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Beyond Trust Species: The Conservation Potential of the National Wildlife Refuge System in the Wake of Climate Change

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3 **The Conservation Potential of the National Wildlife Refuge System in the Wake of Climate**
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25 *Introduction*

26 Over the last two decades, the U.S. Fish and Wildlife Service (“FWS” or
27 “Service”) has come to define its conservation mission in the context of species protection.
28 The concept of “trust species” is now a common focal point for the myriad responsibilities
29 of the FWS. This has become problematic for one of the major programs of the agency:
30 management of the world’s largest biodiversity conservation network, the national wildlife

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31 refuge system (“NWRS”). A major legislative overhaul of the NWRS charter and the
32 imperatives of climate change adaptation have weakened the concept as a reliable
33 touchstone for NWRS management and expansion. The FWS should build on its history
34 and culture to respond to new challenges that the conservation network cannot meet with
35 the “trust species” concept alone. While management to benefit specific species offers a
36 simple measure of accomplishment, as a policy tool it creates more problems than it
37 solves. Adherence to the “trust species” theme limits full engagement with, and abdicates
38 the FWS’ leadership role in, contemporary conservation challenges and science. This
39 article makes the case for alternative measures of NWRS conservation success that move
40 beyond just counting populations.

41 We begin in Part I by tracing the rise of the trust concept to prominence as the
42 dominant FWS conservation theme. We illustrate how the idea works in practice with three
43 examples. In Part II we proceed to analyze what the “trust species” theme offers for
44 conservation objectives and what problems it presents for the NWRS. We conclude that,
45 on balance, its strengths do not justify its predominance. In particular, the trust concept has
46 four problems. First, it fails to capture the full, systemic statutory mandate, and thus
47 neglects an important part of Congress’ instructions. Second, it invites confusion with real
48 federal trust duties pertaining to natural resources damages and relations with Indian tribes.
49 Third, it risks conflation with state public trust doctrines, and therefore blurs the distinction
50 between the FWS’ functions and the state role in wildlife management. Fourth, it narrows
51 the FWS’ conservation vision to only a few elements of the broader ecological concerns
52 animating landscape-level nature protection. Part III shows how climate change, ecosystem

53 management, and land acquisition would be better addressed through a broader approach.
54 We conclude with some suggestions for alternatives to the reductive “trust species” focus.
55 Ecological integrity offers a more accurate theme for the NWRS goals, a more robust tool
56 for adapting to climate change, and a concept that the scientific literature recognizes and
57 quantifies.

58

59 *I. The FWS Use of the “Trust” Concept to Steer the NWRS*

60 The term “trust species,” and the selective conservation mission it implies, appears
61 to have emerged in the late 1980s. The NWRS’ previous conservation vision embraced
62 broader goals. Key concept documents before 1980 recommend comprehensive ecological
63 and landscape objectives.¹ While all cite migratory birds and/or endangered species as
64 fundamental, none utilizes the term “trust” in reference to such taxa, or employs them to
65 constrain the System’s conservation role. Nor does trust terminology appear in either the
66 1976 final environmental impact statement (“EIS”) for the NWRS or two subsequent draft
67 EISs.²

68 In the 1980s and into the next decade, the NWRS and the FWS embraced
69 biodiversity as a conservation driver. The “natural diversity” mandate of the new Alaskan

¹ THOMAS H. BECK, DEPT. OF AGRICULTURE, REPORT OF THE PRESIDENT’S COMMITTEE ON WILDLIFE RESTORATION (1934); ROBERT L. HERBST, DEPT. OF THE INTERIOR, ASSISTANT SECRETARY’S RESPONSE TO NATIONAL WILDLIFE REFUGE TASK FORCE REPORT AND FISH AND WILDLIFE SERVICE DIRECTOR’S RECOMMENDATIONS RELATED TO THAT REPORT (1979); A. Starker Leopold et al., *The National Wildlife Refuge System: Report of the Advisory Committee on Wildlife Management*, in TRANSACTIONS OF THE THIRTY-THIRD NORTH AMERICAN WILDLIFE AND NATURAL RESOURCES CONFERENCE 30-54 (Wildlife Mgmt. Inst. 1968).

² U.S. FISH & WILDLIFE SERV., OPERATION OF THE NATIONAL WILDLIFE REFUGE SYSTEM: FINAL ENVIRONMENTAL IMPACT STATEMENT (1976); U.S. FISH & WILDLIFE SERV., MANAGEMENT OF THE NATIONAL WILDLIFE REFUGES: DRAFT ENVIRONMENTAL IMPACT STATEMENT (1988); U.S. FISH & WILDLIFE SERV., REFUGES 2003: DRAFT ENVIRONMENTAL IMPACT STATEMENT, A PLAN FOR THE FUTURE OF THE NATIONAL WILDLIFE REFUGE SYSTEM (1993) [hereinafter USFWS 1993].

70 refuges, along with internal FWS documents, workshops, and a forum the FWS endorsed
71 during this period, all reflect this general trend.³ In 1989, FWS Director John Turner told
72 Congress that “maintenance and enhancement of biological diversity” is fundamental to
73 the FWS.⁴ He stated that the FWS could contribute to protection of “regional ecosystems
74 and biological communities” via land acquisition and technical assistance.⁵ Director
75 Turner subsequently reinforced this view in a 1991 vision document which focused NWRS
76 priorities on areas of high diversity, declining habitats, and linkages between protected
77 areas.⁶ As late as 1993, the NWRS’ “proposed action” in a never-completed, programmatic
78 draft EIS would have increased attention to nongame species, acquired lands for
79 biodiversity and corridor values, and led to a “significant increase in biodiversity
80 initiatives” in terrestrial habitats.⁷

81 In more recent years, however, the FWS has increasingly employed a “trust”
82 concept to describe its mission. The first published reference we could find is in a 1991
83 report of a group convened to discuss protection of biodiversity on federal lands, which

³ Alaska National Interest Lands Conservation Act, 16 U.S.C. §§ 3101-3233; THE KEYSTONE CTR., FINAL CONSENSUS REPORT OF THE KEYSTONE POLICY DIALOGUE ON BIOLOGICAL DIVERSITY ON FEDERAL LANDS (1991); Deborah Holle et al., Biodiversity The Common Thread: Where Should Responsibility for the Conservation of Biodiversity Reside Within the U.S. Fish and Wildlife Service? And Why? Evaluation of the U.S. Fish and Wildlife Service’s Mission and Responsibilities Relative to Conserving Biodiversity (May 1991) (unpublished internal document); U.S. Fish & Wildlife Serv., Biodiversity Workshop (Oct. 28, 1992) (internal memorandum on file with author).

⁴ U.S. FISH & WILDLIFE SERV., STATEMENT OF DIR. JOHN F. TURNER, DIRECTOR, U.S. FISH & WILDLIFE SERV., DEPT. OF THE INTERIOR, BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES, U.S. HOUSE OF REPRESENTATIVES, CONCERNING THE ROLE OF THE FEDERAL GOVERNMENT IN PROMOTING BIOLOGICAL DIVERSITY 1 (Nov. 16, 1989).

⁵ *Id.* at 10.

⁶ U.S. FISH & WILDLIFE SERV., VISION FOR THE FUTURE: 1991 TOTAL QUALITY MANAGEMENT PLAN (1991).

⁷ USFWS 1993, *supra* note 2, at 8-15.

84 stated the FWS’ mission involves “federal interest public trust resources”.⁸ Internal FWS
85 documents now commonly contain references to “trust responsibility,” “trust resources,”
86 and similar terms.⁹ Yet these terms defy precise definition. Some documents refer to taxa
87 for which the Service has a statutory mandate,¹⁰ but the NWRS’ 1999 Strategic Plan adds
88 species listed in executive orders establishing refuges.¹¹ The 2006 Partners for Fish and
89 Wildlife Act attempts to codify the Service’s “Federal trust species” by listing the most
90 commonly cited elements: “migratory birds, threatened species, endangered species,
91 interjurisdictional fish, marine mammals, and other species of concern.”¹² But, it hedges
92 its specificity in the final phrase.

93 The prominence of wetlands inventory, management, and acquisition within the
94 FWS culture derives from their association with waterfowl conservation and the
95 Emergency Wetlands Resources Act of 1986.¹³ Possibly because of wetlands, the FWS
96 also employs the term trust *resources*, sometimes permitting a looser interpretation of the
97 trust concept. For example, the comprehensive conservation plan (CCP) for the remote
98 Pacific island refuges cites coral reefs as a trust resource, reflecting its establishment

⁸ THE KEYSTONE CTR., *supra* note 3, at 57.

⁹ U.S. FISH & WILDLIFE SERV., FULFILLING THE PROMISE: THE NATIONAL WILDLIFE REFUGE SYSTEM (1999) [hereinafter USFWS 1999]; U.S. FISH & WILDLIFE SERV., A BLUEPRINT FOR THE FUTURE OF MIGRATORY BIRDS: MIGRATORY BIRD PROGRAM STRATEGIC PLAN 2004-2014 (2004); U.S. FISH & WILDLIFE SERV., STRATEGIC PLAN OF THE PARTNERS FOR FISH AND WILDLIFE PROGRAM: STEWARDSHIP OF FISH AND WILDLIFE THROUGH VOLUNTARY CONSERVATION, OCTOBER 1 2006 TO SEPTEMBER 30 2010 (2006) [hereinafter USFWS 2006a].

¹⁰ U.S. FISH & WILDLIFE SERV., FULFILLING THE PROMISE: THE NATIONAL WILDLIFE REFUGE SYSTEM, at xii (1999); USFWS 2006, *supra* note 9, at 13.

¹¹ USFWS 1999, *supra* note 9, at 17.

¹² Partners for Fish and Wildlife Act, 16 U.S.C. § 3771(5)(a).

¹³ Pub. L. No. 99-645, 100 Stat. 3582 (1986) (requiring a National Wetlands Priority Conservation Plan and authorizing wetland purchases from the Land and Water Conservation fund).

99 purpose.¹⁴ Other plans have stretched the concept even further beyond its origins. The
100 Chesapeake Marshlands NWR Complex CCP, along with other Northeastern Region
101 refuge plans, employ a standard glossary that includes cultural resources, navigable waters
102 and “public lands like state parks and national wildlife refuges.”¹⁵ Some within NWRS
103 suggest that, if statutes drive the definition, the Refuge System’s trust responsibilities must
104 include ecosystems, as well as “biological integrity, diversity and environmental health.”¹⁶
105 In perhaps the broadest interpretation, some consider all lands within the NWRS as a trust
106 resource or trust responsibility of the FWS.¹⁷ In effect, “trust” can become a label of
107 convenience, nowhere precisely defined, and wielded inconsistently for various ends.

108 The 2006 strategic habitat conservation “business model,” the Partners for Fish and
109 Wildlife Program, and the emerging NWRS’ acquisition strategy illustrate three ways the
110 trust concept influences the Refuge System.

111 A. Strategic Habitat Conservation

112 In 2006, FWS introduced Strategic Habitat Conservation (“SHC”) as its
113 “conservation business model” to increase accountability via, in its purest form, a singular
114 measure of success: increased populations of FWS trust species. It guides users to
115 identify areas where habitat limitations inhibit population growth, and then relieve the

¹⁴ U.S. FISH & WILDLIFE SERV., HOWLAND ISLAND, BAKER ISLAND, AND JARVIS ISLAND NATIONAL WILDLIFE REFUGES COMPREHENSIVE CONSERVATION PLAN (2008).

¹⁵ U.S. FISH & WILDLIFE SERV., CHESAPEAKE MARSHLANDS NATIONAL WILDLIFE REFUGE COMPLEX COMPREHENSIVE CONSERVATION PLAN (2006).

¹⁶ U.S. FISH & WILDLIFE SERV., MINUTES OF REGIONAL REFUGE BIOLOGIST MEETING, BOLGER CENTER, POTOMAC MARYLAND, ATTACHMENT IV (Oct. 2007).

¹⁷ Noah P. Matson, *Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System*, 44 NAT. RESOURCES J. 1137 (2004).

116 restraints through management, restoration, and/or protection.¹⁸ It employs adaptive
117 elements in a range of applications across the FWS, including the NWRS. In practice, the
118 population metric may yield to on-the-ground complications, reflecting SHC's self-
119 characterization as "a tool, not a rule."¹⁹ However, the lack of an avenue for direct
120 ecosystem-based outcomes in SHC remains a contentious issue.²⁰ An SHC handbook
121 assigns ecosystem outcomes to the province of "other agencies and organizations with
122 different mandates."²¹

123 At SHC's genesis, the NWRS had proposed an acquisition strategy based on a two-
124 track approach using "coarse" and "fine" filters.²² The NWRS proposal would have first
125 conserved ecosystems as surrogates for species, to capture the needs of a full spectrum of
126 wildlife. It would have then employed a secondary, "fine filter" to identify and acquire
127 lands meeting the unique needs of particularly sensitive species. This 2004 acquisition
128 strategy noted that either approach alone "would be incomplete in identifying the high
129 priority habitats necessary for conserving species and the larger ecological communities
130 for which these species depend."²³ During SHC development, the FWS dropped the
131 "coarse filter" in favor of a model solely emphasizing populations of trust species.

¹⁸ U.S. FISH & WILDLIFE SERV., STRATEGIC HABITAT CONSERVATION: FINAL REPORT OF THE NATIONAL ECOLOGICAL ASSESSMENT TEAM (2006) [hereinafter USFWS 2006b].

¹⁹ *Id.*

²⁰ Pauline M. Drobney et al., *Other Views: Refining SHC*, 5 REFUGE UPDATE 16 (July/Aug. 2008).

²¹ U.S. FISH & WILDLIFE SERV., STRATEGIC HABITAT CONSERVATION HANDBOOK: A GUIDE TO IMPLEMENTING THE TECHNICAL ELEMENTS OF STRATEGIC HABITAT CONSERVATION 6 (Version 1.0 2008) [hereinafter USFWS 2008].

²² J. Michael Scott et al., *Gap Analysis: A Geographic Approach to Protection of Biological Diversity*, 123 WILDLIFE MONOGRAPHS (Jan. 1993) (ISSN: 0084-0173); U.S. Fish & Wildlife Serv., *A Process for Integrating Wildlife Population, Biodiversity, and Habitat Goals and Objectives on the National Wildlife Refuge System: Coordinating with Partners at All Landscape Scales* (2004) (internal report on file with author) [hereinafter USFWS 2004].

²³ USFWS 2004, *supra* note 22, at 8.

132 Because the SHC model putatively applies only to species for which the
133 conservation challenge is to relieve habitat constraints, the NWRS might theoretically
134 pursue ecosystem objectives in other programs, such as refuge acquisition. However, the
135 Service-wide emphasis on SHC -- encompassing Directorate-level oversight, a chartered
136 implementation team, a website, and Regional teams and workshops -- has muted
137 discussion of biodiversity, environmental health, and ecological integrity as alternative
138 objectives for NWRS expansion. The “coarse filter/fine filter” concept has lapsed into
139 obscurity, and dialogue around such a dual role for the Refuge System²⁴ has withered.
140 We aim to revive the debate by evaluating the “trust species” idea motivating SHC.

141 B. Partners for Fish and Wildlife

142 The Partners for Fish and Wildlife Program (“PFW”) originated in the 1970s
143 drought and the Food Security Act of 1985.²⁵ Responding to loss of waterfowl habitats,
144 PFW arose as a mechanism to expend Farm Bill funds for wetland restoration on private
145 lands. It has since expanded to stream restoration, endangered species habitats, and
146 uplands.

147 The PFW is now a freestanding national program, but it originated within the
148 NWRS, and its field activities in two of the FWS’ eight Regions are still administered via
149 the refuge program. The FWS considers PFW a bridge between federal and private land
150 conservation.²⁶ Indeed, PFW operational policy assigns highest priority to projects

²⁴ Drobney et al., *supra* note 20.

²⁵ Pub. L. No. 99-198, 99 Stat. 1354 (1985).

²⁶ USFWS 2006a, *supra* note 9, at 2.

151 complementing NWRS activities.²⁷ Thus, much of its work occurs in the vicinity of
152 refuges, and PFW projects buffer refuges from outside developmental pressures.

153 A trust species focus is central to virtually all PFW's operational documents. The
154 Partners for Fish and Wildlife Act explicitly directs PFW to support these taxa, and the
155 program's mission statement, governing policy, and strategic plan all employ trust species
156 as organizing elements.²⁸ Its two overriding priorities for ranking projects both reference
157 specific benefits for trust taxa.²⁹ In short, its projects must improve trust species habitats
158 and maximize their benefits.³⁰

159 If PFW were not so closely tied to the NWRS, its fealty to the trust concept would
160 not be so relevant to the current discussion. However, the program's stated tie to refuges
161 implies an expectation that the NWRS shares the species emphasis over other biodiversity
162 scales. Yet, as we note in Part III, climate change and encroachment make connectivity,
163 resilience, and ecosystem function more pressing conservation concerns. As the NWRS
164 addresses those concerns via its own statutory mandates, the potential of PFW as an ally
165 cannot be overstated. The PFW's focus on trust species, however, will limit its potential to
166 coordinate surrounding matrix lands with refuge management.

167 C. Strategic Growth

²⁷ U.S. FISH & WILDLIFE SERV., POLICY ON PARTNERS FOR FISH AND WILDLIFE PROGRAM (2003) (640 FW § 1.9(A)(1)) [hereinafter USFWS 2003].

²⁸ Partners for Fish and Wildlife Act, 16 U.S.C. § 3771(4); USFWS 2003, *supra* note 27; USFWS 2006a, *supra* note 9.

²⁹ USFWS 2003, *supra* note 27, at 640 FW § 1.9(A)(1).

³⁰ *Id.* at § 1.11(A).

168 Commentators have long noted the Refuge System’s haphazard growth.³¹ The
169 1997 National Wildlife Refuge System Improvement Act (“NWRISA”)³² responded by
170 directing growth of the System to, among other aims, “contribute to the conservation of the
171 ecosystems of the United States,” and “complement the efforts of States and other Federal
172 agencies.”³³ The FWS implementation of this mandate has been inconsistent. But,
173 adherence to a “trust species” model of growth hampers fulfillment of Congress’ mandate
174 and misses opportunities to optimize the conservation potential of the NWRs.

175 The FWS’ 1996 land acquisition policy included “significant biodiversity” among
176 six acquisition objectives. It explained that the FWS acquired lands to “protect
177 representative examples of nationally significant native ecological communities.”³⁴ The
178 NWRISA’s growth mandate supported this approach. *Fulfilling the Promise*, the System’s
179 strategic vision written two years later, stated that maintaining biodiversity would likely
180 require new acquisitions, but that existing guidance inadequately addressed non-trust-
181 species biodiversity objectives.³⁵ The NWRs responded with a “Populations, Habitats, and
182 Biodiversity Goals Team,” which, five years later, articulated a dual-track process
183 identifying both species *and* ecosystems as acquisition drivers.³⁶

³¹ ROBERT L. FISCHMAN, *THE NATIONAL WILDLIFE REFUGES: COORDINATING A CONSERVATION SYSTEM THROUGH LAW* 32-63 (2003); DEFENDERS OF WILDLIFE, *PUTTING WILDLIFE FIRST: RECOMMENDATIONS FOR REFORMING OUR TROUBLED REFUGE SYSTEM—REPORT OF THE COMMISSION ON NEW DIRECTIONS FOR THE NATIONAL WILDLIFE REFUGE SYSTEM* (1992).

³² Pub. L. No. 105-57, 111 Stat. 1252 (1997).

³³ 16 U.S.C. §§ 668dd(a)(4)(c).

³⁴ U.S. FISH & WILDLIFE SERV., *U.S. FISH AND WILDLIFE SERVICE MANUAL SERIES: REAL PROPERTY, LAND ACQUISITION, POLICY AND RESPONSIBILITIES* (1996) (341 FW § 1.4(F)).

³⁵ USFWS 1999, *supra* note 9, at 20-21.

³⁶ USFWS 2004, *supra* note 22.

184 Even as that team began, however, a competing philosophy was emerging. A 2000
185 Director's Memorandum superseded the progressive language of 1996 acquisition policy.³⁷
186 Highly process-oriented, it required only that an acquisition proposal describe a tract's
187 value in terms of "migratory birds, endangered and threatened species, fishery resources."
188 Three months later, the NWRS chartered a "Strategic Growth – Thresholds Standards
189 Team," which finished two years before the Goals team. It recommended five acquisition
190 thresholds, the first stating, "any additions must contribute substantially toward the
191 conservation of priority trust species."³⁸ Three other recommendations required that a
192 candidate tract support habitat goals, habitat connections, and biological integrity--linking
193 each to a trust species context.³⁹

194 The NWRS affirmed the "trust species" thresholds concept in 2004 during a
195 centennial congress with stakeholders. A conference-generated white paper affirmed the
196 dual ecosystem/species approach of the Goals Team as a means of initially identifying
197 potential acquisitions, but largely framed ecosystem conservation in terms of the life
198 history needs of trust species.⁴⁰ The report also appended a draft Director's Order that
199 would have institutionalized this philosophy, but which stalled during the last
200 Administration.

³⁷ U.S. Fish & Wildlife Serv., Changes to the Land Acquisition Planning Process (Aug. 11, 2000) (internal Director's memorandum reference # FWS/RE00-00090).

³⁸ U.S. Fish & Wildlife Serv., Strategic Growth Threshold Standards, Fulfilling the Promise, Executive Summary (2002) (internal report on file with author).

³⁹ *Id.*

⁴⁰ U.S. Fish & Wildlife Serv., Strategic Growth of the National Wildlife Refuge System, Conservation in Action Summit (2004).

201 In June 2004, soon after the summit, the FWS chartered the National Ecological
202 Assessment Team that two years later produced the SHC concept now in use.⁴¹ In the
203 process, the ecosystem-based “coarse filter” proposal virtually disappeared. However, it
204 remains somewhat in evidence in the NWRS’ Land Acquisition Priority System (LAPS),
205 through which tracts approved for purchase compete for funding. The LAPS still
206 considers ecosystem values: its 850-point system awards up to 200 points under an
207 “ecosystem conservation component,” against a combined 600 points for migratory birds,
208 threatened and endangered species, and wetlands components.⁴²

209

210 *II. A Critique of the Trust Concept for NWRS Conservation*

211 Though the “trust species” concept retains some vitality for the FWS, its limitations
212 for the NWRS are increasingly evident as the challenges of fragmentation, climate change,
213 and other stressors mount. The 1997 organic act for the NWRS undermined much of the
214 rationale for the “trust species” doctrine as a unifying mission for the refuges. The defined
215 statutory NWRS mission, combined with the pressing conservation challenges from
216 climate change and a plethora of non-climate stressors (e.g. encroachment, invasives, and
217 water scarcity), prompts this reevaluation of the merits of the “trust species” touchstone.

218 A. The Continued Merits of “Trust Species”

219 A history of predominantly species-oriented management has served NWRS
220 conservation well. Why abandon a good thing? A conservative view rightly leans toward
221 retaining prudent approaches that have achieved successes. Moreover, the FWS is an

⁴¹ USFWS 2006b, *supra* note 18.

⁴² USFWS 2008, *supra* note 21.

222 agency that has suffered over the years from its “roving parentage.”⁴³ Unlike its sister
223 agency in the Interior Department, the National Park Service, the Fish and Wildlife Service
224 (and thus, the NWRS) gets fewer dollars for each acre of conservation land it manages,
225 enjoys less reverence from the public, and suffers from a diffuse, ever-changing set of
226 objectives.⁴⁴ These institutional realities increase the value of the few traditions providing
227 continuity to management and pride to staff.

228 The “trust species” concept ties the NWRS land management division of the FWS
229 more closely to the other operations of the agency. Unlike all the other major federal
230 public land management agencies (i.e., the U.S. Forest Service, the National Park Service,
231 and the Bureau of Land Management), the FWS has considerable regulatory
232 responsibilities.⁴⁵ [Insert Figure 1, appended to the end of the manuscript, somewhere in
233 this vicinity.] Most prominently under the Endangered Species Act (“ESA”),⁴⁶ Migratory
234 Bird Treaty Act,⁴⁷ and the Lacey Act,⁴⁸ the FWS promulgates rules that bind all citizens
235 and limit private land use. It employs enforcement officers with responsibilities that range
236 far from the public estate. It supervises other federal agencies’ compliance with wildlife
237 laws. This broad range of responsibilities creates a challenge in sustaining a strong sense
238 of institutional identity. The “trust species” concept provides a rallying point for all
239 operations. Especially with periodic calls to split off the NWRS for management by a new

⁴³ JEANNE NIENABER CLARKE & DANIEL C. MCCOOL, *STAKING OUT THE TERRAIN: POWER AND PERFORMANCE AMONG NATURAL RESOURCE AGENCIES* (2d ed. 1996).

⁴⁴ Robert L. Fischman, *The Significance of National Wildlife Refuges in the Development of U.S. Conservation Policy*, 21 J. LAND USE & ENVTL. L. 1 (2005).

⁴⁵ See Figure 1, *infra*, illustrating the diverse functions of the FWS.

⁴⁶ 16 U.S.C. §§ 1531-1544.

⁴⁷ 16 U.S.C. §§ 703-712.

⁴⁸ 16 U.S.C. §§ 701, 3371-78.

240 agency concerned solely with refuge administration,⁴⁹ the concept strengthens the
241 justification for retaining the NWRS within the FWS. Because most of the other FWS
242 responsibilities are based on lists of particular taxa (i.e., endangered or threatened species,
243 migratory birds, and interjurisdictional fish), the NWRS coheres with the rest of the FWS
244 family when it also sings from the same “trust resources” songbook. It is important to note
245 here that many of the specific listed resources that FWS is responsible for protecting are
246 not species in the conventional biological sense. The ESA, for instance, specifically
247 includes sub-species and “distinct population segments” as the resources of concern, as
248 well as their habitats. Also wetlands, acquired and protected under the Migratory Bird
249 Conservation Act⁵⁰ and Emergency Wetlands Protection Act⁵¹ are hardly species. In this
250 respect, “trust resources” is a more accurate term than “trust species” to describe the list-
251 based conservation approach. The FWS frequently employs the two terms interchangeably.
252 But neither the FWS nor the NWRS can protect everything. A list enjoys the advantage of
253 providing a clear statement of priorities. It facilitates better assessment and accountability,
254 which is an important strategic challenge for FWS.

255 The substance of the trust concept is a fair general description of the content of at
256 least part of the body of law governing refuge management.⁵² It reflects the heightened
257 duty for protecting something special. In private trust law, the special resource might be
258 an inheritance. In the public realm, trusts for historic preservation and educational

⁴⁹ FISCHMAN, *supra* note 31.

⁵⁰ Ch. 257, 45 Stat. 1222 (1929).

⁵¹ Pub. L. No. 99-645, 100 Stat. 3582 (1986)

⁵² Professor Wilkinson has argued that the “trust notion,” as a “generic concept, is an appropriate description of the federal role in public land law,” but that it is different from the “public trust doctrine” and cannot be enforced directly against Congress or agencies. Charles F. Wilkinson, *The Public Trust Doctrine in Public Land Law*, 14 U.C. DAVIS L. REV. 269, 304 (1980). Wilkinson emphasizes those aspects of the “trust notion” that demand a higher level of care in management of public, as compared to private, resources. *Id.*

259 institutions capture the same high regard for resources that can inspire and equip
260 beneficiaries to realize their potential. This is how most conservationists would regard the
261 elements of the natural world under the stewardship of the FWS.

262 As a legal matter, a trust is created by a settlor (or, grantor) to husband a resource
263 (the corpus of the trust) for a beneficiary. In the case of the NWRS, the settlor can be
264 compared to Congress, which established the NWRS to conserve the natural resources of
265 the refuges for the public as a beneficiary. Specifically, Congress framed the legislative
266 mission of the NWRS as serving to “benefit” “present and future generations of
267 Americans.”⁵³ Also, though the NWRS organic legislation does not use the term “trust” or
268 “trustee,” Congress introduced the NWRSIA with findings that implicitly endorsed
269 President Clinton’s 1996 executive order (E.O. 12996), which refers to the Interior
270 Secretary’s “trustee and stewardship responsibilities” for the NWRS. The trust concept
271 connects with many people who can understand that NWRS conservation is for their
272 benefit. Most Americans clearly understand the corpus of species, especially select
273 animals (such as game), as a valued aspect of nature.

274 Most importantly in supporting the legal fit, a trustee has a fiduciary duty to avoid
275 self-dealing and to make decisions based solely on the terms of the trust for the ultimate
276 good of the beneficiary. The terms of the trust would be roughly analogous to the
277 mandatory substantive management criteria Congress established in its legislative charter
278 for the NWRS. The first and most important criterion, because it directly addresses the
279 NWRS overall mission, is to “conserve,” which means to “sustain and, where appropriate,

⁵³ 16 U.S.C. § 668dd(a)(2).

280 restore and enhance, healthy populations of fish, wildlife, and plants.”⁵⁴ This conception
281 of conservation is quite similar to the fiduciary duty of many trustees to manage
282 endowments to sustain the corpus in perpetuity.

283 B. The Problems with “Trust Species”

284 Despite these considerable merits, as well as the utility and power of the trust
285 analogy as a core value and communications tool, there are serious problems with
286 employing the “trust species” concept as a way of prioritizing or justifying NWRS
287 activities. This section organizes the objections into four categories: fidelity to statutory
288 authority, confusion with real federal trust duties, confusion with state trust doctrines, and
289 the mismatch between the reductive elements of the trust and the landscape-level refuge
290 mandates.

291 1. Fidelity to Statutory Authority

292 From a legal perspective, the lack of an explicit trust mandate in the NWRS organic
293 legislation exposes a hazard of guiding refuge management with the trust concept. Despite
294 a tradition of presidential influence, congressional commands remain the principal text
295 guiding public land agencies. This is a central pillar of constitutional law (which vests
296 public property management authority in Congress), administrative law (which requires all
297 agencies to comply with legislation), and statutory interpretation (which looks first to
298 whether a statute directly and unambiguously deals with an issue before turning to other
299 sources of authority). Employing tests, slogans, or criteria that do not come from statutes
300 distracts land managers from their essential task, which is to fulfill their legal charge.
301 Simply put, the FWS does not really have any direct obligations to the public beneficiaries

⁵⁴ 16 U.S.C. §§ 668dd(a)(4)(A), 668ee(4).

302 other than the obligations Congress explicitly creates. More relevant to our point,
303 Congress' ecological mandates to the FWS⁵⁵ are as critical to the NWRS mission as the
304 traditional species-focused purposes.

305 Despite strenuous efforts over the past forty years, courts have consistently refused
306 to find implied trust duties for federal public land managers. For instance, courts have
307 rejected attempts to hold federal land managers to fiduciary standards of stewardship
308 beyond explicit statutory duties.⁵⁶ Though some public land and environmental laws have
309 provisions that can be generally described as like a trust, they do not establish real trust
310 duties apart from the obligations delineated in the statutes themselves.

311 2. Confusion with Real Federal Trust Duties

312 Besides distracting the NWRS from complying with the actual law, or at least
313 skewing its attention towards the pre-1997 part of its responsibilities, a focus on the trust
314 concept and its undisciplined use diminish its legal meaning and may cause confusion in
315 the situations where the federal government does have a real trust responsibility to act. The
316 recently settled *Cobell* litigation challenged the Interior Department's fiduciary
317 management of billions of dollars owed to American Indians for natural resource use since
318 1887.⁵⁷ The litigation touched most Interior Department employees through the extensive
319 court-ordered closings of government web sites and email accounts, due to concerns about
320 the security of trust fund account information. Especially for this generation of FWS
321 managers, who might circulate into other branches of the Interior Department, it is

⁵⁵ See *infra* Part II.B.4.

⁵⁶ *Sierra Club v. Andrus*, 487 F. Supp. 443, 449 (D.D.C. 1980), *aff'd on other grounds sub nom*, *Sierra Club v. Watt*, 659 F.2d 203 (D.C. Cir. 1981).

⁵⁷ *Cobell v. Kempthorne*, 569 F. Supp. 2d 223 (D.D.C. 2008).

322 important to distinguish the responsibilities of NWRS administration from the trust duties
323 constraining federal management of Indian natural resources.

324 Another, more serious, potential for confusion is the specific, legal designation of
325 the FWS as the federal trustee for recovery of natural resources damages due to releases of
326 environmental contaminants. The Clean Water Act, the Oil Pollution Act, and the
327 Comprehensive Environmental Response, Compensation, and Liability Act each create a
328 fiduciary role for the federal government to represent the interests of the public in
329 recovering money and restoring natural resources damaged by pollution.⁵⁸ Natural
330 resources is a broad category generally including land, animals, “biota,” air, and water.⁵⁹
331 Attorneys in the Interior solicitor’s office and FWS teams around the country specialize in
332 assessing the damage to natural resources from spills and other unfortunate releases.⁶⁰
333 Estimating the monetary value of the damages, and allocating an appropriate proportion to
334 the *federal* trust (as opposed to Indian and state authorities who also can claim damages to
335 resources under their purview) is an important task but differs substantially from NWRS
336 administration. There is a link between the two. In addition to species listed under the
337 ESA, and fish and birds that cross state jurisdictions, many NWRS resources are among
338 those that the federal government has a trust duty to protect by collecting damages for
339 harm under these statutes.⁶¹ But using the same term for the ambitious mission and wider
340 array of goals of affirmative NWRS management (rather than defensive recovery) muddles

⁵⁸ 33 U.S.C. § 1321 (CWA provision); 33 U.S.C. § 2706 (OPA provision); 42 U.S.C. § 9607 (CERCLA provision).

⁵⁹ 33 U.S.C. § 2701(20) (1990); 42 U.S.C. § 9601(16) (1980).

⁶⁰ U.S. Dept. of the Interior Natural Resource Damage Assessments, 43 C.F.R. § 11 (1988).

⁶¹ EPA National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. § 300.600 (1994).

341 relevant standards for the different tasks (land management versus damage recovery), and
342 raises the potential for confusion.

343 3. Confusion with the State Public Trust Doctrines

344 The “trust species” concept for NWRS management tempts confusion between
345 FWS responsibilities and the state public trust duties. While there are helpful analogies to
346 be made between these obligations, they are fundamentally different legal creatures.⁶² The
347 differences reflect the disparities between national and state power in the United States.
348 The U.S. Constitution limits national powers to just those enumerated in the text of the
349 document. In that respect, the federal government has only those powers specifically
350 included in its creation. Federal trusts originate from statutes enacted pursuant to
351 enumerated powers, such as regulating interstate (and American Indian) commerce and
352 federal property.

353 In contrast, states have all other sovereign powers not constitutionally granted to
354 the federal government. That includes all of the traditional privileges and duties of the
355 sovereign stemming from the English crown. The public trust doctrine is one of these
356 ancient principles that states inherited from English law. Over the years, different states
357 have developed varying interpretations of the doctrine, but its basic meaning is that the
358 state governments must act to manage water and associated wildlife in a manner that
359 sustains public interests in the resources. Most of the case law interpreting the public trust
360 doctrine concerns public rights to fish, forage, hunt, and navigate along the shore. Usually
361 the public trust doctrine is invoked to limit exclusive private rights to trust resources.

⁶² Wilkinson, *supra* note 52, at 276 (enumerating reasons why the classic public trust doctrine does not apply to federal public lands).

362 The public trust doctrine also may limit governmental action itself in a manner
363 similar to the fiduciary constraints on the activities of a private trustee. For instance, the
364 California Supreme Court required the state to exercise “continuing supervisory control”
365 over Los Angeles’ permitted water diversions to conserve the “scenery, ecology and
366 human uses of Mono Lake.”⁶³ In a widely quoted formulation, the Court stated that
367 the public trust is more than an affirmation of state power to use public
368 property for public purposes. It is an affirmation of the duty of the state to
369 protect the people’s common heritage of streams, lakes, marshlands and
370 tidelands, surrendering that right of protection only in rare cases when the
371 abandonment of that right is consistent with the purposes of the trust.⁶⁴
372 More often than a limitation on power, the public trust doctrine also operates to
373 grant states trusteeship powers to manage wild animal populations and seek compensation
374 for damages to them.⁶⁵ Indeed, state law often describes this aspect of the trust as creating
375 a state ownership interest in wildlife. While that is an accurate description of state law, it
376 is not applicable where the federal government asserts an interest in the same wildlife
377 resource. The current dispute over management of elk in the National Elk Refuge
378 (“NER”) illustrates the disconnect when states assert sovereign power over the same
379 wildlife that federal government seeks to manage under its constitutional property clause
380 authority.⁶⁶ In situations like these, calling the federal role (derived from a constitutional
381 power given to Congress, then delegated to the FWS through statute) a “trust”

⁶³ Nat’l Audubon Soc’y v. Super. Ct. of Alpine County, 658 P.2d 709 (Cal. 1983).

⁶⁴ *Id.* at 724.

⁶⁵ *E.g.*, State Dept. of Fisheries v. Gillette, 621 P.2d 764 (Wash. App. 1980).

⁶⁶ Wyoming v. United States, 279 F.3d 1214 (10th Cir. 2002).

382 responsibility confuses the nature of the asserted federal power. To the extent that
383 Congress authorized the FWS to call the shots for elk management on the NER, it is not
384 because of the public trust doctrine. That is the state power to act under its own authority;
385 but it cannot prevent the Supremacy Clause of the constitution from trumping that aspect
386 of the public trust.⁶⁷

387 Constructive coordination between state natural resource agencies and the NWRS
388 managers is an important objective. It has deep roots in practice over the past century of
389 refuge administration and a strong foundation in federal legislation. But, delineating the
390 boundaries between state and federal power is hindered when the NWRS adopts the same
391 trustee role that states legitimately claim for themselves. The NWRS can “complement”
392 state wildlife management,⁶⁸ but the “trust species” theme tends to conflate federal
393 management with state objectives more oriented toward game management.

394 Blurring the boundary between the state and federal role in wildlife management is
395 not a mere theoretical concern. The 2006 NWRS management policies reflect this
396 problem.⁶⁹ The content of the policies displays the influence of state interests, advanced by
397 state fish and game officials assigned to the federal government through interagency
398 personnel agreements.⁷⁰ The Goals and Refuge Purposes Policy demotes the systemic,
399 NWRSIA mission to a secondary (“to the extent practicable”) position relative to
400 “paramount” individual purposes, which tend to focus more on traditional fish and game

⁶⁷ Hughes v. Oklahoma, 441 U.S. 322 (1979).

⁶⁸ 16 U.S.C. §§ 668dd(a)(4)(c).

⁶⁹ Robert L. Fischman, From Words to Action: *The Impact and Legal Status of the 2006 National Wildlife Refuge System Management Policies*, 26 STAN. ENVTL. L.J. 77, 116 (“Almost all the weaknesses in the 2006 Policies derive from the Service’s reluctance to distance itself and its refuges from state game and fish management.”) (2007).

⁷⁰ *Id.* at 116-117.

401 concerns.⁷¹ The Appropriate Uses Policy allows state fish and game activities on refuges to
402 escape critical evaluation through memoranda of understanding.⁷² The Wildlife-Dependent
403 Recreation Policy emphasizes the amount of hunting and fishing opportunities on each
404 refuge over their distinctive attributes.⁷³ An alternative policy would distinguish national
405 wildlife refuges through visitor experiences that reflect a greater concern with education
406 through contact with the very best practices of modern ecosystem management. We fear
407 that the “trust species” focus contributes to the confusion surrounding the special emphasis
408 Congress placed on the NWRS, in contrast to the state objectives under the public trust
409 doctrine. A better approach would be to clarify for common understanding exactly what
410 Congress has mandated the NWRS to do in support of a mutual approach to conservation.

411 4. The Mismatch Between the Reductive Elements of the Trust and the
412 Landscape-level Refuge Mission

413 The fourth problem with the “trust species” concept deals less with the nature of a
414 trust responsibility and more with the actual corpus of the trust. Once one accepts that
415 legislation defines whatever duties the FWS has in managing the NWRS, then the question
416 becomes whether those duties amount to a focus on a particular group of species. If they do
417 not, the “trust species” concept may misdirect FWS resources, especially in regards to
418 strategically growing the system. This problem exists on three levels, described below.

⁷¹ U.S. FISH & WILDLIFE SERVICE, FISH & WILDLIFE SERVICE MANUAL, pt. 601 § 1.19.

⁷² U.S. FISH & WILDLIFE SERVICE, FISH & WILDLIFE SERVICE MANUAL, pt. 603 § 1.2(B).

⁷³ U.S. FISH & WILDLIFE SERVICE, FISH & WILDLIFE SERVICE MANUAL, pt. 605; *see* Fischman, *supra* note 69, at 108-112 (discussing the emphasis in the policy).

419 The law governing the NWRS, like most federal wildlife law, defines “wildlife”
420 and “fish and wildlife” to mean “any wild member of the animal kingdom.”⁷⁴ But other
421 substantive management criteria are more specific and less tied to specific resources such
422 as animals and plants. While these criteria are consistent with a trust concept, they are not
423 particularly tied to a trust *species* approach, nor even a more generic *resource*. Instead,
424 they include the mandate to “ensure that the biological integrity, diversity, and
425 environmental health of the [NWRS] are maintained for the benefit of present and future
426 generations of Americans;” and “plan and direct the continued growth of the [NWRS] . . .
427 to contribute to the conservation of the ecosystems of the United States.”⁷⁵

428 The first mismatch level is that the particular species generally listed as the “trust
429 species” do not correspond with the greater number of elements of biodiversity covered by
430 the statutory mandates of the NWRSIA. Also, individual establishment mandates expand
431 the list of protected elements to include such diverse taxa as subsistence game in Alaska,
432 elk that winter in the National Elk Refuge, and longleaf pine populations in the Mountain
433 Longleaf Pine National Wildlife Refuge (“NWR”). But, even if the FWS were to augment
434 the species list, there remains a second mismatch: the NWRSIA does not focus on *species*.
435 Instead, it formulates the mission in terms of animal and plant “*resources*.”⁷⁶ Moreover,
436 the “resources” category is open-ended, not limited to a particular list. The NWRSIA uses
437 the word species only in its findings, where it observes that the NWRS “serves a pivotal
438 role in the conservation of migratory birds, anadromous and interjurisdictional fish, marine
439 mammals, endangered and threatened species, and the habitats on which these species

⁷⁴ 16 U.S.C. § 668ee(7).

⁷⁵ § 668dd(a)(4).

⁷⁶ § 668dd(a)(2) (emphasis added).

440 depend.”⁷⁷ Without diminishing that pivotal role, it is fair to say that the NWRSA
441 embraces new, far broader concerns than species *per se*.

442 Some of those concerns are for smaller scale biodiversity than species, such as sub-
443 species, or evolutionarily significant units, others for the intrinsic ecosystem and other
444 processes that support individual organisms. This second-level problem could be solved by
445 using the term “trust resources” instead of “trust species,” as sometimes happens even now
446 in the various nebulous applications of trust terminology within the FWS lexicon.⁷⁸ While
447 that would more closely align the trust corpus with what Congress stated it wanted
448 conserved by the NWRS, it would undermine one of the benefits of the current approach
449 (however flawed), i.e., that a list of trust species provides a simple, clear, limited set of
450 priorities for the FWS. Without that advantage, the trust concept itself becomes less
451 attractive.

452 There is a third, and less easily remedied, level at which the trust concept fails to
453 match the vision of the organic legislation. Both “species” and “resources” reflect the
454 reductive tendency to confine the trust to specific elements. When applied to refuge
455 management, the trust concept is wedded to the traditional, “resourcist” approach to
456 conservation. This conception of conservation fragments nature into discrete resources
457 having value to people, such as timber and game, which need to be managed in order to
458 perpetuate a sustained flow.⁷⁹ There is much in the NWRS legal authority that reflects that
459 tradition. After all, some statutory provisions date back many decades. However, the

⁷⁷ National Wildlife Refuge System Improvement Act, 16 U.S.C. §§ 668dd-668ee.

⁷⁸ *E.g.*, USFWS 2006b, *supra* note 18.

⁷⁹ Julianne Lutz Newton & Eric T. Freyfogle, *Sustainability: A Dissent*, 19 CONSERVATION BIOLOGY 23 (2005).

460 significance of the 1997 NWRSA, which provided the first comprehensive charter for the
461 NWRS, is that it introduces broader, synthetic, ecological process concepts to the
462 management objectives.⁸⁰ The clearest expression of this more holistic, multi-dimensional
463 vision for the NWRS is the mandate to ensure the maintenance of “the biological integrity,
464 diversity, and environmental health” of the NWRS.⁸¹ This substantive management
465 criterion, which could be shortened in practice to “ecological integrity,” echoes Aldo
466 Leopold more than it does the resourcist Gifford Pinchot. It is adaptable to the stewardship
467 idea of a trust but not oriented toward a corpus defined as species or resources. Some
468 refuge establishment authorities also include ecological terms, such as “native ecosystems”
469 in Rocky Flats NWR, and coral reefs in the Hawaiian Islands NWR. Other provisions of
470 the NWRSA that bolster a less reductive characterization of refuge management goals
471 include the description of the System mission as a “national network of lands and waters”
472 and the mandate to direct the continued growth of the NWRS “in a manner that is best
473 designed . . . to contribute to the conservation of the ecosystems of the United States.”⁸²

474 Defining the bottom line for the NWRS in terms of simple, easy to see, readily
475 measured elements has some obvious advantages. It also has many of the same
476 disadvantages of using imperiled species lists to allocate biodiversity conservation
477 resources, to design reserves, to constrain development, and to signal the state of the
478 environment.⁸³ Fidelity to the NWRSA justifies introducing complexity and

⁸⁰ FISCHMAN, *supra* note 31; Vicky Meretsky et al., *New Directions in Conservation for the National Wildlife Refuge System*, 56 *BIOSCIENCE* 135 (2006).

⁸¹ 16 U.S.C. § 668dd(a)(4)(B).

⁸² §§ 668dd(a)(2), 668dd(4)(C).

⁸³ Hugh P. Possingham et al., *Limits to the Use of Threatened Species Lists*, 17 *TRENDS IN ECOLOGY & EVOLUTION* 503 (2002).

479 complication.⁸⁴ After all, the cutting edge of conservation science, where the NWRS
480 should be, is sustaining processes and systems, not sustaining continual flows of elements
481 (goods).

482

483 *III. New Challenges: Climate Change, Ecological Integrity, and Conservation Biology*

484 Climate change presents new challenges that will strain traditional conservation
485 approaches.⁸⁵ Future management objectives can no longer rely solely upon past
486 population levels and habitat relationships, or even upon heretofore known species
487 assemblages and biotic communities. The likelihood of major compositional change
488 characterized by some as “no-analog ecosystems” and “novel species assemblages”⁸⁶ is too
489 great to justify continued use of traditional formulations based primarily on historic
490 success.⁸⁷ Indeed, given the uncertainties ahead, it seems particularly unwise to focus the
491 management and growth of a 100 million-acre land base primarily on the needs of the
492 biotic subset defined as “trust species,” however expansive. Even managing adaptively,
493 and in full anticipation of change, it is unlikely the NWRS could stay ahead of the curve,
494 correctly guessing which lands to protect, the species compositions and habitat towards

⁸⁴ James R. Karr, *Beyond Definitions: Maintaining Biological Integrity, Diversity, and Environmental Health in National Wildlife Refuges*, 44 NATURAL RESOURCES J. 1093, 1073 (2004) (noting that the NWRSIA marks a transition from species-related goals to more comprehensive biological objectives requiring “new management approaches to track and evaluate refuge condition and management success”).

⁸⁵ Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report, an Assessment of the Intergovernmental Panel on Climate Change* (2007); Camille Parmesan, *Ecological and Evolutionary Responses to Recent Climate Change*, 37 ANN. REV. ECOLOGY, EVOLUTION, & SYSTEMATICS 637 (2006).

⁸⁶ Joshua Lawler et al., *Projected Climate-Induced Faunal Change in the Western Hemisphere*, 90 ECOLOGY 588 (2009); Diana Stralberg et al., *Re-Shuffling of Species with Climate Disruption: A No-Analog Future for California Birds?*, 4(9) PLOS ONE e6825 (2009), available at <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0006825>; Williams & Jackson, *supra* note 93.

⁸⁷ Richard J. Hobbs et al., *Novel Ecosystems: Implications for Conservation and Restoration*, 24 TRENDS IN ECOLOGY & EVOLUTION 599 (2009).

495 which any given tract might be evolving, or the populations individual species or sites
496 might be capable of sustaining. Unless strongly integrated with an ecosystem component,
497 species-oriented efforts might well overwhelm a Refuge System challenged by habitat
498 degradation on multiple fronts⁸⁸ and climate-driven faunal changes that include a flood of
499 newly endangered species.⁸⁹

500 A complementary focus on ecological integrity and natural systems would be more
501 robust to climate change than the current orientation toward species.⁹⁰ Generic adaptation
502 actions, such as connectivity enhancement and protection of climate change refugia,⁹¹
503 more directly emerge from an ecological approach than one primarily prioritizing trust
504 species. To assume the role we endorse here, the NWRS must fully embrace and defend
505 the broadest interpretations of the ecological integrity and ecosystem preservation
506 mandates of the NWRSIA. This would mark the maturing of the FWS as the nation's chief
507 steward of biodiversity, a role not yet identifiably assigned to any federal agency.

⁸⁸ MILLENIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: SYNTHESIS REPORT (2005); Brad Griffith et al., *Climate Change Adaptation for the US National Wildlife Refuge System*, 44 ENVTL. MGMT. 1043 (2009); David S. Wilcove et al., *Quantifying Threats to Imperiled Species in the United States*, 48 BIOSCIENCE 607 (1998).

⁸⁹ J. T. PRICE & T.L. ROOT, U.S. FOREST SERV., POTENTIAL IMPACTS OF CLIMATE CHANGE ON NEOTROPICAL MIGRANTS (2005); Richard J. Hobbs et al., *Novel Ecosystems: Theoretical and Management Aspects of the New Ecological World Order*, 15 GLOBAL ECOLOGY & BIOGEOGRAPHY 1 (2006); Joshua Lawler et al., *Projected Climate-Induced Faunal Change in the Western Hemisphere*, 90 ECOLOGY 588 (2009); C. D. Thomas et al., *Extinction Risk from Climate Change*, 427 NATURE 145 (2004).

⁹⁰ N.E. Heller & E.S. Zavaleta, *Biodiversity Management in the Face of Climate Change: A Review of 22 Years of Recommendations*, 142 BIOLOGICAL CONSERVATION 14 (2009); J. R. Mawdsley et al., *A Review of Climate-Change Adaptation Strategies for Wildlife Management and Biodiversity Conservation*, 23 CONSERVATION BIOLOGY 1080 (2009);

⁹¹ J. Michael Scott et al., *National Wildlife Refuges*, in PRELIMINARY REVIEW OF ADAPTATION OPTIONS FOR CLIMATE-SENSITIVE ECOSYSTEMS AND RESOURCES -- FINAL REPORT 121-176 (U.S. Climate Change Science Program Synthesis and Assessment Product 4.4 2008) available at <http://www.climate-science.gov/Library/sap/sap4-4/final-report/>.

508 The ecological integrity concept has the additional advantage of summarizing much
509 of what conservation biology has taught land managers over the past two decades.⁹² A
510 focus on ecological integrity lends itself to a systems approach and is more robust than the
511 “trust species” model to a wide-scale disturbance, such as climate change. We know from
512 studies of paleoecology that species occurred in assemblages unlike any seen today, and
513 climate change is believed to be a primary driver responsible for changes to such
514 assemblages.⁹³ In response to ongoing climate change we are likely to see new
515 combinations of species with no present day analogs. Such periodic remixing of species
516 supports the growing evidence from field studies and models that it is the function species
517 perform, and not the species themselves, that are most important to maintaining ecological
518 integrity and sustaining the services of ecosystems.⁹⁴ Identifying and promoting
519 redundancy within a diverse range of functional groups (groups of species that perform
520 similar functions) is the best assurance of maintaining ecological integrity after periods of
521 ecosystem disturbance.⁹⁵ Because the “trust species” model takes no account of species
522 function, it could encourage maintaining particular species at the expense of ecological
523 integrity. It could also encourage resistance to inevitable ecosystem change rather than
524 proactively exploring alternative management outcomes that would accommodate such
525 change.

⁹² Robert L. Fischman, *The Meanings of Biological Integrity, Diversity, and Environmental Health*, 44 NAT. RESOURCES J. 989 (2004).

⁹³ John W. Williams & Stephen T. Jackson, *Novel Climates, No-Analog Communities, and Ecological Surprises*, 5 FRONTIERS IN ECOLOGY & ENVIRONMENTAL SCIENCE 475 (2007).

⁹⁴ Sandra Diaz et al., *Biodiversity Loss Threatens Human Well-Being*, 4 PLOS BIOLOGY 1300 (2006); Garry Peterson et al., *Ecological Resilience, Biodiversity, and Scale*, 1 ECOSYSTEMS 6 (1998).

⁹⁵ Thomas Elmqvist et al., *Response Diversity, Ecosystem Change, and Resilience*, 1 FRONTIERS IN ECOLOGY & ENVIRONMENTAL SCIENCE 488 (2003).

526 Ecological integrity is more difficult to measure than populations of species, but it
527 is not impossible to quantify. Multimetric indices for ecological integrity are similar to
528 Apgar scores in medicine or the Dow Jones Industrial Average in finance.⁹⁶ The index of
529 biological integrity, initially used in assessing water quality, is the best known of the
530 multimetric scales.⁹⁷ Multimetric indices can assess how well refuges are maintaining and
531 restoring not just a small group of animals but the “full range of parts (genes, species and
532 assemblages) and processes (mutation, demography, biotic interactions, nutrient and
533 energy dynamics, and metapopulation processes).”⁹⁸ Professor Karr, who pioneered
534 multimetric indices of integrity, cautions:

535 In my experience, most researchers and refuge managers still assume that
536 population size provides a reliable signal about refuge condition. Yet
537 because species abundances vary so much as a result of natural
538 environmental variation, even in pristine areas, population size is rarely a
539 reliable indicator of human influence except for extreme population
540 densities. Other attributes—such as taxa richness (number of unique taxa in
541 a sample, including rare ones) and percentages of individuals belonging to
542 tolerant taxa—vary consistently and systematically with human influence in
543 many kinds of situations.⁹⁹

⁹⁶ James R. Karr, *Biological Integrity*, in *ENCYCLOPEDIA OF ECOLOGY* 408, 409 (Sven Erik Jorgensen & Brian D. Fath eds., 2008) (the Apgar index assesses the health of infants based on five measured criteria, such as heart rate and respiration); Karr, *Beyond Definitions*, *supra* note 84, at 1077-78 (2004).

⁹⁷ Karr, *Biological Integrity*, *supra* note 96, at 409

⁹⁸ *Id.*

⁹⁹ Karr, *Beyond Definitions*, *supra* note 84, at 1079. Professor Karr continues with the following advice on selecting metrics for biological integrity:

Three other issues should be kept in mind during the metric selection process. First, the array of selected metrics should incorporate diverse dimensions of living systems. Robust

544 Unlike ecological health, which embodies value judgments about how well a resource
545 meets social goals, ecological integrity can be objectively measured.¹⁰⁰ As such, it is well
546 suited as a cross-cutting, broad concept to employ as a guiding principle for NWRS
547 acquisition and management.

548 A shift toward an ecological integrity focus would not be such a big leap because
549 some existing FWS initiatives already address ecosystems and ecological processes. In its
550 draft strategic plan for climate change,¹⁰¹ the FWS proposes a new National Fish and
551 Wildlife Adaptation Strategy, as well as a concept called Landscape Conservation
552 Cooperatives.¹⁰² Through partnerships, both are expected to benefit many species across
553 broad landscapes. The NWRS and other Service programs also participate in place-based,
554 collaborative initiatives. When PFW supports efforts like Blackfoot Challenge in
555 Montana¹⁰³ and the Winyah Bay Focus Area in South Carolina,¹⁰⁴ the projects ultimately
556 serve the full range of species and ecosystems. Some refuge comprehensive conservation
557 plans include ecosystem-based goals in support of non-trust habitats. Examples include

metrics typically include taxa richness (biodiversity) and composition, tolerance or intolerance of specific environmental stressors, trophic organization (measured as relative abundance of selected trophic groups), health or condition of individuals, and richness or relative abundance of selected ecological groups. . . . Second, primary measures should capture diverse components of biology, ranging from biomarkers and individual health to populations, community, ecosystem, and landscape attributes. Third, measures should be selected that are sensitive to a range of types and levels of human influence (pollutants; agriculture; urbanization; logging; water withdrawal; alteration of physical environments; environmental fragmentation; overharvest . . . and so on).

Id. at 1081 (citations omitted).

¹⁰⁰ Karr, *Biological Integrity*, *supra* note 96, at 409.

¹⁰¹ U.S. FISH & WILDLIFE SERV., RISING TO THE CHALLENGE: STRATEGIC PLAN FOR RESPONDING TO ACCELERATING CLIMATE CHANGE (Draft 2009) [hereinafter USFWS 2009].

¹⁰² U.S. FISH & WILDLIFE SERV., LCC INFORMATION BULLETIN #1: FORM AND FUNCTION (2010).

¹⁰³ BLACKFOOT COMMUNITY CONSERVATION AREA COUNCIL, BLACKFOOT CHALLENGE: MANAGEMENT PLAN FOR THE CORE (undated) (on file with author).

¹⁰⁴ R. Banks, *The Winyah Bay Focus Area*, in ECOSYSTEM MANAGEMENT: ADAPTIVE, COMMUNITY-BASED CONSERVATION 163-68 (G.K. Meffe et al. eds., 2002).

558 tallgrass prairie (Tewaukon NWR),¹⁰⁵ Anoka sandplain (Sherburne NWR),¹⁰⁶ and Sonoran
559 desert (Cabeza Prieta NWR).¹⁰⁷ But the trust species focus can limit the FWS' attention
560 and imagination in generating the full range of ecological benefits.

561 Though the “trust species” concept provides a concise, easily measured method for
562 setting priorities, it may foster a reductionist view of conservation in contradiction to the
563 science of the day regarding not only climate change, but biodiversity in general. While
564 making exceptions for some endangered species scenarios, the current literature on land
565 protection and ecosystem management strongly promotes a conservation focus favoring
566 biodiversity generally, conservation of representative ecosystems, resilience, and
567 preservation of undeveloped hubs and linkages to facilitate evolutionary adaptation and
568 range transitions among all biota. While the more recent literature surrounding this has
569 been driven by climate change,¹⁰⁸ these philosophies originally arose out of the long-
570 standing recognition of the broad reach that fragmentation and other anthropogenic
571 stressors have on the landscape.¹⁰⁹

¹⁰⁵ U.S. FISH & WILDLIFE SERV., TEWAUKON NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN (2000).

¹⁰⁶ U.S. FISH & WILDLIFE SERV., SHERBURNE NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN (2005).

¹⁰⁷ U.S. FISH & WILDLIFE SERV., CABEZA PRIETA NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN, WILDERNESS STEWARDSHIP PLAN AND ENVIRONMENTAL IMPACT STATEMENT (2007) (FES06-37).

¹⁰⁸ L. Hannah et al., *Climate Change-Integrated Conservation Strategies*, 11 GLOBAL ECOLOGY & BIOGEOGRAPHY 485 (2002); Heller & Zavaleta, *supra* note 90; Mawdsley et al., *supra* note 90.

¹⁰⁹ G.K. Meffe et al., *Introduction: New Approaches for a New Millennium*, in ECOSYSTEM MANAGEMENT: ADAPTIVE, COMMUNITY-BASED CONSERVATION 1 (G.K. Meffe et al. eds., 2002); B. Czech & P. R. Krausman, *Distribution and Causation of Species Endangerment in the United States*, 277 SCIENCE 1116 (1997); H.J. Mader, *Animal Habitat Isolation by Roads and Agricultural Fields*, 29 BIOLOGICAL CONSERVATION 81 (1984).; R.F. Noss & L.D. Harris, *Nodes, Networks, and MUMs: Preserving Diversity at All Scales*, 10 ENVTL. MGMT. 299 (1986); P.G. Risser et al., *Landscape Ecology: Directions and Approaches*, 2 ILL. NAT. HIST. SURV. SPECIAL PUBLICATION 18 (1984).

572 The NWRS, with its 100 million acres of terrestrial lands and waters and 50 million
573 acres of marine resources, should be the backbone of any large-scale effort to safeguard
574 biodiversity.¹¹⁰ It is the largest land system in the world dedicated to wildlife
575 conservation.¹¹¹ With its uniquely rich variety of high quality low elevation lands and
576 deep, productive soils,¹¹² and its vast repository of expertise in habitat restoration and
577 management, it would be unconstructively self-limiting to practice conservation with a
578 “trust-species” constraint. Certainly the history and legal authority undergirding the
579 NWRS do not compel such a narrow view.

580 If, instead, the NWRS fully embraced a broad biodiversity mandate as a complement to
581 its traditionally recognized trust responsibilities, it would open the door to more varied and
582 innovative approaches to growing the System and to managing lands. There are ways to
583 establish conservation priorities without relying solely on species populations. Magness,¹¹³
584 for example, would structure an initial management framework by grouping refuges into
585 categories based on their projected climate envelope and intrinsic resilience to change.
586 Another approach would integrate refuges into the landscape by constructing conservation
587 frameworks on principles of green infrastructure.¹¹⁴ Such frameworks might be integrated

¹¹⁰ DEFENDERS OF WILDLIFE, KEEPING EVERY COG AND WHEEL: REFORMING AND IMPROVING THE NATIONAL WILDLIFE REFUGE SYSTEM 8 (2008).

¹¹¹ SCOTT ET AL., *supra* note 91.

¹¹² J. Michael Scott et al., *National Wildlife Refuge System: Ecological Context and Integrity*, 44 NAT. RESOURCES J. 1041 (2004).

¹¹³ Dawn Robin Magness, *Managing the National Wildlife Refuge System with Climate Change* (Aug. 2009) (unpublished Ph.D. dissertation, University of Alaska), *available at* <http://www.uaf.edu/files/rap/Magness%20dissertation%202009.pdf>.

¹¹⁴ MARK A. BENEDICT & EDWARD T. MCMAHON, *GREEN INFRASTRUCTURE: LINKING LANDSCAPES AND COMMUNITIES* (2006); J.T. Bowman, *Connecting National Wildlife Refuges with Green Infrastructure: The Sherburne-Crane Meadows Complex* (2008) (unpublished M.Sc. thesis, University of Minnesota).

588 with Noss and Harris' concept of connected "multiple-use modules."¹¹⁵ Acquisition
589 guidance might include a criterion of cost vs. ecosystem benefit,¹¹⁶ or revisit the "coarse
590 filter/fine filter" model of ecosystem representation based on gap analysis.¹¹⁷ These
591 approaches may only be fully explored if the FWS embraces a conservation vision
592 unconstrained by the trust species concept.

593

594 *Conclusion*

595 Today we face a singular conservation challenge: how to maintain functional
596 ecosystems in sufficient diversity that they continue to sustain us with the rich array of
597 services indispensable to our quality of life. While many of the traditional conservation
598 tools of the past will still serve in this challenge, the FWS will need to develop new
599 strategies and approaches for the NWRS. Adherence to a "trust species" theme will limit
600 full engagement with the great conservation challenges ahead. To retain its conservation
601 leadership in the face of climate change, the NWRS will need to move beyond just
602 counting populations.

603 Recent administrative reviews highlight the importance of measurable goals and
604 clear priorities.¹¹⁸ Defining and tracking key elements of ecosystem function (e.g.,
605 hydrology, salinity, microfauna, species composition, fire, phenology and the integrity of
606 trophic structures) would provide more dependable bellwethers of impending ecosystem

¹¹⁵ Noss & Harris, *supra* note 109.

¹¹⁶ Brian Czech, *A Transdisciplinary Approach to Conservation Land Acquisition*, 16 CONSERVATION BIOLOGY 1488 (2002).

¹¹⁷ USFWS 2004, *supra* note 22.

¹¹⁸ OFFICE OF INSPECTOR GENERAL, U.S. DEPT. OF THE INTERIOR, PROGRAM ASSESSMENT RATING TOOL: REVIEW OF U.S. FISH AND WILDLIFE SERVICE NATIONAL WILDLIFE REFUGE SYSTEM (2007) (Y-RR-FWS-0003-2006); MGMT. SYS. INT'L, AN INDEPENDENT EVALUATION OF THE EFFECTIVENESS OF THE U.S. FISH AND WILDLIFE SERVICE'S NATIONAL WILDLIFE REFUGE SYSTEM, FINAL REPORT (2008).

607 change than merely tracking the status and trends in populations of individual species or
608 guilds. At minimum, managing to retain or restore these functions would enhance the
609 general resilience of NWRS resources and strengthen the evolutionary processes needed to
610 respond to change. And, multimetric indices of ecological integrity offer measures of
611 progress across a broader range of conservation concerns than species counts.¹¹⁹

612 The NWRS' new draft blueprint for inventory and monitoring,¹²⁰ backed by the
613 FWS climate change plan¹²¹ suggests promising movement in this direction. It proposes
614 broad-based biotic inventory of Service lands, as well as monitoring non-species
615 parameters such as landscape stressors, ecological processes, and phenology. The NWRS
616 should fully embrace these proposals, as well as explore alternative models for strategic
617 expansion, create a new category of national biodiversity refuges, and actively integrate
618 itself into national strategies to address fragmentation without constraining its role to the
619 trust context.

620 The NWRS has evolved and even re-invented itself in response to past crises,¹²²
621 such as the 1930s dust-bowl drought, and we suggest that it do so again. The current
622 threats to biodiversity from landscape fragmentation and climate change are equal to or
623 greater than the past challenges, which sparked significant revisions of refuge system
624 priorities. In transforming, the FWS need not leave behind its traditions. Rather, it should
625 join with the broader environmental community in the challenge of creating new

¹¹⁹ James R. Karr, *Beyond Definitions: Maintaining Biological Integrity, Diversity, and Environmental Health in National Wildlife Refuges*, 44 NAT. RESOURCES J. 1067 (2004).

¹²⁰ U.S. FISH & WILDLIFE SERV., OPERATIONAL BLUEPRINT FOR INVENTORIES AND MONITORING ON NATIONAL WILDLIFE REFUGES: ADAPTING TO ENVIRONMENTAL CHANGE (Draft 2010).

¹²¹ USFWS 2009, *supra* note 101.

¹²² Scott et al., *supra* note 91.

626 conservation paradigms in service to biodiversity, ecosystem function and society. One
627 approach short of abandoning the trust concept entirely would be to adopt a “trust
628 responsibilities” theme that includes the full range of ecological elements and functions.
629 This might include integrating ecological endpoints into SHC, promoting a biodiversity
630 element into PFW’s work with refuges, and seeking a higher profile for ecosystem
631 preservation in plans for strategic growth of the NWRS. The reward for the NWRS would
632 be a broader and more flexible range of alternatives for growth and management, and a
633 more robust decision-making framework for the uncertain future. Many commentators
634 have called upon protected area managers to revisit their operating guidelines in the
635 context of climate change.¹²³ For the FWS, we suggest embracing a role beyond trust
636 species, giving broad interpretation to the integrity and ecosystem mandates of the Refuge
637 Improvement Act. That would secure the FWS’ continued legacy in the face of threats we
638 may even now be unable to appreciate.

¹²³ Jill S. Baron et al., *Options for National Parks and Reserves for Adapting to Climate Change*, 44 ENVTL. MGMT. 1033 (2009).

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Figure 1: FWS Organization and Responsibilities

