The 'Naked' Truth: An Examination of Equipment Use with Raptors

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Abstract: The use of 'equipment' (anklets, jesses, etc.) is often considered necessary for safe management of birds of prey, despite the fact that non-raptorial species are trained worldwide and daily in free-flight settings without it. So why is the application of equipment the automatic default for birds of prey? Is it truly necessary across the board, or are there other options available? Can a trainer safely remove equipment from birds who have worn it in the past? Is it an all-or-nothing decision? What considerations should be examined when deciding on equipment types and functionality for birds of prey? Most importantly, can your bird (for lack of a better term) work 'naked'… while still keeping you, your guests, and your bird safe?

Let's take a deep dive into examining the uses, abuses, and necessities of the equipment we put on birds of prey, and look at how we can make safe training and management decisions that reduce intrusiveness while improving the welfare of our animals.

A Brief History of Raptor Equipment

The sport of falconry has a rich history that spans more than two thousand years. Throughout that time—and perhaps longer—humans have kept, trained, and hunted with birds of prey. As part of this long and complex partnership, certain pieces of 'equipment' have become conventional to use with these birds. There are a number of items that humans may find convenient or necessary for their hunting partner to wear: telemetry, bells, backpacks, and more. Some of these items are used temporarily, such as the hoods used to restrict visual stimuli, and some of them—such as anklets and jesses—may be installed with the intention of the items remaining on the animal for months or years.

With that historical foundation, and in spite of significant advances in the art and science of behavior change principles, equipment use (specifically with anklets, jesses, and leashes) remains well-established in zoos, nature centers, raptor centers, and other non-falconry situations. The use of these tools has become so prevalent that jesses are often installed by default the very moment a bird enters human care. The use of this equipment then persists over time, regardless of the behavior of the animal, with no further consideration as to its real purpose or necessity. When a tool is so prevalent across an industry, some may find it difficult to take a step back and question *why* they're using it in the first place, or if there are viable alternatives.

The use of anklets and jesses may (or may not) be necessary for the sake of safety and programmatic goals, but without keen examination, how is a person to know? To avoid the trap of *'because we've always done it that way'*, we believe it's a topic worth examining with a more

critical eye. And when examined, the explanations given for equipment use typically fall somewhere into the following categories:

- The need to protect the trainer from the bird
- The need to protect the bird from the environment
- The need to control the bird's movement

It's worth us digging a bit deeper into this so that we can see when those reasons are valid and when they may be hiding areas of potential improvement. If improved welfare is our goal, reducing or replacing equipment use with skillful training and excellent relationships has the potential to be time well spent… as is acknowledging the many roadblocks that may stand between us and that lofty goal. In either case, discussing the details can bring us one step closer to giving our birds real control over their environments. It also allows us to ask the big question: what does it *really* take to safely and responsibly allow birds of prey to fly 'naked'… with no equipment at all?

Challenges with Equipment Use

But first, is that question even worth asking? If equipment has been used on raptors for thousands of years, is that not good enough proof for us that we should continue with tried-and-true methods?

In fact, the use of equipment actually introduces a number of risks to the bird that could lead to permanent injury or death. The burden of consistently wearing oversized or excessively heavy equipment can damage feathers, bruise scutes, and cause chronic wounds. Improperly sized equipment can lead to constriction injuries, and a bird with permanent jesses may face entanglement risks if it flies off and the jesses get snagged on a tree branch. Equipment that is purchased from commercial sources may be strong and well-made but is unlikely to fit the individual well, while hand-made equipment is only as good as the skill of the person who made it and errors in production can lead to injury, escape, or death. While mitigating some risks, the use of equipment on birds of prey actually introduces a number of other potential dangers that would not exist otherwise.

This is of especially crucial importance to consider with species that are not biologically capable of safely wearing jesses; non-raptorial species do not have the leg strength to consistently avoid injury during a bate, i.e., trying to fly off a gloved hand. Vultures, corvids, and other non-raptorial birds stand to gain even more on the welfare spectrum from the removal of unsafe equipment and it is our vehement belief that they should be prioritized in the discussion whenever possible.

Looking through a broader lens, training animals using the least intrusive, most positive effective methods has become far more commonplace in zoos and other facilities over the past 30 years and continues to be applied cross-taxa and worldwide. This increase in the community's knowledge of behavioral science allows voluntary behaviors to be trained in free

contact with many species who have the potential to be dangerous to humans. Animals such as African crested porcupines, bobcats, coatimundi, komodo dragons, and more are trained daily with no form of restraint used and with the human sharing space (or even holding!) the animal in question… but because of high-level training and the positive relationship that has been established between animal and trainer, risk stays low and safety remains high. Yet despite this increasingly applied knowledge, installing anklets and jesses on a newly-arrived imprint Eurasian eagle owl is still done without pausing to question if it's actually necessary.

Also, inherent to the use of any restraint device are negative reinforcement and positive punishment. Because most people focus on the goal of keeping the bird on the glove, they miss the detrimental side-effects that science has shown are often the result of this type of training. Those side effects include escape/avoidance behavior, increased aggression, phobia (irrational fear of the environment), and apathy. With that in mind, we take a new view of the consequences of what many people feel is simply an inconvenient impulse from the bird on their glove.

So: yes, we believe the question is worth asking. If we continually analyze equipment use on raptors with the goal of increasing welfare over time, we can start to focus on intrusiveness to the animal versus the potential benefits provided, and so can begin to change our perception of equipment from a tool used by default to control an animal to one used only to ensure safety. And if those safety concerns can be addressed equally well or better through excellent training or through the use of less intrusive technology, then perhaps we can remove the equipment entirely and provide the animal with a net gain to welfare while still meeting our other important goals.

Reducing Intrusiveness

With welfare as our guide, whenever we require an animal to live with a foreign object in direct contact with any part of their body— be it ID band, anklet, jesses, backpack, tag, or anything else— it is our responsibility as trainers and caretakers to ensure the object is as minimally invasive as possible to that animal at all times.

Equipment is now as varied as the people creating it and as the animals wearing it. In the past 30 years, the development of synthetic materials and new techniques have changed the objects that are in direct contact with our birds' bodies from traditional buckskin one-piece jesses to materials like biothane, dacron, kangaroo leather, nylon paracord, and more. Some of these changes have been positive ones as far as reducing intrusiveness goes—for instance, kangaroo leather of the same tensile strength as cow leather is thinner and lighter, which allows the use of lighter and smaller anklets with the same or greater strength. The limits of the materials themselves are no longer a reason for a bird to be wearing oversized equipment, especially for the smallest raptor species.

Rather than view the process of evaluating equipment as either keeping it on or taking it off, sensitive trainers can make great strides towards raising welfare by always looking for ways to

reduce equipment's impact on the animal's daily life and experience. The end result may be the same: flying naked! But an eagle who has previously worn bulky cow leather and has had it replaced with braided paracord and by working in protected contact is still likely experiencing less intrusiveness overall, and therefore an overall increase in welfare—and that's an approximation worth celebrating!

A Safety Tool or a Training Tool?

Traditionally—and too commonly—we find on closer examination of training practices that jesses and anklets are being used primarily for *human* safety and convenience, with bird safety only being a secondary concern. If the previously listed categories had '*at the expense of the bird'* added after them, it might encourage us to ask some critical questions:

- **Protecting the trainer (or others) from the bird**
    - *Does the trainer have a high trust account with the bird?*
    - *Is the animal participating voluntarily with the trainer?*
    - *Is the bird currently being trained using aversive techniques? Has it been trained with those techniques in the past?*
    - *Has bird practiced aggressive behaviors towards the trainer? In what context?*
    - *Can the bird reasonably predict a positive result from interactions with the trainer?*

- **Protecting the bird from the environment**
    - *Does the bird have a chronic or permanent injury that would put them at risk if they try to fly off the glove?*
    - *Is this species biologically capable of wearing equipment safely? If not, does this risk outweigh the possible alternatives?*
    - *Is the area which the bird will be working hazardous?*
    - *Are the environmental risks actually affected by the presence or absence of equipment?*
    - *Could the use of telemetry reduce those risks?*

- **Controlling the bird's movement**
    - *Is it truly necessary to restrict the bird to the glove?*
    - *Could the bird be trained to station on a nearby perch or sit reliably on the glove without equipment?*
    - *Does the bird have the ability to comfortably scratch its head, lift both feet, and turn on the glove?*

There are certainly other questions to ask, and many common scenarios that reveal the answers: skinny 12-inch long jesses are used on an owl, because the length allows a trainer to catch them before they fly to a back perch. A falcon is tethered rather than being free-lofted because it's the only way a trainer can safely pick them up while they bate away. A vulture wears jesses and can't be trained to walk free because a facility can't afford the telemetry

needed to find them if they fly off, or don't have the confidence, staffing, or training skills needed to train them to voluntarily crate or recall. Belt-sized straps of cowhide are used on an 'aggressive' eagle because the trainer will be bitten or footed if they were any shorter.

Placing less intrusive equipment on the aforementioned eagle without first working to establish safe basic behaviors and/or altering environmental antecedents could lead to human injury, and in the absence of those basic behaviors, the eagle continues to wear the burdensome equipment. Training must precede the equipment change in this case, rather than following it.

So, Why Not Just Train Birds to Work "Naked?"

That question is far more complicated than it may seem. Of course, we would all like every ambassador raptor to work free of jesses or other restraints, but accomplishing that goal isn't easy. Let's start by taking a look at who handles raptors:

Professional or Full-time Trainers

Basically, this includes falconers and full-time show presenters. For this paper we will focus on show presenters at zoological facilities. The majority of full-time trainers working with raptors are not the IAATE members we see at conferences. They are well-meaning, hard-working staff members of zoological facilities doing the best they can with what they know. They have learned the traditions passed down from others at the zoo, they have learned from falconers, or they have done their best to figure out on their own how to manage raptors in education programs. When these trainers become members of IAATE they gain access to knowledge, strategies and guidance from experts in the field. However, being an IAATE member alone or becoming a Certified Professional Bird Trainer – Knowledge Assessed (CPBT-KA) does not qualify a person to safely free-fly raptors. To safely fly birds free of equipment requires skill and knowledge that comes from expert guidance and experience. IAATE is a great place to start getting that guidance.

Docents and Other Volunteers

Docents and volunteers often play a critical role in the operation of zoological facilities. Without volunteers, many zoological facilities would need to hire paid staff to perform daily duties that are essential to the care of the animals and operation of the facility. But many facilities simply do not have the budget to hire those staff members. When volunteers work at bird shows, it is often the case that the reinforcers for coming to work is the opportunity to handle the raptors. At first glance, this may seem like a good opportunity to get free help with the bird show. However, when volunteers work one or two days a month, as is the case at many facilities, there is precious little time for the person to develop trust with the bird or gain the observational and mechanical skills required to safely manage the bird. That said, we also want to acknowledge the exceptional volunteers who work extraordinary hours and have developed the skills and knowledge that make them proficient raptor trainers. These high-performing, volunteer raptor-trainers are a rare find, and can make huge contributions to the welfare of the

birds and performance of the program… provided the full-time staff allow their contributions, which may not always be the case.

The "Naked Conundrum"

Why not just take jesses off of all raptors? That question is about as complicated as asking "Why not just release all the birds and other animals at the zoo?" Anyone who knows animals (and has a bit of common sense) understands the compromise to the animals' welfare if either of those actions occurred.

To take equipment off of raptors and fly them free requires, most of all, a skilled trainer to guide the process associated with the pre-requisite behaviors of free-flight. It would begin with establishing a trusting relationship with the bird. This involves days or weeks of repetition of positive interactions with the bird. It means giving the bird a "voice" through its body language behavior and acknowledging when the bird says to stay back and only approaching when the bird invites you into its personal space.

Next is creating voluntary approach behavior, stepping on the glove, flying on the creance, generalizing creance flights to novel conditions like locations, people and other trainers, training recall behavior, fitting telemetry, flying free, generalizing flying in novel conditions and so much more. And, training never ends. Every day brings new conditions and new challenges for the bird and the trainer to respond to.

Training birds to fly free of restraints is a highly specialized endeavor. To do it safely starts with a well-established trusting relationship, a strong history of positive reinforcement training, a keen awareness and ability to adjust antecedent conditions, and exceptional sensitivity that allows a person to accurately read a bird's subtle body language. These are things that are developed over time, most often by working with birds on a daily basis. Then, you add to that a working knowledge of the science of behavior change principles and you have the minimum requirements for safely flying birds "naked." The majority of volunteers, docents and even full-time staff rarely meet these qualifications.

Is Training Birds With Jesses So Bad?

Part of this conundrum begs the question, "Are jesses so bad?" In the right hands, jesses are used as a safety tool and not a training tool. However, when staff members have poor training skills, lack sensitivities and awareness, or work so rarely with individual birds that those birds have low trust with them, then jesses are more likely to be used to "Catch birds up" and restrain them during the program. But, when trainers have high skills and sensitivities and create conditions where birds voluntarily participate in programs, jesses are generally not a compromise to welfare.

Then, why all the talk about taking jesses off? It's because a bird without jesses can go wherever it wants and will experience a high level of control in its environment. And, control is

a primary reinforcer, something we want to give our birds whenever we can to help provide better welfare. But, often giving this free-flight control means avoiding aversive stimuli, like conditions or people or crates it works to avoid. But, keeping the bird safe is also part of our commitment to providing good welfare for the birds in our care. To keep a free-flying bird safe requires the bird to return to its crate, cage or home facility after flying free. It takes a skilled trainer with a high trust account with those birds to teach them to return reliably every time, without compromising its welfare by reducing the bird's food or weight to unhealthy levels. So much to think about!

So, jesses or no jesses? What's the answer? As with so many questions, the answer is often, "It depends." Every zoo, every trainer, every bird, is different. Some zoos and zoo professionals are committed to doing all they can for the birds in their care and will spend the money to seek out the right trainers with the skills and knowledge to train the birds at the highest level. Other zoo professionals lack the skill, interest or time to evaluate good welfare of birds in training programs and they are comfortable doing as they always have done before. Some trainers have put in the time and developed the sensitivities and skills that allow them to create inspirational free-flight programs and safe environments for the birds. Other trainers have not developed the skills that move them beyond the forceful and coercive strategies and toward more humane and safe ways of working with raptors, with or without jesses. And finally, some individual birds are great candidates for consideration for free-flight training, while others are simply not the right tool for the free-flight job.

What Else is Needed?

Beyond the training skill described above, it's worth acknowledging that to safely progress through the training steps required to safely fly birds without equipment, there are resources needed that facilities may need that they may or may not already have available. These include (but are not limited to): secure areas that are safe to fly, telemetry, crates, vehicles, appropriate staffing, perching, etc. There is often cost associated with acquiring these resources, and the lack of any one of them may increase the risk involved with losing equipment as a safety tool. When assessing the risk of reducing or removing equipment, it's worth considering how many of these resources are currently available, and whether or not any unavailable but important resources can be acquired *before* the equipment is removed.

A Selection of Case Studies

The studies of the birds that follow outline the progression in decision-making that lead to equipment-based choices for a selection of birds in NEI's collection, as part of an ongoing examination of how to provide our animals with as much control in their environment as possible while also meeting our safety needs:

> **Hades and Luigi (Harpy eagles):** When presenting large and potentially dangerous eagles as a 'walk-out' bird at the ending of a very large show, the desired behavior is for the bird to stay on a trainer's glove during a walk out to stage, to sit either on the

trainer's glove or a nearby perch calmly with duration throughout the ending of the show, and then remain there steadily while a crowd of potentially hundreds of people approach to take photos and talk to the trainer. This crowd can potentially involve service animals, balloons, waving toys and other objects, umbrellas, camera flashes, and very active children. Equipment use as a safety tool was deemed a necessary and responsible choice. To reduce the level of intrusiveness to the animal, both harpy eagles wear permanent anklets while at home in their enclosures, but approach the trainer voluntarily to have jesses and a leash put on through a shift window before going out to show. On return from working, these birds have their jesses and leash removed and so experience minimal equipment-related intrusiveness during the many hours a day when they are at liberty in their enclosures.

Marshall (Martial eagle):
As with the harpy eagles, and because of his individual training history as a bird who was wild-caught and had no previous training history when we acquired him at 11 years of age from an exhibit setting, it was decided that Marshall needed the safety tool of equipment when outside of his enclosure on the glove. However, wearing permanent anklets was also less desirable due to his fully feathered tarsi. This bird was trained to station with duration on a glove while a trainer installed removable anklets and jesses, and similarly sat for duration to have equipment removed at the end of a training session. This allowed him to experience freedom form this equipment when in his home enclosure, during the many hours a day when it wasn't needed.

Arlo (Milky Eagle Owl), A.J. (Eurasian Eagle Owl), Ember (Black Kite): These young birds were hand-reared at NEI, and a team goal was set early on that traditional equipment would never be placed on these animals. To ensure safety needs were met, these three established strong and reliable crating behaviors at an early age, developed comfort in many locations and while experiencing a variety of environmental stimuli, and were generalized to multiple trainers. Each of them currently wears a backpack on which telemetry can be installed. This backpack may or may not be removed in the future, depending on the behavior consistency the birds show over time and the risk factors present in the areas they may be flying. It's worth acknowledging that it is far easier never to use equipment at all than it is to take it off a bird who has always worn it, or—worse!—to put it on an older bird who has never experienced it before.

Khaleesi and Drogo (Aplomado falcons):
These two aplomado falcons were acquired at a young age and were tethered during initial training with traditional equipment and learned to fly on creance before being flown free with jesses. They progressed from being managed in this style to being managed completely 'naked', over a period of around 5 years. This progression occurred with the following steps: once basic behaviors were established the birds were free-lofted and trained to have their jesses threaded before working outside. Once they were trained to crate voluntarily, we kept their anklets on so that we could install telemetry, but stopped using jesses when duration on the glove and other behavioral consistency

meant that we no longer required them as a safety tool. However, telemetry was still desired, so we installed backpacks which allowed us to remove their anklets. Khaleesi, while wearing a transmitter, was unfortunately able to interact with it in a way that allowed her to hook the transmitter's wire through her jaw, which prompted a conversation on our options: go back to leg mounted telemetry and reinstall an anklet? Make alterations to the backpack mount? Try a tail-mounted transmitter instead? Once trainers acknowledged that both birds had demonstrated behavioral consistency over time and in many environments, we chose instead to fly them without telemetry at all; for these birds, in this context, the risk added by telemetry did not outweigh the risk mitigated by its presence. They have since been successful in multiple states and in multiple show locations over the past few years and have proven to be some of our most reliable performers.

Removing Equipment Isn't All or Nothing

As outlined above, equipment removal does not need to be an all-or-nothing exercise. Instead, it's more of a constant decision-making process where a trainer analyzes potential risks while reducing the intrusiveness experienced by the bird when possible. A bird who is consistently tripping over oversized equipment or experiencing feather damage because of a dangerous tethering setup is not experiencing the highest welfare possible… but neither is a poorly-trained bird wearing no equipment who flies off the hand mid-program and is struck by a car. While trainers cannot control all aspects of the bird's environment, making the decisions that allow the animal the highest welfare over time—even if that decision is ultimately to keep equipment on the bird—should always be our goal. And we can dial in these decisions by asking more questions:

- *Is the animal's behavior towards the trainer such that equipment is required to keep the trainer safe? Is aggression or escape behavior present, which may indicate a relationship challenge with this animal?*
- *Is this equipment keeping the trainer safe at the expense of the animal's comfort?*
- *Can the equipment be made smaller, shorter, or lighter while still meeting safety goals?*
- *Can this equipment be removed (in whole or part) without compromising safety, even if it requires more effort on the part of the trainer, and even if it can only occur some of the time?*
- *What behaviors need to be performed fluently and reliably for the trainer to feel confident giving more control to the animal? Has this animal demonstrated fluent recall despite environmental distraction?*
- *Has evidence-based testing been conducted? How many times does the bird 'need' the safety tool—i.e., how frequently do they bate, and in what circumstances?*
- *Do the staff working with this animal have the skill required to ensure both human and animal safety without the use of equipment? If not, is it possible to move towards this goal?*

- *What potential dangers are added to the animal's environment through the use of equipment? What potential dangers are removed from the animal's environment through the use of equipment? Do comparing these two lists reveal which is the better choice?*

It is our commitment at Natural Encounters, Inc.—as a company and as a team—to examine all equipment use and to resist the urge to default to previous practices out of habit or convenience. In our context, equipment use is considered on a case-by-case basis and with a decision-making process that involves welfare, bird safety, risk management, and the goal of future reduction or removal when it is in the best interests of the animal.

Acknowledging Potential Risks and Drawbacks

Removing or choosing never to use equipment with a new or existing bird is something that requires careful consideration from all parties involved. What is the bird's future? What behaviors do they require? What programmatic goals do you hope to achieve with them? If the bird will be required to be used in fisted static demonstrations in novel and potentially variable environments, then removing equipment may not be beneficial, unless other program goals or options are discussed first.

If you are considering attempting to re-train a free-lofted 'legacy' raptor—a bird who has been traditionally trained with aversive techniques—then cutting off equipment before stating is a great way to avoid the temptation to hold jesses or move along faster than relationship and the bird's behavior dictate. By the time the bird is voluntarily coming to the glove and staying for duration while the trainer navigates the enclosure, then if equipment is still needed at that point, re-evaluate and test to see if removable equipment can be used or if there is some way in which to ensure safety needs are met without removing the agency the animal has only recently regained. It is also worth noting that legacy raptors are some of the most difficult birds to re-train using positive reinforcement techniques; when a bird has spent most of its life without the ability to say 'no', it is likely to say 'no' frequently and intensely after realizing it actually has the ability to do so. Patience, persistence, and consistent evaluation is key.

The Bottom Line: It isn't about NEVER—it's about WHENEVER.

At the end of the day, any decision we make in regard to equipment starts with a goal of reducing intrusiveness using welfare as our guide. Will this decision increase the welfare of the animal, or will it potentially decrease their welfare due to increased risk to the bird? Again, it is worth acknowledging that not every facility has the resources to remove equipment safely, nor do they necessarily have the organizational support to change that. Even facilities that have both of these resources may have management who prioritizes human safety over animal safety or who may not agree that the use of equipment impacts welfare at all. These facilities can still make positive progress towards reducing intrusiveness by closely examining their training practices and the type of equipment used on each individual bird. Changing methods, materials, length, size, or permanence may be possible. Small approximations towards reducing

the burden of the equipment while maintaining animal safety can pay enormous dividends over time.

We acknowledge that the questions which must be answered, and the factors involved in making the choice to remove equipment from an animal (or never to use it in the first place) are not simple to navigate. It's also important to support others, no matter what step they're at in reducing equipment intrusiveness, as we do not all have the same resources available and the goal remains the same—to keep our birds safe, and their welfare high. So rather than focusing on decision to *never* use equipment, our community and our industry has the ability to focus on reducing the intrusiveness of equipment use *whenever* we can safely do so. If this ultimately leads to a high-level goal of moving towards a future where equipment is no longer considered appropriate to use with raptors, it can only happen in a world in which all of those raptors are being trained at a level that allows it, and with trainers who have the skills, resources, knowledge, and facility support required to do so. That is a lofty goal, but it's a good one to strive for!

The bottom line is this: whenever we can manage it safely and we believe it will raise an animal's welfare through providing more choice and control in their environment, we will continue to make sure our birds don't wear anything more than the bare minimum needed to keep them as safe as possible. And *that's* the naked truth.