose xylazine (mg) | Dose ketamine (mg) | Sleep time (minute) |
|---|---|---|---|
| 20 | 0.2–0.4 | 1–2 | <1 |
| 50 | 0.4–0.8 | 2–3 | <1 |
| 100 | 0.6–1 | 3–5 | 1.5–2 |
| 250 | 1–2 | 5–8 | 3–5 |
| 500 | 2–5 | 10–15 | 5–7 |
| 1000 | 3.3–6.5 | 16.5–25 | 10–15 |