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Strategies To Recover **THE FLORIDA PANTHER** and Secure the Preservation of the Florida Wildlife Corridor

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Strategies To Recover the Florida Panther and Secure the Preservation of the Florida Wildlife Corridor

The Florida panther is one of Florida's most iconic species and is the designated state animal. Its image has graced state license plates for over three decades,¹ it has been the subject of an award-winning documentary film,² and it is the namesake of the back-to-back winners of the National Hockey League's 2024 and 2025 Stanley Cup.³ This charismatic species, however, is being driven toward extinction by habitat loss and fragmentation, vehicle collisions, and the lack of genetic diversity. Despite these threats, there is overwhelming public support for recovering the species. What will it take?

More than 15 years ago, the U.S. Fish and Wildlife Service (FWS) sought to answer this question when it issued the third revision of the Florida Panther Recovery Plan. The Florida panther is endangered under the federal Endangered Species Act (ESA).⁴ Before the species can be considered recovered and removed from the ESA's protected species list, there must be three viable, self-sustaining populations of at least 240 individuals, which have been established and subsequently maintained for a minimum of 12 years.⁵ With only a single population of as few as 120 adults in South Florida,⁶ there is a long way to go to achieve these recovery goals and objectives. In addition to its currently occupied range, the panther will need significantly more habitat to roam, find mates, and expand the population.

This article identifies some of the challenges facing the Florida panther, the conservation opportunities for the

panther and other animal species provided by the Florida Wildlife Corridor, and the critical roles federal, state, and local governments all play along the path toward recovery and preservation of the panther and other wildlife. Although the state spends hundreds of millions of dollars annually on land acquisition programs, the future of the species depends on an all-hands-on-deck approach that also requires a combination of management, permitting, and planning actions by federal, state, and local government agencies, with financial assistance from Congress and the state legislature. The FWS should take affirmative steps to strengthen the genetic diversity and expand the geographic range of the Florida panther population, the state should provide a dedicated stream of funding for wildlife crossings, and local governments should rigorously protect panther habitat through their comprehensive plans. These and other measures discussed in this article will help re-establish, connect, and preserve the population — along with the state's wildlife diversity overall — for decades to come.

The Florida Panther

The Florida panther is the last subspecies of puma still surviving in the eastern U.S. The species once roamed throughout the southeastern U.S., but attempts to eradicate the species reduced the panther to a single population in peninsular Florida by the 1890s.⁷ In 1973, the panther was among the first species protected under the ESA.⁸ Despite these measures, the species teetered

on the brink of extinction in the 1970s, when as few as 10 panthers may have remained in the wild.⁹ In 1995, the FWS and the State of Florida released eight female Texas pumas in Florida to increase the population and restore the species' genetic diversity before it was too late.¹⁰

While the first "genetic rescue" of the species saved the species from extinction,¹¹ Florida panthers remain critically endangered, with an estimated 120-230 adults in the wild, mostly in South Florida.¹² Panthers are capable of establishing a much broader geographic range, as males can roam 200-square-mile territories.¹³ However, the entire breeding population of the Florida panther remains south of the Caloosahatchee River.¹⁴

Challenges to Florida Panther Recovery

Florida panthers will need significantly more habitat elsewhere in their southeastern range to roam, find mates, and increase the population. The species cannot be reclassified from endangered to threatened and ultimately removed from the federal list of endangered and threatened species without expansion of the population to areas outside of South Florida.¹⁵ Without bold action across several fronts, however, the prospects remain bleak.

Since the 1980s, Florida has experienced double-digit growth of the human population every decade, with more than 22 million people now residing in the state.¹⁶ Millions of acres of panther habitat have been cleared for development, causing habitat

loss, degradation, and fragmentation throughout South Florida where the species is mostly found. Habitat loss and urbanization is a primary threat to the species and its prospects of expansion and further distribution.¹⁷

A growing human population has also generated more traffic, which has caused vehicle collisions to increase significantly since 2000.¹⁸ This is now the leading cause of direct mortality for panthers,¹⁹ with 29 deaths reported in 2024.²⁰ These collisions threaten the panther and public safety.²¹ Intraspecific competition among individuals vying for limited prey, territory, and mates is another threat to the population, as it often leads to (mostly male) panthers killing other panthers.²² Sea level rise further threatens the population and reduces the spatial extent of habitat for the existing breeding population in South Florida.²³

The Florida Wildlife Corridor: Providing Florida Panthers with Room To Roam

One of the most promising initiatives to protect the panther from further population decline and provide space in which to roam is the Florida Wildlife Corridor. Based on decades of scientific research, the project aspires to protect a network of 18 million acres of lands for Florida panthers, Florida black bears, and many other species.²⁴

In 2021, the state legislature unanimously passed the Wildlife Corridor Act.²⁵ The act seeks to maintain wildlife access to habitats needed for migration and genetic exchange among regional wildlife populations, prevent fragmentation of wildlife habitat, and provide ecological connectivity.²⁶

Citing the state's rapid population growth, the act identifies the Florida panther as a species the corridor seeks to protect, including through the creation of wildlife crossings.²⁷ By facilitating movement of individuals northward, the act helps meet species' recovery planning goals of establishing two additional populations outside Southwest Florida.

Through robust land acquisition programs such as Florida Forever,²⁸

the Rural and Family Lands Protection Program,²⁹ and the recently enacted "Compact to Conserve,"³⁰ hundreds of millions of dollars are available to protect and preserve lands within the Florida Wildlife Corridor.

The corridor provides a tremendous opportunity to advance panther recovery by establishing a conservation vision that leverages state land acquisition programs. However, much more is needed to address threats from existing and new development, roads, and other human activities, even with the most robust spending. The acquisition of 8 million acres of "opportunity lands" needed to complete the corridor will likely take decades even under the most optimistic funding scenarios, while Florida is estimated to add 14.9 million new residents by 2070.³¹ More than a million of them are expected to reside in Lee, Collier, and Hendry counties, where most panthers exist.³² According to the U.S. Fish and Wildlife Service's most recent species status assessment (SSA), "planned developments are most likely to impact panther habitats in southeastern Lee County and northwestern Collier County."³³

The Florida Wildlife Corridor Act does not directly address increasing development pressure within and around the corridor before lands can be acquired for conservation. Unlike wildlife connectivity legislation in other states, the act does not regulate land use³⁴ and does not require local governments to minimize the impacts from future development on wildlife corridors.³⁵ The act also does not address the impacts from associated infrastructure, most notably roads, that could further fragment panther habitat and increase the number of vehicle collisions. While the act identifies the establishment of wildlife crossings as one of its purposes,³⁶ and directs the Florida Department of Environmental Protection to encourage the Department of Transportation to acquire lands in opportunity areas,³⁷ it includes no additional direction or funding mechanism to accomplish these objectives.³⁸ No state statute provides a dedicated source of funding for wildlife crossings. This is where

federal, state, and local agencies all play a critically important role in advancing species recovery and protecting the corridor.

The Federal Role

• *Genetic Rescue* — Genetic rescue is the introduction of new genetic variation to increase the fitness of a population.³⁹ The introduction of Texas cougars in the 1990s is one of the best known uses of genetic rescue, and it undoubtedly saved the Florida panther,⁴⁰ as the benefits of this genetic rescue remain with the population after five generations.⁴¹ Recent population modeling, however, reveals that without genetic intervention in the future, the panther population would face a substantially increased risk of quasi-extinction.⁴² The 2020 SSA, which is currently under revision and peer review,⁴³ concluded that "the question is not whether future genetic management will be needed but when and how it should be implemented."⁴⁴ One study suggested that this may need to be done by adding five to 10 pumas from other populations to the landscape every 20 to 40 years.⁴⁵ While the FWS has no apparent immediate plans to increase the genetic diversity of the panther population, the agency should work with FWC and take steps now toward implementing these measures. Genetic rescue is considered by many scientists as a highly beneficial, yet underutilized conservation tool that has prevented the extinction of several species⁴⁶ and could benefit many more.⁴⁷

• *Translocation and Reintroduction* — Another step the FWS should take in partnership with FWC is to translocate female panthers north of the Caloosahatchee River, which could serve as a bridge to establishing two additional subpopulations, as called for by the recovery plan.

Translocating females into the region (from the source population or through captive breeding) could jumpstart recovery efforts,⁴⁸ by establishing more breeding pairs that would allow the population to grow and expand across its historic range. It could also reduce the impacts of climate change as sea-level rise

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threatens to eliminate some panther habitat in South Florida.⁴⁹ New landscape-level conservation projects in the region, such as the Everglades Headwaters National Wildlife Refuge and Everglades to Gulf Conservation Area, can also protect important panther habitat on working lands.⁵⁰ Translocation could further facilitate panther utilization of the Florida Wildlife Corridor.

Translocation carries some risks of death or injury to individuals throughout the process. Ordinarily, actions that may “take” (kill, harm, or harass) a federally listed species are prohibited under §9 of the ESA.⁵¹ Section 10(a)(1)(A) of the act, however, allows the FWS to issue a permit for “any act otherwise prohibited by [§]9 for scientific purposes or to enhance the propagation or survival of the affected species, including, but not limited to, acts necessary for the establishment and maintenance of experimental populations.”⁵²

On April 12, 2024, the FWS issued a final rule that revised the regulations concerning the issuance of these “enhancement of survival permits,”⁵³ to simplify the permitting process by combining safe harbor agreements (SHA)⁵⁴ and candidate conservation agreements with assurances (CCAA)⁵⁵ into one agreement now known as a “conservation benefit agreement.”⁵⁶ The FWS explained that this will encourage more participation from landowners in endangered species conservation programs by providing assurances that the FWS will not require an increased commitment or impose additional restrictions on a permittee’s current management and use of their land, water, or financial resources. Activities may continue without concern that they would be curtailed by increasing populations

or distribution of the species.⁵⁷ To receive a permit, applicants must demonstrate, among other requirements, that conservation measures are reasonably expected to improve the panther’s existing baseline condition on their property and result in a “net conservation benefit.”⁵⁸

Enhancement of survival permits potentially provide the FWS and FWC with a streamlined mechanism to translocate panthers in the short term, because the region just north of the Caloosahatchee is within the current range of the species and, therefore, would likely not necessitate the additional establishment of an experimental population of panthers. Panthers could be moved to federal or state conservation lands within the region. Moreover, landowners could apply for and receive enhancement of survival permits and enter into conservation benefit agreements to help support panther conservation on their lands. As the FWS noted in its rulemaking, working lands in agricultural and silvicultural production may be well suited for enhancement of survival permits and conservation benefit agreements.⁵⁹

The translocation of female panthers north of the Caloosahatchee could also serve as steppingstones for future reintroduction efforts⁶⁰ and the establishment of additional populations elsewhere in the state.⁶¹ In those areas where panthers historically roamed but may not be within their current range, such as in portions of North Florida,⁶² the FWS could invoke §10(j) of the ESA to establish experimental populations of panthers. Section 10(j) authorizes the release of a species outside its current range if the agency determines that the “release will further the conservation of [the] species” and that the released popula-

tion is wholly geographically separate from other original populations.⁶³ Experimental populations may be considered “essential” or “nonessential.”⁶⁴ To provide for greater management flexibility, they are generally treated as threatened species under the ESA regardless of their designation.⁶⁵ While FWS has established more than 60 experimental populations for various species under the ESA,⁶⁶ they are not without their own set of challenges⁶⁷ and the FWS must remain committed to conservation.⁶⁸

Given that the existing panther population is so low, any new experimental population should be deemed “essential.” Early stakeholder outreach and engagement will also be critically important to minimize human-panther conflict and to build acceptance of panthers in regions of the state where panthers do not frequently occur.⁶⁹ Programs that compensate landowners for depredation of livestock along with the FWC’s new “Florida Panther Payment for Ecosystem Services” pilot program, which rewards private landowners for maintaining and improving panther habitat on their property,⁷⁰ could incentivize landowner cooperation and facilitate future public-private conservation partnerships.

• *Consultation* — The FWS must further exercise its consultation responsibilities under §7 of the ESA to ensure that federally permitted activities do not jeopardize the continued existence of the species. Section 7 requires federal agencies to consult with the FWS when their actions may affect a federally listed species.⁷¹ This consultation process is frequently triggered when developers apply for a permit from the U.S. Army Corps of Engineers to dredge and fill wetlands under the Clean Water Act.⁷² Section 7 of the ESA requires the FWS to consider whether federal actions like these would reasonably be “expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and the recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.”⁷³ If a project is found to jeopardize a species, the act requires the FWS to identify “reason-

able and prudent alternatives” that will not jeopardize the species, if any, to the proposed action and include them in the FWS’s biological opinion for the proposed project.⁷⁴

Given the limited distribution of the species, a stabilization of the once increasing panther population since 2012,⁷⁵ and the continued loss of remaining primary panther habitat, it is critical that the FWS begin any formal consultation with a rigorous assessment of this baseline⁷⁶ and thoroughly analyze whether development projects within panther habitat (particularly those with traffic or growth inducing effects),⁷⁷ when added to this baseline, may not only appreciably reduce the likelihood of survival but also the recovery of the species. As a federal court of appeals once put it, “a species can often cling to survival even when recovery is far out of reach.”⁷⁸

The State Role

Since the 1980s, after the release of the first Panther Recovery Plan, FWC has played a leading role in panther research, monitoring, and recovery.⁷⁹ As discussed earlier, FWC’s partnership with the U.S. Fish and Wildlife Service in the 1990s to increase the genetic diversity of the species saved the species from extinction. The panther faces a series of threats, however, that require the involvement of many other state agencies to adequately address. Perhaps, most importantly for the state, that is reducing vehicle collisions and facilitating safe passage to advance species recovery.

- *Wildlife Crossings* — One seemingly unlikely partner in panther conservation is the Florida Department of Transportation (FDOT), which oversees more than 123,652 centerline miles of public roads in the state, with an estimated 332.4 million daily vehicle miles traveled on the state highway system.⁸⁰ These roads pose a serious risk to wildlife, including the panther.

Recognizing these risks, FDOT partnered with the FWS and FWC to develop a conservation plan for the Florida panther in 2024 under §7(a)(1) of the ESA.⁸¹ Section 7(a)(1) directs all federal agencies to utilize their authorities in furtherance of

the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species.⁸² The intent of the plan is for the FDOT transportation program “to support the USFWS recovery goals for the Florida panther while providing a more efficient and effective consultation process for FDOT actions.”⁸³ “Specifically, the plan is focused on reducing wildlife vehicle collisions (WVC), providing opportunities for range expansion of the panther, public education and outreach, and other innovative conservation measures that together provide a net conservation benefit to the species.”⁸⁴

FDOT has reported that wildlife crossings have effectively reduced the number of WVCs since the first crossings were constructed over 30 years ago along Alligator Alley.⁸⁵ These crossings can take many forms (underpasses, overpasses, and culverts) and can be paired with associated infrastructure such as directional fencing, signage, nighttime speed limit reductions, and roadside animal detection systems.⁸⁶ Presently, there are 58 wildlife crossings within the panther focus area and more than 200 crossings statewide, many of which can support panther range expansion according to FDOT.⁸⁷ These include a recently constructed underpass on I-4 at CR557 in Central Florida that connects portions of the Hilochee Wildlife Management Area.⁸⁸ Wildlife crossings like these will be essential for panthers to move northward throughout the corridor and expand their range.

Yet the ability of FDOT to construct these crossings has been hampered by a lack of funding.⁸⁹ Florida lags behind other states in establishing a dedicated funding stream for constructing wildlife crossings.⁹⁰ Instead, FDOT largely depends on a variety of funding sources from year to year. For example, FDOT received funding under the 2023 Moving Florida Forward Infrastructure Initiative to build a wildlife overpass at I-4 and SR 33 in Polk County (the first of its kind in the state)⁹¹ and recently secured funding under the Infrastructure Investment and Jobs Act of 2021 Wildlife Crossing Pilot Program for a

future wildlife crossing in Highlands County.⁹² Moreover, while FDOT has been successful “retrofitting” crossings and directional fencing into resurfacing and maintenance projects, it most often incorporates WCVs into transportation improvements (such as new road projects).⁹³ As FDOT explains, “retrofit actions can be more challenging to implement and fund when they do not fall within the identified needs of the transportation work program.”⁹⁴ While the FDOT Panther Conservation Plan seeks to make retrofit projects easier to plan for and fund by streamlining the decision-making and review process for where and when retrofits are incorporated into a project, it cannot address funding limitations. A dedicated funding stream that focuses on reducing collisions on both new and existing roads would help mitigate the impacts of new infrastructure and reduce vehicle collisions on existing roadways, particularly where there are known hotspots of vehicle mortalities.⁹⁵

The legislature could further amend the Wildlife Corridor Act to require the creation of an implementation plan, which in addition to establishing a process for tracking the state’s progress toward completing the corridor, could also integrate FDOT’s wildlife crossing initiatives into corridor planning. Other states have found that such plans can attract local, state, and federal dollars to support the construction of crossings.⁹⁶

The Role of Local Government: Guiding Development Away from Florida Panther Habitat

Local governments have an outsized role to play in the preservation of lands within the Florida Wildlife Corridor footprint. The intent of the Florida Wildlife Corridor “is to preserve as much biodiversity as possible in Florida in the face of a population boom, which [without the corridor]... would likely result in a massive transfer of lands from natural or working status to urban or suburban uses.”⁹⁷ Roughly 8 million of the 18 million acres of FLWC lands remain in private ownership.⁹⁸

Given Florida’s land use and en-

vironmental permitting regime, unless and until they are acquired for preservation, the fate of the bulk of these lands will likely be determined by local governments. Local government planning and zoning decisions in the coming years are likely to have a key role in determining whether land acquisition under the act can successfully preserve the "opportunity area" lands before they are either developed or rendered unattainable as a result of land use and zoning approvals that increase their fair market value enough to make acquisition infeasible.

Florida's Community Planning Act

While the Wildlife Corridor Act does not require local governments to consider and minimize the impacts from future development within wildlife corridors, Florida's land use planning law does. A local government's statutory responsibility to adopt, amend, and enforce comprehensive land use plans under the Community Planning Act (F.S. Ch. 163, Part II), includes several key components relevant to the protection of wildlife habitat and corridors, including the fundamental authority to determine the locations of intensive versus non-intensive land uses.⁹⁹

It is the exclusive function of local governments to exercise land use planning authority (determining allowable uses, densities, and intensities) over all land within their jurisdiction, including uplands, wetlands, floodplains, and surrounding lands that protect wetland functions. This is the key difference between state environmental permitting agencies' authority and local government land use planning authority.¹⁰⁰

The Community Planning Act mandates that all local governments adopt and maintain a comprehensive plan that guides future land development.¹⁰¹ Comprehensive plans must protect environmental resources¹⁰² and "[p]rovide for the compatibility of adjacent land uses."¹⁰³ The act strictly prohibits development that is inconsistent with a comprehensive plan.¹⁰⁴

Comprehensive plans make the basic policy decisions about the type and intensity/density of land uses,

based on a "big picture" evaluation of all relevant issues. Comprehensive planning decisions are considered legislative in nature, subject to the most deferential standards of judicial review.¹⁰⁵ They will only be overturned if not fairly debatable and will be upheld when any valid planning rationale supports the decision.¹⁰⁶

A local government's decisions in response to future land use amendment requests are primarily governed by the statutory standards governing such amendment, which include several dictates of relevance to a property's location and characteristics relative to the corridor. A comprehensive plan's future land use map, and any amendments thereto, must be based upon factors, including "the suitability of the plan amendment for its proposed use, considering the character of the undeveloped land, soils, topography, natural resources, and... other factors."¹⁰⁷ F.S. §163.3177(1)(f) requires that all plan amendments, including land use element changes, be based upon relevant and appropriate data and analysis. To be based on data "means to react to it in an appropriate way and to the extent necessary indicated by the data available on that particular subject at the time of adoption of the...plan amendment...."¹⁰⁸

By virtue of its availability in the public domain, the designation of corridor lands and the supporting science makes up at least part of the "available data" upon which comprehensive plan amendments that affect the corridor must be based.¹⁰⁹ As lands within the corridor become the subject of applications seeking to change allowable land uses in local comprehensive plans, the science underlying the corridor now exists as at least one component of the "available" data and analysis concerning the character of those lands. Increasing the intensity of human use, whether buildings, extractive uses, or roads within the corridor is not likely to be an "appropriate reaction" to that data and analysis about the character of the land.

State agencies can also provide safeguards for the panther when a comprehensive plan amendment may have an adverse effect on the

panther and the corridor. Most proposed and adopted comprehensive plan amendments are reviewed by state agencies with specific areas of expertise and jurisdiction and may be administratively challenged by the Florida Department of Commerce. Local governments transmit a draft plan amendment to the state land planning agency and other reviewing agencies, which then provide comments to the local government regarding "important state resources and facilities that will be adversely impacted by the amendment if adopted."¹¹⁰

The act does not define "important state resources and facilities" or provide criteria or factors to be considered in making this determination. The Florida Department of Commerce, FWC, FDOT, and each water management district with corridor lands within its boundaries can best fulfill their roles and responsibilities under the act to ensure that land use decisions of local governments work together to protect the corridor by maximizing their ability to comment upon, and in the case of the Florida Department of Commerce, challenge comprehensive plan changes that could compromise the corridor. These agencies have the authority to protect the corridor footprint as an "important state resource."¹¹¹

The FWC plays the most direct role relative to providing information and comments about "wildlife habitat and listed species and their habitat," which are relevant to a proposed land use change's impact on the success of the corridor, but the Department of Environmental Protection, FDOT, and the state's water management districts' comments related to their statutory responsibilities are also likely to overlap with the corridor footprint and adjacent lands. To best fulfill their dual responsibilities, the agencies may consider entering into a memorandum of understanding under which they coordinate their comments relative to impacts of proposed local land use amendments on the corridor.

The Wildlife Corridor Act includes many provisions supporting a determination that local comprehensive plan amendments that impact the corridor will adversely impact im-

Before the species can be considered recovered and removed from the ESA's protected species list, there must be three viable, self-sustaining populations of at least 240 individuals, which have been established and subsequently maintained for a minimum of 12 years.

portant state resources under F.S. §163.3184(3). F.S. §259.1005(d), defines the corridor to mean the conserved lands and opportunity areas defined by the Department of Environmental Protection as priority one, two, and three categories of the Florida Ecological Greenways Network. The act defines Florida Ecological Greenways Network as a "model developed to delineate large, connected areas of statewide ecological significance."¹¹² The act also underscores the importance of conserving the green infrastructure "that is the foundation of this state's economy and quality of life...."¹¹³

The rural location and sparsely developed nature of most of the corridor lands would typically also militate against land use decisions to intensify uses. The habitat value of lands is already a key determinant of appropriate land uses in a local comprehensive plan.¹¹⁴ Where such lands are flood prone or vulnerable to coastal storms, erosion, or sea-level rise, that is also a factor weighed heavily against the approval of land use changes allowing more intensive use of those lands. The statute requires that land use decisions be based upon an analysis of the impacts of the proposed development on wetlands and floodplains.¹¹⁵ Comprehensive plans must specifically direct future land uses that are incompatible with the protection and conservation of wetlands and wetland functions away from wetlands.¹¹⁶ F.S. §163.3177(6)(a)8.a requires that amendments to a plan's Future Land Use Map (FLUM) be based upon an analysis of the

availability of facilities and services, and much of the corridor is located in areas unlikely to have current or planned urban road, water, sewer, or other facilities and services.

Finally, the fact that most local comprehensive plans currently account for many years' worth of future growth in their urban- and suburban-related land use designations¹¹⁷ also means that, for the foreseeable future, there is no need to convert corridor lands to an urban or suburban use to accommodate a local government's projected growth.

The upshot is that the location of land within the corridor is simply one additional basis, among many others, for local governments to deny requested land use changes that would intensify allowable uses on such lands. Yet, given the critical importance of such lands to the future of the state's economy and way of life, and that of the cities and counties through which it runs, local governments should protect these areas by simply declining requests to change existing land use plans in ways that would adversely affect those lands.

Conclusion

All levels of government can play important roles in advancing Florida panther recovery and protecting the Florida Wildlife Corridor. As this article illustrates, many of our federal, state, and local laws provide the necessary tools to do so. However, with more than 8 million acres of corridor lands still needed to protect species like the Florida panther and allow them to recover within their historical

range, it will take sustained political will and cooperation at all levels to meet the challenge. □

¹ Since 1990, the purchase of specialty "Protect the Panther" license plates have generated more than \$40 million for panther conservation, with the funds going into the Florida Panther Research and Management Trust Fund. See FWS, *Species Status Assessment for the Florida Panther* 173 (Version 1.0, 2020) (hereinafter, "SSA").

² See Path of the Panther, <https://pathof-thepanther.com/>.

³ NHL, Florida Panthers, <https://www.nhl.com/panthers/>.

⁴ Endangered Species, 32 FED. REG. 4001 (Mar. 11, 1967).

⁵ U.S. Fish and Wildlife Service, *Florida Panther Recovery Plan* xi-xii (3d. 2008), available at https://ecos.fws.gov/docs/recovery_plan/081218.pdf.

⁶ FWC, Florida Panther Program, <https://myfwc.com/wildlifehabitats/wildlife/panther/>.

⁷ SSA at v.

⁸ *Id.* at 73.

⁹ Renee Bodine, *The Florida Panther: A Passageway to Success* (Apr. 13, 2022), <https://www.fws.gov/story/2022-04/florida-panther>.

¹⁰ U.S. Fish & Wildlife Service, *Florida Panther Recovery Plan* at 70-71.

¹¹ See *id.* at 10.

¹² FWC, Description and Range, <https://myfwc.com/wildlifehabitats/wildlife/panther/description/>.

¹³ Bodine, *The Florida Panther*.

¹⁴ SSA at 76.

¹⁵ See U.S. Fish & Wildlife Service, *Florida Panther Recovery Plan* at 97-100.

¹⁶ *Florida's Population*, ECONOGRAPHIC NEWS (FLORIDA LEGISLATURE) (Vol. 1, 2024), available at https://edr.state.fl.us/Content/population-demographics/reports/econographicnews_2024_Volume%201.pdf.

¹⁷ SSA at vi, 131.

¹⁸ FWC, Panther Biology, <https://myfwc.com/wildlifehabitats/wildlife/panther/biology/>.

¹⁹ Bodine, *The Florida Panther*.

²⁰ FWC, *Panther Pulse 2024*, available at <https://myfwc.com/media/bczhyn24/2024pantherpulse.pdf>.

²¹ FDOT, *FDOT Conservation Plan for the Florida Panther*, Appendix G. (May 2024), available at https://fdot-www.blob.core.windows.net/sitefinity/docs/default-source/environment/pubs/protected-species/final_conservation_plan.pdf?sfvrsn=b39596e8_3.

²² See note 18.

²³ A rise in sea level of 0.5 meters by 2040 would result in the loss of 11% (973 square kilometers) of functional panther habitat near Big Cypress and Long Pine Key alone. SSA at vii.

²⁴ See Florida Wildlife Corridor Foundation, About the Corridor, <https://floridawildlifecorridor.org/about/about-the-corridor/>.

²⁵ LAWS OF FLA. Ch. 2021-181.
²⁶ FLA. STAT. §259.1055 (3)(a)-(g) (2024).
²⁷ FLA. STAT. §259.1055 (2) (2024).
²⁸ FLA. STAT. §259.105 (2024).
²⁹ FLA. STAT. §570.70 (2024).
³⁰ LAWS OF FLA. Ch. 2024-58.
³¹ SSA at vii.
³² *Id.* at 188.
³³ *Id.* at 194.
³⁴ FLA. STAT. §259.1055 (7) (2024) (stating that “this section may not be construed to authorize or affect the use of private property”).
³⁵ By comparison, California’s governor recently signed into law the Room to Roam Act, which requires cities and counties to protect wildlife connectivity in their land use plans. AB 1889, STATS. 2024, Ch. 686 (Cal. 2024).
³⁶ FLA. STAT. §259.1055 (3)(f) (2024).
³⁷ FLA. STAT. §259.1055 (5)(a) (2024).
³⁸ California passed the Safe Roads and Wildlife Protection Act in 2022, which requires the state transportation department to prioritize wildlife crossings when improving or building roads. AB 2344, STATS. 2022, Ch. 964 (Cal. 2022).
³⁹ Sarah W. Fitzpatrick, *et al.*, *Genetic Rescue Remains Underused for Aiding Recovery of Federally Listed Vertebrates in the United States*, J. OF HEREDITY 354-366 (2023).
⁴⁰ See David P. Onorato, *et al.*, *Multi-generational Benefits of Genetic Rescue*, SCIENTIFIC REPORTS (2024).

⁴¹ *Id.*
⁴² SSA at 140. See also Onorato, *et al.*, *Multi-generational Benefits* (quasi-extinction refers to when a species or population has declined to such critically low numbers that its likelihood of recovery is highly unlikely, even if a small number of individuals persist).
⁴³ FWS, *Peer Review Plan for Species Status Assessment Report for Florida Panther* (*Puma concolor coryi*), available at https://www.fws.gov/sites/default/files/documents/2024-05/peerreviewplan_fy24_ssa_report_for_florida_panther.pdf.
⁴⁴ SSA at 140.
⁴⁵ Madelon van de Kerk, *et al.*, *Dynamics, Persistence, and Genetic Management of the Endangered Florida Panther Population*, WILDLIFE MONOGRAPHS, at 3-35 (2019).
⁴⁶ Onorato, *et al.*, *Multi-generational Benefits* (citing research supporting the benefits to wolf, prairie chicken, and woodrat populations across the world).
⁴⁷ Fitzpatrick, *Genetic Rescue Remains Underused*; Ben J. Novak, *et al.*, *U.S. Conservation Translocations: Over a Century of Intended Consequences*, CONSERVATION SCIENCE AND PRACTICE (2021), available at <https://conbio.onlinelibrary.wiley.com/doi/10.1111/csp2.394> (finding that translocations were instrumental in recovery for 30% of U.S. delisted taxa that were studied).
⁴⁸ According to the U.S. Fish and Wildlife Service, continued expansion of the cur-

rent population into central Florida should further improve the prospects for a viable population through 2070. SSA at 189.

⁴⁹ See Jaclyn Lopez, *Biodiversity on the Brink: The Role of “Assisted Migration” in Managing Endangered Species Threatened with Rising Seas*, 39 HARV. ENVTL. L. REV. 157, 180-182 (2015).

⁵⁰ See FWS, *Land Protection Plan for the Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area* (Jan. 2012), available at <https://www.fws.gov/sites/default/files/documents/FinalLPPEvergladesHeadwatersNWR.pdf>; FWS, *Land Protection Plan and Environmental Assessment for the Establishment of Everglades to Gulf Conservation Area* (2024), available at <https://www.fws.gov/sites/default/files/documents/2024-03/final-everglades-to-gulf-final-lpp-package-with-signatures-1.11.24.pdf>. Florida panther recovery is among the goals and objectives of the Everglades to Gulf Conservation Area.

⁵¹ 16 U.S.C. §1538 (2025).

⁵² 16 U.S.C. §1539(a)(1)(A) (2025).

⁵³ Enhancement of Survival and Incidental Take Permits, 89 FED. REG. 26070-26102 (Apr. 12, 2024).

⁵⁴ A safe harbor agreement is a voluntary agreement between a non-federal property owner and the FWS that provides formal assurances from the FWS that no additional or different management activities will be required if the landowner takes



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certain actions that contribute to the recovery of a listed species. See FWS, Safe Harbor Agreements, <https://www.fws.gov/service/safe-harbor-agreements>.

⁵⁵ A Candidate Conservation Agreement with Assurances is a voluntary agreement that provides incentives for non-federal landowners to conserve candidate and unlisted species that are likely to become candidates for listing in the future. The landowners agree to engage in certain activities that reduce threats to these species and in return, the FWS issues an enhancement of survival permit that provides assurances that if the species is subsequently listed and the activities haven't changed, the FWS will not require the landowner to conduct any additional

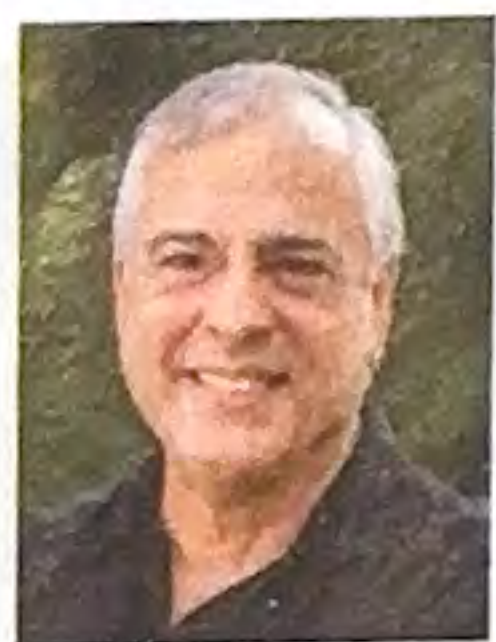
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conservation measures. FWS, Candidate Conservation Agreements with Assurances, <https://www.fws.gov/service/candidate-conservation-agreements-assurances>.

⁵⁶ 89 FED. REG. 26070.

⁵⁷ *Id.* at 26072.

⁵⁸ 50 C.F.R. §17.22(c)(1)(v) (2025).

⁵⁹ See 89 FED. REG. 26072.

⁶⁰ The FWS has stated that such an expansion would reduce the threats posed by development in Southwest Florida. Natural expansion may be occurring slowly, but population augmentation could accelerate the process. SSA at 247.

⁶¹ *Id.*

⁶² According to the SSA, the Big Bend and Apalachicola National Forest could serve as source populations that would supply dispersing individuals to other occupied and unoccupied patches of habitat across the state. Additionally, Eglin Air Force Base and Osceola National Forest could possibly function as source population areas due to their connectivity to larger habitats in North Florida, including the Okefenokee National Wildlife Refuge. A large percentage of these lands are in public ownership. *Id.* at 117.

⁶³ 16 U.S.C. §1539(j)(2)(A) (2025).

⁶⁴ An essential experimental population is one in which the "loss would be likely to appreciably reduce the likelihood of the survival of the species in the wild." 50 C.F.R. §17.80(b) (2025). To date, there have been no essential experimental populations. Benjamin M. Barczewski & Erin H. Ward, *Experimental Populations Under the Endangered Species Act* (2025), <https://www.congress.gov/crs-product/IF12407>.

⁶⁵ *Id.* "Take" however, is still generally prohibited, *Id.*, the terms of which can be set forth by regulation. See 50 C.F.R. §17.82 (2025).

⁶⁶ Barczewski & Ward, *Experimental Populations*.

⁶⁷ One example is the California condor, which was on the brink of extinction in the early 1980s, but a robust captive breeding program brought the population back to more than 500 individuals. As scavengers, condors remain particularly vulnerable to lead poisoning caused by ingesting spent ammunition fragments. According to FWS, this remains the number one known cause of death and the biggest obstacle to sustainable wild populations. FWS, California Condor, <https://www.fws.gov/species/california-condor-gymnogyps-californianus>.

⁶⁸ The plight of the red wolf is a cautionary tale. After a robust recovery program brought the species back from the brink of extinction in 2012, revisions to the FWS's management policies led to substantial take of wolves and the population plunged to only 50 wolves in the wild within a few years. A federal district court held that the FWS's actions violated §§4 and 7 of the ESA by failing to provide for the conservation of the species. *Red Wolf Coalition v. U.S. Fish & Wildlife Serv.*, 346 F. Supp. 3d 802, 814 (E.D. N.C. 2018). Efforts are now underway to rebuild the population, including the construction of wildlife crossings. See Save Red Wolves, saveredwolves.org.

⁶⁹ The 2020 SSA notes that while panther residence in Central Florida is currently low given that few panthers are found in this area, human resistance to panthers could increase there as panthers become numerous following population augmentation. SSA at 245. See also 50 C.F.R. §17.81(e) (2025) (requiring the FWS to consult with state fish and wildlife agencies, affected tribal governments, local governmental agencies, affected federal agencies, and affected private landowners in developing and implementing experimental population rules).

⁷⁰ FWC, Payment for Ecosystem Services, <https://myfwc.com/wildlifehabitats/wildlife/panther/pes/>.

⁷¹ 16 U.S.C. §1536(a)(2) (2025).

⁷² See generally 33 U.S.C. §1344 (2025).

⁷³ 50 C.F.R. §402.02 (2025) (emphasis added); See also *Nat'l Wildlife Fed'n v. National Marine Fisheries Serv.*, 524 F.3d 917 (9th Cir. 2008).

⁷⁴ 50 C.F.R. §§402.02; 402.14(h)(2) (2025).

⁷⁵ See *FDOT Conservation Plan for the Florida Panther* at 29-30.

⁷⁶ When engaging in formal consultation and preparing a biological opinion, the FWS must identify the environmental baseline and analyze the effects of the action added to this baseline in its jeopardy analysis. 50 C.F.R. §402.14(g)(4) (2025). The environmental baseline "refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action." *Id.* §402.02 (2025).

⁷⁷ Effects of the action include "all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action." 50 C.F.R. §402.02 (2025).

⁷⁸ *Nat'l Wildlife Fed'n*, 524 F.3d at 931.

⁷⁹ See *Florida Panther Recovery Plan* at 3-4.

⁸⁰ FDOT, *Florida Moves, Annual Report* 10 (2021-2022).

⁸¹ In 2022, FDOT generally assumed the Federal Highway Administration's (FHWA) environmental responsibilities for all highway projects whose source of federal funding comes from FHWA or which constitutes a federal action through FHWA. This includes interagency consultation under the ESA. *FDOT Conservation Plan for the Florida Panther* at 8 (citing 23 U.S.C. §327 and the implementing Memorandum of Understanding).

⁸² 16 U.S.C. §1536(a)(1) (2025).

⁸³ *FDOT Conservation Plan for the Florida Panther* at 8.

⁸⁴ *Id.*

⁸⁵ *Id.* at 9.

⁸⁶ *Id.* at Appendix E.

⁸⁷ *Id.* at 10.

⁸⁸ FDOT, *Ribbon Cutting Ceremony for*

the Completion of I-4 at CR 557 Interchange and Wildlife Crossing, available at <https://www.swflroads.com/project-files/23/Reference%20Sheet%20-%20Final.pdf>.

⁸⁹ See FDOT Conservation Plan at 17, 64 (listing various projects at different planning stages still awaiting funding).

⁹⁰ Several states have established dedicated funding streams for wildlife crossings, including Colorado, Utah, Wyoming, Nevada, and New Mexico. Utah and Wyoming have created perpetual funding sources. In 2024, grant fund bills were also introduced in the Virginia, Maryland, and Montana state legislatures. See Erin Sito & Logan Christian, 2024 *State of the States*, NCEL, 30-33, 2024.

⁹¹ Isabella Thalheimer and Melenny Gallardo, *Cars, trucks and bears? The Plan To Keep Wildlife Off Interstate 4*, CENTRAL FLORIDA PUBLIC MEDIA, (May 3, 2023), <https://www.wusf.org/environment/2023-05-03/cars-trucks-bears-plan-keep-wildlife-off-interstate-4>.

⁹² See FDOT, Photo Release, <https://www.fdot.gov/info/co/news/2023/09272023>; Federal Highway Administration, Wildlife Crossings Pilot Program, <https://highways.dot.gov/federal-lands/wildlife-crossings/pilot-program>; Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, §11101, 135 STAT. 429 (2021) (authorizing \$350 million in funding under the Wildlife Crossings Pilot Program for 2022-2026).

⁹³ FDOT Conservation Plan at 11.

⁹⁴ *Id.* at 16.

⁹⁵ See FDOT, Wildlife Bridge Crossings ESRI map, <https://fdot.maps.arcgis.com/apps/webappviewer/index.html?id=a105b26615f64b19b543eb9ab61fe197>.

⁹⁶ Sito & Christian, 2024 *State of the States* at 28. New Mexico, Oregon, and Virginia have all developed wildlife corridor action plans. *Id.* at 22-26.

⁹⁷ See Archbold Biological Station and Florida Atlantic University, *The Florida Wildlife Corridor and Climate Change, Managing Florida's Natural and Human Landscapes for Prosperity and Resilience* 1 (2024), available at https://archbold-cms.payloadcms.app/media/ClimateReport_FINAL_04152024-1.pdf.

⁹⁸ *Id.* at 35.

⁹⁹ See *Cal. Coastal Comm'n v. Granite Rock Co.*, 480 U.S. 572, 587 (1987) ("Land use planning in essence chooses particular uses for the land; environmental regulation, at its core, does not mandate particular uses of the land, but requires only that, however, the land is used, damage to the environment is kept within prescribed limits.").

¹⁰⁰ Richard Grosso & Jason Totoiu, *Planning and Permitting to Protect Wetlands: The Different Roles and Powers of State and Local Government*, 84 FLA. B. J. 39 (Apr. 2010); *Johnson v. Gulf County*, 26 So. 3d 33 (Fla. 1st DCA 2009).

¹⁰¹ FLA. STAT. §163.3167(1)(b); §163.3167(2) (2024).

¹⁰² *Id.*; FLA. STAT. §163.3161(4) (2024).

¹⁰³ FLA. STAT. §163.3177(6)(a), 3(g) (2024).

¹⁰⁴ FLA. STAT. §§163.3161(5) and (6), 163.3194(1) and (3), 163.3215 (2024). See also, *Pinecrest Lakes v. Shidel*, 795 So. 2d 191 (Fla. 4th DCA. 2001), *rev. den.*, 821 So. 2d 300 (Fla. 2002).

¹⁰⁵ *Martin County v. Yusem*, 690 So. 2d 1288 (Fla. 1997); *Brevard County v. Snyder*, 627 So. 2d 469 (Fla. 1993).

¹⁰⁶ *Id.*

¹⁰⁷ FLA. STAT. §§163.3177 (6)(a), (2), and (8) b; and 163.3177(6)(a)8.a (2024).

¹⁰⁸ FLA. STAT. §163.3177(1)(f) (2024).

¹⁰⁹ See, e.g., note 24; Center for Landscape Conservation Planning, Univ. of Florida, Florida Ecological Greenways Network, <https://conservation.dcp.ufl.edu/fegn/#fegntools>.

¹¹⁰ FLA. STAT. §163.3184(3) (2024).

¹¹¹ See FLA. STAT. §163.3184(3), (5) (2024).

¹¹² FLA. STAT. §259.1005(c) (2024).

¹¹³ FLA. STAT. §259.1005(3) (2024).

¹¹⁴ See e.g., FLA. STAT. §§163.3177(6)(a), (2), and (8); 163.3177(6)(d)1 and 2 (2024).

¹¹⁵ FLA. STAT. §§163.3177(1)(f), and (6)(a), (2), and (8) (2024).

¹¹⁶ FLA. STAT. §163.3177(6)(d)2 (2024).

¹¹⁷ FLA. STAT. §163.3177(6)(a)4 requires that a plan accommodate at least the minimum amount of land required to accommodate the medium projections as published by the state. Most local governments, in the author's experience, accommodate much more than that future amount of development in their plans.

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