SOUTHERN ENVIRONMENTAL LAW CENTER

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May 28, 2020

VIA EMAIL

Col. Daniel Hibner
U.S. Army Corps of Engineers
Savannah District
100 W. Oglethorpe Avenue
Savannah, GA 31401
Attn: CESAS-SpecialProjects@usace.army.mil

Re: Permit Application No. SAS-2018-00554

Dear Colonel Hibner:

In March 2020, Twin Pines Minerals, LLC, an Alabama-based mining company, filed an application seeking permission to operate a 898-acre heavy mineral sand mine next to the Okefenokee National Wildlife Refuge, one of the largest intact freshwater ecosystems in the world. The proposed mine is the first phase of a larger 12,000-acre project.

On this project as well as the many other projects that you are evaluating, we appreciate the work that your agency does to protect the waters of this Nation especially in these trying times. While many of the choices you make are straightforward, it is projects like the one before you now that test your resolve to make the right decisions and use your authorities in the best interests of the country. Here, we only ask that you apply the law as Congress wrote it.

The Southern Environmental Law Center, as well as Defenders of Wildlife, Center for Biological Diversity, Altamaha Riverkeeper, The Amphibian Foundation, Atlanta Audubon Society, Black Warrior Riverkeeper, Coosa River Basin Initiative, Chattahoochee Riverkeeper, Dogwood Alliance, Environment Georgia, Flint Riverkeeper, Friends of Georgia State Parks & Historic Sites, The Garden Club of Georgia, Georgia Conservancy, Georgia Conservation Voters, Georgia Interfaith Power & Light, Georgia River Network, Georgia Women (And Those Who Stand With Us), Glynn Environmental Coalition, National Parks Conservation Association, The National Wildlife Refuge Association, Ogeechee Riverkeeper, One Hundred Miles, Our Santa Fe River, Satilla Riverkeeper, Savannah Riverkeeper, Sierra Club Florida, Sierra Club Georgia Chapter, Sierra Club Northeast Florida Group, Southwings, St. Marys EarthKeepers, Suwannee Riverkeeper, The Wilderness Society, and Wilderness Watch, **urge you to deny the current application or, at a minimum, to prepare an Environmental Impact Statement for review and comment**.[1]

[1] Because Twin Pines' two applications are similar, the Conservation Groups incorporate into these comments all of their September 12, 2019 comments ("September 12 Comments") and

Please note that the collection of organizations listed above contains international, national, regional, state, and local conservation groups. It is our understanding that no individual Clean Water Act permit on the Georgia Coast, and perhaps the state, has garnered so much interest. Collectively, these organizations have hundreds of thousands of members. The public's keen interest in this project was revealed when over 44,000 people, from all 50 states, four territories, and more than 30 countries, submitted comments on the permit application,[2] setting yet another record. All of these individuals ask one thing, that you ensure Twin Pines complies with the law. As the following comments demonstrate, Twin Pines has not shown that they can build a mine and comply with the law simultaneously.

I. Introduction

It is vitally important that in reviewing Twin Pines' application, the Corps takes into account (i) the incomparable natural resource that would be put in harm's way if the mine were constructed; (ii) how other mining companies have purposefully steered clear of the area even though the heavy minerals below the surface are valuable; (iii) how Twin Pines has attempted to sidestep federal environmental review; (iv) how Twin Pines and its ownership have repeatedly violated environmental laws; and (v) how Twin Pines has not performed the necessary studies, fully engaged the public, subjected its work to third-party scrutiny, or worked with, instead of against, the federal agencies involved in the permit process.

Unlike most other North American wetlands of significance, such as the Everglades or Great Dismal Swamp, the function and health of the Okefenokee has not been compromised by development or agriculture for almost a century, earning it distinction as a Wetland of International Importance[3] and a tentative UNESCO World Heritage Site.[4] When a resource of such immeasurable value is at stake, the Corps must heighten its level of review.[5]

In addition to its ecological and cultural value, local residents depend on the Okefenokee for jobs, food, and quality of life. According to the U.S. Fish and Wildlife Service, the Refuge

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request that the Corps provide responses to all of those comments. A copy of those comments is attached as Exhibit 1. The attachments to both the September 12 Comments and these comments are available at https://southernenvironment.sharefile.com/d-s88246e1d2b84b3cb. For the same reasons, the Conservation Groups request that all documents relating to Twin Pines' July 2019 application be included in the administrative record for the amended application.

[2] Location of 34,014 of the over 44,000 Commenters on Twin Pines March 2020 Application by State (based on data provided by several of the Conservation Groups, on file with the authors) (attached as Ex. 2).

[3] Ramsar Convention, *Wetlands of International Importance*, https://www.ramsar.org/about/wetlands-of-international-importance-ramsar-sites (last visited Apr. 10, 2020).

[4] UNESCO, *Okefenokee National Wildlife Refuge*, https://whc.unesco.org/en/tentativelists/5252/ (last visited Apr. 10, 2020).

[5] 40 C.F.R. § 1508.27.

and its associated ecotourism supports 753 jobs, $17.2 million in annual employment income, $5.4 million in annual tax revenue, and $64.7 million in annual economic output.[6]

This is not the first time that the Refuge has been threatened by a mineral sands mine. In the late 1990s, DuPont proposed to mine a 38,000-acre segment of Trail Ridge, the eastern shoulder of the Refuge.[7] DuPont's plans were scrubbed, however, when it could not prove to the public's satisfaction that its mine would not harm the Okefenokee.[8] From the start, the DuPont project was heavily censured by environmental groups, as well as the Commissioner of the Georgia Department of Natural Resources and Governor Zell Miller. U.S. Secretary of the Interior Bruce Babbitt weighed in by stating: "You can study this, you can write all the documents in the world, but they [DuPont] are not going to prove beyond a reasonable doubt that there will be no impact on [the Refuge]."[9] In 1999, DuPont abandoned its plans when it entered into a settlement with environmental groups, industry groups, and local municipalities.[10] As part of DuPont's exit, it donated a 16,000-acre tract to The Conservation Fund.[11] Since DuPont's retreat, no mining company has ventured near the Refuge, until now.

It is not surprising that these companies have given the Refuge distance; the public remains decidedly against mining in the vicinity of the Refuge. Over 22,000 individuals and groups submitted comments opposing Twin Pines' first application.[12] More than double that number have already submitted comments on this second application. Public sentiment is being driven in part by a sizeable and consistent wave of television, radio, and newspaper stories that have addressed this issue. National, regional, and local newspapers alone have published more than 70 news articles, opinion pieces, and letters to the editor on the proposed mine.[13]

Faced with this overwhelming opposition, Twin Pines has repeatedly claimed its so-called "novel mining technique" will reduce its environmental impact. As an initial matter, Twin Pines should not be allowed to experiment with a supposedly "novel" technique at the doorstep

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[6] United States Fish & Wildlife Serv., Division of Economics, The Economic Contributions of Recreational Visitation at Okefenokee National Wildlife Refuge at 2–3 (May 2019) (attached as Ex. 3).

[7] Nedra Rhone, *Mining proposal raises concerns about future of Okefenokee Swamp*, Atlanta Journal-Constitution (Aug. 9, 2019), https://www.ajc.com/news/state--regional/mining-proposal-raises-concerns-about-future-okefenokee-swamp/8fZ5Ac4J23isp5lGZP6SYO/.

[8] *Id.*

[9] *See* David R. Osier, *A strip mine next door to Georgia's greatest natural wonder could alter it forever*, Georgia Journal (Sept./Oct. 1997) (attached to Sept. 12 Comments as Ex. G).

[10] The Conservation Fund, *Okefenokee National Wildlife Refuge*, https://www.conservationfund.org/projects/okefenokee-national-wildlife-refuge (last visited Apr.10, 2020).

[11] *Id.*

[12] Nedra Rhone, *Mining proposal near Okefenokee draws more than 20k comments from public*, Atlanta Journal-Constitution (Sept. 13, 2019), https://www.ajc.com/atlanta-news-metro/ajc/mining-proposal-near-okefenokee-draws-more-than-20k-comments-from-public/2d6t8gaOmR662h46dMgkEI/.

[13] Collectively attached as Ex. 4.

of the Okefenokee. Indeed, Twin Pines has failed to describe this technique with any detail, and its most recent application only provides a "conceptual mining plan" that it admits may change when mining begins. In any event, no amount of experimentation can overcome the simple fact that Twin Pines' six-year plan to dig up over 63,400,000 cubic yards of earth in close proximity to the Okefenokee—in this first phase alone—will have significant environmental impacts.

Even more suspect than its "conceptual" mining proposals are Twin Pines' attempts to sidestep environmental review. In July 2018, Twin Pines proposed that the Corps should approve the 12,000-acre mine with a nationwide permit[14]—a generic permit that can only be used for projects that have no more than minimal adverse impacts. The mining company first proposed to mine 1,000 acres of the Loncala Tract—the tract that has the highest mineral value but lies nearest the Refuge, and thus likely poses the greatest threat to the ecosystem.[15] After a meeting with the Corps discussing "what level of environmental documentation [environmental assessment (EA) versus an environmental impact statement (EIS)] will be required,"[16] Twin Pines submitted its original application proposing to mine the first phase of its 12,000 acres further from the Refuge. Twin Pines claimed without substantiation that the first phase would not harm the Okefenokee and that it could reconstruct fully functioning wetlands in the mining area within 90 days of excavating them.[17] Twin Pines was hoping to get a permit by the end of 2019 and even began construction on the site without alerting the Corps or finalizing its wetland mitigation assessment or its promised hydrology studies.[18] But when the Corps regulatory division made it clear that the mine would trigger the need for an EIS,[19] Twin Pines remained "adamant" that preparing an EIS would be "unacceptable for [its] business"[20] and instead proposed the current plan.

For all intents and purposes, in this current version of the application, all Twin Pines has done is relabel the proposal a "demonstration project," shave 300 acres off the mine's proposed

[14] Email from Christopher Stanford, TTL, to Jared Lopes, U.S. Army Corps of Eng'rs (July 23, 2018) ("Our main objective is to obtain a permit, preferably a NWP, for heavy mineral mining.") (attached as Ex. 5).

[15] *See* Twin Pines Minerals, Maps of Mineral Concentrations and Depths (attached as Ex. 6).

[16] TTL, Inc., Twin Pines Minerals, LLC: USACE Preapplication Meeting (Dec. 13, 2018) (attached as Ex. 7).

[17] *See generally* July 2019 Application.

[18] Sara Aicher, FWS Refuge Biologist, Notes of March 19, 2019 Meeting with Twin Pines Minerals (attached as Ex. 8); Letter from Chris Stanford and Cindy House-Pearson to William M. Rutlin, regarding SAS-2018-00554, Requested Information, Twin Pines Minerals, St. George, Charlton County, Georgia, TTL Project No. 000180200804.00 (Oct. 18, 2019) (attached as Ex. 9).

[19] Email from U.S. Army Corps of Eng'rs, Savannah Division, to Resource Agencies (Dec. 11, 2019) (attached as Ex. 10); U.S. Army Corps of Eng'rs, SAS-2018-00554 Meeting Agenda (December 11, 2019); U.S. Army Corps of Engr's, Twin Pines Meeting Agenda (Draft) (Jan. 15, 2020).

[20] Email from Steven Metivier to Col. Daniel Hibner (Jan. 16, 2020) (attached as Ex. 11).

initial footprint, and make a highly conditioned offer to buy mitigation credits.[21] Notably, Twin Pines still has no reclamation plan or transient hydrology model and does not commit to wait for the results of its "demonstration" before mining the next phase. In short, Twin Pines began this exercise with an unacceptable proposal—mine the Loncala tract under a nationwide permit—and now it appears that they are still searching for the threshold at which the Corps will let them start mining and not require an EIS.

This is not surprising. Companies with poor environmental compliance records often push back against regulatory and public oversight of their operations. As detailed below, Twin Pines and its ownership appear to have an aversion to regulatory sideboards.[22]

Put simply, the Corps should not allow Twin Pines to mine at the doorstep of the Okefenokee Swamp. To the extent Twin Pines insists otherwise, this project, at a bare minimum, warrants the scrutiny only a thorough, properly prepared EIS can afford. The project is complex, risks to the Refuge are high, endangered and threatened species may be impacted, and there is an exceptional level of public interest. If the Corps required an EIS, there would be more robust public participation (both during scoping and during comment on the Draft EIS), the Corps contractor would be able to supply an independent perspective, an appropriate level of scientific inquiry would be performed, and, in the end, the Corps would have the information it needs to make a sound permit decision. To the extent there would be any delay while preparing an EIS, it would be no more of a delay than the time Twin Pines has already spent studiously avoiding one.

Finally, with this highly controversial and very complex matter, it is vitally important that all those reviewing the Twin Pines application remember that the burden of proof is on Twin Pines. Twin Pines must prove that their proposed project complies with federal law. If the application leaves out necessary elements or important facts are unsubstantiated, the Corps must deny the permit.

II. Twin Pines has a long track record of noncompliance and misrepresentations.

The Okefenokee Swamp is one of the last self-contained, naturally functioning wetlands left on Earth. Rather than study and disclose the risks to the Swamp in an EIS, Twin Pines asks the Corps—and the public—to trust them. But Twin Pines has done nothing to inspire trust. Quite the opposite, Twin Pines and its leadership have a track record of noncompliance and environmental harm.

Twin Pines operates one other facility in Starke, Florida. In January 2018, the Florida Department of Environmental Protection conducted a routine inspection and noted that Twin Pines' silt fence was overwhelmed with sand and "process water and tailing fill [were] deposited

[21] The difference in the acreage of mined wetlands is even smaller. The March 2020 application proposes to mine approximately 453 acres of wetlands, compared to the 522 acres of wetlands proposed in the July 2019 application. Application at 49; July 2019 Application at 18.

[22] *See* Section II, *supra.*

in a wetland without permission."[23] In addition, DEP noted that Twin Pines had been operating the facility without proper authorization for over a year and a half.[24] Based on these and other inspections, DEP issued a consent order in February 2019. The following month, Twin Pines failed a compliance test for particulate matter on three emission units.[25] Later that year, in December 2019, Twin Pines failed yet another compliance test for particulate matter.[26] One month later, in January 2020, Twin Pines failed its retest.[27]

Other companies owned or operated by Twin Pines' leadership fare no better. North Carolina Renewable Power and Georgia Renewable Power routinely violate their environmental permits. For example, in June 2016, North Carolina Renewable Power, under Mr. Ingle's leadership, violated its air permit by exceeding the allowable limits for particulate matter, sulfur dioxide, and nitrogen oxides.[28] The North Carolina Department of Environmental Quality also cited the company for improper operation and maintenance practices based on its exceedingly high monitoring downtimes.[29] DEQ also noted that the company had violated its permits by failing to complete source testing on time.[30] Three months later, in September 2016, DEQ sent the company a notice of deficiency for again failing to submit required compliance reports on a timely basis.[31] Two months after that, DEQ issued another Notice of Violation, this time for exceeding carbon monoxide emissions limitations.[32] A few months later, in March 2017, DEQ issued yet another Notice of Violation for air quality violations.[33] DEQ also cited the facility once again for exceedingly high monitoring downtimes.[34] That June, DEQ issued two additional

[23] *Florida Dept. of Envtl. Prot. v. Chemours*, OCG File No. 18-1240, Consent Order (Feb. 7, 2019) at 5 (attached in Ex. 12); Letter from Florida Dept. of Envtl. Prot. to the Chemours Company TT, LLC (Feb. 7, 2018) (attached in Ex. 13).

[24] *Florida Dept. of Envtl. Prot. v. Chemours*, OCG File No. 18-1240, Consent Order at 5 (Feb. 7, 2019)

[25] *Florida Dept. of Envtl. Prot. v. Twin Pines Minerals, LLC*, OCG File No 19-0196, Consent Order (March 12, 2019) (attached in Ex. 14).

[26] Letter from Florida Dept. of Envtl. Prot. to Twin Pines Minerals, LLC (Feb. 19, 2020) (attached in Ex. 15).

[27] *Id.*

[28] Letter from N.C. Dept. of Envtl. Quality to Steven Ingle, North Carolina Renewable Power (June 29, 2016) (attached in Ex. 16).

[29] *Id.*

[30] *Id.*

[31] Letter from N.C. Dept. of Envtl. Quality to Steven Ingle, North Carolina Renewable Power (Sept. 12, 2016) (attached in Ex. 17).

[32] Letter from N.C. Dept. of Envtl. Quality to Steven Ingle, North Carolina Renewable Power (Nov. 16, 2016) (attached in Ex. 18).

[33] Letter from N.C. Dept. of Envtl. Quality to Steven Ingle, North Carolina Renewable Power (Mar. 13, 2017) (attached in Ex. 19).

[34] *Id.*

notices of violations just two weeks apart. Each violation occurred under Mr. Ingle's leadership.[35]

Georgia Renewable Power, another company with related ownership,[36] has a similar record of violations. The company is perhaps best known for burning creosote-soaked railroad ties and causing a large fish kill in over four miles of neighboring waters through unpermitted runoff.[37] GRP operates two facilities: one in Madison County, Georgia, and the other in Franklin County, Georgia. Both have received numerous Notices of Violations. For example, after receiving multiple complaints from local residents about the GRP Madison plant,[38] the Georgia Environmental Protection Division sent Notices of Violations for both air and water quality violations.[39] GRP Madison recently paid $850,000 to neighbors to settle a lawsuit relating to water pollution.[40] The Franklin Plant has a similar record. In December 2019, EPD sent a Notice of Violation to that plant for a spill that resulted in a fish kill of more than 2,000 fish.[41] Around that same time, EPD investigators also discovered stormwater violations, including process water

[35] Letter from N.C. Dept. of Envtl. Quality to Steven Ingle, North Carolina Renewable Power (June 15, 2017) (attached as composite Ex. 20); Letter from N.C. Dept. of Envtl. Quality to Steven Ingle, North Carolina Renewable Power (June 30, 2017) (attached as composite Ex. 21).

[36] It is our understanding from corporate filings that Raymon Bean, an owner and manager of Twin Pines, also owns all or part of Green Fuels Energy LLC and its subsidiary, Georgia Renewable Power. Twin Pines Minerals, LLC, Application for Certificate of Authority for Foreign Limited Liability Company (May 11, 2018), available at https://ecorp.sos.ga.gov/BusinessSearch.

Steven Ingle, president of Twin Mines, also served as Vice President of Engineering for Green Fuels Energy and Georgia Renewable Power. Lee Shearer, *Alabama company plans wood-burning electricity plants*, Athens Banner-Herald (Sept. 12, 2015), https://www.onlineathens.com/article/20150912/NEWS/309129949. Corporate certificates of formation for the companies are collectively attached as Ex. 22.

[37] Beau Evans, *Rural NE Georgia wood-fired plants leave nearby residents with bad taste*, Georgia Reporter (Nov. 20, 2019), https://georgiarecorder.com/2019/11/20/rural-ne-georgia-wood-fired-plants-leave-nearby-residents-with-bad-taste/.

[38] Complaints are recorded in EPD's Complaint Tracking System, which can be viewed at https://cts.gaepd.org/Public by searching on "GRP" and "Georgia Renewable Power."

[39] Letter from Sean Taylor, Stationary Source Compliance Program Manager, Ga. Envtl. Protection Div., to David Groves, Plant Manager, Veolia North America (Dec. 23, 2019) (attached in Ex. 23); Letter from Lewis F. Hays, Watershed Compliance Program Manager, Ga. Envtl. Protection Div., to David Groves, Plant Manager, Veolia North America (Dec. 9, 2019) (attached in Ex. 24).

[40] *Michael v. GRP Madison, LLC*, Case No. 3:19-cv-00019-CDL, Consent Decree and Judgment, No. 26 (M.D. Ga. Dec. 5, 2019) (attached in Ex. 25).

[41] Letter from Lewis F. Hays, Watershed Compliance Program Manager, Ga. Envtl. Protection Div., to David Groves, Plant Manager (Dec. 9, 2019) (attached in Ex. 26).

being discharged with stormwater.[42] As one local resident put it, "I feel that our community has been written off as collateral damage for this company to make money."[43]

The current project has started off no better. Twin Pines has already misrepresented critical facts to the public[44] and disparaged the public's attempts to engage in the permitting process. Most recently, Twin Pines issued a press statement saying that its hydrology model was "well-received" by peers at the University of Georgia.[45] But Dr. Todd Rasmussen, a professor of hydrology and water resources at the University of Georgia, said otherwise. According to Dr. Rasmussen, "The general consensus is that a rigorous review is needed. But from first impressions, there are many components that are unclear, incomplete, or lacking."[46]

Similarly, last fall, Twin Pines published a full-page newspaper advertisement in the Charlton County Herald calling local opponents of the proposed mine "selfish" for opposing the project simply because it "is too close to [their] homes, schools, businesses or natural environments."[47] According to Twin Pines, the proposed mine is necessary to extract titanium for use in important devices like "surgical tools, prosthetics, automobiles, aircraft, spaceships and military equipment…."[48] According to mineral commodity experts at the U.S. Geological Survey, however, it is "unlikely" that any of the titanium extracted at the proposed mine would become titanium metal.[49] Instead, it would almost certainly be used for titanium dioxide pigment, which is primarily used to color white paint and plastics.[50]

Put simply, neither the Corps nor the public should trust Twin Pines with a world-class resource like the Okefenokee Swamp. There is too much to lose.

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[42] *Id.*

[43] Citizen Complaint to EPD (Nov. 12, 2019) (attached in Ex. 27).

[44] *See* September 12 Comments at 4–5.

[45] Nedra Rhone, *Mining company withdraws permit application for project near Okefenokee*, Atlanta Journal-Constitution (Feb. 8, 2020), https://www.ajc.com/news/mining-company-study-concludes-operations-will-not-damage-okefenokee-swamp/ATK9pE3RthxmrH6ypsoIgL/ (attached as Ex. 28).

[46] *Id.*

[47] Steven Ingle, Twin Pines Minerals, LLC, *Opposition is easy… If you don't have to prove your point*, Charlton County Herald (Sept. 25, 2019) (attached as Ex. 29).

[48] *Id.*

[49] Email from U.S. Geological Survey to Anna Figueroa, Southern Environmental Law Center (Mar. 27, 2020) (on file with authors).

[50] U.S. Geological Survey, National Minerals Information Center, *Titanium Statistics and Information*, https://www.usgs.gov/centers/nmic/titanium-statistics-and-information (last visited Apr. 10, 2020).

III. Twin Pines' hydrology model is incomplete and inaccurate.

Excavating and processing sediments up to 50 feet deep across 898 to 12,000 acres of Trail Ridge risks reducing the volume and increasing contamination of the water in the Okefenokee Swamp. As shown in the diagram below, the water level of the Okefenokee sits at about 120 feet above sea level. To the east of the Swamp, Trail Ridge rises to 140 feet before dropping off to the St. Marys River at about 20 feet above sea level. The lenses of less permeable materials in the ridge that limit water flow towards the river would be destroyed by the mine's operation.[51] To date, Twin Pines has not adequately evaluated the effect that this homogenization across the full 12,000-acre project area would have on the Okefenokee.

[51] Twin Pines claims that certain of these less permeable materials, consolidated sands, are not necessary to preserve water levels on the ridge in its model. TTL Response to SELC October 7, 2019 Questions, Question 7 (May 26, 2020) (attached as Ex. 30). One of the assumptions underlying this claim is that the horizontal lengths of consolidated sand units are "short." *Id.*; *compare e.g.*, TTL, Inc., Subsurface Lithology of the Surficial Aquifer at Twin Pines Mine, Generalized Geologic Cross-Section D-D' (Dec. 11, 2019) (describing counter-intuitively discontinuous units in closely-spaced boreholes), *with* July 2019 Application, App'x B, Generalized Cross-Section D-D'. This assumption is based on a statistical analysis of scattered boreholes which are not clearly representative of the entire project area, do not account for lateral and vertical grading within and between units, and may not reflect the real-world distribution of the consolidated sands.

Twin Pines further asserts that the consolidated sands "do not impede downward flow of groundwater" over scales larger than a few hundred feet—and seems to completely dismiss the possibility that known layers of soil types other than consolidated black sand such as silty clayey sand, clayey sand, and semi-consolidated sand found throughout the area also restrict downward flow of groundwater. TTL Response to SELC October 7, 2019 Questions, Question 7 (May 26, 2020). Taken together with the consolidated sands, layers of low permeability materials extend across significant areas beneath Trail Ridge. Restriction of vertical flow by these laterally-gradational, reduced permeability layers would be eliminated by the proposed mining operation. We also note that Twin Pines has not characterized groundwater flow through deeper portions of Trail Ridge in its submissions to the Corps.

In short, Twin Pines argues that the consolidated sands are dispersed and function more like a screened window than one of glass. And from this, with scant evidence for doing so, it argues the homogenization of soils during mining will have no more effect on the vertical movement of groundwater than a tear in the screen would have on the wind.

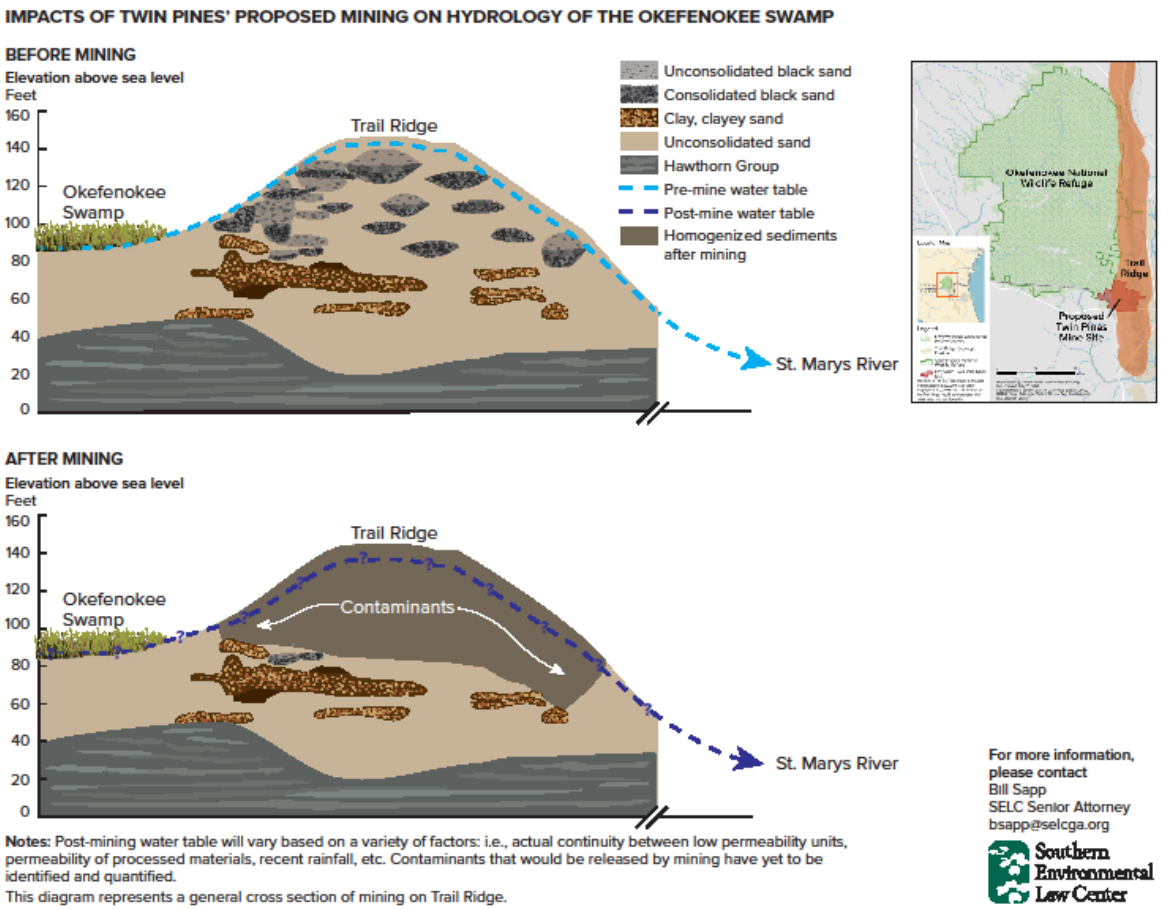

Figure 1: Impacts of Twin Pines' Proposed Mining on Hydrology of Trail Ridge

Further, disturbing the natural consolidated, semi-consolidated, and unconsolidated sediments that comprise Trail Ridge would release contaminants to groundwater. These releases would impact water quality in groundwater and surface streams, both in the Okefenokee Swamp and in areas east of Trail Ridge. It has now been over a year since SELC first requested impacts to water quality be characterized, but pertinent evaluations have not been reported.[52]

After the initial public comment period closed and before withdrawing its first application, Twin Pines submitted a hydrology report to the Corps concluding that the proposed mine would have an effect on, but would not harm, the Okefenokee National Wildlife Refuge. As discussed in the attached analysis, the hydrology model and accompanying report are incomplete and inaccurate.

[52] Twin Pines still has not completed an evaluation of likely contaminant discharges from mining operations. *Id.* at Questions 4 and 6 (May 26, 2020).

First, the hydrology model leaves important things out. For example:

- The model does not assess effects of the mine during the years of mining operations.

- The model does not identify or evaluate the fate and transport of contaminants that will be released by the mine.

- The model does not evaluate the impacts of the mining process on water quality, either surface water or groundwater.

- The model does not evaluate the impacts of groundwater withdrawal (up to 720,000 gallons per day) from the Floridan Aquifer on the Okefenokee Swamp or other resources.

- The model does not consider leakage from the process water ponds, drainage from the processed sands, or any other operational processes that will recharge the shallow aquifer.

- The report does not explain how the pre-mining, kriged and calibrated model correlates with measured stream flows and other real-world conditions.

- The model's sensitivity to the variation of critical parameters such as recharge rate and hydraulic conductivity was not evaluated.

- The model does not address the U.S. Geological Survey's regional groundwater model.

In addition, the hydrology model gets critical things wrong. For example:

- The Hawthorn formation, underlying the surficial aquifer, is modeled as a no-flow boundary when the USGS has shown that changes in Floridan aquifer groundwater levels do affect water levels in the surficial aquifer. Twin Pines must incorporate site-specific data to corroborate its critical assumption to the contrary.

- Drain boundary conditions are used in the model to represent streams. It is unclear why drains were used to represent streams rather than using the MODFLOW stream package which would, for example, allow water to infiltrate into the subsurface over losing reaches of streams.

- The model boundaries are set with no-flow boundaries to the north and south and fixed head boundaries to the east and west. Fixed head and no flow boundaries do not reflect existing conditions or conditions which could develop during and after mining.

- The model's use of kriging to distribute hydraulic conductivity values across the site results in a distribution that does not reflect the distribution of real-world sediments as evinced by the sharp change in conductivity at the border of the mine in the Application's Figures 49–51 and the model's creation of low conductivity barriers along both the east and west flanks of Trail Ridge that extend down to the Hawthorn. There is no field data indicating that laterally and vertically continuous bands of low conductivity materials encircling the central ridge actually exist.

- The hydraulic conductivity of spoils placed back in the mine pits was assumed to be lower than the original in-place sediments which would have their humate layers destroyed and some fine sediments removed during processing.

- The calculated recharge rate was reduced by approximately 40% in order to produce desired groundwater head elevations without determination of whether it reflects real-world conditions.

- The fixed head and no-flow boundaries, in addition to other constraints such as the distribution of hydraulic conductivity values, appear to seriously constrain this model. Constraints imposed on this model to create the necessary head distribution render the results of this exercise to be of questionable value.

These concerns and others are addressed in the attached report prepared by Mark Hutson.[53] The bottom line is this: the model is incomplete and inaccurate and certainly does not support Twin Pines' conclusion that the mine will not harm the Okefenokee National Wildlife Refuge.

IV. The public did not have a meaningful opportunity to comment on the proposed project.

A. The lack of information in the application prevents meaningful comment by the public.

The Corps may not issue a Section 404 permit before providing public notice and an opportunity to meaningfully comment on the proposed project.[54] "[T]he opportunity to comment … necessarily require[s] that the Army present for public scrutiny the rationale and pivotal data

[53] Letter Report from Mark A. Hutson, P.G., to William Sapp (April 12, 2020) ("Hutson Report") (attached as Ex. 31).

[54] 33 U.S.C. § 1344(a); 33 C.F.R. § 325.3(a). The application must be complete at the time the notice is issued, which requires "sufficient information to give a clear understanding of the nature and magnitude of the activity to generate meaningful comment."

underlying its proposed action *before* the close of the comment and hearing period."[55] After all, "without pivotal data and information, public comment cannot be meaningful."[56]

For example, in *Ohio Valley Environmental Coalition v. U.S. Army Corps of Engineers*, the Corps issued a Section 404 permit to a coal mining company to operate a surface mine in West Virginia. The court vacated the permit, finding that the Corps had not provided adequate notice or opportunity to comment. The court reasoned, "in light of the central role compensatory mitigation plays in determining whether a Section 404 permit for a [surface] mine will cause or contribute to significant environmental degradation," "the lack of information on mitigation in the notices deprived plaintiffs of an existing procedural right—the right to comment intelligently."[57]

Here, as in *Ohio Valley*, the application lacks critical information. For example, the company still has not submitted basic documents like a water management plan. Nor has it completed critical tasks like developing adequate groundwater and surface water flow models.[58] This leaves fundamental questions unanswered. For instance, would mining 50 feet deep, as Twin Pines intends to do, eliminate subsurface strata that prevent water in the Okefenokee Swamp from flowing eastward, thereby draining the swamp or at least lowering the water table enough to cause temporary or permanent ecological disruptions?[59] Would mining in the northern phases of the project alter regional groundwater flows that currently move directly into the Okefenokee Swamp? Without complete information, the public cannot meaningfully comment on the proposed project, and the Corps cannot competently evaluate the application.

Among other things, Twin Pines:

- Has not submitted information about the hydrology model necessary to fully evaluate the model;

- Has not submitted any information about its wetlands restoration plan;

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[55] *Nat'l Wildlife Fed'n v. Marsh*, 568 F. Supp. 985, 994 (D.D.C. 1983) (emphasis in original).

[56] *Friends of the Earth v. Hall*, 693 F. Supp. 904, 948 (W.D. Wash. 1988) (granting § 404 permit without releasing a mitigation monitoring plan for public comment violated notice requirements under Clean Water Act); *see also Ohio Valley Envtl. Coal. v. U.S. Army Corps of Engineers*, 674 F. Supp. 2d 783, 805 (S.D.W. Va. 2009) (granting § 404 permit without releasing substantive information on mitigation violated notice requirements under Clean Water Act); *Nw. Envtl. Def. Ctr. v. Wood*, 947 F. Supp. 1371 (D.Or.1996); *Nat'l Wildlife Fed'n v. Marsh*, 568 F. Supp. 985, 994 (D.D.C. 1983) (Clean Water Act notice requirements require that "the Army present for public scrutiny the rationale and pivotal data underlying its proposed action *before* the close of the comment and hearing period.").

[57] *Ohio Valley*, 674 F. Supp. 2d at 799, 804.

[58] *See* Section III.

[59] *See* Richard Rheinhardt, *Review of USACE Clean Water Act Permit Application by Twin Pines Minerals* 5–7 (2019) ("Rheinhardt Report") (attached as Ex. F to September 12 comments).

- Has not submitted a mitigation plan beyond year two of its six year proposal;
- Has not submitted a water or slime management plan for mining operations;
- Has not submitted a pollutant fate and transport analysis to describe the effects of the mine on water quality;
- Has not submitted sufficient analysis, baseline data, or performance standards for its monitoring plan;
- Has not submitted sufficient information about air, light, and noise impacts; and
- Has not provided 24 pages of the cultural resources report attached to the July 2019 application, which apparently includes the report's conclusion, and has not made public any additional reports with the March 2020 application, despite repeated efforts by SELC and others to obtain the reports from the Corps or Twin Pines.[60]

Indeed, even the Corps appears to acknowledge that certain information is missing. During the virtual public meeting, the Corps stated that it could not answer some of the public's questions because they would "require a lot of research"[61] – suggesting that the answers to these "extremely technical"[62] questions were not apparent from Twin Pines' submissions.

By failing to provide the requested information, the Corps has deprived the public of its right to meaningfully comment on the application. To comply with the Clean Water Act and its implementing regulations, the Corps must provide the information requested in these comments for public review and comment.

B. The Corps should host additional public meetings to respond to public questions and concerns.

In the public notice for this application the Corps said "Public Meetings will be held in the State of Georgia." And that "General locations under consideration include metro Atlanta, metro Savannah, and a location near the project area." On May 13, 2020 the Corps held a virtual public meeting. We commend the Corps for its flexibility during the unprecedented circumstances of the COVID-19 pandemic and response.

[60] For the July 2019 application, the 24-page section was omitted from the version Twin Pines provided to SELC, from the version published by the Corps, and from the version received through the FOIA process. *See* July 2019 Application, App. E: Cultural Resource Survey Reports, TerraXplorations, Inc., "A Phase I Cultural Resources Survey of the Twin Pines Minerals Keystone Property in Charlton County, Georgia," at 41-65 (Oct. 26, 2018). For the March 2020 application, Appendix I (containing the Cultural Resource Survey Reports), was entirely omitted from the versions provided by Twin Pines and the version posted by the Corps.

[61] Virtual Public Meeting Recording at 2:00:30.

[62] *Id.*

Unfortunately, Twin Pines' presenters used over two hours of the three-hour meeting largely reading the same information already included in their application, which permitted Twin Pines and the Corps to avoid answering questions submitted by the concerned public. Two of Twin Pines' presenters were unable to speak because earlier presentations had run long, and the Corps eventually interrupted Twin Pines' hired hydrologist's presentation to ensure that a few questions were asked during the meeting. The chat function, available to some, was filled with questions, many of which were skipped over. Over 90 specific questions posed to the Corps and Twin Pines by email before the meeting went similarly unaddressed.

The failure to address many of these questions directly affects the public's ability to provide meaningful comment on the application. For example, the coastal conservation organization One Hundred Miles asked if Twin Pines would transport any materials onto or off of the site by truck, what the estimated truck traffic would be, and whether the trucks would route through any communities. It would take dozens of dump trucks visiting the site every day for six years to ship heavy minerals off-site. Similarly, Defenders of Wildlife asked about the existence of light and sound studies and whether Twin Pines' estimated speed of mining progression included mining operations at night. Twin Pines has not clearly stated whether it intends to operate the mine 24/7 or into the night. Six years of nightly industrial operations could impact the Okefenokee Wilderness and the International Dark Sky Park at Stephen C. Foster State Park, as well as the overall visitor experience for the hundreds of thousands of annual visitors.

Despite the limitations of the forum, hundreds of citizens tuned in to the meeting and multiple news outlets covered it. The substantial public interest in the project and the technical nature of the project and its impacts warrant additional, in-person public meetings when it is safe to do so. Because Twin Pines dominated the virtual public meeting—to the detriment of the public's interest in asking questions and being heard, and because Twin Pines' application leaves critical questions unanswered, we request that the Corps require Twin Pines answer questions in another public forum and extend the comment period accordingly.

C. The Corps' failure to respond in a timely manner to SELC's FOIA appeal prevents meaningful comment.

On March 31, 2020, SELC appealed the partial denial of a Freedom of Information Act request relating to this project.[63] SELC's request included all communications between Twin Pines and the Corps, as well as any decision documents relating to whether an EIS would be required to process the original application. Emails and the sequence of events surrounding Twin Pines' withdrawal of its first application strongly suggest that a decision had been made by Corps staff, the Regulatory Division, and Colonel Hibner to require an EIS.[64] And among the

[63] Freedom of Information Act Appeal: FP-20-11839 (Mar. 31, 2020) (attached as Ex. 32).

[64] *Id.* (referencing Email from U.S. Army Corps of Eng'rs, Savannah Division, to Resource Agencies (Dec. 11, 2019) (attached as Ex. 10) (staff recommendation of EIS); Email from Steven Metivier to Col. Daniel Hibner (Jan. 16, 2020) (attached as Ex. 11) (regulatory division meeting with Twin Pines regarding EIS); Email from Steven Metivier to Cindy House-Pearson

redacted documents are a "Memorandum of Agreement Between the U.S. Army Corps of Engineers and Twin Pines Minerals, LLC Regarding Processing of a Department of the Army Permit Application to [REDACTED]," a Memorandum for Record presumably describing the reasons for requiring an EIS, and various meeting agendas describing next steps in the preparation of an EIS. SELC appealed these redactions and other withholdings relating to the Corps' decision, and the Corps has failed to respond within the statutory deadline. SELC reserves the right to submit supplemental comments after receiving any unlawfully withheld public records relating to the processing of Twin Pines' applications.

V. To comply with NEPA, the Corps must prepare an Environmental Impact Statement to analyze the environmental impacts of the proposed mine.

A. Because the proposed mine will have significant environmental impacts, the Corps must prepare an Environmental Impact Statement.

The National Environmental Policy Act (NEPA) is "designed to prevent agencies from acting on incomplete information and to 'ensure that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast.'"[65] To this end, NEPA obligates the Corps to prepare an Environmental Impact Statement if "*any* significant environmental impacts *might* result" from a project permitted by the Corps.[66]

To evaluate whether a potential impact is "significant," the Corps must analyze both the context in which the proposed action would take place and the intensity of its impact.[67] The "context" requirement "means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality."[68] "Considering context is critical because the significance of an action can vary based on the setting and surrounding circumstances."[69] In other words, where a proposed project may impact resources of national or international importance, the bar for intensity of impacts is lower.

(Jan. 11, 2020) (scheduling meeting between Twin Pines and Col. Hibner for January 27, 2020) (attached as Ex. 33). Twin Pines withdrew its original application the next week. *See also* U.S. Army Corps of Eng'rs, SAS-2018-00554 Meeting Agenda (December 11, 2019); U.S. Army Corps of Eng'rs, Twin Pines Meeting Agenda (Draft) (Jan. 15, 2020) (collectively attached as Ex. 34).

[65] *Sierra Club v. U.S. Army Corps of Eng'rs*, 295 F.3d 1209, 1214 (11th Cir. 2002) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)) (internal quotation marks omitted).

[66] *Sierra Club v. Peterson*, 717 F.2d 1409, 1415 (D.C. Cir. 1983) (first emphasis in original); 42 U.S.C. § 4332(2)(C).

[67] 40 C.F.R. § 1508.27.

[68] *Id.*

[69] *Am. Rivers v. Fed. Energy Regulatory Comm'n*, 895 F.3d 32, 49 (D.C. Cir. 2018); *see also* 40 C.F.R. § 1508.27 ("Significance varies with the setting of the proposed action.").

Here, the "context" of the proposed action alone warrants the preparation of an EIS. The 12,000-acre project area and the 898-acre "demonstration project" border the Okefenokee Swamp. In 1937, the Swamp was designated as a National Wildlife Refuge, and it remains the largest refuge in the eastern United States.[70] It is also a National Wilderness Area and a National Natural Landmark, a designation reserved for "the best examples of biological and geological features" in the country.[71]

On an international scale, the Okefenokee Swamp has been named a "Wetland of International Importance" through the Ramsar Convention.[72] It is also a candidate for designation as a UNESCO World Heritage Site.[73] The Stephen C. Foster State Park is a designated International Dark Sky Park.[74] According to the U.S. Fish and Wildlife Service, in any given year, visitors from all 50 states and over 35 countries visit the Refuge. In fact, at least 10% of the Refuge's overall visitation is comprised of international visitors.[75] It should come as no surprise, therefore, that people from all 50 states, four U.S. territories, and over 30 countries have already submitted comments opposing the mine. The global significance of the Refuge alone should trigger the preparation of an EIS.

The second consideration, "intensity," concerns "the severity of impact."[76] NEPA regulations prescribe several factors that can make a proposed project significant, including:

- "Impacts that may be both beneficial and adverse;"
- "Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, … wetlands… or ecologically critical areas;"
- "The degree to which the effects on the quality of the human environment are likely to be highly controversial;"

[70] U.S. Fish & Wildlife Serv., *Okefenokee at a Glance*, https://www.fws.gov/uploadedFiles/OkefenokeeGlance.pdf (last visited Apr. 10, 2020) (attached as Ex. 35).

[71] Nat'l Park Serv., *National Natural Landmarks Program*, https://www.nps.gov/orgs/1211/index.htm (last visited Apr. 10, 2020).

[72] Ramsar Convention, *Wetlands of International Importance*, https://www.ramsar.org/about/wetlands-of-international-importance-ramsar-sites (last visited Apr. 10, 2020).

[73] UNESCO, *Okefenokee National Wildlife Refuge*, https://whc.unesco.org/en/tentativelists/5252/ (last visited Apr. 10, 2020).

[74] International Dark Sky Association, *Stephen C. Foster State Park Named First International Dark Sky Park in Georgia (U.S.)*, https://www.darksky.org/stephen-c-foster-state-park-named-first-international-dark-sky-park-in-georgia-u-s/ (last visited Apr. 10, 2020).

[75] U.S. Fish and Wildlife Service, Visitor Services and Ecotourism, https://www.fws.gov/uploadedFiles/VS_Ecotourism_2018.pdf (last visited Apr. 10, 2020).

[76] 40 C.F.R. § 1508.27(b).

- "The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;"

- "The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;"

- "Whether the action is related to other actions with individually insignificant but cumulatively significant impacts;"

- "Whether the action will violate other environmental statutes;"

- "The degree to which the action may …cause loss or destruction of significant scientific, cultural, or historical resources;" and

- "The degree to which the action may adversely affect an endangered or threatened species or its [critical] habitat."[77]

The proposed mine trips each of these intensity factors. First, the proposed mine would have significant adverse impacts. Twin Pines concedes that the 898-acre "demonstration project" would impact at least 475 acres of wetlands from mining and infrastructure development and excavate nearly six million dump trucks worth of sand during the first six years of operations. Even if the mine was not adjacent to the Okefenokee, the significant environmental impacts of mining such a large area would trigger NEPA's requirement to prepare an EIS.[78]

The full 12,000-acre project area would cause even greater destruction. The complete mine, which would cover approximately 18.75 square miles, would be larger than the nearby city of Waycross. Assuming a proportional amount of wetlands impacts across the 12,000-acre project area,[79] the proposed mine would, by conservative estimates, impact over **3,500 acres of wetlands**. It is our understanding that the Savannah District has never permitted a private project in Georgia with anything close to this much aquatic impact.

Further, these numbers do not even account for the secondary impacts to the neighboring Okefenokee Swamp. As described by multiple experts, mining could alter the form and structure of Trail Ridge, and in turn affect the water quality, as well as the flow into, through, and out of

[77] 40 C.F.R. § 1508.27.

[78] Over the last 30 years, it is our understanding that the Savannah District has only required an EIS for *one* private project in Georgia: Glades Reservoir in Hall County. Glades sought to flood 850 acres, including 39 acres of wetlands. Glades Reservoir Environmental Impact Statement, http://gladesreservoir.com/; *see also* Sally Bethea, "Proposed Hall County reservoir a waste of tax dollars to benefit developers, politically connected insiders," SAPORTA REPORT (Dec. 6, 2015), https://saportareport.com/proposed-hall-county-reservoir-a-waste-of-tax-dollars-to-benefit-developers-politically-connected-insiders/.

[79] Twin Pines has estimated the mineral reserves at around 7,000 acres. They want to "demonstrate" on 898 acres of that, impacting over 475 acres of wetlands. *See* Section VII(A)(3), below.

the Swamp. Among other things, mining could lower the water levels in the swamp. According to the U.S. Fish and Wildlife Service, even slightly lowered water tables within the Okefenokee risk immediate irreversible effects:

> Lowered water tables within the Okefenokee basin could elevate fire frequency and intensity and alter fire behavior due to increased exposure of traditionally wetted areas. Further, even slight changes in the low mean water table or altered seasonal hydrology could result in a reduction of organic peat soils that dominate the basin. Slight changes in soils, hydrology, and fire behavior would result in changed vegetative patterning that govern habitat conditions.[80]

The numbers also do not reflect non-aquatic impacts, such as the destruction of habitat, the reduction of air and water quality through the release of contaminants, and the degradation of the visitor and wilderness experience due to light, dust, and noise from mining operations. Indeed, the severity of these adverse impacts recently led American Rivers to list the Okefenokee Swamp and St. Marys River as one of the top ten most endangered rivers in the nation.[81]

Second, the proposed mine is located in a unique geographic area. As described above, the 12,000-acre project area and the 898-acre "demonstration project" border the Okefenokee Swamp, one of the most exceptional places on Earth. It is home to over 620 species of plants, 233 species of birds, 39 species of fish, 37 amphibians, 64 reptiles, and 50 mammals, and has been named a "Wetland of International Importance" through the Ramsar Convention."[82] As the U.S. Fish and Wildlife Service put it, "The Okefenokee is like no other place on earth."[83]

Third, much of the information on aquatic impacts is incomplete or uncertain. As discussed in Section VI, Twin Pines says their "Reclamation Plan … will be submitted at a later date,"[84] and their Conceptual Mining Plan "may require modification once mining begins."[85] Under Twin Pines' Monitoring Plan, the "frequency of transducer data downloading may be

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[80] Letter from U.S. Fish & Wildlife Serv. to U.S. Army Corps of Eng'rs, Savannah Division at 3 (Oct. 8, 2019) (USFWS Letter) (attached as Ex. 36).

[81] American Rivers, America's Most Endangered Rivers: #8: Okefenokee Swamp, GA/FL, https://endangeredrivers.americanrivers.org/okefenokee-swamp/ (last visited Apr. 15, 2020).

[82] Ramsar Convention, *Wetlands of International Importance*, https://www.ramsar.org/about/wetlands-of-international-importance-ramsar-sites (last visited Apr. 10, 2020).

[83] U.S. Fish and Wildlife Serv., *About the Refuge*, https://www.fws.gov/refuge/Okefenokee/about.html (last visited Apr. 10, 2020); *see also* Georgia Laws 1919, at 1424–26 ("Congress Urged to Establish a National Park in Okefenokee Swamp") ("[N]ature herself worked hard and furnished here a natural sanctuary… the dense jungles in which birds and animals hide themselves from danger will disappear unless protected, and the great forests, jungle and swamp which form the headwaters for two great rivers will disappear unless steps are taken to preserve the same.").

[84] Application at 53.

[85] *Id.* at 45.

adjusted,"[86] the "frequency of [water level] measurements may be changed,"[87] and the "frequency of water-quality data sampling and number of monitoring locations may periodically be adjusted."[88] Twin Pines claims it will use monitoring data to "support future revisions of the groundwater model" and to "allow the development of models relating precipitation to groundwater levels [which have not been provided to the Corps or the public]," but does not say when, whether, or how that will happen.[89] The law is clear about these types of omissions: "Preparation of an EIS is mandated where uncertainty may be resolved by further collection of data or where the collection of such data may prevent 'speculation on potential...effects.'"[90]

Fourth, the potential effects of the proposed mine are highly controversial. For example, Twin Pines produced a hydrology report purportedly showing that mining would do no harm to the Okefenokee Swamp. However, multiple experts have criticized that report as incomplete and inaccurate.[91] For example, the state geologist at the Georgia Environmental Protection Division called parts of the model "completely inadequate."[92]At a minimum, there is "a substantial dispute about the size, nature, or effect" of the proposed action.[93]

There is substantial controversy in the ordinary sense of the term as well. Within days of the submittal of Twin Pines' initial application, both local and national media outlets reported on the application, from the Savannah Morning News[94] to the Washington Post and New York Times.[95] The controversy echoes the earlier debate from 1997, when DuPont announced its plan to mine thousands of acres immediately north of the Twin Pines site. Local communities and conservation groups have been opposing mining on Trail Ridge adjacent to the Okefenokee Swamp over the two decades since, and the controversy has only increased with Twin Pines' proposals. According to the Corps, approximately 22,000 people submitted comments in response to Twin Pines' July 2019 application. And over twice that number have already

[86] *Id.* at 29.
[87] *Id.* at 28.
[88] *Id.* at 29.
[89] *Id.* at 4.
[90] *See Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 870 (9th Cir. 2004) (citations omitted).
[91] *See generally* Hutson Report; Letter from James Kennedy, State Geologist, Georgia Environmental Protection Division, to Stephen Wiedl, Wetlands Unit, Georgia Environmental Protection Division (March 23, 2020) (Kennedy Report) (attached as Ex. 37).
[92] Kennedy Report at 6.
[93] *See Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998); *Am. Bird Conservancy, Inc. v. FCC*, 516 F.3d 1027, 1033 (D.C. Cir. 2008).
[94] Mary Landers, *Strip Mining Planned Next to Okefenokee National Wildlife Refuge*, July 15, 2019, https://www.savannahnow.com/news/20190715/strip-mining-planned-next-to-okefenokee-national-wildlife-refuge.
[95] Russ Bynum, *Company Wants to mine at edge of protected Okefenokee Swamp*, July 16, 2019, https://www.washingtonpost.com/business/company-wants-to-mine-at-edge-of-protected-okefenokee-swamp/2019/07/16/, https://www.nytimes.com/aponline/2019/07/16/us/ap-us-okefenokee-mining-plan.html.

submitted comments opposing the company's March 2020 application, despite the ongoing global pandemic. This level of interest and controversy, standing alone, should trigger the requirement for an EIS.

Fifth, if the Corps were to grant a permit for the first phase of the mining project, it would likely establish a precedent for future actions and cause cumulatively significant impacts.[96] As discussed elsewhere, Twin Pines' application seeks a permit for the first phase of the mining project (approximately 898 acres), but the complete project site is approximately 12,000 acres.[97] In other words, the permit covers only a small percentage of the full project. Moreover, as discussed further in Section VII(A)(3), and as seemingly recognized by the Corps during review of the original application,[98] there is also a reasonable probability of future mining proposals in the area which would rely on the Corps' determinations on this permit.[99] In other words, in granting or denying the permit in this case, the Corps could, for all practical purposes, be opening the door to mining on the entire 12,000 acres if not across the entirety of unprotected lands on Trail Ridge in Georgia.

Sixth, the proposed project threatens a violation of federal law or requirements for protection of the environment.[100] Specifically, the proposed mining project threatens to impair the U.S. Fish and Wildlife Service's ability to fulfill its substantive management requirements for protecting Okefenokee Refuge.[101] To meet its statutory mandate to "ensure the biological integrity, diversity and environmental health of the [National Wildlife Refuge] System,"[102] refuge policy directs the Service to "first and foremost, maintain existing levels of biological integrity, diversity and environmental health at the refuge scale."[103] In addition, the Refuge Administration Act requires the Service to "assist in the maintenance of adequate water quantity and quality" to fulfill the wildlife-first mission of the Refuge System and the purposes of each

[96] For example, DuPont (now Chemours)'s Florida Mines on Trail Ridge have expanded northward over the decades. *See* September 12 Comments, Regional Map, Fig. 3.

[97] USACE Issue Paper; USFWS Letter at 1.

[98] *See* Unknown Author, Map from Corps FOIA Production FP-20-11839 (attached as Ex. 38) (map of "Foreseeable future expansion").

[99] In addition, this is a resource of regional importance to surficial waters and aquifers which interactions are increasingly understood to be highly interconnected throughout South Carolina, Georgia, Florida, and Alabama via the Floridan and other aquifers. Connections and interconnections with the Okefenokee are only dimly understood, but they exist. However, even if there is no connection to waters further away than the St. Marys and Suwannee River and underlying aquifer systems, the precedent of granting a permit such as what is proposed without the thorough review engendered by a full EIS is patently unwarranted and exceptionally dangerous.

[100] 40 C.F.R. § 1508.27(b)(10).

[101] *See* 16 U.S.C. §§ 668dd–668ee.

[102] 16 U.S.C. §§ 668dd(a)(4)(B).

[103] U.S. Fish and Wildlife Service Biological Integrity, Diversity and Environmental Health Policy, 601 FW 3 (Apr. 16, 2001, *as amended* July 31, 2006).

refuge and even to acquire "water rights that are needed for refuge purposes."[104] As explained by expert hydrologists, the mine could cause leakage of groundwater from the Okefenokee Swamp, introduce contaminants into the refuge water supply, and produce other ecological disruptions. The project's potential to severely degrade or destroy refuge habitat, disturb or kill refuge-dependent wildlife and adversely impact species that migrate between the refuge and the project site could make it extremely difficult, if not impossible, for the Service to comply with its mandated management requirements and lead to violations of the Refuge Administration Act.

Seventh, the proposed mine would likely contribute to the loss or destruction of significant scientific, cultural, or historical resources. The cultural and historic resources associated with the Swamp are tremendously important, with evidence of Native American occupation dating back to 2500 BCE and a long history of exploration and settlement in the region.[105] In addition, universities from around the world, as well as federal, state, and local agencies, have conducted scientific research within the neighboring Okefenokee Swamp for decades.

Finally, the proposed mine would likely harm threatened and endangered species or their critical habitat. As discussed in detail in Section IX below, the mining project is likely to adversely affect many species listed under the Endangered Species Act. For other listed species, at a minimum, the application lacks sufficient information to demonstrate that it will not adversely affect these species.

Each of these significance factors, as applied in the context of the Okefenokee Swamp, independently requires the Corps to prepare an EIS before it decides whether to grant or deny a permit to Twin Pines[106]—together, they certainly do.[107]

B. An environmental assessment, no matter how long, does not replace an EIS.

Because these significance factors have been triggered, the Corps may not avoid an EIS by preparing a lengthy environmental assessment. When the significance factors are present, an EA, no matter how lengthy or detailed, can never replace an EIS. That is because "an EA and an EIS serve very different purposes."[108] An EA focuses on whether any effects might be significant; an EIS is a complete investigation of what those effects would be. "To treat an EA as if it were an EIS would confuse these different roles, to the point where neither the agency nor

[104] *See* 16 U.S.C. §§ 668dd(a)(4)(F)-(G); *see also Arizona v. California*, 460 U.S. 605, 610 (1983) (discussing federal reserved water rights doctrine).

[105] U.S. Fish and Wildlife Service, *Okefenokee at a Glance*, https://www.fws.gov/uploadedFiles/OkefenokeeGlance.pdf (last visited Apr. 10, 2020) (attached as Ex. 35).

[106] *See Fund for Animals v. Norton*, 281 F. Supp. 2d 209, 235 (D.D.C. 2003) (noting that "the existence of one or more significance factors" can trigger the need for an EIS).

[107] The reasons and issues listed above are not exhaustive, and throughout these comments we raise numerous other issues, risks, and inadequacies that trigger and should be addressed in an EIS.

[108] *Sierra Club v. Marsh*, 769 F.2d 868, 875 (1st Cir. 1985) (Breyer, J.).

those outside it could be certain that the government fully recognized and took proper account of environmental effects in making a decision with a likely significant impact on the environment."[109] "For one thing, those outside the agency have less opportunity to comment on an EA than on an EIS. For another thing, those inside the agency might pay less attention to environmental effects when described in an EA than when described in an EIS."[110]

The full opportunity for public participation associated with an EIS is critical for a project with numerous significant environmental impacts like the one at hand. For example, in response to a question from the public during the May 13, 2020 virtual public meeting, the applicant explained that "rough clearing" during the mining process would entail "removing any of the vegetive [sic] overland materials at the site, stockpile it there close to the mining area. Any of the vegetive [sic] materials, which includes roots, stumps, or undergrowth would be used in a tub grinder to grind those up to be mixed in with topsoil that is salvaged to be replaced during the reclamation activity."[111] These "rough clearing" activities have significant consequences to protected species, soil composition, and hydrological impacts, but they were not described in Twin Pines' application.

Additional public participation would unquestionably reveal equally important information relating to the application and its environmental consequences. For example, to date, the only studies contemplated to address potential environmental impacts are those proposed by the applicant, which primarily concern groundwater. The scoping process associated with the preparation of an EIS would help to identify other yet to be identified environmental impacts and provide the public with an opportunity to suggest additional studies that should be incorporated into any so-called demonstration project.[112] These opportunities are critical to understanding the full scope of the process and allowing robust public participation. Public notice and comment is not a substitute for scoping.

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[109] *Id.*

[110] *Id.*

[111] Virtual Public Meeting Recording at 2:05:00.

[112] The full EIS process would answer questions not addressed in Twin Pines' current application. For example, assuming the possibility for cumulative impacts from multiple future mining operations along Georgia's Trail Ridge, what would the cumulative impacts to wetlands be? The lack of adequate watershed wetland mitigation would likely result in significant losses in aquatic function along Trail Ridge. *See* Section VII(F), below. In addition to potential subsurface hydrologic impacts, the runoff from thousands of acres of excavated wetlands would likely result in aquatic function impairment to the Okefenokee. NEPA requires investigation of environmental impacts *before* the Corps makes a permit decision. 40 C.F.R. §1500.1(b) ("NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken."); *see Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348-49 (1989) ("NEPA ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast.").

C. Segmenting the project into smaller parts to avoid preparing an EIS is unlawful.

Twin Pines may not divide the project into smaller parts to avoid preparing an EIS. As shown above, even standing alone, the proposed "demonstration project" triggers the need for an EIS. But even if it did not, segmenting the project into smaller parts to avoid preparing an EIS is unlawful.

As discussed above, in July 2019, Twin Pines submitted its first application, seeking to mine 1,200 acres next to the Okefenokee National Wildlife Refuge. The U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and Georgia Department of Natural Resources each expressed serious concerns about the proposed mine, warning that it could result in "unacceptable," "permanent," and "irreversible" damage to the Okefenokee National Wildlife Refuge.[113] Tens of thousands of individuals also submitted comments opposing the mine, and elected officials from several downstream communities called for heightened review.[114]

Ultimately, the Corps regulatory division concluded that the proposed mine required the preparation of an EIS.[115] Rather than comply with this requirement, Twin Pines was "adamant [with the Corps] that doing the EIS right now was unacceptable for [its] business."[116] So, Twin Pines withdrew its application to mine 1,200 acres and submitted a new application to mine approximately 900 acres in the same location.[117]

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[113] Letter from U.S. Envtl. Prot. Agency to U.S. Army Corps of Eng'rs, Savannah Division (Oct. 3, 2019); Letter from U.S. Envtl. Prot. Agency to U.S. Army Corps of Eng'rs, Savannah Division (Sep. 12, 2019); Letter from U.S. Fish & Wildlife Serv. to U.S. Army Corps of Eng'rs, Savannah Division (Oct. 8, 2019); Letter from U.S. Fish & Wildlife Serv., to U.S. Army Corps of Eng'rs (Feb. 20, 2019); Email from Ga. Envtl. Protection Div. to U.S. Army Corps of Eng'rs, Savannah Division (Dec. 2019) (collectively attached as Ex. 39).

[114] Letter from Sen. William Ligon to Col. Daniel Hibner, U.S. Army Corps of Eng'rs (Jan. 27, 2020); Letter from Camden County Joint Development Authority (Jan. 27, 2020); Letter from Dr. C. Grayson Day, Jr., Mayor, Kingsland, GA (Dec. 5. 2019); Letter from John F. Morrissey, Mayor, St. Marys, Georgia (Dec. 3, 2019); Letter from Steve Parrot, Mayor, Woodbine, Georgia (Dec. 3, 2019); Letter from John A. Miller, Mayor, Fernandina Beach, FL (Dec. 2, 2019) (collectively attached as Ex. 40).

[115] Email from U.S. Army Corps of Eng'rs, Savannah Division, to Resource Agencies (Dec. 11, 2019) (attached as Ex. 10); U.S. Army Corps of Eng'rs, SAS-2018-00554 Meeting Agenda (December 11, 2019) and U.S. Army Corps of Eng'rs, Twin Pines Meeting Agenda (Draft) (Jan. 15, 2020) (attached as Ex. 34).

[116] Email from Steven Metivier to Col. Daniel Hibner (Jan. 16, 2020) (attached as Ex. 11 .

[117] The March 2020 application requests permission to mine 69 fewer acres of wetlands. *Compare* Application at 49 *with* July 2019 Application at 18. However, on the TIAA property, which lies closest to the Okefenokee Swamp, Twin Pines now seeks to fill over 8% more wetlands than it did in the July 2019 application. *Id.* On the Keystone property, the next closest property to the Swamp, Twin Pines now seeks to fill over 16% more wetlands than it did in the

The law is very clear on this tactic: Segmenting a large project into smaller pieces to avoid preparing an EIS is unlawful.[118] NEPA regulations plainly state, "**Significance cannot be avoided …by breaking [an action] down into small component parts**."[119]As one court put it, "If developers are allowed to leave an area undeveloped … in one application and then just submit a new, unrelated application" at a later time, "then the requirements of NEPA are eviscerated."[120] If preparing an EIS is "unacceptable for [its] business," then Twin Pines may abandon the project altogether—but it cannot break down its application into smaller parts to sidestep NEPA requirements.

VI. The proposed project is not a "demonstration" project.

Twin Pines has misleadingly styled this application as a new "demonstration project" in an attempt to distinguish it from the original proposal. But the Corps already understood Twin Pines' original, July 2019, application to be for a "test site."[121] Twin Pines also told the U.S. Fish and Wildlife Service that the original application was "a test … to prove they can use this

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July 2019 application. *Id.* In other words, even though the total acreage of fill is slightly less, more acres will be filled closer to the Swamp than before.

[118] 40 C.F.R. § 1507.27(7).

[119] *Id.*

[120] *Lafitte's Cove at Pirates' Beach Nature Soc'y v. U.S. Army Corps of Eng'rs*, No. CIV.A. G-04-185, 2004 WL 3186592, at *6 (S.D. Tex. Dec. 14, 2004); *see also Alpine Lakes Prot. Soc. v. Schlapfer*, 518 F.2d 1089, 1090 (9th Cir. 1975) ("Characterizing any piecemeal development of a project as 'insignificant' merits close scrutiny to prevent the policies of NEPA from being nibbled away by multiple increments, no one of which may in and of itself be important enough to compel preparation of a full EIS."); *Colony Fed. Sav. & Loan Ass'n v. Harris*, 482 F. Supp. 296, 302 (W.D. Pa. 1980) ("There is substantial case law establishing that large projects may not be artificially segmented into smaller ones for the purpose of avoiding NEPA or minimizing the appearance of adverse environmental impact."); *Nat. Res. Def. Council, Inc. v. Hodel*, 865 F.2d 288, 297–98 (D.C.Cir.1988); *PEACH v. U.S. Army Corps*, 87 F.3d 1242, 1247 (11th Cir.1996) (an applicant "cannot 'evade [its] responsibilities' under the National Environmental Policy Act by 'artificially dividing a major federal action into smaller components, each without a "significant" impact.'").

As discussed in Section VII(A)(3), the 404(b)(1) guidelines also "provide that the review may not be 'piecemeal'—a few acres here, a small tract there." *Buttrey v. U.S.*, 690 F.2d 1170, 1180 (5th Cir. 1982); *See also U.S. v. Rueth Dev. Co.*, 335 F.3d 598, 600 (7th Cir. 2003) (noting that the Corps denied a § 404 permit application because the applicant had "present[ed] his development plans in a piecemeal fashion in an attempt to avoid a comprehensive review of their cumulative environmental impact"); *Salt Pond Assocs. v. U.S. Army Corps of Engineers*, No. CIV.A. 92-597-LON, 1993 WL 738478, at *11 (D. Del. Sept. 22, 1993) (noting that the Corps denied the initial permit application because the Corps "did not respond to piecemeal permit applications in '[f]ederally regulated wetlands associated with a single and complete project'").

[121] USACE Issue Paper.

method without hurting the resources."[122] It seems the "test" was whether Twin Pines could begin mining operations near the Okefenokee without rigorous third-party evaluation of its plans, as evidenced by Twin Pines withdrawal of the "test site" application only one week after meeting with Colonel Hibner about NEPA requirements and after submitting its flawed hydrology studies.[123]

Several years into planning for this mine Twin Pines remains noncommittal in its submissions to the Corps. According to Twin Pines, the "Reclamation Plan … will be submitted at a later date,"[124] and the Conceptual Mining Plan "may require modification once mining begins."[125] Under Twin Pines' Monitoring Plan, the "frequency of transducer data downloading may be adjusted,"[126] the "frequency of [water level] measurements may be changed,"[127] and the "frequency of water-quality data sampling and number of monitoring locations may periodically be adjusted."[128] Twin Pines claims it will use monitoring data to "support future revisions of the groundwater model" and to "allow the development of models relating precipitation to groundwater levels [which have not been provided to the Corps or the public]," but does not say when, whether, or how that will happen.[129]

Twin Pines nowhere commits to wait for "verification" of the mine's environmental impacts before applying for and beginning future phases of the mine. Yet, it wants the benefit of the implication that this project can stand alone. Not only has Twin Pines failed to show this first phase will stand alone,[130] it has failed to prove that its proposed project would demonstrate anything at all.

Twin Pines' claim of negligible water resource impacts would purportedly occur as a result of two separate, but related, actions. First is Twin Pines' on-site mitigation plan for the hundreds of acres of excavated wetlands, which still has not been provided to the Corps or the

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[122] Sara Aicher, FWS Refuge Biologist, Notes of March 19, 2019 Meeting with Twin Pines Minerals (attached as Ex.8).

[123] Nedra Rhone, *Mining company withdraws permit application for project near Okefenokee*, Atlanta Journal-Constitution (Feb. 8, 2020), https://www.ajc.com/news/mining-company-study-concludes-operations-will-not-damage-okefenokee-swamp/ATK9pE3RthxmrH6ypsoIgL/.

[124] Application at 53.

[125] Application at 45. And it is unclear what is so "innovative" about the mining plan using a dragline and conveyor. *Id.* Other aspects of the mining plan are also unclear, for example how and why separated humate will be buried below sand tailings when Twin Pines is only using a single tailings conveyor, *id.* at 38, 45–46, and how and where process water ponds will be constructed. *Id.* at Fig. 75. Similarly, Twin Pines fails to explain the role of its bentonite experiment in the application. *Id.* at 14.

[126] Application at 29.

[127] Application at 28.

[128] Application at 29.

[129] Application at 4.

[130] *See* Section VII(A)(3).

public.[131] Second is Twin Pines' plan for the water quality and water level in the area which consists of dumping the processed and homogenized sands back into 898 acres of open mine pits and waiting to see what happens.

However, the monitoring plan Twin Pines submitted cannot be implemented or enforced by the Corps because it is missing critical components regarding the monitoring period, method, and parameters and has utterly failed to consider remedial actions. When the risk is to a resource like the Okefenokee Swamp, the Corps should not tolerate such uncertainty.

A. Twin Pines' Monitoring Plan fails to address key monitoring requirements.

Twin Pines' proposed monitoring plan has failed "to demonstrate compliance with the [404(b)(1)] Guidelines" and lacks required information.[132] Under NEPA, mitigation must be clearly described and enforceable.[133] Whether the backfilling of the pits is considered minimization or permittee-responsible compensatory mitigation,[134] the Corps' monitoring regulations show that Twin Pines' demonstration project is entirely inadequate. A monitoring "plan must address the monitoring requirements for the compensatory mitigation project," including the length of the monitoring period and the parameters to be monitored.[135] Neither is clearly identified here.

To determine success, the monitoring period must at a minimum be longer than five years from completion of the mitigation project.[136] Twin Pines has offered the unclear promise of "post-mining monitoring … for a period equal to the period of mining."[137] Twin Pines must clarify its intent here, specifically whether the "post-mining" period starts at the end of all phase one mining operations or at some earlier time. Assuming Twin Pines means six years,[138] Twin Pines must also provide some kind of justification for the length of the monitoring period and

[131] As of November 2019, Twin Pines had not even begun wetlands mitigation assessment. Email from Christopher Stanford, TTL, to Justin Hammonds, U.S. Army Corps of Engineers (Nov. 20, 2019) (attached as Ex. 41).

[132] U.S. Envtl. Prot. Agency, Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with CWA Section 404(b)(1) Guidelines Alternatives Requirements, *available at* https://www.epa.gov/cwa-404/memorandum-appropriate-level-analysis-required-evaluating-compliance-cwa-section-404b1.

[133] 33 C.F.R. § 325 App. B(21); CEQ, Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact at 6–7 (Jan. 14, 2011).

[134] 33 CFR § 320.4(r)(1) (Corps' mitigation policy); 40 C.F.R. § 1508.20 (CEQ definition of mitigation).

[135] 40 C.F.R. § 230.96.

[136] 40 C.F.R. § 230.96(b).

[137] Application at 4.

[138] Application at 29.

explain whether it can assess the effects of the mine on water level and quality and aquatic resource function.[139]

Relatedly, Twin Pines must clearly establish that there are enough monitoring wells in the right locations with sufficient baseline data to assess the effects of mining operations, including the processing plant and process water ponds. Many of Twin Pines' piezometers were installed to investigate water elevations far outside the "demonstration" area and none appear to be appropriately located to detect contaminants migrating from the source area in a timely manner.[140] If wells are also required at off-site locations to determine impacts on the Okefenokee, the Corps must determine whether it can even implement or enforce such monitoring. As described in the attached expert report, Twin Pines' proposed "one round of background sample collection is clearly insufficient to characterize natural seasonal variation in water quality and identify a statistically significant range of background values for each parameter."[141]

Even if the monitoring did collect appropriate data, Twin Pines has not set any standards by which to judge it. Hydrology performance standards should consider "the hydrologic variability exhibited by aquatic resources … and the expected stages of the aquatic resource development process, in order to allow early identification of potential problems and appropriate adaptive management."[142] The lack of actionable water quality and water level thresholds in the monitoring plan leaves the Corps and the public guessing as to what Twin Pines will do when the data it collects comes in. This is particularly concerning where, as here, early intervention to prevent damage is critical.[143]

With respect to water quality impacts, Twin Pines says "data will be evaluated against current groundwater and surface water quality standards."[144] As noted above, Twin Pines has not released any predictions about pollutant discharges resulting from its mine.[145] Nor has Twin Pines addressed what statistical testing would be conducted to identify impacts.[146] And one sampling event is insufficient to establish baseline values for comparison.[147] That is, the Corps is and will be unable to know what the water quality data shows and whether any unexpected issues arise.

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[139] *See* Hutson Report at 6.

[140] Hutson Report at 6.

[141] Hutson Report at 6.

[142] 40 C.F.R. § 230.95(b).

[143] Letter Report from Mark A. Hutson, P.G., to William Sapp at 4 (Sept. 12, 2019) ("Hutson Sept. 12 Report") (attached to Sept. 12 Comments as Ex. D).

[144] Application at 34.

[145] The lack of analysis of water quality impacts did not prevent Twin Pines from asserting that "there will be no oils or other pollutants released from the proposed activities." Application at 49.

[146] Hutson Report at 6.

[147] Hutson Report at 6.

With respect to water level impacts, the continued lack of a water management plan raises concerns about the accuracy of any water level predictions. Similar mines in Georgia have struggled with managing excess water in mine pits and storage ponds.[148] Twin Pines has failed to reckon with this basic proposition. Twin Pines has not evaluated leakage and other discharges of its Floridan aquifer withdrawals into the surficial aquifer.[149] Further, its hydrology model fails to account for storm events or even seasonal precipitation patterns, let alone the anticipated effects of climate change on regional precipitation.[150] As such, we have the following questions that must be specifically addressed by Twin Pines and the Corps:

- What effect will storms or drought have on interpretation of the data and operation of Twin Pines' mine?
- Are the rain gauges in appropriate locations for interpreting the data in the monitoring wells?
- How will Twin Pines know if water level changes are attributable to mining when there is scant background data?[151]
- Exactly when and under what conditions will Twin Pines pump water out of the pits?[152]
- Where will that water go?
- How much water would Twin Pines pump?
- What effect would that have on the water table?
- How will Twin Pines' annual reports differentiate the effects of this undetermined pumping of the surficial aquifer from the effects of homogenizing the sands 50 feet deep and the effects of discharging water pumped from the Floridan?[153]

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[148] Southern Ionics Minerals, NPDES Application Additional Information at 1 (Jan. 16, 2018) ("3 years of operating the [mine] demonstrates that during wet periods there is too much water in the process circuit and there is a risk of mine pits overflowing and discharging untreated water.") (attached as Ex. 42).

[149] Hutson Report at 3; *see also* TTL Response to SELC October 7, 2019 Questions, Question 2 (May 26, 2020) ("TPM's retention ponds total volume will be approximately 5 acre-feet. … Calculations to quantify the volume of water anticipated to leak from the process water ponds on a daily basis have not been conducted at this time.").

[150] *See* Application at 15–21.

[151] Not only has the length of data collection been limited, but two of the three rain gauges Twin Pines installed are missing months of data due to the destruction of one gauge and the corrupted data of another. Application, Table 10.

[152] In its revised groundwater withdrawal application to Georgia EPD, Twin Pines says "water will not be withdrawn from any *natural* surface water body" and that "dewatering [of the mine pits] will occur occasionally," but admits that an "effective water management strategy" has still not been developed. Twin Pines Minerals, Industrial Groundwater Withdrawal Permit Application – Revision 1 at 1, 3 (Nov. 25, 2019) (emphasis added) (attached as Ex. 43).

[153] On May 26, Twin Pines said it "now plans to prepare and submit a revised [groundwater withdrawal] application" and that they "now propose to install two wells in the Floridan, each to deliver 500 gpm." TTL Response to SELC October 7, 2019 Questions, Question 1 (May 26,

Twin Pines simply states that in its annual monitoring reports, "Groundwater-level data will be compared with groundwater levels predicted by the groundwater models."[154] But the "models" do not predict groundwater levels annually; they only predict a static post-mining condition after the entire first phase.[155] It is unclear whether Twin Pines is referring to its self-described "unrealistic" moving mine discussion.[156] The Corps may not allow Twin Pines to make "predictions" as it constructs and operates the mine. A reliable transient model of the site is needed before operations begin.[157] The Corps must establish what change in water level at each location would require remedial action by Twin Pines, what that remedial action would be, and whether there is a change in water level that would cause Twin Pines to halt mining.

B. Twin Pines' Monitoring Plan is not implementable or enforceable.

As described throughout these comments, lowering or raising the level of the surficial aquifer could have significant effects on the wetlands in the surrounding area including the Okefenokee Swamp. Yet it does not seem as though Twin Pines has even considered what to do—or what can be done—if mining the first phase affects the water level in the Okefenokee.[158] Twin Pines is asking for permission to excavate 898 acres 50 feet deep "to validate" its groundwater model before mining up to 12,000 acres (the effects of which have not been modeled).[159] If the partial model is wrong,[160] there could be adverse impacts to groundwater, surface water, and the Okefenokee Swamp. Similarly, Twin Pines has not considered what to do if operation of the mine releases contaminants into groundwater or surface water.[161] These real risks are nowhere reflected in the application.

Without this information, the Corps cannot determine the required "sufficient financial assurances *to ensure a high level of confidence* that the compensatory mitigation project will be successfully completed, in accordance with applicable performance standards."[162] And if there are deficiencies in the hydrology model that result in violations of performance standards,

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2020). Twin Pines' November 2019 revised application was for two wells at 500 gpm. It is unclear why or whether a new revision is forthcoming.

[154] Application at 34.

[155] Hutson Report at 5–7. And the fundamental flaws in the submitted groundwater model prevent reliance on its "predictions." "If the characterization of the hydrologic balance is incomplete or in error, it is not possible to correctly predict the consequences of the mining plan on the hydrologic balance during and after mining." Hutson Sept. 12 Report at 3 (attached to Sept. 12 Comments as Ex. D).

[156] Application at 25.

[157] Hutson Report at 7.

[158] Hutson Report at 6–7.

[159] Application at 1.

[160] *See* Section III; Kennedy Report.

[161] Hutson Report at 6–7.

[162] 33 C.F.R. § 332.3(n)(1).

corrective action would require reestablishment of "aquatic resource functions."[163] Here, for example, the cost of reestablishing the hydraulic barrier of Trail Ridge should not be borne by the public. Corps regulations require denial of permits where it cannot reasonably implement or enforce necessary conditions, and based on this application, the Corps should do so here.[164]

VII. The proposed project violates Clean Water Act Section 404(b)(1) Guidelines.

The 404(b)(1) Guidelines are substantive environmental criteria used to evaluate whether a proposed activity complies with Section 404 of the Clean Water Act. The Guidelines reflect two key principles: first, the degradation or destruction of wetlands may represent an irreversible loss;[165] and second, the Corps should not permit the discharge of dredged or fill material "unless it can be demonstrated" that the discharge will not have an unacceptable adverse impact.[166] In other words, "[t]he burden of proof to demonstrate compliance with the Guidelines rests with the applicant; **where insufficient information is provided to determine compliance, the Guidelines require that no permit be issued**."[167]

The "amount of information needed to make such a determination and the level of scrutiny required by the Guidelines" depends on "the severity of the environmental impact," as determined by "the functions of the aquatic resource and the nature of the proposed activity."[168] Given that the proposed project may harm one of the largest freshwater ecosystems in the world, Twin Pines has not provided anywhere close to the required level of information.

The comments below address each relevant criterion: aquatic impacts, practicable alternatives, avoidance and minimization, mitigation, and protected species.

A. The proposed mine would significantly degrade aquatic resources.

Under the 404(b)(1) Guidelines, the Corps may not grant a Section 404 permit if the proposed action would "cause or contribute to significant degradation of the waters of the United States," including wetlands.[169] To determine whether a proposed project would significantly

[163] 40 C.F.R. § 230.97(c)(3).
[164] 33 C.F.R. § 325.4; *see also* 33 C.F.R. § 320.4(r)(2).
[165] 40 C.F.R. § 230.1 ("The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.").
[166] *Id.* ("Fundamental to [the] Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern.").
[167] U.S. Envtl. Prot. Agency, Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with CWA Section 404(b)(1) Guidelines Alternatives Requirements (emphasis added).
[168] U.S. Army Corps of Eng'rs, Regulatory Guidance Letter 93-02, Guidance on Flexibility of the 404(b)(1) Guidelines and Mitigation Banking (August 23, 1993), *available at* https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll9/id/1385.
[169] 40 C.F.R. § 230.10(c).

degrade wetlands or other waters, the Corps must consider direct, secondary, and cumulative impacts, including impacts to wildlife, recreation, aesthetics, and economics.[170] Here, the impacts of the proposed mine would harm thousands of acres of wetlands, as well as the wildlife that live there. In addition, the proposed mine would likely harm the neighboring Okefenokee National Wildlife Refuge and Okefenokee Wilderness.

1. Direct Impacts

According to Twin Pines, the first phase of the proposed mine would directly impact more than 475 acres of wetlands and more than 400 linear feet of stream. Twin Pines unbelievably calls this a "Small scale project[] … [that] represents good stewardship of the environment."[171] As described in the Conservation Groups' September 12 comments, it would likely take decades for habitat to return and perhaps longer for biogeochemical cycling to return to pre-mining conditions, especially if topsoil is not sorted by hydrogeomorphic (HGM) type when stockpiled.[172]

2. Secondary impacts

The application also largely ignores secondary impacts of the proposed mine. Under the Guidelines, "Secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material."[173] The analysis of secondary impacts is critical: as the Guidelines recognize, "[w]hen disruptions in flow and circulation patterns occur, apparently minor loss of wetland acreage may result in major losses through secondary impacts."[174]

As discussed above and set forth in the attached expert reports, mining could alter the form and structure of Trail Ridge, and in turn affect the water quality and flow into, through, and out of the Swamp. So far, Twin Pines' identification and evaluation of potential changes in on-site and off-site hydrology has been unsophisticated, incomplete, and, in some cases, reckless. Given the location of the proposed mine, the scale of secondary impacts could be enormous. As experts have pointed out,[175] there is a real risk that the mine could irreversibly harm the Okefenokee Swamp, and Twin Pines has not adequately shown otherwise.

The proposed mine would likely have substantial secondary impacts on the biology of the aquatic ecosystem as well by damaging or destroying neighboring habitat and harming the biological productivity of neighboring ecosystems. In short, there is a very real risk of harm not only to the Okefenokee Swamp, but to neighboring wetlands, rivers, and watersheds and the species that rely on them.

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[170] 40 C.F.R. § 230.10(c)(1)–(4); 40 C.F.R. § 230.11.
[171] Application at 5.
[172] Sept. 12 Comments at 16; Rheinhardt Report (attached to Sept. 12 Comments as Ex. F).
[173] 40 C.F.R. § 230.11.
[174] *Id.* § 230.41
[175] *See e.g.* Hutson Report (attached as Ex. 31), Rheinhardt Report.

3. Cumulative Impacts

a. The application does not consider the cumulative effects of piecemeal impacts.

Although the first phase of the proposed mine is limited to 898 mined acres, Twin Pines still intends to expand the mine to at least 12,000 acres.[176] Twin Pines' application does not consider the cumulative impacts of the 12,000-acre mine at all. Instead, it asks the Corps to let it begin mining and decide later whether there are significant harmful impacts.

As with NEPA, the 404(b)(1) Guidelines do not permit this type of piecemeal analysis. The Guidelines require all wetlands impacts from all phases of a project to be considered together. As the Fifth Circuit Court of Appeals put it:

> The [404(b)(1) Guidelines] . . . provide that the review may not be "piecemeal"—a few acres here, a small tract there. The rationale is simple. "Although a particular alteration of wetlands may constitute a minor change," the regulations note, "the cumulative effect of numerous such piecemeal changes often results in a major impairment of the wetland resources."[177]

The proper question, then, is whether the proposed 12,000-acre mine would significantly degrade wetlands or other waters. Although the impacts from the "demonstration project" alone should be disqualifying, the scale of potential impacts from the full mine is staggering. During this phase of the mining project, Twin Pines intends to mine approximately 453 acres of wetlands.[178] Assuming a proportional amount of wetlands impacts across the 12,000-acre project area,[179] the proposed mine would, by conservative estimates, impact over **3,500 acres of wetlands**, not including those impacted by the construction of infrastructure. These numbers far exceed (by nearly five-fold) the impacts discussed in the application. **It is our understanding**

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[176] USACE Issue Paper; USFWS Letter at 1.

[177] *Buttrey v. U.S.*, 690 F.2d 1170, 1180 (5th Cir. 1982); *see also U.S. v. Rueth Dev. Co.*, 335 F.3d 598, 600 (7th Cir. 2003) (noting that the Corps denied a § 404 permit application because the applicant had "present[ed] his development plans in a piecemeal fashion in an attempt to avoid a comprehensive review of their cumulative environmental impact"); *Salt Pond Assocs. v. U.S. Army Corps of Eng'rs*, No. CIV.A. 92-597-LON, 1993 WL 738478, at *11 (D. Del. Sept. 22, 1993) (noting that the Corps denied the initial permit application because the Corps "did not respond to piecemeal permit applications in '[f]ederally regulated wetlands associated with a single and complete project'").

[178] Application at 49.

[179] Twin Pines will impact more than 453 acres of wetlands in this phase: counting processing facilities and other structures, there will be more than 475 acres of wetlands affected. It is unclear whether those structures will need to be moved to new wetlands to keep pace with the phases of the mining project. Further, National Wetland Inventory maps show more wetlands on Trail Ridge along future phase sites than on this one, and as seen with the current application, NWI often underestimates the extent of federally protected wetlands.

that the Savannah District has never permitted a private project in Georgia with anything close to this much aquatic impact.

There is no question that Twin Pines intends to mine the entire 12,000-acre Saunders Tract. Twin Pines met with the Corps as early as 2017 to discuss permitting 30 years of mining through 1,000-acre phases.[180] In 2018, Twin Pines purchased about 7,000 acres of the tract. Twin Pines drilled hundreds of boreholes across the 12,000 acres in its "extensive mineral exploration of the Saunders Tract" and found "economic concentrations of heavy minerals" across the entire tract up to 70 feet deep.[181] Also in 2018, Twin Pines undertook cultural resources field work and "conducted a wetland delineation on the first 1,000-acre parcel (referred to as the Loncala Tract) which [was then] the first phase of the project."[182] Twin Pines even submitted a "Mineral Exploration Work Plan" for the Loncala Tract to the Corps in August 2018 which was sharply critiqued by EPA experts.[183]

For these same reasons, Twin Pines' application also underestimates the proximity of the proposed mine to the Okefenokee Swamp. Twin Pines repeatedly states that the proposed site would be nearly three miles from Okefenokee National Wildlife Refuge, thus "providing a substantial buffer of protection for this sensitive resource."[184] But later phases of mining would occur on property located within a half mile of the Swamp—substantially closer than the application suggests.[185]

b. The application does not consider the cumulative impacts of past, present, and future mines.

The application also ignores the impacts of past, present, and reasonably foreseeable future heavy mineral mines on Trail Ridge. Like NEPA, the 404(b)(1) Guidelines require the Corps to consider "cumulative impacts," or changes that "are attributable to the collective effort of a number of individual discharges of dredged or fill material."[186] This is because "the cumulative effect of numerous…changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems."[187]

Here, Twin Pines should have considered the cumulative impacts of past, present, and reasonably foreseeable future mines in the region. In southeast Georgia, hundreds of acres have

[180] Twin Pines Minerals, Project Activities and Timeline (Aug. 13, 2019) (attached as Ex. 44); USACE Issue Paper; Email from C. Stanford to J. Lopes (July 23, 2018) ("The mine site is approximately 12,000 acres and the area will be mined in 1,000-acre parcels over 30 years.").

[181] Application at 41; Twin Pines Minerals, Maps of Mineral Concentrations and Depths (attached as Ex. 6).

[182] Email from C. Stanford to J. Lopes (July 23, 2018).

[183] Email from E. Somerville to J. Lopes et al. (Sep. 5, 2018) ("In general, the questions to be answered by the hydrologic investigation are not framed very clearly...") (attached as Ex. 45).

[184] Application at 44.

[185] *Id.* at 15.

[186] 40 C.F.R. § 230.11

[187] *Id.*

already been mined for heavy minerals, and mining operations remain ongoing.[188] In addition, as described in the Conservation Groups' September 12 comments and demonstrated by the map below, there is a real risk of future heavy mineral sand mines in the region—for example, on neighboring property owned by Toledo Manufacturing Company and the property immediately south of the proposed project area[189]—either of which could result in the excavation of thousands of acres of Okefenokee-adjacent wetlands on top of Twin Pines' current project.

The Corps must also consider potential impacts caused by a Twin Pines expansion beyond 12,000 acres. Mines like that proposed by Twin Pines often continue to expand once they establish a foothold, as has occurred in Florida with the Trail Ridge (then Highland, then Maxville, then North Maxville) Mine owned by DuPont (now Chemours).[190]

[*Figure 2 on following page*]

[188] *Cf.* Press Release, The Chemours Company, Chemours Acquires Operations of Southern Ionics Minerals (SIM): Acquisition Will Enable Substantial Increased in Mineral Sands Production (Aug. 2, 2019), *available at* www.southernionicsminerals.com/pdf/news_release_chemours_acquires_SIM.pdf.

[189] Our understanding is that there has recently been exploratory drilling on the tract immediately south of the proposed project area.

[190] *See* Regional Map, September 12 Comments at Fig. 3; *see also* Twin Pines, LLC, Myths v. Facts: Twin Pines Mining Project at ¶ 4 (Aug. 13, 2019) (noting Twin Pines "would like to expand").

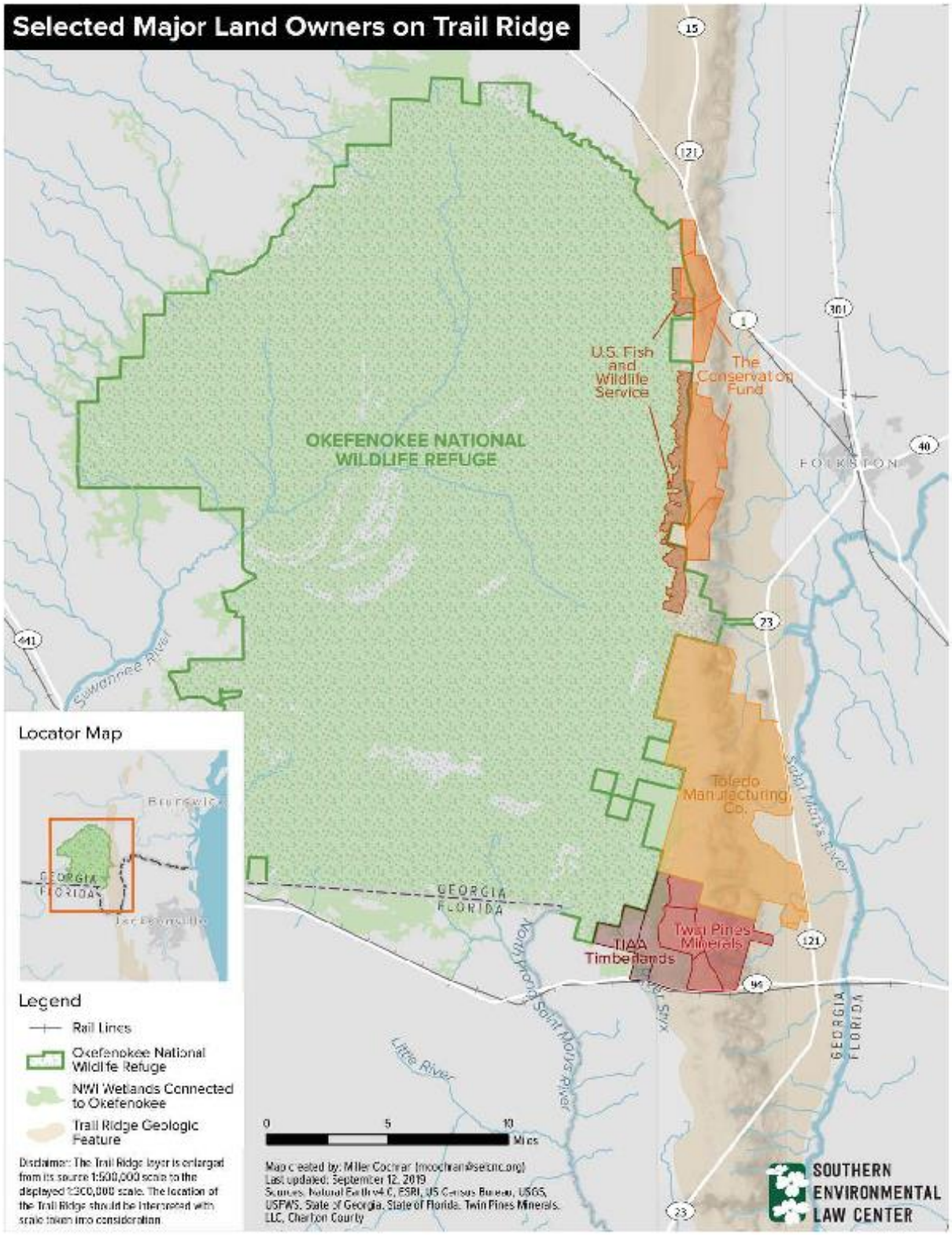

Figure 2: Selected Major Land Owners on Trail Ridge

B. The proposed project would harm threatened and endangered species and their critical habitat.

The 404(b)(1) Guidelines also prohibit the Corps from issuing a Section 404 permit if the proposed project would jeopardize the continued existence of a threatened or endangered species, or would result in the likely "destruction or adverse modification" of critical habitat.[191]

In assessing the project's impact on endangered species, the Corps may not limit its review to the direct impacts of the proposed fill, as Twin Pines has done in its application. The Corps must also consider the secondary or indirect impacts to the surrounding habitat and the endangered and threatened species that live there. For example, in *Riverside Irrigation District v. Andrews*[192] an applicant sought a Section 404 permit to deposit dredge and fill material to build a dam and reservoir. Although the applicant and the Corps agreed that the fill itself would not degrade an endangered species' habitat, the Corps found that the indirect impacts of building the dam—for example, depleted stream flow—would adversely affect the habitat. The applicant argued the Corps should not be permitted to consider this type of indirect impacts to endangered species. The court disagreed, explaining that the Corps was required to consider direct *and* indirect impacts to endangered species.

As addressed in the Conservation Groups' September 12 comments and Section IX below, the proposed mine violates the 404(b)(1) Guidelines because it is likely to harm threatened and endangered species and their habitat.

C. The proposed mine may significantly degrade Okefenokee National Wildlife Refuge.

The 404(b)(1) Guidelines also require the Corps to examine the proposed mine's potential impacts to sanctuaries and refuges.[193] As discussed in the Conservation Groups' September 12 comments and throughout these comments and the attached expert report, the proposed mine could have catastrophic effects on the Okefenokee National Wildlife Refuge.

D. Twin Pines did not adequately consider alternatives.

Under the 404(b)(1) Guidelines, the Corps may not grant a Section 404 permit if there is a practicable alternative that would have less environmental impact.[194] An alternative is

[191] 40 C.F.R. § 230.10(b)(3).
[192] 758 F.2d 508, 513 (10th Cir. 1985).
[193] 40 C.F.R. § 230.40.
[194] 40 C.F.R. § 230.10(a). The purpose of the alternatives analysis, as stated in the preamble to the Guidelines, is "to recognize the special value of wetlands and to avoid their unnecessary destruction, particularly when practicable alternatives were available in non-aquatic areas to achieve the basic purposes of the proposal." 33 C.F.R. § 230.10(a)(2). NEPA requires a similar analysis.

practicable if "it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose."[195] For non-water-dependent projects like this one, the presumption is that there is a less damaging alternative.[196] That presumption is difficult to overcome. To do so, an applicant must show that there are no other sites that can accommodate, or are available for, the project purpose.[197]

Twin Pines did not even try to meet its burden. Instead, the company artificially limited its search criteria to a site "in southeast Georgia or northeast Florida" having "access[] to rail." Twin Pines does not explain why a rail line is necessary (simply stating that "cost … would increase" is insufficient)[198] or why another region would not do. Because of these hypothetical restraints, nearly all of the applicant's potential alternatives are located on the 12,000-acre project site. As a result, all contain high percentages of wetlands and are located less than three miles from the Okefenokee Swamp.

Although Twin Pines identifies two off-site alternatives that they evaluated, they do not provide the location or any identifying details. They simply ask the Corps to trust that they considered other places.[199] This is wholly inadequate. Twin Pines also identifies a number of other offsite alternatives that they eliminated, but this is largely a summary of deposits that have already been mined—not valid alternatives that satisfy the company's obligations under the 404(b)(1) Guidelines.

Twin Pines also presented an unreasonably narrow statement of the project's purpose and need. The purpose and need for the project presented by the applicant is so unreasonably narrow that only one alternative—the applicant's preferred alternative to mine at its preferred site—would accomplish the goal of the agency's action. During the virtual public meeting, the applicant summarized its purpose and need for the proposed project as: "1–Gather data required to evaluate the groundwater hydrology model completed on the selected site; 2–Demonstrate that heavy metal mineral sand mining can be accomplished in an environmentally sensitive area with

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[195] *Id.*

[196] 40 C.F.R. § 230.10(a)(3); *see also Shoreline Assocs. v. Marsh*, 555 F. Supp. 169, 180 (D. Md. 1983), *aff'd,* 725 F.2d 677 (4th Cir. 1984).

[197] *Bersani v. U.S. Envtl. Prot. Agency*, 850 F.2d 36, 44 (2d Cir. 1988); *see also Hough v. Marsh*, 557 F. Supp. 74, 84 (D. Mass. 1982).

[198] Application at 35. We are aware of multiple mines that have or continue to use trucks to transport their minerals, often significant distances. Iluka Resources trucked roughly a hundred miles from Lulaton to Green Cove Springs. Maria Mange and David Wright, Eds., HEAVY MINERALS IN USE, at 1184. Chemours intends to truck from its Amelia Mines in Jesup to its separation plant in Offerman. Press Release, Southern Ionics Minerals (Nov. 27, 2018).

[199] Twin Pines simplistically says "the mineral concentration per cut must average greater than 1.5% economic heavy minerals." Application at 35. But, "economic value and mining potential of a titanium deposit is highly dependent on its mineralogy … Mineral assemblage, grain size, morphology, texture, and type and quantity of included trace elements all contribute to the economic potential of a deposit." Woodruff, et al., *Critical Mineral Resources of the United States* T6 (2017).

negligible impact; [and] 3–Develop a high-quality heavy mineral sand reserve to produce heavy mineral sand (titanium and zircon) concentrate products."[200] Among other things, this unreasonably narrow and specific definition of the project's purpose and need necessarily requires that any alternative be conducted "on the selected site" and in "an environmentally sensitive area," thus automatically precluding any alternatives in other geographic locations that are less environmentally sensitive. Such a predetermined outcome violates the 404(b)(1) Guidelines and NEPA, and consequently the Corps should decline to use the applicant's unreasonably narrow definition of purpose and need.

E. The application fails to adequately demonstrate avoidance or minimization of adverse aquatic impacts.

The 404(b)(1) Guidelines require applicants to avoid discharges of dredged or fill material to the extent practical, then minimize any unavoidable impacts, and then mitigate for any impacts that could not be minimized.[201] Twin Pines does none of these things.

To demonstrate that it has avoided discharges to the extent practical, a permit applicant must discuss the "original site development plan and why this plan was not the least environmentally damaging practicable plan."[202] Then, the applicant must compare the original plan to the final plan to demonstrate "how many acres of wetland and/or linear feet of stream were avoided."[203] Twin Pines falls short on both. Twin Pines *increased* the acreage of wetlands it will mine on the two tracts closest to the Okefenokee.[204] And although Twin Pines shaved approximately 69 acres of mined wetlands off its initial application, the purpose was not to avoid wetlands. Indeed, they may mine those wetlands at a later date. Instead, the purpose was to break the overall project into smaller parts to sidestep NEPA requirements. This is not avoidance.

Twin Pines likewise fails to minimize the impacts of the proposed mine. Under the 404(b)(1) Guidelines, minimization means "mitigating an aquatic resource impact by managing the severity of a project's impact on resources at the selected site."[205] "Minimization is achieved through the incorporation of appropriate and practicable design and risk avoidance measures."[206] Twin Pines barely mentions its minimization obligations in the application. The company says that "in order to minimize the temporal loss of wetland function on-site, TPM is proposing to

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[200] TTL, Inc., PowerPoint Presentation, Twin Pines Minerals Proposed Saunders Demonstration Mine SAS-2018-00554 (May 13, 2020); *see also* Application at 5.

[201] 33 C.F.R. § 320.4(r); 40 C.F.R. § 230.10(d).

[202] U.S. Army Corps of Eng'rs, Guidelines for Preparation of Analysis of Section 404 Permit Applications Pursuant to the Section 404(b)(1) Guidelines of the Clean Water Act at 9, *available at* https://www.sas.usace.army.mil/Portals/61/docs/regulatory/IP_SAS_404_b_1_Guidelines.pdf.

[203] *Id.*

[204] *Compare* Application at 49, *with* July 2019 Application at 18.

[205] Envtl. Prot. Agency, Types of Mitigation Under CWA Section 404, https://www.epa.gov/cwa-404/types-mitigation-under-cwa-section-404-avoidance-minimization-and-compensatory-mitigation (last visited Apr. 10, 2020).

[206] *Id.*

reconstruct the mined wetlands."[207] But, as discussed in our September 12 comments and in Section VII(F)(1) below, Twin Pines still has not provided a reclamation plan or responded to criticism by multiple experts about their proposed reconstruction. Twin Pines says dragline mining in 100-foot-wide strips across the site would decrease the length of time of impacts in an area and allow for earlier reclamation. However, this approach myopically ignores secondary impacts to wetlands not directly being excavated, which could be dewatered during excavation of neighboring areas. Rather than allow the rapid recovery of a wetland area, that area will have a moving mine with a cone of depression up to 1,000 feet wide cutting through it every couple of weeks or months for years.[208]

F. The application's compensatory mitigation plan violates the 404(b)(1) Guidelines.

Twin Pines' mitigation plan fails to offset the impacts of the first phase of the mine. Twin Pines relies on the purchase of credits from mitigation banks to try to offset the impacts to almost 500 acres of wetlands in this first phase. However, as explained below, the plan is not "sufficient to replace lost aquatic resource functions" for purposes of the Clean Water Act, or NEPA.[209] Twin Pines remains silent about the noise, light, and air pollution impacts of its project, as well as the water quality implications of a 900-acre to 12,000-acre mine in the crook of the St. Marys River.

The Corps recognized in the virtual public meeting that Twin Pines "has submitted a very conceptual mitigation plan."[210] Indeed, Twin Pines' water impacts mitigation plan lacks any serious discussion of on-site mitigation or reclamation, relies on nonexistent credits in a different watershed, and ignores impacts to wetlands and streams beyond the border of its first phase (including reasonably foreseeable future impacts). And no amount of mitigation could compensate for damage to the singular Okefenokee Swamp. The Corps must require additional documentation, investigation, and mitigation from Twin Pines, or deny it a permit.

1. Twin Pines still lacks a reclamation plan.

In our comments on the original phase one application, we attached an expert report of wetland ecologist Dr. Richard Rheinhardt who described how Twin Pines' plan to create wetlands from scratch in an active mining area within ninety days of excavation had "trivialize[ed] the difficulty of creating wetlands under potentially inhospitable reclamation conditions."[211] We further directed Twin Pines' attention to the Corps' mitigation checklist of twenty-three elements required for a complete compensatory mitigation plan.[212] In the intervening six months, Twin Pines' on-site mitigation or reclamation plan has inexplicably

[207] Application at 48.

[208] *See* Application at 26 (about 80 days to cross the site), 27 (cone of depression), Fig. 64 (same), and Fig. 75 (wetlands do not line up horizontally with the mine).

[209] 33 CFR § 332.3(f)(1).

[210] Virtual Public Meeting Recording at 2:21:00.

[211] Rheinhardt Report at 5 (attached to Sept. 12 comments as Ex. F).

[212] Sept. 12 Comments at 34.

gotten even less detailed.[213] However, in the public meeting Twin Pines relied in part on the undeveloped reclamation plan for its claim that the project would result in no net loss of wetlands.[214]

If Twin Pines intends to rely on on-site mitigation, the approach it proposes would fail for two reasons. First, the 2008 Mitigation Rule, which controls compensatory mitigation, sets forth a clear hierarchy in which permittees must purchase mitigation banking credits if they are available. If they are not, the permittee must make payments to the state in-lieu fee program. Only if those two mechanisms are unavailable can a permittee undertake permittee responsible mitigation. [215] Since there appears to be no reason that both credits and in-lieu fee payments would be unavailable here, Twin Pines should not be able to diverge from the mitigation hierarchy.[216] Second, the 2008 Mitigation Rule also provides that the restoration of areas that were previously wetlands to the creation of wetlands where there are none. Restoration is favored because restored wetlands have a higher likelihood of success.[217] Twin Pines proposes wetland *creation*, the least preferred form of mitigation other than preservation.[218]

Public notice for Section 404 permits must include a discussion of mitigation plans, including any compensatory mitigation.[219] Public comment can then help inform the development of detailed planning documents.[220] Moving forward on the project as proposed, without public comment on an actual, enforceable plan from Twin Pines, would be unlawful.

2. There are not enough mitigation credits available to offset wetlands impacts.

Twin Pines' mitigation plan contains several convenient omissions. For one, it says mitigation would occur through the purchase of mitigation credits before each of the six years of

[213] Application at 53. Oddly, Twin Pines treats on-site impacts as lasting less than a year in its mitigation calculation spreadsheets in Appendix F, but as permanent (or greater than a year) in the application itself. Application at 52; *compare* July 2019 Application at Appendix C (claiming on-site impacts to excavated wetlands would last less than 90 days). We note that Twin Pines has failed to identify any other similar mine that has successfully re-created wetlands at this scale. Application at 49, 53. We further note with respect to on-site impacts that Twin Pines continues to argue its compensatory mitigation burden should be reduced because the site is degraded, but it does little to substantiate that claim.

[214] Virtual Public Meeting Recording at 1:25:00.

[215] 33 C.F.R. § 332.3

[216] *See* note 222, below.

[217] 33 C.F.R. § 332.3.

[218] *Id.*

[219] Compensatory Mitigation for Losses of Aquatic Resources under CWA Section 404 (Final Rule), 73 Fed. Reg.19,593, 19,611.

[220] *Id.*; *see also Ohio Valley Envtl. Coal. v. U.S. Army Corps of Engineers*, 674 F. Supp. 2d 783, 805 (S.D.W. Va. 2009) (granting § 404 permit without releasing substantive information on mitigation violated notice requirements under Clean Water Act).

mining proposed.[221] What it fails to mention is that there are currently only enough credits in the Primary Service Area (PSA) for the first two years of operations.[222]

	Twin Pines' Calculated Wetland Credits Required	Credits Currently Available[223] in "St. Marys Primary Service Area"
April 2020		**1,343.08**
Year One	553.36	789.72
Year Two	541.92	247.80
Year Three	396.32	(148.52)
Year Four	489.28	(637.80)
Year Five	405.44	(1,043.24)
Year Six	143.60	(1,186.84)
Secondary Impacts	*Unknown*	
Future Phases	*Unknown*	
Total	**At least 2,529.92**	

Figure 3: Available Wetland Mitigation Credits.

Further, of the three mitigation banks in the PSA,[224] just two have the potential to earn additional credits: Hog Creek and Musket Bay. The Corps should not rely on the theoretical future release of credits from both these banks, particularly Hog Creek—which has had credits revoked for failure to construct and monitor properly in the past and has yet to have a single year of monitoring meet either the original or modified hydrology performance standards. In fact, Hog Creek has failed to submit a single monitoring report since 2015.[225]

[221] Application at 52.

[222] In the public meeting Twin Pines mentioned that it "is currently planning" to mitigate with mitigation bank credits "or in-lieu fee programs." Virtual Public Meeting Recording at 1:25:38. The application only mentions banks. Application at 52. Twin Pines recently said it "has assessed current and future credit availability … [and] determined there are adequate available and future available wetland credits to fully compensate for the proposed impacts." TTL Response to SELC October 7, 2019 Questions, Question 16 (May 26, 2020). This "assessment" was not included in the Application and has not been made available for public review and comment.

[223] Assuming there are no other credit purchases in the area over the next six years, despite average sales of roughly 60 wetland credits a year from the three banks Twin Pines identified. *See* U.S. Army Corps of Eng'rs, Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS), Cyber Repositories and Ledgers for Hog Creek, Musket Bay, and Offerman Mitigation Banks, *available at* https://ribits.usace.army.mil/ (note Musket Bay sold 33.28 credits in February of 2020 alone).

[224] Twin Pines also mentions Satilla River Mitigation Bank, within the tertiary service area; however that bank only has 12.11 credits available, has not sold any credits since 2007, and has only received one release of riverine wetland credits, in 1996.

[225] *See* RIBITS, Cyber Repository and Ledger for Hog Creek Mitigation Bank.

Twin Pines also omits any consideration of secondary impacts to wetlands and streams beyond the borders of the mine's first phase. Even its own flawed hydrology modeling anticipates drawdown of and increases in the level of the surficial aquifer underlying wetlands and streams in the surrounding area.[226] Although Twin Pines would prefer the Corps put its head in the sand with regard to anything beyond the borders of the first phase, this draining of neighboring waters constitutes an adverse impact and must be quantified and mitigated.[227]

Similarly, the application contains no discussion of mitigation of future phases on Twin Pines' 12,000 acres or other foreseeable mining on Trail Ridge.

3. Twin Pines has not demonstrated the appropriateness of the credits that are available.

Twin Pines' application fails to demonstrate that the mitigation banks it has identified can compensate for the 478 acres of wetlands it will destroy in this first phase. Corps regulations describe a watershed approach for mitigation decision-making.[228] That is, the "compensatory mitigation should be located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services."[229]

The three wetland mitigation banks are 50 to 60 miles away from the mining site on a different river.[230] Musket Bay and Hog Creek are in the Satilla River HUC8 watershed and Offerman is in the Little Satilla HUC8. The Okefenokee Swamp is not in either watershed. Hog Creek and Musket Bay are in the Bacon Terraces ecoregion, although Offerman, like Twin Pines' site, is in the Sea Island Flatwoods.[231] Hog Creek contains largely riverine wetlands[232] and Musket Bay is on the other side of Waycross. And none of the banks are on Trail Ridge between the St. Marys and Satilla Rivers.

[226] *See* Application at Fig. 58.

[227] U.S. Army Corps of Eng'rs, Savannah District's 2018 Standard Operating Procedure for Compensatory Mitigation at 11 (April 27, 2018).

[228] 33 C.F.R. § 332.3.

[229] 33 C.F.R. § 332.3(b)(1).

[230] *See* Fig. 4, below; *see also* Section IX(C)(2).

[231] Georgia Department of Natural Resources, Wildlife Resources Division, State Wildlife Action Plan at 43 (Sept. 2015), https://georgiawildlife.com/WildlifeActionPlan.

[232] In Twin Pines' original application 85% of wetlands impacts were to depressional wetlands. July 2019 Application at 20.

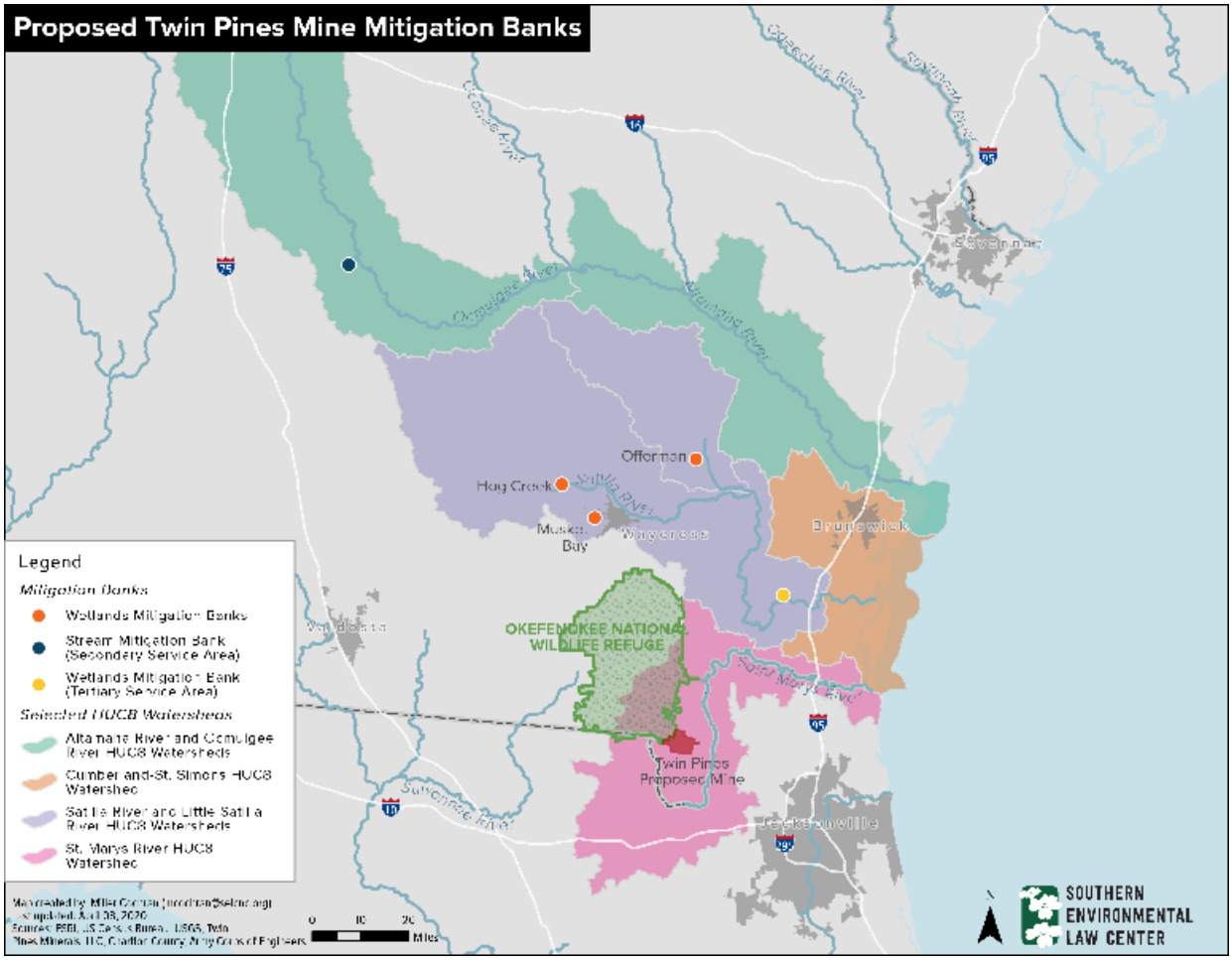

Figure 4: Proposed Twin Pines Mine Mitigation Banks

That is, the "Satilla River PSA" delineated in 2003 is not determinative here.[233] A project of this scale demands more information and analysis.[234] The Corps must address whether watershed specific wetland functions, such as flood control and water quality benefits, can be

[233] The Satilla River PSA included the St. Marys HUC8 for unclear reasons. Like this PSA, all three banks were founded prior to the 2008 Mitigation Rule. But even then, the Corps understood that mitigation projects were to be analyzed on a case by case basis. *See* U.S. Army Corps of Eng'rs, Savannah District, 2004 Standard Operating Procedure for Compensatory Mitigation at 6 (March 2004), *available at* https://www.sas.usace.army.mil/Portals/61/docs/regulatory/Mitigation_Comp_SOP.pdf ("A compensatory mitigation project generally should be located in the same [HUC8] as the impact site. The further removed geographically that the mitigation is, the greater is the need to demonstrate that the proposed mitigation will reasonably offset authorized impacts."); *see generally* U.S. Army Corps of Eng'rs, Savannah District, Regulatory Guidelines to Evaluate Proposed Mitigation Bank Credit Purchases in the State of Georgia (c. 2004).

[234] 33 C.F.R. § 332.3(c)(3)(iii).

adequately replaced by mitigation in an entirely different river system.[235] Other ecological suitability factors that must be addressed include hydrological conditions, soil characteristics, and habitat diversity and connectivity.[236] Similar considerations apply to the Patriots Pride Stream Mitigation Bank 120 miles and two major rivers away from Twin Pines' proposed mine. And the Corps "must require a mitigation ratio greater than one-to-one where necessary to account for [*inter alia*] differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project."[237]

VIII. The proposed project violates Clean Water Act Public Interest Guidelines.

In addition to the 404(b)(1) Guidelines, the Corps must comply with its own Public Interest Guidelines. While the 404(b)(1) Guidelines establish substantive criteria relating to a project's impact on aquatic resources, the Public Interest Guidelines obligate the Corps to evaluate whether the environmental and social costs of a project outweigh the economic benefit to the applicant.[238] As part of its analysis, the Corps may consider factors like "conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, … recreation, water supply and conservation, water quality, … and, in general, the needs and welfare of the people."[239]

The Conservation Groups' addressed the Public Interest Guidelines in their September 12 comments. As set forth in those comments, the proposed mine would (1) harm wetlands and the environment generally; (2) harm fish and wildlife; (3) harm a national landmark, a national wildlife refuge, and a wilderness area; (4) diminish the historic, cultural, scenic, and recreational values of the Swamp; (5) harm the local economy and (6) violate the Charlton County Comprehensive Plan. All of those concerns still apply.

In addition, since our previous comments, at least five neighboring communities have called for heightened review or opposed the mine, explaining why the health of the Okefenokee National Wildlife Refuge is critical to their communities and expressing concerns about downstream water contamination and the effects of groundwater withdrawals.[240]

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[235] 33 C.F.R. § 332.3(f)(2).

[236] 33 C.F.R. § 332.3(d).

[237] 33 C.F.R. § 332.3(f)(2).

[238] 33 C.F.R. § 320.4(a)(1); 33 C.F.R. § 320.4(b)(4) (Corps may not issue permit to alter "important" wetlands unless "the benefits of the proposed alteration outweigh the damage to the wetlands resource"); *see also Slagle v. U.S.*, 809 F. Supp. 704 (D. Minn. 1992) (Section 404 permit denied because it was not in the public interest).

[239] 33 C.F.R. § 320.4 (listing these values and others as proper considerations in assessing public interest).

[240] Letter from Sen. William Ligon to Col. Daniel Hibner, U.S. Army Corps of Eng'rs (Jan. 27, 2020); Letter from Camden County Joint Development Authority (Jan. 27, 2020); Letter from Dr. C. Grayson Day, Jr., Mayor, Kingsland, GA (Dec. 5. 2019); Letter from John F. Morrissey, Mayor, St. Marys, Georgia (Dec. 3, 2019); Letter from Steve Parrot, Mayor,

There have also been other developments that bear on the Corps' public interest review. For example, in its July 2019 application, Twin Pines represented that the proposed mine would create 150 to 200 jobs. In our September 2019 comments, the Conservation Groups raised concerns about the accuracy of these numbers and about how many of those jobs would actually be located in Charlton County or filled by residents of Charlton County. Twin Pines did not respond to these questions. But notably, in its March 2020 application, Twin Pines omitted its claims about how many jobs the mine would create. In addition, it appears that many of the jobs created by Twin Pines would likely be temporary. Indeed, in early February, before the COVID-19 pandemic, Twin Pines notified the Florida Department of Economic Development that it intends to lay off its entire staff of 40 workers at its Starke, Florida facility.[241]

By comparison, as described in our September 12 comments, the Okefenokee National Wildlife Refuge generates substantial employment and economic input in Charlton County and neighboring communities. Of the hundreds of national wildlife refuges throughout the nation, the Okefenokee ranked fourth in terms of economic output in a recent report.[242] According to the U.S. Fish and Wildlife Service, the Refuge had over 720,000 recreation visits in 2016, with approximately 65 percent of those visits coming from non-residents.[243]

Woodbine, Georgia (Dec. 3, 2019); Letter from John A. Miller, Mayor, Fernandina Beach, FL (Dec. 2, 2019) (collectively attached as Ex. 40).

[241] David Pendered, *Okefenokee mining applicant laid off entire staff of 40 at sand mine it's closing in Fl*, Saporta Report (March 22, 2020), https://saportareport.com/okefenokee-mining-applicant-laid-off-entire-staff-of-40-at-sand-mine-its-closing-in-fl/; *see also* Letter from Twin Pines Minerals, LLC to Florida Department of Economic Development (Feb. 6, 2020).

[242] *Id.* at 12.

[243] United States Fish & Wildlife Serv., Division of Economics, The Economic Contributions of Recreational Visitation at Okefenokee National Wildlife Refuge at 2–3 (May 2019), *available at* https://www.fws.gov/economics/divisionpublications/bankingonnature/bon2017/refuges/Okefenokee%20R%204.pdf (attached as Ex. 3).

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	35,554	82,958	118,512
Auto Tour	91,019	136,529	227,548
Boat Trail/Launch	4,367	13,102	17,469
Bicycle	782	261	1,043
Photography	3,627	10,881	14,508
Interpretation	37,534	87,578	125,112
Other Recreation	24,066	24,066	48,132
Visitor Center	49,922	116,485	166,407
Hunting: Big Game	155	-	155
Fishing:	4,623	-	4623
Total Visitation	**251,649**	**471,860**	**723,509**

Figure 5: 2016 Recreation Visits to the Okefenokee National Wildlife Refuge[244]

Spending from those visits supported economic activity in the four-county region surrounding the Refuge, including Charlton County. According to the U.S. Fish and Wildlife Service, recreational spending in the local communities was associated with approximately **753 jobs**, $17.2 million in annual employment income, $5.4 million in annual tax revenue, and $64.7 million in annual economic output.

Activity	Residents	Non-Residents	Total
Non-Consumptive	$4,702,100	$59,786,000	$64,488,100
Hunting	$4,600	$0	$4,600
Fishing	$210,600	$0	$210,600
Total Expenditures	**$4,917,200**	**$59,786,000**	**$64,703,200**

Figure 6: Visitor Recreation Expenditures Associated with the Okefenokee National Wildlife Refuge (2016)[245]

	Residents	Non-Residents	Total
Economic Output	$4,917,200	$59,786,000	$64,703,200
Jobs	57	697	753
Jobs Income	$1,307,000	$15,853,900	$17,160,900
State and Local Tax Revenue	$383,100	$5,065,700	$5,448,800

Figure 7: Local Economic Contributions Associated with Recreation Visit to the Okefenokee NWR (2016)[246]

[244] *Id.*
[245] *Id.*
[246] *Id.*

Further, as described in our September 12, the Okefenokee Swamp provides a number of valuable ecological goods and services to the local community, including:

> (1) maintenance and conservation of environmental resources, services and ecological processes; (2) protection of natural resources such as fish, wildlife, and plants; (3) protection of cultural and historical sites and objects; (4) provision of educational and research opportunities; and (5) outdoor and wildlife-related recreation.[247]

Since its original application, Twin Pines has repeatedly stressed the importance of its proposed titanium mine to the public, citing Presidential Executive Order 13817, A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals.[248] As an initial matter, and as explained in Section II above, it is unlikely that any of the titanium extracted at the proposed mine would become titanium metal for use in aircraft, spaceships, prosthetics, and military equipment,[249] as Twin Pines represented at the public meeting. Instead, it would almost certainly be used for titanium dioxide pigment, which is primarily used to color white paint and plastics.[250] In any event, the executive order does not obviate the requirements to conduct a detailed analysis of environmental impacts under NEPA and to balance the public interest factors under the CWA. Indeed, "th[e] order shall be implemented consistent with applicable law."[251] Moreover, the executive order does not speak to whether mining for minerals in the proposed location is necessary or appropriate. In this case, the general aims of the executive order to secure minerals are heavily outweighed by the rare, environmentally sensitive resources at stake – as recognized by the over 44,000 commenters in opposition to this application for the mine.

IX. The Army Corps must comply with the Endangered Species Act

The Corps must comply with the Endangered Species Act (ESA) when making its permitting decision for the proposed mine. This includes entering into formal consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service regarding the mine's effects on federally endangered and threatened species, ensuring the Corps' decision to permit the mine will not jeopardize the future existence of these species, and generally utilizing the Corps' authorities in furtherance of the ESA. Without proper consultation that results in a biological opinion with a valid incidental take statement, the Corps' authorization of and

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[247] *Id.* at 1.

[248] A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals, Exec. Order No. 13,817, 82 Fed. Reg. 60,835 (Dec. 26, 2017); see also A Final List of Critical Minerals 2018, 83 Fed. Reg. 23,295 (May 18, 2018).

[249] Email from U.S. Geological Survey to Anna Figueroa, Southern Environmental Law Center (Mar. 27, 2020) (on file with authors).

[250] U.S. Geological Survey, National Minerals Information Center, *Titanium Statistics and Information*, https://www.usgs.gov/centers/nmic/titanium-statistics-and-information (last visited Apr. 10, 2020).

[251] *Id.*

applicant's operation of Twin Pines will cause unlawful taking of federally protected species, in violation of Section 9 of the Act.

Congress enacted the ESA to provide a "means whereby the ecosystems upon which endangered species and threatened species depend may be conserved…[and to implement] a program for the conservation of such endangered species and threatened species."[252] At its core, the Act prohibits any person from taking any species listed as endangered, and empowers the Service to promulgate regulations prohibiting the taking of any species listed as threatened.[253] "Take" is defined broadly to include all manner of harm or harassment to protected species, including both direct injury or mortality and also acts and omissions which disrupt or impair significant behavioral patterns.[254] Similarly, federal agencies are required to "carry[] out programs for the conservation of endangered species and threatened species,"[255] and to "insure that any action authorized, funded, or carried out by such agency…is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of [the critical] habitat of such species."[256]

When an action authorized, funded, or carried out by a federal agency "may affect listed species or critical habitat," Section 7 of the ESA requires the agency to consult with the expert wildlife agency (the U.S. Fish and Wildlife Service for terrestrial species and manatees, and National Marine Fisheries Service for marine and some anadromous species) to ensure the action "is not likely to jeopardize the continued existence" of an endangered or threatened species or "result in the destruction or adverse modification" of a species' critical habitat.[257] The Service must evaluate the potential effects of the action, including cumulative effects, on listed and proposed species and critical habitat to ultimately determine whether the action will jeopardize the species or result in adverse impacts to critical habitat.[258] Thus, Section 7 consultation imposes two obligations on federal agencies: 1) a procedural requirement to consult with the Service and determine the effects of their actions on species and their habitat; and 2) a

[252] 16 U.S.C. § 1531(b).

[253] 16 U.S.C. §§ 1538(a)(1); 1533(d); 50 C.F.R. § 222.101.

[254] "Take" is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19); 50 C.F.R. § 222.102.

[255] 16 U.S.C. § 1536(a)(2).

[256] 16 U.S.C. § 1536(a)(2).

[257] 16 U.S.C. § 1536(a)(2).; 50 C.F.R. § 402.10.

[258] *See* 50 C.F.R. § 402.12(a) (requiring agencies to prepare a biological assessment to determine whether the action is likely to adversely affect a listed species or its habitat, thus requiring formal consultation or conference); *Id.* § 402.12(f)(4) (requiring federal agencies to include "[a]n analysis of the effects of the action on the species and habitat, including cumulative effects" in its biological assessment); *Id.* § 402(g)(3)–(4) (stating that the Services have the responsibility to "[e]valuate the effects of the action and cumulative effects on the listed species or critical habitat" and "[f]ormulate its biological opinion as to whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of the listed species or result in the destruction or adverse modification of critical habitat").

substantive requirement to ensure their actions do not jeopardize endangered or threatened species or their habitat.[259]

During consultation, the Service must consider the "effects of the action," which 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."[260] These effects "may occur later in time and may include consequences occurring outside the immediate area involved in the action."[261] To determine whether a consequence is caused by the proposed action, the Services apply "but for" causation and determine whether the consequence is "reasonably certain to occur."[262] The agency must also consider "cumulative effects," which are effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation."[263]

The Service must then summarize its findings in a biological opinion (BiOp) for the proposed action.[264] Specifically, the BiOp determines whether the proposed agency action will jeopardize the continued existence of any species or result in adverse modification of a species' critical habitat.[265] If the Service determines the agency action is likely to jeopardize the continued existence of a listed species or result in adverse modification, it "shall suggest those reasonable and prudent alternatives which [it] believes" would not result in jeopardy or adverse modification.[266] Additionally, if the Service determines the action will result in take of species, it must issue an "incidental take statement" that specifies and limits the amount of take that may result from the action.[267]

Pervading the Section 7 consultation process is the mandate that "each agency use the best scientific and commercial data available."[268] Importantly, each federal agency has an independent duty to "use the best scientific and commercial data available" to ensure any action it authorizes "is not likely to jeopardize the continued existence…or result in the destruction or adverse modification of [the critical] habitat" of any listed species.[269] Section 7(a)(1) of the ESA requires the Corps, in consultation with and with the assistance of the Service, to utilize its authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species.[270] Federal agencies have an independent and substantive obligation to insure that their actions are not likely to jeopardize the continued

[259] *Fla. Key Deer v. Paulison*, 522 F.3d 1133, 1138 (11th Cir. Fla. 2008).
[260] 40 C.F.R. §§ 402.14(g), 402.02.
[261] *Id.* § 402.2.
[262] *Id.*
[263] *Id.*
[264] 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.14(h).
[265] 50 C.F.R. § 402.14(h).
[266] 16 U.S.C. § 1536(a)(2), (b)(3)(A).
[267] *Id.* § 1536(i).
[268] *Id.* § 1536(a)(2).
[269] 16 U.S.C. § 1536(a)(2), (b)(3)(A).
[270] 16 U.S.C. § 1536(a)(1).

existence of endangered or threatened species or adversely modify critical habitat.[271] Indeed, a "no jeopardy" biological opinion from the Service does not absolve the action agency of its duty to insure that its actions comply with the ESA.[272]

A. Impacts to Individual Species

As an initial matter, the application does not consider the entire area to be impacted by the project, and thus fails to examine the full range of impacts and species that will be affected. The project's hydrological impacts, when coupled with the conversion of Trail Ridge habitat, will impact several species that are found within the larger Refuge ecosystem as well as downstream in the St. Marys and Suwannee Rivers.

The applicant wrongly concludes that, after conservation measures, the project will not have significant effect on threatened or endangered species. Rather, the applicant has failed to overcome evidence demonstrating that (1) the proposed mine is likely to impact several species; and (2) an insufficient amount of information exists to rule out the potential for negative impacts to several listed species and other species of concern.

1. Endangered Species

a. Atlantic and Shortnose Sturgeon

Both the shortnose and Atlantic sturgeon are present in the St. Marys River, the headwaters of which are formed by the Okefenokee Swamp. Sturgeon use freshwater rivers such as the St. Marys to spawn and as juvenile habitat.[273] Although Atlantic sturgeon travel to deeper marine waters for part of their lifetimes, shortnose sturgeon spend most of their time in their natal estuary. Both species are vulnerable to bycatch, poor water quality (which impairs spawning success), dredging, and water withdrawals, among other things. The shortnose sturgeon is listed as Endangered throughout its entire range and all five U.S. Atlantic sturgeon distinct population segments (DPS) are listed as Endangered or Threatened under the ESA. Though shortnose and Atlantic sturgeon have suffered vast historical losses, researchers recently rediscovered both within the St. Marys River.[274] While shortnose sturgeon trends are largely unknown, the St. Marys (Critical Habitat for the Atlantic sturgeon) supports a year-round population of Atlantic sturgeon and serves as seasonally important habitat for migrating

[271] 16 U.S.C. § 1536(a)(2); *See Pyramid Lake Paiute Tribe of Indians v. United States Dep't of the Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990).

[272] *Res. Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1994).

[273] NOAA Fisheries, Atlantic Sturgeon, https://www.fisheries.noaa.gov/species/atlantic-sturgeon; NOAA Fisheries, Shortnose Sturgeon, https://www.fisheries.noaa.gov/species/shortnose-sturgeon (last accessed Apr. 8, 2020).

[274] Fox, A.G., I.I. Wirgin, and D.L. Peterson. 2018. Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 10:606–618; Fritts, M.W. and D.L. Peterson. 2010. Status of Atlantic and shortnose sturgeon in the Satilla and St. Marys Rivers, GA. Conference Paper.

individuals.[275] From 2013 to 2016, a total of 25 individuals were captured (20 unique).[276] In 2014, the discovery of age-one river resident juveniles represented the "first documented evidence of successful Atlantic sturgeon reproduction within the St. Marys river."[277] However, in light of poor recruitment levels—the juveniles were likely produced from a single spawning event in 2013—the population remains "precariously close to extirpation."[278] The surviving sturgeon are thus acutely vulnerable to point and non-point source pollution; fluctuations in temperature; changes in dissolved oxygen levels; and increased sediment loads—all of which may result from the proposed mine.[279]

Given the scale of the proposed project, increased sediment discharges into the St. Marys River basin are inevitable and threaten to potentially degrade the spawning habitat that remains. Indeed, Atlantic sturgeon depend upon "well-oxygenated water, clean substrates for egg adhesion, crevices that serve as shelter for post-hatch larvae, and macroinvertebrates for food."[280] In addition to sediment loads, to the extent that the proposed mine discharges treated water into the St. Marys River, over the course of many years, this would change the composition of riparian communities, the pH levels to which sturgeon are accustomed, and the levels of dissolved oxygen.

The National Marine Fisheries Service has already made clear in a 2014 Biological Opinion that "the loss of a small number of [shortnose sturgeon] . . . can have an appreciable effect on the numbers, reproduction and distribution of the species . . . [especially when] there are very few individuals in a population, the individuals occur in a very limited geographic range, or the species has extremely low levels of genetic diversity."[281] The Atlantic and shortnose sturgeon of the St. Marys River likely satisfy these criteria. With potentially as few as three dozen remaining Atlantic sturgeon (and maybe even fewer shortnose individuals), the loss of even a single individual may cause the collapse of the river's population; diminish the genetic diversity of the South Atlantic DPS; and hasten the regional population's continued decline.

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[275] Fox, Adam & Wirgin, Isaac & Peterson, Douglas. 2018. Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia. Marine and Coastal Fisheries. 10. 606-618.

[276] *Id.* at 610.

[277] *Id.* at 613–14.

[278] *Id.* at 615.

[279] Atlantic States Marine Fisheries Commission, Atlantic Sturgeon Habitat Fact Sheet, http://asmfc.org/uploads/file/sturgeonHabitatFactsheet.pdf; NOAA Fisheries Recovery Outline, Atlantic Sturgeon; Atlantic Sturgeon Status Review Team. 2007. Status Review of the Atlantic Sturgeon; Atlantic States Marine Fisheries Commission. 2017. Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report; Atlantic States Marine Fisheries Commission. 2012. Habitat Addendum IV, III, II to Amendment 1 to the Interstate Fishery Management Plan for Atlantic Sturgeon.

[280] Atlantic Sturgeon, Life History and Habitat Needs, Atlantic States Marine Fisheries Commission.

[281] NOAA's National Marine Fisheries Service, Northeast Regional Office. Endangered Species Act Section 7 Consultation Biological Opinion, Tappan Zee Bridge Replacement (Apr. 2, 2014).

The Corps must engage NMFS in Section 7 consultation on the endangered shortnose sturgeon and the Atlantic sturgeon, whose South Atlantic DPS is endangered. The low threshold of "may affect" is easily met here, and furthermore, with so few remaining members of the species the loss of only a few members could have an appreciable effect on the overall population.

The applicant has not provided sufficient information to determine if and to what extent the shortnose and Atlantic sturgeon would be impacted by any such changes in their environment due to the proposed project.

b. Red-cockaded Woodpecker

The red-cockaded woodpecker (RCW) is among the coastal plain's most charismatic, visible and imperiled species. It makes its home in mature pine forests, generally more than 80 years old, where it plays a vital role in the intricate web of life by providing shelter in the nesting cavities it excavates in living pine trees.[282] The red-cockaded woodpecker is the only woodpecker that excavates cavities exclusively in living pine trees.[283] At least 27 species of vertebrates have been documented using their cavities, either for roosting or nesting.[284]

Though RCWs were once found throughout the greater Southeast, from New Jersey to Florida and west to Texas, historical logging operations resulted in the loss of nearly 90 million acres of longleaf pine.[285] Because the species uniquely depends upon mature pine forest—trees that are at least 60–80 years old—as few as 7,800 active clusters exist today across the species' range, down from a historical, pre-European settlement estimate of 1–1.6 million family groups.[286] The species remains listed as Endangered under the ESA.

The larger 12,000-acre project is adjacent to the Refuge, where several active RCW clusters are known to reside. Currently, the Refuge is home to 97 clusters, 46 of which are active.[287] These "are most likely the remains of a much larger population that once depended on the pine stands surrounding the refuge," such as that within the proposed project site.[288]

Based on recent surveys, there are at least 15 active clusters near the southeastern-eastern refuge boundary.[289] Some RCWs may use the project site for foraging, and the full project could eliminate what habitat remains for dispersing individuals. For the Okefenokee clusters, this is of

[282] U.S. Fish and Wildlife Service, Red-cockaded woodpecker, https://www.fws.gov/rcwrecovery/rcw.html (last visited Apr. 8, 2020).
[283] *Id.*
[284] *Id.*
[285] *Id.*
[286] U.S. Fish and Wildlife Service. 2018. Draft Species Status Assessment Report for the Red-Cockaded Woodpecker (Picoides borealis). Version 1.1, at 1, 5.
[287] U.S. Fish & Wildlife Serv., Okefenokee National Wildlife Refuge-Red-Cockaded Woodpeckers Report.
[288] *Id.* at 1.
[289] *Id.*

concern, since the population is already small, isolated and suffering from a lack of connectivity—three factors that are known to heighten the risk of extinction for the red-cockaded woodpecker.[290]

In addition to obvious habitat fragmentation concerns, the disturbances caused by light, noise and air pollution may further affect the Okefenokee population. The proposed mine will require the installation and operation of heavy machinery, the erection of semi-permanent facilities, road construction, and likely night-time lighting near the Refuge. These activities may affect the nesting and foraging patterns of those found along the Trail Ridge boundary.

The applicant fails to demonstrate that there would be no jeopardy to the red-cockaded woodpecker, given that it would only worsen habitat fragmentation, eliminate foraging habitat, and cause disturbances such as light, noise, and smoke pollution. The Corps and Service must analyze how these activities and consequences from the mine will affect the red-cockaded woodpecker.

Additionally, it appears that RCW surveying was conducted across an artificially small area. If suitable foraging habitat is indeed present within a project area, as agency communications suggest, US Fish and Wildlife Service survey protocols require surveyors to determine where such foraging habitat may lie and whether it will be impacted by proposed activities.[291] Twin Pines correctly noted that "pine trees must be of sufficient size and spatial distribution to be inhabited by red-cockaded woodpeckers."[292] It's unclear, however, whether those trees are absent from just the proposed permit area or the larger 12,000-acre tract. If the project area contains any suitable foraging habitat that will be impacted by the project, that habitat, if it contains any 60-year-old trees or older, *and all other suitable nesting habitat within 0.8 km* (0.5 mi) of the project site, regardless of ownership, must be surveyed for the presence of red-cockaded woodpeckers.[293]

c. Hairy Rattleweed

Found within a 125-square-mile area in South Georgia, the hairy rattleweed is a perennial legume that is entirely covered in hairs. The species is primarily restricted to open, sandy areas and prefers higher and drier sites. The hairy rattleweed is found within the Refuge and is considered Endangered throughout its entire range. The rattleweed is negatively impacted by clear cutting, soil compaction resulting from heavy machinery, and inconsistent fire regimes. Should the hydrological regime change within the Refuge, however, fire intensity and frequency could increase, potentially exposing the species to unnatural burns. Florida hartwrightia (ESA

[290] Schiegg K, Daniels SJ, Walters JR, Priddy JA, Pasinelli G. 2006. Inbreeding in red-cockaded woodpeckers: Effects of natal dispersal distance and territory location. Biological Conservation 131:544–552.

[291] U.S. Fish & Wildlife Service. Guidelines for Surveys to Assess Potential Project Impacts to Red-cockaded Woodpecker Nesting and/or Foraging Habitat.

[292] Application at 57.

[293] U.S. Fish & Wildlife Service. Guidelines for Surveys to Assess Potential Project Impacts to Red-cockaded Woodpecker Nesting and/or Foraging Habitat at 289.

candidate); floodplain tickseed (ESA candidate); purple honeycomb-head (ESA candidate); and white fringeless orchid (ESA Threatened) are also sensitive to soil disturbances and could be similarly affected by mining operations and an altered hydrological cycle.

The Corps and Service must analyze the proposed mine's impacts to the hairy rattleweed, including how it may be affected by a change in hydrology and increased wildfires. The application currently lacks sufficient evidence to demonstrate that the project will not jeopardize the hairy rattleweed.

d. Florida Panther

As one of the two apex predators that historically roamed the Southeast, the Florida panther was heavily persecuted for centuries. By the time the ESA became law, the species had been lost throughout virtually its entire range and only a handful of individuals clung to existence in South Florida. Thanks to tireless conservation efforts, those individuals were saved, and the population has since grown to an estimated 120–230 adults and subadults. In a major conservation milestone, females with kittens were also recently documented north of the Caloosahatchee River,[294] which has long been a major barrier to panther dispersal and range expansion.

Panthers have faced an uphill battle after their numbers declined to as few as 20-30 individuals.[295] Despite the relative success of a genetic restoration project, only "a single wild population in south Florida" exists and it is "all that remains of [the] species."[296] Development in south Florida has significantly increased in the area of suitable panther habitat and has led to increased panther mortalities from vehicle collisions, inbreeding, increased competition for food, and territorial disputes.[297] For example, it is estimated that male panthers travel and patrol a territory of several hundred square miles.[298] The panther's large territory-needs and limited habitat has led to intraspecific aggression, which was responsible for approximately 42% of

[294] Chad Gillis, Rare Sight: Female Florida Panther, kitten caught on camera north of Caloosahatchee, USA Today, https://www.usatoday.com/story/tech/science/environment/2020/02/13/female-florida-panther-and-kitten-were-documented-north-of-the-caloosahatchee-river-again/4748808002/ (Feb. 13, 2020).

[295] *Florida Panther: National Wildlife Refuge, Florida*, U.S. FISH & WILDLIFE SERV., http://www.fws.gov/refuge/florida_panther/wah/panther.html.

[296] *Id*.

[297] Staletovich, Jenny, *Panther deaths in Florida hit record high in 2014*, MIAMI HERALD (DEC. 23, 2014). In 2014, thirty panthers were killed, and the majority of these deaths resulted from vehicle collisions. *Id*.

[298] Tingley, Kim. 2015. *Plight of the Panther: What happens when preserving a species makes it unpopular?* ON EARTH, http://www.onearth.org/earthwire/florida-panther-conservation-controversy.

panther mortalities between 1990 and 2004.[299] Consequently, the species is still threatened by habitat loss and fragmentation, roadway mortality, and long-term challenges posed by a lack of genetic diversity and human acceptance.

In view of these continuing threats, any permitting must be consistent with the panther's recovery plan to ensure that the action undertaken does not undermine the species' chances of recovery. The recovery plan sets forth a goal to "maintain, restore, and expand the panther population and its habitat in south Florida and expand the breeding . . . population in south Florida."[300] Because natural recolonization may prove unattainable, researchers have examined several potential reintroduction sites, and concluded that, of the nine areas that were identified, Okefenokee National Wildlife Refuge, Ozark National Forest, and Felsenthal National Wildlife Refuge regions had the highest combination of effective habitat area and expert opinion scores.[301] The Florida Game and Freshwater Fish Commission (now Florida Fish and Wildlife Conservation Commission) conducted a Florida Panther Reintroduction Feasibility Study and concluded that reintroduction of the Florida panther within the greater Okefenokee ecosystem is biologically feasible.[302]

For this reason, while the area around the mine does not currently support a Florida panther population, it could serve as important dispersal habitat for the species. If mining were to commence along the Refuge boundary, Trail Ridge's upland habitat—the preferred hunting grounds for Florida panther—would be diminished and with it, the effective habitat area and the overall ability of the larger ecosystem to support a viable population.

The Corps and Service must comprehensively review the mine's impacts on the Florida panther, considering: 1) the fact that there is currently not enough habitat available to support the existing panther population; and 2) the impact of other projects in the panther's range. So far, the applicant has failed to provide sufficient information to fully analyze the mine's impacts to the species in this context. Consequently, there is no basis to conclude the mine would not result in jeopardy to the endangered Florida panther, given that the species suffers low population numbers due to habitat loss and fragmentation and Okefenokee National Wildlife Refuge is one of only a handful of places where the species could be reestablished.

[299] The Florida Panther Recovery Team & South Florida Ecological Services Office, U.S. Fish & Wildlife Serv., *Panther recovery plan* (Puma concolor coryi), U.S. FISH & WILDLIFE SERV., at 17 [Panther Recovery Plan]; Tingley 2015 at 26.

[300] *Id.* at (IV)(1), 101.

[301] Thatcher, Cindy & Manen, Frank & Clark, Joseph. 2009. A Habitat Assessment for Florida Panther Population Expansion into Central Florida. Journal of Mammalogy.

[302] Belden, R. C. and J.W. McCown. 1996. Florida panther reintroduction feasibility study. Game and Fresh Water Fish Comrn., Bur. Wildl. Res. Final Rep. 70pp.

2. Threatened Species

a. Eastern Indigo Snake

The Service listed the eastern indigo snake as threatened under the ESA in 1978.[303] Reaching lengths of over eight feet, the eastern indigo is North America's longest snake, with males weighing up to ten pounds. The species is generally colored an iridescent bluish-black, with a reddish chin.

Historically, the species was found throughout Florida, Alabama, Mississippi, and portions of Florida; however, the species is now only found within Georgia and Florida.[304] Eastern indigo snakes are more often "found in pinelands, tropical hardwood hammocks, and mangrove forests," as they are more inclined to upland habitats and ecosystems.[305] The most frequent types of habitat where the indigo is found includes "pine flatwoods, scrubby flatwoods, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitat"; however, the species needs a variety of these habitats to complete its life cycle.[306] The eastern indigo snake shares a special relationship with the gopher tortoise, which is critical in northern portions of the snake's range because it will take refuge in the tortoise's burrows to weather the cold.[307] This relationship is somewhat less critical in the milder south Florida climate where indigo snakes have been documented using manmade refugia and disturbed habitats.[308] The snakes are still known to use the underground burrows of these tortoises and other species in the region of the project.[309] Thus, the survival of the indigo snake is essentially tied to the health and survival of the gopher tortoise.

The eastern indigo snake was initially listed as threatened as the result of several activities including, habitat destruction and fragmentation, "over-collecting for the pet trade, and mortality from gassing gopher tortoise burrows to collect rattlesnakes."[310] Presently, the species is vulnerable to habitat destruction and fragmentation associated with "residential and commercial construction, agriculture, and timbering."[311] Development will continue to impact the eastern indigo snake because it permits increasing human populations in indigo snake habitat, which leads to an increased risk of snake mortality resulting from vehicular collisions and contact with property owners and domestic animals.[312] The indigo snake is also subject to harm

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[303] U.S. Fish & Wildlife Service, *Multiple Species Recovery Plan for South Florida: Eastern Indigo Snake*, Drymarchon corasi couperi, U.S. DEPARTMENT OF INTERIOR, 4-567, http://www.fws.gov/verobeach/msrppdfs/easternindigosnake.pdf [*Eastern Indigo Snake*].

[304] *Id*. at 4-568.

[305] *Id*.

[306] *Id*. at 4-568–4-569.

[307] *Everglades Eastern Indigo Snake*.

[308] *Id*.

[309] *Id*. The use of gopher tortoise and other species' burrows by indigos is often considered taking "refuge." *Eastern Indigo Snake* at 4-572.

[310] *Eastern Indigo Snake* at 4-572.

[311] *Id*.

[312] *Id*.

from the bioaccumulation of pesticides in its prey, which results from the use of pesticides in agricultural and silvicultural activities, and from contact with rodenticide used to control rat populations within its range.[313]

Since the eastern indigo snake's listing in 1978, extant populations have grown increasingly disjunct, particularly those in the Florida panhandle, where gopher tortoise losses have accelerated.[314] The overall resiliency of the eastern indigo population is predicted to be low to very low in the future without targeted conservation efforts.[315]

Though the eastern indigo utilizes a variety of habitats, including longleaf pine sandhills, flatwoods, and coastal dunes, the species requires hundreds to thousands of acres for home range territories, and moves over longer distances than any other North American snake. An adult male eastern indigo may encompass as much as 553 acres, while a female may encompass as much as 106 acres.[316] This large range makes the snake particularly vulnerable to habitat fragmentation and loss.

Breininger et al. (2012) have concluded that habitat fragmentation is likely a critical factor for the eastern indigo snake's persistence and that eastern indigo snakes are vulnerable to extinction in conservation areas bordered by roads and developed areas. Though the snake's chances of survival can be quite high in conservation core areas, its survival rates significantly decline in conservation areas along highways and in suburbs.[317] More than half of known snake mortalities documented in the study were caused by humans, directly or indirectly, along roads.[318] Additionally, the Service should consider whether "corridors" between protected areas are wide enough to provide adequate protection for eastern indigo snakes.[319]

When assessing the project's impacts on eastern indigo snake habitat, the Service should not only consider broad habitat types used by the eastern indigo snake (e.g., upland habitat) but also availability of essential microhabitat required by the species. For example, Hyslop et al. (2009) found that "[r]eduction in suitable underground shelters caused by habitat degradation and loss, which reduces or eliminates populations of [gopher tortoise], is likely an important factor in extirpation of the species from areas *otherwise perceived as suitable habitat*."[320]

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[313] *Id.*

[314] Enge, K.M., D. J. Stevenson, M.J. Elliott, and J.M. Bauder. 2013. The historical and current distribution of the eastern indigo snake (Drymarchon couperi). Herpetological Conservation and Biology 8:288−307.

[315] U.S. Fish & Wildlife Serv. 2018. Species status assessment report for the eastern indigo snake (*Drymarchon couperi*). Version 1.0. Atlanta, GA, 6.

[316] U.S. Fish & Wildlife Serv. 1999. South Florida Multi-Species Recovery Plan, Eastern Indigo Snake [*Eastern Indigo Snake*].

[317] *Id.*

[318] *Id.*

[319] *See Id.*

[320] Hyslop, N.L., R.J. Cooper & J.M. Meyers. 2009. Seasonal Shifts in Shelter and Microhabitat Use of *Drymarchon couperi* (Eastern Indigo Snake) in Georgia. Copeia 3:458–464.

Though much of Trail Ridge along the Okefenokee is subject to timber operations, the land offers indigo snakes a matrix of habitat types, including upland and lowland features, and is considered part of the species' recovery unit and a Conservation Focus Area (CFA). In recent years, mining for limestone, phosphate and titanium has increased in Georgia and Florida. Because these mines disproportionately occur in wildlife-rich areas, their effects on indigo snakes have been documented, and the Service has already noted that habitat modification, mining debris and equipment, and the discharge of hazardous materials "adversely impact" indigo snakes.[321]

In this case, mining operations will likely result in both direct mortality and the fragmentation of existing populations: the proposed mine may operate all day and night for upwards of thirty years; require increased vehicular access, which, even in the absence of habitat alterations, can cause indigo populations to crash by 95 percent;[322] result in the loss of the vegetation and cover that indigo snakes depend upon; and ultimately impair north-south movement between Trail Ridge populations separated by the mine's 12,000-acre footprint.

The Service reaffirmed the likelihood of these impacts by noting that, without "meaningful avoidance and minimization measures … the proposed Project may result in loss of habitat, individuals, and natural corridors that are utilized by this species."[323]

The Service's recovery plan for the eastern indigo snake highlights monitoring as an essential tool for attaining the snake's recovery.[324] The *entirety of the project area* should therefore be carefully surveyed to determine the relevant locations and habitat use of eastern indigo snakes. The Corps should also impose a monitoring plan for the life of the permit, which would allow the Service to identify severe population declines and take action.

Additional consideration should also be given to how the Project stands to impact the Okefenokee and CFA. As best we can tell, Twin Pines has not considered this question or examined how the permanent loss of habitat will affect the CFA's continued viability as a recovery unit for the indigo snake. Indeed, though the CFA consists of over 350,000-acres and is one of the largest core blocks outlined by the Service, indigo snakes do not occupy the islands within the refuge or lands north and west of the swamp, making the Trail Ridge and its associated private lands of importance to the CFA as a whole.

There is a reasonable likelihood the proposed mine project would result in jeopardy for the eastern indigo snake. This species requires thousands of connected acres for home range territories and it has grown increasingly vulnerable due to habitat fragmentation. This heavy mineral sands mining would continue to compound this problem by creating habitat loss and disrupting natural corridors used by the species. Furthermore, as the Service has noted, mining

[321] *Id.* at 41.
[322] Godley, J.S. and P.E. Moler. 2013. Population declines of eastern indigo snakes (Drymarchon couperi) over three decades in the Gulf Hammock Wildlife Management Area, Florida, USA. Herpetological Conservation and Biology 8:359-365.
[323] USFWS Letter 4.
[324] *Eastern Indigo Snake* at 4-579, 4-581.

debris and equipment, along with the discharge of hazardous materials, adversely impact this species. Despite these concerns, the applicant has not proposed any meaningful avoidance and minimization measures for impacts to this species.

b. Frosted flatwoods salamander

The Service listed the frosted flatwoods salamander as threatened in 1999.[325] The main threat to the species is loss of both its longleaf and slash pine flatwoods terrestrial habitat and its seasonally inundated breeding habitat, with fire suppression considered to be the primary reason for the degradation of remaining habitat.[326] Additionally, habitat fragmentation from development and roads threatens the species survival, making recolonization of suitable habitat critical to the species' recovery.[327]

The frosted flatwoods salamander depends upon small, isolated and ephemeral ponds in pine forests to complete its complex breeding and life cycle.[328]

In September 2019, the Service published a five-year review concluding that the salamander's trend is overall decreasing, with declines in number of individuals per population and the number of populations throughout the historic range.[329] Out of the original 25 populations the Service initially described, only nine are known to still exist—five in Apalachicola National Forest, two in St. Marks National Wildlife Refuge, one in Fort Stewart in Georgia, and one possible population in Francis Marion National Forest in South Carolina, which hasn't been detected since 2010.[330]

In 2018, Hurricane Michael made landfall in the Florida panhandle.[331] Storm surge pushed seawater into some of the ephemeral freshwater ponds the salamander uses for breeding, resulting in salt concentrations ranging from 11 to over 200 times the normal salt concentration.[332] Salamander populations at St. Marks National Wildlife Refuge took the most immediate damage, with individual salamanders appearing underweight and a near-complete 2019 breeding season failure.[333] While Apalachicola National Forest received less severe

[325] 64 Fed. Reg. 15,691 (Apr. 1, 1999). The Service initially listed the flatwoods salamander as threatened but later determined it was two separate species—the frosted flatwoods salamander (*Ambystoma cingulatum*) and the reticulated flatwoods salamander (*Ambystoma bishopii)*—and uplisted the reticulated flatwoods salamander to endangered status. *See* 74 Fed. Reg. 6,700 (Feb. 10, 2009).

[326] U.S. Fish & Wildlife Service, Frosted flatwoods salamander (*Ambystoma cingulatum*) 5-Year Review: Summary and Evaluation, https://ecos.fws.gov/docs/five_year_review/doc6176.pdf (Sep. 13, 2019).

[327] *Id.*

[328] *Id.*

[329] *Id.*

[330] *Id.*

[331] *Id.*

[332] *Id.*

[333] *Id.*

hurricane impacts, the area is still being investigated.[334] This storm event highlights the importance of available inland habitat for the frosted flatwoods salamander.

Based on continuing habitat destruction and degradation, and steady frosted flatwoods salamander population declines, in 2019 the Service recommended uplisting the species to endangered, rather than threatened.[335]

The applicant's surveys fail to acknowledge that Trail Ridge historically supported the species. Even if there are no salamanders on site, the degradation of wetlands could permanently preclude its potential relocation or recolonization. It could also result in the loss of breeding habitat for other extant amphibian populations that require similar habitat conditions.

c. Wood stork

The Service listed the wood stork as an endangered species in 1984, and it is the only species of stork "regularly occurring in the United States."[336] In 2014, the Service upgraded the status of the species to "threatened," largely due to successful recovery efforts in Georgia.[337] Although wood storks have seen some improvements in their numbers overall, the species is still in decline, as evidenced by its numbers in Corkscrew Swamp, which until recently was considered "the most productive colony in the nation."[338] Wood storks are found primarily in Florida, Georgia, and parts of South Carolina; however, there have been occasional sightings in North Carolina and as far west as Mississippi.[339] It is suspected that the species migrates and spends its winters in south Florida, as there is an influx of storks during winter months.[340] Historically, the central and northern Everglades are among the areas where this population surge is most evident. Some years, the Everglades system has been documented to support approximately 55% of the entire U.S. population of the species.[341] Unfortunately, south Florida colonies have been plagued with multi-year nest failures in recent years.

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[334] *Id.*

[335] *Id.*

[336] U.S. Fish & Wildlife Service, *Wood Stork Recovery Plan: Revised Recovery Plan for the U.S. Breeding Population of the Wood Stork,* http://ecos.fws.gov/docs/recovery_plan/970127.pdf, at 1 (Jan. 27, 1997) [hereinafter *Wood Stork Recovery Plan*].

[337] *Endangered and Threatened Wildlife and Plants; Reclassification of the U.S. Breeding Population of the Wood Stork From Endangered to Threatened*, 79 Fed. Reg. 37078 (June 30, 2014).

[338] National Audubon Society, Inc., *Audubon: Corkscrew Swamp Sanctuary, Wood Storks* (*Mycteria americana*) [*Audubon: Corkscrew Swamp*]. In the first decade of monitoring at Corkscrew Swamp, from 1958–1967, there was an average of 5,450 wood stork chicks a year, compared to the years 2003–2012, which experienced an average of 540 chicks. *Id*.

[339] *Wood Stork Recovery Plan* at 2.

[340] *Id*.

[341] *Id*.

In Southwest Florida, Lauritsen (2010) examined the importance of seasonal, short-hydroperiod wetlands to foraging federally threatened wood storks, which supply most of the food energy for initiating reproduction and suggested that the loss of these wetlands are not being appropriately mitigated for under State wetlands permitting law. The impacts of the loss of these wetlands may result in no nesting or abandonment of nesting attempts by wood storks at sites such as Corkscrew Swamp Sanctuary.

Both freshwater and estuarine wetland ecosystems may serve as suitable wood stork habitat.[342] Storks tend to nest in a variety of different trees depending on what is available within the habitat, including: cypress, black gum, southern willow, red mangroves, prickly pear cactus, Brazilian pepper, and Australian pine.[343] Wood storks require nesting sites located in standing water throughout the nesting season to protect the nest from predators.[344]

For foraging, it is critical that the storks have access to shallow, open water.[345] The species forages using tactilocation, a process where it wades through the water with its beak submerged and clamps down on prey, usually small fish, when they come in contact with its beak.[346] Storks require shallow waters to wade in and fairly dense stocks of fish to support a colony's feeding habits.[347] Storks' needs are somewhat less specific when it comes to roosting trees; although they look for similar sites as those used for nesting, they will roost in a greater variety of trees depending on the availability of food.[348]

The greatest threats to the wood stork's existence are the loss of adequate habitat for feeding, changes in water levels and hydrology (habitat modification), lack of nesting habitat, "human disturbance," and loss resulting from the adverse effects of pesticide and chemical contamination.[349] As wetlands are drained and filled—primarily for development and agriculture—the stork's habitat is irreversibly destroyed. Because of the stork's specific foraging and nesting needs, changes in hydrology resulting from developmental impacts, both direct and indirect, can have a major effect on the species' ability to survive in a given area.

Because the Okefenokee remains functionally whole and largely intact, wood storks utilize the Refuge for foraging and nesting purposes. In fact, one of the original purposes of designating Okefenokee as a National Wildlife Refuge was to provide "a refuge and breeding ground for migratory birds."[350] Unfortunately, the proposed mine potentially stands to alter the hydrological regime upon which the species relies. The Service "expect[s] impacts to ground water characteristics including water table elevation, and rate and direction of flow as the soil

[342] *Id*. at 3.
[343] *Id*.
[344] *Id*.
[345] *Id*. at 4.
[346] *Id*.
[347] *Id*.
[348] *Id*.
[349] *Id*. at 10–12.
[350] U.S. Fish & Wildlife Serv., Okefenokee National Wildlife Refuge Comprehensive Conservation Plan at 6, App. I (2006) ("Okefenokee Refuge CCP").

profile is permanently homogenized" within the Refuge.[351] Should these impacts be realized, they "may not be able to be reversed," and could potentially have a major impact upon the ability of wood storks to locate prey.[352] It is well established that "storks are especially sensitive to any manipulation of a wetland site that results in either reduced amounts or changes in the timing of food availability."[353] A drop in the water table, furthermore, would not only affect prey availability, but it could prove fatal to breeding storks, which avoid predation by creating nests in flooded environments.[354]

The Service has also noted that, in addition to drainage and wetland alteration issues, one of the greatest threats facing the wood stork are the behavioral changes caused by human disturbance.[355] The effects of 30 years of lighting, noise disturbances and human encroachment near the Refuge boundary may well affect the foraging and nesting habits of wood storks within the Okefenokee. Mine-related runoff, sedimentation, and potential chemical accidents may also cause a decline in the number and availability of native fishes (stork prey) and have a deleterious impact upon the aquatic vegetation upon which those fishes depend.

When assessing the impacts of the proposed mine on the wood stork, the Corps and Service will need to take all of the aforementioned factors into account. The agencies should calculate the loss of wetlands and other surface waters (jurisdictional and non-jurisdictional) that will result from the project and the effect that will have on the wood stork. Changes in the hydrological regime and mine-related runoff could have a major impact upon the ability of wood storks to locate prey. Changes in the hydrological regime could also prove fatal to breeding storks. Moreover, impacts such as indefinite lighting, noise disturbances, and human encroachment near the refuge boundary are likely to affect the foraging and nesting habits of the species. Thus, it is impossible to make a no jeopardy determination regarding impacts on the wood stork unless further studies are conducted.

d. Gulf sturgeon

Historically, the Gulf sturgeon subspecies occurred in most major Gulf rivers, from the Mississippi to Tampa Bay, Florida. Listed as Threatened under the ESA, major threats to the Gulf sturgeon include dams, loss of habitat, poor water quality and industrial runoff.

A significant number of Gulf sturgeon occur in the Suwannee river (182 river miles of Critical Habitat), the headwaters of which are formed by the Okefenokee Swamp. The Suwannee supports the most viable population of Gulf sturgeon remaining, with potentially upwards of

[351] USFWS Letter at 3.
[352] *Id.* at 2.
[353] Ogden J. Habitat Management Guidelines for the Wood Stork in the Southeast Region. Everglades National Park, 4.
[354] *Id.* at 5
[355] *Id.*

10,000 individuals. Gulf sturgeon are known to utilize much of the Suwannee River for spawning and nursery purposes and have been documented as far as 137 river miles upstream.[356]

Like its counterparts, the Gulf sturgeon is sensitive to changes in water quality, dissolved oxygen levels, and temperature fluctuations.

The Suwannee River basin is pocketed by nearly 200 springs, all of which are fed by the Floridan aquifer. These springs partially influence water flow and temperature within the river and offer the Gulf sturgeon important cool water habitat. Unfortunately, decreased groundwater levels, caused by pumping, can reduce the spring flow that Gulf sturgeon rely upon in the summer months.[357]

The applicant intends to withdraw significant volumes of water from the Floridan aquifer for years.[358] Though pumping will occur closer to the St. Marys River than the Suwannee, the potential impacts of Twin Pines' water withdrawals on the Gulf sturgeon have not been examined. It is also unclear how an altered hydrological regime within the Refuge would affect spawning Gulf sturgeon.

The Corps must engage the National Marine Fisheries Service in Section 7 consultation on the threatened Gulf sturgeon, which may be affected because it utilizes the Suwannee River for spawning and nursery purposes. This river's headwaters are formed by the Okefenokee Swamp. Insufficient data currently exists to make a no jeopardy determination for the species because the application fails to include meaningful information about hydrologic impacts that could be used to analyze the potential impacts of water withdrawals on the species and how an altered hydrological regime would affect spawning Gulf sturgeon.

3. Candidate Species and Other Key Species

a. Gopher Tortoise

The gopher tortoise is a federal candidate species under the ESA and a highly valuable "keystone species" that benefits and ensures the survival of other species in its ecosystem.[359] This tortoise is known to benefit over 300 different species, including eastern indigo snakes, foxes, skunks, and lizards, which use gopher tortoise burrows for shelter and for various parts of

[356] U.S. Fish & Wildlife Serv. and Gulf States Marine Fisheries Commission. 1995. Gulf Sturgeon Recovery Plan. Atlanta, Georgia. 170, 14.

[357] *Id.* at 27.

[358] *See* Hutson Report at 3.

[359] U.S. Fish & Wildlife Service, *Range-Wide Conservation Strategy for the Gopher Tortoise*, U.S. DEPT. OF INTERIOR, 4, https://www.fws.gov/southeast/pdf/strategy/gopher-tortoise-conservation-strategy-v2.pdf [*Conservation Strategy for Gopher Tortoise*].

their lifecycles.[360] The gopher tortoise is generally found in longleaf pine or oak sandhill ecosystems, but it may also be found in other dry, upland habitats within its historic range.[361]

Like many coastal plain species, the gopher tortoise was once common throughout upland habitats in the South. The species has lost 80 percent of its historical range and continues to suffer from habitat destruction, habitat fragmentation and degradation, caused by urban development, agricultural conversion, forestry, and mining.[362] Habitat fragmentation can lead to reproductive isolation, increased predation due to exposed habitat edges, and mortality resulting from vehicular collisions.[363]

The gopher tortoise is a candidate for listing under the ESA and is state-listed in Georgia and Florida. Should it experience continued declines, hundreds of other species, including the eastern indigo snake, will feel the impacts. In Georgia, for example, indigo snakes depend upon tortoise burrows for warmth during the winter months.[364]

In the long-term, continued mining would greatly reduce the ability of the property to support the species. Gopher tortoises require large parcels of undeveloped and unfragmented land, as well as soils that have not been permanently homogenized or compacted by heavy machinery. In this case, the cumulative impacts of mining—roadbuilding, logging, compaction of burrows, fragmentation of suitable habitat—is likely to result in the complete extirpation of the species from the entire 12,000-acres. This would affect not just the indigo snake, but other commensal species, such as the gopher frog.

Though avoidance and translocation were cited as tools to "potentially benefit the gopher tortoise population," Twin Pines has failed to produce the site of the desired relocation or provide any tangible data to support such assertions. In fact, at the 2019 Twin Pines hearing in Folkston, Georgia, surveyors indicated that tortoises would be relocated and fenced in within the larger Twin Pines review area. Considering Twin Pines intends to mine the majority of its acreage, it is unclear, for the reasons stated above, how the phase-by-phase rotation of tortoises within the project review area would prove feasible. Without additional information, it is probable that the proposed project and subsequent phases of mining will result in a net loss for the species.

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[360] *Id*.

[361] U.S. Fish & Wildlife Service: North Florida Ecological Services Office, *Gopher Tortoise* (*Gopherus polyphemus*), U.S. FISH & WILDLIFE SERVICE, http://www.fws.gov/northflorida/gophertortoise/gopher_tortoise_fact_sheet.html.

[362] *Conservation Strategy for Gopher Tortoise* at 9; NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia, http://www.natureserve.org/explorer.

[363] *Conservation Strategy for Gopher Tortoise* at 9.

[364] Stevenson, D.J., K.J. Dyer, and B.A. Willis-Stevenson. 2003. Survey and monitoring of the eastern indigo snake in Georgia. Southeastern Naturalist 2:393-408; Enge et al. 2013.

b. Gopher Frog

The gopher frog is an ESA candidate species and is state-listed in Georgia. It is considered Georgia's rarest frog.[365] Gopher frogs are longleaf pine ecosystem endemics and rely on temporary, fishless wetlands for successful breeding.[366] They are threatened by historic and ongoing habitat loss and habitat degradation from suppression of naturally occurring fire.[367]

A 2014 genetic study of gopher frogs concluded that there are three evolutionary significant units, one in the coastal plain and two in peninsular Florida.[368] They concluded that the peninsular Florida is the only region where the status of the species is stable, and that a coastal plain distinct population segment warranted "immediate listing."[369] There are only 16 known populations in Georgia.[370]

Though the value of wetlands is often ascribed to size, the importance of wetlands to gopher frogs and other amphibians is tied to their spatial configuration to other wetlands on the landscape.[371] For that reason, we are concerned that Twin Pines' proposed project, especially when coupled with later phases of mining, will result in cumulative impacts to amphibian diversity that transcend those articulated in the current permit application. The Okefenokee National Wildlife Refuge does not exist in isolation, and its amphibian diversity requires a mosaic of habitats, including those within the proposed project area. Increased analysis should be given to these larger population dynamics, as well as those occurring within the entirety of the roughly 12,000-acre Twin Pines parcel. It is inadequate to survey for gopher frogs on a piecemeal basis when the applicant intends to eventually mine on a scale that could impair a larger population and sever an important Georgia wildlife corridor.

Twin Pines must also articulate where it intends to relocate gopher frogs, with careful consideration given to the larger state of the population in Georgia. Simple relocation, without further consideration given to the resiliency, redundancy, and connectivity of extant populations, as well as the localized habitat features of the target population, may result in a net loss and hasten the eventual listing of the gopher frog under the ESA.

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[365] Amphibian Foundation, Gopher Frogs, https://www.amphibianfoundation.org/index.php/research/gopher-frogs.

[366] *Id.*

[367] *Id.*

[368] Richter, S.C., E.M. O'Neill, S.O. Nunziata, A. Rumments, E.S. Gustin, J.E. Young, and B.I. Crother. 2014. Cryptic Diversity and Conservation of Gopher Frogs Across the Southeastern United States. *Copeia* 2:231–237.

[369] *Id.*

[370] *Id.*

[371] Semlitsch, R.D. (2000). Size does matter: the value of small isolated wetlands. National Wetland Newsletter, 22(1), 5-6, 13; Semlitsch, R.D. (2002). Critical elements for biologically based recovery plans of aquatic- breeding amphibians. Conservation Biology, 16(3), 619-629; Semlitsch, R.D. (2008). Differentiating migration and dispersal processes for pond-breeding amphibians. Journal of Wildlife Management, 72(1), 260-267.

Gopher frogs depend upon wetlands and gopher tortoise burrows for various life stages, both of which will be impacted by the proposed mine. Like gopher tortoise, it is unlikely that gopher frog will be found on-site after mining operations conclude.

c. Florida pine snake

The applicant's surveys confirmed the presence of the Florida pine snake on the project site. Because the species has lost 97 percent of its historical range, it is state-listed as threatened in Florida. Efforts are underway to restore habitat for the Florida pine snake, which requires high, dry, and easy-to-tunnel land. Because mining could result in the permanent compaction of the soils upon which the species depends, Florida pine snakes are likely to be extirpated from the site.

d. Southern hognose snake

The habitat of the Southern hognose snake (ESA candidate) was also documented on the site. Like the Florida pine snake, the species depends upon well-drained soils and requires underground habitat, which is likely to be compacted and disturbed by mining operations.

e. Bachman's Sparrow

The Georgia state-listed Bachman's sparrow has been documented on the site. The Bachman's sparrow has experienced significant range contractions, as a result of habitat conversion and commercial development. The species depends upon open, mature pinelands, regenerating clear cuts, and utility rights-of-way. Mining disturbances are likely to result in the localized disappearance of Bachman's sparrows from the site and affect the behavioral patterns of the larger population found within the Refuge.

f. Bald Eagle

Bald eagles are known to utilize Okefenokee National Wildlife Refuge. Because Trail Ridge is an inseparable component of the larger refuge ecosystem, any mining disturbances stand to potentially affect the nesting and hunting success of the bald eagles that depend upon the waters of the Swamp.

g. Florida Black Bear

The Florida black bear is the largest land mammal in Florida and has a short tail, prominent canine teeth, and feet with short, curved, non-retractable claws on each of its five digits.[372] While not currently recognized as federally or state listed, it was a Florida state protected species for decades, and its northern subpopulation spends time in Georgia. Florida

[372] Florida Fish and Wildlife Conservation Commission. 2012. *Florida Black Bear (Ursus americanus floridanus) Management Plan.* Tallahassee, FL: FWC, http://myfwc.com/media/2612908/bear-management-plan.pdf, at 5.

black bears are omnivorous and forage in a wide range of habitats.[373] Optimal Florida black bear habitat is a mixture of flatwoods, swamps, scrub oak ridges, bayheads and hammock habitats, thoroughly interspersed.[374] Home range size and shape appears to be influenced by the timing and location of nutritional resources, subpopulation density, reproductive status, and anthropogenic factors like habitat fragmentation.[375] Florida black bears have relatively large home ranges, averaging 40 km^2 for females and 65 km^2 for males.[376] In Okefenokee National Wildlife Refuge, the Florida black bear's annual home range is 13,811 acres.[377]

Today, the Florida black bear occupies 49% of its historic range in Florida.[378] Its remaining habitat is degraded and fragmented, resulting in high rates of vehicle collisions and smaller, more isolated populations.[379] The Florida black bear historically roamed throughout all of Florida and southern portions of Georgia, Alabama and Mississippi,[380] but habitat loss and fragmentation as well as unregulated hunting significantly reduced bear numbers from an estimated 11,000 in the 1800s to 300 by the 1970s.[381] By the time the Florida Game and Freshwater Fish Commission (now the Florida Fish and Wildlife Conservation Commission) classified the Florida black bear as a threatened species in most Florida counties in 1974, there were only an estimated 300–500 bears left.[382] Today, the Florida black bear's population is

[373] Maehr, D. S. and J. R. Brady. 1982. Fall food habits of black bears in Baker and Columbia counties, Florida. Proceedings of the Southeastern Association of Fish and Wildlife Agencies 36:565–570.

[374] Maehr, T. S. Hoctor, L. J. Quinn, and J. S. Smith. 2001. Black bear habitat management guidelines for Florida. Technical Report No. 17. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL. 83 p., http://myfwc.com/media/425789/BB_Hab_Mgmt_Guide.pdf.

[375] FWC 2012 at 8.

[376] FWC 2012 at 9.

[377] FWC 2012 at 10.

[378] Florida Fish and Wildlife Conservation Commission. 2019. *Florida Black Bear (Ursus americanus floridanus) Management Plan.* Tallahassee, FL.1., https://myfwc.com/media/21923/2019-florida-black-bear-management-plan.pdf.

[379] Dixon, J.D., M.C. Wooten, J.W. McCown. 2007. Genetic consequences of habitat fragmentation and loss: the case of the Florida black bear (*Ursus americanus floridanus*). *Conserv Genet*, 8: 455-464.

[380] Brady, J.A. and D.S. Maehr. 1985. Distribution of black bears in Florida. *Florida Field Naturalist*, 31: 1-7.

[381] Hendry, L. 1982. *Florida's vanishing wildlife.* Gainesville, FL: Florida Cooperative Extension Service.

[382] McDaniel, J. 1974. Florida report on black bear management and research. In M. a. Pelton (Ed.), *Proceedings of the second eastern workshop on black bear management and research*, Gatlinburg, TN. pp. 157-162; Brady 1985 at 3.

estimated at roughly 4,000 and its occupied range occurs in 62 of Florida's 67 counties.[383] Roughly 1,000 bears reside in Georgia and Alabama.[384]

The Florida black bear is highly threatened by habitat loss and fragmentation, which, coupled with human encroachment, have resulted in subpopulations that are increasingly isolated from each other.[385] The remaining habitat is degraded and fragmented, resulting in high rates of vehicle collisions and smaller, more isolated populations.[386] Habitat fragmentation and anthropogenic barriers to movement have limited the dispersal capability of the Florida black bear, reducing gene flow among populations, and resulting in genetically distinct populations.[387] Florida black bears are also threatened by hunting and disease.

Florida black bears are known to occur on the site, as well as within the Refuge. Though the species is not federally-listed, the Florida black bear continues to suffer from a lack of connectivity and meaningful gene flow between populations. The proposed mine threatens to further impair connectivity and, at least for the duration of mining, will likely result in the localized disappearance of the species from the larger tract. How this will affect the long-term genetic viability of the larger population is unaddressed by Twin Pines.

B. Bentonite and Associated Wildlife Impacts

According to Twin Pines' latest application, "TTL considered that the vertical hydraulic conductivity of sands returned to the mine pit during reclamation/restoration may need to be reduced to ensure that groundwater levels are appropriate for maintaining wetlands."[388] To that end, high-yield, high viscosity bentonite, at a percentage of 10–12.5%, was found to be required to achieve a relative permeability similar to consolidated sands in the proposed project area.[389]

Because bentonite wetland reclamation is often associated with stunted recruitment of aquatic vegetation, greater consideration should be given to active plant propagation beyond the simple replanting of longleaf pine.[390] Reliance upon the existing bank, when coupled with the compaction of the affected soils, may deter swift recolonization of both vegetation and wildlife on the affected property. Though bentonite is commonly used in the restoration of wholly

[383] Florida Fish and Wildlife Conservation Commission. 2019. *Florida Black Bear (Ursus americanus floridanus) Management Plan.* Tallahassee, FL.1., https://myfwc.com/media/21923/2019-florida-black-bear-management-plan.pdf.

[384] *Id* at 11.

[385] Dobey, S., D.V. Masters, B.K. Scheick, J.D. Clark, M.R. Pelton, and M. Sunquist. 2002. Popluation ecology of black bears in the Okefenokee-Osceola ecosystem. Final report to Study Cooperators.

[386] Dixon 2007 at 455-464.

[387] Dixon 2007 at 455-464.

[388] Application at 14.

[389] *Id.*

[390] McKinstry, M. & Anderson, S. (2003). Improving aquatic plant growth using propagules and topsoil in created bentonite wetlands of Wyoming. Ecological Engineering. 21. 175-189. 10.1016/j.ecoleng.2003.12.002.

isolated wetlands, it is also unclear whether Twin Pines will be able to replicate the temporal and spatial diversity—and thus, amphibian diversity—of the complex wetland system found within the project area.

We are furthermore concerned by the prospect of bentonite failure and its implications for aquatic wildlife. Bentonite is known to clog the gills of aquatic organisms.[391] When coupled with increased temperatures and reduced dissolved oxygen levels, the impacts are lethal.[392] For endangered species occurring within the affected watershed, this is of concern. The Atlantic sturgeon, for instance, is an ESA-listed Endangered species, and, with only a few dozen documented individuals, is "precariously close to extirpation."[393] Should bentonite find its way into the river system, it could have a deleterious effect on individuals utilizing the upper reaches of the St. Marys River.

C. The Corps and Service Must Comply with the Endangered Species Act

All aspects of the Corps' permitting, and indeed the mine itself, must comply with the ESA, "a powerful and substantially unequivocal statute."[394] Congress enacted the ESA "to provide a program for the conservation of … endangered species" and "to provide a means whereby the ecosystems upon which [such] … species depend may be conserved."[395]

"Conservation" and "conserve" mean "to use and the use of all methods and procedures which are necessary to bring an endangered species … to the point at which the measures provided pursuant to [the ESA] are no longer necessary"—i.e. to recover such species from imperiled status.[396] Thus, "[t]he plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost."[397] To accomplish this objective, the ESA was designed to be "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation."[398] "[T]he language, history, and structure of the [ESA] indicates beyond doubt that Congress intended endangered species to be afforded the highest of priorities."[399] This conservation mandate colors the Act from nose to tail.

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[391] O'Connor, J. 1991. Evaluation of Turbidity and Turbidity-Related Effects on the Biota of the San Francisco Bay-Delta Estuary, 50-51, citing Peddicord et al. (1975).

[392] *Id*.

[393] Fox, Adam & Wirgin, Isaac & Peterson, Douglas. 2018. Occurrence of Atlantic Sturgeon in the St. Marys River, Georgia. Marine and Coastal Fisheries. 10. 615.

[394] *Loggerhead Turtle v. Cty. Council of Volusia Cty., Fla.*, 148 F.3d 1231, 1246 (11th Cir. 1998) (quoting *Strahan v. Linnon*, 967 F.Supp. 581, 618 (D. Mass.1997), *aff'd* 187 F.3d 623 (1st Cir. 1998)).

[395] 16 U.S.C. § 1531(b).

[396] *Id.* § 1532(3); *see also* 50 C.F.R. § 402.02 (defining "recovery").

[397] *Fla. Key Deer v. Paulison*, 522 F.3d 1133, 1138 (11th Cir. 2008) (quoting *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184, 194 (1978)).

[398] *Tenn. Valley Auth.*, 437 U.S. at 180.

[399] *Loggerhead Turtle*, 148 F.3d. at 1246 (quoting *Tenn. Valley Auth.*, 437 U.S. at 174).

Moreover, when Congress passed the ESA in 1973 it was acutely aware that stemming the loss of biodiversity required more than protecting individual animals and plants. It also required protecting habitat from destruction or adverse modification. Of the many threats to America's wildlife heritage, Congress recognized that the "most significant has proven also to be the most difficult to control: the destruction of critical habitat."[400] In the 1978 amendments to the ESA, Congress reemphasized that "[t]he loss of habitat for many species is universally cited as the major cause for the extinction of species worldwide."[401]

1. The Corps must consult with the Services regarding impacts to federally endangered and threatened species and ensure against jeopardy

a. No compelling evidence demonstrates that consultation would result in a finding of no jeopardy

As explained above, the Applicant has not demonstrated that it will not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of the critical habitat of these species. At best, there are too many gaps in the science and data presented in the application to know with certainty whether a "no jeopardy" finding is warranted for certain species. At worst, it appears likely that for some species, the mine would indeed result in jeopardy. The Corps, therefore, must engage the U.S. Fish and Wildlife Service and the National Marine Fisheries Service for all listed species that may be affected by the proposed project within its action area.

This analysis must span "all areas to be affected directly or indirectly" by the project and not merely the immediate area involved in the action."[402] The impacts will likely carry far downstream of the 12,000-acre site and also within the Refuge. Therefore, the Corps and the appropriate consulting agency must consult on the below listed species that either may, will likely, or almost certainly be impacted.

b. Consultation and the biological opinion must address the significant habitat loss and fragmentation that will result from the mine

This project will directly impact at least 1,042 acres of prime habitat for listed species—and even more if the Applicant receives authorization for the larger 12,000 acres it seeks to mine. The leading cause of extinction is habitat loss.[403] Habitat loss and fragmentation, coupled with

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[400] H.R. Rep. No. 93-412, 93d Cong., 1st Sess. (July 27, 1973); *Tenn. Valley Auth.*, 437 U.S. at 179 ("Congress stated from the finding that '[t]he two major causes of extinction are hunting and destruction of natural habitat.' Of these twin threats, Congress was informed that the greatest was destruction of natural habitats.") (citations omitted).

[401] H.R. Rep. No. 95-1625, at 5 (1978), *reprinted in* 1978 U.S.C.C.A.N. 9453, 9455.

[402] 50 C.F.R. § 402.02(d).

[403] Harris, L.D. and G. Silva-Lopez. 1992. Forest fragmentation and the consrevation of biological diversity. In P. a. Fielder, *Forest fragmentation and the conservation of biological*

human encroachment, have resulted in populations of species that are increasingly isolated from each other.[404] Large mammalian carnivores, like the Florida panther, are particularly vulnerable to habitat loss and fragmentation because of their relatively low numbers, large home ranges, and interactions with humans.[405] Their low fecundity and long generation times result in reduced levels of genetic variation.[406] Habitat loss and fragmentation can lead to increased mortality;[407] reduced abundance;[408] disruption of the social structure of populations;[409] reduced population viability;[410] isolated populations with reduced population sizes and decreased genetic variation.[411] Loss of genetic variation may reduce the ability of individuals to adapt to a changing

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diversity. New York: Chapman and Hall. Pp. 197-237; Meffe, G.K. 1997. *Principles of conservation biology.* Sunderland, MA: Sinauer Associates, Inc.

[404] Dobey, S., D.V. Masters, B.K. Scheick, J.D. Clark, M.R. Pelton, and M. Sunquist. 2002. Population ecology of black bears in the Okefenokee-Osceola ecosystem. Final report to Study Cooperators.

[405] Noss, R. 1996. Conservation biology and carnivore conservation in Rocky Mountains. *Conserv Biol*, 10(4): 949-963; Woodroffe, R. and J.R. Ginsberg. 1998. Edge effects and the extinction of populations inside protected areas. *Science*, 280, 2126-2128.

[406] Roelke, M.E., J.S. Martenson, and S.J. O'Brien. 1993. The consequences of demographic reduction and genetic depletion in the endangered Florida panther. *Curr Biol*, 3(6), 340-350; Lu, Z., W.E. Johnson, M. Menotti-Raymond, N. Yuhki, J.S. Martenson, S. Mainka, H. Shi-Qiang, Z. Zhihe, G. Li, W. Pan, X. Mao, and S.J. O'Brien. 2001. Patterns of genetic diversity in remaining giant panda populations. *Conserv Biol*, 15(6): 1596-1607.

[407] Jules, E.S. 1998. Habitat fragmentation and demographic change for a common plant trillium in old-growth forest. *Ecology*, 79(5): 1645-1656.

[408] Flather, C.H and M. Bevers. 2002. Patchy reaction-diffusion and population abundance: the relative importance of habitat amount and arrangement. *Am Nat*, 159(1): 40-56.

[409] Ims, R.A. and H.P. Andeassen. 1999. Effects of experimental habitat fragmentation and connectivity on root vole demography. *J. Anim Ecol*, 68(5): 839-852; Cale, P. 2003. The influence of social beavior, dispersal and landscape fragmentation on population structure in a sedentary bird. *Biol Conserv*, 109: 237-248.

[410] Harrison, S. and E. Bruna. 1999. Habitat fragmentation and large scale conservation: what do we know for sure? *Ecography*, 22(3): 225-232; Srikwan, S. and D.S. Woodruff. 2000. Genetic erosion in isolated small-mammal populations following rainforest fragmentation. In A. a. Young, *Genetics, Demography, and Viability of Fragmented Populations*. New York: Cambridge University Press. pp. 149-172; Cale 2003 entire; Lindenmayer, D. and J. Fisher. 2006. *Habitat Fragmentation and Landscape Change: An Ecological and Conservation Synthesis.* Washington, D.C. Island Press.

[411] Frankham, R. 1996. Relationship of genetic variation to population size in wildlife. *Conser Biol*, 10: 1500-1508.

environment; cause inbreeding depression;[412] reduce survival and reproduction;[413] and increase the probability of extinction.[414]

A 2009 study concluded the anthropogenic influences—primarily road density and vehicular traffic—can substantially affect the population dynamics of large carnivores with large home ranges, like the Florida panther.[415] Habitat fragmentation and anthropogenic barriers to movement have limited the dispersal capability of species, reducing gene flow among populations and resulting in genetically distinct populations.[416] Large carnivores may be much more susceptible to losses in genetic variation due to habitat fragmentation because of their large home ranges, low population densities, and long generation times.[417] Isolation is reinforced when travel between subpopulations is limited due to significant barriers, such as high-volume roads.[418] Thus roads and other anthropogenic obstacles cans substantially reduce gene flow among populations.[419]

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[412] Ebert, D. C. 2002. A selective advantage to immigrant genes in a Daphnia metapopulation. *Science, 295*, 485-488.

[413] Frankham 1995.

[414] Saacheri, I., M. Kuussaari, M. Kankare, P. Vikman, W. Fortelliua, and I. Hanski. 1998. Inbreeding and extinction in a butterfly metapopulation. *Nature*, 392: 491-494; Westemeier, R.L., J.D. Brawn, S.A. Simpson, T.L. Esker, R.W. Jansen, J.W. Walk, E.L. Kershner, J.L. Bouzat, and K.N. Paige. 1998. Tracking the long-term decline and recovery of an isolated population. *Science*, 282, 1695-1698; Kramer-Schadt, S., E. Revilla, T. Wiegand, and U. Breitenmoser. 2004. Fragmented landscapes, road mortality and patch connectivity: modeling influences on the dispersal of Eurasian lynx. *Journal of Applied Ecology*, 41: 711-723; Letcher, B.H., K.H. Nislow, J.A. Coombs, M.J. O'Donnell, and T.L. Dubreuil. 2007. Population response to habitat fragmentation in a stream-dwelling brook trout population. *PLoS ONE* 2(11): e1139; Ruiz-Gutierrez, V., T.A. Gavin, and A.A. Dhondt. 2008. Habitat fragmentation lowers survival of a tropical forest bird. *Ecological Application*, 18(4): 838-846; Sherwin, W.B. and C. Moritz. 2000. Managing and monitoring genetic erosion. In A. a. Young, *Genetics, demography, and viability of fragmented populations*. New York: Cambridge University Press. pp. 9-34.

[415] Hostetler, J.A., J.W. McCown, E.P. Garrison, A.M. Neils, M.A. Barrett, M.e. Sunquist, S.L. Simek, and M.K. Oli. 2009. Demographic consequences of anthropogenic influences: Florida black bears in north-central Florida. *Biological Conservation*, 142: 2456-2463.

[416] Dixon, J.D., M.C. Wooten, J.W. McCown. 2007. Genetic consequences of habitat fragmentation and loss: the case of the Florida black bear (*Ursus americanus floridanus*). *Conserv Genet*, 8: 455-464.

[417] Paetkau, D. and C. Strobeck. 1994. Microsatellite analysis of genetic variation in black bear populations. *Mol Ecol*, 3(5): 489-495; Johnson, W.E., E. Eizirik, M. Roelke-Parker, and S.J. O'Brien. 2001. Applications of genetic concepts and molecular methods to carnivore conservation. In J.L. Gittleman et al. (Eds.), *Carnivore Conservation*. New York: Cambridge University Press. Pp. 335-358.

[418] Paetkau 1994 entire; Mader, H. 1984. Animal habitat isolation by roads and agricultural fields. *Biol Conserv*, 29: 81-96; Brody, A. and M. Pelton. 1989. Effects of roads on black bear movements in western North Carolina. *Wildl Soc Bull*, 17: 5-10; Proctor, M.F., B.N. McLellan,

Habitat fragmentation from the mine itself and associated roads is also a significant threat to the eastern indigo snake. Roadways are a pervasive part of human development, and though they have a relatively small footprint their impacts are devastating and far-reaching.[420] Roads directly kill wildlife through road fatalities and indirectly through habitat fragmentation, genetic isolation, pollution, and a host of other impacts. As our transportation network expands, so does the wildlife death toll, with estimates as high as one million direct vertebrate fatalities along America's roadways each day.[421] Likewise, tens to hundreds of millions of snakes are killed annually by vehicles on roads in the United States.[422] Enge and Wood (2002) estimate that approximately 1.4 million snakes are killed annually in Florida, though they indicate that estimate is likely low.[423]

Herpetologists have long recognized the "irreparable landscape alteration from the nation's transportation infrastructure,"[424] and studied the physical and behavioral traits of reptiles and amphibians that make them particularly susceptible to road mortality.[425] The eastern indigo

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and C. Strobeck. 2002. Population fragmentation of grizzly bears in southeastern British Columbia, Canada. *Ursus*, 13, 153-160; Voss, C.C., A.G. Antonisse-De Jong, P.W. Goedhart, and M.J. Smulders. 2001. Genetic similarity as a measure for connectivity between fragmented populations of the moor frog (Rana arvalis). *Heredity*, 86, 598-608; Gerlach, G. and K. Musolf. 2000. Fragmentation of landscape as a cause for genetic subdivision in bank voles. *Conserv Biol*, 14: 1066-1074; Trombulak, S. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation Biology*, 14, 18-30; Coffin, A. 2007. From roadkill to road ecology: a review of the ecological effects of roads. *Journal of Transport Geography*, 15(5): 396-406.

[419] Dixon 2007 at 455-464; Kyle, C.J. and C. Strobeck. 2001. Genetic structure of North American wolverine (*Gulo gulo*) populations. *Mol Ecol*, 10, 337-347; Walker, C.W., C. Vila, A. Landa, M. Linden, and H. Ellegren. 2001. Genetic variation and population structure in Scandinavian wolverine (Gulo gulo) populations. *Mol Ecol*, 10, 53-63; Ernest, H.B, W.M. Boyce, V.C. Bleich, B. May, S.J. Stiver, and S.G. Torres. 2004. Genetic structure of mountain lion (Puma concolor) populations in California. *Conserv Genet*, 4: 353-366.

[420] Andrews, K. M., J. W. Gibbons, and D. M. Jochimsen. 2006. Literature Synthesis of the Effects of Roads and Vehicles on Amphibians and Reptiles. Federal Highway Administration (FHWA), U.S. Department of Transportation, Report No. FHWA-HEP-08-005. Washington, D.C. 151 pp; Clark, R.W., W.S. Brown, R. Stechert, and K.R. Zamudio. 2010. Roads, Interrupted Dispersal, and Genetic Diversity in Timber Rattlesnakes. Conservation Biology 24(4):1059–1069.

[421] Andrews et al. 2006.

[422] DeGregorio, B.A., E.J. Nordberg, K.E. Stepanoff, and J.E. Hill. 2010. Patterns of Snake Road Mortality on an Isolated Barrier Island. Herpetological Conservation and Biology 5(3):441–448.

[423] Enge, K.M., and K.N. Wood. 2002. A Pedestrian Road Survey of an Upland Snake Community in Florida. Southeastern Naturalist 1(4):365–380.

[424] Andrews, K.M. and J.W. Gibbons. 2005. How Do Highways Influence Snake Movement? Behavioral Responses to Roads and Vehicles. Copeia 2005(4): 772–782.

[425] Andrews et al. 2006.

snake's physical characteristics and behavior patterns make it highly susceptible to road mortality.[426] Because eastern indigo snakes are long-lived, have large home ranges, and are large-bodied, they are more likely to succumb to vehicle collisions, and this threat may result in such a significant loss of individuals that it threatens the sustainability of impacted populations.[427]

A species' life history can impact the frequency and severity of road mortality impacts. Long-lived species with delayed sexual maturity are especially vulnerable to increases in adult mortality, and because many reptiles are long-lived road mortality can severely impact their populations.[428] Road mortality can have a particularly pronounced negative effect on long-lived snakes like the eastern indigo.[429] Because of these negative effects, Row et al. (2007) concluded: "[I]f no measures are taken to decrease road mortality, it is probable that many populations of long-lived species in close proximity to roads will go extinct or at least experience significant declines."[430]

Natural behaviors also make certain species like the eastern indigo snake more susceptible to road mortality.[431] These behaviors include movement-associated behavior, such as speed and immobilization defenses; daily movement patterns; migration; breeding and nesting; movement to hibernation sites; dispersal; defensive behavior; foraging behavior; and communication and social behavior.[432] Many of the eastern indigo snake's behaviors and traits make it more likely to be negatively impacted by road mortality. For instance, the eastern indigo snake is a wide-ranging species that travels as far as 224 hectares, which means this snake is much more likely to encounter roads and the associated risks of direct mortality or isolation.[433] Additionally, snake species that move frequently over long distances have been observed to experience higher mortality than more sedentary species.[434] Long-distance movers, like the eastern indigo snake are also particularly sensitive to edge effects.[435] Species that depend on

[426] Andrews, K.M., J.W. Gibbons and D.M. Jochimsen. 2008. Ecological effects of roads on amphibians and reptiles: a literature review. In *Urban herpetology. Herpetological Conservation*. Vol. 3. Jung, R.E. & Mitchell, J.C. (Eds). Salt Lake City, UT: Society for the Study of Amphibians and Reptiles.

[427] Andrews et al. 2008, at 127.

[428] Row, J.R., G. Blouin-Demers, and P.J. Weatherhead. 2007. Demographic effects of road mortality in black ratsnakes (*Elaphe obsoleta*). Biological Conservation 137:117–124.

[429] Row et al. 2007.

[430] Row et al. 2007.

[431] Andrews et al. 2006, at 15–21.

[432] Andrews et al. 2006, at 15–21.

[433] U.S. Fish & Wildlife Service. 1999. Multiple Species Recovery Plan for South Florida: Eastern Indigo Snake *Drymarchon corais couperi* 4-567, *available at* http://www.fws.gov/verobeach/msrppdfs/easternindigosnake.pdf; Andrews et al. 2006, at 19–20.

[434] Andrews et al. 2008, at 123.

[435] Andrews et al. 2008, at 123 (citing Breininger, D.R., M.J. Mazerolle, M.R. Bolt, M.L. Legare, J.H. Drese, and J.E. Hines, 2012. Habitat fragmentation effects on annual survival of the federally protected eastern indigo snake. *NASA Publications*. Paper 106).

large areas of non-fragmented landscape to complete their life cycles are in greatest jeopardy.[436] Enge and Wood (2002) predict that slow-moving species and active species with large home ranges will experience future declines in area due to cumulative road mortality and increased traffic.[437]

The eastern indigo snake's natural behaviors near roadways may also put it at additional risk for road mortality. While some species of snake avoid crossing roads, larger snakes like the eastern indigo are less likely to exhibit this avoidance behavior, which places them directly in the path of traffic.[438] This readiness to cross may only be exacerbated during mating season, when the willingness of reproductive snakes to cross roads reduces the barrier effect of the roads but also increases the chance of mortality for these classes.[439] Eastern indigo snakes may also readily cross roads when the road's placement fragments foraging areas, separating the snakes from important food sources.[440]

Once on the road, the eastern indigo snake's mode of movement, speed, and defensive behaviors make it less likely it will successfully cross without being subject to a vehicle collision.[441] Andrews and Gibbons (2005) investigated the behavior of various species of snake near roads and found that the eastern racer (*Coluber constrictor*), a species of snake that shares the subfamily *Colubrinae* with the eastern indigo snake, readily crosses roads.[442] In another road-mortality study, DeGregorio et al. (2010) found that of five snake species recovered, most of them were eastern racers. A large proportion of the eastern racers found by DeGregorio et al. were gravid, and they hypothesized that the gravid snakes were highly impacted by road mortality because of their large home range size and propensity to seek out nesting sites.[443] The findings of Andrews and Gibbons and Degregorio et al. could indicate that the subfamily of snakes to which the eastern indigo snake belongs could have traits that make them more susceptible to road mortality.

Andrews and Gibbons (2005) also identified specific features of snake movement and defensive behaviors that made certain species more likely to be impacted by road mortality. They concluded that species with higher mass-to-length ratios (thick-bodied snakes) are more likely to cross roads at a slower rate of speed, subjecting them to a higher risk of road mortality when they cannot cross quickly enough to avoid collision.[444] The scientists found that even snakes that rely on rapid flight to escape predators (e.g., *Coluber constrictor*) exhibited higher immobilization responses to oncoming vehicles than hypothesized.[445] Because eastern indigo snakes are heavy-

[436] Andrews et al. 2008, at 123.
[437] Enge and Wood 2002, at 377.
[438] Andrews and Gibbons 2005.
[439] Row et al. 2007 at 122; Andrews et al. 2006, at 18–19.
[440] Andrews et al. 2006, at 21.
[441] Andrews et al. 2006, at 20.
[442] Andrews, K.M. and J.W. Gibbons. 2005. How Do Highways Influence Snake Movement? Behavioral Responses to Roads and Vehicles. Copeia 2005(4): 772–782.
[443] DeGregorio et al. 2010, at 445.
[444] Andrews & Gibbons 2005, at 776–780.
[445] Andrews & Gibbons 2005, at 779–780.

bodied snakes and members of the subfamily *Colubrinae*, they may have characteristics that may make them more likely to cross roads at slower rates, causing great harm and even jeopardy.[446]

Impacts from road-mortality are compounded by other road-related impacts that are less readily measureable but still significant.[447] For instance, the isolating nature of roads can lead to population-level impacts, such as skewed population structure via altered sex ratios and composition of age classes and restricted gene flow that results in decreased genetic diversity.[448] Because eastern indigo snakes are long-lived, the negative impacts of these effects may take decades to become apparent, at which point it may be too late to remedy them.

While the eastern indigo snake's characteristics make it more likely to suffer the ill effects of roads, there are also compounding characteristics of people and the roads themselves that contribute to the negative impacts. Roads with higher speeds, heavier traffic, and lower visibility can be devastating to nearby herpetofauna. Breininger et al. (2012) found that habitat fragmentation is likely a critical factor for the eastern indigo snake's persistence and that eastern indigo snakes are vulnerable to extinction in conservation areas bordered by roads and developed areas. Though the snake's chances of survival can be quite high in conservation core areas, its survival rates significantly decline in conservation areas along highways and in suburbs.[449] More than half of known snake mortalities documented in the study were caused by humans, directly or indirectly, along roads.[450]

Additionally, because snakes are a maligned group of animals, humans are more likely to intentionally kill them when they are easily visible on the roadway.[451] Snake researchers in Louisiana have reported that 30% of drivers will change lanes to intentionally kill a snake and 10% will back over the snake again to ensure it is dead.[452]

Determination of the overall impact of road mortalities and numbers of eastern indigo snakes taken by vehicle impacts must be done with caution, as many factors can lead to understated effects. Visual-observation studies of road kill rates are likely to produce results much lower than actual road kills that occur. Based on a study of road kills on radio-telemetry tagged snakes, Row et al. (2007) estimate that 2 of every 3 road kills are not found.[453] This disparity in detection of road kills may be attributable to scavengers, which can rapidly remove

[446] Row et al. 2007, entire.
[447] Andrews et al. 2006, at 4.
[448] Andrews et al. 2008, at 131; Clark et al. 2010, entire
[449] Breininger et al. 2012, at 365.
[450] Breininger et al. 2012, at 365.
[451] USFWS 1999, at 4-567; Andrews et al. 2006, at 24–25.
[452] Schlierf, R., R. Hight, S. Payne, J. Shaffer, B. Missimer, and C.G. Willis. Undated. Kennedy Space Center (KSC) Launch Pad Avian Abatement Efforts Including Related KSC Road Kill Reduction Effort. 22 pp.
[453] Row et al. 2007 at 122.

carcasses from the road and cause underestimation of mortality.[454] Additionally, the covert nature of many herpetofaunal species makes sampling and studying the negative impacts of roads challenging,[455] and eastern indigo snakes are highly cryptic.

The proposed mine is certain to destroy and fragment significant areas of habitat for endangered and threatened species. Consequently, the Corps and Service must consult and analyze these significant and permanent habitat impacts from the mining itself as well as the related roads and infrastructure to ensure they will not jeopardize federally listed species in the area.

c. Consultation and the Biological Opinion Must Account for the Cumulative Effect of Climate Change

The Corps and Service must consider all available climate change science when evaluating the effects of the Mine during formal consultation.

As detailed in the National Climate Assessments, key climate change impacts include rising temperatures, the increasing frequency of heat waves and other extreme weather events, the flooding of coastal regions by sea level rise and increasing storm surge, the rapid loss of Arctic sea ice and the collapse of Antarctic ice shelves, declining global food and water security, increasing species extinction risk, ocean acidification, and the global collapse of coral reefs.[456] As summarized by the Fourth National Climate Assessment:

> In addition to warming, many other aspects of global climate are changing, primarily in response to human activities. Thousands of studies conducted by researchers around the world have documented changes in surface, atmospheric, and oceanic temperatures; melting glaciers; diminishing snow cover; shrinking sea ice; rising sea levels; ocean acidification; and increasing atmospheric water vapor.[457]

Global average surface temperatures have risen by 1.8°F (1.0°C) since 1901, most of which occurred during the past three decades.[458] As of 2018, 16 of the last 17 years were the warmest ever recorded by human observations.[459] Global average temperature reached a record

[454] Hubbard, K.A., and A.D. Chalfoun. An Experimental Evaluation of Potential Scavenger Effects on Snake Road Mortality Detections. Herpetological Conservation and Biology 7(2):150–156.

[455] Andrews et al. 2006, at 22.

[456] Melillo, Jerry M et al. (eds.), Climate Change Impacts in the United States: The Third National Climate Assessment, U.S. Global Change Research Program (2014); U.S. Global Change Research Program, Climate Science Special Report: Fourth National Climate Assessment, Vol. I (2017), https://science2017.globalchange.gov/ [USGCRP Vol I]; U.S. Global Change Research Program, Impacts, Risks, and Adaptation in the United States, Fourth National Climate Assessment, Volume II (2018), https://nca2018.globalchange.gov/ [USGCRP Vol II].

[457] USGCRP Vol I at 10.

[458] USGCRP Vol I at 13.

[459] USGCRP Vol I at 76.

high in 2016, which scientists determined was "only possible" because of anthropogenic climate change,[460] with 2017 ranked as the second hottest year on record.[461]

The United States warmed by 1.8°F (1.0°C) between 1901 and 2016, with the most rapid warming occurring after 1979.[462] The U.S. is expected to warm by an additional 2.5°F (1.4°C), on average, by mid-century relative to 1976-2005, and record-setting hot years will become commonplace.[463] By late century, much greater warming is projected, ranging from 2.8 to 7.3°F (1.6 to 4.1°C) under a lower emissions scenario and 5.8 to 11.9°F (3.2 to 6.6°C) under a higher emissions scenario.[464] The urban heat island effect—which is expected to strengthen as urban areas expand and become denser— will amplify climate-related warming even beyond those dangerous increases.[465]

Climate models project continued warming in all seasons across the southeast United States and an increase in the rate of warming.[466] The warming of air and water temperatures projected for the southeast will create heat-related stress for fish and wildlife. Climate change will alter the distribution of native plants and animals and will lead to the local loss of imperiled species and the displacement of native species by invasive species.[467] Concerning the effects climate change is expected to have on southeastern environments, Karl (2009) states, "[e]cological thresholds are expected to be crossed throughout the region, causing major disruptions to ecosystems and to the benefits they provide to people."[468]

The warming climate will likely cause ecological zones to shift upward in latitude and altitude and species' persistence will depend upon, among other factors, their ability to disperse

[460] Knutson, Thomas R. et al., CMIP5 model-based assessment of anthropogenic influence on record global warmth during 2016, 99 Bulletin of the American Meteorological Society S11 (2017).

[461] National Aeronautics and Space Administration, Long-term warming trend continued in 2017: NASA, NOAA, Release 18-003, January 18, 2018, https://www.nasa.gov/press-release/long-term-warming-trend-continued-in-2017-nasa-noaa [NOAA 2017].

[462] USGCRP Vol I at 17.

[463] USGCRP Vol I at 11.

[464] USGCRP Vol I at 17.

[464] USGCRP Vol I at 17 and 136: The high emissions scenario RCP 8.5 corresponds to a rise of CO_2 levels from the current-day 400 ppm up to 936 ppm by the end of this century. The lower emissions scenarios RCP4.5 and RCP 2.6 correspond to atmospheric CO_2 levels remaining below 550 and 450 ppm by 2100, respectively. These scenarios are numbered according to change in radiative forcing by 2100: +2.6, +4.5, +8.5 watts per square meter (W/m^2).

[465] USGCRP Vol I at 17.

[466] Karl, T.R., J.M. Melillo, and T.C. Peterson. 2009. *Global Climate Change Impacts in the United States.* Global Change Research Program. New York: Cambridge University Press at 111-113.

[467] *Id.* at 113.

[468] *Id.* at 115.

to suitable habitat.[469] Because of some of the species' already limited range and few available alternative habitat locations, protecting existing habitat will be critical to the survival of those species.

Climate change will increase the incidence and severity of both drought and major storm events in the southeast.[470] The percentage of the southeast region experiencing moderate to severe drought has already increased over the past three decades. Since the mid-1970s, the area of moderate to severe spring and summer drought has increased by 12 percent and 14 percent, respectively. Fall precipitation tended to increase in most of the southeast, but the extent of region-wide drought still increased by nine percent.[471] Hurricane-generated storm surge events—the enormous walls of water pushed onto the coast—have also become more frequent and severe.[472] One study found that large storm surge events of Hurricane Katrina magnitude have already doubled in response to warming during the 20th century, and projected that Atlantic hurricane surge events will increase in frequency by twofold to sevenfold for each 1°C in temperature rise.[473] As the climate warms, Atlantic hurricane rainfall and intensity is projected to increase, making hurricanes more destructive.[474] Studies of Hurricane Harvey concluded that climate warming made the storm's record rainfall more likely and intense.[475]

Both drought and severe storms could threaten species like the Florida black bear, Florida panther, and eastern indigo snake with habitat alteration, altered vegetation, and altered prey base and food availability.[476] Additionally, major storm events can decimate habitat, leaving fewer suitable places for species to live. For example, in 2018 Hurricane Michael caused far-reaching

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[469] Peters, R.L. and J.D.S. Darling. 1985. The greenhouse effect and nature reserves. *Bioscience*, 35(11), 707-717.

[470] Karl, T.R., J.M. Melillo, and T.C. Peterson. 2009. *Global Climate Change Impacts in the United States.* Global Change Research Program. New York: Cambridge University Press at 111-116.

[471] Karl 2009 at 111.

[472] Komar, Paul D. & Jonathan C. Allan, Increasing hurricane-generated wave heights along the U.S. east coast and their climate controls, 24 Journal of Coastal Research 479 (2008); Grinsted, Aslak et al., Homogeneous record of Atlantic hurricane surge threat since 1923, 109 PNAS 19601 (2012).

[473] Grinsted, Aslak et al., Projected hurricane surge threat from rising temperatures, 110 PNAS 5369 (2013).

[474] USGCRP Vol II at 74.

[475] Emanuel, Kerry, Assessing the present and future probability of Hurricane Harvey's rainfall 2017, 114 PNAS 12681 (2017); Risser, Mark D. and Michael F. Wehner, Attributable human-induced changes in the likelihood and magnitude of the observed extreme precipitation during Hurricane Harvey, 44 Geophysical Research Letters 12,457 (2017); van Oldenborgh, Geert J. et al., Attribution of extreme rainfall from Hurricane Harvey, 12 Environmental Research Letters 124009 (2017).

[476] Seager, R., A. Tzanova, and J. Nakamura. 2009. Drought in the Southeastern United States: causes, variability over the last millennium, and the potential for future hydroclimate change. *Journal of Climate,* 22: 5021-5045.

destruction of frosted flatwoods salamander habitat in St. Marks National Wildlife Refuge, home to one of few known salamander populations, when storm surge pushed sea water into the ephemeral wetland ponds the salamander uses for breeding.[477] With more and more coastal habitat loss to sea level rise, inland habitat—like the habitat proposed for mining—will become critical to the survival of many species.

Global average sea level rose by seven to eight inches since 1900 as the oceans have warmed and land-based ice has melted.[478] Sea level rise is accelerating in pace with almost half of recorded sea level rise occurring since 1993.[479] The Fourth National Climate Assessment estimated that global sea level is very likely to rise by 1.0 to 4.3 feet by the end of the century relative to the year 2000, with sea level rise of 8.2 feet possible.[480] Sea level rise will be much more extreme without strong action to reduce greenhouse gas pollution. By the end of the century, global mean sea level is projected to increase by 0.8 to 2.6 feet under a lower emissions RCP 2.6 scenario, compared with 1.6 to 6 feet under a high emissions RCP 8.5 scenario.[481] Many areas of the Southeast Atlantic and Gulf of Mexico coasts have experienced significantly higher rates of relative sea-level rise than the global average during the past 50 years.[482] The impacts of sea level rise will be long-lived: under all emissions scenarios, sea levels will continue to rise for many centuries.[483]

Coastal regions are threatened by increased flooding due to sea level rise and intensifying storm surge.[484] A nationwide study estimated that approximately 3.7 million Americans live within three feet of high tide, putting them at extreme risk of flooding from sea level rise in the next few decades, with the most vulnerable residents in Florida, Louisiana, California, New York

[477] Walls, S.C., W.J. Barichivich, J. Chandler, A.M. Meade, M. Milinichik, K.M. O'Donnell, M.E. Owens, T. Peacock, J. Reinman, R.C. Watling, O.E. Wetsch. 2019. Seeking shelter from the storm: conservation and management of imperiled species in a changing climate. *Ecology and Evolution* 9:7122-7133.

[478] USGCRP Vol II at 74.

[479] USGCRP Vol II at 74, 339.

[480] USGCRP Vol II at 74, 487, 758.

[481] USGCRP Vol I at 344.

[482] Karl 2009 at 37.

[483] Melillo, Jerry M. et al. (eds.), Climate Change Impacts in the United States: The Third National Climate Assessment, U.S. Global Change Research Program (2014), https://www.globalchange.gov/browse/reports/climate-change-impacts-united-states-third-national-climate-assessment-0 at 45; USGCRP Vol I at 345-346.

[484] Climate Central, Surging Seas Risk Zone Map, http://sealevel.climatecentral.org/ (accessed March 22, 2019); Hauer, Mathew E. et al., Millions projected to be at risk from sea-level rise in the continental United States, 6 Nature Climate Change 691 (2016); See online mapping tools at National Oceanic and Atmospheric Administration, Office for Coastal Management, Digital Coast, Sea Level Rise Viewer, https://coast.noaa.gov/digitalcoast/tools/slr.html.

and New Jersey.[485] As humans migrate inland to escape rising sea levels, they will move into areas of suitable habitat for many rare and imperiled species, resulting in fewer areas for these species to exist.

2. The Proposed Mitigation is Inadequate to Mitigate for Harm to Listed Species and Their Habitat

Twin Pines has also failed to demonstrate that its mitigation plan would adequately offset the project's destructive impacts on wildlife and habitat to ensure that the project would comply with the Section 404(b)(1) guidelines. First, as discussed above in Section VII(F), the application does not demonstrate that Twin Pines' mitigation plan would establish a likelihood for ecological success and sustainability, in part because it has failed to demonstrate that the project site and the mitigation banks it has identified possess similar types of habitat. Furthermore, the mitigation banks selected by Twin Pines do not appear within the same watershed or 8-digit Hydrologic Unit Code as the project. Finally, even assuming that Twin Pines' selected mitigation banks do possess the same kind of habitat as the project site, it has failed to demonstrate connectivity between the habitat and the banks.

Twin Pines has failed to demonstrate that its compensatory mitigation plan establishes a "likelihood for ecological success and sustainability," a factor that the Corps must take into account when reviewing a mitigation plan.[486] For example, Musket Bay, located north of the swamp, was initially drained to maximize timber production, altering wetland hydrology and vegetation composition. Musket Bay Mitigation Bank is now comprised of "bottomland hardwoods, cypress swamp, cypress-tupelo gum swamps, emergent wetland, scrub-shrub wetland, mixed bottomland hardwood, wet pine flats, and mixed pine-cypress wetland systems."[487] These habitat features vary considerably from those on Trail Ridge. Much of the diversity of wildlife found along Trail Ridge depends upon piney uplands and ephemeral and isolated wetlands historically associated with longleaf pine ecosystems. The frosted flatwoods salamander, the striped newt and the gopher frog, to name a few, require these upland habitat features to carry out several of their life stages, none of which Musket Bay seems capable of supporting. As best we can tell, the Musket Bay Mitigation Bank appears to be a single bottomland wetland, replete with fish, stable water levels, and other elements generally not conducive to the above-listed species found within or near the proposed project area.

This trend toward consolidation—the destruction of smaller wetlands in exchange for a single, large-scale wetland—has significant consequences for amphibian diversity and abundance. To better account for the life history and habitat requirements of sensitive

[485] Strauss, Benjamin H. et al., Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States, 7 Environmental Research Letters 014033 (2012).

[486] *See* 40 C.F.R. § 230.93(a)(1).

[487] RIBITS, Musket Bay Fact Sheet.

amphibians, researchers have suggested that, in some cases, several small wetlands are preferable to one larger wetland.[488]

Amphibians aside, the general value of a mitigation bank such as Musket Bay to wildlife is unclear. The proposed project area, on the other hand, nearly abuts the Okefenokee Swamp, a core wildlife area, and lies just south of what the Georgia Department of Natural Resources considers Priority 1 and 2 Greenways. By virtue of isolation and acreage, Musket Bay furthermore appears incapable of supporting not only amphibians of concern but larger-ranging and similarly rare species, such as the eastern indigo snake, red-cockaded woodpecker and gopher tortoise, all of which either utilize Trail Ridge or the adjoining swamp and national wildlife refuge.

Moreover, "[c]ompensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit."[489] There is no indication that the selected mitigation banks would offset the extent and type of destructive impacts on species and habitat that the project would cause. First, Twin Pines has failed to demonstrate that its project would not cause a take or jeopardy of listed species. The habitat at Musket Bay Mitigation Bank, for example. appears dissimilar to the habitat at the project site, resulting in a diminishment of the amount of habitat available to amphibians and the many other species that depend upon piney uplands and ephemeral and isolated wetlands. The mitigation plan only attempts to account for the impacts that would be experienced immediately within the "demonstration project" footprint. However, off-site species and habitat would experience significant degradation as well. Twin Pines' identified mitigation banks would not remedy the harmful impacts that the project's activities would have on many non-terrestrial species, including the Atlantic sturgeon, the shortnose sturgeon, and the Gulf sturgeon, all of which are protected under the ESA. The mitigation plan also fails to demonstrate that it would address any harmful impacts that the project could have on the Refuge. Furthermore, the project site is within a CFA for the eastern indigo snake.[490] CFAs are areas that were identified in the eastern indigo snake's species status assessment as targeted areas "that have the greatest chance of maintaining or restoring sufficient habitat (quality and quantity) and connectivity among populations."[491] The project would diminish the quality and quantity of the species' CFA, and the mitigation plan does nothing to offset this. The mitigation plan therefore fails to comply with 40 C.F.R. § 230.93(a)(1).

[488] Porej, D., & Hetherington, T.E. (2005). Designing wetlands for amphibians: the importance of predatory fish and shallow littoral zones in structuring of amphibian communities. Wetlands Ecology and Management, 13, 445-455.

[489] 40 C.F.R. § 230.93(a)(1).

[490] Southeast Region, U.S. Fish and Wildlife Service, *Draft Eastern Indigo Snake Recovery Implementation Strategy* at 25 (Aug. 2019); *available at* https://www.fws.gov/athens/pdf/2019_E_IndigoSnake_RIS_DRAFT.pdf.

[491] *Id.* at 3.

Finally, pursuant to the guidelines, a reviewer should take habitat connectivity into consideration when analyzing the adequacy of mitigation plans.[492] Even if the project site and the mitigation bank possessed the same kind of habitat, Twin Pines has failed to demonstrate habitat connectivity between them.[493] Habitat connectivity, which is the extent to which separate areas of similar habitat are connected, is critical because, among other functions, it helps maintain breeding populations within species. The smaller the gene pool, the greater the likelihood that species will become vulnerable to inbreeding and disease. Habitat connectivity allows for flow between members of species, broadening the breeding population and diversifying the gene pool. Twin Pines has failed to demonstrate that any other existing mitigation bank would maintain habitat connectivity.

In light of the foregoing, Twin Pines has failed to demonstrate that its mitigation plan would adequately offset unavoidable impacts to wildlife and habitat.

X. Twin Pines' cultural resource surveys are inadequate under the National Historic Preservation Act.

The "fundamental purpose of the NHPA is to ensure the preservation of historical resources."[494] Under Section 106 of the Act, federal agencies must "take into account the effects of their undertakings on historic properties and afford the [Advisory Council on Historic Preservation] a reasonable opportunity to comment on such undertakings."[495] Similar to NEPA, Section 106 is a "stop, look, and listen provision" requiring agencies to actually consider effects to historic and cultural resources before proceeding beyond project planning into implementation.[496]

Twin Pines had three Phase 1 cultural resources surveys performed for its first application; two of these are applicable here. The surveys were inadequate for the first application; they remain inadequate for the second application. After reviewing all three surveys for the first application, Terracon Consultants, Inc. identified seventeen substantial deficiencies. In the following, Terracon highlights the most serious ones:

> First, no [area of potential effects] was defined for the project. Second, the architectural survey and descriptions in the [Twin Pines] report were inadequate and it is unclear if this work was performed by someone meeting [required] standards. Third, there are conflicting assessments of the [certain effects]. Fourth, two of the three project areas had no architectural surveys conducted . . . and at least one possible historic resource, the Atlantic, Valdosta, and Western Railway, was missed. Fifth, and perhaps most significantly, is that there is no discussion of potential archeological deposits that may have been found deeper than 80 cm

[492] 40 C.F.R. § 230.93(b)(1).
[493] Musket Bay Mitigation Bank is 51 miles from the project site. Application, Table 19.
[494] *Te-Moak Tribe v. U.S. Dep't of Interior*, 608 F.3d 592, 609 (9th Cir. 2010).
[495] 36 C.F.R. § 800.1(a); *see also* 54 U.S.C. § 306105.
[496] *Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 805 (9th Cir. 1999).

> below the ground surface. Testing of deposits deeper than 80 cm should have been conducted.[497]

Before proceeding, Twin Pines and the Corps should address the comments provided by Terracon. Below we focus on three of the most egregious deficiencies.

A. Twin Pines violated the NHPA by not exploring a large enough geographic area.

Twin Pines' consultant went astray when it first started its work on this project. It did not establish an Area of Potential Effects (APE). In other words, it did not determine the proper scope of its surveys.[498] Unless this is done properly, the Corps, as the lead federal agency for the project, cannot rely on the results of the surveys. The APE is defined as:

> [T]he geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The [APE] is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.[499]

Under the NHPA, the Corps must identify any cultural and historic resources within the APE and determine whether the project would result in adverse effects to those resources. ACHP regulations implementing Section 106 of the Act define "adverse effect" broadly as:

> [A]n undertaking [that] may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.[500]

The Corps' historical and cultural resource analysis in this case thus substantially relies upon setting an appropriate APE, which is important because the work within the APE can be extensive. This analysis typically includes "background research, consultation, oral history interviews, sample field investigation, and field survey."[501] If an agency fails to define the APE properly, historic and cultural resources subject to direct or indirect effects from the project could be overlooked. Here, the Twin Pines failed to define an APE at all, leaving the public unable to meaningfully comment on the scope of the cultural analysis and the Corps unable to rely on the results of the surveys.

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[497] Letter report from William Green and Brent Handley to William W. Sapp, regarding Review of Three Cultural Resource Reports Pertaining to the Proposed Heavy Minerals/Twin Pines Mine Saint George, Charlton County, Georgia (August 28, 2019) (attached as Ex. 46).

[498] 36 C.F.R. § 800.4(a).

[499] 36 C.F.R. § 800.16(d).

[500] 36 C.F.R. § 800.5(a)(1).

[501] 36 C.F.R. § 800.4.

Even if the consultants had established an APE that encompasses the area that the consultants surveyed, the consultants would still have erred. For instance, in the introduction of each report, the consultants state that the surveys cover certain parcels, when in fact they cover a fraction of those parcels.[502] To add additional confusion, the consultants state in the introduction of the Adirondack property survey that it covers the Keystone property.[503]

But even more important, since the project area is only the first section of a multi-phased mining project that will cover the entire 12,000-acre Twin Pines tract, the cultural resources surveys should encompass the entire 12,000-acre tract, as well as any areas outside of the tract that contain historic properties that could be adversely affected by any mining on the 12,000-acre tract. Until the Corps conducts cultural resources surveys on this larger legally acceptable APE, it has not met the requirements of the NHPA. And until the Corps makes these new surveys available to the public for comment, it has not met its duty to provide an opportunity to be involved in the permit process.

B. Twin Pines did not dig its test pits to the proper depth.

Even in the areas where the consultants did search for historic and cultural resources, they did not take the hard look that is required. As Terracon states in its report, when the consultant was using test pits for its archeologic investigation, it did not dig the test pits deep enough. Since this is such a critical element of archeological work, Terracon obtained a second opinion on this issue from Geoarcheology Research Associates, which specializes in answering questions of this nature. Geoarcheology concluded that Terracon is correct that the consultants did not dig its test pits sufficiently deep. Geoarcheology explained that there could be historic or prehistoric resources between the 60 cm depth that the consultant dug its test pits and the 80 cm depth that they should have reached.[504] In short, the consultants dug their test pits 25 percent too shallow.

In response to this criticism, Twin Pines has dug additional deeper holes in a small area of the site; however, it appears the person overseeing the work did not have the experience to

[502] Matt Lyons, TerraXplorations, Inc., A Phase I Cultural Resources Survey of the Twin Pines Minerals Adirondack property in Charlton County, Georgia at 1 (May 2019) ("Adirondack Cultural Review"); Matt Lyons, TerraXplorations, Inc., A Phase I Cultural Resources Survey of the Twin Pines Minerals Keystone property in Charlton County, Georgia at 1 (October 2018) ("Keystone Cultural Review"); Matt Lyons, TerraXplorations, Inc., A Phase I Cultural Resources Survey of the Twin Pines Minerals TIAA property in Charlton County, Georgia at 1 (June 2019) ("TIAA Cultural Review").

[503] Adirondack Cultural Review at 1.

[504] Joseph Schuldenrein, Geoarcheology Research Associates, Geoarchaeological Review of A Phase I Cultural Resources Survey of the Twin Pines Minerals Adirondack Property in Charlton County, Georgia by Matt Lyons, TerraXPlorations, Inc., May 31, 2019 (August 26, 2019) (appended to Ex. 47).

properly evaluate the work performed.[505] If that is the case, the extra work Twin Pines performed will have done little to demonstrate that Twin Pines properly surveyed the site. Additionally, this work was not referenced in this application nor posted with the public notice, so the public was denied the opportunity to review it.[506]

C. There is no indication that Twin Pines has shared its surveys with the State Historic Preservation Officer.

Had Twin Pines shared the surveys with the State Historic Preservation Officer (SHPO), the deficiencies in the surveys would, in all likelihood, have been identified. However, there is no indication in the Twin Pines application that the consultant has provided the surveys to the SHPO. Similarly, there is no indication in the application that the consultant shared the surveys with any federally recognized Indian Tribes. Both forms of vetting are required by Section 106 of the NHPA.

Twin Pines must share the surveys with the public as well. The public is entitled to review a complete copy of the application. In this case, however, that is impossible. The application that both the Corps and Twin Pines have made available does not include the two applicable surveys or its letter describing additional tests that it performed.[507] These documents should be made available to the public for a comment period of 30 days.

XI. The Corps must ensure that the proposed mine would not adversely impact the Okefenokee Wilderness Area.

As part of the public interest test, the Corps must also consider whether the proposed mine would have any adverse impacts on the Okefenokee Wilderness Area. The 12,000-acre Twin Pines tract directly abuts the wilderness. As explained elsewhere in these comments, since Twin Pines has made it clear that its mining project will progress in phases and there is no indication that Twin Pines will set aside a buffer between the proposed mine and the wilderness area, it is fair to conclude that mined area will extend up to the wilderness area boundary. Unless Twin Pines engages in extraordinary measures, the proposed phased mining project will have adverse noise, light, and recreational impacts on the wilderness area.

Congress passed the Wilderness Act in 1964 to ensure that there were lands in the United States that offered solitude so that people would have the opportunity to experience natural sights and sounds. The Act aims to preserve and protect such lands in their natural condition.[508] Congress defined "Wilderness" as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" and "an area of undeveloped Federal land retaining its primeval character and influence, without permanent

[505] Letter from Chris Stanford and Cindy House-Pearson to William M. Rutlin, regarding SAS-2018-00554, Requested Information, Twin Pines Minerals, St. George, Charlton County, Georgia, TTL Project No. 000180200804.00 (Oct. 18, 2019).

[506] *See* Application at 65.

[507] Although Twin Pines references the surveys, it does not include them in the application.

[508] 16 U.S.C.§§ 1131-36.

improvements or human habitation, which is protected and managed so as to preserve its natural conditions."[509] The area also must provide "outstanding opportunities for solitude or a primitive and unconfined type of recreation."[510]

Under the Wilderness Act, Congress determined that the Department of Interior (DOI) and Department of Agriculture should be in charge of administering any wilderness area set aside. Other Federal agencies are charged with the responsibility of "preserving the wilderness character" of these special places.[511]

In the Act, wilderness areas "shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."[512] They were not to be exploited for commercial gain.[513] And, except in emergency situations, the DOI was to exclude all motorized vehicles.[514] Wilderness areas are intended to be a place where individuals can experience natural soundscapes and darkened night skies unmarred by human-caused noise and light, an area that can provide the visitor a sense of remoteness and solitude.

The Wilderness Act requires that wilderness areas and their "community of life are [left] untrammeled by man" and that their "primeval character and influence . . . are preserve[d] in [their] natural condition."[515] Congress concluded that it is only in this manner that the solitude and primitive nature of these special places can remain unspoiled. Of all federal lands in this country, wilderness areas are the only ones that are designed so that individuals can escape all the trappings of modern life. The proposed Twin Pines mine would thwart what Congress was trying to achieve when it designated the Okefenokee Wilderness.

Recognizing the iconic nature of the Okefenokee Swamp, Congress set aside 353,981 acres of the 438,000-acre swamp as a National Wildlife Refuge in 1937.[516] As one commentator explained, "the National Wildlife Refuge System is the nation's most valuable asset for ecological conservation."[517] One of the central goals of the Refuge system is to "[c]onserve those ecosystems, plant communities, wetlands of national or international significance, and

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[509] *Id.* § 1131.
[510] *Id.*
[511] *Id.* § 1131(b).
[512] *Id.*
[513] *Id.* § 1131(c).
[514] *Id.*
[515] 16 U.S.C. § 1131.
[516] USFWS Letter. Bruce Babbitt, then Secretary of the Interior, played a key role in shepherding an organic act for the century-old refuge program through Congress. *See* USFWS, News Release, "Interior Secretary Babbitt endorses unprecedented legislation defining mission and priority public uses of the National Wildlife Refuge System," 1997 WL 222781 (May 2, 1997).
[517] Robert L. Fischman, Fischman, Robert L., "From Words to Action: The Impact and Legal Status of the 2006 National Wildlife Refuge System Management Policies," 77, 78 (2007). Articles by Maurer Faculty. Paper 170. http://www.repository.law.indiana.edu/facpub/170.

landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts.[518] Thirty-seven years later, in 1974, Congress increased the protections to the swamp when it designated 343,850 acres of the refuge a wilderness area.[519] Those protections are embodied in the Comprehensive Conservation Plan for the wilderness area, which states those protections are designed to "[r]estore, preserve, and protect the primeval character and natural processes of the Okefenokee Wilderness, leaving it untrammeled by man while providing recreational solitude, education, scientific study, conservation ethics, and scenic vistas."[520]

For the myriad reasons discussed above, federal agencies have a duty to protect wilderness areas. This includes the Corps. Before the Corps grants a Clean Water Act permit, it must consider any adverse impacts that an activity might have on a wilderness area. Similarly, the federal agency administering the wilderness area, the Fish and Wildlife Service in this case, must consider these impacts during the Corps permit process.

Courts have been diligent in ensuring that federal agencies hold to their obligation to protect wilderness areas from outside impacts and pollutants. For example, the federal district court for the district of Minnesota found that a proposed snowmobile trail was incompatible with the use of the adjacent Boundary Waters Canoe Area, noting that the federal agency administering the wilderness area is responsible for preserving the wilderness character of the area.[521] The court explained that the text of the Wilderness Act indicates that the agency's duty to preserve the wilderness is wholly independent of the source or location of that activity.[522] In other words, it does not matter whether the noise would be coming from inside or outside the wilderness; the administering agency has a duty to prevent it. Thus, in the case of the proposed Twin Pines mine, the Service, as well as the Corps under its public interest test, have a duty to consider the impacts of the proposed mine on the wilderness area.

Under the proposed action, visitors to Okefenokee Wilderness Area would be subject to the light, noise, and other forms of pollution that the proposed mine would produce, especially when Twin Pines begins mining the portions of its site abutting the wilderness area.[523] As explained above, the wilderness area attracts hundreds of thousands of visitors a year. In 2016, over 5,500 visitors camped overnight at the upland campsites and sleeping platforms in the wilderness area.[524]

Many visitors travel to the Okefenokee Wilderness Area to enjoy the quiet of a primitive place. The proposed mine would destroy that experience. The machinery at the

[518] 16 U.S.C. § 668ee.
[519] Okefenokee Wilderness, Public Law 93-429 (Oct. 1, 1974).
[520] Okefenokee Wilderness Area, Comprehensive Conservation Plan (2006).
[521] *Izaak Walton League of Am., Inc. v. Kimbell*, 516 F. Supp. 2d 982, 988 (D. Minn. 2007).
[522] *Id.*
[523] Until Twin Pines sells the mineral rights of those portions of its land abutting the wilderness area, it is fair to assume that it will mine up to the border of the wilderness area. Similarly. it is fair to assume that Twin Pines will operate the proposed mine 24 hours a day.
[524] E-mail from U.S. Fish & Wildlife Serv. staff member (Sept. 6, 2019).

proposed mine would generate a substantial amount of sound. Most of the excavation work would be done by a dragline, which Twin Pines describes as a "large crane-like earthmoving machine" that is equipped a with a "large capacity bucket" so that it can move "large quantities of material" efficiently.[525] The noise from the dragline would be coupled with the sound from other pieces of smaller excavation equipment such as bull dozers, backhoes, and dump trucks. Once the titanium ore is harvested by these machines, Twin Pines would feed it into a "Pre-concentration Plant," which contains "spiral centrifuges."[526] From there the concentrated ore would be fed into a "Wet Concentration Plant" for further processing and then continue on to a "Mineral Separation Plant."[527] Twin Pines would also use a train to move the processed material to market. The Twin Pines mine would therefore be a highly industrialized and noisy endeavor.

A recent study demonstrated anthropogenic noise impacts various species of amphibians, arthropods, birds, fish mammals, mollusks and reptiles.[528] Animals rely on sounds within their environment for essential information, such as mating and warning signals and echolocation; when these sounds are overpowered by anthropogenic noise, it poses serious threat to wildlife.[529] The Okefenokee is world renowned for its diverse migratory bird population; however, noise generated from the proposed mine infrastructure could disrupt migration patterns, cause birds to avoid the area and decrease the bird population density within the wildlife refuge.[530]

Already, visitors to the Floyd Island campsites that are located within the wilderness area complain to the Service about hearing an existing train that is 10.5 miles away.[531] The sounds from the proposed mine would only compound such noise intrusions into the wilderness area and detract further from the wilderness experience. Twin Pines must address this noise pollution, and the federal agencies must account for it in their analyses.[532]

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[525] *See* Original Application at 6.

[526] *See id.* at 5.

[527] It is not clear whether the mineral processing plant will be located at the mine, or elsewhere. *See id.*

[528] Hansjoerg P. Kunc and Rouven Schmidt, *The effects of anthropogenic noise on animals: a meta-analysis* at 1, Biology Letters (Apr. 10, 2020), https://doi.org/10.1098/rsbl.2019.0649.

[529] Ibid.

[530] Ana Benitez-Lopez et al, *The impacts of roads and other infrastructure on mammal and bird populations,* Biological Conservation (Apr. 10, 2020), https://doi.org/10.1016/j.biocon.2010.02.009.

[531] E-mail from U.S. Fish & Wildlife Serv. staff member (Sept. 6, 2019).

[532] Some of the questions we have about the Twin Pines operation follow: Is Twin Pines willing to conduct a sound study to predict the amount of sound that the proposed mine would generate and describe the concrete measures it would take to mitigate those impacts? Is Twin Pines willing to accept a permit condition that would limit work in the mine to an 8-hour shift during daylight hours? Is Twin Pines willing to accept a permit condition that would require it to

Many visitors travel to the wilderness area to also escape from the lights of developed areas. The wilderness area is an exceptional place to go for this purpose. The swamp is recognized as an International Dark Sky Park and has one of the darkest skies in the Southeast.[533] To preserve this designation and to afford visitors a dark-sky experience, the Stephen C. Foster State Park has instituted a strict lighting management plan to limit light pollution to protect the park's unique ecosystem.[534]

In addition to attracting visitors to areas like the Okefenokee Wilderness Area, scientists are finding that skies that are not polluted by light are critical to the survival of ecosystems. As one scientist noted, "[t]hough it may not be as immediately toxic as a chemical spill, light pollution is now among the most chronic environmental perturbations on Earth."[535] He went on to explain that researchers have already identified the negative impacts of light pollution to "a shocking array of non-urban species, including bats, insects, plants, fish, turtles, marine invertebrates including corals, and even primates."[536] Insects, which are often drawn to light, are a vital part of the wetland ecosystem as an essential food source for birds and amphibians. The potential lights from the mine could disrupt insect behavior, adversely impacting the food chain.[537]This is particularly relevant to the Okefenokee Swamp because it is "world renowned for its amphibian populations that are bio-indicators of global health."[538]

It will be all but impossible to prevent light from the proposed mine from entering the wilderness. In addition to the lights on the crane-like dragline and the other excavation equipment, the processing plants described above will also be lighted. At other comparable mines, such mills reach above the tree line and would shine directly into the wilderness area. From the observation tower at Seagrove Lake, visitors have commented on seeing the lights from the D. Ray James Prison, which is located 16 miles from the tower.[539] Based on this

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construct an earthen berm of sufficient height to prevent the sounds emanating from the mine from reaching the wilderness area?

[533] Stephen C. Foster State Park Named First International Dark Sky Park in Georgia (U.S.), https://www.darksky.org/stephen-c-foster-state-park-named-first-international-dark-sky-park-in-georgia-u-s/.

[534] Stephen C. Foster State Park, *A Proposal to International Dark Sky Association*, International Dark Sky Association (Apr. 10, 2020), https://www.darksky.org/wpcontent/uploads/2016/11/SCFSP_IDSP_application.pdf.

[535] Our Nights are Getting Brighter, and Earth is Paying the Price, Science and Innovation, https://www.nationalgeographic.com/science/2019/04/nights-are-getting-brighter-earth-paying-the-price-light-pollution-dark-skies/.

[536] *Id.*

[537] Travis Longcore and Catherine Rich, *Ecological Light Pollution* at 194-195, Front Ecol Enviro (accessed Apr. 13, 2020) https://esajournals.onlinelibrary.wiley.com/doi/epdf/10.1890/1540-9295%282004%29002%5B0191%3AELP%5D2.0.CO%3B2

[538] U.S. Fish & Wildlife Serv., Okefenokee National Wildlife Refuge, About the Refuge, https://www.fws.gov/refuge/Okefenokee/about.html.

[539] E-mail from U.S. Fish & Wildlife Serv. staff member (Sept. 6, 2019).

observation, the lights from the proposed mine would reach far into the wilderness area. Twin Pines must address such light pollution, and the federal agencies must account for it in their analyses.

To date, Twin Pines has not done so. In neither application has the mining company discussed whether it plans to operate at night or not. If it intends to do so, it must make this intention known to the public. As discussed above, mining at night would have a fundamental adverse impact on the wilderness area and the public's enjoyment of the wilderness during overnight camping trips.

Unless the public has an opportunity to weigh in on the light and sound aspects of the proposed mine, Twin Pines will have failed to meet its obligation to inform the public of its intentions regarding the mine. Light and sound issues provide a perfect example of why an EIS is needed for this project. It is our understanding that despite receiving comments on potential light and sound impacts on the first application, Twin Pines has done nothing to study or account for these impacts. A fully developed EIS would address the question of whether the light and sound emitted from the proposed mine site, as well as from the Loncala site, would adversely impact the Okefenokee Wilderness Area.

At a minimum, any Corps permit must include a condition stating that the mine can only operate during the day for an eight-hour shift, and that the Corps cannot modify this condition unless Twin Pines can demonstrate an extreme hardship. Furthermore, if the Corps determines that a modification is necessary, the Corps must publish a public notice and provide a 30-day public comment period.

XII. The proposed project violates other federal laws.

As described in the Conservation Groups' September 12 comments, before granting a permit, the Corps must ensure that the proposed mine would not adversely affect the Okefenokee National Wildlife Refuge or the Okefenokee Wilderness, both of which are federally protected and must be managed to fulfill their purpose under the Wilderness Act and the National Refuge Act.[540] In addition, under the federal reserved water rights doctrine, the Corps must ensure that the proposed mine would not cause changes to surface or groundwater quantities that would impact the Refuge or Wilderness Area.[541]

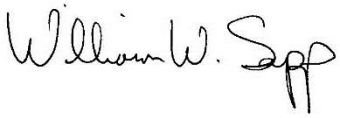
XIII. Conclusion

Six years of continuous mining is not a "demonstration." Multiple experts have shown it could cause irreparable harm to one of the world's greatest natural resources. We urge the Corps to deny this application or, at a bare minimum, to prepare an EIS to study how the proposed mine would impact the Okefenokee Swamp. Indeed, if this project does not warrant the preparation of an EIS, it is hard to imagine that any project ever would—a result that plainly disregards NEPA's statutory mandates.

[540] *See* Sept. 12 Comments at 61–68.
[541] *See* Sept. 12 Comments at 68.

If you have any questions, please feel free to contact us at 404-521-9900 or bsapp@selcga.org. Thank you for considering this request.

Sincerely,



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