

Do social values influence levels of conservation effort in threatened species? The case of two Australian chats

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Abstract This research aims to understand why one of two almost identical subspecies of the Australian yellow chat *Ephthianura crocea* has received significantly higher levels of local and institutional support than the other despite both having the same conservation status and taxonomic distinctiveness, factors commonly thought to influence conservation effort. Using a qualitative multiple case study approach we explored how a range of social factors, including stakeholder attitudes and institutional, policy and operational aspects, might have affected conservation efforts for the two taxa. Our results suggest that the conservation trajectories of these two subspecies have diverged since their identification as threatened species in 2000 because of differences in the social landscapes within which they persist. For one subspecies local advocacy was kindled initially by the small number of local endemic bird species but developed into a strong emotional engagement, resulting in increased local awareness, government funding, and effectiveness of conservation action. The other subspecies has had to compete for attention with approximately 200 other threatened taxa occurring in its region. No individual advocate has accorded this subspecies a high priority for action, and none of those responsible for its conservation have seen it or acknowledged an emotional attachment to it. Our findings confirm that initiation of conservation effort is strongly tied to the social values of individuals with power to take action, regardless of legislation.

Keywords Attitudes, birds, champions, conservation effort, social construction, threatened species, values

Introduction

Over the last few decades substantial funding has been made available for bird conservation, to try to reverse species decline and extinction trends (Garnett et al., 2003;

McCarthy et al., 2008). Most research on threatened birds and their conservation has been ecological, and tends not to consider the social processes and the prevailing values of human societies that affect threatened birds. Adopting a biocultural perspective on extinction could have positive implications for conservation practice (Ladle & Jepson, 2008). Understanding human values and how they influence conservation of threatened birds is essential if conservation success is to be realized.

Values, 'enduring belief[s] that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence' (Rokeach, 1973, p. 5), can be held at the level of individuals, groups, societies and cultures. Where values are shared across levels they are sometimes referred to as social values, '...sets of ideals and beliefs to which people individually and collectively aspire and which they desire to uphold' (Jepson & Canney, 2003). Such values are constructed, and what is regarded as the truth and as valuable may be thought of as no more than the currently accepted ways of understanding and appreciating the world (Burr, 2003). Thus, shared knowledge, beliefs and values concerning wildlife are based on 'a range of assumptions about wildlife and expectations about nature' (Hyttén & Burns, 2007) that are specific to the social and cultural context in which they have been constructed.

At an individual level, identity, knowledge and beliefs are constructed through complex processes of socialization and acculturation (Berger & Luckmann, 2011) that affect an individual's ability to conform to the expectations of the social groups to which they belong. Individuals who are involved in wildlife management are thus likely to hold a shared subset of the values of the society from which they are drawn. These may be overlain with, and sometimes in conflict with, the values espoused by the organizations they represent.

Multiple stakeholders representing various sectors of society may participate in conservation strategies and may have varying importance in conservation networks (Jepson et al., 2011). Non-human factors, including species or devices such as IUCN Red Lists, can also contribute significantly (Jepson et al., 2011).

Within Australia, national (Commonwealth), state and territory governments have legislative responsibility for protection of the environment. Usually one department in each jurisdiction has primary responsibility for the environment.

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Within such departments, responsibility for decisions about threatened species often falls to individual managers, some of whom may be experts in the field. For threatened wildlife, such experts are usually biologists and, partly as a result, the issues are typically framed in ecological terms rather than being seen as social problems, although this is changing.

Beyond government scientists, other stakeholder groups involved in conserving threatened species include the private sector, representing business and industry that may be affected by conservation efforts, and environmental NGOs, which advocate for, or otherwise facilitate, conservation effort. In Australia as in many other countries, birds are often highly valued by society (Zander et al., 2014) and have unsolicited political power held for them in trust by interest groups (Czech et al., 1998) such as BirdLife Australia, which may in part advocate values that are shared by wider society. Directing and maintaining the public's attention to threatened species typically falls to organizations such as BirdLife Australia. In each case the values of the individuals and organizations in these sectors are likely to influence outcomes for threatened species conservation.

Whereas the wider public, who may be expected either to finance a strategy via government spending or otherwise tolerate the restrictions that are frequently associated with conservation interventions (Hunter & Rinner, 2004), are also stakeholders, individual members of the public who become involved in conservation are commonly associated with one of the stakeholder groups already mentioned.

Decisions about setting funding priorities for threatened species are generally made by experts, and conservation research often focuses on threatened species listed in legislation rather than on common or non-threatened species, and on mammals and birds rather than plants and invertebrates (Seddon et al., 2005; Trimble & Van Aarde, 2010). Certain types of biodiversity tend to attract disproportionate amounts of public attention, such as tigers *Panthera tigris* and elephants (Elephantidae spp.; Smith et al., 2012), or a species may develop a high public profile as a result of being the subject of political controversy. Flagship species are one of several potential framings for wildlife-related work focusing on single species. Some flagship species could be described as actors, as their engagement produces agency, which can effect change in the status quo (Jepson et al., 2011). Selection of a flagship species often depends on the values and goals of the agency conducting the conservation effort, and their intuition about public interests in the area where those efforts are being conducted (Home et al., 2009; Smith et al., 2012). Aesthetic appeal is often prioritized over threat status, resulting in many overlooked Cinderella species (Home et al., 2009; Smith et al., 2012).

We hypothesize that the type and strength of the values held by individuals involved in the management of threatened species are likely to have a profound effect on the level of human, financial and other resources allocated to

the task relative to need and the outcome of that funding. We ask how the values of key stakeholders involved with the conservation of two closely related threatened birds have affected their conservation management. This work, part of a growing body of social research on 'what motivates people to engage in activities that harm or promote the conservation of biodiversity' (Sandbrook et al., 2013), aims to understand why one of the study subspecies has received high levels of local and institutional support while the other has had very little, despite both having similar conservation status and taxonomic distinctiveness, factors commonly thought to influence conservation effort (Restani & Marzluff, 2002; Garnett et al., 2003). Understanding the values of people influential in making decisions and implementing conservation measures for these threatened birds can help drive more effective conservation action in the future, as in other fields (Carlos et al., 2014).

Methods

This research drew predominantly from the discipline of social psychology, the theory of social constructionism and the human dimensions of wildlife research. Using a qualitative multiple case study approach (Yin, 2003) we explored how a range of social factors, including stakeholder attitudes and institutional, policy and operational aspects may affect conservation efforts for threatened bird taxa. We focused on two Endangered subspecies of a small (c. 9 g) endemic Australian passerine: the Alligator Rivers yellow chat *Epthianura crocea tunneyi* and the Capricorn yellow chat *Epthianura crocea macgregori*. This matched pair was selected because the taxa had contrasting societal support (e.g. funding, recovery plans, recovery actions, voluntary actions) despite being similar in biology and appearance, thus controlling for the influence of aesthetic or behavioural attributes of a taxon that might have masked other social drivers of conservation response (Ainsworth, 2014).

The adult male yellow chat has bright yellow breeding plumage, with a black band across the chest, which is absent in the pale lemon females and non-breeding males (Schodde & Mason, 1999; Woinarski & Armstrong, 2006; DSEWPaC, 2013a,b). Both subspecies have highly restricted ranges: *E. crocea tunneyi* occurs only on the floodplains of two rivers east of Darwin in the Northern Territory, and *E. crocea macgregori* is restricted to the Capricorn region on the east coast of Queensland. Both subspecies inhabit coastal salt-pans and use shallow drainage channels and depressions supporting a mosaic of wetland vegetation such as samphire shrublands (Woinarski & Armstrong, 2006; DSEWPaC, 2013a,b; Houston et al., 2013).

The context for each taxon was established through a desktop analysis of peer-reviewed scientific literature,

gathering data about the biology and ecology, conservation status and governance, levels of conservation effort, and social and economic considerations for the two taxa. A stakeholder analysis identified the major stakeholders and their institutional affiliations.

It was important to identify which individuals within a cross-section of society were deemed to hold appropriate knowledge and experience of the conservation of each taxon so that their particular attitudes could be analysed. Thus, 13 key informants were invited to participate in the study because they were considered to be sufficiently knowledgeable regarding the conservation of the case study taxa and were anticipated to hold a diverse range of values for them. All except two of those invited agreed to participate in the study. The small number of stakeholders deemed sufficiently knowledgeable to contribute to the research is a potential limitation of this study but was unavoidable given the small scale of the conservation effort.

GA conducted semi-structured interviews with 11 key informants during April–May 2011. Informants were provided with a statement in plain language that guaranteed their anonymity and asked for their consent prior to being interviewed (Ainsworth, 2014). Four informants represented the Alligator Rivers yellow chat (a birdwatcher, a business/industry representative, a national park management agency representative, and a state/territory government scientist), and seven represented the Capricorn yellow chat (two academics, one business/industry representative, a birding NGO representative, a landholder, a natural resource management agency representative, and a state/territory government scientist).

Interviews lasted approximately 1 hour and the questions focused on the informants' values and attitudes towards the case study taxa. We generally avoided direct questions regarding participant values because of the difficulty with identifying or articulating values that are deeply held, privately defended, ethically charged or not available to consciousness at a moment's notice, and to avoid participants potentially overstating the strength of their views in a possible desire to conform socially (Satterfield, 2001). Questions were asked in a way that was intended to be meaningful to participants and to allow for subsequent qualitative content analysis (Minichiello et al., 2008). The term 'value' was used minimally and always in a common language sense that participants were expected to understand in general terms (Ainsworth, 2014).

All interviews were recorded and transcriptions were imported into *NVivo v. 10* (QSR International Pty Ltd, Doncaster, Australia). Attitudes were coded manually according to a new typology of 12 attitudes to avifauna, developed in GA's PhD research to describe the various ways Australians value birds (Ainsworth, 2014). The 12 attitude categories reflect aesthetic, biophysical, conservation,

ecological, experiential, humanistic, mastery, moral, negative, spiritual, symbolic and utilitarian values held by Australians for birds (Ainsworth, 2014). Individual coding nodes were created in *NVivo* for each of the 12 categories and text was coded under one or more nodes, depending on the attitude(s) expressed. The following comment, for example, discusses the ecological relationship between a species and its habitat and was primarily coded under the ecological node: 'There's no other bird living in that particular exact habitat in the region.'

Results

Conservation status and governance

Legislative responsibility for the two subspecies lies with both the Commonwealth and the relevant state or territory governments. The Alligator Rivers subspecies is listed as Endangered under both the Commonwealth's Environment Protection and Biodiversity Conservation Act 1999 and the Northern Territory's Territory Parks and Wildlife Conservation Act 2000 (DSEWPac, 2013a; DLRM, 2014). The Capricorn subspecies is listed as Critically Endangered under the Environment Protection and Biodiversity Conservation Act 1999 and Endangered under Queensland's Nature Conservation Act 1992 (Houston & Melzer, 2008; DSEWPac, 2013b). Both subspecies face some common threats, such as damage to habitat by grazing and feral animals, invasive exotic grasses, climate change, fire, and impacts on water quality from saltwater intrusion or altered water flows (Woinarski & Armstrong, 2006; Houston et al., 2013; DSEWPac, 2013a,b; Kyne & Jackson, 2015).

The Alligator Rivers subspecies was first identified as Endangered by Garnett & Crowley (2000) on the basis of its small range and extent of suitable habitat. At the time the population was estimated to comprise, with low certainty, c. 500 individuals and to be a single, declining population. A systematic assessment of its status in 2004 found 96 individuals (Armstrong, 2004), but none were found during a monitoring programme in Kakadu National Park during 2007–2009 (Woinarski et al., 2012). The population was recently estimated to be < 300 individuals (Garnett et al., 2011) and a systematic survey for the subspecies conducted in Kakadu in 2014 found only 26 individuals at a single location, suggesting a substantial decline over a 10-year period (Kyne & Jackson, 2015).

The Northern Territory Government produced a two-page Threatened Species Information Sheet in 2006 describing the status of the Alligator Rivers subspecies, and its conservation and management priorities (Woinarski & Armstrong, 2006). Although Commonwealth Conservation Advice was approved in 2008 by the Commonwealth

TABLE 1 Examples of support for the conservation of the Alligator Rivers *Epthianura crocea tunneyi* and Capricorn *Epthianura crocea macgregori* yellow chat subspecies (Armstrong, 2004; Woinarski & Armstrong, 2006; Houston & Melzer, 2008; Kyne & Dostine, 2011; DEHP, 2013; DERM, 2013; DSEWPaC, 2013a,b).

Type of support	Alligator Rivers yellow chat	Capricorn yellow chat
Recovery programme	None	Informal recovery team
Expert groups	None	BirdLife Australia conservation project Back on Track; high priority for conservation
Research	Distribution & abundance within Kakadu National Park	3 major studies on incidence, ecology & rediscovery
Publications	0 species profile references (SPRAT*) 1 book chapter	29 species profile references (SPRAT*)
Funding	None	AUD 535,150: estimated cost to implement 5-year recovery programme AUD 22,816: Threatened Species Network Grants received (2003–2005)
Stakeholder involvement	Department of Land Resource Management, Kakadu & Mary River National Parks; Aboriginal Land Trusts	BirdLife Australia, including BirdLife Capricornia; Department of Environment Heritage Protection, state government agencies & shire councils; Environment Protection Agency; Australian universities; pastoral leaseholders & freeholders; Fitzroy Basin Authority & other natural resource management agencies; Australian Defence Department; indigenous groups

*Australian Commonwealth Government Species Profile and Threats Database

Environment Minister (Threatened Species Scientific Committee, 2008), there was no recovery plan or team in place at the time of this research.

Most records of the Alligator Rivers subspecies have been from three conservation reserves: Kakadu and Mary River National Parks and Harrison Dam Reserve (Woinarski & Armstrong, 2006), all within a few hours' drive of Darwin, the regional administrative centre. Although both park management plans listed this subspecies, among many, as being in need of protection within the parks, management activities aimed specifically at conserving chats were not being undertaken in either park (Director of National Parks, 2007; PWSNT, 2011).

The Capricorn subspecies was also first identified as threatened by Garnett & Crowley (2000). It is restricted to Capricornia, an area of the central Queensland coast, near the Fitzroy River and within a few hours' drive of the regional city of Rockhampton. It has been recorded at 15 sites but only regularly at five locations, including Torilla Plain, where it is most abundant (Garnett et al., 2011). The subspecies was once believed to be extinct but was rediscovered on the marine plain on Curtis Island in 1992, having not been seen for 70 years (Houston et al., 2004; FBA, 2007). It was first listed as Critically Endangered in 2000 on the basis that the habitat of this single population was thought to be decreasing in area and quality. The population at the time was thought to comprise as few as 50 mature individuals in winter (Garnett & Crowley, 2000). In 2004 two additional populations were found at sites where the birds were previously thought to be extinct (Houston et al., 2009). Populations are now thought to fluctuate, with a mean

population of c. 250 mature individuals. Management documentation includes a national recovery plan, and recovery efforts have been managed by an informal recovery team (FBA, 2007; Houston & Melzer, 2008; Birds Australia, 2011).

Conservation effort

Of the two yellow chat subspecies the Alligator Rivers was less well studied and had been the focus of less conservation effort (Table 1). It also had fewer and less diverse stakeholders involved in its conservation.

The Capricorn subspecies had been reasonably well surveyed compared with its Northern Territory counterpart; it was a high priority for conservation under Queensland's Back on Track species prioritization framework (DEHP, 2013). It was the focus of a Birds Australia (now BirdLife Australia) conservation project (Birds Australia, 2011) and was promoted as a flagship species by local environmental groups, partly because of its aesthetic appeal and partly because of its status as the only endemic bird in the Capricorn region (612 ABC Brisbane, 2013; Capricorn Conservation Council, 2014).

Social and economic considerations

The Alligator Rivers subspecies has been recorded in national parks managed by the Commonwealth (Kakadu) and Northern Territory Governments (Mary River) but neither government has provided dedicated funding to manage the subspecies, even though Kakadu is one of the best-funded national parks in Australia. In 2010 a record

TABLE 2 Comparison of attitudes expressed by key informants about the Alligator Rivers and Capricorn yellow chat subspecies, according to the avifaunal attitude categories.

Attitude	Alligator Rivers yellow chat (n = 4)	Capricorn yellow chat (n = 7)	Example
Aesthetic		✓	Appreciation of physical characteristics of birds
Biophysical		✓	Physical attributes & biological functioning of birds
Conservation	✓	✓	Relating to conservation of threatened birds
Ecological	✓	✓	Interrelationships between birds & natural habitats
Experiential		✓	Experiences with birds in their natural habitat
Humanistic		✓	Affection or concern for, symbolic meaning of, birds
Mastery	✓	✓	Literal or metaphorical mastery & control of birds
Moral	✓	✓	Responsibility for conserving bird taxa
Negative			Dislike of birds, or conflict between birds & people through competition for resources
Spiritual			Birds possessing spiritual significance
Symbolic		✓	Birds as flagship species
Utilitarian			Material benefit of birds or bird habitat to human society

23,000 people visited Shady Camp, one of the few places where the Alligator Rivers subspecies has been seen recently and a popular and nationally known recreational fishing spot in Mary River National Park. However, park management did not mention the chats being present in the vicinity (PWSNT, 2011). There is no coordinated bird conservation group in the Northern Territory region to draw attention to the subspecies.

The Capricorn subspecies' habitat occurs across a range of tenure types, including freehold, leasehold (special, mineral and grazing) and protected areas (Curtis Island marine plain; Houston et al., 2013; McCabe & James, 2013). Most of the known breeding habitat, at Twelve Mile Creek (Fitzroy Delta), lies within the upper extent of leasehold land used for salt extraction (Houston & Melzer, 2008). Applications for development that had the potential to affect the habitat of the Capricorn subspecies, such as infrastructure development in the Port of Gladstone (BirdLife Capricornia, 2013), had to be referred to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (since 2013 Department of the Environment) under the Environment Protection and Biodiversity Conservation Act 1999 to determine if the developments were likely to have a deleterious effect on the subspecies (Houston & Melzer, 2008). There was a requirement to monitor grazing practices on freehold grazing properties and grazing lease areas in Curtis Island Conservation Park (Houston & Melzer, 2008).

Funding of recovery efforts in Queensland has come mainly from the Queensland and Commonwealth Governments, but Central Queensland University, the Fitzroy Basin Authority, BirdLife Capricornia and the Threatened Species Network have also contributed funds (Threatened Species Network, 2006; FBA, 2007; Houston & Melzer, 2008; Birds Australia, 2011; Table 1). Important habitat was managed by those with an interest in the affected land, such as staff of Curtis Island National Park, workers

at a salt refinery, and pastoralists and graziers. The bird-watching and fishing communities accessed some areas of habitat at Twelve Mile Creek for recreational purposes (Houston & Melzer, 2008).

Which values are held for each subspecies?

Attitudes towards the two yellow chat subspecies were revealed through the answers of key informants to a set of questions used to initiate conversations. These attitudes are compared in Table 2, according to the 12 categories in the avifaunal attitudes typology.

How did you get involved with the yellow chat? At the time interviews were conducted none of the key informants for the Alligator Rivers subspecies had seen the bird in the wild, and they implied that interest in the taxon was limited to a few local people. They perceived the bird to be rare, given its small population and limited distribution. It was not known to be under immediate threat and therefore was not a priority for conservation effort. It was said that a small government team was responsible for conserving the chat, along with c. 200 other threatened species (many of which are endemic to the Kakadu region). A similar situation was described in Kakadu National Park, where conservation of the main population was led by an individual with a broad research and monitoring remit but no particular role regarding the birds. Both key informants from the government and national park agencies responsible said they were involved in the conservation effort as part of their role rather than having any specific personal interest in it:

It's a listed threatened species and therefore I had to address it as I have to every other threatened species. (Northern Territory government informant)

One key informant described how his birding tour business could contribute to conservation efforts for the taxon by

recording sightings and generating an interest in the bird among his local, national and international tour guests if he had more accurate information about where it could be found. Another key informant, a local birdwatcher, had published a summary of current knowledge about the taxon. He said that he appreciated the symbolic role it played in highlighting the efforts required to conserve what was generally considered to be a pristine wetland landscape, but also intimated how keen he was to add this difficult-to-see bird to his list of Top End sightings:

I found it difficult to find information on, so my quest to see one hasn't succeeded yet. (Birdwatcher)

In contrast, most of the key informants for the Capricorn subspecies stated they saw the bird on a regular basis, or knew where the birds could be sighted. One key informant explained that he got involved when Birds Queensland funded the Queensland Parks and Wildlife Service to investigate the conservation status of the Curtis Island population in 2000. A second key informant said he became involved when two mainland populations were discovered at Torilla Plain and the Fitzroy Delta in 2004, and that this acted as a catalyst for much of the conservation effort for the taxon:

We really had the opportunity to study a bird that was little known in the whole of Australia, more easily than anyone else. . . I don't think I knew enough about the significance of them at the time. . . it was a bird I'd never seen . . . I devoured everything about them after we did. (Academic)

Key informants mentioned that after this rediscovery a range of opportunities arose, resulting in several new research partnerships with individuals and local organizations. They also pointed out how individuals could influence conservation efforts significantly; for example, in 2008 one key informant started working at a salt refinery within key habitat of the Capricorn subspecies and, because he had a general interest in birds and in conservation of threatened birds in particular, he granted permission to Central Queensland University to survey the salt pans. He explained how this decision resulted in a personal affection for the birds and an interest in their survival. Conversely, another key informant had replaced a local staff member of a natural resource management agency in 2010 and, as a result of an administrative oversight, ceased annual funding to conduct population surveys and monitoring. A key informant who owned a pastoral property where the Torilla Plain population was discovered described how a scientist found it during a routine wetland bird survey on his property:

I just said to him I'd been here all my life and I see them on a regular basis. He was kinda knocked over when I told him that and . . . that's how they started coming up here and counting them. (Pastoralist)

Another key informant got involved with the subspecies through BirdLife Capricornia, which promotes it as the region's only endemic bird, thereby creating demand among

birdwatching tourists to see what has become an iconic taxon for the region.

What is most important to you about conservation of the yellow chat? Key informants identified the collection of biophysical and threat impact data as most important to the conservation of the Alligator Rivers subspecies. The partnership between the Northern Territory Government and the Commonwealth Government-managed Kakadu National Park was described as sometimes facilitating this flow of information and sometimes blocking it. Improved community engagement was also raised as an important issue. However, this was perceived by some key informants as being neither supported by the authorities nor desired by the community:

I know that places like Shady Camp are somewhere birders will go to try and see the species because they want to tick another species off. To be honest, I don't see that as a big imperative. What I want to know is that the species is relatively secure and those sorts of things. (Northern Territory government informant)

Discussion about the importance of conserving the Capricorn subspecies focused more on its inherent right to exist and society's responsibility for preventing its disappearance. Reasons given included the bird's attractive appearance, its engaging behaviour and its specialized role in a fascinating landscape. Protecting its habitat and managing threats were identified as key actions that could be implemented.

Do you personally believe that conservation efforts for the yellow chat will succeed or fail? There were no actions being undertaken with the aim of conserving the Alligator Rivers subspecies at the time of this research. Population monitoring was infrequent and had not been conducted since 2004, as the population was not perceived to be declining significantly. Climate change was perceived as being a significant unknown factor, with the potential to affect the taxon's habitat either positively or negatively. Key informant opinions about the success of conservation efforts for the Capricorn subspecies were more positive. However, in part this was attributed to finding additional populations rather than the efficacy of conservation efforts. The ongoing preservation of suitable habitat was identified as a concern, as it was thought to rely in the short term on the precarious support of landholders and government in the face of economic pressure, and to be vulnerable to climate change in the longer term. It was suggested that the local university's survey and monitoring efforts could provide justification for protecting key habitat.

Is it important to you that a population of the yellow chat exists in the wild? The existence of a wild population of the Alligator Rivers subspecies meant various things to the individuals involved, including protecting the important ecological function the birds play in their wetlands habitat and as an indicator of the system's health, respecting the

birds' intrinsic right to persist where they belong, and maintaining their psychological or other contribution to humanity. The subspecies was not described in emotional terms, which is perhaps unsurprising given that none of the key informants had seen it in the wild and it had no public champion to encourage interest. The connection of the Capricorn subspecies to its habitat, its intrinsic right to exist and the benefit it provided to people as an interesting, unique and attractive bird were all given as reasons for preserving a wild population of this taxon, especially in light of conflicting social values:

These species have got a huge financial benefit for the community. If we just take tourism as an example, people are prepared to spend a lot of money to go to where there are threatened species or endemic species that can't be seen anywhere else, and that kind of thing is totally ignored as compared to having a new coalmine or some other infrastructure built. (Birding NGO informant)

Discussion

The two yellow chat subspecies exist in different human social contexts, as indicated by the attitudes expressed about them (Table 2), and they were socially constructed by key informants in different ways. Few people were known to have seen the Alligator Rivers subspecies in the wild, not even those who manage conservation effort for it, and this lack of experience with the taxon contributed to its ongoing obscurity. Only conservation, ecological, mastery and moral attitudes were expressed about it. In contrast, key informants had opportunities to engage directly with the Capricorn subspecies because of its proximity to human habitation, and the resulting knowledge, affection and support meant this subspecies was valued more highly and more diversely across a broader cross-section of society than the Alligator Rivers subspecies. It therefore appeared better placed to receive support, and thus persist, in the face of future conservation challenges.

In retrospect both subspecies had the potential to follow identical conservation trajectories. Both were confirmed as distinct subspecies in 1999 (Schodde & Mason, 1999) and their rarity was acknowledged, and both were listed as threatened species in 2000 (Garnett & Crowley, 2000). Their conservation trajectories first started to diverge in 2002 when the Capricorn subspecies was categorized as Critically Endangered under the Environment Protection and Biodiversity Conservation Act 1999; the Alligator Rivers subspecies was not categorized as Endangered until 2006. This divergence was already being influenced by the contrasting social landscapes within which the birds existed.

One could argue that a lack of general awareness of, and knowledge about, the Alligator Rivers yellow chat had hampered social interest and stakeholder involvement in recovery efforts, but this was also true for the Capricorn subspecies when both were listed as threatened in 2000. Similarly, both locations where the birds live are relatively

remote but are nevertheless within a few hours' drive of similar-sized regional cities, both of which have universities conducting environmental research.

Critically, the Alligator Rivers subspecies never had a champion to encourage interest or empathy. It was not described by any key informant in humanistic terms and appeared to be given low financial, organizational and emotional priority among the c. 200 other threatened species in the Northern Territory (many of which are endemic to the Kakadu region). That neither of the two key informants identified as responsible for the conservation of the bird had allocated time to see the taxon, and the other two key informants could not find information on where to see it, is indicative of the low level of local interest. Potential interest groups, such as birdwatchers and recreational fishers, also showed little interest in the taxon, possibly because of the wealth of other distinctive local bird species and the taxon's remote and inhospitable geographical location, or because there was no local birding NGO to stimulate interest.

Although the taxon was listed under the Environment Protection and Biodiversity Conservation Act 1999 it was not perceived to warrant a recovery team or recovery plan, and therefore no funding was forthcoming from the Commonwealth Government to conduct formal recovery efforts under this Act. The few individuals within the Department of Land Resource Management responsible for the management of the subspecies had neither the evidence required on which to base any increased support for its recovery, nor the capacity to develop strategies to gather such evidence. Consequently, it has not been established whether or not threats to its survival are becoming more serious.

In contrast, for the Capricorn subspecies a correlation was found between experiential, humanistic and conservation attitudes expressed by key informants about this subspecies (i.e. personal encounters with it, and concern about its plight, led key informants to engage proactively in recovery efforts).

Listing of the subspecies as a high priority under the Queensland Government's Back on Track species prioritization framework (DEHP, 2013) meant it was prioritized for further analysis under the programme. Additionally, a national recovery plan facilitated the management of the subspecies by an informal recovery team. These two policy frameworks were thus part of the conservation network and effected positive management action for the Capricorn yellow chat.

The Capricorn subspecies had the advantage of having two champions representing the scientific and birdwatching communities. Champions can lend credibility to conservation initiatives and improve levels of participation and commitment by other stakeholders (Knight et al., 2010). In this case the champions created an informal recovery team,

developed a recovery plan in association with the relevant government agency, conducted specialist research, secured funding and raised public awareness of the subspecies. Additionally, because it existed on a variety of land tenure types, a diverse range of key stakeholders became engaged in managing critical habitat for the Capricorn yellow chat, there was increased awareness about its plight, and demand was created for it to be protected.

Although the government management agency with legislative responsibility for conservation of the Capricorn yellow chat responded to societal interest, it was the champions' emotional connection to the species, derived from their personal experiences with it, that distinguished these interviews from those related to the Alligator River subspecies.

A possible additional reason why the Capricorn subspecies has been the focus of greater conservation effort is the publicity generated by the discovery, in 2004, of two small populations on the mainland, where it was previously thought to be extinct (Houston et al., 2009). This is an example of a Wallacean extinction, whereby inadequate biogeographical knowledge about the taxon appears to have resulted in a good news story that inspired conservation action (Ladle & Jepson, 2008). Even though, ironically, this discovery meant the subspecies was less threatened than previously thought, it also made the subspecies more accessible; more people could see the birds and become involved in their conservation, widening the range of stakeholder support (Conaghan, 2013). This discovery altered how the subspecies was socially constructed, prompting action that led to increased interest in its conservation.

Further publicity was generated when critical habitat was potentially threatened by expansion of a local harbour (Eberhard, 2012; BirdLife Capricornia, 2013; Jacques, 2013) and when BirdLife Capricornia highlighted the subspecies in a campaign before an election, calling for all political parties to protect Australia's most threatened birds (Gladstone Observer, 2013).

The Alligator Rivers yellow chat has not attracted much attention in the media. It exists entirely within protected areas, so is probably thought by the public to be well cared for, and the threats it faces are diffuse and difficult to ameliorate (Kyne & Dostine, 2011). This subspecies has similar aesthetic appeal and threat status to the flagship Capricorn yellow chat, yet it remains a Cinderella species with flagship potential but no NGO support to promote it. That neither Northern Territory nor Commonwealth government environmental agency staff recognized the potential agency of the Alligator Rivers yellow chat to attract interest from the local fishing and birdwatching communities highlights a missed opportunity to develop conservation effort for the subspecies and its habitats, and adopt a more enlightened conservation management and policy approach (Jepson et al., 2011).

Neither the Alligator Rivers yellow chat nor its habitat is threatened directly by human intervention, and therefore

rather than benefiting from a controversial or transformative event it has remained in relative obscurity to face an uncertain fate. Possibly because of this, and despite its listing under the Environment Protection and Biodiversity Conservation Act 1999, it has never been considered to warrant a national recovery plan. Consequently, this subspecies has received less conservation funding and support than the Capricorn yellow chat (Table 1) and has had a less diverse range of stakeholders involved in its conservation.

Local lobbying, partly as a consequence of this study, resulted in a dedicated survey for the Alligator Rivers subspecies in Kakadu National Park in September 2014. Only 26 individuals were found and most locations of previous sightings had been uprooted by feral pigs *Sus scrofa* (Kyne & Jackson, 2015). It remains to be seen if this assessment will prompt conservation interest in the subspecies, as happened with the rediscovered Capricorn subspecies.

This research supports the idea that human preferences bias research and conservation effort regardless of legislative responsibilities; it suggests how and why particularly closely related threatened bird taxa are valued differently, and how this may be linked to overall levels of conservation funding and social interest in them. Few previous attempts have been made to engage diverse stakeholders in priority setting (but see Miller & Weston, 2009). These findings are consistent with the notion that decisions about which taxa to prioritize for conservation effort are often influenced by political decision making, significant events or social attitudes, which propel certain species into the limelight and engender some societal response. The factors most influential in these two case studies appear to be the presence of champions, and current social constructions of competing species and the profile of threats and threatening processes.

The contrasting networks of human and non-human actors involved in the conservation of the two subspecies were also significant. Our findings suggest that the initiation of conservation actions for threatened bird taxa are influenced directly by the unique networks of people engaged in specific conservation strategies and the ways they socially construct various taxa, which is probably related to the attitudes and experiences of key individuals, their sphere of expertise and influence, and associated institutional norms (Berger & Luckmann, 2011). It was also evident that particular contemporary social factors played a significant role in catalysing conservation action for the Capricorn subspecies, including the current social construction of the subspecies itself, its rediscovery, and the policy frameworks triggered by its current conservation status.

Our findings thus demonstrate the important role that cultural and social framings of conservation issues, and the values and priorities of local conservation actors, play in conservation success (Ladle & Jepson, 2008). Accordingly, this study confirms that social values can have a significant influence on conservation effort,

particularly when key individuals become committed to conserving particular taxa and effectively mobilize others who share their values.

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Biographical sketches

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