

## Notes on the vocalizations of Cliff Flycatcher (*Hirundinea ferruginea*)

Peter Boesman

In the following we briefly analyze and compare voice of the different races of Cliff Flycatcher (*Hirundinea ferruginea*). We also try to quantify the extent of any vocal differences using the criteria proposed by Tobias *et al.* (2010), as a support for taxonomic review. We have made use of sound recordings available on-line from Xeno Canto (XC) and Macaulay Library (ML).

Song of all races is structurally very similar, a long note followed by a trilled series of notes (which highly vary in number) (Fig. 1).

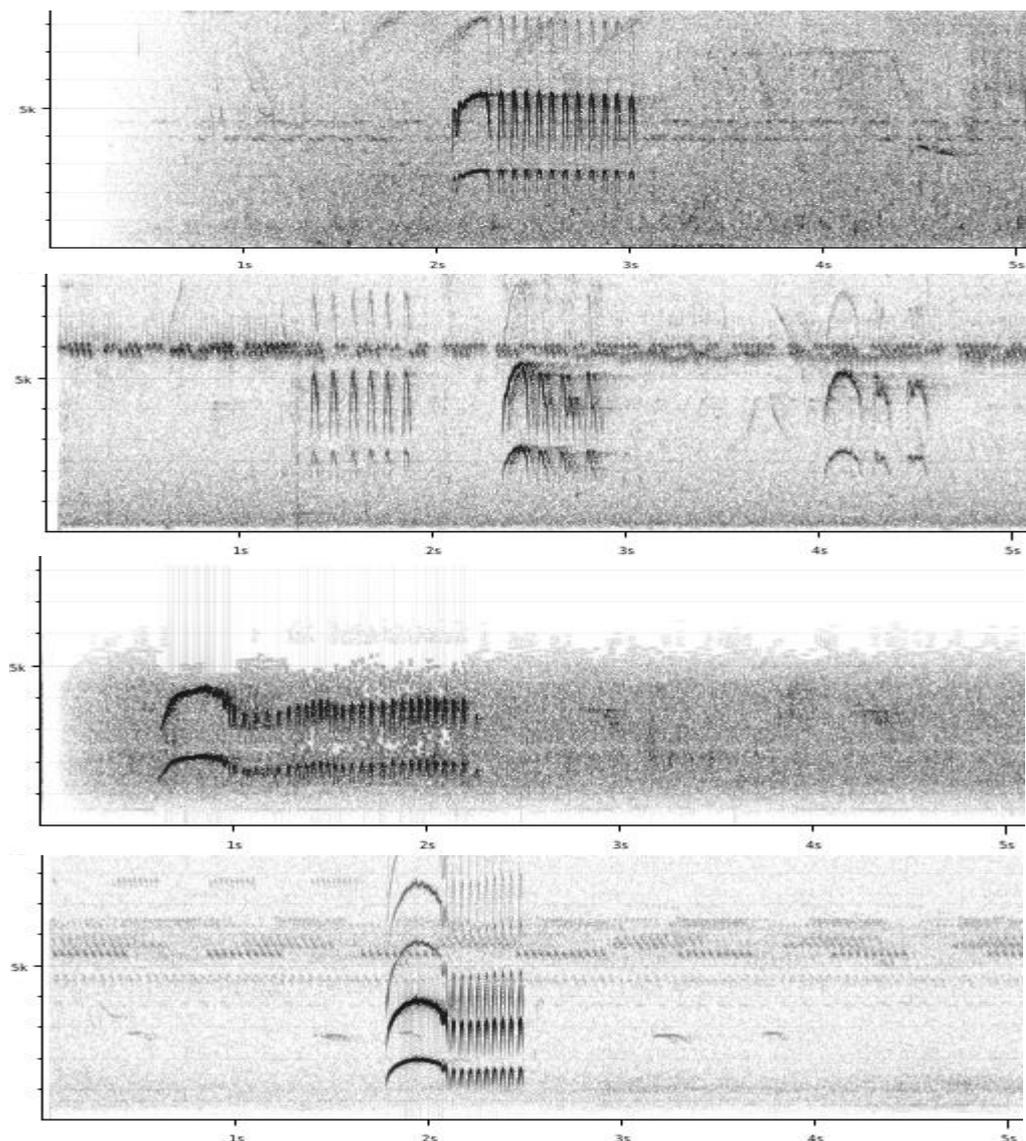


Figure 1: from top to bottom: example of song of race *sclateri*, *ferruginea*, *pallidior* and *bellicosa*.

There are however some notable differences:

**NW group:** *H. f. sclateri* and *H. f. ferruginea* (n=9)

Length 1st note	0.15-0.21s
min. note length	0.03-0.05s
max. freq.	2600-3100Hz
freq. range*	1100-1400Hz
max. pace**	0.05-0.088

\* freq. range of fundamental

\*\* pace is measured as period, duration between two subsequent notes

**SE group:** *H. f. pallidior* and *H. f. bellicosa* (n=9)

Length 1st note	0.20-0.37s <i>pallidior</i> and 0.28-0.40s <i>bellicosa</i>
min. note length	0.033-0.040s
max. freq.	1810-2400Hz
freq. range	600-1000Hz
max. pace	0.041-0.055

Also: in about all samples of SE group the first long note seems to be connected to the first note of the trill, while in the NW group, there is a very clear separation between first long note and subsequent notes.

Differences are thus:

Song of *pallidior/bellicosa* is lower-pitched (score 2-3), has a smaller frequency range (score 2), reaches a faster pace (score 1-2) and has a longer start note (score 1-2).

When applying Tobias criteria we obtain as a total vocal score about 4.

This note was finalized on 3rd July 2015, using sound recordings available on-line at that moment. We would like to thank in particular the many sound recordists who placed their recordings for this species on XC and ML.

## References

Tobias, J.A., Seddon, N., Spottiswoode, C.N., Pilgrim, J.D., Fishpool, L.D.C. & Collar, N.J. (2010). Quantitative criteria for species delimitation. *Ibis* **152**(4): 724–746.

## Recommended citation

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