Procedures for Wing Clipping

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Birds have been maintained in captivity for hundreds of years. As a society, we have decided that it is reasonable to hold birds in captivity. In supporting this practise, we have also decided that it is reasonable to perform procedures that allow us to help the bird cope well with the captive situation. There is some argument as to whether we should allow birds wings to be clipped or trimmed, on animal welfare grounds. I would argue strongly that there are certain situations where it is entirely appropriate to clip the wing. These situations need to be clearly identified before the bird's wing is clipped as there are some situations where wing clipping is inappropriate.

There are several methods of clipping available. You need to ascertain the clients intention when they ask you to clip the wing as I feel that different procedures suit each situation. You need to discuss this with the client prior to performing the procedure[13]. As well you need to discuss the advantages and disadvantages of each procedure so that the client understands exactly what they can expect and any precautions they need to institute.

Situations where wing clipping is appropriate:

1. Pet Birds:

- **Dangers of Escape**. Pet birds free within the house may escape through a window or open door. Once outside the familiar environment, they become disoriented and may fly away in panic. these birds are easy victims for predatory and aggressive birds. As well they may die a slow death from starvation or misadventure. For most owners recapture of these much loved pets is extremely difficult or impossible.

- **Misadventure within the house**. Most pet birds readily settle into the routine of their owners and will have their favourite perching sites throughout the house. A problem arises when the birds take fright in response to unexpected sounds or movement and launch into panic flight. These uncontrolled efforts at escape can cause damage when the bird crashes into walls, doors, mirrors or windows. On other occasions, inexperienced birds will land in inappropriate locations such as water hazards (baths, toilet bowls), thermal hazards (hot cooking surfaces, a sink or bath full of hot water, heaters, burning candles) or unstable/slippery surfaces[4]. This can result in death from injuries such as drowning, severe trauma or burns. Birds may also damage ornaments and decorations or chew materials throughout the house[10].

- **Dominant Behaviour**. Free flying birds that are able to regularly adopt a higher "perch location" than their owners may adopt a dominant role in the relationship. In some birds that have a tendency to behavioural aggression this

may reinforce their aggression and result in injuries to the client as well as the loss of the companion-animal bond. In severe cases this may lead to the bird being euthanased if the aggression becomes, in the client's judgement, uncontrollable. This situation can be extremely difficult to address as the client is often unwilling to trust the bird again if they have been frightened or injured by the bird's actions.

- **Direct human contact**. Clients who fear the complications of fully flighted birds being released in the house will usually adopt the option of keeping the bird continually caged. This interferes with close contact with the bird and the opportunity to form a strong bond between the bird and its owners. Direct human contact is necessary for removal of the birds natural hesitation to trust its owner[4]. After clipping the bird's wing its territory is dramatically reduced and it is forced to remain with its owner[4]. This results in the bird learning that relationships with people is pleasant and that there is nothing to fear or flee[4]. There are positive benefits for both the bird and the owner from the development of a strong human-pet bird bond. It is something that should be strongly encouraged in most pet bird situations.

2. Aviary Birds:

- **Overt aggression**. In many aviary situations an individual bird may constantly and persistently display aggression to other birds[1,5,10,15]. This has been reported on occasions where one bird is ready to mate and the other is not. In some species (e.g. Cockatoos) this aggression has resulted in death of the mate through trauma, even in well established and bonded pairs. If this has occurred in the past, clipping the wing of the aggressive bird, just prior to the beginning of the breeding season, will allow the recipient of the aggression to escape more easily and avoid severe injuries. As well, I have personally observed that the procedure of wing clipping has directly influenced and reduced the aggressive behaviour of a dominant bird.

- **Repeated cases of trauma in an aviary**. In some situations it is wise to pre-empt self inflicted injuries caused by a bird flying into the wall of an aviary. Newly hatched birds (particularly Neophemas and Psephotus species) may panic easily on inaugural flight and in long-flighted aviaries hit the far wall with significant impact. As well some aviaries that have regular occurrences of this type of trauma, in response to sudden noises or regular frights from predators (neighbours' cats, owls and other raptors or predatory birds). Precautionary wing clips may help avoid some of these problems.

Advantages of Wing Clipping

- **Reduced risk.** Birds are allowed the freedom of the house with a substantially reduced risk of escape of opportunity to fly into potentially dangerous places. The reduction in flying ability allows the owner to more carefully control the bird's access without having to totally change their household. As well the birds cannot fly through open windows or doors[4]. If the bird does escape outdoors, it is less likely to become lost and disoriented. Without the ability of free flight, it will be easier to an owner to recapture the bird.

- **Training aid**. Reduced flight ability significantly reduces the training and taming time[6,9,15]. As the bird cannot panic and fly as far from the owner, the opportunity for taming and pleasant interactions is increased. This gives even an inexperienced owner an opportunity to tame their pet.

- **Aggression Control**. In aggressive individuals, wing clipping has been demonstrated to reduce aggression towards humans and other birds, by reducing dominant behaviour.

Disadvantages of Wing Clipping

- **Predator avoidance**. Birds that have been subjected to wing clipping will be less able to effectively flee from predators such as cats, dogs, raptors[6]. These birds need to be confined in areas that provide security from such possible predators. It should be noted that many of these increased security needs are still required for fully flighted cage birds as they are still prone to attack through the wire of a cage. It is during periods outside their cage that opportunities over and above those seen for caged individuals that other opportunities for predation may arise. It is my opinion that the benefit of being able to be released from the confines of the cage is so great as to overwhelm the slightly increased risk of predation, particularly if appropriate security procedures are applied.

- **Improper clipping technique**. If this procedure is applied by an inexperienced or careless operator, it is possible that the bird may be injured or escape[6].

Useful Equipment

Have all the equipment you will need prepared prior to restraining the bird. The range of equipment will vary with your personal preferences. A list of equipment used by experienced avian veterinarians is [8,14,15]:

Clean towel
Mosquito forceps
Artery forceps (haemostats)
Styptic Agent (Silver Nitrate, Ferric Chloride etc.)
Cotton-tipped applicators
Blunt/blunt straight scissors
Large pair of dog/cat claw clippers
Small pair of dog/cat claw clippers
Adequate light source
Comfortable stool and/or bench to rest your arms
Short bladed, straight edged, podiatry clippers
Suture Scissors

Which Procedure Should you Select

Wing clipping is a simple procedure[10,15] that needs to be individualised to each bird. It should be provided by people with an understanding of the anatomy (see figure 1) and physiology of

flight and after discussion with the owner as to the bird's local environment[10]. It is an area in which avian veterinarians should adopt a leading role. In some states in Australia, wing clipping is illegal and it is a case of the law working against itself as inexperienced owners attempt this procedure due to the lack of experienced and legal operators being available.

There are several wing clipping techniques available to achieve flight control in a bird[2,,3,6,8,11,12,14,15]. If they are applied correctly they are reversible (with feather regrowth) and cause no pain or disfigurement. You need to identify the owner's expectations and the individual features of the bird's intended environment to select which procedure will give you the appropriate result. It will be a source of considerable ill will if a bird leaves your veterinary hospital with poorly or incorrectly clipped wings[15]. If too many feathers are removed, large or heavy-bodied birds may sustain injuries such as limb fractures, lacerations of the keel region, beak injuries[11,13,15]. If the feather shafts are left overly long, this may result in irritation to the bird and put them on the path to becoming a feather picker[13,15].

Questions to ask/ Features to discuss with the client:

1. Where will the bird be housed ?

Is this a pet or aviary bird
Describe the height of structures available to be climbed. What is the greatest height
What obstacles are present that may be flight hazards
Which rooms in the house will the bird be able to access

2. What are the client's expectations of this procedure ?

Is the bird to be taken out of the house e.g backyard
Any other locations/premises where will the bird be taken
Discuss the aim of preventing upward flight, not rendering the bird flightless

3. What is the birds diet?

look for a history that may suggest deficiencies such as nutritional secondary hyperparathyroidism or hypocalcaemia. In some cases the birds may have fragile bones that will develop spontaneous fractures or fractures associated with normal restraint procedures.

4. When did the bird last moult?

It is best to wait until the bird has fully moulted before performing a wing clip. This allows developing feathers to have the support of the surrounding feathers, as they grow.

Is the bird moulting now. Birds with blood quills are more easily damaged during the restraint procedure. - a little blood goes a long way, particularly on a white bird[12].

5. How well does the bird fly now[11]?

Does the bird fly well enough to require a trim or are they requesting a trim because they feel "it might be due now".

If the bird has been trimmed previously, enquire as to how it was done (the procedure used may or may not still be apparent) and was it successful[11]. Does it need to be modified or has the successful formula for this individual been determined.

Restraint

It is preferable to have two people perform the wing clip[8,10,15]. Usually I hold a large bird in a towel, with my left hand and have an assistant support the wing over the radius and ulna, while I use my right hand to perform the clip. Small birds such as Budgerigars and Cockatiels I simply hold in my hand. Some veterinarians prefer an assistant to hold the bird allowing them two free hands to clip the wing[15]. As with all cases of bird restraint, the person holding the bird should not apply excessive pressure to the body or sternum as this will compromise the bird's breathing.

The person holding the wing should support the humerus as well as the radius and ulna. The wing should not be grasped by the distal extremities or primary feathers as this may result in fracture of the humerus if the bird flaps wildly[2,15].

The wing is gently extended to separate the primary feathers. If there is concern regarding blood feathers being present, the wing should be held up to a strong light to allow transillumination to detect any abnormal feathers or blood filled rachis.

Each feather to be cut is isolated separately, the upper and lower coverts are pushed to the side and the calamus cut between the pulp cap and plumes (downy barbs)[12]. (see figure 2)

To cut the two leading primary feathers or not ?

If the two or three primary feathers at the leading edge are not cut, they serve two important functions. They provide a more aesthetically pleasing result when the wings are folded against the body, and it is less obvious that the wing has been clipped[7,10]. As well they provide support and protection for newly emerging feathers that are fragile and have blood in the rachis[7,14]. These have to be balanced against the point that birds with a strong downbeat (e.g. Quarrions - *Nymphicus hollandicus*) may retain enough uplift to be able to fly. Some avian veterinarians prefer to remove the two primary feathers at the leading edge[2,8,15], but I disagree and prefer to leave them as I have seen too many birds with damaged and bleeding emerging feathers.

Cockatiels seem to be a difficult bird to adequately trim wing feathers and some experimentation and individualisation is required, as they as such strong fliers for their size[10]. Gallagher[7] removed the eight terminal primary feathers bilaterally on one bird, but it was still fly and gain elevation. On a second Cockatiel, he removed the ten terminal primary feathers bilaterally - this bird failed to fly but hit the floor heavily. Currently, his preferred technique is to leave the two terminal primary feathers and cut the adjacent thirteen feathers below the level of the coverts. This allows a gentle 30% fall to the ground with some control of landing.

Axelson[3] described a method that I have used frequently (figure 7)- All the primary and secondary flight feathers, except for three or four secondaries nearest the body and the distal two or three primary flight feathers, are cut even with or a little shorter than the coverts on one wing. The four unclipped feathers closest to the body hide the cut edges, while the distal primaries give the folded wing a more aesthetic appearance and protect growing feathers.

To cut feathers on both wings or not ?

It is strongly recommended by most American avian veterinarians and aviculturists that both wings should be symmetrically trimmed[2,6,9,15]. They argue that an asymmetrically trimmed wing causes a bird to spiral and leads to increased incidence of trauma[14,15].

Harrison[8] recommends a single wing trim (figure 5) for light-bodied birds (Cockatiels, conures, Budgerigars, Australian parrots, dwarf macaws and cockatoos) - this includes all the primaries and most of the secondary remiges on one wing. This is modified for obese or heavy bodied birds such as African Grey Parrots - The two or three leading distal primary remiges are left intact (figure 6). In some cases he recommends other wing clipping patterns be used, but on both wings - for either slow flying species (e.g. cockatoos) or strong flying species, such as cockatiels, where the previous methods have been unsuccessful (figure 8).

For many years, my preferred technique has been to only trim one wing and then to carefully expose the bird to attempts to fly from a very low perch or from the ground. This view has been supported by other avian veterinarians[3,12]. After several attempts at flight where they were thrown off balance, this has usually frustrated them and resulted in no further attempts at flight. In my experience the spiral action was sufficient to teach them that flight was no longer a pleasant experience[3]. However, it would concern me if these birds were left unsupervised and climbed to a significant height and then attempted to launch themselves. If only one wing is trimmed the birds must be more closely supervised.

Birds with both wings trimmed are more likely to be able to fly if exposed to a strong gust of wind[9,10]. This should be discussed with the client. While it is not recommended that any bird be taken outside[8,9], it is often a strong desire by the client to have this interaction with their bird. Birds that are to be taken outside are less likely to fly with only one wing trimmed.

How Short Should the Feathers Be Cut?

Madill[12] and Harrison[8] recommend cutting the calamus between the pulp cap and the plumes (downy barbs) (figures 1 & 2). Alternately, Jones[10], Allen[2] and Gallerstein[6] recommend cutting the primary feathers along the line of the external wing coverts (figure 3). If the feathers are left any longer than this the bird is likely to be able to fly[10]. Jones[10] argues that if the feathers are cut too short there may be increased irritation to the bird and they may have delayed moult or become prone to feather picking. Hillyer[9] adopts a different approach, recommending that the primaries are cut in an arc such that the outermost primaries are cut the shortest and the inner ones are left progressively longer until they reach the level of the secondary flight feathers as this gives a more cosmetic result when the bird stretches its wing (figure 4).

This is just another area that you should discuss with the client before beginning. In my opinion, you need to experiment with the different techniques recommended as no single one will suit all birds or all clients' tastes. Each of these has subtle differences that you need to

discuss with the client as each person's idea of what is aesthetically pleasing is different.

Wing Clipping Procedures

In many cases, it is important to be clear that the main aim of a wing clip is not to render the bird flightless but to prevent upward flight[10,13,15]. A wing trim when properly performed should result in a bird that cannot fly, but can glide gracefully to the ground[9,15]. The bird should not develop any lift in still air and still be aesthetically pleasing in appearance[15].

Wissman[15] proposed a standardised wing trim (figure 9) that meets most of the requirements discussed in this paper. It is a bilateral wing trim involving the distal 6 primary feathers being trimmed. She has also provided a table for different species (Table 1).

Table 1. How many Feathers to Remove? (after Wissman[15])

Bird Species	Number of primary feathers to remove per wing
Amazons	4-5
Budgerigar	6
Cockatiel/Quarrion	6-8
Conures & other long-tailed species	5-7
Cockatoos	7
Macaws	5

As a general guide, young birds and obese birds tend to be poor fliers and should have minimal wing clips, Amazons usually need intermediate clips, while Macaws, Cockatoos and Cockatiels tend to be light-bodied and often require the shortest wing clips[9].

In most cases, there is agreement that:

- The feathers should be clipped proximal to the leading edge of the covert feathers[15]. Always clip the feather below the barbules, as a half-clipped feather will allow more upward flight and requires the removal of more feathers to restrict flight than if the entire feather is removed[15]. As well, leaving a shaft visible distal to the feather coverts is aesthetically unpleasing.

- A sharp pair of nail clippers should be used to avoid splintering the shaft or leaving a ragged edge. Scissors may be used but they require more care and stronger restraint, to avoid more serious damage from the bird suddenly flapping.

- You should always check each shaft you intend to cut, prior to cutting, to ensure there is no blood in the rachis or in an adjacent feather that may be cut at the same time[13].

- Each rachis should be identified individually and isolated prior to cutting[15]. Each feather should be cut individually. If this is a difficult, the feather should be sprayed with alcohol to reveal the condition of the rachis and its contents[15]. Never clip a blood filled rachis[14].

- Large or heavy bodied birds usually need less feathers removed than birds that are thin or normal weight[10,15].

- Remove a conservative number of feathers initially and then adjust as required. I recommend you have a test flight in a room (with a carpeted floor or over a thick towel), to assess the effectiveness of the clip, prior to the bird leaving[8,10,15]. Beware hard flooring and great heights[11]. Hold the bird on a small perch or your arm a short distance above the ground. Suddenly drop the bird downwards to make the bird flap its wings and attempt to fly. Assess the bird's flying ability and remove additional feathers, if necessary, until the bird has no uplift[10,15].

- If a blood feather is found at a specific location on one wing, you will likely find a blood feather at the corresponding location on the contralateral side[15]. Leave this feather for a couple of weeks and trim it once it has fully emerged.

- Access to clipping the rachis is usually better from the medial aspect.

- No wing trim is a guarantee against flight[8,10,11].

- It is not recommended that fledgling birds have their wings trimmed prior to learning to fly well and effectively. They need to have developed the skills to take-off and land properly. These skills are never developed as effectively later in life[15], particularly in African Grey Parrots[10]. Conversely many birds are done at a young age as this allows them to adjust to the procedure more easily.

Different Wing Clipping Techniques

To summarise the techniques described in this article, I prefer to use the categories developed by Lightfoot[11] who describes three basic variations and lists advantages and disadvantages of each:

1. Removal of distal primary feathers on both wings

- She feels this is the preferred method for many birds

- Usually 4-8 feathers are removed

- Advantages:

  a) a balanced clip that is symmetrical
  b) there are no distal primary feathers to cross in the back or stick through the cage bars
  c) Cut the feathers below the coverts is aesthetically pleasing and there are no rachis remnants to irritate the bird and cause feather picking

- Disadvantages:

  a) Some species easily damage new blood feathers as they grow especially African Greys (*Psittacus erithracus*) and Cockatiels (*Nymphicus Hollandicus*).

  b) Distal wing and feather trauma are a common chronic problem in flighty birds

2. Removal of the proximal primary feathers and some secondary feathers

! Advantages

a) this clip retains the protection for distal primary feathers as they grow

! Disadvantages

a) Some species easily damage new blood feathers as they grow especially African Greys (*Psittacus erithracus*) and Cockatiels (*Nymphicus Hollandicus)*

b) Distal wing and feather trauma are a common chronic problem in flighty birds

c) when one or two clipped feathers regrow the bird may regain upward flight

d) this clip is not recommended for any bird which is taken outdoors unprotected

3. The one wing clip

! This is still a popular type of clip

! Advantages

a) you can use either of the above two types of clip or similar modifications
b) this is the best technique to prevent the bird flying away outdoors

! Disadvantages

a) The spiral to the ground will be more pronounced if the distal primary feathers are removed
b) bruising from contact with objects is more common with this technique

Records

Lightfoot[11] recommends that your consultation record should list the number and location of the feathers clipped. She uses a rubber stamp similar to those used for dermatology records in cat and dog cases. This is a simple and useful idea.

Instructions for the Client

! The bird should not be taken outside the house or aviary unless it is in a carry cage or similar[15]. These birds may be able to escape in a gust of wind or if frightened. Many of these birds can still fly well horizontally, although they will usually not be able to climb effectively. Even a short flight may give them access to potentially dangerous situations[15].

! These birds can still climb extremely well and so should not be left unsupervised when out of their cage. Emphasise that a wing trim is designed to deter flight and that no wing trim is a guarantee against flight[11].

- **!** Remember to warn clients that new feathers will replace these ones at the next moult and the bird will require the wing to be trimmed again[9,10,12].

- **!** Treat the bird as a fully flighted bird during each moult[15]. The usual recommendation is that the bird will need its wing trimmed within 8-12 weeks of the beginning of the moult[14]. My preference is to see the birds at two-weekly intervals and do a "top-up" clip until all feathers are done. This normally takes 6-8 weeks.

- **!** Ask the client to call and let you know how well the wing clip is working[11].

- **!** During the first few days at home, give the bird a test flight, each day, to assess how it is adapting to the wing clip. Remind the client that the bird will adapt to the clip with time. Take care with the first test flight as it will be different to how it performed in the consulting room as it is more comfortable at home and it will be stimulated to try what it has been able to do in the past[11].

Figure 1. Diagram of mature primary feather (after Jones[10])

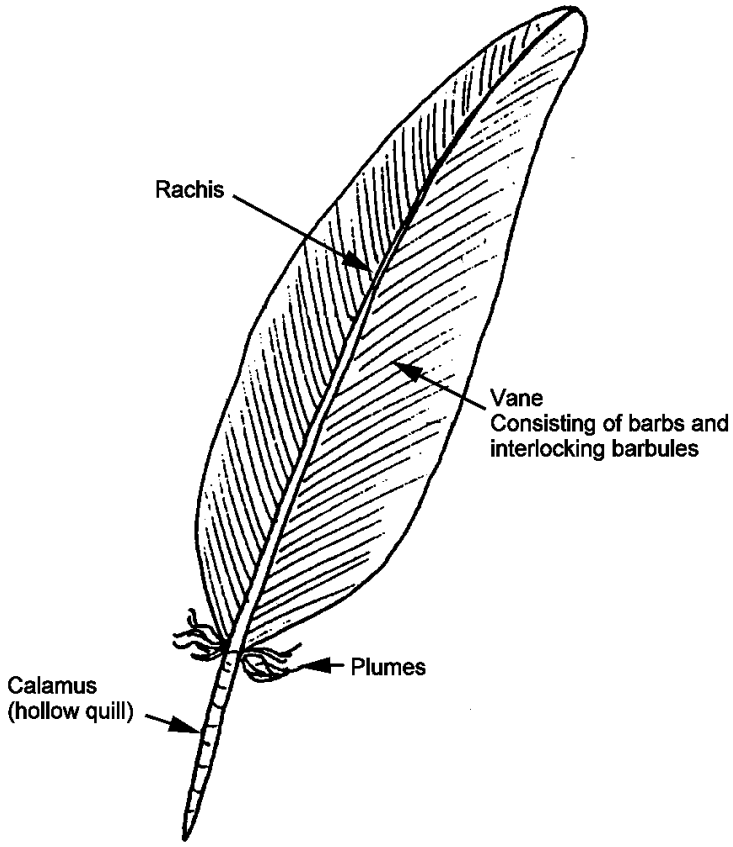


Figure 2. Cross section of wing and primary feathers. (after Madill[12])

Note position of upper and lower covert feathers in relation to calamus of primary feather.

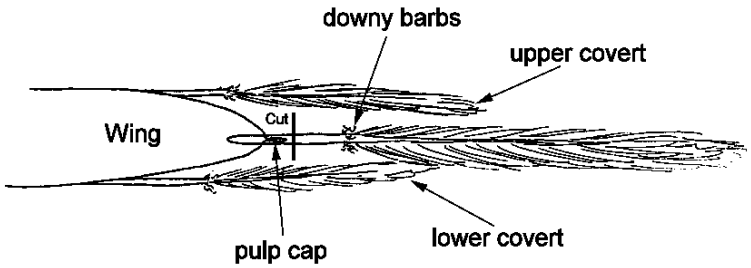


Figure 3. Dorsal aspect of Right Wing (after Jones[10])

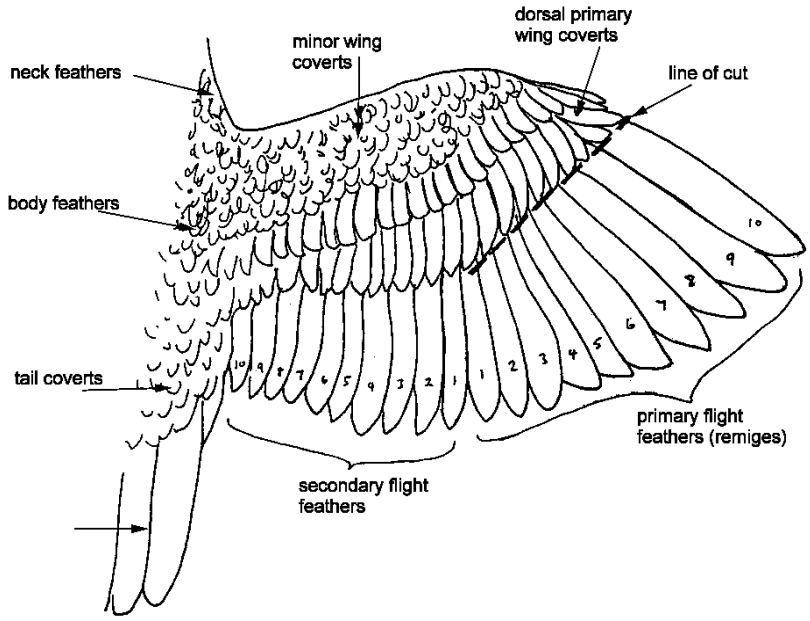


Figure 4. The Hillyer Technique of Wing Trimming (after Hillyer[9])
The primaries are increasingly longer proximally, to blend in with the secondary feathers

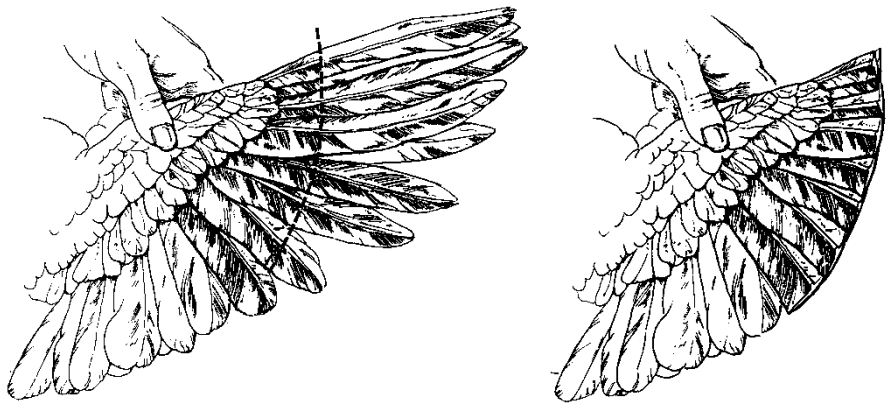


Figure 5. The Harrison Single Wing Clip (after Harrison[8])
(A) before the clip (B) After the clip

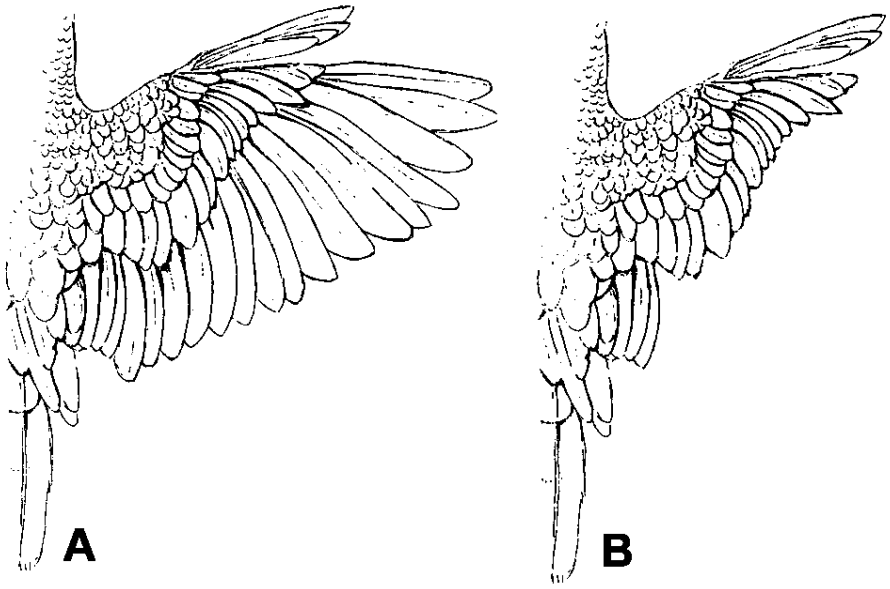


Figure 6. The Harrison Modified Single Wing Clip (after Harrison[8])
The distal primaries are retained

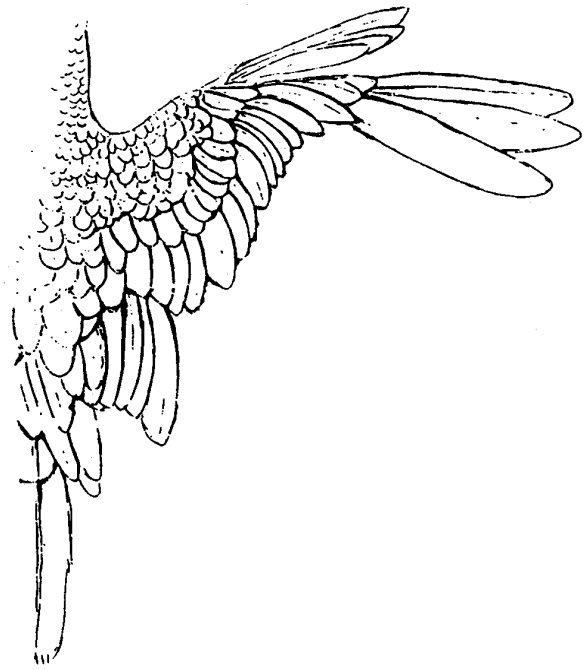


Figure 7. The Axelson Single Wing Clip (after Axelson [3])
(A) before the clip (B) After the clip

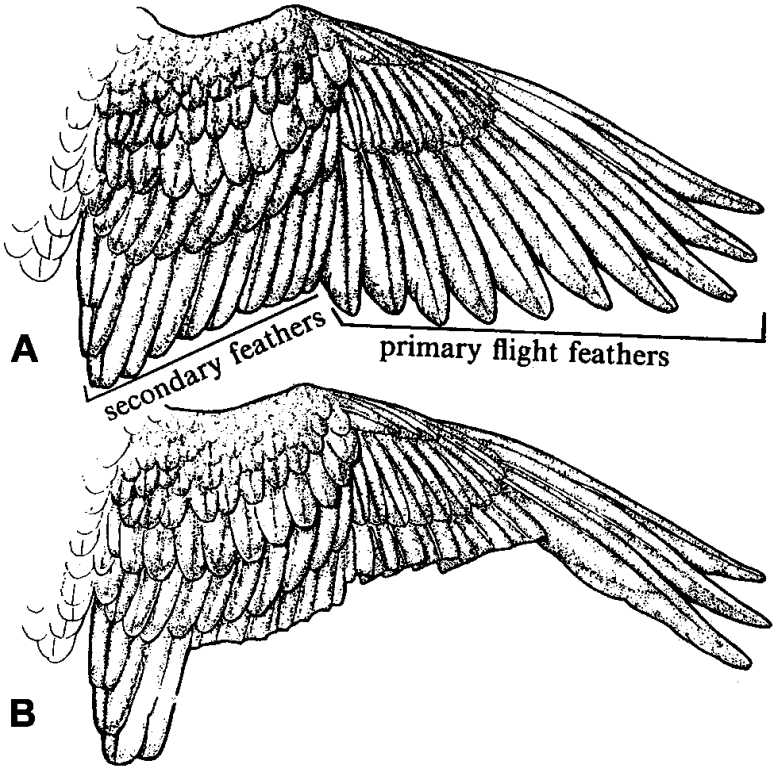


Figure 8. The Harrison Alternative Bilateral Wing Clips (after Harrison[8])
(A) Partial removal of tips of both wings - for slow flying species such as cockatoos
(B) Removal of all primary feathers on both wings is necessary for flight control in some species

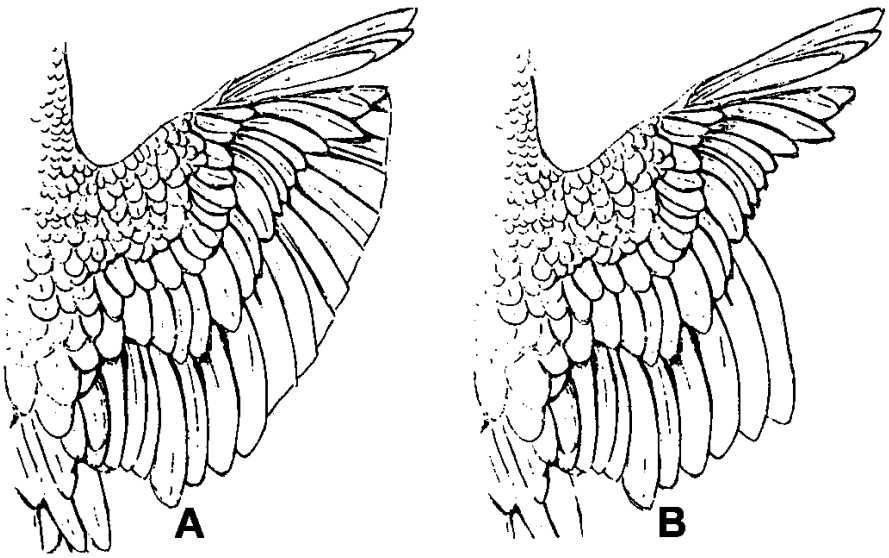
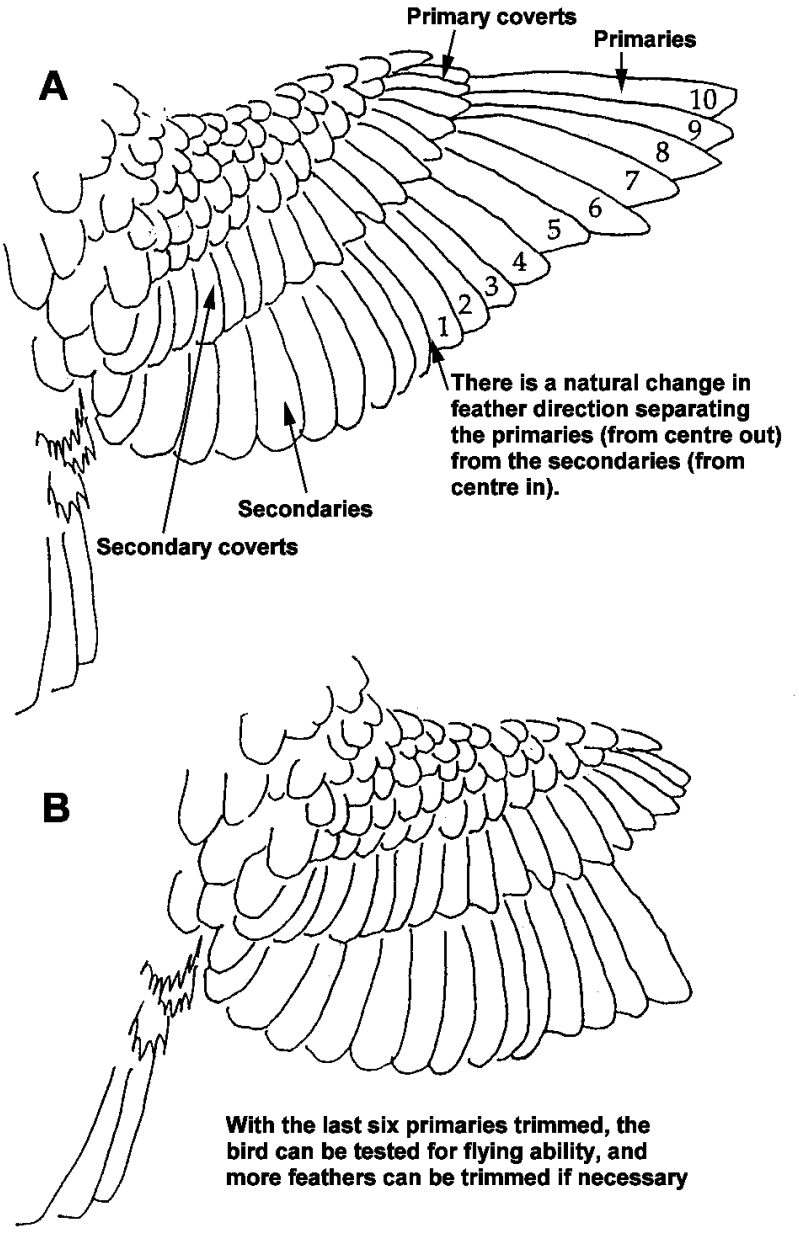


Figure 9. The Wissman Proposed Standardised Bilateral Wing Clip
(after Wissman[15]) (A) before the clip (B) After the clip



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