

# The sustainable pair specificity in duet structures of the red-crowned crane *Grus japonensis* promotes the vocal-based monitoring of nesting pairs through the years

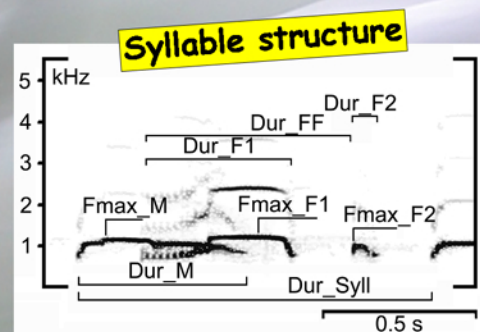
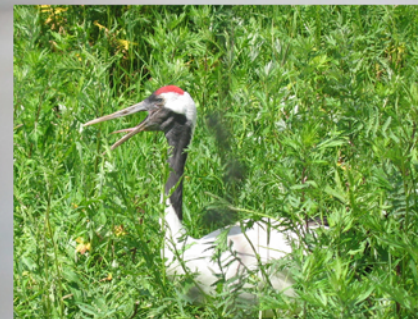
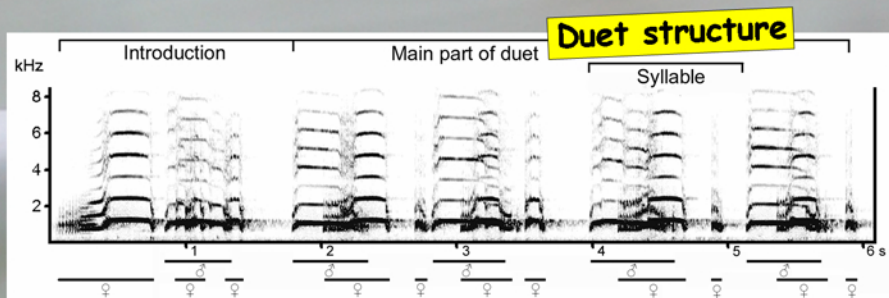
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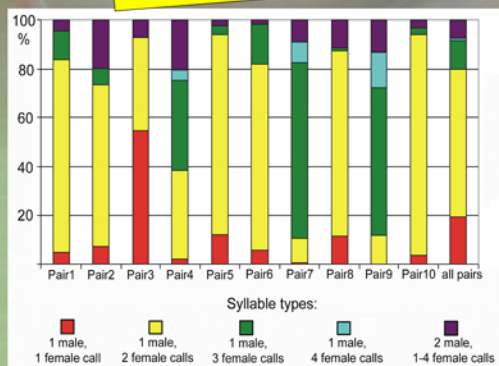
The vocal-based monitoring has proved its use in many bird species and is promising for the red-crowned crane. This species counts in the wild hardly over 2000 birds and is Endangered in the IUCN Red List status. Loud duets of nesting pairs can be recorded properly from a distance 800 m in nature and are potentially appropriate for the monitoring, however their use in conservation is prevented in the absence of knowledge:

## ARE THE DUETS PAIR-SPECIFIC AND STABLE THROUGH THE YEARS?



In 2003-2006, we recorded 343 duets from 8 captive and 2 wild pairs. All duets contained introduction and main part. The introduction is an unordered alternation of pair mate calls. The main part is a regular sequence of syllables. Each syllable contains 1-2 male and 1-4 female calls.

## Percentages of different syllables

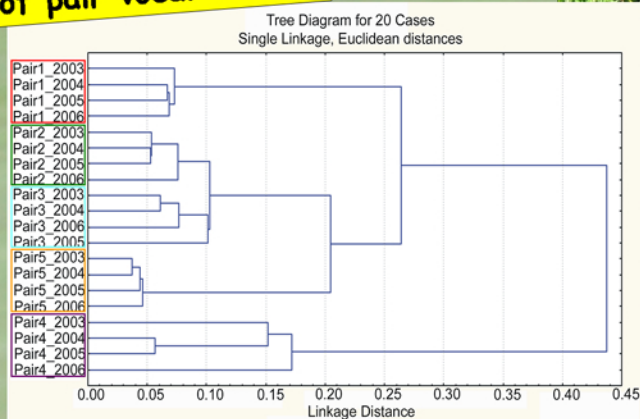


We subdivided the syllables into five types, by the number of the male and the female calls per syllable, and estimated percentages of different syllables in 343 duets of the 10 pairs. Syllables with one or two female calls per male call were the most widespread. The analysis showed the sustainable pair-specific use of particular syllable types through the four years.



## Stability of pair vocal identity

For five captive pairs, we examined stability of duets structures throughout four years, 2003-2006. We took 4 - 20 duets per pair per year, 272 duets in total. For duet syllables, containing either 1 male and 2 female calls or 1 male and 3 female calls, we measured 8 temporal-frequency parameters.



Discriminant analysis showed high percentages of correct classification to pair, varying from 98.2 to 100% between years. Cross-validation of duets from the test sets (represented by samples of 2004, 2005 and 2006) with discriminant functions derived from the training duet sets (represented respectively by pooled samples of 2003, 2003-2004, and 2003-2005) showed comparable high percentages of correct classification to pair, varying from 91.2 to 95.4% between analyses.

## High perspective for monitoring!

Reliability of identification for 5 examined pairs was very high both within- and between years. mistaken assignment occurred only between two pairs (#2 & #3). However, these two pairs did differ strongly by percentages of different syllables within duets.

**RED-CROWNED CRANE PAIRS CAN BE RELIABLE IDENTIFIED BY THEIR DUETS AND PAIR-SPECIFIC DIFFERENCES IN SYLLABLE PARAMETERS ARE STABLE BETWEEN YEARS.**