

Animals and Society Institute



# PARROT BREEDING AND KEEPING: THE IMPACT OF CAPTURE AND CAPTIVITY

## POLICY PAPER

How the pet trade  
results in long-term harm  
to wild and captive birds

**G. A. Bradshaw**  
**Monica Engebretson**



# **Animals and Society Institute**



## **Parrot Breeding and Keeping: The Impact of Capture and Captivity**

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**The Animals and Society Institute** is an independent research and educational organization that advances the status of animals in public policy and promotes the study of human-animal relationships. We are a think tank as well as a producer of educational resources, publications and events. Our objectives are to promote new and stricter animal protection laws, stop the cycle of violence between animal cruelty and human abuse, and learn more about our complex relationship with animals.

**G.A. Bradshaw, Ph.D. Ph.D.** is the founder and director of The Kerulos Center and author of *Elephants on the Edge: What Animals Teach Us About Humanity* (Yale University Press: 2009). Her discovery of Post-Traumatic Stress Disorder (PTSD) in free-living African elephants established the field of trans-species science and psychology. This work has been extended to include the psychological effects of trauma and violence on chimpanzees, parrots and grizzly bears, and studies on wildlife self-determination.

**Monica Engebretson** has been a professional in the field of animal protection since 1999. She has led numerous policy initiatives and authored multiple key publications, including the North American chapter in *Long Distance Transport and Welfare of Farm Animals* (Cabi 2008) and *Cruelty Uncaged – Fur Farming in North America* (Born Free USA: 2009). She is also the author of a children's book, *Lucky*, based on a true story of a wild-caught lorikeet who was returned to the wild in Indonesia.

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Animals and Society Institute  
2512 Carpenter Road, Suite 202-A  
Ann Arbor, MI 48108-1188 USA

Tel: (734) 677-9240  
Fax: (734) 677-9242

[www.animalsandsociety.org](http://www.animalsandsociety.org)

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# 1. Executive Summary

Public opinion and science now acknowledge animal sentience. This awareness raises concerns about many long-accepted cultural practices that affect nonhuman animals. The capture and possession of wildlife is one outstanding example. Once considered acceptable, wildlife capture, captivity, breeding and their associated laws and regulations are under ethical scrutiny. Through a review of the science literature, we pursue two lines of enquiry to assess the impacts of these practices on parrot welfare: Given what is known scientifically about parrots, what are the effects of capture and captivity on Psittaciformes species' (parrot, cockatoo, and New Zealand parrot species commonly referred to as "parrots") well-being and, of these species, are there any that can be positively listed for trade and breeding while remaining consistent with science, ethics, and conservation goals?

Analysis of scientific theory and data indicate that the "pet" trade, and other commodification of birds, conflicts with ethical and conservation goals. Capture, captivity, and captive breeding are harmful to parrot and other bird well-being at individual, population and species levels. Effects of confinement – stereotypy (repetitive behavior), depression, infanticide, self-injurious behavior, and physical ailments commonly found in captive wildlife – are symptoms of traumatic and poor environmental conditions that severely compromise well-being. The fact that these states transmit as traits across generations and apply to all birds means that captive breeding has far-reaching negative effects. Subsequently, no parrot species is a viable candidate for captivity.

Science dictates that standards and criteria used to assess and protect human well-being accurately extend to parrots and other animals. A single, unitary model of welfare and legal protection may serve human and nonhuman animals. To conform to the goals of good welfare, species conservation and environmental protection, parrot capture, trade, and captive breeding for commercial or personal use should be prohibited. The exception is the carefully monitored use of captive breeding as a conservation tool to replenish diminishing free-living populations. However, this practice should not be used as an alternative to protecting wild species. Instead, it must be regarded as a last and necessary option to safeguard the continuance of free-living parrots and executed without sacrificing individual welfare to benefit a "greater good."

## 2. Introduction

The practice of capturing and confining wildlife is entrenched culturally and economically. Many societies have a tradition of keeping birds in captivity as status symbols, luxury items, entertainment, or symbols of good luck. Parrots also have been used for ceremonies and consumed as food. They were among the first “goods” to be traded with European explorers of tribal indigenous lands.<sup>1</sup> Similar to other species, parrots are kept as companion animals to fulfill social, emotional, and cognitive needs of their human caretakers.<sup>2,3</sup>

While it has existed for millennia in various parts of the world, the captive wildlife trade only joined domestication as a highly lucrative global enterprise through European colonialism and industrialization. There are now nearly 26 billion animals, and more than 10,000 species, in captivity on farms, zoos, breeding centers, laboratories and private homes.<sup>4</sup> Every year, millions of wild animals are shipped around the world with profits of billions of dollars.<sup>5</sup> Southern China alone receives tens of millions of animals a year for use as food and medicine.<sup>6</sup> Birds figure large in the international wildlife trade. For example, a survey of four markets in Bangkok in 2001 found that of 36,537 observed birds, only 37 percent were native to Thailand, while 63 percent were non-native species.<sup>7</sup>

Controversy tracks trade trends. Similar to other issues, wildlife captivity revolves around a clash between human interests and other animal wellbeing. There are opposing opinions about its legitimacy. Many industries, including research, zoos, commercial and private pet trades, individuals, food, and entertainment enterprises, depend on the revenue that bird and other wildlife commodification provides. However, animal protection supporters decry the immense suffering caused by these practices and how, directly or indirectly, they undermine the already precarious state of wild populations. Recent scientific advances and changes in public opinion toward the ethics of captivity have added to the debate.<sup>8,9</sup> Avian welfare is a critical topic because it affects hundreds of species and millions of birds’ lives.

Through an analysis of standing science, we assess implications for birds in captivity and their wild counterparts in terms of animal welfare, species conservation, and environmental protection. Wild-caught and captive-bred parrots are addressed together; although there are legal, political, and logistical differences, a parrot is a parrot whether free-

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living or captive, wild-caught or captive-bred. The two groups of birds literally travel different paths, but they share a common final destination: captivity. Consequently, both wild-caught and captive-bred birds are legitimately subjects of the same welfare issues and conditions.

Following widespread convention, we begin with a review of standing science to articulate the scientific foundation and language for which questions of welfare, policy, and law are grounded. Through this lens, implications for parrot well-being are examined using an assessment developed for nonhuman animals, namely, the Schuppli & Fraser companion animal suitability framework.<sup>10</sup> This approach readily accommodates a growing body of multidisciplinary knowledge (e.g., natural history, trans-species psychology, neurobiology, ecology, veterinary medicine). Additionally, it has the ability to include free-living population attributes (e.g., home range, physical activity, mental and emotional well-being, foraging, communication, social structure, reproduction, rearing and developmental processes) as well as provide a scientific approach for describing captivity and its effects on welfare.

However, it is important to note that while a welfare assessment designed for nonhuman animals is employed here, standing science shows that ethical and legal standards crafted to evaluate and safeguard human well-being logically and readily extend to birds and other nonhuman animals. It is scientifically accurate to assess avian welfare using criteria articulated by laws and codes such as the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct, the Geneva Convention, and the Declaration of Helsinki.<sup>11,12</sup>

### 3. Parrot Biology, Natural History and Socio-ecology

“Parrot” is a term commonly used to refer to any of the more than 350 species belonging to the Psittaciformes order comprising three families: Psittacoidea (“true” parrots), Cacatuoidea (cockatoos), and Strigopoidea (New Zealand parrots). These species are found worldwide in subtropical and tropical climates, but there are species living in temperate latitudes, high altitudes (e.g., Patagonia, Tierra del Fuego, New Zealand) and even sub-Antarctic islands. Parrot body size ranges from a few centimeters to more than one meter in length: from the relatively small budgies, cockatiels and lovebirds and medium-sized conures, Amazons, and African Greys to larger cockatoos and macaws.<sup>13</sup>

Parrots are well known for their perceptiveness, brilliant and spectacular plumage, strong tongues, curved beaks, and zygodactyl feet (two digits facing forward and two facing backward) that allow these birds to be formidable climbers. They demonstrate the ability and inclination to learn human language and their cognitive acumen is likened to “feathered apes”.<sup>14,15,16</sup> Some species are very long lived; there are recorded ages beyond 100 years (e.g., Amazon yellow-naped (*Amazona auropalliata*)).<sup>17,18</sup> Parrot ranges may extend hundreds of miles and vary with cycles of fruiting and other food availability. Flocks can fly tens to hundreds of miles a day in search of food.<sup>19</sup> Their overall diet generally consists of fruit, seeds, nuts, insects, bark, nectar, and other plant materials.

Typically, parrots nest in hollowed-out tree boles. As altricial species, young parrots spend three months or more dependent on their parents to feed them, followed by an extensive period of time in cohort crèches.<sup>20</sup> Parrots are generally diurnal and highly social. They establish strong, monogamous pair-bonds and roost in large flocks and colonies sometimes consisting of up to thousands of other, same-species birds (e.g., burrowing parrots).<sup>21</sup> Much of their time is spent socially: allopreening (grooming each other), engaging in vocal communications and other intense exchanges and interactions, foraging, and rearing young.<sup>22,23</sup> Diverse lines of research document how forming and maintaining relationships among “social brained” species (sensu Dunbar, 1998)<sup>24</sup> is critical for survival not only in terms of predator avoidance and foraging efficiency, but for healthy emotional and psychological development and overall well-being.<sup>25,26,27</sup> Unsurprisingly, parrots in captivity also

form deep lasting bonds. The majority spends their lives without the company of members of their species, but their social affinity often leads to strong relationships with humans and others with whom they live.

## 4. Captivity, Breeding and Trade

Despite being common in captivity, parrots are not classified as domesticated species. They have a relatively brief history of being bred, they are not evolutionarily adapted to thrive in captive circumstances<sup>28,29</sup> and they are not usually bred to produce traits that characterize domesticated animals or that distinguish them significantly from their wild counterparts. Compared to farmed and companion animal breeding that has been established for millennia, large-scale wildlife (including parrot) breeding has existed only a short while.<sup>30,31</sup>

Most captive breeding, trade, and collections were rare until the 20th century.<sup>32</sup> Starting in the 1970s and continuing through the 1990s, exotic birds represented one of the fastest-growing “pet” choices both in the United States and across Europe.<sup>33</sup> Currently, birds are the fourth most popularly kept companion animal in the United States after fish, cats, and dogs.<sup>34</sup> Based on an opinion poll of 2,000 Norwegian homes, there were approximately 135,000 pet birds in captivity,<sup>35</sup> making them the fifth most popular companion animal group in Norway after fish, cats, dogs and rabbits.

Large-scale importation of parrots made these species readily available to the general public worldwide. In 1975 when the Convention on International Trade in Endangered Species (CITES) was founded, an estimated 7.5 million wild birds were traded.<sup>36</sup> During the 1990s, international trade was estimated at 2-5 million individuals each year (these numbers do not consider the number of birds traded within their country of origin).<sup>37</sup> Parrots are one of the most affected groups of species, representing more than 20 percent of the wild birds traded.<sup>38,39,40</sup>

In the last decade, international trade in wild-caught birds has diminished as a result of increased legislation and trade restrictions based on conservation, humanitarian, and precautionary measures designed to prevent epidemic outbreaks such as avian flu (i.e., HPAI or H5N1). In

2005, the European Union (EU) imposed a temporary import ban to help prevent H5N1 strain of bird flu outbreaks. In 2007, the ban was made permanent. Passage of the 1992 U.S. Wild Bird Conservation Act (WBCA) “practically eliminated import of parrots to the USA” with “no apparent shift in parrot imports to other global regions from the Neotropics.”<sup>41</sup> Nonetheless the bird trade, including captive-bred birds and illegally obtained wild-caught birds, continues to flourish.

The number of birds kept as pets since the passage of the WBCA has fluctuated, but not drastically. Bird trade and possession do not appear to have been affected by the legislation. According to the American Veterinary Medical Association (AVMA), 11.7 million birds were kept as pets in 1991 (one year before passage of the WBCA); five years later the number increased slightly to an estimated 12.2 million. In 2001, the numbers dipped to 10.1 million, but then increased again in 2007 to an estimated 11.2 million.<sup>42,43</sup>

However, the WBCA did reduce the supply of wild-caught birds available directly to the public as pets and to bird breeders as breeding stock, but opened up an opportunity for increasing the number of captive-bred birds available for purchase. In the United States, bird breeders saturated the market for many species.<sup>44,45</sup> In recent years, the prices of domestic parrots have fallen; for some species, prices began to fall in the 1980s even before the passage of the WBCA.<sup>46</sup> The legacy of wild-caught parrots and current overproduction of parrots in the United States have led to a constant flood of birds in need. Although the number of rescue organizations is growing, none are able to keep up with the influx of abandoned and abused parrots.

Despite protections afforded by CITES and other trade restrictions, the international and domestic bird trade continues to threaten many species.<sup>47,48,49,50,51</sup> According to a 2008 report produced by the Congressional Research Service (CRS), “the illegal wildlife trade is among the most lucrative illicit economies in the world behind illegal drugs and possibly human trafficking and arms trafficking.” Global trade in illegal wildlife is an expanding economy, estimated to be worth at least \$5 billion and potentially more than \$20 billion annually.<sup>52</sup> The CRS report points out that desire to acquire and possess wildlife drives the legal and illegal trade: “Countries with high demand for legally obtained wildlife are suspected to be the same countries with the highest demand for illegally obtained wildlife. These countries include the United States, Peoples’ Republic of China, and members of the European Union.”<sup>53</sup>

Poor to no enforcement of laws continues to be a major conservation challenge, especially where illegal practices are viewed as socially acceptable at the local level.<sup>54</sup> In many cases, there is little on-the-ground law enforcement because of tacit or open approval of poaching and limited to no resources allocated for effectively deterring parrot capture and nest-raiding.<sup>55</sup>

Parrots represent the greatest proportion of threatened and endangered species of any large family of birds.<sup>56</sup> Their populations are beset with multiple stressors, as illustrated by a description of causes underlying the rapid decline of macaws reported in Costa Rica.

Key issues [responsible for parrot declines] appear to be the deforestation and loss of habitat, illegal poaching for the “pet” trade, and killing by indigenous populations for feathers and food. However, one cannot ignore the broader historical picture, namely, the intensive cultivation of bananas and the associated use of DDT and other poisons that started over 30 some years before. From this perspective, similar to other wildlife, the rapid decline of macaws likely resulted from the double impact of habitat destruction, poaching, and toxins into diet.<sup>57</sup>

As threatened and endangered species, parrots “are some of the most sought-after birds. Estimates of mortality on captured and transported parrots are as high as 90 percent. Thirty-six percent of the world’s parrot species are listed by the International Union for the Conservation of Nature as threatened or near threatened, and 55 percent of these are threatened to some degree by trade.”<sup>58</sup> In Mexico, it is estimated that 65,000-78,000 parrots are captured each year, and approximately 4-14 percent of those (3,133-9,400) are smuggled in to the United States annually. The fact that the overall mortality rate for trapped parrots may exceed 75 percent before reaching the purchaser (50,000-60,000 dead birds annually) means that only a fraction of birds are actually available for sale and purchase.<sup>59</sup> This increases pressure to secure birds from the wild or through captive breeding, at the expense of birds’ lives.

For some species, such as yellow-naped and yellow-headed Amazon (*Amazona oratrix*) parrots, the U.S. market is the main impetus for their capture. Of the top 10 Mexican species seized in the United States, five are endangered species, two are threatened, and one species is in special protection. The captive trade also exerts tremendous impacts on

wild birds from and on other continents. For example, South Africa has become an important hub for the international trade in wild-caught birds. Traffickers are making huge profits and taking advantage of government officials in unstable countries like the Democratic Republic of Congo (DRC). In 2011, South African breeders imported more than 5,000 wild-caught African Grey parrots (*Psittacus erithacus*) from the DRC, and exported nearly 25,000 African Grey parrots to markets around the world. These birds include captive-bred birds produced from wild-caught parents as well as wild-caught birds laundered through South African breeders and exported as captive-bred.<sup>60,61</sup>

Wild-caught parrots exported to South Africa are frequently used as breeders, and some are re-exported from South Africa to the Far and Middle East as companion animals. The parrot trade is also a significant welfare and conservation concern in Indonesia, with parrots captured and traded domestically and internationally (with significant smuggling of Indonesian parrots into the Philippines).<sup>62</sup> Once common in the islands of Indonesia and East Timor, to which it is endemic, the yellow-crested cockatoo (*Cacatua sulphurea*) is now extinct through much of its historic range. The species has suffered an extremely rapid population decline, equivalent to over 80 percent, over the short period of three generations.<sup>63</sup> This decline is almost entirely attributed to trapping birds for sale as household pets.<sup>64</sup>

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## 5. Assessing Well-being and Welfare

Methods and criteria used to assess human and nonhuman animal well-being are distinct and separate. The rationale for this two-tiered approach has been based on the claim that nonhuman animals lack attributes warranting ethical and legal protection maintained for our own species. Specifically, nonhuman animals are considered to be deficient in mental and emotional capacities that humans possess. However, this assertion contradicts standing science.

Over the past 150 years, scientists have gathered an enormous amount of data and theory that articulates a trans-species paradigm of brain, mind, and behavior.<sup>65,66,67,68,69,70</sup> The widespread use of animal models (use of nonhumans to study human mental and physical health and function) reflects tacit understanding that nonhuman and human animals share similar neural substrates and capacities to feel, think, and experience consciousness.<sup>71,72</sup> Now, this understanding is openly admitted.

In July 2012, a prominent international group of neuroscientists stated “unequivocally...humans are not unique in possessing the neurological substrates that generate consciousness. Nonhuman animals, including all mammals and birds, and many other creatures, including octopuses, also possess these neurological substrates.”<sup>73</sup> Such widespread acceptance of animal sentience and agency is particularly important for assessing non-mammals (e.g., birds, reptiles, amphibians, and insects) and small mammals (e.g., mice, rats, guinea pigs) whose mental, social, and physical capacities have been largely denied or dismissed.<sup>74,75</sup>

As a result, accompanied by growing public appreciation for animal sentience, welfare issues are under scrutiny. For example, the Five Freedoms has long served as a basis for evaluating domesticated and captive animal welfare. Recently, however, it is criticized for its implicit acceptance of animal captivity and domestication as valid, normative states and failing to include key scientific data.<sup>76</sup> The five tenets, 1) freedom from hunger, thirst, and malnutrition; 2) freedom from disease and injury; 3) freedom from physical and thermal discomfort; 4) freedom from fear distress and other negative psychological states; 5) freedom to carry out most normal forms of behavior,<sup>77,78,79</sup> do not take into account implications of neurosciences that provide a scientifically objective way to describe health effects from captivity and other interventions.<sup>80</sup>

## 5.1 The Role of Neuroscience in Health and Welfare Assessments

Current health and welfare models increasingly revolve around neurosciences because they are able to evaluate welfare by describing the effects of environmental change on brain, mind, and body.<sup>81,82</sup> Neurobiology links the internal state and health of an individual with imposed external challenges.<sup>83</sup> As the center that perceives, processes, and mediates changes in the environment, the brain controls responses to stress. In its most general definition, stress is the differential between an individual and his/her environment. Every species and individual has a particular evolutionary, ecological, and experientially determined envelope of tolerance within which they are able to live more or less comfortably.

Conventionally, free-living environmental conditions and the associated psychological and physical states and processes are regarded as baselines for defining (and are reflective of) normal and healthy existence. Altricial vertebrate brains develop in a highly social environment. The dominant environmental input that an infant experiences is parental (attachment). Socialization patterns vary with culture, species, and stages of development and may include siblings, mates, and other group members throughout life. These positive relationships provide mental and emotional sustenance and stability. Infant mammals and chicks are evolutionarily adapted to thrive in natural developmental contexts.

Relationships form the primary external source of sensory input for regulating developmental processes that interact with genetics and the greater environmental surround. Social interactions shape psychology, behavior, and emotions. Infant-parent communication occurs through diverse modalities as touch, smell, taste, sound, and sight thereby forming a sensory matrix in which the developing mind is embedded. Early social experiences are major influences on brain structures and processes that guide successful functioning in the world. Through social transactions, young human and nonhuman animals learn how to process complex social (e.g., communication) and ecological (e.g., foraging) information and develop coping strategies appropriate to environmental change. The resultant ability to modify mental state, behavior, and physiology helps accommodate stressor effects (self-regulation).<sup>84,85</sup>

Certain levels and types of environmental change are part of everyday life, but if stress exceeds normal levels in terms of magnitude (trauma)

or duration (chronic), environmental impacts can cause harm. Traumatic stress is defined as a physically or emotionally inflicted injury that results from an actual or perceived threat to survival.<sup>86</sup> Traumatic disruption from a single event can create lifelong changes in social learning and mental functions.<sup>87,88</sup>

Events that disrupt normal rearing experiences, such as premature weaning, isolation, and loss of family, negatively affect brain pathways. Social deprivation can profoundly affect mind and body with lasting effects.<sup>89,90</sup> External stressors communicate to and within the body neurobiologically through prolonged or acute activation of the brain's hypothalamic-pituitary-adrenal axis (HPA), which plays a core role in stress mediation.<sup>91,92</sup> Neuroendocrinal shifts relate to observable changes in behavior and mental health. In addition to causing distressed psychological states, chronic stress and trauma increase vulnerability to disease and injury.<sup>93</sup>

An understanding of neuropsychology and neurophysiology plays another useful role in helping assess well-being. Human medicine relies substantively on the client's subjective feelings and communiqués. However, in cases where a shared language is lacking, health practitioners often must rely on interpretation by a third party, such as a caregiver. Caregivers may describe the psychological state of their charges as "happy," "sad" or "depressed," but these emotional states are difficult to translate and evaluate medically. When subjective symptoms are related to neurobiology, clinical observations are more readily related to medical tests. Psychological states and their expression (mood and behavior) relate to underlying neurobiology. For example, parrot symptoms such as angry outbursts, distressed and anxious screaming, and biting often reflect an inability to negotiate the environmental stress of isolation and confinement and/or experience of compromised development and trauma. In a neuropsychological framing, symptoms cease to be "bad behavior" that requires "fixing" and instead emerge as communiqués of serious mental and physical challenges inflicted by the environment.

## **5.2. Parrot Brains, Minds and Well-being**

Birds have long been denied having mental and emotional capacities possessed by mammals. However, today, there is scientific recognition of a unitary vertebrate common model of mind and brain that includes birds.<sup>94,95</sup> Past models of avian neuroanatomy (brain structure and cell architecture) incorrectly implied that brain evolution progressed

from reptiles to birds to humans where older, less complex regions of the brain (e.g., paleostriatum and archistriatum) were separated from newer portions (e.g., neostriatum). Models of avian neuroanatomy have been revised to create an alternative terminology that positions birds comparable to humans.<sup>96,97</sup>

Comparative studies show “the bird brain...is analogous to the mammalian brain having comparable capacities and functions.”<sup>98</sup> Although mammalian and avian brain structures may have diverged through time, brain functions, mental states, and behavior converged. Structures that process and regulate sociality, cognition, and emotions and associated traits (e.g., maternal behavior, communication, self-awareness, episodic memory, play, sexual behavior, fear, aggression, moral development, and affect regulation) are highly conserved evolutionarily across species. Birds exhibit sophisticated cognitive capacities, linguistic ability, spatial memory, social reasoning, personality, representation of self, psychological and social needs, tool use, episodic memory, and vocal learning similar to primates.<sup>99,100,101,102</sup> Parrot brains are also comparably plastic and vulnerable to environmental change and stress.<sup>103</sup>

Taken in total, theory and data show that mammal-avian comparisons provide a sound, rigorous scientific foundation for assessing parrot mental, emotional, and physical well-being.<sup>104,105,106,107</sup> Recent treatments recognize “the balance, now or through life, of the quality of the complex mix of subjective feelings associated with brain states induced by various sensory inputs and by cognitive and emotion processes” (e.g., neurobiology, stress psychophysiology).<sup>108</sup> Such neurobiological “leveling” brings welfare assessments under a species-common, human-inclusive framework and psychological diagnoses used by human health professions.<sup>109,110,111,112,113</sup> Once thought immune psychologically to human stressors, wild and captive wildlife are both vulnerable, a realization that unifies conservation and animal protection.<sup>114</sup>

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## 6. Impacts of Capture and Captivity on Parrot Welfare

The language and concepts of neuroscience make visible what has been rendered invisible through cultural conditioning: in the present case, the psychological and physical effects of environmental manipulation on birds. Whether wild-caught or captive-bred, undomesticated animals are vulnerable to suffering associated with unnatural conditions of captivity.<sup>115,116</sup> Survival and successful breeding do not signify well-being, nor do they guarantee that welfare is good or adequate.<sup>117,118,119</sup> Graham (1998) reports that the seemingly “care-free” life of a caged bird is a myth; autopsies of these birds often reveal evidence of “a life beset with stress” in the form of lesions.

Wild-caught and captive-bred birds live in environments significantly different from those to which they are evolutionarily and ecologically adapted. Captive conditions deviate hugely in terms of foraging, food, sociality, ambiance, sound, smell, and habitat. A bird’s ability to successfully adapt to various captive situations depends on his or her basic genetic and psychobiological makeup and developmental experience. “Successful adaptation” is a highly relative term because, by definition, all captive situations exceed the types, levels, magnitude, and duration of stress that define free-living environments.

Although wild parrots experience stress, including predation, these are stressors to which parrots are adapted evolutionarily and have coping strategies, structures, and processes to aid in recovery. In contrast, stressors associated with capture and captivity fall far outside their evolutionarily and ecologically determined tolerance.<sup>120,121,122,123</sup> Wild-caught and captive-bred birds lack coping mechanisms that may evolve through long-term acclimatization during domestication. In addition to radical reduction in physical and social activity, captivity prevents what healthcare professionals consider an essential factor in maintaining well-being: agency, or free will.<sup>124</sup>

By scientific definitions, capture and captive life are traumatic. Companion birds typically experience a series of disruptions in their lifetime: shock trauma (capture), premature weaning (either through capture or captive breeding), subsequent compromised rearing (warehouse breeding), social trauma (multiple homes, separation from other birds or human companions), poor physical and social enrichment (barren

cages, isolation), overcrowding, housing with incompatible individuals or housing in close proximity to predatory animals (humans, dogs, cats).<sup>125,126,127</sup> Similar to humans deprived of meaningful socialization and companionship, parrots suffer emotionally, often wasting away physically. This suffering is expressed commonly as major depression, anorexia, self-injury, and other symptoms.<sup>128</sup>

Psychological, behavioral and physical presentations relate directly or indirectly to a history of neurophysiological compromise.<sup>129,130,131</sup> Symptoms express biochemically and behaviorally in multiple ways.<sup>132,133</sup> Direct (e.g., death of mother, impaired rearing) or indirect (e.g., transmitted maternal stress) compromise induces sustained effects on the brain and creates structural vulnerability to early death, impaired cognition, and behavioral dysfunction. Deviations from normal social interactions translate to altered patterns in core survival. Even in sanctuary, captive birds typically lack natural social structures and processes (such as mates or flocks) that help support trauma recovery.

The stress of captivity dramatically increases susceptibility to disease and has an overall negative effect on welfare.<sup>134,135,136,137</sup> In contrast, wild parrots have a strong innate immunity, as suggested by the lack of hemoparasites and a low incidence of intestinal parasites.<sup>138</sup> Birds respond to stress with a physiological response via the release of corticosterone (CORT) secreted by the adrenal gland. Similar to other species, they begin mounting a CORT response immediately upon capture prior to human interaction that increases in concentration during human handling.<sup>139,140,141</sup> CORT remains elevated in captivity and may increase or be exacerbated by other stressors.<sup>142</sup> For example, many psychological disorders in captive birds tend to dominate in certain types of parrots versus others (e.g., self-mutilation in cockatoos versus Amazons). These observations are consistent with the link between neuroendocrinal pathways and species-specific patterns of sociality.<sup>143</sup>

Post-Traumatic Stress Disorder (PTSD) and complex PTSD (C-PTSD) have been diagnosed across species.<sup>144</sup> Clinical diagnoses correlate with neurological evidence. Decreased hippocampal volume (the part of the brain involved in spatial learning and memory tasks) has been linked to depression and symptoms of PTSD in humans<sup>145</sup> and other animals, including birds. Wild birds brought into captivity for only a few weeks may lose up to 23 percent of their hippocampus mass; captivity stress is regarded as a primary factor in its reduction.<sup>146,147,148</sup> Impairment of socio-affective circuits, especially in higher cortical

regions, underlie many emotional responses indicative of stress and distress, including persistent fearful temperament; diminished capacity to modulate memory, fear, and social judgment; hyperaggression and emotional dysregulation (agitated screaming, biting); symptoms of PTSD and complex PTSD; feather-picking and feather-damaging behavior; personality disturbances (depression, social and physical incompetence, and attachment disorders); eating disorders; mate trauma; unresponsiveness; poor motor-cognitive-affective skills and response, low activity; and stereotypy.

Stereotypy – abnormal, repetitive, unvarying behaviors – is one of the most common symptoms of birds in captivity and regarded widely as an indicator of poor welfare.<sup>149,150,151,152,153,154,155,156,157</sup> Far from being movement “without purpose,” stereotypies reflect distress and severely taxed mental states. Lack of social interaction and unnatural environments contribute to the development of both oral and locomotor stereotypy.<sup>158,159,160,161,162</sup> Garner et al., (2003) found that stereotypy in captive orange-wing (*Amazona amazonica*) Amazon parrots was correlated with poor performance of the same psychiatric (“gambling”) task as stereotypy in autistic and schizophrenic human patients, suggesting “potential psychological distress in animals showing these behaviors.” Feather-picking and plucking behaviors in parrots have been described as similar to compulsive and impulsive disorders such as hair-pulling and hand-washing behaviors in humans.<sup>163</sup>

Developmental and relational trauma become deeply engrained and are difficult to resolve. While Meehan et al. (2003a; 2004) showed that environmental enrichment (including appropriate foraging substrates and increased physical complexity) may help reduce parrot stereotypies, symptoms may reappear when triggered. The latent nature of trauma often impedes symptom eradication. Clinical observations, animal model studies, and longitudinal studies of human trauma victims show that chronic stress and trauma transmit across generations.<sup>164</sup> Transmission occurs from parent to infant socially, culturally, and neurobiologically, including relational stress during gestational and postnatal periods that passes to offspring.<sup>165,166,167</sup>

Scientific findings concerning cross-generational stress effects have significant implications for animal welfare and captive breeding. “Environmental adversity...increase[s] stress reactivity through sustained effects on gene expression in brain regions known to regulate behavioral, endocrine, and autonomic responses to stress,”<sup>168</sup> resulting

in behavioral and psychophysiological deficits (e.g., intra-specific and inter-specific hyperaggression to the point of killing, anxiety disorders). Bird sanctuaries that care for unwanted parrots regularly observe these symptoms. Ironically, this behavior often prompts people to relinquish their parrots, who must then be rescued.

As the U.S. sanctuary Foster Parrots Ltd. founder Marc Johnson and executive director Karen Windsor observe:

Excessive and inappropriate vocalization, stereotypical behavior, displaced aggression, hyper-phobic behavior, feather destruction and self-mutilation are common symptoms of parrots, particularly those who have been captive-bred or have been passed from home to home multiple times. Our greatest challenge in sanctuary is accommodating birds who identify themselves as human, but who are nonetheless wild animals. They appear to live in a state of constant inner conflict and confusion. They have a foot in two worlds, but they fit into neither.<sup>169</sup>

A mixed or conflicting sense of self that evolves by cross-fostering or in other compromised developmental contexts has been observed to retard the trauma survivor's ability to recover. Additionally, a bi-species identity often makes the creation of an effective post-trauma recovery setting extremely difficult.<sup>170</sup>

Cross-generational transmission of stress is potentially problematic for rearing programs that use the progeny of captive-bred birds to repopulate dwindling wild populations. Derrickson & Snyder (1992) describe how "many of the difficulties in obtaining good reproductive performance from endangered parrots may be related to behavioral problems arising from several widely used captive management practices: hand-rearing and forced-pairing." While reintroduction programs report important successes and may play a critical role for conservation, the effects of stress and trauma necessarily must be included in assessments and added to ongoing discussions concerning individual and species' welfare and viability.<sup>171,172</sup>

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## 7. Parrot Welfare FAQs

Current science served as a lens to evaluate the implications of capture and captivity on parrot welfare. This assessment was structured by the companion animal welfare assessment developed by Schuppli & Fraser (2000). Three main criteria were considered: the health and well-being of birds in captivity; the health and viability of wild populations (i.e., impacts and implications of capture, captive trade and breeding on psittacine conservation); and the effects on health and welfare of humans and the environment by parrots in captivity.

### **1. Is there adequate knowledge of the species with respect to nutritional requirements, health care, environmental requirements for physical and thermal comfort, requirements for exercise, social interaction, and natural behavior?**

Yes and no. There is ample scientific knowledge that captivity cannot provide parrots with the essentials needed for healthful living comparable to those possessed by free-living populations. There is ready access to scientific and clinical information in diverse forms (through online resources and libraries) that provide extensive information about parrot health and well-being. Further, science clearly shows that capture, captivity, and breeding are deleterious to parrots both directly and indirectly. However, while there is ample information concerning what parrots require to achieve reasonable well-being within the intrinsically unhealthful condition of captivity, it is infrequently applied relative to the numbers of parrots in captivity.

The major impediment to improving captive welfare exists for several reasons, including insufficient motivation to learn and apply current knowledge, poor dissemination of information to guardians/owners, and few enforceable regulations that adequately address parrot welfare. These shortfalls are related to the fact that many individuals, professions, and institutions involved in parrot care and welfare evaluation are heavily dependent on the captive parrot trade. Parrot welfare has only recently become a legitimate topic of study and concern.

**Commercial and Family Care:** Retail stores often do not provide purchasers with adequate information concerning bird care, culture and behavior. Most parrot buyers/guardians know very little about the birds' natural history, psychology, culture and needs, and they are also generally not informed about the considerable fiscal, physical,

and emotional commitment that is necessary to provide lifelong care to these highly social and flighted species.<sup>173</sup> Pet shops typically sell parrots with little or no training of prospective caretakers, and place an emphasis on the sale of juveniles or unweaned babies because a parrot's "pet quality" is highest prior to reaching sexual maturity.<sup>174</sup> As a result, animal abuse and neglect regularly occur in private homes and in retail establishments. Common problems associated with captive birds in retail stores include overcrowding; all-seed diets; constrictive cages; failure to provide perches, or providing unsuitable perches; food and water bowls placed directly under perches; lack of environmental enrichment, veterinary care, disease testing and origin documentation; the sale of unweaned birds; and lack of adequate exercise.<sup>175</sup>

Malnutrition is responsible for almost 90 percent of all clinical conditions observed by avian practitioners.<sup>176</sup> Avian professionals openly acknowledge that seed diets lack nutrients, and yet seed diets remain the most widely available and most common household bird diet.<sup>177,178</sup> Commercial seed mixes are typically not indigenous to the natural habitat of parrot species. Also, many fruits and other plants native to parrot habitats are not available in other parts of the world. Nutritional deficiencies can contribute to both physical and psychological problems.

During the past 20 years, avian research and clinical knowledge have improved considerably. Specialty avian practices have tailored diagnostic tests, emergency medical procedures, and anesthesia monitoring for birds.<sup>179,180</sup> However, only 11.7 percent of bird-owning households currently seek veterinary advice for their birds.<sup>181</sup> Further, the causes of many illnesses are not well understood or untreatable; many common ailments go undiagnosed or are underappreciated because their symptoms are synonymously associated with captivity and therefore considered normal. There is a "dangerous lack of breeding biology data for 87% of parrot species."<sup>182</sup>

## **2. Is there adequate knowledge of the species with respect to recognizing and preventing negative states such as fear, pain and distress?**

Yes. There is substantive knowledge on emotions, behavior, brain, and psychological states in both mammals and birds that provide information on how to recognize fear, pain, and distress in parrots, something recognized nearly 150 years ago.<sup>183</sup> However, parrot mental health and emotions have been largely ignored or marginalized. It is only very

recently that behavior (let alone avian mental health) and natural history have been included in veterinary diagnosis and treatment of parrots in captivity. Despite widespread knowledge that parrots are highly social, most private housing does not include multiple birds or permit normal socialization; most captive parrots live alone or with little human, avian, or other animal contact. Many abnormal psychological states and associated behaviors found in captive parrots are considered “normal.” Most people who keep parrots are either indifferent or unaware of how wild birds live and behave, or understand that much of captive bird behavior (such as stereotypy and biting) is symptomatic of distress and deprivation. For example, in contrast to cats or dogs, keeping parrots in a cage is a culturally accepted practice. Captivity is not perceived and appreciated as the profound threat to mental and physical well-being that it entails, nor are birds generally understood as having physical, emotional, and social needs comparable to humans and other companion animals. As a result, excessive screaming and biting are classified as “bad behavior” requiring “training,” not as bona-fide symptoms of distress, need, and fear.

**3. If there is adequate knowledge of the species’ requirements, might the owner still have practical difficulty providing suitable food, veterinary services, and an environment that meets the animal’s needs regarding comfort, psychological welfare, exercise, social interaction, and natural behavior?**

Yes. Recommendations for an optimal captive environment generally exceed the capacity of the average private owner.<sup>184</sup> Providing even the minimally adequate space and social contact is well beyond either the means or inclination of most parrot guardians. In 1998, the World Parrot Trust (WPT) estimated that as many as 50 percent of all companion parrots were kept in cramped and inadequate conditions. Davis (1998) agrees: “Although birds are intelligent and highly responsive to, and aware of, their surroundings, their treatment seldom reflects this fact.”

Living space issues are a major problem. It is not sufficient to judge appropriate cage size by body size; adequate living space needs to accommodate the natural airborne movement of a bird. Graham (1998) maintains, “It would seem that the ideal enclosure for a captive bird is one of such size and equipped with such [internal] furnishings that the bird would have no awareness of its [sic] captivity. Anything less is a compromise and acceptance, on the part of the keeper, that the kept may, or will be, subject to the stresses imposed by a lesser or greater degree of restriction of its normal behaviors.” The majority of

birds, particular large-bodied macaws, live in cages far smaller than Graham describes. Typically, the sizes of cages sold with a bird are minimal to save on cost. A cage is often considered adequate if the bird's extended wingspan and tail length can be freely accommodated within the cage.<sup>185</sup> Cages that accommodate wing stretching are very expensive, and very few guardians have the financial or physical capacity to provide an aviary for flight. This inadequacy is reinforced by the general lack of appreciation for basic parrot needs. Similarly, housing in breeding facilities and private homes generally hinders the ability of parrots to express their natural behaviors, including socialization, foraging behavior, and flight.<sup>186,187,188,189,190,191</sup>

Veterinary costs can be high because of the demands for specialized care. Relinquished parrots proliferate in animal shelters and rescue and sanctuary facilities, many of which are ill-equipped or ignorant of birds' needs (Table 1).<sup>192,193</sup> Even in situations where knowledge and substantive resources exist (e.g., zoos), there is no guarantee of good welfare.<sup>194</sup> The lack of knowledge of species-specific dietary information and the tendency for bird owners not to seek veterinary care additionally compromises most parrots' well-being.<sup>195,196,197</sup>

#### **4. Can a parrot's size be so large when mature that the owners may be unable to accommodate him or her, or so small that the animal might easily be injured?**

Yes. Body size is not an adequate criterion upon which to base welfare standards. The inability to support psychological well-being and express normal behavior (such as flying) and exist free from intense distress threatens all birds in captivity.<sup>198,199,200,201,202,203,204</sup> While smaller birds such as parakeets may appear to be easier to care for in terms of meeting environmental needs (i.e., cage cost and size), their needs are comparable to those of larger birds. However, the majority exist in cages far too small for any degree of healthful living. It might be argued that the relatively low cost of smaller-bodied species constitutes an increased risk of being purchased on impulse. Small birds often sustain bone breakage and other injury from handling: bird bodies and wings are extremely fragile and susceptible to injury.

The lower commercial value of smaller species may also place them at a greater risk of being considered disposable when no longer wanted by a caretaker, or when necessary veterinary care exceeds the retail value of the animal, particularly in a commercial setting. Subsequently,

smaller birds face somewhat different challenges in the pet trade than other birds but not necessarily fewer challenges than their larger, higher-priced counterparts.<sup>205,206,207,208</sup>

### **5. Are the birds' life expectancies so great that the owner may lose the commitment or ability to provide care throughout their lives?**

Yes. Parrots can live for decades, and in some cases longer than the average human lifespan. Even under the best circumstances, parrots are at risk of having to live in multiple households and diverse conditions, all of which are extremely stressful and often lethal. Parrots form deep long-term bonds, and the loss of a companion (human or other animal) is extremely stressful. It is not uncommon that the surviving parrot succumbs shortly after such a loss (Table 2). While the average lifespan of captive parakeets, cockatiels (*Nymphicus hollandicus*), and lovebirds is 15-20 years, an age lower than many other captive parrot species, their lifetime care still requires considerable commitment on the part of the guardian.

### **6. Is there any appreciable risk of suffering, injury, illness, or death arising from parrot procurement and transportation?**

Yes. Regulations protecting captive birds from inappropriate care, acquisition, and sales are critically lacking at international, national and state levels.<sup>209</sup> Procurement and transportation methods employed by the wild-capture trade are particularly problematic. Transporters rely on volume to make a profit so they can withstand high bird mortalities; and high percentages of birds are “already dead or dying due to stress, rough handling, sickness, crushing, asphyxiation, temperature shock, dehydration and diarrhea” by the time they arrive at their destination or are seized en route.<sup>210</sup>

Parrots are particularly sensitive to the stress of transport, separation from other birds, and restraint. Even parrots held captive for multiple years or bred in captivity have been shown to develop stress-induced body temperature increases when restrained from five to 15 minutes<sup>211</sup> and may reach lethal or near lethal body temperature (46.1-47.2 degrees C./115-117 degrees F.) in that time. They also demonstrate other stress responses.<sup>212</sup> Food and water deprivation, overcrowding, lack of rest, and prolonged exposure to extreme heat or cold are commonly cited welfare problems associated with long-distance transport for many species and therefore constitute major stressors.<sup>213,214</sup>

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## **7. Is there any appreciable risk of a parrot attacking or injuring humans and other animals?**

Yes. Parrots are one example of species that are “ill-suited as companion animals simply because they have qualities that may detract from, or fail to enhance, the welfare of the owner.”<sup>215</sup> Parrots of all species can inflict painful bites capable of breaking the skin and leaving scar tissue. Larger birds such as macaws and cockatoos are capable of inflicting serious flesh wounds that may leave permanent disfigurement. Many natural parrot behaviors, especially those expressed after sexual maturity and those associated with chronic stress and trauma, may lead to parrot relinquishment, abuse, and neglect. Risks include physical damage of the guardian.<sup>216</sup> (Table 1) Biting is part of a parrot’s natural behavior and can be related to communication within the flock, defending territory, or in response to frustration, fear, sexual aggression, or play.<sup>217</sup> Nearly every parrot will experiment with nipping or biting his or her human caretaker; the behavior can be reinforced or discouraged depending on the knowledge and reaction of the caretaker.

“Attacks” may be accompanied by subtle warning communiqués that can be difficult to detect by the inexperienced observer.<sup>218</sup> While sexual libido is reduced in mammals through routine procedure of spaying and neutering, no equivalent procedure currently exists for birds. Clubb (1998) notes that the adult reproductive stage is the longest life stage of a parrot and that “sexual maturity and resultant behavioral changes are inevitable in “pet” birds. Bonding (pair formation) with a single person, displaced aggression, sexual frustration, and destructive behavior are among behavioral changes that many render birds undesirable companions.” As is noted in regard to PTSD, such responses are natural relative to the unnatural conditions of captivity.<sup>219</sup>

## **8. If a risk of injury exists, can it be made acceptably low by selecting safe individuals or by proper management?**

Yes. There are diverse resources describing how to help maintain quality of life and reduce stress and possible conflict during the various life stages of parrots. Many books, other accessible educational media, and consultants are available that teach how to deter injury. Chief among these approaches are principles used in trauma recovery: provision of a loving, sensitive, and secure psychophysical environment that supports parrot well-being. This includes creating a living situation that respects and addresses species-specific needs.

However, many avian consultants and medical practitioners continue to define symptoms of captivity as “undesirable behaviors” rather than as symptoms socially and ecologically poor conditions and/or past trauma. Subsequently, the goal of dominant techniques are based on eliminating symptoms, not their underlying causes. A lack of understanding of the mechanisms and causes of PTSD, widespread absence of trauma-informed education, and the intrinsic stress of captivity leads to expectations by a guardian that many, if not all, trauma survivors cannot overcome; namely, total eradication of deep psychophysiological scars.

**9. Is there any appreciable risk of parrots transmitting disease to humans or to wild or domestic animals? And if a risk exists, can it be made acceptably low by finding individuals free from the disease(s) or by proper management?**

Yes. The wildlife trade and associated infectious diseases (e.g., highly pathogenic avian influenza H5N1), where the legal and illegal trade of birds plays a significant role, pose significant threats to human and animal health and global biodiversity. Recent studies insist that “to ensure public safety, immediate proactive changes are needed at multiple levels” to stem zoonotic disease that is dramatically rising as a result of the increase in wildlife trafficking. Salmonellosis, tuberculosis, yersiniosis and avian chlamydiosis (commonly known as psittacosis or “parrot fever”) are transmitted through the air, fecal matter, and broken skin, from birds to humans. While psittacosis has the potential to infect any bird species, it is particularly common in parrots, pigeons, and doves.<sup>220,221</sup> The vast majority of cases reported to the U.S. Centers for Disease Control – between 30 and 100 cases per year – result from exposure to “pet” birds.<sup>222</sup> Psittacosis can cause significant illness, especially for people with compromised immune systems, but most people respond to oral anti-bacterial treatments.<sup>223</sup> Considering that millions of birds are kept as household companions, the incidence of this disease in humans is quite low. The risks to the non-bird-owning community is also quite low unless infected birds (who can be asymptomatic carriers for many years and intermittently shed the bacteria) are housed for public display or sale. Parrots (particularly wild-caught birds) are a significant carrier of Exotic Newcastle Disease (END), which poses risks to domestic poultry<sup>224</sup> (also see point 12).

**10. Do parrots have objectionable characteristics (e.g., noise, odor, uncleanliness, unruliness, destructive behavior) that may prove unacceptable to the owner or the community? Do they have other characteristics (e.g., solitary, sedentary or nocturnal nature) that may cause the owner to lose interest and commitment?**

Yes. Despite the fact that they are generally fastidious, many humans consider parrots “objectionable” and “messy.” People often obtain parrots believing that they are easy to care for because they live in relatively small cages. Often symptoms of parrot distress and trauma are simply labeled as “bad behavior” and the bird is punished (abused). Isolation and the inability to move and interact normally increases parrot stress, discomfort, anxiety and other distressed mental states and behaviors. Many people do not appreciate or tolerate ways of being that are basic to parrot culture. Parrots enjoy calling to and greeting each other in the early morning and evening. Calling is a way to “keep in touch” and in the wild is a key method of support for birds of the same species. Their calls and communiqués are loud and exuberant compared with those of cats, dogs and fish, and hence parrots often are considered disruptive, particularly in urban settings (where most captive birds are kept). As highly social species, they require committed, intense and ongoing interactions requiring time and attention that exceed what most guardians are willing to provide. Many natural parrot behaviors, particularly those expressed after sexual maturity, often cause parrot guardians to relinquish, neglect, abandon, or abuse the bird.<sup>225,226,227,228,229</sup>

Mismatches between human guardian expectations and parrot cultures frequently lead to abuse (e.g., putting the bird in a dark closet or garage for years, starvation) and neglect (e.g., avoidance of contact on the part of the human). As the Kaytee Avian Foundation (KAF) notes, “Unfulfilled needs of the parrot...result in misbehavior which further weakens the bond.”<sup>230</sup> The special needs of undomesticated species such as parrots do not lend themselves to accommodate changes in a household. KAF adds, “Many birds lose their homes due to changes in the family structure such as deaths, divorces, financial difficulties, moving into places that do not accommodate ‘pets’...unfulfilled expectations, becoming bored with the ‘pet’ and behavioral problems” (Table 1).<sup>231</sup> “Buyer regret” may lead the bird owner to sell or give the bird away; consequently, the commercial bird industry has a high rehoming rate.<sup>232</sup> The unsuitability of parrots in captivity increases their susceptibility to disease and injury, requiring more attention from the guardian and costly medical care.<sup>233</sup>

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## 11. Is captive breeding detrimental to parrot welfare?

Yes. By definition, forced incarceration and objectification constitute a profound violation of basic rights of anyone. Such practices are prohibited in the case of individuals comparably sentient to parrots – humans. As discussed above, large-scale breeding and human hand-rearing compromise normal development, and may predispose birds to distressed psychological states that are perceived as “problematic” behavior.<sup>234,235</sup> Critically, stress and trauma transmit across bird generations. Psychological and physiological issues created through capture and captivity therefore propagate through successive generations.

As with other production- and profit-driven endeavors, standard bird industry breeding practices focus on maximizing profit, producer convenience and cost minimization. Animal welfare considerations that do not result in substantial profit margin increases or hedge against profit loss are largely ignored. Exceptions to this are found only in countries that have passed legislation specifically requiring breeders to comply with animal welfare provisions or prohibiting certain practices that compromise welfare.<sup>236</sup> Parrot breeding for the companion animal trade has not focused on shaping the psychological well-being of parrots to increase their compatibility in the captive environment or as companion animals. Rather than focusing on qualities that would increase psychological health – such as providing rearing and socio-ecological conditions that are healthful and emulate natural environments or by selecting for traits that reduce fear and aggression – breeding in aviculture has been largely focused on successful breeding and/or profitable color mutations with little or no attention paid to the psychosocial traits of parents and offspring.<sup>237</sup> In some cases, breeders of captive birds may have actually selected against traits that would lead to better welfare or “pet quality.” Historically, parrots who have expressed captivity-related stress and other “undesirable pet behavior” (including feather plucking, excessive screaming, and biting) are relinquished or sold to or breeding facilities.<sup>238</sup>

## 12. Is there any appreciable risk of parrots causing ecological damage to wild or domestic birds in the U.S. if they escape or are released?

Yes, potentially. The number of birds released each year and exact estimates of naturalized parrot populations are unknown.<sup>239</sup> Sightings

of free-flying parrots and established flocks suggest that in addition to accidental escapes, some “pet” birds may be intentionally set free when their caretakers tire of them. At least 74 free-living exotic parrot species have been reported in North America; at least 19 species have nested in Florida, at least 13 have been documented in California, and two species are established in southern Texas.<sup>240,241,242,243</sup> While post-release viability is somewhat climate-dependent, feral populations are found in non-tropical, cold climates (including The Netherlands and Belgium).<sup>244</sup> While there is debate about the current and/or potential impacts of naturalized parrots on native wildlife species among scientists, aviculturists, birders, environmentalists and animal advocates, there are potential negative effects. Released or escaped parrots can establish naturalized colonies.<sup>245,246</sup> For example, in the United States, wild peach-faced lovebirds (*Agapornis roseicollis*) appear to be competing with native birds for nesting sites in cactus cavities in Arizona.<sup>247</sup> In addition, these birds are still capable of transmitting disease.<sup>248</sup>

Importation of wild-caught birds significantly increases the disease risks associated with the pet bird trade that can affect native and non-native birds. The mixing of birds from different geographical ranges, coupled with close confinement and highly stressful conditions, increases the susceptibility of imported birds to infectious organisms. Pearson et al. (1975) found in birds tested in U.S. quarantines prior to the passage of the U.S. Wild Bird Conservation Act that 25 percent of groups of birds tested positive for Exotic Newcastle Disease (END) where parrots represented more than 75 percent who tested the positive. Parrots in the U.S. have been reported with END in the U.S. Animal Health Association Proceedings in every year since 1997. In 2002, a parrot in a California “pet” store tested positive for the disease;<sup>249</sup> the diagnosis came just six months before an outbreak in California that spread to Nevada, Arizona, and Texas. According to F. Dustan Clark, Extension Poultry Health Veterinarian at the University of Arkansas’s Avian Advice, eradication costs associated with exotic poultry disease outbreaks in the United States typically cost about \$1 million per day of the outbreak.<sup>250</sup> In 2004, END entered Italy through a shipment of parrots, lovebirds, and finches imported from Pakistan for the pet trade.<sup>251</sup>

### **13. For parrot species that exist in the wild, are trade and transportation subject to adequate regulation and enforcement?**

No. Perhaps the single most effective tool against organized poaching, wildlife smuggling, and damage to free-living birds is the Convention

on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Additional to CITES, the Wild Bird Conservation Act (WBCA) of 1992 provides further protections to wild birds traditionally imported into the United States as companion animals. The Act limits or prohibits imports of exotic birds when necessary to ensure that wild exotic bird populations are not harmed by removal of exotic birds from the wild for trade and that exotic birds in trade are not subject to inhumane treatment. The law includes provisions to limit or prohibit U.S. import of exotic bird species covered by CITES and authorizes moratoria on the import of species not necessarily covered by CITES.

The Act requires documentation by the importer on the source of the bird, a complete description, and the reasons for import. Also, the importer is permitted to import only two exotic birds as companion animals per year. The law makes exceptions for birds imported as part of approved breeding consortiums. The U.S. Department of the Interior administers the Act through the Fish and Wildlife Service. However, despite protections afforded by CITES and the WBCA, the international and domestic bird trade continues to be a major threat for many species.<sup>252</sup> Demand for and subsequent collection of wild parrots for the global pet trade continues to endanger wild parrots<sup>253</sup> even though it is now more feasible than ever to rear captive-bred birds. Lack of enforcement of international and local laws persists in undermining conservation.<sup>254,255</sup>

#### **14. What effect does capturing parrots from the wild have on native bird populations and ecosystems?**

Nearly a third of the world's approximately 358 parrot species are threatened with extinction due to the combined forces of habitat destruction and continued collection for the pet trade.<sup>256,257,258,259</sup> The cost of wild capture tends to be much less than captive breeding. Generally speaking, the funds received by those who capture wild birds are less than in recipient countries. Further, poaching does not have the overhead costs associated with captive-breeding institutions. The capture of wild birds has devastating mortality rates.<sup>260</sup> The yellow-headed Amazon parrot, for example, has suffered the greatest decline of any bird in the Americas: more than 90 percent since the 1970s, with the majority of the decline (68 percent) in the last decade.<sup>261</sup> The trauma of capture is not limited to birds who are poached; trauma is also sustained by those who lose their family and flock members. Science predicts and shows that trauma effects have long-lasting effects through social disruption.

## 15. Are the wild capture and captive breeding of parrots related?

Yes. The capture trade is driven by market demand coupled with the large profits to the pet industry and rural poverty in many countries with wild parrot populations.<sup>262</sup> There is also demand for wild birds to replenish captive breeding stock. Although the concept of a legal trade in parrots managed under a “sustainable harvest” regime has been suggested as a potential conservation approach<sup>263,264</sup> and is in fact specifically listed as an exception under the WBCA; to date, no successful “sustainable harvest” project has been demonstrated.<sup>265</sup> Further, scientific understanding of bird social, mental and emotional capacities makes such activities not only unviable but unethical and unconscionable. It is important to also consider that studies that measure the effects of collection on populations typically do not measure short- and long-term damage on the population resilience of social animals such as parrots, which may be quite profound. Science predicts and shows that trauma effects have long-lasting effects through social disruption.

Additionally, the legal bird trade provides a smokescreen for poachers to operate behind. Wright et al., (2001) revealed that the WBCA cut poaching rates from almost 50 percent to 20 percent, refuting the claims of some bird enthusiasts<sup>266</sup> that limiting legal trade intensifies illegal trade and poaching.<sup>267</sup> As mentioned above, the yellow-headed Amazon has suffered a more than 90 percent decline since the 1970s, and that decline has continued despite the wide availability of captive-reared yellow-headed Amazons.<sup>268</sup> As previously noted, the illegal and legal trade in wild-caught African Grey parrots continues despite availability of captive-bred ones; indeed, the breeders of African Grey parrots in South Africa are key drivers of the trade.

Currently, there is no marking system that could reliably distinguish legally collected birds from illegally collected birds.<sup>269</sup> Without reliable marking systems and tight controls, attempts to implement sustainable live-bird harvest programs could actually increase conservation problems rather than solve them.<sup>270</sup> Although the breeding of certain species (such as parakeets) has been argued as having less of an influence on the wild bird trade, the practice of keeping birds of any species in captivity encourages trade overall.

## 8. Conclusions and Recommendations

Parrot capture, captivity, and captive breeding challenge standards of welfare because confinement fundamentally undermines bird mental and physical health. The inability to live, move and interact in ways that one is evolved to do and exercise free agency are constant sources of unhealthful stress. Based entirely on rigorous standing science, the present evaluation places all parrot species in what Schuppli & Fraser (2000) called Category E: “Species that are unsuitable as companion animals because of undue harm or risk of harm to one or more of: the animal, the owner, the community, or the environment” (Table 2). Because stress, trauma, and psychological, social and physical deprivation are not limited to a certain body size or species, no species is suited for captivity.<sup>271</sup> The placement of all parrot species in Category E precludes the inclusion of any species in a “positive list,” i.e., species suitable for commercial trade and breeding.

Since captivity cannot meet the physical or psychological requirements of birds, welfare policy is compelled to reflect this scientific understanding. This implicitly includes maintaining a ban on the capture and import of wild birds, as well as captive breeding. The one area of captive breeding that is ethically ambiguous is the rearing of birds for reintroduction into open habitat to restore the species. Wildlife reintroduction has an inconsistent past, filled with more failures than successes. Parrot breeding and reintroduction efforts are no exception. Indeed, many endangered birds have proven to be much more difficult to rear successfully and healthily in captivity than their closely related, non-endangered counterparts.<sup>272</sup> The ill effects that may result from hand-rearing are a constant danger.

However, the ever-growing numbers of wild species in peril, coupled with improved methods and awareness concerning the delicate nature of captive rearing, suggest that under strict regulation, captive breeding for the purpose of reintroduction may be warranted. While reintroduction is difficult,<sup>273</sup> there are successes. For example, the Costa Rican ARA Project reports<sup>274</sup> that

“Macaws...confiscated by [government authorities] from the illegal pet trade, unwanted pets or occasionally injured wild birds...[have been] rehabilitated...resulting in eight releases totaling 70 birds over thirteen years with a survival rate of around 85%....By the end of 2012 the ARA Project will have increased macaw populations of both species by an incredible 6%.”<sup>275</sup>

To this end, there is scientific recognition for creating common standards and developing a “more strategic approach where research and monitoring targets questions that...identified a priori” to avoid haphazard management and to minimize mortality.<sup>276</sup> Strategic approaches include careful consideration of rearing methods, release methods and sites, law enforcement, policy, and monitoring and the welfare of individuals.

However, there are valid concerns about, and a need to prevent, the creation of a reintroduction breeding industry where priorities focus more on maintaining breeding facilities than on the restoration of wild populations. Such situations can end up sacrificing individual birds “for the greater good” and thereby fundamentally violate welfare. It is also been argued that promulgating the belief that wildlife can be replenished by captive breeding takes attention and resources away from the imperative to preserve existing wild parrot populations and their habitats. Subsequently, reintroduction programs must be seen as a last and necessary effort and in no way supplant active, vigorous preservation programs, nor ignore or sacrifice individual parrot well-being and rights.

Because parrots have psychological and physiological capacities comparable to other animals and humans, they qualify for comparable protection. Standing science shows that it is logical, accurate and appropriate to extend ethical and legal criteria used to protect human to birds and other nonhuman animals (Tables 3 & 4). Therefore, current laws, regulations, and assessments pertaining to nonhuman animal welfare must be replaced with standards such as the American Psychological Association’s Ethical Principles of Psychologists and Code of Conduct, Geneva Convention, and Declaration of Helsinki. Scientific evidence redefines parrot welfare and conservation to issues of social justice and sovereignty. From this perspective, subjecting parrots to capture and captivity without consent violates basic rights and, by definition, constitutes a compromise to well-being.<sup>277, 278, 279</sup>

As in the case of other species, there is the question of what laws and regulations should be enacted to safeguard the well-being of animals already in captivity. In addition to eliminating these practices, the following key recommendations are made to extend appropriate protection. They include:

- Requiring and enforcing compliance with species-specific requirements for humane handling, care, and treatment of birds,

including environmental quality control based on criteria comparable to those required for humans

- Implementing and enforcing meaningful penalties for noncompliance
- Prohibiting captive breeding, sale, trade, and transport of unweaned parrots
- Requiring that parrot guardians maintain records for identifying where the birds were acquired in order to assist law enforcement in distinguishing illegally smuggled parrots from legally traded parrots
- Requiring mandatory disease testing and health certificates
- Requiring intensive guardian education and a demonstrated ability to care for parrots
- Prohibiting the use of birds in invasive and exploitive research, entertainment, and other exploitive circumstances

## 9. Appendix

**Table 1: Factors leading to abuse, neglect, or relinquishment (after Kaytee Avian Foundation, 2010)**

<b>Behavioral factors</b>	<b>Health and personal factors</b>	<b>Compatibility factors</b>
Biting/Aggression	Moving	Not enough time
Noisiness	Having a baby	Incompatibility with family members
Feather destructive behavior	Physically unable to care for	Not enough space
Difficult to train	Medical issues, allergies	Incompatibility with other parrots
	Allergies	Cost of care
	Retirement	Best interest of bird
	Marriage/Divorce	Messiness
	Death	Boredom, tired of caring for animal

**Table 2: Classification of suitability according to parrot species (after Schuppli & Fraser, 2000)**

<b>Category A</b>	Species whose use for companionship is generally positive for the animal and the owner, whose needs are easily met, whose procurement and transportation raise no appreciable problems, and whose use involves no apparent risks to the community or the environment.	None
<b>Category B</b>	Species that require significant commitment of time and/or resources in order that their use be positive for the animal and the owner, but where ownership is unproblematic with regard to procurement, transportation and effects on the community and the environment. Substantial owner education may be needed for such species.	None

<p><b>Category C</b></p>	<p>Species that have complex or demanding requirements needing skillful and knowledgeable owners who are prepared to commit significant time and/or resources to animal ownership, but where ownership is unproblematic with regard to procurement, transportation and effects on the community and the environment. Control of ownership (e.g., ownership only by qualified persons) may be appropriate for such species.</p>	<p>None</p>
<p><b>Category D</b></p>	<p>Species where there is insufficient knowledge (e.g., regarding procurement, transportation, environmental impact or the animal's needs) to allow a confident assessment of its suitability as a companion animal. Use of these species might be acceptable in the future if knowledge becomes adequate and any necessary safeguards are in place.</p>	<p>None</p>

<p><b>Category E</b></p>	<p>Species that are unsuitable as companion animals because of undue harm or risk of harm to one or more of: the animal, the owner, the community, or the environment.</p>	<p>Budgerigars (<i>Melopsittacus undulates</i>), cockatiels (<i>Nymphicus hollandicus</i>), and lovebirds (<i>Agapornis</i> spp.). Pygmy parrots (<i>Myiopsitta</i>) and Fig Parrots (<i>Cyclopsitta</i> and <i>Psittaculirostris</i>). Medium-sized parrots, such as conures (<i>Aratinga</i> spp.), parakeets (<i>Psittacula</i> spp), Amazons (<i>Amazona</i> spp.), and African Grey parrots (<i>Psittacus erithacus</i>), lorries and other nectar-feeding parrots. Large-sized parrots such as cockatoos (<i>Cacatua</i> spp.) and macaws (<i>Ara</i> spp.).</p>
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**Table 3: Psychiatric/psychological assessment of parrots and other birds<sup>280,281</sup>**

Elements	Description
Identifying data	Name, age, gender, significant relationships, species
Source and reliability	Identify the source of all information and any associated uncertainties
Chief complaint	Problem description and primary symptoms as reported by caregivers
History of current symptoms	A description of what (symptoms), how much and long (severity), and associated factors; previous treatments; triggering factors and setting; chronological description of the evolution of the symptoms; changes in interests, relationships, behaviors, habits, and physical health; duration and variability of symptoms; stressors; summary review of symptoms, including mood, anxiety, affect, psychosis, and other (e.g., eating disorder)
Mental health history	All known mental symptoms and their course over the patient's lifetime, including interventions and treatments

Medical history	Known medical history including potential causes of or contributors to current emotional behavioral symptoms (e.g., anxiety from hyperthyroidism) or confounding factors that affect choice of treatment options and their efficacy; an account of major medical illnesses, conditions, and treatments (past and present), as well as surgeries and other invasive procedures (where possible note if such procedure was performed for the benefit of the patient or as part of a research protocol); record of procedures and medications received; note current medical conditions as well as a review of current medications
Developmental, family, and social history	A review of the stages of the patient's life to identify context of mental health and physical symptoms and current and past psychosocial stressors; childhood/ family and social environment, number, quality and nature of relationships; natural parrot and/ or human cultural influences on the patient's life; and any known information on family-related risk factors
Mental status examination	Identify areas of mental functioning and record evidence of signs and symptoms of mental illnesses (See Table 4 (MSE) for details).

Physical examination	Any and all known information from the patient's most recent (within a year of the assessment) physical examination, clarifying if the information came from a routine exam or an exam performed to treat an illness, injury or other condition—(if results of a recent physical examination are not available, the assessor should determine when and by whom the patient's last physical examination was performed and inquire about abnormal findings)
Formulation	A narrative that contains an analysis and synthesis of data and observations leading to a biopsychosocial understanding of the patient's condition; include diagnosis, prognosis, recommendations for medical and behavioral interventions, and other treatment planning; include discussion of biological factors (medical, social, and medication history), psychological factors (childhood circumstances, upbringing, interpersonal interactions and individual temperament) and social factors (external stressors and contextual circumstances such as living environment and interpersonal relationships).

DSM multiaxial diagnoses	A diagnostic assessment modeled on the DSM-V that includes (1) major psychiatric diagnoses (PTSD, major depression, etc.), (2) medical conditions; (3) past and current contributing psychosocial stressors; and (4) global assessment of functioning based on the patient's ability to integrate into Psittaciforme society, maintain their social status within that society, mitigate his/her own symptoms in an adaptive or maladaptive manner (e.g. seeking comfort from others vs. isolating from the group), ability to assimilate rehabilitative interventions, etc.
Treatment recommendations	Given the overall assessment of the individual, a summary of treatment options to be explored in the course of developing a formal and individual specific treatment plan, including contingencies and comparative benefit and risk assessment for each treatment strategy

**Table 4: Mental Status Examination for parrots and other birds<sup>282</sup>**

<b>Component Of MSE</b>	<b>Description</b>
Appearance and behavior	A general description of how the patient looks, including color, texture and health of feathers and skin, coloring, weight, posture, effects of appropriate or inappropriate grooming, willingness to approach, physical indicators of self-injury or injury by others. Behavioral disturbances, including distinguishing features, signs of distress, agitation, disinhibition, disinterest, etc.
Motor activity	Motor activity can be described as normal, slowed (bradykinesia), or agitated (hyperkinesia). Descriptions include flight, gait, freedom of movement, any unusual or sustained postures, pacing, tics, jitteriness, tremor, apparent restlessness, startle upon waking, startle upon approach by or movement of others, noise, or other environmental changes (hypervigilance), any existing repetitive movements such as rocking, swaying, head-bobbing, etc. (stereopathies), over- or undergrooming, etc.
Calls	Identify frequency of alarm calling and whether it occurs in the absence of a perceivable threat; frequency of crying or screaming and whether it occurs after an external incident or in the absence of an identifiable external trigger, etc.

Affect	Describe patient's sustained emotional state and affect in terms of five parameters: quality, quantity, range, appropriateness and congruence, (relevant descriptors include dysphoric, happy, euthymic, irritable, angry, good tempered, agitated, labile, intense/reactive, flat, etc.)
Thought processes	Describe task and problem-solving behaviors, for example if they are clear, organized, and goal-directed, or conversely tangential, loose, perseverating, blocked, confused, or repetitious; note if patient's short-term memory is intact, and they are able and interested in attempting novel solutions which draw from previous experience
Perceptual disturbances	Include hallucinations, delusions, depersonalization, and derealization identifiable as the patient attacking his/her own foot, wing or other parts of body as if it belonged to someone else or were a threat to them, withdrawing from appropriate social interaction in a trance like state, inability to move without holding on to the walls, bars, etc. in the absence of any physiological need for such support; and other behaviors inconsistent with expectable behaviors

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Cognition and judgment	Describe alertness, orientation, concentration, memory (both short and long term), calculation, fund of knowledge, abstract reasoning, insight, and judgment — the patient's capacity to make good decisions and act on them in particular regarding rules of parrot social behavior that benefit his/her functioning well within the group, foster alliances, exercises appropriate or inappropriate use of his/her power, and other evidence of ability to make both social and physical decisions that benefit the patient and or his/her social affiliates
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**Animals and Society Institute**

2512 Carpenter Road, Suite 202-A

Ann Arbor, MI 48108-1188, USA

tel: (734) 677-9240

fax: (734) 677-9242

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