



Impact of Dunes Sagebrush Lizard Protection on Oil and Gas Activity in West Texas

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ABSTRACT: Habitat of dunes sagebrush lizard, proposed for federal protection as an endangered species, exists on approximately 749,000 acres (<2 percent) of the 39.6-million-acre Permian Basin. Lizard habitat makes up less than 5 percent of all lands and only 5 percent of state lands in the six out of 254 Texas counties where it is found. Industry proponents grossly exaggerate the impact of lizard protection on oil and gas activity. Nearly 5,000 new oil and gas wells will be created in Texas lizard habitat over the next 20 years even if the animal is protected. Similar analysis revealed that lizard protection affects less than 1 percent of oil and gas activity on federal lands in southeast New Mexico. Any tradeoff between environmental protection and economic development will be very minor and can be resolved through the flexible mechanisms provided in the Endangered Species Act.

Introduction

The dunes sagebrush lizard (*Sceloporus arenicolus*) is proposed by the U.S. Fish and Wildlife Service (FWS) for protection under the Endangered Species Act (ESA).² Listing the animal as an endangered species is controversial because oil- and gas-industry proponents claim listing will curtail fossil fuel extraction in lizard habitat, with “catastrophic” impacts to jobs and public services. Oil and gas drilling is a significant economic activity in the Permian Basin of southeast New Mexico and west Texas (Figure 1). The region is one of the largest domestic producers of fossil fuel in the United States, generating approximately 17 percent of the nation’s domestic crude oil.³ In addition to oil and gas extraction, the Permian Basin is home to agricultural industry that produces food crops and grazes livestock. While these activities are important for the region’s economy, they also have a significant effect on wildlife and its habitat. The dunes sagebrush lizard is particularly vulnerable to industrial activities that destroy or fragment its shinnery oak sand-dune habitat, which has declined by more than 40 percent since 1982.⁴ In light of steady declines in lizard habitat and populations over several decades, the FWS concluded that survival of the species depends on ESA protection.⁵

Members of Congress representing Permian Basin constituencies have proposed legislation that would block federal protection of the dunes sagebrush lizard despite its scientific merit.⁶ U.S. Rep. Mike Conaway of Texas predicted that ESA listing would threaten the national economy of the United States by curtailing domestic oil production and raising the price of gasoline.⁷ That

assertion echoes industry claims that lizard protection “would shut down drilling activity for a minimum of two years and as many as five years.”⁸ In addition, Jerry Patterson, the land commissioner of the state of Texas, vowed to intervene in federal court if the FWS lists the animal as endangered, citing potential loss to public schools of “billions in lost royalties on oil and gas produced in West Texas,” and asserting that the fiscal impact on local government would be “catastrophic.”⁹

However, none of these elected officials have supported their claims of economic doom with evidence. The FWS maintains that it is “absolutely not true” that ESA listing will close down oil and gas drilling in the region.¹⁰ Indeed, prior analysis of oil and gas activity on public land managed by the U.S. Bureau of Land Management in southeast New Mexico showed that lizard protection affected less than 1 percent of more than 58,000 acres leased to oil and gas operators in 2010-2011, and that unsold surplus leases on public lands would not be affected.¹¹

This analysis quantifies the effect of protecting dunes sagebrush lizard under the ESA to private and state lands that are potentially developable for oil and gas production in six counties of west Texas. Only those six counties out of 254 in Texas host lizard habitat. The animal’s specialized habitat exists on approximately 749,000 acres, or 1.8 percent of lands in the 39.6-million-acre Permian Basin (Figure 1). Within Texas, lizard habitat exists on just 197,115 acres, or less than 5 percent of all lands in the six counties that make up the analysis area. Lizard habitat also exists on 9,869 acres (5 percent) of state-owned and asset lands where oil and gas extraction produces royalties for local government. Any tradeoff between environmental protection and economic activity is likely to be very minor and resolvable through the flexible mechanisms provided in the ESA.

Method

We applied findings of Fitzgerald and others (2011) to determine the location and distribution of dunes sagebrush lizard habitat in six counties of west Texas.¹² A request for the original data from that report was not returned so we digitized (*i.e.*, created a digital representation of a map) its four lizard-occurrence probability scales and interpreted all of them to express the distribution of habitat. We analyzed this digitized map in a Geographic Information System (GIS) to quantify the extent of lizard habitat.

We used the interactive lease-mapping program of the Texas General Land Office (GLO) to quantify lizard habitat on state lands.¹³ We captured and digitized those assets into a GIS. The digitized GLO maps are not an exact representation of state lands, but the scale of this analysis was sufficiently broad for potential error to be negligible. Where our estimate of habitat acreage differed from Fitzgerald and others (2011), we deferred to that report, as did the Texas Comptroller for Public Accounts.¹⁴ All of the GIS data used to describe lizard habitat in New Mexico were obtained from the Fitzgerald Herpetology Lab website of Texas A&M University.¹⁵

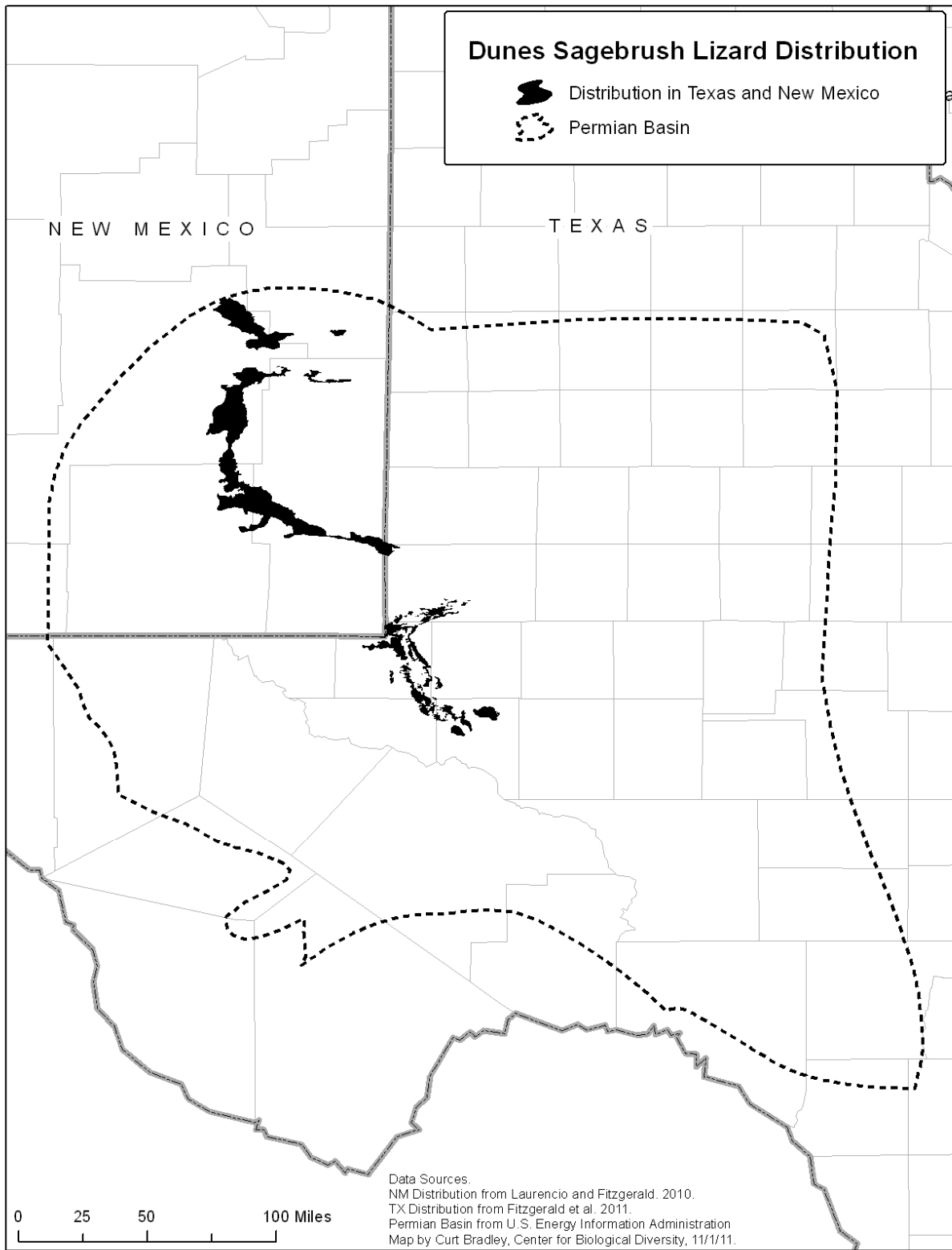


Figure 1. Dunes sagebrush lizard habitat comprises approximately 749,000 acres, or less than 2 percent of the 39.6-million-acre Permian Basin in southeast New Mexico and west Texas.

Results

I. Private lands

Private lands make up 4,016,988 acres — about 98.9 percent of total lands — in the six counties under analysis (Table 1). Only 189,823 acres (4.7 percent) of private lands may be dunes sagebrush lizard habitat (Table 1). Habitat on private land is most extensive in Winkler County (90,765 acres, or 17.8 percent) and Crane County (42,995 acres, or 10.2 percent) (Table 1). Some lizard habitat exists on private land in Ward (3.9 percent), Andrews (3.3 percent) and Ector (0.9 percent) counties, but it is negligible in Gaines County (<0.1 percent). All habitat in Ector, Gaines and Ward counties is located on private land.

II. State lands

State-owned and royalty asset lands make up 45,174 acres, or 1.1 percent of total lands, in the six counties (Table 1). They are most extensive in Ward County, where the greatest area — approximately 56 percent — of Permanent University Fund (PUF) lands exist in the analysis area (81,362 acres) (Table 1). State lands are also significant in Crane County, where the second-largest area of PUF lands (63,614 acres) and Relinquishment Act lands (18,398 acres) exist (Table 1). Relinquishment Act lands are most extensive in Winkler County (23,976 acres) and common in Andrews (9,730 acres) and Ward (9,178 acres) counties (Table 1). State lands make up less than 1 percent of Ector and Gaines counties (Table 1).

Dunes sagebrush lizard habitat exists on 9,869 acres — about 5 percent — of state lands in the six counties (Table 1). Habitat is most extensive in Winkler County, making up 7,292 acres (7.4 percent) of state lands (Table 1). Crane County hosts lizard habitat on 2,498 acres (5.5 percent) of state lands. A small area of lizard habitat exists on 79 acres (0.3 percent) of state lands in Andrews County (Table 1). No other county has lizard habitat on state lands.

Discussion

Habitat of dunes sagebrush lizard exists on less than 5 percent of total lands in the analysis area (Table 1, Figure 2). Our results overstate the extent of habitat because we use the shinnery oak formation as a proxy, consistent with Fitzgerald and others (2011) and Laurencio and Fitzgerald (2010).¹⁶ The lizard's highly specialized habitat requirements exist in a “spatially dynamic system” of oak-dominated sand dunes and flats that shift over time.¹⁷ Lizard populations do not exist at all locations considered here to be suitable.¹⁸ Therefore, our use of shinnery oak as a habitat proxy expresses a maximum potential distribution of the animal that is unlikely to be realized at any given time. Fitzgerald (2011) cautions that dunes sagebrush lizard may be extirpated from Crane County despite the existence of habitat (Table 1, Figure 2) due to cumulative effects of habitat removal by development and climate change at the southernmost extent of the range of the species.¹⁹

We consider all private lands to be potentially developable for oil and gas extraction. Dunes sagebrush lizard habitat may exist on 187,246 acres (4.6 percent) of private lands in the analysis area. This overstates the potential impact of ESA regulation, as not all lands host recoverable

Table 1. Land ownership and dunes sagebrush lizard habitat in six counties of west Texas.

State Lands							
County Name	Total Acres of County	Relinquishment Act	Surface Sold - All Minerals Reserved	Permanent University Fund	Free Royalty	Court Judgment	Total State (% county)
ANDREWS	956,917	9,730	680	0	0	0	10,411 (1.1)
CRANE	502,682	18,398	1,013	63,614	0	0	83,024 (16.5)
ECTOR	575,703	1,852	0	0	0	631	2,483 (0.4)
GAINES	958,419	3,573	709	0	893	0	5,174 (0.5)
WARD	533,068	9,178	5,041	81,362	3,728	0	99,308 (18.6)
WINKLER	535,373	23,976	0	525	967	0	25,469 (4.8)
Total	4,062,162	66,706	7,443	145,501	5,588	631	45,174 (1.1)

Dunes Sagebrush Lizard Habitat on State Lands							
County Name	DSL Habitat (% county)	Relinquishment Act	Surface Sold - All Minerals Reserved	Permanent University Fund	Free Royalty Land	Court Judgment	Total State (% DSL)
ANDREWS	31,183 (3.3)	79	0	0	0	0	79 (0.3)
CRANE	45,493 (9.1)	1,890	0	608	0	0	2,498 (5.5)
ECTOR	4,946 (0.9)	0	0	0	0	0	0
GAINES	281 (<0.1)	0	0	0	0	0	0
WARD	17,155 (3.2)	0	0	0	0	0	0
WINKLER	98,057 (18.3)	7,023	0	0	269	0	7,292 (7.4)
Total (DSL %)	197,115 (4.9)	8,993 (13.5)	0	608 (0.4)	269 (4.8)	0	9,869 (5.0)

fluid mineral resources, and standard industry practice includes wide spacing of oil and gas wells (*i.e.*, ~1 well per 40 acres).²⁰ New development in lizard habitat proposed by the state of Texas in the next two decades would create up to approximately 4,680 wells on private land even if the lizard is protected.²¹

The greatest potential impact of ESA regulation to state-owned and royalty asset lands would occur where lizard habitat makes up about 9,000 acres — less than 14 percent — of Relinquishment Act lands in the analysis area (Table 1). It also may affect about 600 acres — less than 1 percent — of PUF lands (Table 1). A draft conservation plan for the lizard in Texas quantifies the magnitude of impact to oil and gas activity on state lands. In a maximum development scenario, fewer than 250 new wells would be created on 9,869 acres of habitat in the next 20 years.²² Royalty values are variable across deposits and cannot be quantified here with confidence.²³ However, our results overstate the impact of lizard protection because oil and gas drilling is likely to proceed in suitable habitat with conditions intended to conserve populations, such as avoidance of occupied sites.²⁴

Opponents of ESA protection for the lizard claim that voluntary agreement with industry to conserve habitat on state and private lands can prevent extinction. However, participation in past agreements has been limited, and habitat destruction and population declines are ongoing, particularly in Texas, where nearly all of the shinnery oak formation is located on private land (Table 1, Figure 2).²⁵ Voluntary restrictions of industrial activity will fail to prevent extinction unless they avoid removal and fragmentation of habitat.²⁶

Binding habitat conservation plans (HCPs) insulate property owners from liability and ensure operational certainty of industrial activity when new species are listed as endangered.²⁷ The state of Texas proposed such a plan for the dunes sagebrush lizard. Under that plan, new oil and gas development would occur on up to 21,256 acres (10.8 percent) of lizard habitat in the analysis area over a 20-year period, suggesting that fossil fuel extraction need not “shut down” in the event of ESA listing (Table 1).²⁸ The draft HCP addresses issues under control of property rights, such as habitat restoration or creation, and avoidance of lizard populations. By committing to such measures, property owners can sidestep use restrictions beyond those agreed.

Conclusion

The limited area of dunes sagebrush lizard habitat makes ESA regulation very unlikely to affect more than a small portion of oil and gas activity in west Texas. Lizard habitat exists on 197,115 acres in the analysis area, or less than 0.5 percent of all lands in the Permian Basin (Figure 1), and less than 5 percent of total lands in the analysis area (Table 1). State lands, in particular, make up a minor fraction of both total lands (1.1 percent) and lizard habitat (5 percent) in the six counties of west Texas (Table 1, Figure 2). Even if drilling were to cease everywhere in lizard habitat following an endangered listing, which is not likely, fossil fuel extraction would continue unabated on 95 percent of state lands and nearly 99 percent of all lands in the analysis area.

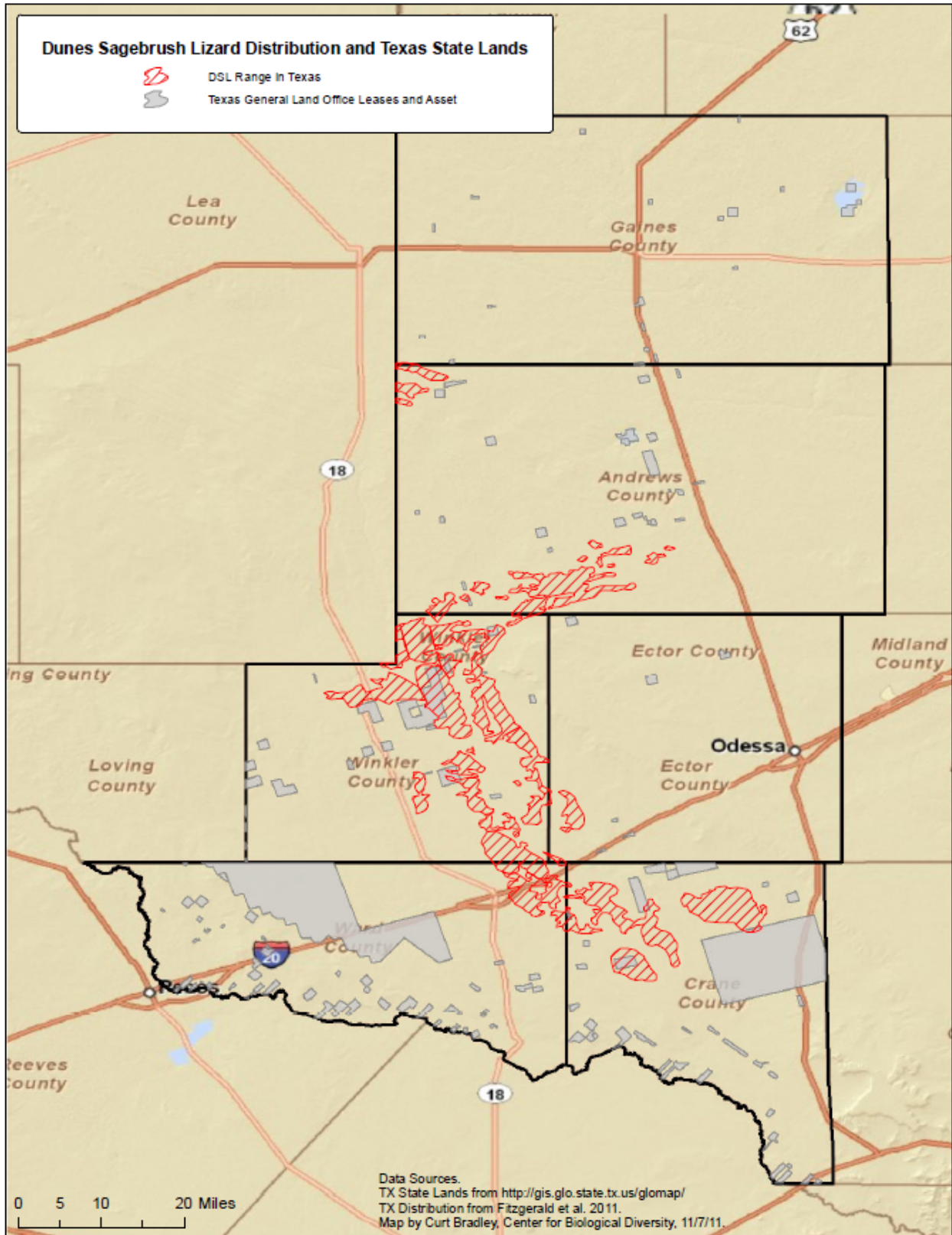


Figure 2. Dunes sagebrush lizard habitat comprises approximately 9,869 acres (5 percent) of state lands in the six west Texas counties where it exists.

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- ¹ Ecologist, Center for Biological Diversity, P.O. Box 25686, Albuquerque, NM 87125, email: jlininger@biologicaldiversity.org
- ² U.S. Fish and Wildlife Service. 2010. Proposed rule: Endangered status for dunes sagebrush lizard. *Federal Register* 75: 77801-17. Dec. 14; also see http://biologicaldiversity.org/species/reptiles/dunes_sagebrush_lizard/index.html.
- ³ University of Texas Permian Basin Center for Energy & Economic Diversification, *Graphs and Data on Permian Basin Oil Production and Reserves*, <http://ceed.utpb.edu/energy-resources/petroleum-library/permian-basin-statistics/graphs-and-data-on-permian-basin-oil-production-and-reserves/> (accessed Oct. 26, 2011); also see Advanced Resources International. 2006. *Basin Oriented Strategies for CO2 Enhanced Oil Recovery: Permian Basin*. Unpubl., U.S. Department of Energy: Washington, D.C. Feb. (117 pp.), available at: http://fossil.energy.gov/programs/oilgas/publications/eor_co2/Permian_Basin_Document.pdf. (The Permian Basin produced about 841,000 barrels of oil per day in 2004, but production in the region has declined following a peak in 1974.)
- ⁴ U.S. Fish and Wildlife Service, *op. cit.*, 77803.
- ⁵ *Ibid.*, 77813.
- ⁶ U.S. Rep. Steve Pearce (NM) proposed to amend the FY 2012 House Interior Appropriations bill to block listing of the dunes sagebrush lizard under the ESA. Pearce has been vocal in predicting economic calamity if the lizard is protected. See M. Simonich, “New Mexico Congressman Pearce: Protecting Lizard Would Put Jobs at Risk,” *El Paso Times*, Apr. 19, 2011, available at: http://www.elpasotimes.com/news/ci_17877554 (quoting Pearce, “Most of the oil and gas jobs in southeast New Mexico are at risk,” if the lizard is protected as an endangered species).
- ⁷ P. Manning, “Saving the Dunes Sagebrush Lizard Could Endanger, Lawmakers Say,” *FoxNews.com*, May 10, 2011, available at: <http://www.foxnews.com/politics/2011/05/10/saving-dunes-sagebrush-lizard-kill-oil-production/>.
- ⁸ C. May, “Is the Obama Administration Protecting Lizards at Expense of Jobs?,” *Daily Caller*, Sept. 19, 2011, available at: <http://dailycaller.com/2011/09/19/is-the-obama-administration-protecting-lizards-at-expense-of-jobs/> (quoting Ben Shepperd of the Permian Basin Petroleum Association).
- ⁹ J. Patterson, “Lizard must not impede energy future,” *Amarillo Globe-News*, June 10, 2011, available at <http://amarillo.com/opinion/opinion-columnist/guest-opinion-columnist/2011-06-11/patterson-lizard-must-not-impede-energy-future#.TsbXcnJuqSo>; also see TexasInsider.org, “Jerry Patterson Update on Sand Dunes Sagebrush Lizard Endangered Species Status,” Oct. 13, 2011, available at: <http://www.texasinsider.org/?p=54322>.
- ¹⁰ R. Romo, “Lizard listing at center of debate,” *Albuquerque Journal*, Apr. 28, 2011.
- ¹¹ J.C. Lininger and C. Bradley. 2011. *Impact of Dunes Sagebrush Lizard on Oil and Gas Activities in New Mexico: Bureau of Land Management Lease Offerings and Nominations in 2010-2011*. Unpubl., Center for Biological Diversity: Albuquerque, NM. Oct. (14 pp.). Available at: http://www.biologicaldiversity.org/species/reptiles/dunes_sagebrush_lizard/pdfs/Oil_Gas_DSL_report_v1_5_final.pdf.

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- ¹² L.A. Fitzgerald, C.W. Painter, T.J. Hibbitts, W.A. Ryberg and N. Smolensky. 2011. *Final Report on the Range and Distribution of Sceloporus arenicolus in Texas: Results of Surveys Conducted 8-15 June 2011*. Unpubl., Department of Wildlife and Fisheries Science, Texas A&M University: College Station, TX. July 1 (38 pp.).
- ¹³ <http://gisweb.glo.texas.gov/glomap/index.html> (accessed Nov. 16, 2011).
- ¹⁴ Texas Comptroller of Public Accounts. 2011. *Draft Texas Conservation Plan for the Dunes Sagebrush Lizard (Sceloporus arenicolus)*. Austin, TX. Sept. 27 (150 pp.). Available at: http://texasahead.org/texasfirst/resources/task_force/priority/reference_docs/dsl/TCP_DSL_Plan_92711.pdf.
- ¹⁵ <http://herpetology.tamu.edu/Fitzgerald/arenicolus.html> (accessed Nov. 16, 2011).
- ¹⁶ L.A. Fitzgerald and others (2011), *op. cit.*; also see Laurencio, L.R. and L.A. Fitzgerald. 2010. *Atlas of distribution and habitat of the dunes sagebrush lizard (Sceloporus arenicolus) in New Mexico*. Unpubl., Texas Cooperative Wildlife Collection, Department of Wildlife and Fisheries Sciences, Texas A&M University: College Station, TX. ISBN# 978-0-615-40937-5.
- ¹⁷ U.S. Fish and Wildlife Service, *op. cit.*, 77803; also see B. Hedges (n.d.). Letter to U.S. Fish and Wildlife Service re: "Peer Review for the U.S. Fish and Wildlife Service's Proposed Rule to List the Dunes Sagebrush Lizard (*Sceloporus arenicolus*) as Endangered Throughout its Range." Unpubl., Department of Biology, Pennsylvania State University: University Park, PA. (6 pp.) ("It is reasonable to conclude that areas within this dynamic system must be considered one complete system instead of multiple separate habitats.")
- ¹⁸ S.T. Smallidge and N. Ashcroft. 2011. Letter to Steve Pearce and Dennis Kintigh re: "Request for a scientific review of the December 14, 2010 U.S. Fish and Wildlife Service proposal to list the dunes sagebrush lizard as endangered under the Endangered Species Act." Unpubl., New Mexico State University Range Improvement Task Force: Las Cruces, NM. Aug. 10 (7 pp.).
- ¹⁹ L.A. Fitzgerald. 2011. "Arenicolus listing package review." Unpubl., Department of Wildlife and Fisheries Science, Texas A&M University: College Station, TX. Jan. 31 (2 pp.).
- ²⁰ Texas Comptroller of Public Accounts, *op. cit.*, 55. ("The typical size of spacing in the Permian Basin is 40 acres, or 1 well per 40 acres.")
- ²¹ *Ibid.*, 18; also see N. Juliano, "Permian Basin plan would allow drilling even if lizard wins endangered status," *Inside Energy*, Oct. 10, 2011.
- ²² Texas Comptroller of Public Accounts, *op. cit.*, 55.
- ²³ H.R. Williams and B.R. Haigh, "Mineral rights and royalties," *Handbook of Texas Online*, <http://www.tshaonline.org/handbook/online/articles/gym01> (accessed Nov. 21, 2011).
- ²⁴ U.S. Fish and Wildlife Service. 2011. *Draft Environmental Assessment for the Texas Conservation Plan for the Dunes Sagebrush Lizard: A Candidate Conservation Agreement with Assurances and/or a Habitat Conservation Plan for the Dunes Sagebrush Lizard (Sceloporus arenicolus)*. Southwest Region: Albuquerque, NM. Sept. 30 (43 pp.). Available at: http://www.fws.gov/southwest/es/Documents/R2ES/Draft_EA_TX_CP_DSL_20110930.pdf.

²⁵ U.S. Fish and Wildlife Service (2010), *op. cit.*, 77810-11.

²⁶ *Ibid.*

²⁷ U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1996. *Habitat Conservation Planning and Incidental Take Permit Processing Handbook*. U.S. Dept. Interior and Commerce: Washington, D.C. Available at: <http://www.fws.gov/endangered/esa-library/index.html#hcp>.

²⁸ Texas Comptroller of Public Accounts, *op. cit.*, 18.