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ORIGINAL ARTICLE

Outcome charts pilot project: for their welfare and yours

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Abstract

As a veterinarian or rehabilitator, it can be hard to make triage decisions for displaced, ill or injured animals. Does this animal have a good likelihood of release? Should it be euthanized? What about permanent placement? While some of this information exists in codes, standards, publications and anecdotes, navigating it can be difficult. Partners for Wildlife staff and fellows, along with subject-matter-experts have compiled outcome charts for seven groups or specific species of commonly presented wildlife: bats; cervids; freshwater turtles; mink (*Neogale vison*); rabbits and hares; raptors and vultures (*Cathartes aura and Coragyps atratus*). These concise charts are designed to promote timely and humane decisions for their welfare and yours.

Keywords

Wildlife rehabilitation; triage; timely decision-making; euthanasia; captive placement; release to the wild

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Abbreviations

IWRC: International Wildlife Rehabilitation Council
NWRA: National Wildlife Rehabilitators Association
SME: Subject matter expert

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Introduction

Wildlife rehabilitation is the treatment and temporary care of injured, diseased and displaced indigenous wildlife, and the subsequent return of healthy animals to appropriate habitats in the wild (Miller 2012). While release to the wild is the intended outcome, euthanasia is a common outcome. Some consider permanent placement in human care as an outcome. A consensus is lacking among wildlife stakeholders regarding any positive and/or negative impacts of wildlife rehabilitation on individuals or populations, or our shared environment (Cooper & Cooper 2006; Monadjem et al. 2014; Hagen et al. 2024; Mullineaux & Pawson 2024). Equally nebulous is the definition of "success" in wildlife rehabilitation. Is it relief of individual suffering? Is it the number of animals released back to the wild? Or contributions of these animals returned to the ecosystem? (Mullineaux & Pawson 2024).

An animal's welfare, or its quality of life under human auspices, is of increasing concern to the public. Concurrently, the influence of community, termed social license to operate, is expanding to a variety of animal-based industries, including wildlife. Within that social license to practice, animal welfare is increasingly a priority (Hampton & Teh-White 2019; Hampton et al. 2020). There is a growing realization that people have significant impacts on the lives and welfare of wildlife (Kirkwood 2013; George et al. 2016). Given the lack of a shared perspective among stakeholders regarding wildlife rehabilitation, and a social culture of positive welfare for wildlife, it behooves wildlife rehabilitators and veterinarians to prioritize the welfare of the animal.

Outcome decisions (release to the wild, euthanasia, ± captive placement) have welfare consequences for wildlife. Triage and making timely decisions are also emotionally and ethically challenging for wildlife rehabilitators and veterinarians (Mullineaux 2014). This is especially true for those new to the field or those individuals without strong mentorship (White et al. 2023). Appropriate outcomes are also strongly dependent upon available resources and appropriate reference materials. While some of this information exists in codes, standards, publications and anecdotes, navigating it can be difficult.

Having species and facility-specific frameworks can help guide decision making, diminish moral distress for caretakers and ensure consistent, timely and humane outcomes for wildlife presented for rehabilitation. Frameworks can augment conversations between regulatory authorities, veterinarians of record and rehabilitators about animal welfare, decision points and outcomes.

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In addition, developing taxonomic or species-specific outcome charts with leaders in the field is a way of further establishing best practices and professional standards.

Materials and methods

Partners for Wildlife is an initiative of The Raptor Center, part of the University of Minnesota College of Veterinary Medicine. One component of this initiative is an annual fellowship program consisting of permitted wildlife rehabilitators and veterinarians interested in clinical wildlife medicine. Initially, the outcome charts were used as learning/teaching exercises for the cohorts. A framework was devised by Partners for Wildlife staff with explanations for each criterion (see Table 1). The Outcome Chart template includes the following categories:

- organizational mission statement
- legal restrictions (international, tribal, United States federal, state and local as applicable)
- animal assessments (physical, emotional (affective) and behavioral/environmental)
- resources required versus available for outcome (euthanasia, rehabilitation or captive placement)
- reference materials (evidence-based science, professional standards, best practices)

Outcome charts were initially drafted by Partners for Wildlife fellows; each fellow chose a species or taxonomic group of their interest, demonstrating the flexibility of the tool. Once drafted, the charts were shared with taxonomic SME. Each SME group included both wildlife rehabilitators and clinical wildlife veterinarians with experience in that taxon or species. Subject matter experts were identified via participation in wildlife rehabilitation conferences, related publications and/or professional recommendations. Each SME group was given the draft outcome chart. They were asked to establish specific professional standards via consensus for the most common scenarios for that taxon/species, with special consideration for early-stage professionals.

Results

The following outcome charts have been completed (see Appendix 1):

- American mink (*Neogale* (formerly *Neovison*) *vison*)
- Bats
- Cervids
- Rabbits and hares
- Raptors (excluding New World vultures and California condors)
- Turtles (aquatic/semi-aquatic freshwater and terrestrial species)
- Vultures (Turkey vultures (*Cathartes aura*) and black vultures (*Coragyps atratus*))

Discussion

The process of wildlife rehabilitation is impacted by what is allowed under federal and state regulations, informed by wildlife rehabilitation science and best practices and influenced by professional and personal ethics. At the center of this triad is animal welfare, which requires appropriate triage and timely decision-making regarding outcomes.

A general template was developed based on the above criteria (Table 1) and provided examples for groups or individual species of commonly presented wildlife. For maximum utility, each outcome chart needs to be adapted to the individual facility, the state where the facility is located and the species or taxonomic group. As an example, the Raptor Outcome Chart has been customized for The Raptor Center and the state regulations of Minnesota.

Components of an outcome chart

Organizational mission statement. Each facility has its own mission, which may influence the outcome of wildlife. For example, not all facilities can or will accept domestic, non-native or invasive species, and not all facilities will place wildlife into permanent human care.

Legal restrictions. These are primarily federal or state regulations although occasionally, international, tribal or local regulations may apply. Some species or taxonomic groups have applicable federal regulations, whether regarding wildlife rehabilitation or some other aspect of federal law including controlled substances, off-label drug use or use of drugs in game animals (Clapham et al. 2019). In a like manner, each state has its own policies regarding wildlife rehabilitation including permits, endangered or restricted species, release or placement options, etc. States also have applicable regulations regarding the practice of veterinary medicine, reportable diseases, euthanasia and public health.

Assessments. After mission and legal considerations, the results of the physical, affective and behavioral assessments are major determinants for an animal's outcome, especially for the euthanasia outcome. These assessments are based on Fraser's Three Spheres model of animal welfare (Fraser et al. 1997). The World Organization for

Table 1 Generic outcome chart template with suggested prompts.

Criteria for Outcomes in U.S. Wildlife Rehabilitation

Example Taxon Group/Species Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal restrictions			
Federal	Are there any applicable federal rehabilitation permit requirements?	Are there any applicable federal rehabilitation permit requirements?	Are there any applicable federal placement permit requirements?
	Are there any other applicable federal requirements?	Are there any other applicable federal requirements?	Are there any other applicable federal requirements?
State (List)	Are there any applicable state rehabilitation permit requirements?	Are there any applicable state rehabilitation permit requirements?	Are there any applicable state placement permit requirements?
	Are there any other applicable state requirements?	Are there any other applicable state requirements?	Are there any other applicable state requirements?
Assessments			
Physical/Body	What clinical signs would require an immediate euthanasia for this taxon?	What are your physical release requirements for this taxon?	What are the physical requirements for this taxon to thrive in captivity?
Emotional/Mind	What mental conditions would require an immediate euthanasia for this taxon?	What are your mental release requirements for this taxon?	What are the mental requirements for this taxon to thrive in captivity?
Behavioral/Nature	What behavioral conditions would require an immediate euthanasia for this taxon?	What are your behavioral release requirements for this taxon?	What are the behavioral requirements for this taxon to thrive in captivity?
Resources (Required vs Available)	What resources are needed to perform euthanasia?	What resources are needed for release?	What resources are needed for captive placement?
Reference materials (most recent version)	What professional standards do you utilize for euthanasia of this taxon?	What professional standards do you utilize for release of this taxon?	What professional standards do you utilize for captive placement of this taxon?

(Any additional notes)

Animal Health and others define animal welfare as "the physical and mental state of an animal in relation to the conditions in which it lives and dies" (WOAH 2024). Determining the state of an animal's physical, emotional and behavioral welfare will assess how well that animal will adapt to the rigors of wildlife rehabilitation.

The most specific section in the outcome charts is physical assessment, under the euthanasia outcome. Especially for those new to wildlife rehabilitation, knowing when to euthanize an animal can be challenging. What is the prognosis for common causes of admission? What types of permanent anatomical injuries are compatible with release to the wild? Having specific, predetermined humane endpoints can ensure timely euthanasia for animals, as well as diminish moral distress associated with decision-making for caretakers.

Unassisted deaths of wildlife in care, or lengthy time-to-death parameters are indications of poor-quality triage, diagnostics, treatment or husbandry protocols (Molina-Lopez et al. 2013; Cope et al. 2022). More outcome studies are being published in the wildlife rehabilitation literature that separates death outcomes into euthanasia and died-in-care. Those that are longitudinal studies consistently show euthanasia percentages rising, concurrent with unassisted or natural death percentages falling (Molina-Lopez et al. 2013; Orós et al. 2016; Montesdeoca et al. 2017; Inzani & Williams 2018; Mullineaux & Pawson 2024). Proposed reasons include additional regulations, more formalized protocols, improved education and training, better access to veterinary care and greater awareness of animal welfare and behavioral needs.

Physical assessment under the euthanasia outcome is the most detailed section because physical assessments can be more comprehensive and objective and often require a substantial veterinary medicine knowledge base. None-the-less, affective and behavioral assessments are equally as important. Unfortunately,

these assessments can be more subjective and there are substantially fewer publications, especially in the wildlife field (Diggins et al. 2022; Goldenberg et al. 2022; Willette et al. 2023). It can be challenging to identify these specific assessment items related to outcomes without detailed natural history and behavior information, which is often lacking in wildlife.

Optimum assessments in physical, affective and behavioral categories are required for release to the wild; suboptimal assessments generally result in euthanasia of the animal (Willette et al. 2023). In some instances, captive placement may be considered. Considerations include the purpose for this placement and what this animal's quality of life will be now and over the long-term. What are the physical, emotional and behavioral requirements for *this individual to thrive* in captivity? Is the placement type—education, exhibition, breeding, foster, research—appropriate and available? Does the facility have the appropriate permits, resources, knowledge, training, veterinary and welfare standards for **this individual**? Federal and/or state regulators may require permission as well as documentation of the animal's current and future suitability to permanent placement in human care. This evaluation should be current and comprehensive and ideally, involve experienced, impartial professionals.

Resources. All outcomes require specific resources including the facility, supplies and equipment, funding and rehabilitative and veterinary knowledge and skills (Mullineaux 2014; Cope et al. 2022; Mullineaux & Pawson 2024). If the necessary resources are not available, the animal should be stabilized and quickly transferred to another permitted rehabilitator who does or be euthanized in a timely and appropriate manner. Many facilities fail to recognize the fact that stretching resources for "just one more animal," exceeding their capacity for care or "trying less than optimum practices" to avoid euthanasia, ultimately jeopardizes the health, welfare and successful outcome of that animal, as well as other animals undergoing rehabilitation at the facility (ASV 2022).

Reference materials. Finally, list up-to-date reference materials appropriate for the species or taxonomic group. When possible, preference should be given to evidence-based science in textbooks and journal articles, along with best practices and standards established by professional organizations as noted in the example outcome charts.

As with all written policies or protocols, outcome charts need to be updated on a regular basis as standards are updated, new information is published, resources change, professional skills improve with experience and wildlife rehabilitation and welfare evolves.

Conclusions

Regardless of an outcome chart, all wildlife undergoing rehabilitation are, at best, likely to experience neutral animal welfare and many are experiencing poor animal welfare due to captivity, pain and stress/distress (Cooper & Cooper 2006; Schott 2015; Willette et al. 2023). Longer time in captivity (length of stay) has the potential to lead to secondary problems, spread of disease or inappropriate behavior upon release (ASV 2022; Mullineaux & Pawson 2024). Due to this constant state of "less than good welfare," every animal undergoing rehabilitation should be re-evaluated on a regular and frequent basis to ensure that it is making satisfactory progress towards its release to the wild. For any individual that is not advancing in an acceptable manner, its outcome decision should be re-visited, and adjustments made as appropriate.

These outcome charts provide the wildlife rehabilitator and the veterinary practitioner with decision-making information in a readily available and concise format, especially for those new to the field or when dealing with a new species or taxonomic groups. It is hoped that these few outcome charts can be an impetus for others to expand and improve upon (especially in the affective and behavioral assessments) and develop and publish additional outcome charts with leaders in the field, further establishing best practices and professional standards.

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Recommended reading

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Poisson K. & Weiss, R. eds. 2021. *Wildlife rehabilitation: A comprehensive approach*. 2nd ed. Eugene, OR: The IWRC.

Authors' Bios

Michelle Willette is a senior veterinarian at The Raptor Center, an assistant professor at the University of Minnesota College of Veterinary Medicine and Intern Program Supervisor for Partners for Wildlife. She has an extensive background in zoological and wildlife medicine with an emphasis on animal welfare, disaster preparedness and response and public health.

Gail Buhl is the Partnership Coordinator for Partners for Wildlife. She has been involved in wildlife rehabilitation as a volunteer, board member of a state organization and a state and federal permit holder for over 30 years. Gail presents at many state and national wildlife rehabilitation and ambassador animal conferences.

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Appendix 1 All sample taxa tables.

Criteria for Outcomes in U.S. Wildlife Rehabilitation
American mink (Neogale (formerly Neovison) vison)
Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal restrictions			
Federal	Drug Enforcement Agency—Controlled Substances Act	It is not legal to release domestic, also identified as farm or ranch, minks[1] Drug Enforcement Agency—Controlled Substances Act Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	USDA Animal Welfare Act licensed facility, unless exempt
State	Veterinary license or appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding disease considerations (e.g., rabies, SARS- CoV-2, HPAI) - See state Reportable Diseases list	Appropriate state wildlife rehabilitation permit Minks are considered a rabies vector, SARS-CoV-2 vector, HPAI vector and fur-bearer species, which may have additional restrictions with regards to rehabilitation and release	Appropriate state wildlife placement permit, specific restrictions may apply for domestic minks Local restrictions may apply Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical/Body	Non-resolvable neurological issues Non-repairable bony fractures or soft-tissue injuries Distemper or rabies (rabies suspects should be submitted for testing) Mink enteritis virus or Aleutian Disease Virus (ADV), also known as mink plasmacytosis Non-resolvable spinal trauma with pelvic limb paralysis, absent voluntary motor and no appreciable pain response Irreversible toxicosis, e.g., from environmental toxins such as PCBs, dioxin or lead, or from poisons such as rodenticides Organ failure Limb amputation Blind or deaf from injury or illness[1]	Full recovery from illness or injuries with no evidence of pain or complications Possess adequate senses, dentation, limbs, tail, digits and claws for obtaining and consuming food, obtaining shelter and escaping predators[1] Goals of physical reconditioning met with normal activity mechanics, body condition, agility, strength and endurance for age, sex and season	Injuries are completely healed Injuries or illness will not progress Permanent disability compatible with captive purpose Will not require constant pain management or other intensive care management Able to engage in water play and other natural activities such as climbing and roaming (important for reducing or limiting stereotypic behavior[1])
Emotional/Mind	Unable to process environmental signals (presence of prey or danger), with no signs of improvement Stress of treatment and captivity outweighs benefits of rehabilitation	Able to function normally, including appropriate response to threats and potential prey	Injury/illness is not painful Adapting well to captivity, with appropriate barriers from the public and minimal fear or stress No indication of stereotypic behaviors with appropriate housing[1]
Behavioral/ Nature	Inability to provide normal self-care (grooming, toileting)	Exhibits natural behaviors	Exhibits species-specific behavior

(*Continued*)

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Criteria	Euthanasia	Release	Captive placement
	Inability to self-feed	Able to recognize, hunt, capture, dispatch and consume natural prey in the natural environment *** Note: "habituation" does NOT constitute a reason for being non-releasable[1] ***	Injury/illness will not prevent opportunities to thrive (rest, move, engage in water play, navigate to higher levels, self-feed, groom, explore) Does not exhibit self-destructive or stereotypic behaviors[1] Not stressed by captivity
Resources (Required vs Available)	Training/PPE to safely and humanely euthanize in accordance with professional standards Required licensing for method Ability to appropriately dispose of carcass considering human, animal, and environmental health	Resources required for care or treatment and reconditioning including: facility; supplies and equipment; diet and knowledge and skills Understanding of species biology, natural history and welfare and behavioral needs Appropriate release protocol, including season, weather and release site Ability to supplement food during initial post-release period, especially for minks brought in as infants or juveniles (generally supplement > 2 weeks post release for juveniles)	Appropriate placement available (permits, resources, knowledge, training and welfare standards) Has access to veterinary services by a provider knowledgeable about mustelid care and challenges Appropriate housing available, including sufficient space and enrichments[1] Environment appropriate to exhibit natural behaviors Ability to offer training to minimize stress during shifting and other procedures
Reference materials (Most current edition)	AVMA Guidelines for Euthanasia of Animals NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter, et. al. AVMA Professional Code of Ethics NWRA Professional Code of Ethics Global Federation of Animal Sanctuaries (GFAS) Standards for Caniform[2] Sanctuaries	IWRC Wildlife Rehabilitation—A Comprehensive Approach NWRA Professional Code of Ethics – Wildlife Rehabilitators Exotic Animal Formulary. Carpenter et al. Medical Management of Wildlife Species. Hernandez et al. GFAS Standards for Caniform[2] Sanctuaries Wild Mammals of North America, edited by George A. Feldhamer, Bruce C. Thompson, Joseph A. Chapman	Association of Zoos and Aquariums Mustelid (Mustelidae) Care Manual GFAS Standards for Caniform[2] Sanctuaries NWRA Professional Code of Ethics – Educators Exotic Animal Formulary. Carpenter et al. Medical Management of Wildlife Species. Hernandez et al.

[1] Refer to the evaluation criteria for more information.

[2] The Caniformia, or Canoidea (literally "dog-like"), are a suborder within the order Carnivora. They typically possess a long snout and nonretractile claws and include minks.

Natural history considerations. Minks are semi-aquatic mammals that thrive in a variety of habitats which include access to a permanent body of water—pond, creek, stream, river, lake or ocean. They are strict carnivores, and their preferred prey is rodents, but they will consume nearly any source of protein available to them including other mammals, reptiles, amphibians and aquatic or avian species. Careful selection of a release site to match the individual being released is an important component of a successful reintroduction to the wild. Minks are tolerant, disdainful even of humans and are unlikely to be aggressive towards humans outside of normal wildlife aggression if starving or fearful. It is difficult to promote a bond between a human and wild mink that will persist beyond adolescence (this is less true of domestic minks), although juveniles may retain a measure of dependence and reliance on primary caretakers longer into the fall than expected, especially females. They will outgrow this, and achieve independence, in their own time. Thus, habituation and imprinting are not considered to be a concern even for a juvenile raised as single, when appropriate release conditioning is provided.

Minks are independent and while often believed to be territorial, the evidence is weak and, to the contrary, fur trappers will repeatedly trap multiple minks in a small area. Early autumn is the preferred time of year for release. Highest mortality will be seen with winter and early spring release.

Domestic minks, also referred to as farm or ranch minks, are American Minks that have been intensely bred since the late 1800s to obtain the highest quality and quantity of pelt for the lowest cost. Breeding has focused on three primary areas of interest: coat color, reduced or absent fear, aggression towards humans and pelt size. This has resulted in an animal which often quickly grows to be 2–5 times larger than its wild counterpart, with little difference in size between the sexes; there may be loose bags of skin on the haunches (greater pelt area) and fur colors vary dramatically and include white, fawn, silver, red, blue and multi-colored (see https://furcommission.com/true-colors/). Fur color is an indication of selective breeding intensity, with more of the "wild" traits seen in the native dark brown, black and albino. Other changes include an altered metabolism often leading to obesity, and a more "social" nature, allowing them to live in proximity with other minks without being excessively stressed, in addition to typical health concerns associated with inbreeding. Domestic minks released into the wild generally have poor survival rates and negative impacts on native populations.

Stress and stereotypic behavior. Perhaps the most widely used behavioral indicator of welfare problems in captive animals is stereotypic behavior (SB). Minks display a variety of SBs like those displayed by other Carnivora. Thus, they show the whole-body forms typical of this taxon (e.g. pacing back and forth and whole-body bobbing), head-only forms (e.g. head bobbing, head twirling and head weaving) and finally, minks, like some other captive mustelids, can also repeatedly scratch at enclosure walls with their front paws ("scrabbling"). Note that SB may help an individual to cope; for example, minks that perform high levels of SB may be more confident and less fearful than minks stereotyping less.

Scrabbling seems to be most often directed toward minks housed in close proximity (especially two males housed next to each other) and is reduced by increasing the distance and barriers between cages, along with an enriched environment. Whole-body and head-only SBs may be alleviated with an enriched environment. Biting and attacking the bars of the cage and/or littermates, and self-mutilation, including fur biting, are other indications of stress.

Once the animal is self-feeding, housing juveniles in pairs, especially male/female pairs, until about six months of age, along with access to water for swimming, structures for climbing, platforms to rest upon, interactive items such as ropes and toys and chunky or whole prey food, has been shown to increase the quality of care and reduce stress and SBs in captive minks. Adults should be housed with similar forms of enrichment, except individually.

Minks should not be smelly. A mink that is "poofing" is a stressed mink, and the source of stress should be identified and addressed. A mink on an appropriate diet should not have strong smelling feces.

Captive housing and release environment. Minimum housing for minks should include access to a nest/hide box, a pool (defined here as a body of water large and deep enough to for the mink to submerge its entire body) with easy access in and out of the water, such as ramps, and an elevated platform to rest upon. More space (aquatic, vertical and horizontal) is always better than less for reducing stress and for pre-release conditioning, but if there are resource limitations then consider the following: hiding spaces and a pool are minimum requirements, along with food and access to fresh drinking water; additional levels are more valued than horizontal space (go up, not out, if you must choose one or the other). Cage size limitations can be offset with additional and (gradually) changing enrichment such as manipulable toys; tunnels; a variety of natural prey foods and food textures; varying the size and shape of the pool and resources for climbing and resting such as platforms, hammocks and shelves.

Mink release sites require appropriate habitat and abundant prey. Wild minks are commonly found along the edges of waterways such as lakes, rivers and streams with abundant prey hideouts and cover, including grassy or brushy banks, overhanging banks, log jams and along the jagged edges of wetlands with large areas of open water. In marine environments, minks select shallow vegetated and tidal slopes, and sites protected from waves. Beaches with small rocks should be avoided, due to the lack of cover and low abundance of prey. Natural prey includes small mammals, slow moving and small fish, frogs, crayfish and crabs and young muskrats. Minks will also opportunistically consume rabbits and hares, squirrels, birds and their eggs, reptiles, aquatic insects, earthworms and snails. Minks should not be released near sites with protected ground nesting birds, to minimize human conflict.

Medications. Guidelines for ferrets should be followed when choosing medications and vaccines. If ferret recommendations are not available, then follow guidelines for felines.

Physical attributes. The following is a list of physical attributes and their purpose, to help determine appropriate rehabilitation and release or captive placement opportunities versus euthanasia. For release, the mink must demonstrate an ability to locate, capture, kill and consume the prey available in the release area; navigate the terrain; provide self-care and escape predators and other threats to be deemed releasable.

Citation: *Wildlife Rehabilitation Bulletin* 2025, *43*(1), 1–76, http://dx.doi.org/10.53607/wrb.v43.294

Tails. The tail is used as a prop for balancing and serves as both a rudder and stabilizer in the water. A loss of over half the tail length will limit the animal's ability to catch fish, dive, navigate deep or challenging water ways and limit the animal's ability to escape using a water way. This does not render the animal non-releasable, but a release site will need to be selected with abundant non-aquatic prey and access to quiet, shallow water. With time the animal will learn to compensate for balance and other aspects of tail use but is unlikely to ever be an agile swimmer able to make sharp turns, dives, barrel rolls or spin in the water.

Teeth. The canine and carnassial teeth are necessary for seizing, killing and tearing into whole prey, and also for protection against attack. The animal must be able to capture and consume a sufficient quantity and variety of prey available at the release site to support its naturally high metabolism. A mink without adequate teeth for release may still do fine in captivity with an appropriate diet of ground or chunked meat, and with access to rope and toys such as those made for cats and small dogs that can double as dental cleaning devices and provide an outlet for the need to chew.

Nose, eyes and ears. Vision, hearing and the sense of smell are all important for minks. Minks, like other mustelids, are very sensitive to smells. The sense of smell is believed to be somewhat less developed than in other terrestrial mustelids, perhaps due to their semi-aquatic nature. Vision is clearer through air than through water and is used for detecting motion that would alert the mink to threat or prey, and for balance. Minks rely heavily on vision when foraging; however, there is a published report of a juvenile mink in Florida that came into rehabilitation having lost an eye to injury; the animal was radio tagged and released after being restored to health and having demonstrated an ability to catch live fish. The animal was still alive and being monitored in the wild six months after release. Auditory acuity (hearing) serves the same purpose as vision (alerting the mink to danger or the presence of prey, and for balance), and studies have shown that minks can hear the ultrasonic vocalizations emitted by rodent prey. Complete loss of vision or hearing is likely to have too great of an impact on the quality of life to justify even captive placement although this may depend on the age of the animal when the loss occurred; a careful period of observation should be made prior to captive placement.

Limbs, digits and claws. The mink must have all limbs and paws for a reasonable quality of life; this is a non-negotiable requirement for release and is strongly recommended for captive placement as well. The toes and claws are strong and used (individually and together) to restrain prey; they are also used for self-defense, climbing and (limited) digging. The animal would need to be carefully assessed if more than one toe or claw was missing from any foot.

"3 Strikes Rule"—multiple issues that individually may not be critical but in combination become significant; the probability of release decreases *exponentially* with each additional injury.

Criteria for Outcomes in U.S. Wildlife Rehabilitation

Bats

Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal restrictions			
Federal	If there has been a human bite or potential exposure, the animal needs to be euthanized and submitted for rabies testing. - see CDC and AVMA guidelines Follow CDC guidelines for potential pre- and post-exposure prophylaxis* Drug Enforcement Agency—Controlled Substances Act	The Endangered Species Act of 1973 and the Fish and Wildlife Coordination Act of 1956 currently protect the ten federally listed endangered bat species and one threatened species. Federal law safeguards not just the bats, but their habitat as well. Bats use caves and mines for habitat and hibernating; roosting areas are protected by law. Drug Enforcement Agency— Controlled Substances Act Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	USDA Animal Welfare Act licensed facility, unless exempt
State	Veterinary license or appropriate state wildlife rehabilitation permit - Note some states require an additional "rabies vector species" permit Highly variable state requirements; important considerations include: - Legally able to admit - Threatened or endangered species considerations or restrictions - Disease considerations or restrictions (e.g., rabies, White-nose syndrome) - see state Reportable Diseases list If there has been a human bite or potential exposure, the animal needs to be euthanized and submitted for rabies testing. - see CDC and AVMA guidelines Applicable Veterinary Practice Acts	Appropriate state wildlife rehabilitation permit - Note some states require an additional "rabies vector species" permit Highly variable state requirements; important considerations include: - Legally able to admit - Threatened or endangered species considerations or restrictions - Disease considerations or restrictions (e.g., rabies, White-nose syndrome) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife placement permit - Note some states require an additional "rabies vector species" permit Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical/body	Seizures Missing one wing or part of wing Blindness confirmed by vet	Not obviously pregnant or nursing* Both wings intact, no missing fingers or digits Eyes and ears functional (no more than 25% pinna loss)	Missing fingers, one thumb, extensively scarred or constricted membrane that does not allow for effective foraging in flight Majority of teeth missing or unable to eat whole insects

(*Continued*)

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Criteria	Euthanasia	Release	Captive placement
	Cannot sustain flight, goes to the ground consistently within a few minutes of taking flight; refuses to fly* - post-rehabilitation (in the absence of any identifiable or correctable condition)	Teeth in good condition overall (some missing teeth acceptable) Able to maintain weight in seasonal range for species Both legs/feet in good condition No open wounds or signs of infection Injuries have healed to allow normal use of limbs and senses. Able to fly normally and has been reconditioned for flight; able to bank and land.* - Recommend 1 hr of flight time for every 1 week in rehab for injured bats. - Not required for healthy hibernated/ overwintered bats.	Injuries including: - Missing digits—1 thumb or 1–2 toes. Must be evaluated for ability to groom. Wing tear that extends from wing edge to wing bone (radius/ulna or humerus) that was not repaired.
Emotional/mind	Refuses food and/or water for 72 hr if no medical condition is apparent and appropriate pain and anxiolytic medications are ineffective Self-mutilating behavior Cannot sustain flight, goes to the ground consistently within a few minutes of taking flight; refuses to fly* - post-rehabilitation (in the absence of any identifiable or correctable condition)	Displays normal behavior for species Eating solid food (whole live mealworms or other species appropriate food) Anxiolytic medications may help minimize emotional issues during *temporary* conditions.*	No stress signs seen Calm when handled and viewed Colonial bats should always be housed with conspecifics Minimum holding and care standards must be met.
Behavioral/ nature	Self-mutilating behavior Colonial bats that are non-releasable and cannot be housed with conspecifics, either due to behavior or lack of conspecifics for housing Cannot sustain flight, goes to the ground consistently within a few minutes of taking flight; refuses to fly* - post-rehabilitation (in the absence of any identifiable or correctable condition)	Availability of conspecifics upon release Capable of sustained flight Behaves normally for species and age Lands appropriately, head down the majority of time, up high on flight enclosure wall Able to breed and forage for food	Lands on the ground or low on the wall, with no improvement in height over time; consistently lands head up Reliably eats complete soft food, viscera or whole live mealworms (hand fed or self-feeding)
Resources (Required vs Available)	Training/PPE to safely and humanely euthanize in accordance with professional standards Required licensing for method Ability to appropriately dispose of carcass considering human, animal and environmental health Knowledge of rabies submission requirements	Resources required for care and/or treatment and reconditioning including: facility; supplies and equipment; diet and knowledge and skills Understanding of species biology, natural history and welfare and behavioral needs*	Facility with appropriate permits, enclosure size and captive management protocols for each species. Bats kept in captivity should have an educational purpose and not be housed solely to avoid euthanasia.

(*Continued*)

Criteria	Euthanasia	Release	Captive placement
		Availability of appropriate release sites, including season, weather and disease risks	
		Release from hand or from crate at dusk or full dark in appropriate habitat (home territory when known)	
		Can release by placing on an appropriate tree/structure if monitored until flight.	
Reference materials	Centers for Disease Control rabies home page	NWRA/IWRC Standards for Wildlife Rehabilitation	Association of Zoos and Aquariums Institutional Ambassador Animal Policy/Placement Tool
(Most current edition)	AVMA Guidelines for the Euthanasia of Animals	NWRA Principles of Wildlife Rehabilitation	Wildlife In Education: A Guide for the Care and Use of Program Animals
	NWRA Wildlife Formulary	IWRC Wildlife Rehabilitation—A Comprehensive Approach	NWRA Professional Code of Ethics—Educators
	Exotic Animal Formulary. Carpenter et al.	NWRA Wildlife Formulary	Bat World Sanctuary
	AVMA Professional Code of Ethics	Exotic Animal Formulary. Carpenter et. al.	Lollar, A. (2023). The Rehabilitation and Care of Insectivorous Bats. Available online at the Bat World Sanctuary.
	NWRA Professional Code of Ethics	Medical Management of Wildlife Species. Hernandez et. al.	
		Bat Conservation International	
		Bat World Sanctuary	
		Lollar, A. (2023). The Rehabilitation and Care of Insectivorous Bats. Available online at the Bat World Sanctuary.	

* Addendum

All people handling bats should have pre-exposure rabies vaccines and a current titer. Titers should be checked every 2 years at a minimum.

All people handling bats should be aware of the signs and symptoms of rabies and follow all rabies protocols as dictated by the CDC and local health departments. Any bat that is deemed an exposure must be euthanized and tested for rabies, even if it is not displaying clinical signs. There is no known incubation period for rabies in bats, so quarantining a bat after an exposure is not an option.

There are over 45 species of bats in North America. Specific behaviors, weight ranges, diet and habitat considerations vary by species. Regionality affects bat behavior within a species.

Anxiolytic medications are a valuable tool that can help minimize emotional issues during temporary rehabilitation. They should not be used long-term or to offset inappropriate housing, diet or lack of enrichment.

Do not house mixed sex bats together.

In cases where a female bat is visibly pregnant, the dam should be held until after delivery and the pups are volant, releasing the entire family together. Crevice-dwelling mothers and their pups are released near or into the mother's colony, and foliage-roosting mothers and their pups are released near the place where the mother was originally found.

Juveniles learning to fly may take an extended period to fly and land appropriately. Juveniles will vary in flight time and conditioning requirements. If they are free of injury and illness, are old enough to fly and are in an appropriate flight enclosure, but are not flying well after two weeks of consistent opportunity, a further assessment of ability is required.

Overwintered bats that may be kept awake for a variety of reasons, may have atrophied flight muscles and will require additional reconditioning.

It can be complicated and time consuming to sort out physical, affective and/or behavioral issues preventing sustained flight in a bat. Regardless, a bat that is unable or unwilling to fly, presumably due to pain or distress will have a lesser quality of life and is likely not a good candidate for permanent placement.

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Criteria for Outcomes in U.S. Wildlife Rehabilitation

Cervids

Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal Restrictions			
Federal	Drug Enforcement Agency—Controlled Substances Act	Drug Enforcement Agency—Controlled Substances Act Food Animal Residue Avoidance Databank (FARAD) —Residue Avoidance Program Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	USDA Animal Welfare Act licensed facility, unless exempt Recommend prioritizing Association of Zoos and Aquariums (AZA) accredited facilities
State	Veterinary license or appropriate state wildlife rehabilitation permit Highly variable state requirements; important considerations include: - Legally able to admit - Disease considerations or restrictions (e.g., CWD) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife rehabilitation permit. Highly variable state requirements; important considerations include: - Release location - Drug withdrawal times - Release date - Tagging or marking status - Infectious disease and PPE requirements Applicable Veterinary Practice Acts	Appropriate state wildlife placement permit. Highly variable state requirements; important considerations include: - Facility - Reproductive status - Disease testing Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical/Body	**Euthanize:** - Congenital abnormalities - Blindness in one or both eyes - Failure of passive transfer - Malocclusion (traumatic or congenital) - Completely lacerated tendon - Open fractures with necrotic bone - Obvious skull fractures with neurologic signs - Limb luxation - Limb amputation (partial or complete including toe or hoof) - Severe/displaced pelvic fractures **Consider euthanasia based on resources:** - Severe emaciation/hypoglycemia - Fractures (depending on you and your veterinarians' capabilities) - Severe non-resolving diarrhea - Severe fly strike and/or maggot infestation Rehabilitation of an individual will not adversely affect the facility's operation nor care of other patients	Normal ambulation in all four limbs Able to reproduce Appropriate size Appropriate hair coat Bilaterally visual	Free from pain Ambulatory Consider reproductive status

(*Continued*)

Criteria	Euthanasia	Release	Captive placement
Emotional/Mind	Malimprinting or habituation not resolved with placement in appropriate environment. Extreme stress such that rehabilitation is not feasible and/or safe for patient or handlers	Able to recognize predators and respond appropriately (including humans) Able to recognize conspecifics Conspecifics/herd for rearing; strongly discourage rearing single orphan	Habituation Not imprinted due to human risk
Behavioral/ Nature	Malimprinting or habituation not resolved with placement in appropriate environment.	Appropriate fear response to predators (including humans) Able to appropriately forage	No stereotypical behavior (e.g., pacing, excessive grooming) Enclosure that encourages natural behavior such as being able to hide and forage
Resources (Required vs Available)	Training/PPE to safely and humanely euthanize in accordance with professional standards Required licensing for method Ability to appropriately dispose of carcass considering human, animal and environmental health	**Rearing:** - Appropriate space to raise species without overcrowding - Food/ability to obtain food to raise species to release (including place to browse and consistent source of formula) - Personnel to provide appropriate care and husbandry - Working relationship with veterinarian comfortable with species - Methods to provide husbandry without risking/encouraging habituation **Release:** - Release location with appropriate habitat and carrying capacity - Consider soft release where possible (higher success rate) Ability to transport to release site including access to appropriately size transport vehicle	Appropriately sized and furnished enclosure for species Personnel to provide appropriate care and husbandry Working relationship with veterinarian conformable with species
Reference materials (Most current edition)	AVMA Guidelines for the Euthanasia of Animals NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter, et. al. AVMA Professional Code of Ethics NWRA Professional Code of Ethics	NWRA/IWRC Standards for Wildlife Rehabilitation NWRA Principles of Wildlife Rehabilitation IWRC Wildlife Rehabilitation—A Comprehensive Approach NWRA Wildlife Formulary	AZA Institutional Ambassador Animal Policy/Placement Tool AZA Ungulate Husbandry Manuals Wildlife In Education: A Guide for the Care and Use of Program Animals GFAS Standards for Ruminants

(*Continued*)

Citation: *Wildlife Rehabilitation Bulletin* 2025, *43*(1), 1–76, http://dx.doi.org/10.53607/wrb.v43.294

Criteria	Euthanasia	Release	Captive placement
		Exotic Animal Formulary. Carpenter, et. al. Medical Management of Wildlife Species. Hernandez, et. al. "White- Tailed Deer Fawn Rehabilitation Protocol" by Kelley LaBonty Forness, M. 1984. Raising White- tailed Fawns "Wild." Journal of Wildlife Rehabilitation, 7(4):5–6. Cain, J. W., Ashling, J. B., & Liley, S. G. (2018). Survival and cause- specific mortality of translocated female mule deer in southern New Mexico, USA. Wildlife Research, 45(4), 325–335. Hewitt, D. G. (Ed.). (2011). Biology and management of white-tailed deer. CRC Press.	Wall E.L. & Hartley M. 2017. Assessing enclosure design and husbandry practices for successful keeping and breeding of the Burmese brow antlered deer (Eld's deer, Rucervus eldii thamin) in European zoos. *Zoo Biology 36(3)*, 201–212. Harper C.A. 2008. *A guide to successful wildlife food plots: blending science with common sense*. University of Tennessee. Hewitt, D.G. (ed.). 2011. *Biology and management of white-tailed deer*. CRC Press.

Criteria for Outcomes in U.S. Wildlife Rehabilitation

Rabbits and Hares

Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal restrictions			
Federal	Drug Enforcement Agency—Controlled Substances Act	Drug Enforcement Agency—Controlled Substances Act Food Animal Residue Avoidance Databank (FARAD) —Residue Avoidance Program Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	USDA Animal Welfare Act licensed facility, unless exempt
State	Veterinary license or appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding: - Threatened or endangered species considerations or restrictions - Disease considerations or restrictions (e.g., RHDV2) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding: - Threatened or endangered species considerations or restrictions - Disease considerations or restrictions (e.g., RHDV2) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife placement permit Check with your state regulatory agency regarding: - Threatened/endangered species may have regulations regarding placement for captive breeding programs. Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical/Body	Mandible/maxilla fracture Permanent malocclusion Disemboweled Non-repairable bony fractures; - Compound fractures - Close to joint - Inability to stabilize in proper alignment Fractures in adults without surgical option Significant joint trauma including fractures/luxations/subluxations Non-repairable soft-tissue injuries Deep or significant muscle damage Tendon damage Tail amputation/degloving resulting in loss of > 50% of tail; must be able to tail flash/signal when healed Degloving injuries (depending upon veterinary and management resources): - Degloving involving legs or joints - Circumferential degloving injuries - Degloving > 50% dorsum	Full recovery from illness and/or injuries with no clinical evidence of complications Normal ambulation; able to run, freeze and hide Normal hearing Normal vision Fully furred Normal weight Digestive system working normally RHDV2 considerations: Do not release animals into active disease outbreak areas Do not release rabbits within quarantine period nor with concern for ability to spread disease Jackrabbits need good muscle condition as they need to outrun predators, as compared to cottontails who just need short sprints into cover Jackrabbits need pre-release outdoor caging with room to run and develop muscle	Wild rabbits and hares are very poor placement candidates and should not be placed in an ambassador or educational program. Thoughtful considerations should be made regarding exhibition placement or captive breeding programs to ensure placement is truly being sought in the best interest of the animal's long-term welfare. Permanent injury compatible with captive purpose Injury/illness is not chronically painful

(*Continued*)

Citation: *Wildlife Rehabilitation Bulletin* 2025, *43*(1), 1–76, http://dx.doi.org/10.53607/wrb.v43.294

Criteria	Euthanasia	Release	Captive placement
	Spinal fracture/trauma with: - Posterior paralysis - No deep-pain response - Urinary retention related to nerve damage Hind quarter paresis where improvement plateaus "Log-rolling" Head trauma where improvement plateaus Neuro deficit not significantly improved within 2 weeks Permanent vision deficits Permanent hearing deficits Damage to ear pinnae resulting in loss of >50% pinnae Severe starvation (body condition score <3/9) Severe dehydration (>10%) Severe symptomatic hypothermia Severe symptomatic hyperthermia Severe diarrhea and/or bloat (infants; particularly rebound symptoms after successful initial treatment) Clinical signs of contagious disease Reasonable concern for RHDV2 - Facility's biosecure quarantine capabilities "3 strikes rule"—multiple problems that individually may not be critical but in combination become clinically significant; probability of release decreases *exponentially* with each additional injury Neonates—minimum weight or age are not included on this chart as this varies with each facility and the resources available Rehabilitation of an individual will not adversely affect the facility's operation nor care of other patients		
Emotional/Mind	High stress/fear individuals who are unable to tolerate temporary captivity and handling: - Expected duration and type of treatment are important considerations when deciding to proceed with rehabilitation		Wild rabbits and hares are very poor placement candidates and should not be placed in an ambassador or educational program. Thoughtful considerations should be made regarding exhibition placement or captive breeding programs to ensure placement is truly being sought in the best interest of the animal's long-term welfare. Adapts well to captivity Reduced fear response

(*Continued*)

Criteria	Euthanasia	Release	Captive placement
Behavioral/ Nature	Malimprint or habituation not resolved with placement in appropriate environment: Very rare in cottontails without neurologic or developmental disability Hares are more prone to imprinting/ habituation	Not imprinted or habituated Exhibits natural behaviors Self-feeding and maintaining weight Appropriate fear behavior (e.g., hides when approached) Diurnal/nocturnal	Wild rabbits and hares are very poor placement candidates and should not be placed in an ambassador or educational program. Thoughtful considerations should be made regarding exhibition placement or captive breeding programs to ensure placement is truly being sought in the best interest of the animal's long-term welfare. Injury/illness will not prevent opportunities to thrive (move, balance, self-feed, groom and conduct species appropriate behaviors). Does not exhibit self-destructive or stereotypic behaviors
Resources (Required vs Available)	Training/PPE to safely and humanely euthanize in accordance with professional standards Required licensing for method Ability to appropriately dispose of carcass considering human, animal and environmental health	Resources required for care and/or treatment including facility; supplies and equipment; diet and knowledge and skills Understanding of species biology, natural history and welfare and behavioral needs Availability of appropriate release sites, including season, weather disease risks Appropriate release protocol	Appropriate placement available (permits, resources, knowledge, training and welfare standards) Appropriate acquisition for facility's collection plan Has access to veterinary services Appropriate housing and enrichment available Environment appropriate to exhibit natural behaviors

(*Continued*)

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Criteria	Euthanasia	Release	Captive placement
Reference materials (Most current edition)	AVMA Guidelines for Euthanasia of Animals NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter et al. AVMA Professional Code of Ethics NWRA Professional Code of Ethics	NWRA/IWRC Standards for Wildlife Rehabilitation NWRA Principles of Wildlife Rehabilitation IWRC Wildlife Rehabilitation—A Comprehensive Approach NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter et. al. Medical Management of Wildlife Species. Hernandez et. al. Oberly M. 2015. *An assessment of infant eastern cottontail rehabilitation success*. Doctoral dissertation, The Ohio State University. Paul G.C. & Friend D.G. 2020. Body weight as an indicator of vulnerability to domestic cat predation for juveniles of three species of cottontail rabbits (Sylvilagus spp.) in Colorado, USA: Implications for release criteria. *Journal of Wildlife Diseases 56(4)*, 965–967. Principati S.L., Keller K.A., Allender M.C., Reich S. & Whittington J. 2020. Prognostic indicators for survival of orphaned neonatal and juvenile eastern cottontail rabbits (Sylvilagus floridanus): 1,256 Cases (2012–17). *Journal of Wildlife Diseases 56(3)*, 523–529. Gage L.J. 2008. *Hand-rearing wild and domestic mammals*. John Wiley & Sons. Wild Mammal Babies—The First 48 hr and Beyond; Irene Ruth and Debbie Gode, MPA, CVT; 4th edition	Association of Zoos and Aquariums Institutional Ambassador Animal Policy/Placement Tool Wildlife In Education: A Guide for the Care and Use of Program Animals NWRA Professional Code of Ethics—Educators

Criteria for Outcomes in U.S. Wildlife Rehabilitation
Raptors (excluding New World vulture and California Condors)
The Raptor Center

Criteria	Euthanasia	Release	Captive placement
Mission	Treat to release	Treat to release	Rare; if unable to return to full function, assess physical, emotional, behavioral and environmental aspects for placement
Legal restrictions			
Federal	USFWS Migratory Bird Treaty Act (MBTA) Permit—Rehabilitation USFWS MBTA—any bird that cannot feed itself, perch upright or ambulate without inflicting additional injuries to itself where medical and/or rehabilitative care will not reverse such conditions…any bird that is completely blind, and any bird that has sustained injuries that would require amputation of a leg, a foot or a wing at the elbow or above (humero-ulnar joint) USFWS MBTA—obtain authorization before euthanizing endangered and threatened migratory bird species…without service authorization when prompt euthanasia is warranted by humane consideration for the welfare of the bird. Drug Enforcement Agency—Controlled Substances Act	USFWS MBTA Permit—Rehabilitation USGS MBTA Permit—Bird Banding and Marking Permit (if banding) Drug Enforcement Agency—Controlled Substances Act Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	USFWS MBTA Permit—Veterinarian Statement of Condition that Renders Migratory Bird/Eagle as Non-releasable - Imprinted/habituated birds are required to be transferred to another facility USFWS MBTA Permit—Special Purpose—Possession for Education (Live); unless exempt USFWS Bald/Golden Eagle Protection Act Permit—Eagle Exhibition - must be offered to Native American eagle aviaries first USDA Animal Welfare Act licensed facility, unless exempt
Minnesota	Veterinary license or appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding: - Threatened or endangered species considerations or restrictions - Disease considerations or restrictions (e.g., HPAIV) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding: - Threatened or endangered species considerations or restrictions - Disease considerations or restrictions (e.g., HPAIV) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife placement permit. Threatened/endangered species considerations or restrictions Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical/Body	Non-repairable bony fractures or soft-tissue injuries Malunion or healed malaligned fracture Joint trauma including fracture/luxation/subluxation*	Full recovery from illness and/or injuries with no clinical evidence of complications Goals of physical reconditioning program met with normal flight mechanics, strength and endurance for species; may require specialized conditioning	Injuries are completely healed Illness or injury will not progress Permanent injury compatible with captive purpose, i.e., exhibition, outreach, breeding, etc.

(*Continued*)

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Criteria	Euthanasia	Release	Captive placement
	Partial wing amputations*	A complete set of healthy remiges and rectrices (natural or imped)	
	>10% decrease of long bone length (except femur)*	No risk to human/domestic animal/wildlife/ environmental health and safety	
	Significant trauma to patagium and/or patagial tendon*		
	Coelomic trauma with exposed/contaminated internal organs		
	"Spinal trauma" with posterior paralysis and/or no "deep pain" response		
	Severe toxicosis with clinical signs* Severe starvation*		
	Permanent eye injury(ies) with vision deficits*		
	Severe pododermatitis (Grade 4/5)		
	Amputation of 1st and/or 2nd digit, or 3rd digit (Accipiters)*		
	"3 Strikes Rule"*		
	Rehabilitation of this individual will not adversely affect the facility's operation		
Emotional/Mind	Extreme stress such that rehabilitation is not feasible and/or safe for patient or handlers*		Prior injury/illness is not painful
			Adapting well to captivity with minimal fear or distress*
Behavioral/ Nature	Exhibits inappropriate behavior due to medical condition	Exhibits species appropriate natural behaviors	Exhibits species appropriate natural behaviors
	Hard "malimprint" or habituated to humans*	Able to catch and dispatch live prey; may require live prey testing or "hacking" depending upon species	Injury/illness will not prevent opportunities to thrive (perch, move, balance, self-feed, bathe and conduct species appropriate behaviors)
			Does not exhibit self-destructive or stereotypic behaviors
			Not aggressive towards humans
Resources (Required vs Available)	Training/PPE to safely and humanely euthanize in accordance with professional standards	Resources required for care and/or treatment and reconditioning including: facility; supplies and equipment; diet and knowledge and skills	Appropriate placement available including: permits, resources, knowledge, training and welfare standards
	Required licensing for method	Understanding of species biology, natural history and welfare, and behavioral needs	Appropriate acquisition for the facility's collection plan. Many raptor species live several decades, thought must be given to commitment abilities and succession planning.
	Ability to appropriately dispose of carcass considering human, animal and environmental health	Availability of natal or foster nests	
		Appropriate release protocol, including season, weather, release site and migration patterns	Has access to veterinary services
			Appropriate housing available
		Identification (i.e., banding) and post release monitoring if possible (Note banding requires a permit.)	Environment appropriate to exhibit natural behaviors

(*Continued*)

Criteria	Euthanasia	Release	Captive placement
Reference materials (Most current edition)	AVMA Guidelines for the Euthanasia of Animals NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter et. al. AVMA Professional Code of Ethics NWRA Professional Code of Ethics	NWRA/IWRC Standards for Wildlife Rehabilitation NWRA Principles of Wildlife Rehabilitation IWRC Wildlife Rehabilitation—A Comprehensive Approach NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter et al. Medical Management of Wildlife Species. Hernandez et. al. Raptor Medicine, Surgery, and Rehabilitation. Scott. BirdsoftheWorld.Org	Association of Zoos and Aquariums Institutional Ambassador Animal Policy/Placement Tool Wildlife In Education: A Guide for the Care and Use of Program Animals NWRA Professional Code of Ethics—Educators Raptors in Captivity: Guidelines for Care and Management GFAS Standards for Birds of Prey Sanctuaries International Association of Avian Trainers and Educators (IAATE) Selection Considerations for Non-releasable Birds

* Evaluated on a case-by-case basis—see below

Joint trauma including fracture/luxation/subluxation—some veterinarians have had some success with very acute "elbow or stifle" joint luxations with prompt treatment

Partial wing amputations—some amputations that do not impede mobility, such as the alula or distal phalanges may be suitable for captive placement if all other physical, emotional and behavioral aspects are appropriate

>10% decrease of long bone length (except femur) —greater than 10% decrease in long bone length will result in "uneven" perching or flying. Raptors can compensate for a shortened femur by extending the "stifle" joint

Significant trauma to patagium and/or patagial tendon—any injury that results in limited wing extension

Severe toxicosis with clinical signs—depending upon the toxic agent involved. Raptors with high lead levels exhibiting clinical signs have a very poor prognosis. Raptors with barbiturate toxicosis that improve over 24 hr have a good prognosis.

Severe starvation—primary starvation in juveniles (failure to thrive) can have a good prognosis; primary starvation in adults (no other concurrent illness or injury) have a very poor prognosis; secondary starvation in adults depends upon the concurrent illness/injury and the degree of starvation

Permanent eye injury(ies) with vision deficits—especially bilateral injuries; should be evaluated by an avian ophthalmologist. Raptors may present with pre-existing eye injuries. Evaluate age, body condition and if the pre-existing eye injury has any bearing on current admission.

Amputation of 1st and/or 2nd digit or 3rd digit (Accipiters) —these are the "power toes" used for killing prey. An adult bird with hunting experience may overcome this handicap if all the remaining digits are normal. Raptors may present with pre-existing digit injuries. Evaluate age, body condition and if the pre-existing digit injury has any bearing on current admission.

"3 Strikes Rule"—multiple issues that individually may not be critical but in combination become significant; probability of release decreases *exponentially* with each additional injury

Extreme distress such that rehabilitation is not feasible or safe for patients or handlers—unless able to transfer the patient to a facility with appropriate resources.

Hard "malimprint" or habituation—If a bird becomes imprinted to humans while under your care, you will be required to transfer the bird. A habituated raptor might be "unhabituated" with proper training or might be suitable for captive placement if all other physical, emotional and behavioral aspects are appropriate. Birds that are aggressive towards humans should be euthanized.

Anxiolytic medications are a valuable tool that can temporarily help minimize emotional issues. They should not be used long-term or to offset inappropriate housing, diet or lack of enrichment.

Overall individual considerations include: species, which influences hunting style and migration patterns; age which influences hunting experience and adaptability and locations which may require survival in urban or harsh environments

Updated and reprinted from Willette, M., Rosenhagen, N., Buhl, G., Innis, C., & Boehm, J. (2023). Interrupted Lives: Welfare Considerations in Wildlife Rehabilitation. Animals, 13(11), 1836. https://www.mdpi.com/2076-2615/13/11/1836 Assessed Feb 2024.

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Criteria for Outcomes in U.S. Wildlife Rehabilitation
***Turtles* (*Aquatic/Semi-Aquatic Freshwater and Terrestrial Species*)**
Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal restrictions			
Federal	Endangered Species Act (ESA) —obtain consent before euthanizing any patient that falls under this Act; at veterinarian's discretion. Drug Enforcement Agency—Controlled Substances Act	ESA—Permit required for species listed Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) —Permit required for species listed Drug Enforcement Agency—Controlled Substances Act; if patient is prescribed controlled substances during care Food Animal Residue Avoidance Databank (FARAD) —Residue Avoidance Program Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	ESA—Permit required for species listed CITES—Permit required for species listed
State	Veterinary license or appropriate state wildlife rehabilitation permit Highly variable state requirements; important considerations include: - Threatened/endangered species considerations and restrictions - Disease considerations or restrictions - see state Reportable Diseases list - Non-native/nuisance species - see state list of native species - Out of state capture, rescue or collection - Unknown capture, rescue or collection location Applicable Veterinary Practice Acts	Appropriate state wildlife rehabilitation permit Highly variable state requirements; important considerations include: - Threatened/endangered species considerations and restrictions - Disease considerations or restrictions - see state Reportable Diseases list - Non-native/nuisance species - see state list of native species - Out of state capture, rescue or collection - Unknown capture, rescue or collection Applicable Veterinary Practice Acts	Appropriate state wildlife placement permit Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical Body	Catastrophic shell fractures Severe jaw fracture Vision impairment in both eyes; consider euthanasia for vision impairment in one eye, especially for aquatic and/ or predatory species Catastrophic soft tissue damage- organs outside of body, necrosis of organs, severely contaminated organs	Full recovery from illness and/or injuries with no clinical evidence of complications or chronic pain - Ambulation normal on multiple surfaces, including inclines and declines - Fixations removed and fractures stable - Successfully passed eggs (no dystocia) - Doing well off medications, withdrawal period passed	Usually involves a legal case where the patient is clinically healthy Physically normal, or very minor defects (e.g., amputated toe, unilateral enucleation) Free of clinical signs and negative on appropriate/available disease screening diagnostic tests (e.g., *Mycoplasma* spp., ranavirus, herpesvirus, etc.)

(*Continued*)

Criteria	Euthanasia	Release	Captive placement
	Luxations, other than toes and tail tips (case by case basis, dependent on severity of injury, sex dependent for some species) Exhibits signs of chronic illness (e.g., arthritis or metabolic bone disease) Bilateral severe injury to eyes Head and spinal fractures with loss of deep pain sensation in lower extremities Limb amputation—some exceptions at veterinarian's discretion Complete bilateral bridge fracture (will always have significant internal trauma) Open coelom with damage or significant contamination to internal organs Neurological issues that affect the ability to locomote and feed Bilateral pelvic fractures	Recovery/rescue location of turtle is known (generally a state regulatory requirement) Neurologically normal Clinically healthy hatchlings (generally state regulatory requirements regarding incubation of eggs and release times) Temperatures/season adequate for release; acclimated to current season Physically conditioned to perform functions needed for species to survive in the wild No risk to humans/domestic animals/wildlife/environmental health and safety	
Emotional/Mind	Severely depressed mentation or lethargy accompanied by shell injuries; almost always indicates severe internal trauma Irreversible habituation with no appropriate placement found	Appropriate mentation for season, accounting for brumation	Free of pain Exhibiting normal behavior for species Adapts well to captivity (does not show "fearful" body language when reacting with humans or in captivity) Irreversible habituation
Behavioral/ Nature	Unable to perform basic natural functions due to medical conditions - Unable to catch live prey; if applicable - Unable to swim, dive, float as applicable to species Recovery/rescue location of turtle is unknown with no appropriate placement found	Expresses species typical behavior, relationships and cognitive abilities - Able to catch live prey (if applicable) Evades predators	Recovery/rescue location unknown and turtle meets all other placement criteria Non-native species to area found (most likely released or escaped pet) Large enough enclosure with natural environment
Resources (Required vs Available)	Admission is not recommended for patients that will definitely require placement. Training/PPE to safely and humanely euthanize in accordance with professional standards (note pithing is required as a secondary method) Required licensing for method Ability to appropriately dispose of carcass considering human, animal and environmental health	Resources required for housing, treatment and care; often for extended time periods. Understanding of species-specific husbandry requirements and unique behavioral traits Appropriate release protocol, restrictions for minimum release temperatures and seasonal acceptable release dates Transport available to recover/rescue location Release turtle as close as possible to location found, directly into/next to water source for applicable species	Suitable placement option available: - Permits - Resources - Knowledge - Training and welfare standards - Disease testing - Appropriate interstate paperwork as necessary - Transportation within two weeks of completion of paperwork Good relationship with regulatory officials Appropriate acquisition for facility's collection plan Access to veterinary services

(*Continued*)

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Criteria	Euthanasia	Release	Captive placement
Reference materials (Most current edition)	AVMA Guidelines for the Euthanasia of Animals NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter, et. al. NWRA Professional Code of Ethics AVMA Professional Code of Ethics Lafeber—Reptile Wildlife Euthanasia Techniques Webinar (2020)	NWRA/IWRC Standards for Wildlife Rehabilitation NWRA Principles of Wildlife Rehabilitation IWRC Wildlife Rehabilitation- a Comprehensive Approach NWRA Wildlife Formulary Exotic Animal Formulary. Carpenter et. al Medical management of Wildlife Species. Hernandez et. al Mader's Reptile and Amphibian Medicine and Surgery	Association of Zoos and Aquariums Institutional Ambassador Animal Policy/Placement Tool Wildlife In Education: A Guide for the Care and Use of Program Animals NWRA Professional Code of Ethics—Educators

Criteria for Outcomes in U.S. Wildlife Rehabilitation

Vultures (Turkey vultures (Cathartes aura) and Black vultures (Coragyps atratus))

Facility

Criteria	Euthanasia	Release	Captive placement
Mission	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?	Does your mission statement impact your wildlife rehabilitation activities?
Legal Restrictions			
Federal	USFWS Migratory Bird Treaty Act (MBTA) Permit—Rehabilitation MBTA—Any bird that cannot feed itself, perch upright or ambulate without inflicting additional injuries to itself where medical and/or rehabilitative care will not reverse such conditions…any bird that is completely blind, and any bird that has sustained injuries that would require amputation of a leg, a foot or a wing at the elbow or above (humero-ulnar joint) Drug Enforcement Agency—Controlled Substances Act	USFWS MBTA Permit—Rehabilitation USGS—MBTA Permit—Bird Banding and Marking Permit (if banding). Leg bands should NOT be used on vultures due to urohidrosis. They require wing tags or other marking device options. Contact USGS Bird Banding Lab for further details. Drug Enforcement Agency—Controlled Substances Act Food and Drug Agency—Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA)	USFWS Transfer Request—Veterinarian Statement of Condition that Renders Migratory Bird as Non- Releasable - Imprinted/habituated birds are required to be transferred to another facility USFWS MBTA Permit—Special Purpose Possession—Education (Live); unless an exempt facility USDA Animal Welfare Act licensed facility, unless exempt
State	Veterinary license or appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding: - Disease considerations or restrictions (e.g., HPAIV) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife rehabilitation permit Check with your state regulatory agency regarding: - Disease considerations or restrictions (e.g., HPAIV) - see state Reportable Diseases list Applicable Veterinary Practice Acts	Appropriate state wildlife placement permit Appropriate Health Certificate, signed by a veterinarian, for transport across state lines
Assessments			
Physical/Body	Non-repairable bony fractures or soft- tissue injuries Malunion or healed mal-aligned fracture Joint trauma including fracture/luxation/subluxation* Partial wing amputations* >10% decrease of long bone length (except femur)* Significant trauma to patagium and/or patagial tendon* Coelomic trauma with exposed/contaminated internal organs “Spinal trauma” with posterior paralysis and/or no “deep pain” response Severe toxicosis with clinical signs*	Full recovery from illness and/or injuries with no clinical evidence of complications Goals of physical reconditioning program met with normal flight mechanics, strength and endurance for species A complete set of healthy remiges and rectrices (natural or imped). Possible to release with small gaps as that is a natural occurrence when molting in the wild.* No risk to human/domestic animal/wildlife/environmental health and safety Turkey vultures: Olfactory senses functional, necessary to find food.*	Injuries are completely healed Illness or injury will not progress Permanent injury compatible with captive purpose, that is, exhibition, outreach, breeding, etc.

(*Continued*)

Criteria	Euthanasia	Release	Captive placement
	Severe starvation*		
	Permanent eye injury(ies) with vision deficits*		
	Severe pododermatitis (Grade 4/5)		
	Amputation of multiple toes or whole foot*		
	"3 Strikes Rule"*		
	Rehabilitation of this individual will not adversely affect the facility's operation		
Emotional/Mind	Extreme stress such that rehabilitation is not feasible and/or safe for patient or handlers*		Prior injury/illness is not painful
			Adapting well to captivity with no fear or distress*
Behavioral/ Nature	Exhibits inappropriate behavior due to medical condition	Exhibits species appropriate natural behaviors	Exhibits species appropriate natural behaviors
	Hard "malimprint" or habituated to humans*	**Orphans:** Young vultures imprint very quickly and easily on humans and must be re-nested or raised by foster parents for successful release. Procedures and concerns for treating	Injury/illness will not prevent opportunities to thrive (perch, move, balance, self-feed, bathe and conduct species appropriate behaviors.
		orphans are distinctly different from injured adults.*	Does not exhibit self-destructive or stereotypic behaviors
			Not aggressive towards humans
Resources (Required vs Available)	Training/PPE to safely and humanely euthanize in accordance with professional standards	Resources required for care and/or treatment and reconditioning including: facility; supplies and equipment; diet and knowledge and skills	Appropriate placement available including: permits, resources, knowledge, training and welfare standards
	Required licensing for method	Understanding of species biology, natural history and welfare and behavioral needs	Appropriate acquisition for the facility's collection plan. Vultures can live 50+ years in captivity, thought must be given to commitment abilities and succession planning.
	Ability to appropriately dispose of carcass considering human, animal and environmental health	Availability of natal or foster nests	Has access to veterinary services
		Appropriate release protocol, including season, weather, release site and migration patterns	Appropriate housing available
		Identification and post release monitoring if possible (Note banding requires a permit.)	Ability to house multiple birds together to meet social needs *
			Environment appropriate to exhibit natural behaviors
Reference materials (Most current edition)	AVMA Guidelines for Euthanasia of Animals	NWRA/IWRC Standards for Wildlife Rehabilitation	Association of Zoos and Aquariums Institutional Ambassador Animal Policy/Placement Tool
	NWRA Wildlife Formulary	NWRA Principles of Wildlife Rehabilitation	Wildlife In Education: A Guide for the Care and Use of Program Animals
	Exotic Animal Formulary. Carpenter, et. al.	IWRC Wildlife Rehabilitation—A Comprehensive Approach	NWRA Professional Code of Ethics—Educators
	AVMA Professional Code of Ethics NWRA Professional Code of Ethics	NWRA Wildlife Formulary	Raptors in Captivity: Guidelines for Care and Management
		Exotic Animal Formulary. Carpenter et. al.	GFAS Standards for Birds of Prey Sanctuaries
		Medical Management of Wildlife Species. Hernandez et. al.	International Association of Avian Trainers and Educators (IAATE) Selection Considerations for Non-releasable Birds
		Raptor Medicine, Surgery, and Rehabilitation. Scott.	
		BirdsoftheWorld.Org	

* Evaluated on a case-by-case basis—see below

Special Concerns for Physical/Medical: Joint trauma including fracture/luxation/subluxation—Acute elbow and stifle luxations may be treated effectively but treatment must begin immediately.

Partial wing amputations—some amputations that do not impede mobility, such as the alula or distal phalanges may be suitable for captive placement if all other physical, emotional and behavioral aspects are appropriate

>10% decrease of long bone length (except femur) —greater than 10% decrease in long bone length will result in "uneven" perching or flying. Raptors can compensate for a shortened femur by extending the "stifle" joint.

Significant trauma to patagium and/or patagial tendon—any injury that results in limited wing extension

Severe toxicosis with clinical signs—depending upon the toxic agent involved. Raptors with high lead levels exhibiting clinical signs have a very poor prognosis. Raptors with barbiturate toxicosis that improve over 24 hr have a good prognosis.

Severe starvation—primary starvation in juveniles (failure to thrive) can have a good prognosis; primary starvation in adults (no other concurrent illness or injury) has a very poor prognosis; secondary starvation in adults depends upon the concurrent illness/injury and the degree of starvation.

Permanent eye injury(ies) with vision deficits—especially bilateral injuries; should be evaluated by an avian ophthalmologist. Raptors may present with pre-existing eye injuries. Evaluate age, body condition and if the pre-existing eye injury has any bearing on current admission.

Amputation of multiple toes may affect perching, bracing against food or weight distribution. Vultures may present with pre-existing digit injuries. Evaluate age, body condition and if the pre-existing digit injury has any bearing on current admission

Turkey vultures: Consider head trauma's potential to damage olfactory senses in the brain, which are primary for food-finding in this species. If severe trauma is known or suspected, test for function if possible.

"3 Strikes Rule"—multiple issues that individually may not be critical but in combination become significant; probability of release decreases **exponentially** with each additional injury.

Extreme distress such that rehabilitation is not feasible or safe for patients or handlers—unless able to transfer the patient to a facility with appropriate resources.

Anxiolytic medications are a valuable tool that can temporarily help minimize emotional issues. They should not be used long-term or to offset inappropriate housing, diet or lack of enrichment.

Special Concerns for Orphaned/Young Vultures: As gregarious birds, largely dependent upon each other for food-finding, learning proper social skills directly from other vultures is critical for orphans. Because of their highly social nature, orphaned baby vultures imprint very quickly and cannot be successfully raised for release by humans alone. In the case of turkey vultures, scent-based recognition of caregivers is also a potential issue. Re-nesting is ideal. If not available, captive foster parents must be used. Transfer to a facility with experience and success in fostering vultures is recommended. Foster parents must be assessed with care; aggression or cannibalism may happen if foster vultures are not "primed" for breeding and young birds are suddenly introduced. Young vultures must learn appropriate social skills to succeed upon release.

You must take every precaution to avoid imprinting or habituating birds in your care to humans. If a bird becomes imprinted to humans while under your care, you will be required to transfer the bird. Human-raised, human-imprinted or habituated birds may be "unhabituated" with proper training or may be suitable for captive placement if all other physical, emotional and behavioral aspects are appropriate. Those birds that lack appropriate fear of humans or show inappropriate behaviors with foster parents or conspecifics should be euthanized.

Special Concerns for Captive Placement: Facilities should consider their ability to keep vultures in pairs or groups to meet their social needs. Human imprinted birds may not accept the company of other vultures unless introduced at a young age; consider the long-term mental health of birds kept alone.

Equipment use: Best practices in the industry are moving away from the use of permanent falconry equipment on vulture legs. Facilities should consider their resources and experience of staff to work with captive birds without equipment or removable equipment.

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