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Conserving the World's Megafauna and Biodiversity

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1 **Conserving the world's megafauna: the fierce urgency of now**

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81
82 In their critique of our call to save the world's terrestrial megafauna (Ripple et al.
83 2016), Ford et al. argue that we undermine broader efforts to conserve biodiversity.
84 Their main arguments are that (1) megafauna conservation does not conserve other
85 species; (2) megafauna already receives enough attention; (3) megafauna does not
86 play a compelling enough ecological role to justify increased conservation efforts; (4)
87 megafauna conservation is counterproductive by taking too big a share of
88 conservation resources; and (5) megafauna is less imperiled than other species and
89 over-shadows their declines.
90

91 Here we acknowledge that all aspects of biodiversity are important and that efforts to
92 conserve megafauna are unlikely to be enough in isolation to conserve all species. We
93 agree with Ford et al. that stronger and varied conservation approaches are necessary
94 to conserve the earth's biodiversity. However, we deem it necessary to respond to
95 Ford et al.'s critique by highlighting several important factors for consideration.
96

97 With respect to Ford et al.'s first and third arguments, we assert that megafauna are
98 strong candidates, perhaps the strongest candidates amongst all vertebrates, as
99 umbrellas for conservation (Caro 2010). This is because megafauna have slow life
100 histories and large habitat requirements; thus, conserving megafauna means
101 conserving large tracts of ecosystems and the diversity of species they host. In a
102 conservation plan for the Cape Floristic Region of South Africa, the mammal
103 conservation plan was the most space and area demanding of the various taxon-
104 specific plans, this despite highly conservative population targets used for the medium
105 and large mammals (Kerley et al. 2003). In addition, there is abundant evidence
106 demonstrating that megafauna can cause direct or indirect effects on other species and
107 ecosystem functions (Estes et al. 2011; Dirzo et al. 2014, Ripple et al. 2014, 2015).
108 Indeed, in Point 3 of our Declaration we highlight how megafauna can affect
109 ecosystem processes and services, and other species throughout the food web.
110 Megafauna may not trigger ecological cascades in all systems, however we do assert
111 that, in many instances, the loss of megafauna will cause disproportionate ecological
112 disruption in comparison to several other taxonomic groups. Nonetheless, this
113 assertion does not imply that specific conservation efforts that are not focused on

114 megafauna are not needed, or that targeted interventions that perhaps benefit only one
115 or two large mammals are also not justified.

116
117 For the second and fourth arguments made by Ford et al., we acknowledge and are
118 acutely aware that funding for conservation is finite and that great care is needed
119 when considering its use. In our paper (Ripple et al. 2016), we did clearly call for
120 additional conservation resources, so it is not just how the existing resources are
121 allocated, but also recognition that society needs to invest more money. However, we
122 are also aware that funding is not perfectly transferrable and that much of the support
123 for conservation would decrease or disappear if megafauna species were made less of
124 a focus (Kerley et al. 2003). We do however emphasize that our focus on megafauna
125 conservation is not about discriminating against other species, but simply harnessing
126 the potential of megafauna to achieve broad conservation outcomes. We are aware
127 that the dire prospects facing broad swathes of the world's biodiversity are seriously
128 worrisome. We therefore need to think very carefully about how best we allocate
129 those resources and about what the most effective strategies are likely to be for
130 achieving positive conservation outcomes for as many species as possible. We do
131 agree that focusing too much effort and resources on some taxa at the expense of
132 others is dangerous. However, we argue that megafauna have unique economic and
133 cultural values and thus have an ability to harness public and political support for
134 conservation. The trick is therefore to seek conservation interventions that yield the
135 greatest bang for our buck—for megafauna, and for other species too.

136
137 We do not agree with Ford et al. in their fifth argument that megafauna is less
138 imperiled than other species when considering all terrestrial vertebrates. The fact is
139 that mammalian terrestrial megafauna are greatly imperiled and highly threatened
140 when compared to other vertebrate taxa. Ripple et al. (2014, 2015) reported that 59%
141 of the world's largest carnivores (≥ 15 kg, $n = 27$) and 60% of the world's largest
142 herbivores (≥ 100 kg, $n = 74$) are classified as threatened with extinction based on
143 IUCN criteria. These endangerment levels appear especially troublesome when
144 compared to just 26% threatened for all mammals, 14% for birds, 23% for reptiles,
145 and even 42% for amphibians, the latter is considered one of the most imperiled
146 groups (IUCN 2015). It is also not correct to assume that all megafauna species are
147 well studied and well loved. This lack of knowledge and interest is especially true for
148 many of the threatened large herbivores such as the Palawan Bearded Pig (*Sus*
149 *ahoenobarbus*), Oliver's Warty Pig (*Sus oliveri*), Mountain Anoa (*Bubalus quarlesi*),
150 White-lipped Deer (*Przewalskium albirostris*), and the recently described 110-kg tapir
151 *Tapirus kabomani* sp. nov. (Cozzuol et al. 2013), among others (see Ripple et al.
152 2015, supplemental materials).

153
154 A broader concern we have with Ford et al.'s critique is that it presupposes a world
155 where the predicament of all plant and animal species top the political agenda of most
156 governments and is a shared concern by most people. Conservation has unfortunately
157 become a political choice and not only a scientific exercise. Thus, while scientists
158 may consider that "all species are equal", in the socio-political 'real' world some
159 species are considered "more equal than others". Once granted, political support for
160 conservation can have profound impacts on the prospects for conservation. For
161 example, Amur tiger (*Panthera tigris altaica*) populations are recovering from quasi
162 extinction after President Putin stated tigers were Russians' pride (Vice News 2015)
163 or the Indian state of Gujarat praising itself for being the only state with Asiatic lions

164 (*P. leo persica*) (The Telegraph 2016). In Africa, several countries have set aside vast
165 tracts of land for conservation and have a firm political commitment to preserving
166 those lands. This is due in part to appreciation of the potential economic value of such
167 areas and the large mammals they contain, as well as to notions of the importance of
168 preserving natural heritage for future generations.

169
170 In other cases, political support for conservation is likely the product of popular
171 support. Megafauna is better than most aspects of biodiversity at engendering that
172 support, because it is considered to be so charismatic by so many people. It is simply
173 a fact that most of the world's most captivating and popular species are megafauna.
174 Where millions of tourists travel to Africa to observe megafauna [O], there is no
175 evidence that tourists travel to the upper reaches of the Amazon to see the world's
176 highest diversity of fungi [O]. While we agree with Ford et al. that the conservation
177 status of the human-gut microbiota is critically important and deserves scientific
178 attention, we suspect it is unlikely to receive political attention, except when
179 addressing human disease issues, when the focus falls on the eradication, not the
180 conservation of pathological organisms. Furthermore, the failure to conserve the
181 charismatic megafauna risks losing public support for conservation more broadly on
182 the assumption that 'if conservationists cannot conserve a tiger with all the money and
183 support we gave them, the won't be able to conserve the critically endangered pink
184 velvet worm *Opisthopatus roseus* [O]. Thus, we emphasize that focusing on megafauna
185 conservation is not discriminating against other species, but simply adopting an
186 evidence-based approach on how to achieve greatest social and political impact.

187
188 We wrote our declaration because, despite being the most cherished species by the
189 public, many megafauna species are steadily cruising towards extinction. We
190 unfortunately still have not crafted the recipe to save these species and our
191 Declaration calls for the urgent need of alternative approaches. Our rallying call is
192 certainly not "Megafauna *über alles*" as Ford et al. suggest, but could instead be
193 understood as a conservation interpretation of Dr. Martin Luther King Jr.'s own
194 words: "We are now faced with the fact that tomorrow is today. We are confronted
195 with the fierce urgency of now. In this unfolding conundrum of life and history, there
196 "is" such a thing as being too late. This is no time for apathy or complacency. This is
197 a time for vigorous and positive action." Megafauna need immediate attention, and,
198 yes, non-megafauna do as well. We invite Ford et al. —and everyone— to join us in
199 our efforts to save megafauna and all biodiversity as the fierce urgency is now.

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