



January 21, 2014

Via Certified Mail Return Receipt Requested

Mike King, Executive Director
Colorado Department of Natural Resources
Executive Director's Office
1313 Sherman Street, Room 718
Denver, CO 80203

Dick Wolfe, State Engineer and Director
Colorado Division of Water Resources
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Denver, CO 80203

Craig Cotten, Division Engineer
Colorado Division of Water Resources
Division 3 Main Office
301 Murphy Drive
Alamosa, CO 81101

Sally Jewell, Secretary of the Interior
U.S. Department of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Daniel M. Ashe, Director
U.S. Fish and Wildlife Service
1849 C Street N.W.
Washington, D.C. 20240

Dr. Benjamin Tuggle, Regional Director
Southwest Regional Office
U.S. Fish and Wildlife Service
500 Gold Avenue SW
Albuquerque, NM 87102

RE: Notice of Intent to Sue the State of Colorado for Violations of the Endangered Species Act Related to its Administration, Distribution, and Regulation of Water in the Rio Grande Basin in Colorado

Dear Executive Director King, State Engineer Wolfe, Division Engineer Cotten, Secretary Jewell, Director Ashe and Regional Director Tuggle:

In accordance with the 60-day notice requirement of Section 11(g) of the Endangered Species Act (“ESA” or “Act”), 16 U.S.C. § 1540(g), you are hereby notified that WildEarth Guardians (“Guardians”) intends to bring a civil action against the State of Colorado, through the above-named officials¹ (hereinafter “State of Colorado” or “Colorado”) for violating section 9 of the ESA, 16 U.S.C. § 1538 and its implementing regulations by causing ongoing and imminent future “take” without a permit authorized by law of the endangered Rio Grande silvery minnow

¹ Under C.R.S. § 37-92-301(1) (2013), the state engineer is “responsible for the administration and distribution of the waters of the state, and, in each division, such administration and distribution shall be accomplished through the offices of the division engineer as specified in this article.”

(*Hybognathus amarus*) and/or Southwestern willow flycatcher (*Empidonax traillii extimus*) located in the middle Rio Grande² as the result of Colorado's administration, distribution, and regulation of the waters in the Rio Grande basin from its headwaters to the Colorado-New Mexico state line. The same activity also causes ongoing and imminent future "take" without a permit authorized by law of the endangered silvery minnow and/or willow flycatcher by destroying or adversely modifying their designated critical habitat as defined in 50 C.F.R. § 402.02. *See* 16 U.S.C. § 1538(g).

I. ESA Requirements

In 1973, Congress enacted the Endangered Species Act to provide "a program for the conservation of . . . endangered species and threatened species" and "a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved." 16 U.S.C. § 1531(b). In enacting the statute, the plain intent of Congress was "to halt and reverse the trend towards species extinction, whatever the cost." *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 184, 98 S.Ct. 2279 (1978).

Under the mandates of the Act, the Secretary of the Interior is responsible for promulgating regulations listing "endangered" and "threatened" species of animals and plants based on specific criteria listed in section 4(a)(1), and to designate "critical habitat" for the listed species. 16 U.S.C. § 1533. Section 9 of the ESA prohibits the "take" of all listed endangered species. 16 U.S.C. § 1538(a)(1)(B). The term "take" means "to harass, harm, . . . wound, kill, trap, [or] capture" an endangered species. *Id.* § 1532(19).

The terms "harass" and "harm" are further defined in the ESA's implementing regulations. "Harass" means "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." 50 C.F.R. § 17.3. "Harm" means "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." *Id.* "Congress intended to define 'take' in the 'broadest possible manner to include every conceivable way' in which any person could harm or kill wildlife." *See Aransas Project v. Shaw*, 930 F.Supp.2d 716, 726 (2013).

It is also unlawful for any "person" to "cause [an ESA violation] to be committed," and thus the ESA prohibits a governmental agency from authorizing any activity resulting in take. *See* 16 U.S.C. § 1538(g); *see also, e.g., Strahan v. Coxe*, 127 F.3d 155, 163 (1st Cir. 1997). "The ESA's prohibition against "takes" governs both the actions, and failure to act, by all "persons,"

² The "middle Rio Grande" is the region between Cochiti Dam in northern New Mexico and Elephant Butte Reservoir located in south central New Mexico.

including any “officer, employee, agent, department, or instrumentality of . . . any State.” *Aransas Project*, 930 F.Supp.2d at 726; 16 U.S.C. § 1532(13). Without a biological opinion and an incidental take statement from the U.S. Fish and Wildlife Service (“Service”) covering the activity’s take of an endangered species, an action agency is not authorized to “take” or jeopardize *any* members of that species.

The ESA provides for citizen enforcement of the provisions of the Act. To enforce the “take” prohibition of section 9, 16 U.S.C. § 1538(g), “any person may commence a civil suit on his own behalf . . . to enjoin any person, including the United States and any other governmental instrumentality or agency, who is alleged to be in violation of any provision of the this chapter.” 16 U.S.C. §1540(g)(1)(A). An injunction under section 9 of the ESA can be warranted upon a showing of “a reasonably certain threat of imminent harm” to a listed species. See *Forest Conservation Council v. Rosboro Lumber Co.*, 50 F.3d 781, 784 (9th Cir. 1995).

II. Factual Background

A. Listed Species Negatively Impacted by the State of Colorado’s Administration, Distribution and Regulation of Water in the Rio Grande Basin

i. Rio Grande Silvery Minnow (*Hybognathus amarus*)

The Rio Grande silvery minnow is a “small, relatively heavy-bodied minnow, round to ovate in cross-section, with moderately small eyes and a small, slightly oblique mouth.” See *Rio Grande Silvery Minnow Recovery Plan*, First Revision 2010 (Originally Approved on July 8, 1999) at 5. Adults reach about 4 inches in length and exhibit a light greenish-yellow color. *Id.* The silvery minnow is a “pelagic spawner that produces thousands of semibuoyant, non-adhesive eggs that passively drift while developing.” *Id.* at 6. Reproduction in the silvery minnow is triggered by and corresponds with high or peak spring flows that historically occurred in May or June as a result of snowmelt runoff. *Id.* at 7.

The silvery minnow was historically one of the most abundant and widespread species in the entire Rio Grande, occurring from Espanola, New Mexico to the Gulf of Mexico and in much of the Pecos River. *Id.* at 15. The silvery minnow has been extirpated from more than 95% of its historical range and today only occupies a 174-mile stretch of the river in the middle Rio Grande from Cochiti Dam and Elephant Butte Reservoir.³ *Id.* at 2.

The Service listed the Rio Grande silvery minnow as “endangered” under the ESA in 1994 and designated critical habitat for the entire reach of the middle Rio Grande in 1999. See 59

³ The silvery minnow was reintroduced into the Rio Grande near Big Bend, Texas in 2008. This population is considered “a nonessential, experimental population under section 10(j) of the ESA (73 FR 74357).” 2010 Recovery Plan at 16.

Fed. Reg. 36988 (7/20/94); 64 Fed. Reg. 36,274 (7/6/99). Pursuant to section 4(f) of the ESA, the Secretary of the Interior developed a recovery plan for the silvery minnow in 1999 and revised it in 2010. *See* 75 Fed. Reg. 7625 (2/22/10). The decline of the Rio Grande silvery minnow is attributable to the “destruction and modification of its habitat due to dewatering and diversion of water, water impoundment, and modification of the river (channelization)” among other factors. 2010 *Recovery Plan* at 2.

On May 6, 2013, the Service issued a draft “recommendation for water needed to support a wild silvery minnow population in the Middle Rio Grande” whereby a self-sustaining population could be achieved (“Hydrologic Objective”). *See U.S. Fish and Wildlife Service’s Hydrologic Objective* dated May 6, 2013 at 1. The Service’s recommendations are based on “the relationship between average density of silvery minnows measured over 20 years and associated hydrologic variables measured during those same years.” *Id.* Although the Hydrologic Objective focuses on the relationship between success of the silvery minnows and flow conditions, implementing the recommended flows in the Rio Grande would also benefit the flycatcher and help support flycatcher habitat and breeding territories.

The Service’s Hydrologic Objective focuses on two life stages of the silvery minnow reproduction (Age 0 Strategy) and survival (Age 1+ Strategy). The Service reports that 95% of the silvery minnow population in the middle Rio Grande is of the Age 0 class. *Id.* Reproduction of the silvery minnow is directly tied to the peak discharge including timing of flow, flow duration and flow magnitude. *Id.* The Service reached the following conclusions:

1. “Higher magnitude flow in spring results in more silvery minnows in fall.” *Id.* at 2. The following table shows the average densities of silvery minnow found in the fall based on the magnitude of flow in the spring:

Rate of Flow (cubic feet per second)	Average Density in Fall (silvery minnow/100m ²)
2500	~ 1.0
3300	~ 1.5
5400	~ 5.0

2. “Duration of overbank flooding (i.e., days of peak discharge > 2,500 cfs at Central gage) results in more silvery minnows.”⁴ *Id.* at 3.

⁴ The “Central gage” is more formally known as USGS Station No. 08330000, Rio Grande at Albuquerque, New Mexico and is located at Latitude 35°05'21", Longitude 106°40'50.5" in Bernalillo County, New Mexico.

Duration of Overbank Flooding (in excess of 2500 cfs at the Central gauge in NM)	Average Density in Fall (silvery minnow/100m ²)
15 days	~ 1.0
28 days	~ 1.5
68 days	~ 5.0

3. “Successful spawning, percent hatch, and rate of development is optimal in early to late May.” *Id.*

These correlations found by the Service indicate that for silvery minnows to successfully reproduce, the species needs high magnitude flows, for a longer duration that occur in the spring (ideally in May).

The Service also recommends that in years when no spring peak flow is generated “measures should be taken to reduce the extent and duration of drying.” *Id.* The Service found that similar to the relationship between peak flow and successful reproduction in the minnow “there is a significant relationship between the magnitude of flow measured at San Acacia Gage and the abundance of silvery minnows surveyed in fall.”⁵ *Id.* The following table shows the relationship between duration of low flow and number of silvery minnow:

Duration of Low Flow Days (i.e. <150 cfs at San Acacia gage in summer or <300 cf in winter)	Average Density in Fall (silvery minnow/100m ²)
98 days	~ 1.5
63 days	~ 3.0

Likewise, a correlation can be found between magnitude of river drying (i.e. miles of river drying or days <150 cfs at San Acacia gauge in summer or <300 cfs in winter) results in less silvery minnows:

Magnitude of River Drying	Average Density in Fall (silvery minnow/100m ²)
42 miles	~ 1.5
30 miles	~ 3.0

⁵ The “San Acacia gage” is also know as USGS Station No. 08354900, Rio Grande Floodway at San Acacia, New Mexico and is located at Latitude 34°15'23", Longitude 106°53'27" in Socorro County, New Mexico.

Id.

The Service's Hydrologic Object emphasizes that peak flows in May, of a certain magnitude and duration, and base flows in the river for the remainder of the summer are crucial to prevent significant habitat modification actually killing the minnow by impairing essential behavior patterns such as breeding, feeding or sheltering. The State of Colorado administers, distributes, and regulates water in a manner that is directly contrary to the needs of the endangered silvery minnow in the middle Rio Grande.

ii. Southwestern willow flycatcher (*Empidonax traillii extimus*)

The Southwestern willow flycatcher is a small migratory bird approximately six inches long, weighing about half an ounce. *See 2002 Southwestern Willow Flycatcher Final Recovery Plan* dated August 30, 2002 at 4. "It has a grayish-green back and wings, whitish throat, light grey-olive breast, and pale yellowish belly." *Id.* The willow flycatcher inhabits the streamside and wetland thickets of New Mexico, Arizona, west Texas, and southern portions of Nevada, Utah, California, and Colorado. *Id.* at 7. The willow flycatcher's breeding habitat includes "patchy to dense riparian habitats along streams or other wetlands, near or adjacent to surface water or underlain by saturated soil." *Id.* at 11.

On February 27, 1995, the Service listed the Southwestern willow flycatcher as endangered pursuant to section 4 of the ESA and designated critical habitat on July 22, 1997. *See 60 Fed. Reg. 10694 (2/27/95); 62 Fed. Reg. 39129 (7/22/97).* At the time of listing, the known flycatcher population was estimated between 300 and 500 pairs. *Id.* In its listing rule, the Service found that the Southwestern willow flycatcher is endangered by loss of habitat and population declines resulting in substantial part from human impacts on the species and its critical habitat. *Id.* These include adverse modifications of riparian habitat necessary for the breeding and successful reproduction of the flycatcher as a result of human development, channelization, changes in surface water hydrologic regimes, introduction of alien species, and other activities. *Id.* In 2002, the Secretary of the Interior released a recovery plan setting forth the measures necessary to recover the species. *See 2002 Southwestern Willow Flycatcher Final Recovery Plan.* The recovery plan indicates that the most severe loss of flycatchers and their habitat occurred in the Rio Grande valley. *Id.* at 31.

Flycatchers arrive on their breeding grounds in late April and May and the peak flows that benefit the minnow also promote flycatcher nesting habitat and breeding territories. Spring peak flows and base flows in the Rio Grande during the irrigation season are key factors for protecting and restoring habitat for the Southwestern willow flycatcher. The State of Colorado administers, distributes and regulates water in a manner that is directly contrary to the needs of the endangered Southwestern willow flycatcher in the middle Rio Grande.

B. Colorado's Administration, Distribution, and Regulation of Water in the Rio Grande Basin of Colorado Significantly Reduces the Magnitude and Duration of any Peak Flow in the Rio Grande in Central New Mexico

The Rio Grande exhibits a dynamic flow regime that historically would vary from year to year by an order-of-magnitude. U.S. Bureau of Reclamation, *West-Wide Climate Risk Assessment: Upper Rio Grande Impact Assessment*, dated December 2013 at 15. The unregulated annual flows at the Rio Grande gauge near Del Norte, Colorado⁶ ("Del Norte Gauge")—the gauge that measures the flows entering the basin from the southern Rocky Mountains—can fluctuate from fewer than 100,000 acre-feet to over 1,000,000 acre-feet. *Id.* at 16.

Sixty-five percent of the native flows in the Rio Grande originate from snowmelt and runoff from the headwaters of the San Juan Mountains of Colorado. *Id.* at 11. Prior to the modification of the natural hydrograph by the construction of dams, storage of water, and diversions for irrigated agriculture in the San Luis Valley, a significant spring peak flood flow occurred each year. Many of the native species that inhabit the Rio Grande evolved with and rely on the dynamic nature of the river for their survival, including the Rio Grande silvery minnow and Southwestern willow flycatcher.

The alteration and elimination of such a peak-flow in the Rio Grande threatens the survival and recovery of the silvery minnow and willow flycatcher in the middle Rio Grande. The State of Colorado's administration, distribution, and regulation of water in the southern Colorado plays a critical role in limiting the amount of water that is available to create a peak-flow in the spring of each year. A simple comparison of the flows measured at the Del Norte Gauge (upstream of the San Luis Valley) to the flows measured at the Rio Grande near Lobatos, Colorado gauge⁷ ("Lobatos Gauge") near the Colorado-New Mexico state line (downstream of the San Luis Valley) demonstrates the impact of irrigation in the San Luis Valley on spring peak flows on Rio Grande.

A table showing this comparison—including the daily average flows at each gauge (in cubic feet per second) from April 1 to May 31 for a five-year period from 2009 to 2013—is attached as **Exhibit A**. In addition to this gauge data, the table calculates the rate of flow consumed in the San Luis Valley, the percent of the total flows at the Del Norte Gauge that reach the Colorado-New Mexico state line (as measured at the Lobatos Gauge) on a daily basis, and the average delivery by Colorado during the months of April and May.⁸ As shown in the table,

⁶ USGS Station No. 08220000, Rio Grande near Del Norte, Colorado is located at Latitude 37°41'19.0", Longitude 106°27'35.5" in Rio Grande County, Colorado.

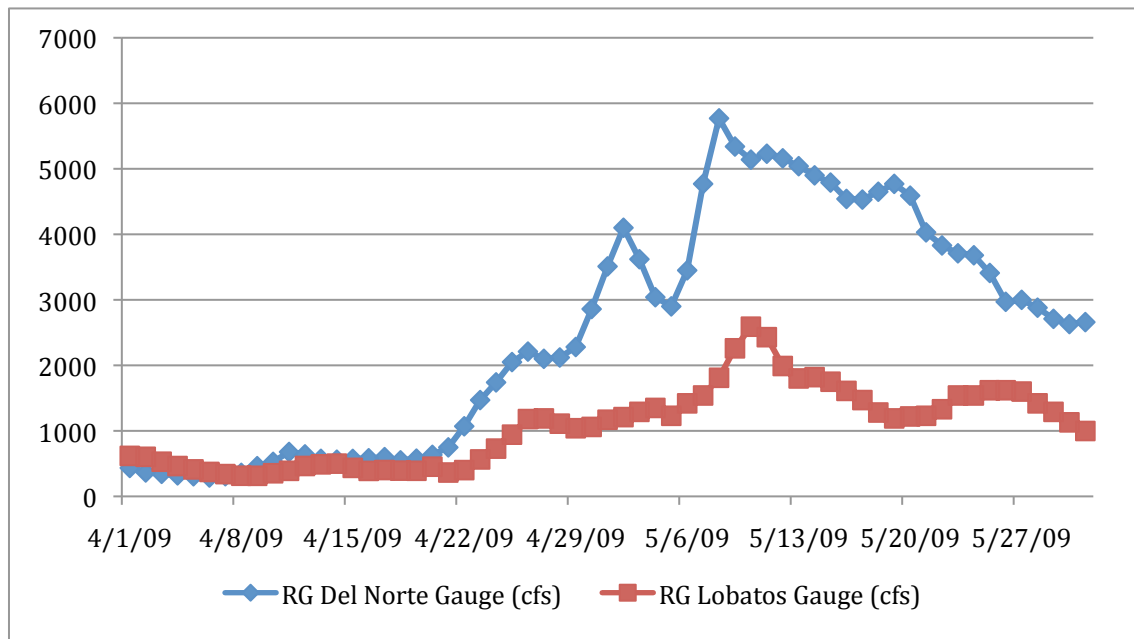
⁷ USGS Station No. 08251500, Rio Grande near Lobatos, Colorado is located at Latitude 37°04'43", Longitude 105°45'23" in Conejos County, Colorado.

⁸ Data from April 1 to May 31 was isolated because the natural peak flow in the hydrograph is developed and reached during that period. Any peak flow that occurs naturally or that is generated by modified

Colorado’s administration, distribution, and regulation of water in the basin is responsible for the depletion of a significant (at times up to 98 percent of the flows measured at the Del Norte Gauge failed to reach the Colorado-New Mexico state line) portion of the flows in the Rio Grande.

For example, in 2009, runoff in the Rio Grande basin was forecast as of April 1 to be 91 percent of average at the Del Norte Gauge, which is close to an average year. During the months of April and May in 2009, roughly 40 percent of the flows at the Del Norte Gauge were depleted before reaching the Lobatos Gauge near the state line. However, on certain days within the months of April and May, Colorado consumed nearly 75 percent of the flows measured at the Del Norte Gauge leaving only 25 percent of the headwaters’ flows at the state line. *See* May 19, 2009 data, showing measurement of 4,770 cfs at the Del Norte Gauge and 1190 cfs at the Lobatos Gauge (3,580 cfs was consumed in the San Luis Valley). A graphical representation of this 2009 data is included in **Figure 1**.

Figure 1. Comparison of Rio Grande Flows at Del Norte and Lobatos Gauges From April-May 2009



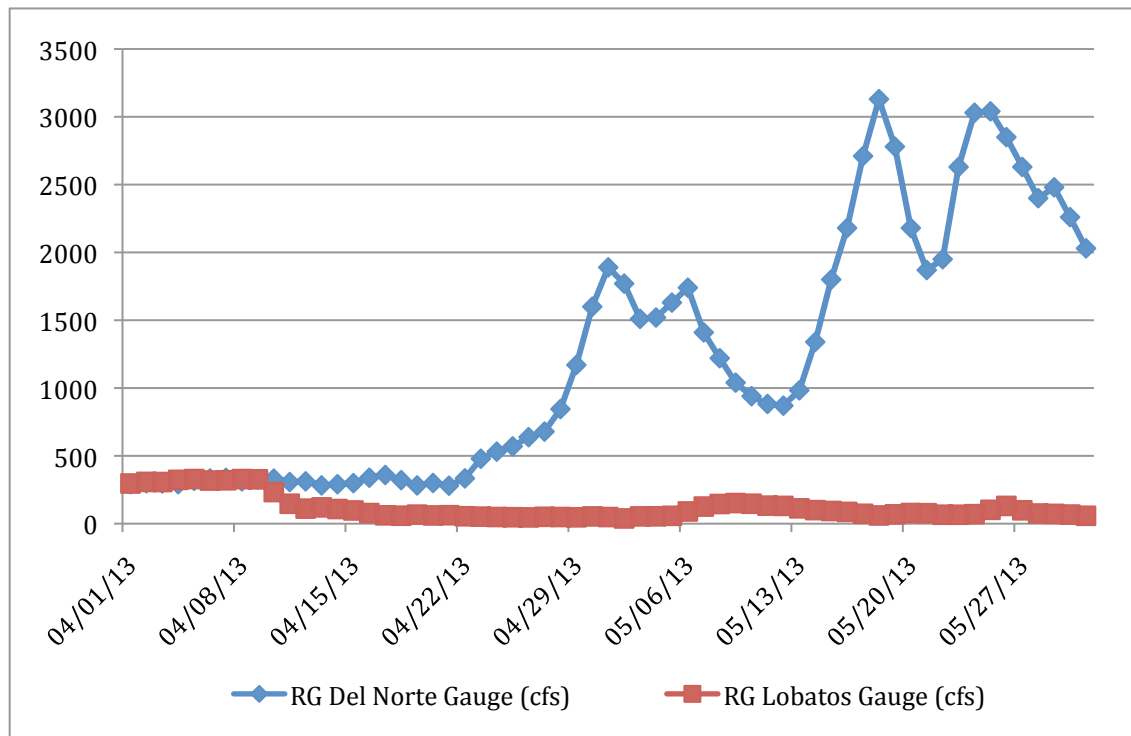
The impacts of irrigation in the San Luis Valley are even more pronounced in dry years on the Rio Grande. In 2013, the April 1 forecast at the Del Norte Gauge was 51 percent of

operations at Cochiti reservoir occurs during this period. Further, as discussed above, the silvery minnow and flycatcher rely on such a peak-flow in May to reproduce.

average. During the months of April and May of that year, on average 75 percent of the flows at the Del Norte Gauge were consumed by the San Luis Valley before reaching the Lobatos Gauge. However, the average numbers do not tell the whole story.

On May 18, 2013, the peak in the hydrograph at the Del Norte Gauge reached 3,130 cfs. The San Luis Valley consumed 98 percent of the flows (3,069 cfs) leaving only 2 percent (60 cfs)⁹ at the Lobatos Gauge. A graphical representation of this data is included in **Figure 2**. When 65 percent of native flows in the Rio Grande result from snowmelt runoff from the southern Rockies and 98 percent of that is consumed by irrigation in Colorado, no peak flow can occur naturally in the critical habitat of the minnow and flycatcher; nor could a peak flow be manufactured by modification of reservoir operations to store and release a peak flow because sufficient base flows in the river do not exist to either store water for later release or to carry water released from storage. Thus, in years of low flows—when endangered species in the basin need the water the most—Colorado is consuming nearly all of the water in the system.

Figure 2. Comparison of Rio Grande Flows at Del Norte and Lobatos Gauges From April-May 2013



⁹ The flow rate of 60 cubic feet per second for the entire day is equivalent to 120 acre-feet. As compared to the flow rate of 3,069 cubic feet per second consumed in the San Luis Valley that is equivalent to 6,087 acre-feet per day.

The administration of water rights by the State of Colorado under the priority system to maximize beneficial use is causing a severe depletion to the Rio Grande system. The only reason the San Luis Valley does not consume all of the water measured at the Del Norte Gauge is the State of Colorado's obligation to deliver a certain percentage of that water to the Colorado-New Mexico state line under the Rio Grande Compact of 1939 ("Compact").¹⁰ However, even considering the State of Colorado's obligations under the Compact, the State of Colorado's obligation to not "take" listed endangered species is a completely separate obligation above and beyond any agreement between the states of New Mexico, Texas and Colorado. Therefore, the State of Colorado cannot hide behind its compliance with the Compact as an excuse for not meeting its obligation to comply with the mandates of the ESA.

III. Violations of Section 9 of the ESA

Guardians hereby puts the State of Colorado on notice that it will promptly seek judicial relief if the State fails to remedy the ongoing and imminent future violations of the ESA. 16 U.S.C. §§ 1538(g).

Guardians hereby provides notice that the State of Colorado is violating section 9 of the ESA, 16 U.S.C. § 1538(g), and its implementing regulations by causing ongoing and imminent future "take" without a permit authorized by law of the endangered Rio Grande silvery minnow and/or Southwestern willow flycatcher as the result of Colorado's administration, distribution, and regulation of water in the Rio Grande basin in Colorado.

Guardians hereby provides notice that the State of Colorado is violating section 9 of the ESA, 16 U.S.C. § 1538(g), and its implementing regulations by causing ongoing and imminent future "take" without a permit authorized by law of the endangered Rio Grande silvery minnow and/or Southwestern willow flycatcher by destroying or adversely modifying critical habitat of the listed species as defined in 50 C.F.R. § 402.02.

¹⁰ On March 18, 1938, the states of Colorado, New Mexico and Texas entered into the Rio Grande Compact in an effort to remove controversy among the states and allocate waters of the Rio Grande located above Ft. Quitman, Texas. Congress approved the Compact in 1939. Article III of the Rio Grande Compact establishes Colorado's annual "obligation to deliver water in the Rio Grande to the Colorado-New Mexico State line." The Compact provides a process for calculating Colorado's delivery obligation in each calendar year based on a sliding scale. Colorado's delivery obligation is very small under the Compact when flows are low, but its delivery obligation increases exponentially as the flows into the system increase. The State of Colorado, however, does not have an obligation to deliver its annual obligation in a way that represents the historic flow regime. Thus, even under the Compact, Colorado attempts to deliver as much of its annual obligation as possible during the non-irrigation season, thus diminishing any chance for a peak flow as would have occurred historically.

IV. Noticing Party

WildEarth Guardians is a non-profit, public interest, environmental advocacy, and conservation organization. Guardians' mission is to protect and restore wildlife, wild rivers, and wild places in the American West. Guardians has over 43,000 members and activists, many of whom live, work, and recreate in areas affected by the ESA violations described herein. Guardians and its members have a substantial interest in the conservation and recovery of the Rio Grande silvery minnow, Southwestern willow flycatcher, and other listed species in the middle Rio Grande and are adversely affected by the State of Colorado's failure to protect the listed species and their habitat in compliance with the ESA.

The name, address and telephone number of the party giving this notice is as follows:

WildEarth Guardians
516 Alto Street
Santa Fe, New Mexico 87501
(303) 884-2702
jpelz@wildearthguardians.org

V. Conclusion

One of the purposes of the ESA citizen suit provision, 16 U.S.C. § 1540(g), is to encourage discussions among parties in order to avoid potential litigation. We encourage the State of Colorado to seriously consider the concerns detailed in this notice and ask that you discuss the steps the State may taken going forward to remedy these legal violations. However, if the aforementioned violations of the ESA are not remedied within 60 days of the date of this letter, we intend to file a citizen's suit in federal court seeking preliminary and permanent injunctive relief, declaratory relief, and attorneys' fees and costs concerning these violations. If you believe any of the above information is incorrect, have any additional information that might help avoid litigation, or wish to discuss this matter further, please feel free to contact me at the phone or email address listed below.

Sincerely,

Jen Pelz
Wild Rivers Program Director
jpelz@wildearthguardians.org
303-884-2702

EXHIBIT A
2009-2013 Comparison of Daily Average Flows in Rio Grande
From April 1 to May 31

DATE	RG DEL NORTE (Daily Average)	RG LOBATOS (Daily Average)	(Del Norte - Lobatos)	% Remaining @ CO-NM State Line	AVG % Remaining/ Annual Peak
4/1/09 0:00	434	618	-184	142.40%	58.87%
4/2/09 0:00	365	604	-239	165.48%	
4/3/09 0:00	344	529	-185	153.78%	
4/4/09 0:00	321	463	-142	144.24%	
4/5/09 0:00	307	412	-105	134.20%	
4/6/09 0:00	288	373	-85	129.51%	
4/7/09 0:00	308	340	-32	110.39%	
4/8/09 0:00	359	315	44	87.74%	
4/9/09 0:00	461	314	147	68.11%	
4/10/09 0:00	527	353	174	66.98%	
4/11/09 0:00	678	390	288	57.52%	
4/12/09 0:00	641	464	177	72.39%	
4/13/09 0:00	573	489	84	85.34%	
4/14/09 0:00	560	500	60	89.29%	
4/15/09 0:00	572	435	137	76.05%	
4/16/09 0:00	582	389	193	66.84%	
4/17/09 0:00	599	402	197	67.11%	
4/18/09 0:00	550	393	157	71.45%	
4/19/09 0:00	576	391	185	67.88%	
4/20/09 0:00	634	453	181	71.45%	
4/21/09 0:00	748	364	384	48.66%	
4/22/09 0:00	1070	401	669	37.48%	
4/23/09 0:00	1470	564	906	38.37%	
4/24/09 0:00	1740	729	1011	41.90%	
4/25/09 0:00	2050	942	1108	45.95%	
4/26/09 0:00	2210	1180	1030	53.39%	
4/27/09 0:00	2100	1190	910	56.67%	
4/28/09 0:00	2120	1110	1010	52.36%	
4/29/09 0:00	2280	1040	1240	45.61%	
4/30/09 0:00	2860	1060	1800	37.06%	
5/1/09 0:00	3510	1170	2340	33.33%	
5/2/09 0:00	4100	1210	2890	29.51%	
5/3/09 0:00	3620	1290	2330	35.64%	
5/4/09 0:00	3040	1350	1690	44.41%	

5/5/09 0:00	2900	1230	1670	42.41%	
5/6/09 0:00	3450	1420	2030	41.16%	
5/7/09 0:00	4770	1540	3230	32.29%	
5/8/09 0:00	5770	1810	3960	31.37%	PEAK
5/9/09 0:00	5340	2260	3080	42.32%	
5/10/09 0:00	5140	2590	2550	50.39%	
5/11/09 0:00	5230	2430	2800	46.46%	
5/12/09 0:00	5160	1990	3170	38.57%	
5/13/09 0:00	5040	1800	3240	35.71%	
5/14/09 0:00	4900	1820	3080	37.14%	
5/15/09 0:00	4790	1750	3040	36.53%	
5/16/09 0:00	4540	1610	2930	35.46%	
5/17/09 0:00	4530	1470	3060	32.45%	
5/18/09 0:00	4650	1280	3370	27.53%	
5/19/09 0:00	4770	1190	3580	24.95%	
5/20/09 0:00	4590	1220	3370	26.58%	
5/21/09 0:00	4030	1230	2800	30.52%	
5/22/09 0:00	3830	1330	2500	34.73%	
5/23/09 0:00	3710	1540	2170	41.51%	
5/24/09 0:00	3680	1540	2140	41.85%	
5/25/09 0:00	3410	1620	1790	47.51%	
5/26/09 0:00	2970	1620	1350	54.55%	
5/27/09 0:00	3000	1600	1400	53.33%	
5/28/09 0:00	2880	1420	1460	49.31%	
5/29/09 0:00	2710	1290	1420	47.60%	
5/30/09 0:00	2630	1130	1500	42.97%	
5/31/09 0:00	2660	998	1662	37.52%	
4/1/10 0:00	623	718	-95	115.25%	56.93%
4/2/10 0:00	514	826	-312	160.70%	
4/3/10 0:00	427	852	-425	199.53%	
4/4/10 0:00	316	766	-450	242.41%	
4/5/10 0:00	353	695	-342	196.88%	
4/6/10 0:00	381	609	-228	159.84%	
4/7/10 0:00	336	498	-162	148.21%	
4/8/10 0:00	471	446	25	94.69%	
4/9/10 0:00	564	403	161	71.45%	
4/10/10 0:00	725	411	314	56.69%	
4/11/10 0:00	905	522	383	57.68%	
4/12/10 0:00	1120	649	471	57.95%	
4/13/10 0:00	1200	777	423	64.75%	
4/14/10 0:00	1030	1100	-70	106.80%	
4/15/10 0:00	1140	827	313	72.54%	

4/16/10 0:00	1430	691	739	48.32%	
4/17/10 0:00	1800	758	1042	42.11%	
4/18/10 0:00	1870	850	1020	45.45%	
4/19/10 0:00	1880	1110	770	59.04%	
4/20/10 0:00	1840	1070	770	58.15%	
4/21/10 0:00	2190	970	1220	44.29%	
4/22/10 0:00	2690	1110	1580	41.26%	
4/23/10 0:00	2430	1340	1090	55.14%	
4/24/10 0:00	1670	1300	370	77.84%	
4/25/10 0:00	1360	894	466	65.74%	
4/26/10 0:00	1300	768	532	59.08%	
4/27/10 0:00	1460	783	677	53.63%	
4/28/10 0:00	1760	817	943	46.42%	
4/29/10 0:00	1990	868	1122	43.62%	
4/30/10 0:00	1590	969	621	60.94%	
5/1/10 0:00	1320	828	492	62.73%	
5/2/10 0:00	1170	657	513	56.15%	
5/3/10 0:00	1040	596	444	57.31%	
5/4/10 0:00	1130	555	575	49.12%	
5/5/10 0:00	1590	500	1090	31.45%	
5/6/10 0:00	2480	476	2004	19.19%	
5/7/10 0:00	2400	565	1835	23.54%	
5/8/10 0:00	2500	670	1830	26.80%	
5/9/10 0:00	2600	641	1959	24.65%	
5/10/10 0:00	3150	654	2496	20.76%	
5/11/10 0:00	2970	772	2198	25.99%	
5/12/10 0:00	2910	728	2182	25.02%	
5/13/10 0:00	2520	623	1897	24.72%	
5/14/10 0:00	2040	547	1493	26.81%	
5/15/10 0:00	1890	487	1403	25.77%	
5/16/10 0:00	1960	470	1490	23.98%	
5/17/10 0:00	2530	462	2068	18.26%	
5/18/10 0:00	3410	503	2907	14.75%	
5/19/10 0:00	3150	554	2596	17.59%	
5/20/10 0:00	2680	521	2159	19.44%	
5/21/10 0:00	3130	459	2671	14.66%	
5/22/10 0:00	4100	450	3650	10.98%	
5/23/10 0:00	4280	517	3763	12.08%	
5/24/10 0:00	3890	849	3041	21.83%	
5/25/10 0:00	2950	1050	1900	35.59%	
5/26/10 0:00	2520	904	1616	35.87%	
5/27/10 0:00	2960	698	2262	23.58%	

5/28/10 0:00	4090	673	3417	16.45%	
5/29/10 0:00	4980	1150	3830	23.09%	PEAK
5/30/10 0:00	4720	1600	3120	33.90%	
5/31/10 0:00	4090	1820	2270	44.50%	
4/1/11 0:00	362	146	216	40.33%	18.49%
4/2/11 0:00	467	113	354	24.20%	
4/3/11 0:00	578	99.8	478.2	17.27%	
4/4/11 0:00	516	97.2	418.8	18.84%	
4/5/11 0:00	476	154	322	32.35%	
4/6/11 0:00	528	101	427	19.13%	
4/7/11 0:00	588	83.1	504.9	14.13%	
4/8/11 0:00	549	67.8	481.2	12.35%	
4/9/11 0:00	501	77.5	423.5	15.47%	
4/10/11 0:00	455	79.5	375.5	17.47%	
4/11/11 0:00	416	62.6	353.4	15.05%	
4/12/11 0:00	418	65.5	352.5	15.67%	
4/13/11 0:00	388	73.5	314.5	18.94%	
4/14/11 0:00	404	70.2	333.8	17.38%	
4/15/11 0:00	402	59.6	342.4	14.83%	
4/16/11 0:00	402	56.4	345.6	14.03%	
4/17/11 0:00	480	58	422	12.08%	
4/18/11 0:00	672	58.4	613.6	8.69%	
4/19/11 0:00	908	63.2	844.8	6.96%	
4/20/11 0:00	948	149	799	15.72%	
4/21/11 0:00	973	262	711	26.93%	
4/22/11 0:00	969	193	776	19.92%	
4/23/11 0:00	932	174	758	18.67%	
4/24/11 0:00	932	179	753	19.21%	
4/25/11 0:00	845	168	677	19.88%	
4/26/11 0:00	801	150	651	18.73%	
4/27/11 0:00	724	129	595	17.82%	
4/28/11 0:00	665	126	539	18.95%	
4/29/11 0:00	666	125	541	18.77%	
4/30/11 0:00	634	112	522	17.67%	
5/1/11 0:00	614	124	490	20.20%	
5/2/11 0:00	560	158	402	28.21%	
5/3/11 0:00	540	182	358	33.70%	
5/4/11 0:00	521	202	319	38.77%	
5/5/11 0:00	539	193	346	35.81%	
5/6/11 0:00	618	178	440	28.80%	
5/7/11 0:00	769	190	579	24.71%	
5/8/11 0:00	1130	213	917	18.85%	

5/9/11 0:00	1480	295	1185	19.93%	
5/10/11 0:00	1390	327	1063	23.53%	
5/11/11 0:00	1320	272	1048	20.61%	
5/12/11 0:00	1110	284	826	25.59%	
5/13/11 0:00	1040	239	801	22.98%	
5/14/11 0:00	1280	221	1059	17.27%	
5/15/11 0:00	1620	232	1388	14.32%	
5/16/11 0:00	2220	248	1972	11.17%	
5/17/11 0:00	2520	272	2248	10.79%	
5/18/11 0:00	2190	285	1905	13.01%	
5/19/11 0:00	1830	295	1535	16.12%	
5/20/11 0:00	1480	245	1235	16.55%	
5/21/11 0:00	1290	222	1068	17.21%	
5/22/11 0:00	1230	202	1028	16.42%	
5/23/11 0:00	1300	196	1104	15.08%	
5/24/11 0:00	1410	195	1215	13.83%	
5/25/11 0:00	1400	233	1167	16.64%	
5/26/11 0:00	1600	230	1370	14.38%	
5/27/11 0:00	2060	220	1840	10.68%	
5/28/11 0:00	2790	222	2568	7.96%	
5/29/11 0:00	3780	250	3530	6.61%	
5/30/11 0:00	4110	358	3752	8.71%	PEAK
5/31/11 0:00	3520	421	3099	11.96%	
4/1/12 0:00	1630	895	735	54.91%	14.43%
4/2/12 0:00	1570	876	694	55.80%	
4/3/12 0:00	1270	814	456	64.09%	
4/4/12 0:00	1040	431	609	41.44%	
4/5/12 0:00	998	272	726	27.25%	
4/6/12 0:00	1090	208	882	19.08%	
4/7/12 0:00	1100	168	932	15.27%	
4/8/12 0:00	1120	145	975	12.95%	
4/9/12 0:00	1210	123	1087	10.17%	
4/10/12 0:00	1380	166	1214	12.03%	
4/11/12 0:00	1720	187	1533	10.87%	
4/12/12 0:00	1870	209	1661	11.18%	
4/13/12 0:00	1520	240	1280	15.79%	
4/14/12 0:00	1260	227	1033	18.02%	
4/15/12 0:00	1080	207	873	19.17%	
4/16/12 0:00	975	174	801	17.85%	
4/17/12 0:00	870	192	678	22.07%	
4/18/12 0:00	794	214	580	26.95%	
4/19/12 0:00	795	170	625	21.38%	

4/20/12 0:00	802	172	630	21.45%	
4/21/12 0:00	927	176	751	18.99%	
4/22/12 0:00	1110	176	934	15.86%	
4/23/12 0:00	1460	194	1266	13.29%	
4/24/12 0:00	1870	227	1643	12.14%	
4/25/12 0:00	2240	237	2003	10.58%	
4/26/12 0:00	2470	224	2246	9.07%	
4/27/12 0:00	2650	256	2394	9.66%	
4/28/12 0:00	2350	285	2065	12.13%	
4/29/12 0:00	2000	314	1686	15.70%	
4/30/12 0:00	1700	303	1397	17.82%	
5/1/12 0:00	1730	238	1492	13.76%	
5/2/12 0:00	1780	171	1609	9.61%	
5/3/12 0:00	1970	175	1795	8.88%	
5/4/12 0:00	2250	170	2080	7.56%	
5/5/12 0:00	2590	178	2412	6.87%	
5/6/12 0:00	2850	194	2656	6.81%	
5/7/12 0:00	2890	197	2693	6.82%	PEAK
5/8/12 0:00	2590	214	2376	8.26%	
5/9/12 0:00	2440	249	2191	10.20%	
5/10/12 0:00	2280	224	2056	9.82%	
5/11/12 0:00	2350	173	2177	7.36%	
5/12/12 0:00	2430	170	2260	7.00%	
5/13/12 0:00	2420	196	2224	8.10%	
5/14/12 0:00	2300	218	2082	9.48%	
5/15/12 0:00	2220	203	2017	9.14%	
5/16/12 0:00	2250	184	2066	8.18%	
5/17/12 0:00	2450	151	2299	6.16%	
5/18/12 0:00	2550	150	2400	5.88%	
5/19/12 0:00	2490	186	2304	7.47%	
5/20/12 0:00	2440	170	2270	6.97%	
5/21/12 0:00	2500	147	2353	5.88%	
5/22/12 0:00	2650	130	2520	4.91%	
5/23/12 0:00	2850	124	2726	4.35%	
5/24/12 0:00	2740	143	2597	5.22%	
5/25/12 0:00	2350	156	2194	6.64%	
5/26/12 0:00	2130	150	1980	7.04%	
5/27/12 0:00	1970	138	1832	7.01%	
5/28/12 0:00	1670	122	1548	7.31%	
5/29/12 0:00	1360	136	1224	10.00%	
5/30/12 0:00	1260	162	1098	12.86%	
5/31/12 0:00	1370	157	1213	11.46%	

4/1/13 0:00	291	296	-5	101.72%	25.56%
4/2/13 0:00	298	308	-10	103.36%	
4/3/13 0:00	297	307	-10	103.37%	
4/4/13 0:00	291	323	-32	111.00%	
4/5/13 0:00	316	329	-13	104.11%	
4/6/13 0:00	333	318	15	95.50%	
4/7/13 0:00	338	320	18	94.67%	
4/8/13 0:00	312	329	-17	105.45%	
4/9/13 0:00	325	327	-2	100.62%	
4/10/13 0:00	332	233	99	70.18%	
4/11/13 0:00	307	147	160	47.88%	
4/12/13 0:00	312	111	201	35.58%	
4/13/13 0:00	282	120	162	42.55%	
4/14/13 0:00	291	108	183	37.11%	
4/15/13 0:00	299	97.3	201.7	32.54%	
4/16/13 0:00	339	78.1	260.9	23.04%	
4/17/13 0:00	359	61.6	297.4	17.16%	
4/18/13 0:00	321	58.6	262.4	18.26%	
4/19/13 0:00	282	66.7	215.3	23.65%	
4/20/13 0:00	300	60.7	239.3	20.23%	
4/21/13 0:00	280	62.4	217.6	22.29%	
4/22/13 0:00	334	54.5	279.5	16.32%	
4/23/13 0:00	479	51.8	427.2	10.81%	
4/24/13 0:00	531	49.1	481.9	9.25%	
4/25/13 0:00	570	47.5	522.5	8.33%	
4/26/13 0:00	638	46.3	591.7	7.26%	
4/27/13 0:00	679	50.6	628.4	7.45%	
4/28/13 0:00	845	49	796	5.80%	
4/29/13 0:00	1170	46.8	1123.2	4.00%	
4/30/13 0:00	1600	53.4	1546.6	3.34%	
5/1/13 0:00	1890	48.8	1841.2	2.58%	
5/2/13 0:00	1770	38.5	1731.5	2.18%	
5/3/13 0:00	1510	53.7	1456.3	3.56%	
5/4/13 0:00	1520	54.2	1465.8	3.57%	
5/5/13 0:00	1630	57.8	1572.2	3.55%	
5/6/13 0:00	1740	90	1650	5.17%	
5/7/13 0:00	1410	126	1284	8.94%	
5/8/13 0:00	1220	145	1075	11.89%	
5/9/13 0:00	1040	152	888	14.62%	
5/10/13 0:00	940	147	793	15.64%	
5/11/13 0:00	883	133	750	15.06%	
5/12/13 0:00	870	131	739	15.06%	

5/13/13 0:00	983	113	870	11.50%	
5/14/13 0:00	1340	99.8	1240.2	7.45%	
5/15/13 0:00	1800	93.5	1706.5	5.19%	
5/16/13 0:00	2180	86.9	2093.1	3.99%	
5/17/13 0:00	2710	72.9	2637.1	2.69%	
5/18/13 0:00	3130	60.4	3069.6	1.93%	PEAK
5/19/13 0:00	2780	68.6	2711.4	2.47%	
5/20/13 0:00	2180	78.5	2101.5	3.60%	
5/21/13 0:00	1870	77	1793	4.12%	
5/22/13 0:00	1950	66	1884	3.38%	
5/23/13 0:00	2630	65.9	2564.1	2.51%	
5/24/13 0:00	3030	70.1	2959.9	2.31%	
5/25/13 0:00	3040	102	2938	3.36%	
5/26/13 0:00	2850	131	2719	4.60%	
5/27/13 0:00	2630	98.5	2531.5	3.75%	
5/28/13 0:00	2400	74.9	2325.1	3.12%	
5/29/13 0:00	2480	72.2	2407.8	2.91%	
5/30/13 0:00	2260	67.2	2192.8	2.97%	
5/31/13 0:00	2030	58.2	1971.8	2.87%	