

Protocol for Bleaching Feathers to Mark Bearded Vultures

Version 2017-04-13

The juvenile bearded vultures have been individually marked by bleaching of certain feathers before the release since the beginning of the reintroductions of bearded vultures in the Alps. This method was first used by Nina Callies and has since then been used on 212 bearded vultures in the Alps without any incidents (State 2015). This method has further been used in many other vulture conservation projects.

When bleaching feathers one has to pay attention especially to the following points:

- Customary hair bleaching agent based on hydrogen peroxide is used for the bleaching. This method which decolourates the pigments of the feathers does not work with species where the colour is based on other (physical) principals (structural colours).
 - The chemical process depends strongly on external influences. Especially temperature influences the time of exposure essentially. Therefore, no rigid instructions can be given about the time necessary to bleach the feathers. It is recommended to use the degree of decolouration as a guide during the bleaching and to interrupt the process as soon as the shading has reached an ochre or light brown colour.
 - Absolutely avoid excessive bleaching! UV radiation will later continue to bleach the feathers. Too intensive bleaching (up to white shading) will lead to the risk of destroyed barbs at a later stage where only the quills are left.
 - Concentrations of 3-12% hydrogen peroxide have been used for the bleaching. The 12% concentration has the advantage of a shorter handling duration of the bird (especially when temperatures are low!). However, the relatively high concentration requires a fast washing out of the bleaching agent as soon as the desired decolouration has been reached (see below).
 - We recommend bleaching a maximum of three feathers for the eleven secondaries closest to the body and a maximum of two neighbouring feathers for all others. This ensures that no large gaps occur in case of premature aging of the feathers.
 - In total no more than three positions per individual should be bleached.
 - To prevent confusions with gaps due to moulting the tips of the feathers should not be bleached.
 - Hydrogen peroxide is a caustic substance and has to be handled with great care. The substance must not be in contact with bare skin and especially not with mucosa.
 - Before applying the bleaching agent (as paste) the feathers chosen for bleaching have to be carefully isolated using aluminium foil to ensure that the bleaching agent does not get in contact with other parts of the body and neighbouring feathers. After the application of the agent the treated feathers should be wrapped completely in aluminium foil. The progress of the bleaching process should be checked regularly so that it can be stopped in time.
 - The bleaching agent must be washed out fast and carefully with lots of water as soon as the feathers show an ochre or light brown colour to prevent the feathers from getting harmed.
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- To immobilise the bird it is recommended to cover the head of the bird with a light fabric. No pressure must be applied to the chest when fixating the fabric to prevent interferences with the breathing of the bird.
- The laying position on the back stresses the breathing because the heavier chest muscles need to be lifted with each breath. Therefore, no pressure to the chest should be applied when fixating the bird. If the bleaching takes longer (colder temperatures) it should be considered to turn the bird on the belly for the duration of the exposure to the bleaching agent.
- Preferably a minimum of three people take part in the whole bleaching process. The first person fixates the bird and monitors the breathing. The second person applies the bleaching paste and is responsible for the technical part. The third person hands the necessary equipment and validates the correct position of the markings. This is important because confusions between the two sides of the body are easily done and the feathers might not be chosen exactly according to the marking specifications. It is further important that the third person documents the markings at the end of the process using photographs, which are very useful in later identifications of the marked individuals.
- The cardiovascular system of many bird species is very vulnerable. Therefore, the whole bleaching process should be conducted as fast as possible and without further noise disturbances.

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14. März 2016

Suggested citation:

Nina Roth-Callies, Hans Frey (2016): Protocol for Bleaching Feathers to Mark Bearded Vultures Guideline of the Vulture Conservation Foundation (document version: 2016-03-14).

Annex: Picture charts of the bleaching process.

Annex: Picture charts of the bleaching process.



All the necessary equipment is prepared: marking specifications, bleaching agent, aluminium foil, water for washing.



The designated feathers for the bleaching are precisely counted and separated from the neighbouring feathers using aluminium foil.



The bleaching agent is carefully applied to the feathers. The tips of the feathers are not bleached. After the bleaching agent has been applied the feathers are wrapped into aluminium foil. This enhances the speed of the bleaching agent and prevents "smearing" at the same time.



The bleaching agent is washed off hearty and carefully as soon as the feathers become ochre or light brown.



After the bleaching all markings are accurately documented using photographs.