

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST, ARIZONA



Cattle grazing along the edge of the Blue River in the Red Hill Allotment

**PREPARED BY THE CENTER FOR BIOLOGICAL DIVERSITY
DECEMBER, 2018**



Because life is good.

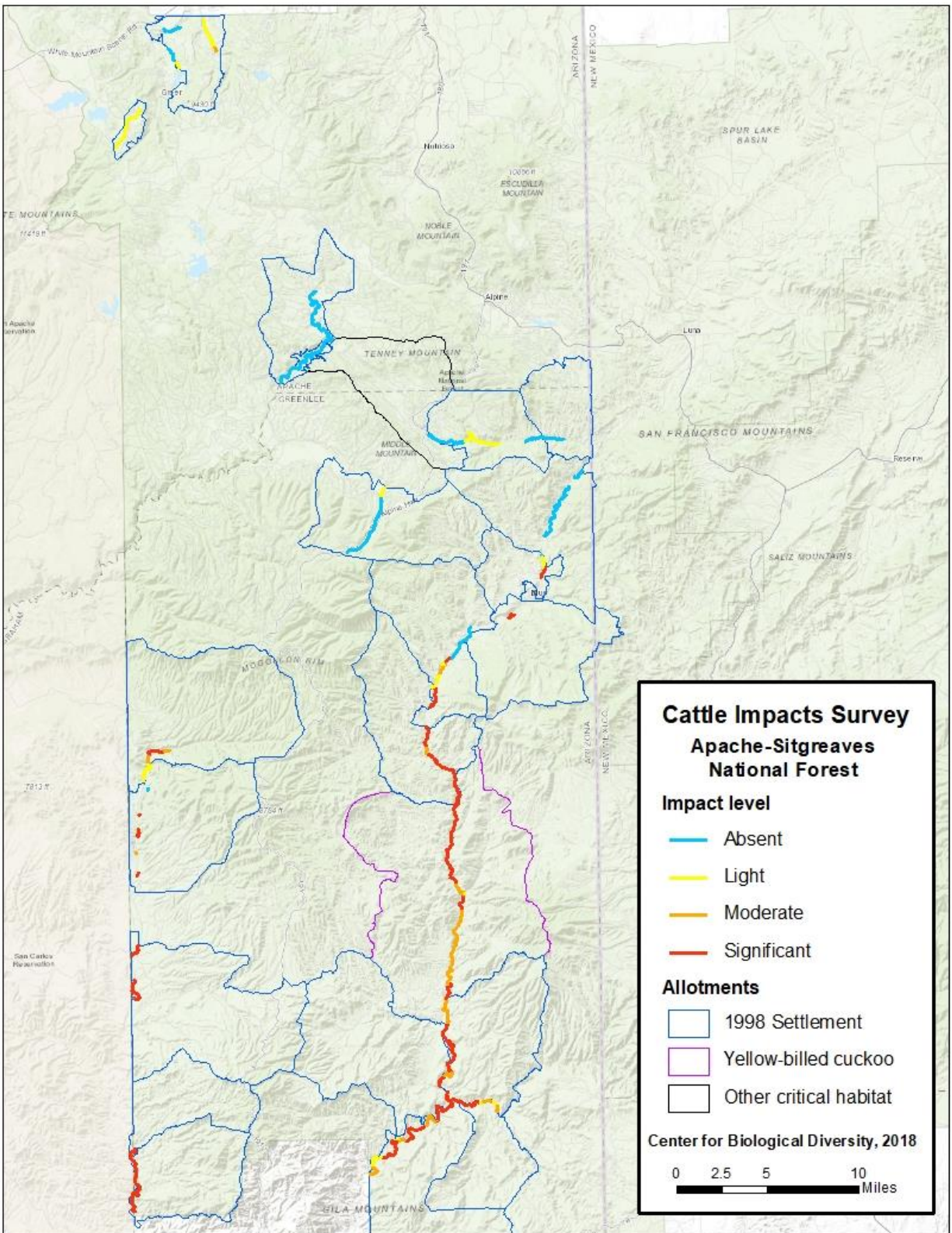
BACKGROUND

Federal public lands in the Southwest harbor incredible biological diversity, including many threatened or endangered species dependent on healthy riparian habitat. Preservation of these species and protection of these federal lands is of significant public interest. Since our founding, the Center for Biological Diversity has led efforts to reform overgrazing on public lands, particularly as it relates to the health of critical habitat. One of our significant court challenges was a 1997 suit arguing that the Forest Service had failed to consider the effects of grazing on seven imperiled species including the southwestern willow flycatcher (SWWF), Mexican spotted owl, spikedace, Apache trout, and loach minnow. In 1998, a settlement agreement emerged from this legal challenge, *Southwest Center for Biological Diversity v. U.S. Forest Service* (D. Ariz. CV-97-TUC-JMR), resulting in an order to remove cattle from hundreds of stream miles across the southwest, including streams on 19 allotments in the Apache-Sitgreaves National Forest. Consistent with NEPA and the ESA, these grazing enclosures should remain in place unless additional analysis deems them unnecessary.

Commitments made by the Forest Service resulted in the construction of extensive enclosure fencing and agreements with permittees to remove cattle from these areas. Following these measures, rapid establishment of streamside grasses, cottonwoods in flood channels, and willow recruitment along the riparian habitat occurred throughout the enclosure areas. This led to a much needed process of restoration across many miles of critical riparian habitat. Within the past several years, however, there has been a noticeable increase in trespass cattle in areas closed to livestock. Increasing anecdotal evidence of heavy grazing impacts along certain reaches of both the Blue and San Francisco Rivers and Eagle Creek has been reported. Concerns about the slow rate of ecosystem recovery in other areas raised the question of whether cattle are truly absent from riparian areas purportedly excluded from grazing. These multiple lines of anecdotal evidence convinced the Center that an immediate, comprehensive assessment of riparian areas supposedly excluded from grazing was warranted. Subsequently, in 2018, twenty allotments in the Apache-Sitgreaves National Forest were surveyed for current cattle impacts.

Recent Forest Service documentation suggests that riparian enclosures are intact and functional. For example, the Wildbunch Allotment Environmental Assessment states or implies several dozen times that enclosures are successfully in effect on the Blue River. Likewise, the Stateline Range Environmental Assessment continues to advance the false narrative that enclosures are in working order on up to fourteen allotments across the Gila and Apache-Sitgreaves National Forest. Unfortunately, discrepancies between these statements and the conditions on the ground are substantial, and this report provides the hard evidence that must be acknowledged by the Forest Service.

OVERVIEW MAP OF ALLOTMENTS SURVEYED IN APACHE-SITGREAVES NATIONAL FOREST



ASSESSMENT OVERVIEW

The purpose of this rapid assessment was to determine if cattle are present within riparian areas excluded from grazing on grazing allotments in the Apache Sitgreaves-National Forest, and to document the extent and intensity of impacts from cattle grazing across these riparian ecosystems. Further objectives were to quantitatively evaluate these impacts in six specific categories using a rapid assessment survey based on accepted methodologies (see Literature Consulted section), document these data with georeferenced photographs, and map the overall impact levels of cattle throughout the allotment drainages.

In 2018, we surveyed twenty allotments across the Apache Sitgreaves-National Forest. Nineteen of these allotments were included in the 1998 grazing settlement agreement, which stipulated installation and monitoring of riparian exclusions for endangered species protection. Four of the nineteen also contain proposed yellow billed cuckoo critical habitat, which has occurred since the 1998 settlement. One additional allotment with yellow billed cuckoo or other critical habitat was surveyed which was not part of the 1998 settlement.

RESULTS SUMMARY

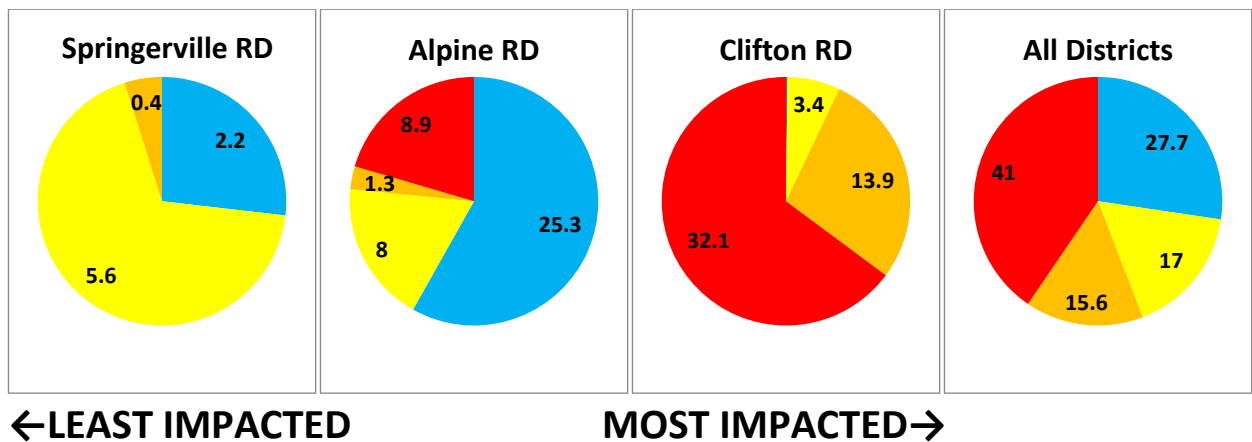
This report contains a summary of results across all allotments surveyed, individual descriptions and maps for each allotment, and hyperlinked photos to specific cattle impacts observed. All the data is stored in a GIS database containing hundreds of additional photographs. A thorough explanation of survey methods is included at the end of this report in the Methods section. In total, data was collected for 101.1 linear miles of stream and riparian habitats. Results showed that 27.7 miles of riparian habitat were absent of any cattle impact, 17 miles showed light impacts, 15.6 miles had moderate levels of impact and 41 miles were deemed to have significant negative impacts from cattle. We've determined that harmful cattle impacts exist in all three Apache Sitgreaves-National Forest districts that were surveyed, and in 80% of all of the allotments surveyed (see Tables 1 and 2). Cattle signs were recent in over half of the allotments and cattle were seen and documented in restricted riparian areas in 11 out of the 20 allotments. In almost half of all riparian areas surveyed, there is intense pressure on native grasses resulting in their replacement with non-palatable invasive plants. Soil compaction and denuded soils are widespread across these impacted landscapes and trampled streambanks are common. Browsing pressure by cattle is suppressing woody plant regeneration along the majority of surveyed waterways, thus preventing the natural renewal of critical wildlife habitats and threatening the recovery of several listed species. By far the most severely impacted streams are on the Clifton Ranger District, especially the Blue and San Francisco Rivers and Eagle Creek.

**TABLE 1. OVERALL SURVEY MILES OF CATTLE IMPACTS*
ON THE APACHE SITGREAVES NATIONAL FOREST BY DISTRICT.**

Ranger District	Miles Rated "Absent"	Miles Rated "Light"	Miles Rated "Moderate"	Miles Rated "Significant"	Total Miles Surveyed
Springerville	2.2	5.6	0.4	0	8.2
Alpine	25.3	8.0	1.3	8.9	43.5
Clifton	0.1	3.4	13.9	32.1	49.5
TOTAL	27.7	17	15.6	41.0	101.1

*See methods section for specific grazing impact category descriptions and weighting table used to calculate overall level of impact ratings.

MILES RATED BY SEVERITY LEVELS ACROSS RANGER DISTRICTS



MILES RATED BY SEVERITY LEVELS ACROSS PRIMARY RIVERS AND THEIR TRIBUTARIES

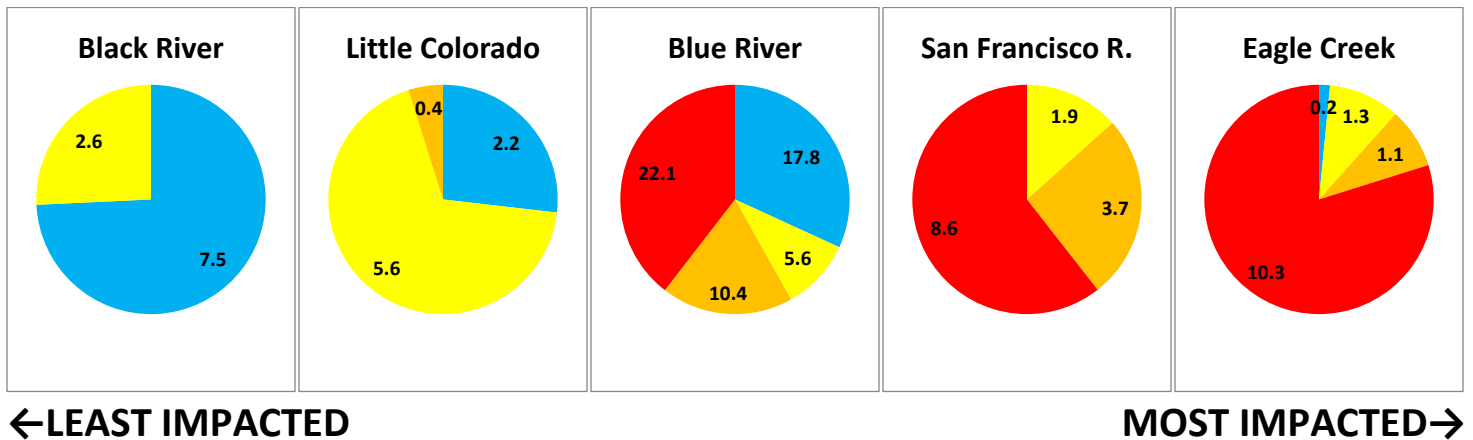


TABLE 2. APACHE SITGREAVES NATIONAL FOREST RANGER DISTRICTS AND MILES OF CATTLE IMPACTS IN INDIVIDUAL ALLOTMENTS.

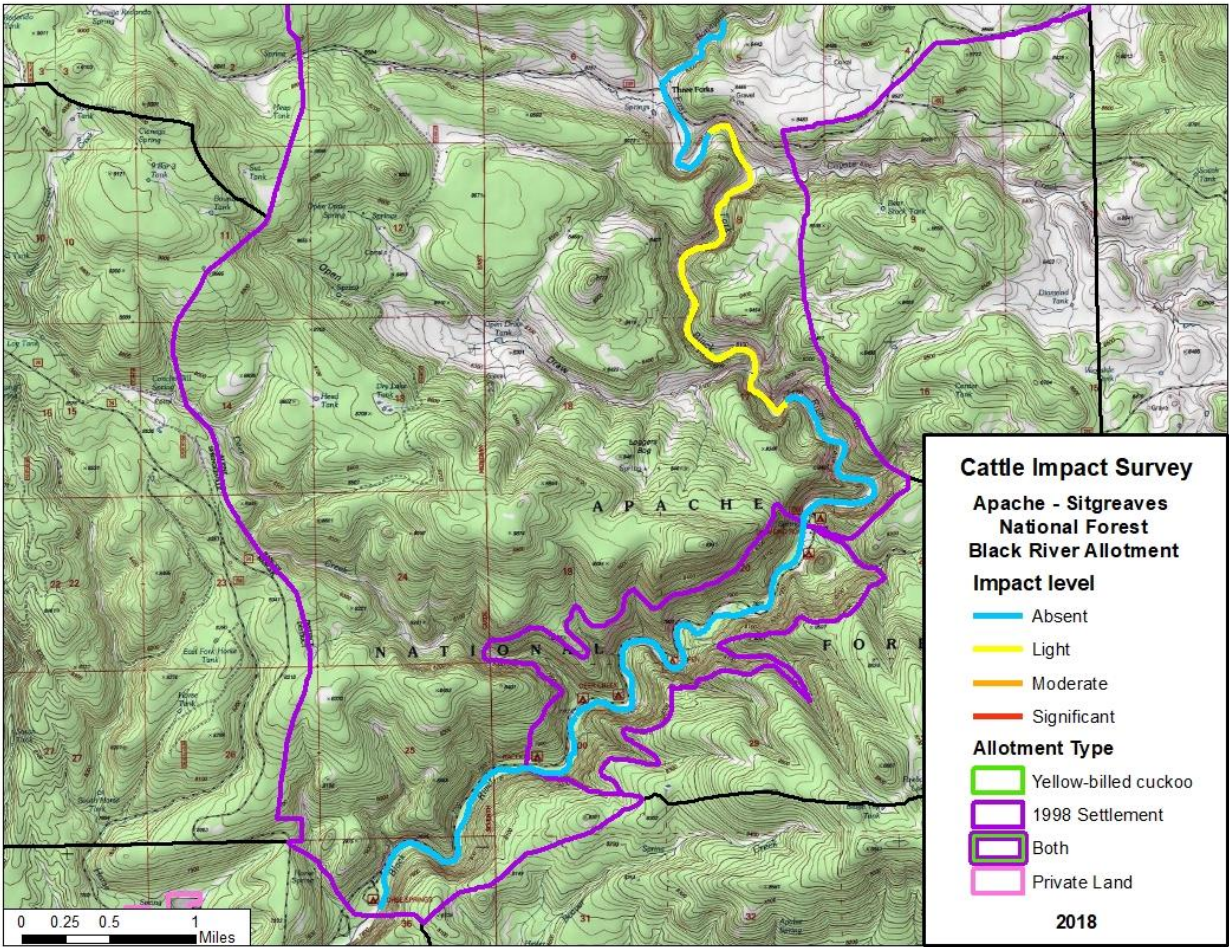
Ranger District	Grazing Allotment	Primary Drainage	Miles Rated:				Total Miles
			Absent	Light	Moderate	Significant	
Alpine 43.5 miles total	Black River	N. & E. Fork Black River, Boneyard Ck.	7.5	2.6			10.1
	Bobcat Johnson	Blue River	5.8				5.8
	Cow flat	Blue River				0.6	0.6
	Fishhook-Steeple Mesa	Blue River	2.4	1.0	0.8	2.0	6.2
	Fishhook-Steeple Mesa	Steeple Creek		0.3			0.3
	Foote Creek	Hannagan Creek	4.1	0.6			4.7
	Lower Campbell Blue	Campbell Blue Creek	4.0	2.3			6.3
	Lower Campbell Blue	Coleman Creek		0.6			0.6
	Raspberry	Blue River			0.5	5.6	6.2
	Red Hill	Blue River		0.6		0.7	1.3
	Turkey Creek	Campbell Blue Creek	1.4				1.4
Clifton 49.5 miles total	Dark Canyon	Eagle Creek				4.4	4.4
	Double Circle	Eagle Creek				2.7	2.7
	East Eagle	Eagle Creek		1.3	0.5	0.7	2.5
	East Eagle	East Eagle Creek			0.3	0.5	0.8
	Hickey	San Francisco River		1.1	2.6	7.2	10.9
	Hickey	Unnamed Stream		0.2			0.2
	Mud Springs	Eagle Creek	0.1		0.2	1.1	1.5
	Pigeon	Blue River				0.6	0.6
	Pleasant Valley	San Francisco River		0.5	1.1	1.4	3.0
	Sandrock	Blue River			8.2	7.8	16.0
	Sandrock	Little Blue Creek		0.2			0.2
	Tule	Eagle Creek				0.9	0.9
Wildbunch	Blue River			0.9	4.8	5.7	
Springerville 8.5 miles total	Greer	Benny Creek		3.1			3.1
	Greer	Fish Creek	0.4				0.4
	Greer	Little Colorado River	1.8	0.6			2.4
	Greer	South Fork Little Colorado River		1.9	0.4		2.3
Total Surveyed Stream Miles Apache-Sitgreaves National Forest			27.7	17	15.6	41.0	Total 101.1

*some columns and row totals do not add up due to rounding discrepancies

RESULTS REPORTED FOR EACH ALLOTMENT

District: Alpine
 Allotment: Black River
 Type: 1998 Settlement
 Drainage: Black River/Boneyard Creek/North Fork/East Fork/
 Surveyed: 5/20/2018
 Cattle Seen: NO

The Black River corridor survey included Boneyard Creek and the North and East Forks of the Black River. The area is used heavily and extensively for recreational hunting, fishing and camping purposes. There was a recent fire in the drainage ([photo](#)) and extensive restoration road work has been done. There is little evidence of any cattle impact nor cattle trespass but some areas show impact from past cattle trespass. These signs are relatively old.

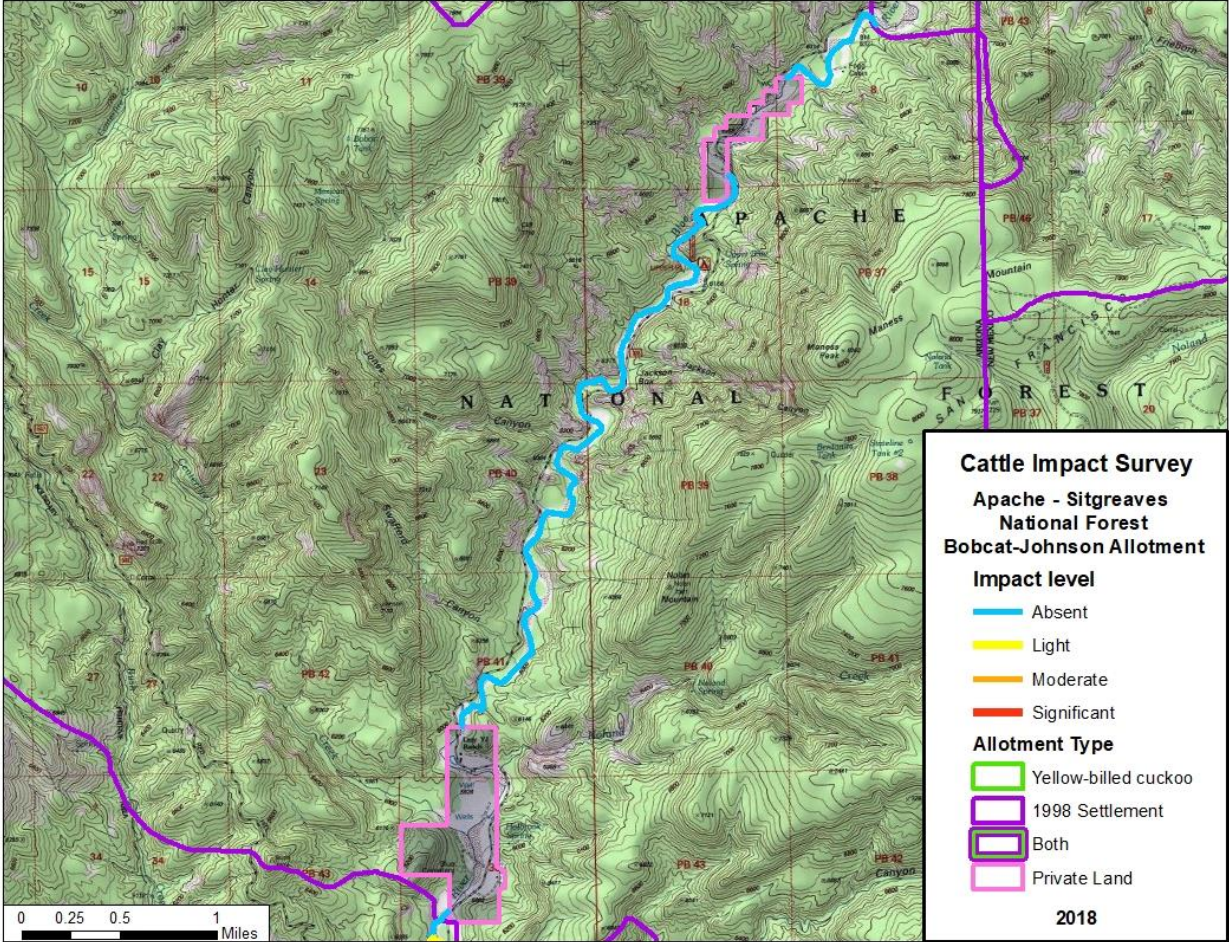


Absent	Light	Moderate	Significant	Total
7.5 miles	2.6 miles			10.1 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
Allotment: Bobcat-Johnson
Type: 1998 Settlement
Drainage: Blue River
Surveyed: 5/19/2018
Cattle Seen: NO

This allotment on the Blue River was absent of any cattle impact and no cows were seen. This section of the river is steep walled with canyon stretches and is thickly vegetated. Access and passage for cattle is geographically restricted ([photo](#)).

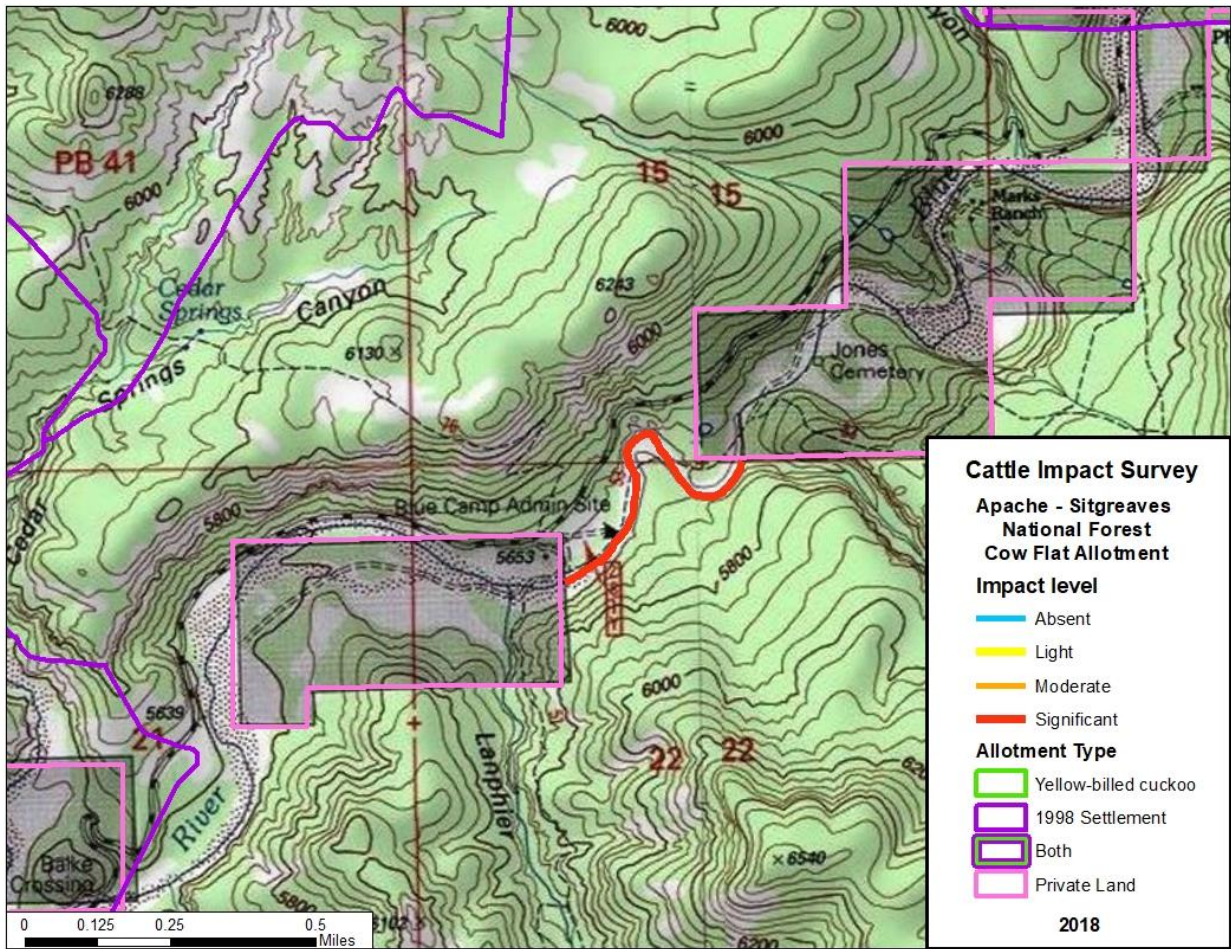


Absent	Light	Moderate	Significant	Total
5.8 miles				5.8 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
Allotment: Cow Flat
Type: 1998 Settlement
Drainage: Blue River
Surveyed: 5/19/2018
Cattle Seen: NO

This approximately half-mile of National Forest land between two private property parcels is severely impacted by cattle. Pervasive grazing to bare, denuded ground dominated the reach. Banks were sheared ([photo](#)) and trampled from consistent trailing and cattle feces was evident in the water. It appeared from the level of impact that cattle were using the area consistently.

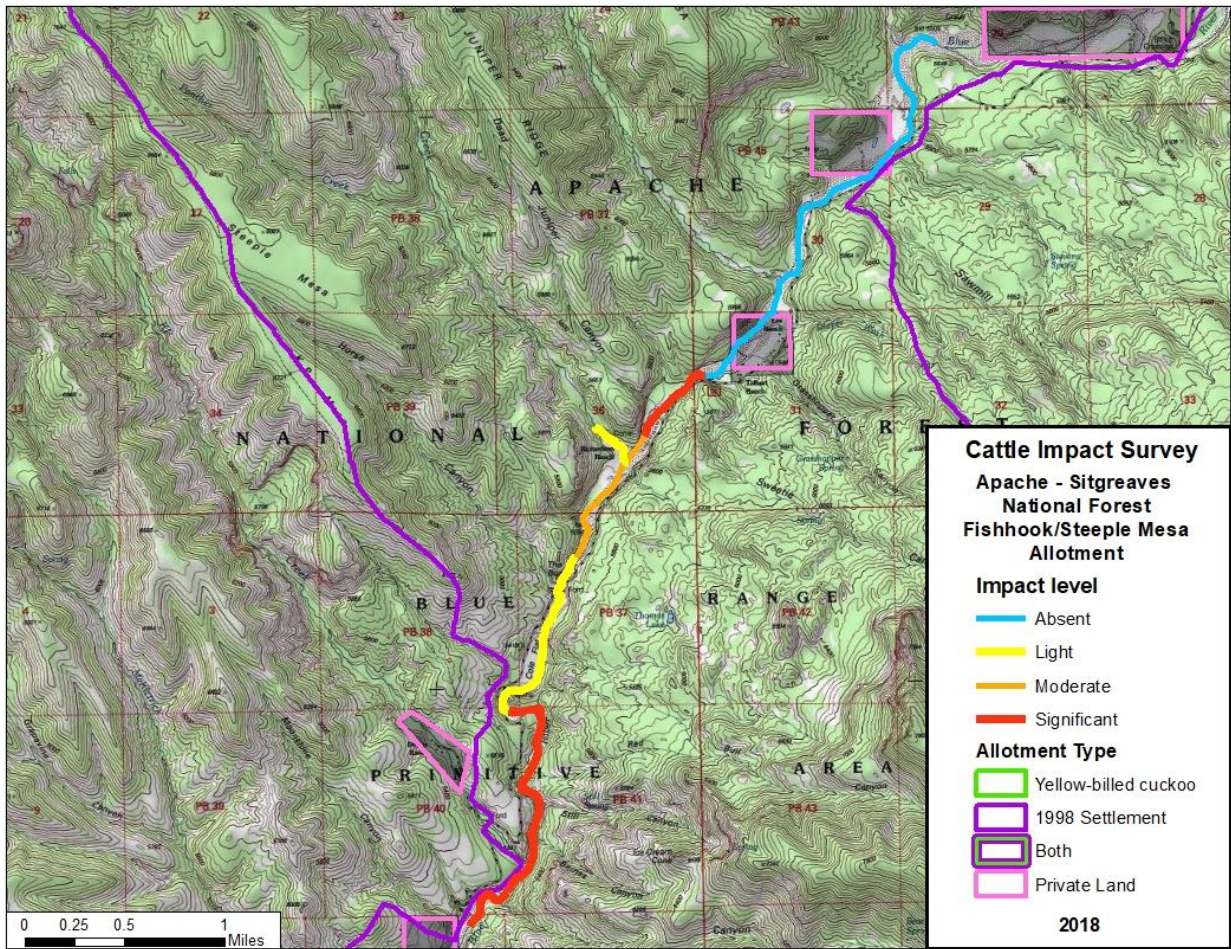


Absent	Light	Moderate	Significant	Total
			0.6 miles	0.6 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
 Allotment: Fishhook-Steeple Mesa
 Type: 1998 Settlement
 Drainage: Blue River, Steeple Creek
 Surveyed: 5/20/2018
 Cattle Seen: **YES**

On the northern, upstream section of this riparian enclosure and allotment, impact was minimal to absent in the areas of Fishhook Creek, Sawmill Canyon and Grant Creek. Near Grasshopper Canyon, impacts begin with streamside grazing and cattle clearly entering the riparian area from the road (photo). Cattle trails begin here and move downstream while grazing and browsing impacts continue to be moderate (photo). Cattle use is current as feces and fresh tracks are evident at the water's edge (photo). At the downstream end of the allotment, ground disturbance impacts become severe with 30 square meter wallows of bare denuded ground.

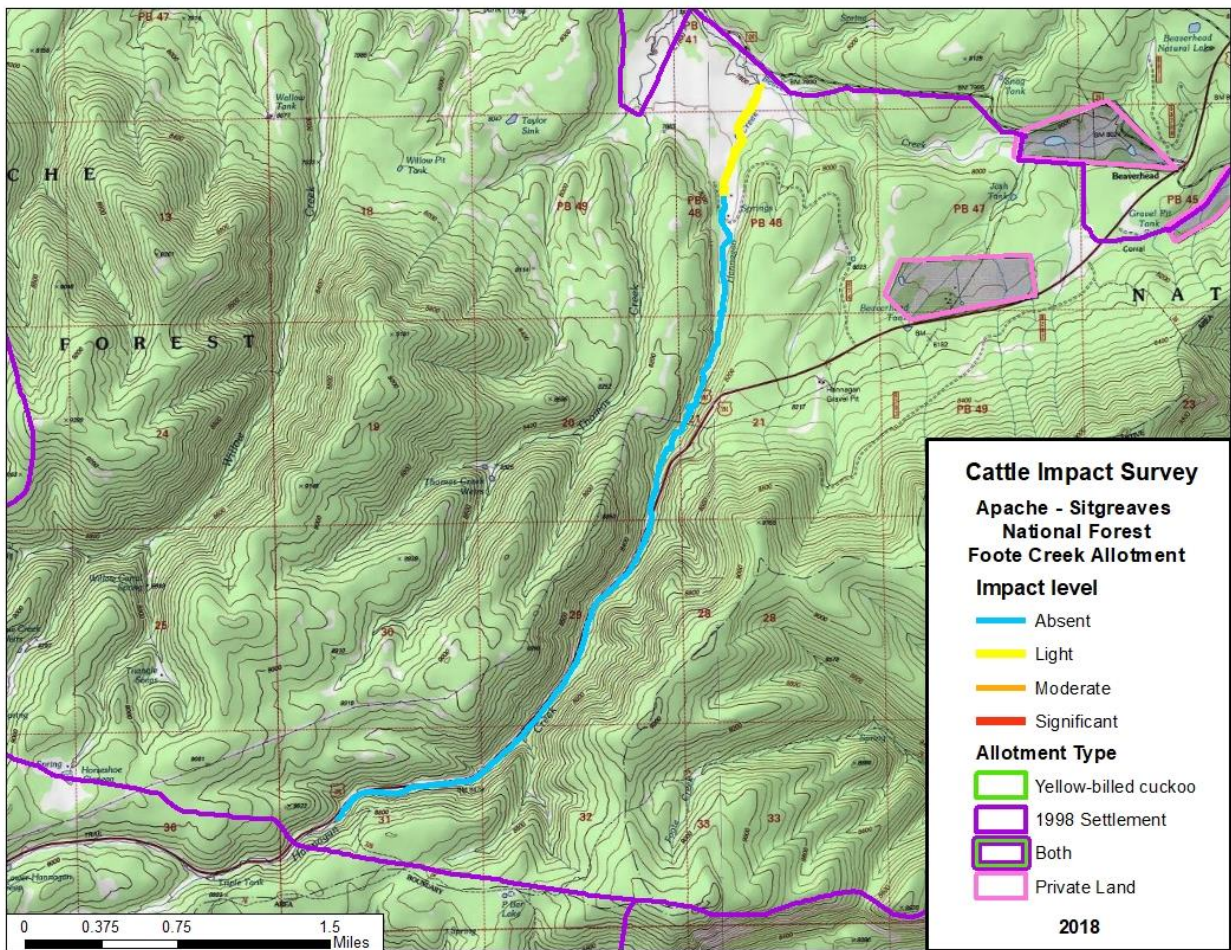


Absent	Light	Moderate	Significant	Total
2.4 miles	1.3 miles	0.8 miles	2.0 miles	6.5 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
Allotment: Foote Creek
Type: 1998 Settlement
Drainage: Hannigan Creek
Surveyed: 6/7-6/8/2018
Cattle Seen: No

Few signs of cattle impact were seen in this allotment. Downstream from the highway 91 crossing, a secure enclosure fence creates a protected corridor and exhibits good vegetative growth. Towards the northern end of the allotment signs of cattle were old and were encountered infrequently both in and out of the enclosures where overall impact is light ([photo](#)). However, unmarked ATV trails crossed Hannigan Creek multiple times, damaging saturated areas and herbaceous growth ([photo](#)).

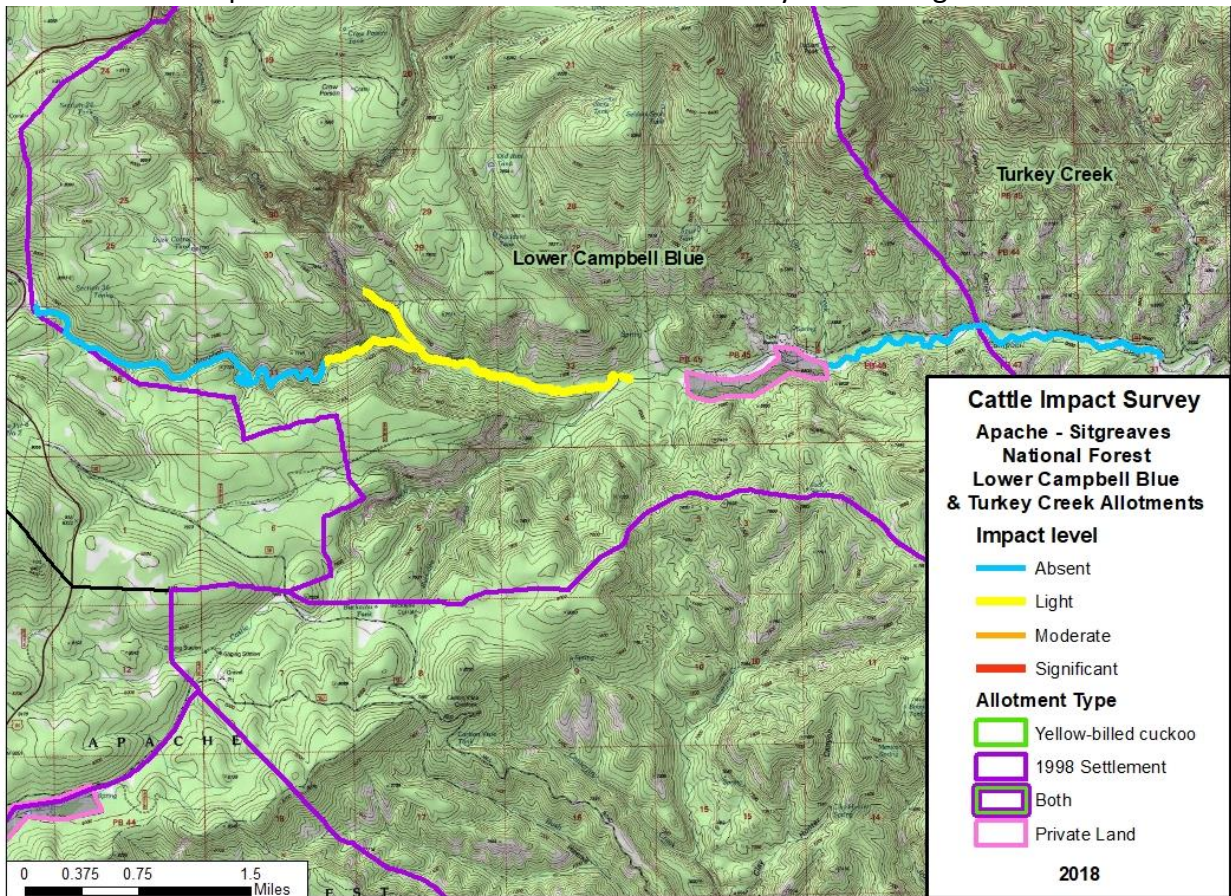


Absent	Light	Moderate	Significant	Total
4.1 miles	0.6 miles			4.7 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
Allotment: Lower Campbell Blue
Type: 1998 Settlement
Drainage: Campbell Blue Creek, Coleman Creek
Surveyed: 7/27-7/29/2018
Cattle Seen: **YES**

A major tributary of the Blue River, Campbell Blue Creek runs in an easterly direction through the Lower Campbell Blue allotment, with the smaller tributary of Coleman Creek flowing southeast to join Campbell Blue. The terrain varies from gently sloping ponderosa forest with open meadows at the western end to narrow canyons with thick riparian vegetation at the middle and lower portions of the creek. Some areas are heavily impacted by past wildfire. One cow with a green ear tag was encountered, which did not spook ([photo](#)). A fence line was encountered running adjacent to the creek at the western end of the allotment where no sign of cattle was observed but the fence is in disrepair ([photo](#)). Despite encountering one cow, cattle impact was light in the most downstream portion of the surveyed area. On Coleman Creek, cow pies were seen on a faint trail ([photo](#)) but no impacts to streambanks were observed and riparian vegetation was robust. From the narrow canyon portion of the Campbell Blue to the western allotment boundary no cattle sign was observed.

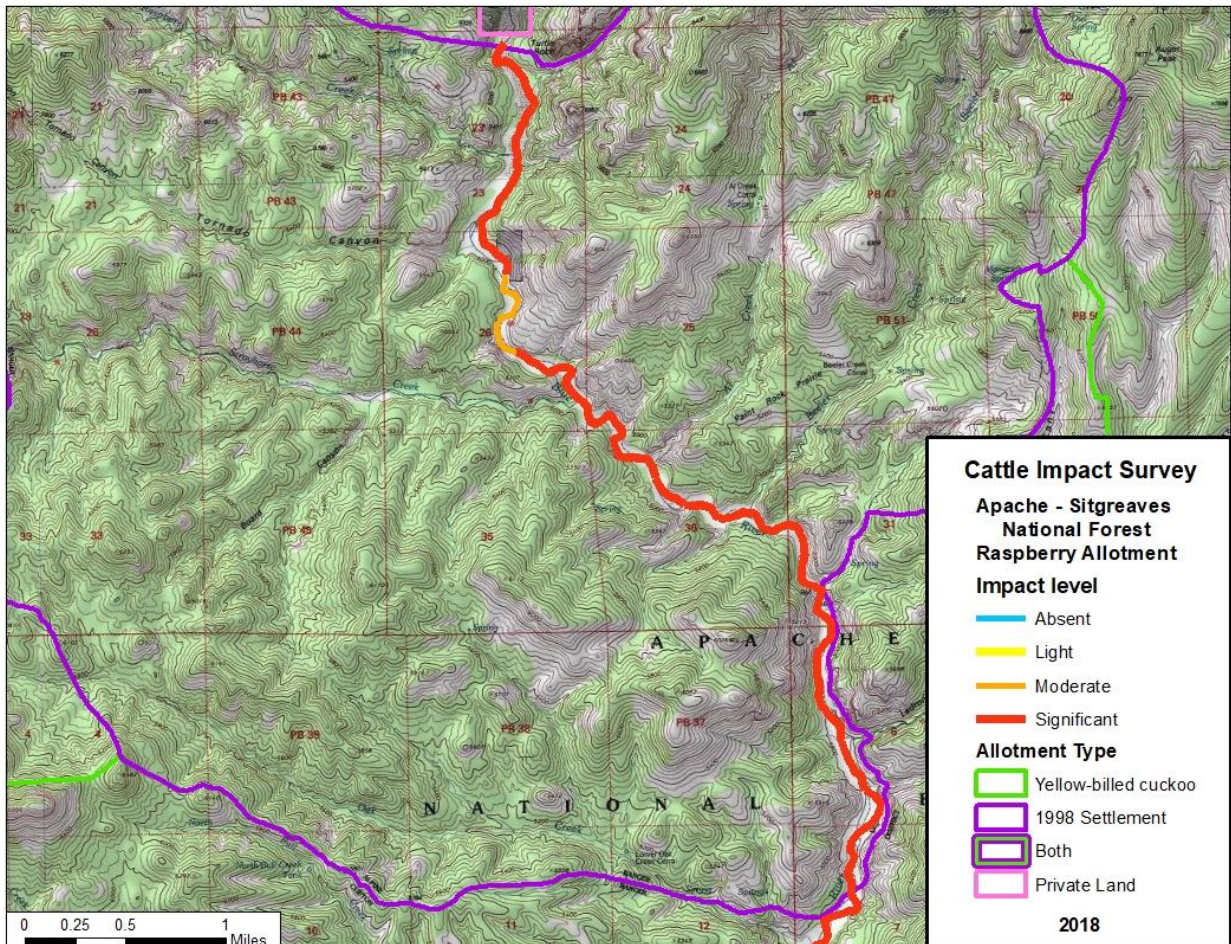


Absent	Light	Moderate	Significant	Total
4.0 miles	2.9 miles			6.9 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
 Allotment: Raspberry
 Type: 1998 Settlement
 Drainage: Blue River
 Surveyed: 5/18-5/19/2018
 Cattle Seen: **YES**

This allotment stretches from private property at the south end of the Blue River Road to near the confluence of Oak Creek and the Blue River. Three head of cattle were seen and cattle sign was present throughout the allotment. Cattle impacts varied from low and moderate in narrow portions of the canyon to severely impacted in wide areas. Upland benches are extensively grazed, showing signs of loafing, wallows, and diminished vegetative cover (photo). Several seeps and springs are heavily trampled (photo). Trails persist throughout the surveyed area, many of which are causing shearing and erosion of streambanks (photo). Cattle use appears to be both recent and continuous within this allotment. Failure of enclosure infrastructure allows easy movement into riparian areas, such as this downed fence at Beeler Creek (photo).

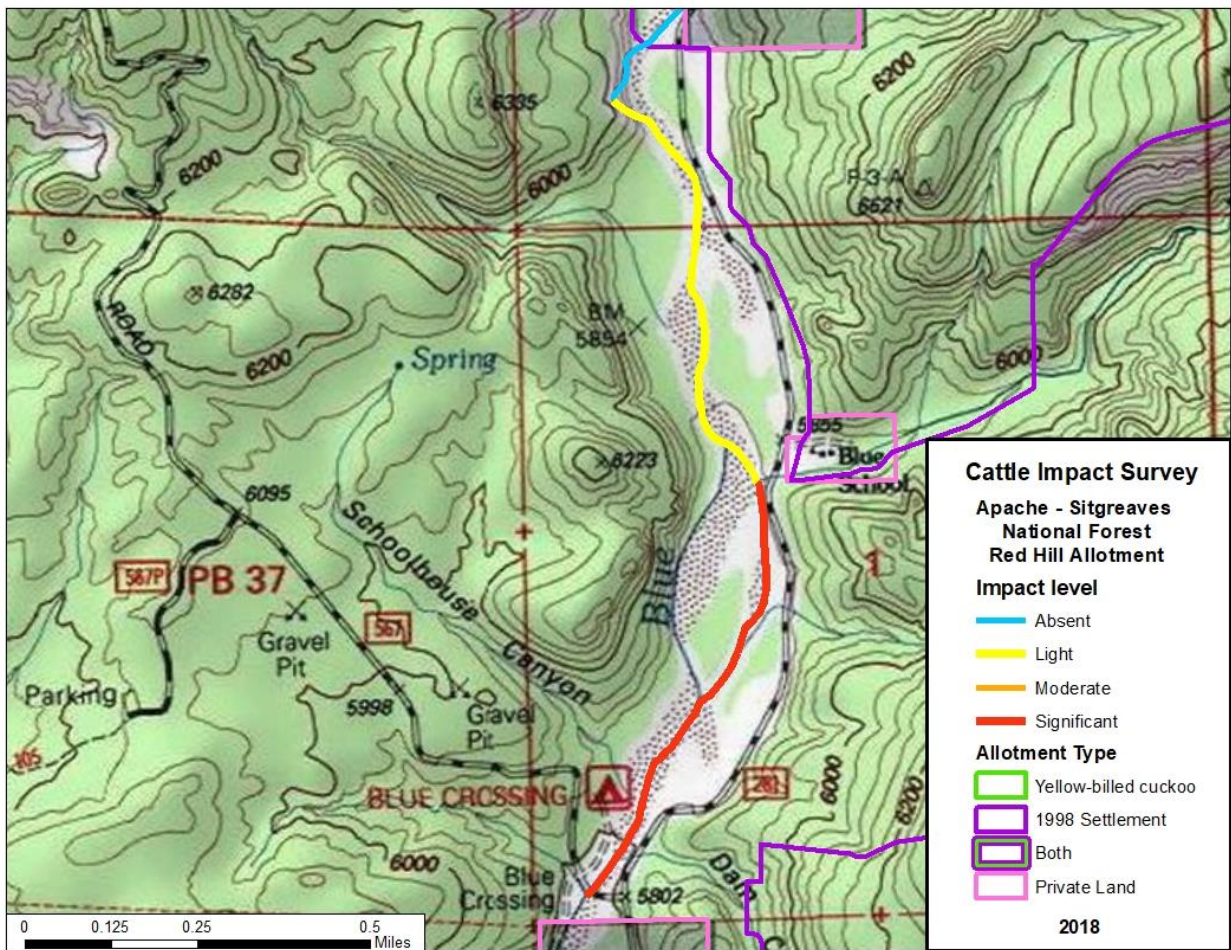


Absent	Light	Moderate	Significant	Total
		0.5 miles	5.6 miles	6.1 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
 Allotment: Red Hill
 Type: 1998 Settlement
 Drainage: Blue River
 Surveyed: 5/19/2018
 Cattle Seen: **YES**

The survey began on the southern end of the allotment at the edge of private property and the beginning of the Blue River Crossing Campground. Cows were seen immediately in the river, on the banks, and throughout the public use area. Banks were severely trampled and grazing is intense ([photo](#)). Cattle appear to be residing within the first ¼ mile of the allotment and the area was highly degraded ([photo](#)). Surface water appears heavily contaminated by cow feces ([photo](#)). Farther upstream, between the next two private properties, impacts were light.

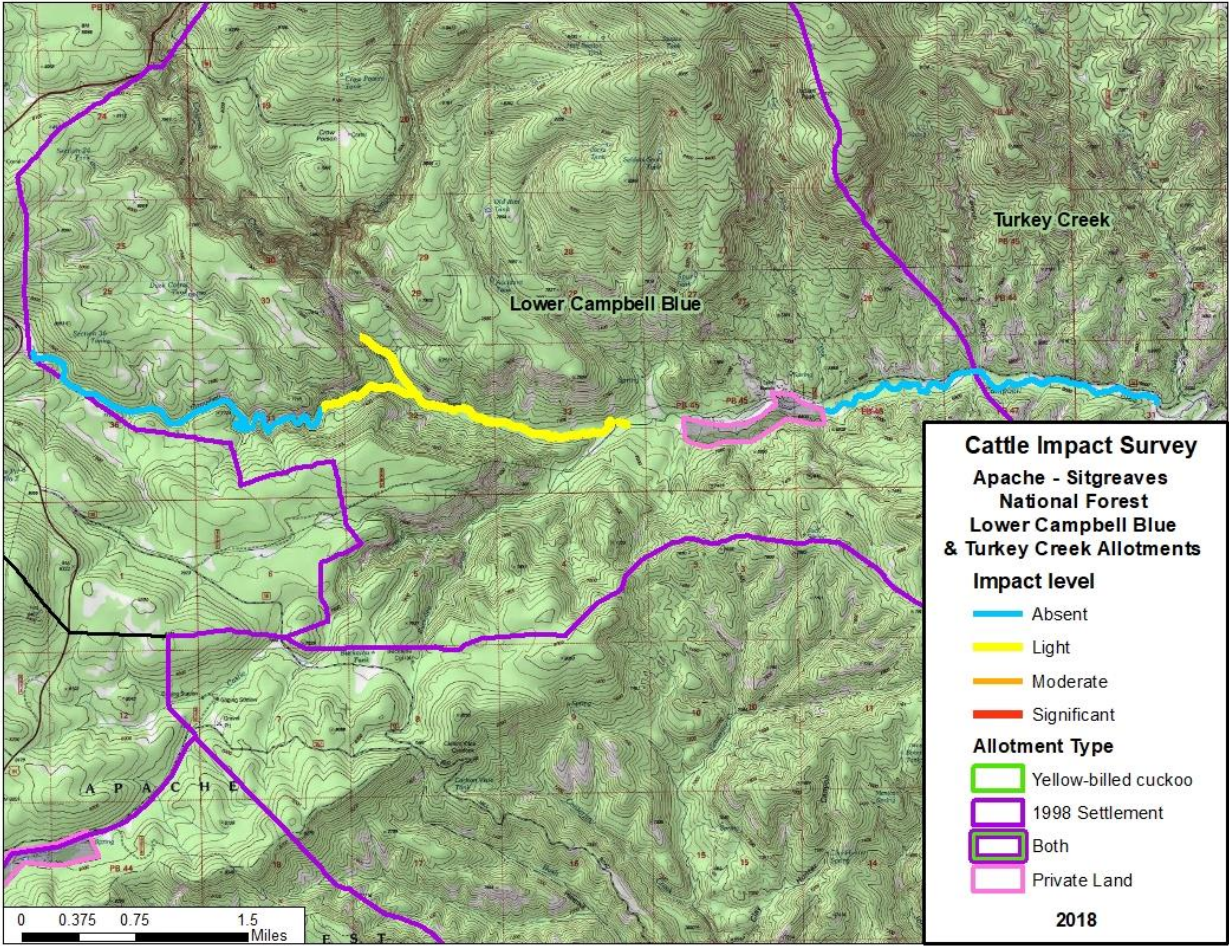


Absent	Light	Moderate	Significant	Total
	0.6 miles		0.7 miles	1.3 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Alpine
Allotment: Turkey Creek
Type: 1998 Settlement
Drainage: Campbell Blue Creek
Surveyed: 5/19/2018
Cattle Seen: NO

No cattle or signs of livestock use of Campbell Blue Creek in the Turkey Creek Allotment were observed.

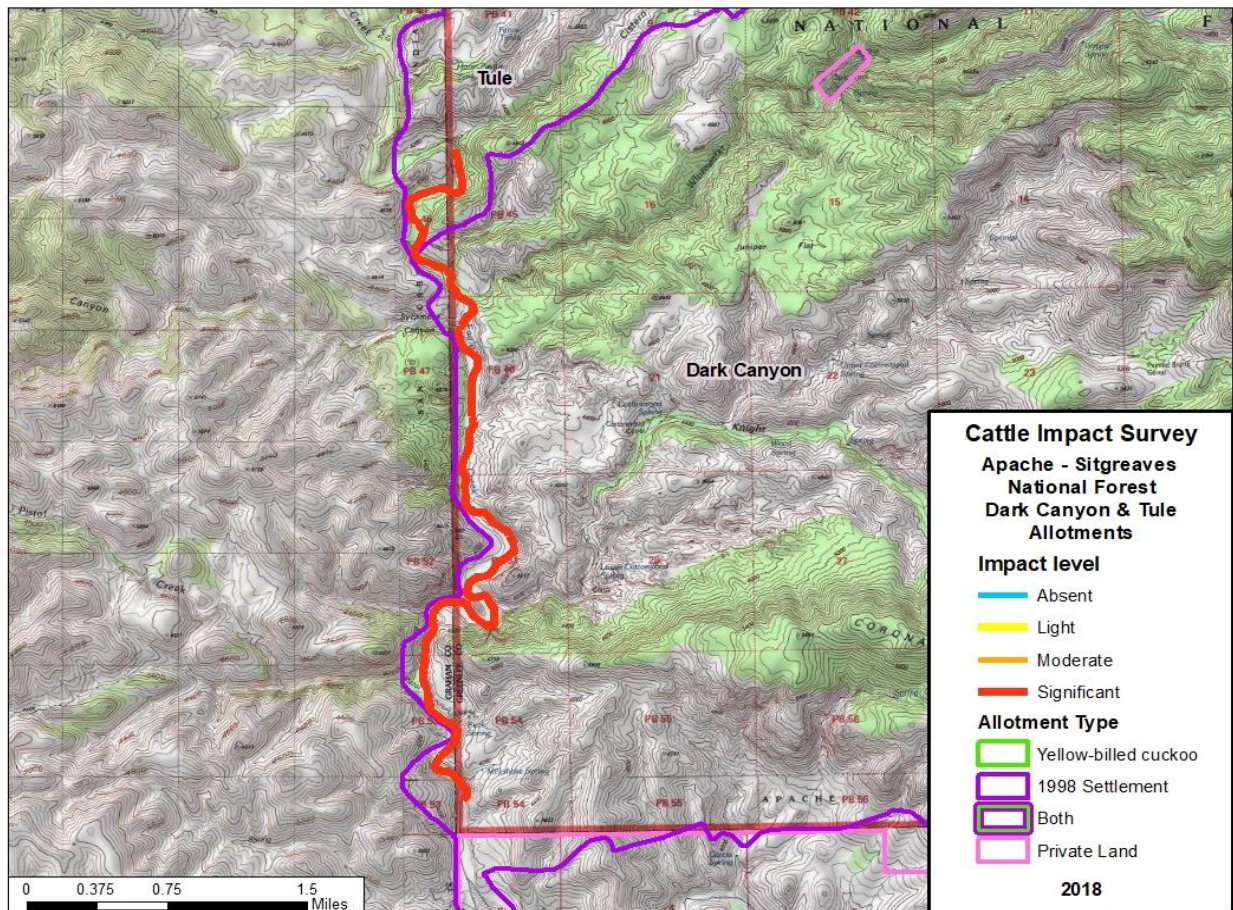


Absent	Light	Moderate	Significant	Total
1.4 miles				1.4 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: Dark Canyon
Type: 1998 Settlement
Drainage: Eagle Creek
Surveyed: 7/1-7/2/2018
Cattle Seen: **YES**

Eagle Creek runs perennially southward along the western edge of the Dark Canyon allotment and adjacent to the San Carlos Apache Reservation. Private land spans the southwestern edge of the allotment and the Tule allotment lies along the northern boundary. Three head of cattle were seen while surveying and recent cattle sign was present throughout the allotment. Overall cattle impacts were severe, becoming slightly more moderate at the northern portion of the allotment where the canyon narrows. Although a cobble streambed protects portions of the streambank, there are many examples of severe trampling of streamside vegetation, shearing of banks and heavy near-channel browsing. Wide and sandy portions of the canyon showed extensive trailing, wallows and loafing areas ([photo](#)). Several fences were encountered running adjacent to Eagle Creek, spanning Eagle Creek, and a short distance up Knight Canyon. All were in disrepair and allow passage for cattle ([photo](#)).

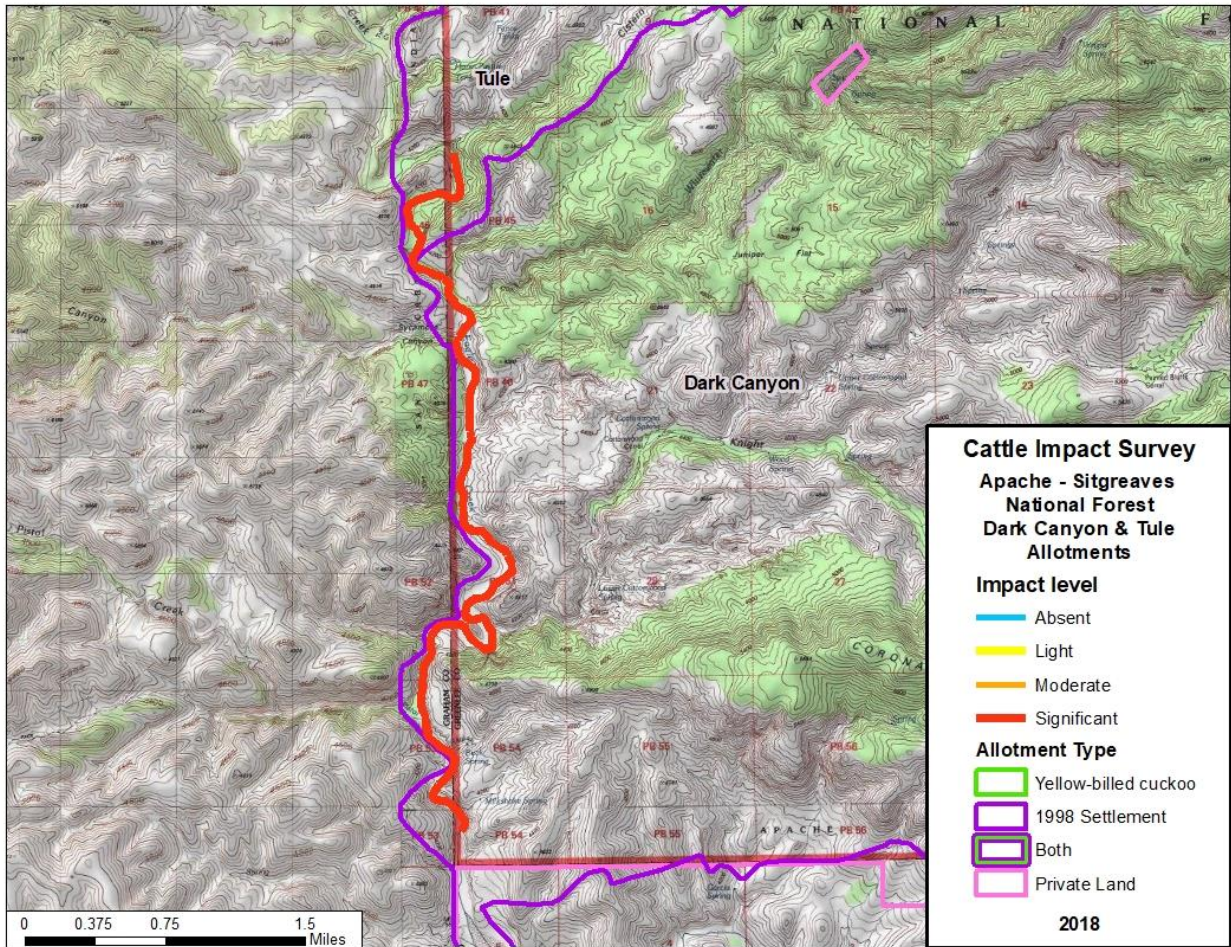


Absent	Light	Moderate	Significant	Total
			4.4 miles	4.4 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: Tule
Type: 1998 Settlement
Drainage: Eagle Creek
Surveyed: 7/2/2018
Cattle Seen: NO

Eagle Creek flows through a small portion of the southwestern corner of the Tule allotment. Although no cattle were seen during the time of the survey, recent cattle sign was seen throughout the surveyed portion of the creek. Where the canyon is most narrow and the streambank consists of cobbles impact was moderate. Broader portions of the streambed show severe impact with wallows, loafing areas and heavy grazing ([photo](#)). Trails are present throughout the surveyed area and examples of severe trampling of streamside vegetation were encountered. The fence spanning the creek between Tule and Dark Canyon allotments was down and in disrepair.

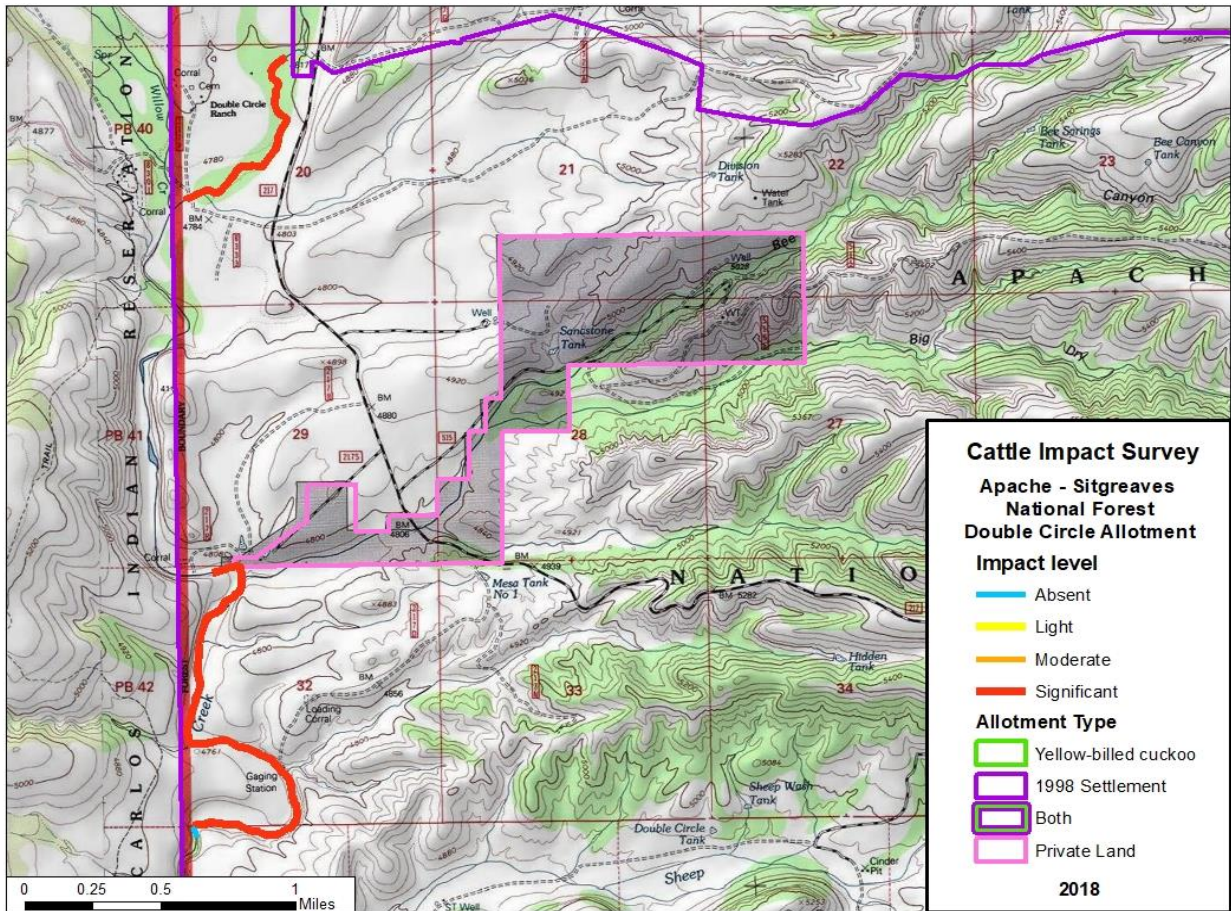


Absent	Light	Moderate	Significant	Total
			0.9 miles	0.9 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: Double Circle
Type: 1998 Settlement
Drainage: Eagle Creek
Surveyed: 6/6/2018
Cattle Seen: **YES**

Eagle Creek meanders along the northwest boundary of this allotment and the eastern boundary of the San Carlos Apache Reservation. A total of eight cows were encountered during the survey and no tags or brands were seen ([photo](#)). Cattle sign was abundant throughout and ranged from moderate to severe impacts. Gently sloping streambanks are under intense grazing pressure. The presence of wallows suggests sustained utilization of this enclosure area ([photo](#)). While most of the upland pastures near private land had well-maintained fences, one fence leading to the riparian corridor was left open ([photo](#)). At the south end of the survey area, a secure fence spanned the narrow canyon where the stream enters San Carlos Apache land- the vegetation beyond this fence looked un-grazed and robust.

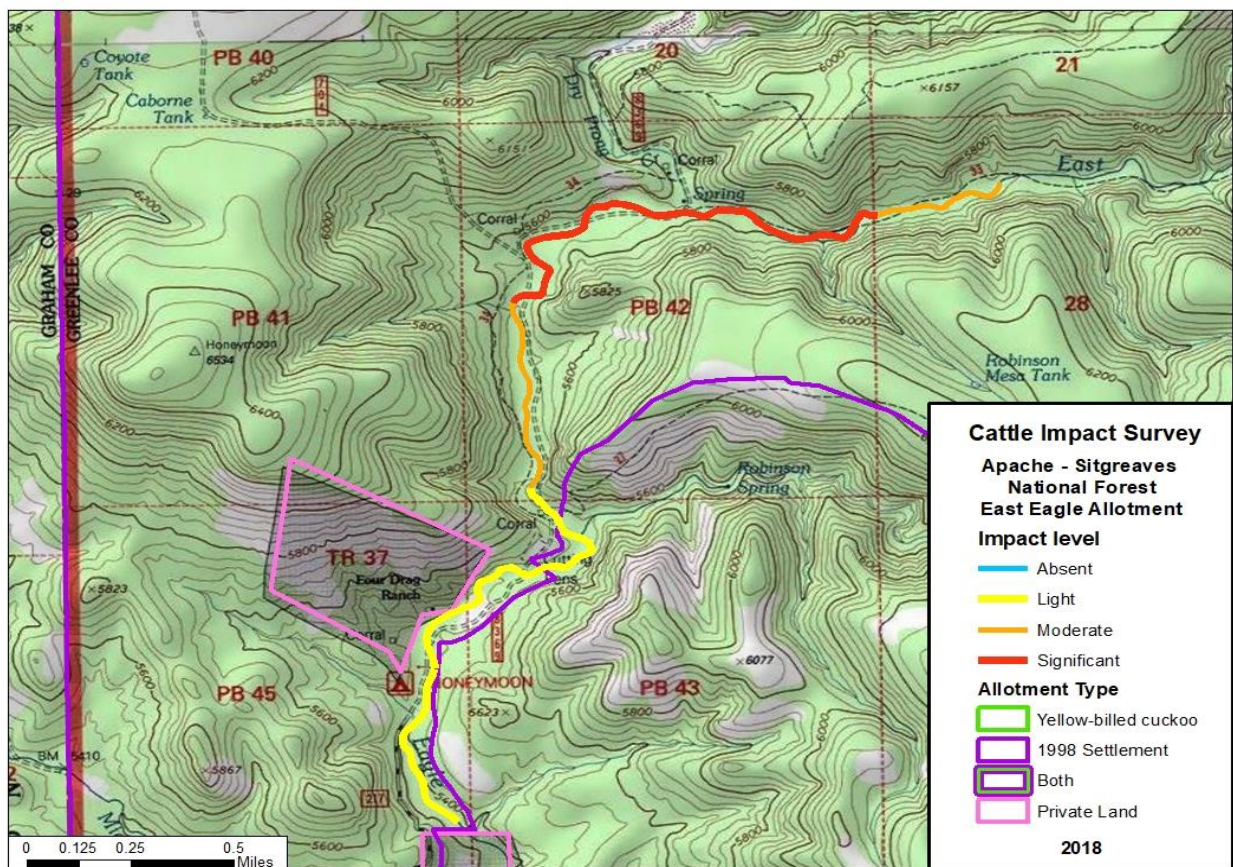


Absent	Light	Moderate	Significant	Total
			2.7 miles	2.7 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: East Eagle
Type: 1998 Settlement
Drainage: Eagle Creek, East Eagle Creek
Surveyed: 6/7/2018
Cattle Seen: **YES**

Approximately two miles of Eagle Creek and one mile of East Eagle Creek were surveyed, including the beginning of Eagle Creek from the confluence with East Eagle Creek to just downstream of Honeymoon Campground. The southernmost portion of Eagle Creek in the vicinity of Honeymoon Campground showed no sign of cattle grazing. There is a fence at the northern end of the campground beyond which cattle impact increased, and where five head of cattle were encountered. This herd had orange-yellow ear tags and were tame ([photo](#)). Just upstream from the herd, an open fence was located near the confluence with East Eagle Creek. This area was crisscrossed by frequently used cattle trails leading down streambanks, patches of heavily grazed grasses and herbaceous vegetation, and areas with greatly reduced understory vegetation ([photo](#)). No cattle were encountered in East Eagle Creek, though there were moderate to severe cattle impacts including several heavily grazed patches. The majority of East Eagle Creek was dry at the time of the survey, therefore it is likely cattle will move back in after the creek is running again.



Absent	Light	Moderate	Significant	Total
	1.3 miles	0.8 miles	1.2 miles	3.3 miles

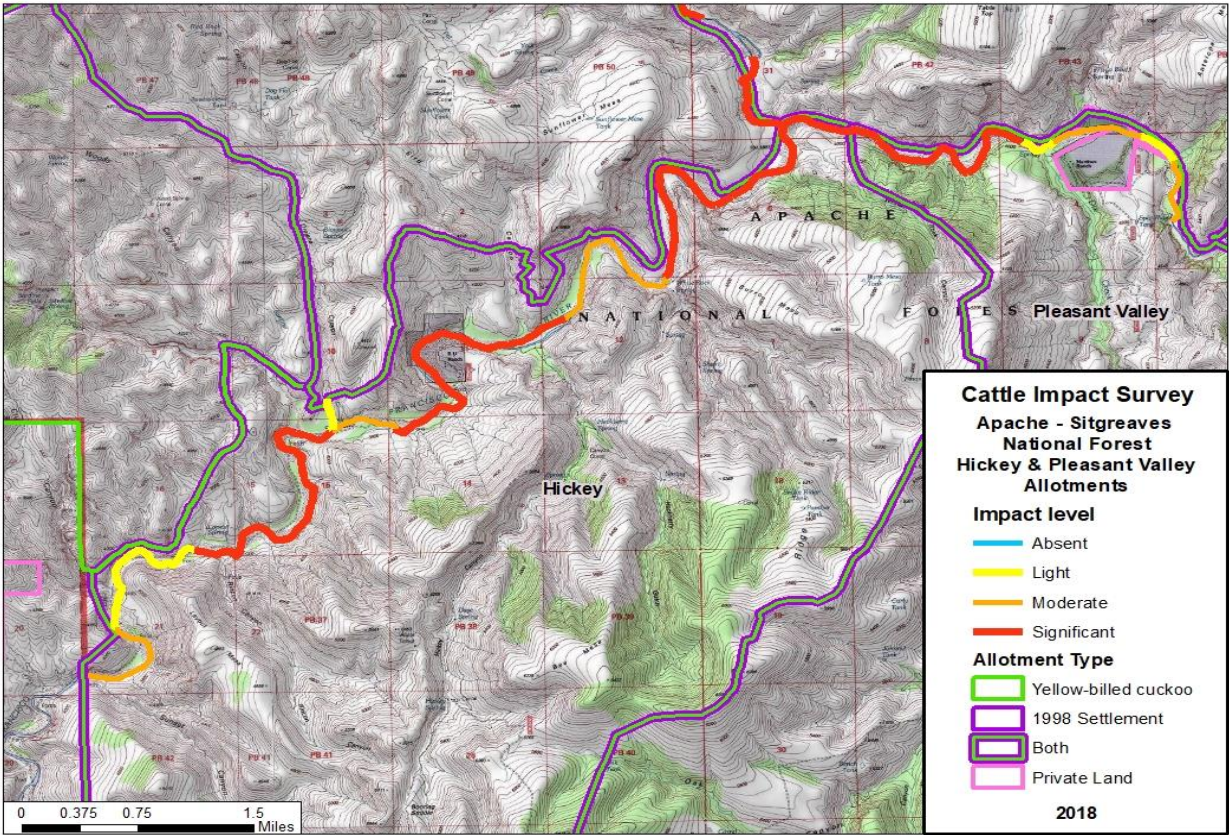
District: Clifton
Allotment: Hickey
Type: 1998 Settlement & Yellow Billed Cuckoo
Drainage: San Francisco River
Surveyed: 1/1-1/4/2018
Cattle Seen: NO

More than ten miles of this allotment were surveyed along the Blue River, Orejano Canyon, Sardine Creek, and the San Francisco River. Pervasive and severe impacts to banks, water quality ([photo](#)), and vegetation ([photo](#)) were observed throughout the full reach. Cattle are degrading banks through trampling and creating trails, and defecating directly in the stream. Downstream from the Blue River impacts remain significant, and in a few cases, moderate for miles. Entrance to riparian areas is easily achieved due to downed fences at Orejano and Sardine Canyons ([photo](#)) and elsewhere from the Pigeon Allotment ([photo](#)). There was no evidence of enclosure fencing at White Rock Canyon or Bird Canyon ([photo](#)). In the vicinity of the old RU Ranch, impacts were generally light or moderate. However, trampled banks and browsed cottonwood and willow saplings were common in wider parts of the canyon. Some gravel bars were browsed down to stubble, pocked with tracks throughout, and adjacent older willows were stripped of leaves and their tips bitten ([photo](#)). Severely trampled areas ([photo](#)) and overgrazed grasslands in the floodplain showed evidence of major congregation, such as this site with more than 90 cow pies in this one photo ([photo](#)).

District: Clifton
Allotment: Pleasant Valley
Type: 1998 Settlement & Yellow Billed Cuckoo
Drainage: San Francisco River
Surveyed: 1/1-1/4/2018
Cattle Seen: NO

Approximately 2.9 miles of the San Francisco River were surveyed through this allotment in nine distinct segments. Upstream from the Martinez Ranch diversion dam livestock impacts were moderate. A section of fence was down, providing easy passage from outside the exclusion into the riparian corridor ([photo](#)). Between the diversion dam and the upstream edge of the private property, livestock impact was low, but evidence such as cow pies ([photo](#)) and trampled sandy soils ([photo](#)) were documented. Cow and sheep trails through the area just downstream of Martinez Ranch braid throughout the gallery forest where low to moderate impacts included very fresh cattle tracks ([photo](#)) and very fresh cow pies. Past the confluence of Dix Creek, impacts increased quickly, and the remainder of the allotment to the boundary with the Hickey Allotment is significantly impacted. Fresh cow pies deposited on top of recently fallen sycamore leaves ([photo](#)) attest to the recent occupancy of cattle. Recent tracks and cow pies ([photo](#)) occurred prolifically throughout these segments which were heavily grazed in areas. Large trampled areas occurred sporadically ([photo](#)), including wallows along the rivers edge ([photo](#)), and there were numerous well-worn paths throughout the floodplain mesquite bosque ([photo](#)). Cattle find shade under junipers, creating large sandy wallows and depositing numerous feces including some that were very recent.

Map for Hickey and Pleasant Valley Allotments

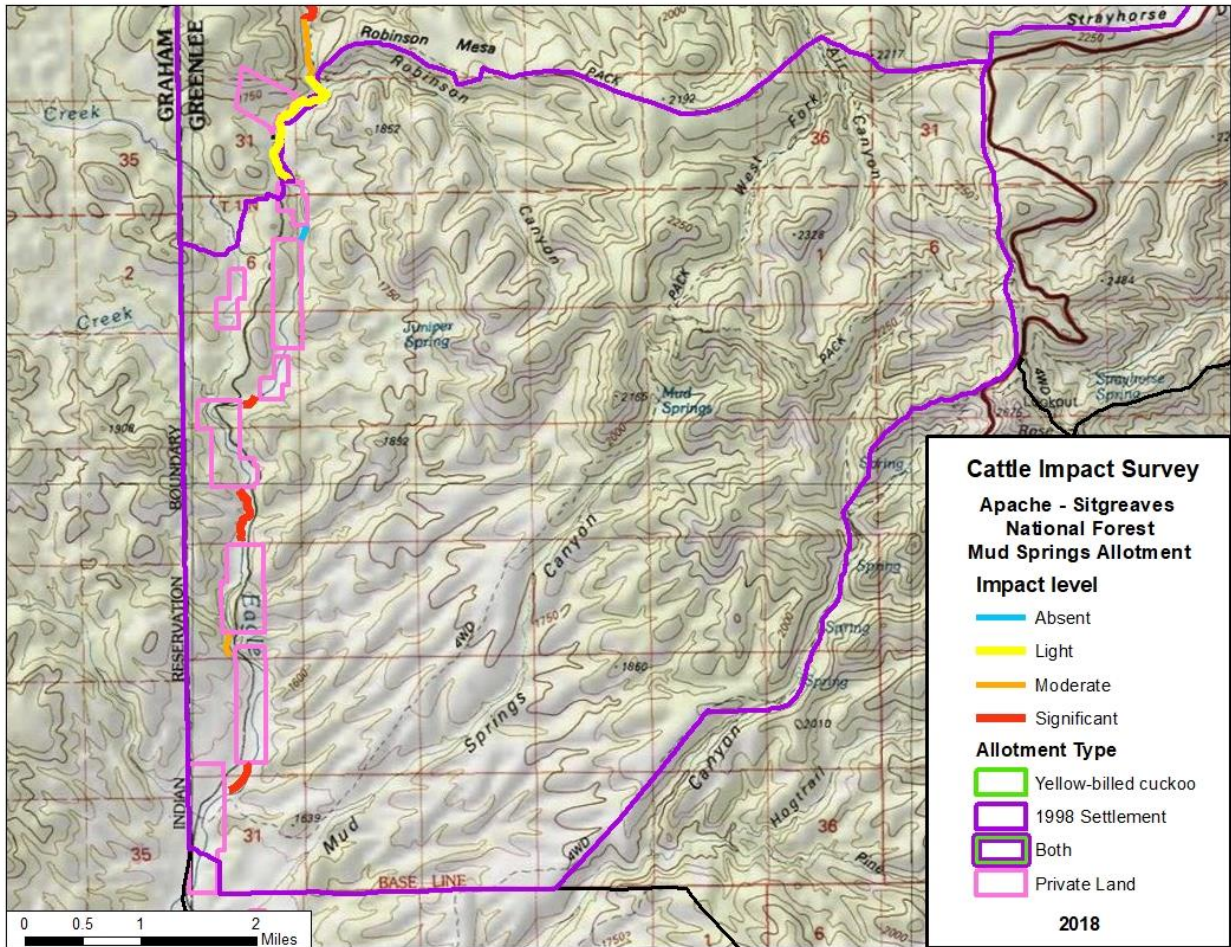


Allotment	Absent	Light	Moderate	Significant	Total
Hickey		1.3 miles	2.6 miles	7.2 miles	11.1 miles
Pleasant Valley		0.5 miles	1.1 miles	1.4 miles	3.0 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: Mud Springs
Type: 1998 Settlement
Drainage: Eagle Creek
Surveyed: 6/7/18
Cattle Seen: **YES**

Eagle Creek flows south along the western portion of this allotment with private land parcels interspersed throughout the riparian corridor. Likely due to fragmented land ownership and fencing, cattle impact varied. The majority of the allotment showed moderate to severe cattle impact, with large swaths of heavily grazed grasses within the floodplain and on upland benches. Some portions of the streambank were severely compromised, with compacted soils near trails and grazing, as well as heavy browsing of streamside woody vegetation ([photo](#)). One cow was seen. No cattle sign was observed in the northernmost section of the survey area, where riparian vegetation and a grassy understory in the adjacent floodplain were robust and healthy.

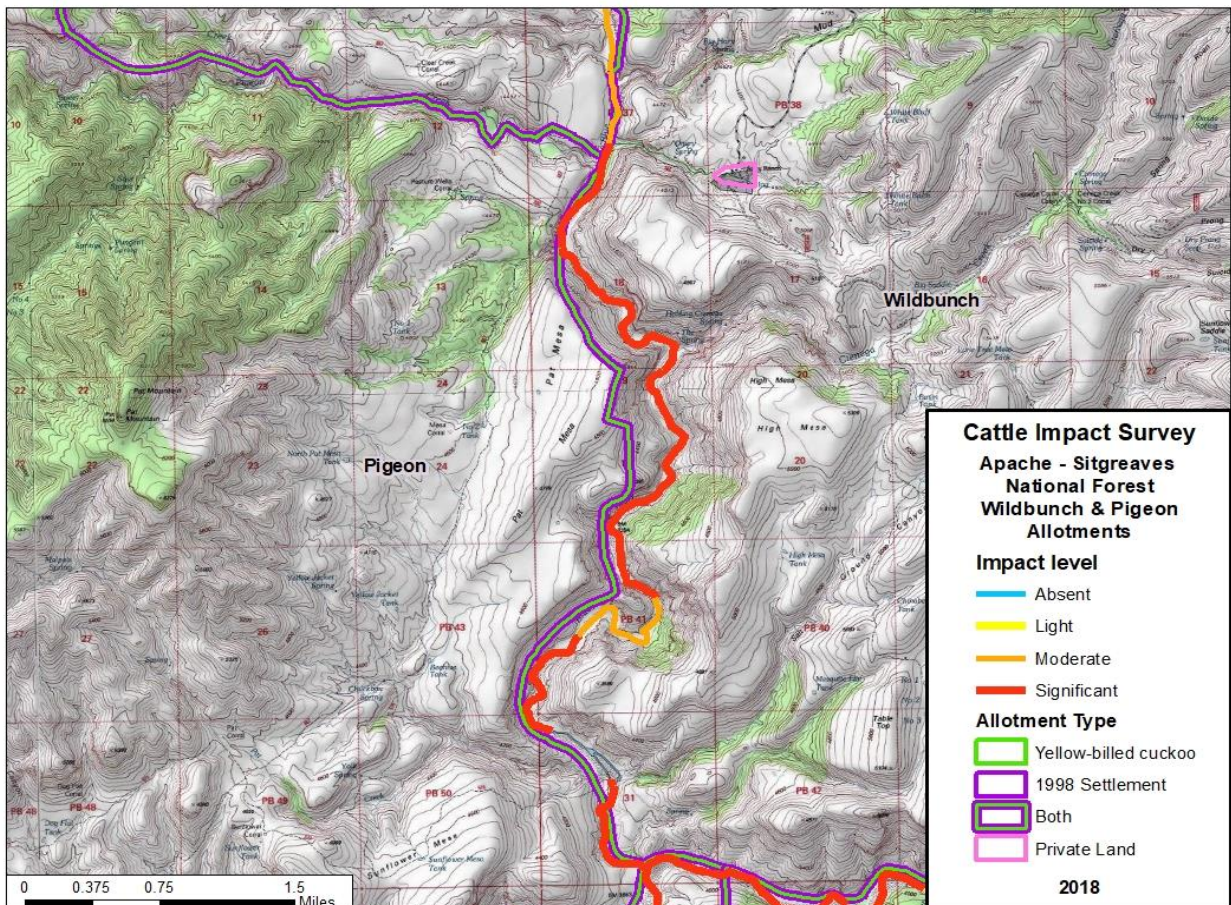


Absent	Light	Moderate	Significant	Total
0.1 miles		0.2 miles	1.1 miles	1.4 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: Wildbunch & Pigeon
Type: 1998 Settlement & Yellow Billed Cuckoo
Drainage: Blue River
Surveyed: 5/20-5/21/2018
Cattle Seen: YES (photo)

This survey encompassed a narrow stretch of the Blue River canyon corridor from the Mud Springs Canyon confluence near Stacy Ranch to the confluence with the San Francisco River. Impact within the allotment was moderate to severe. This reach is predominantly in the Wildbunch Allotment, but the lowest section is within the Pigeon Allotment. The allotment boundaries were indiscernible as no functional fencing was found. Cattle trails were found throughout the allotment, some very wide and indicating frequent use (photo). Several loafing areas were located in upland benches in the mesquite forest (photo), exhibiting severely impacted under-and mid-story vegetation. Streambanks were heavily trailed causing erosion and shearing. Eight head of cattle were encountered and no ear tags or branding were seen. During the survey, they continued to push downstream, browsing mature willows in side channels.

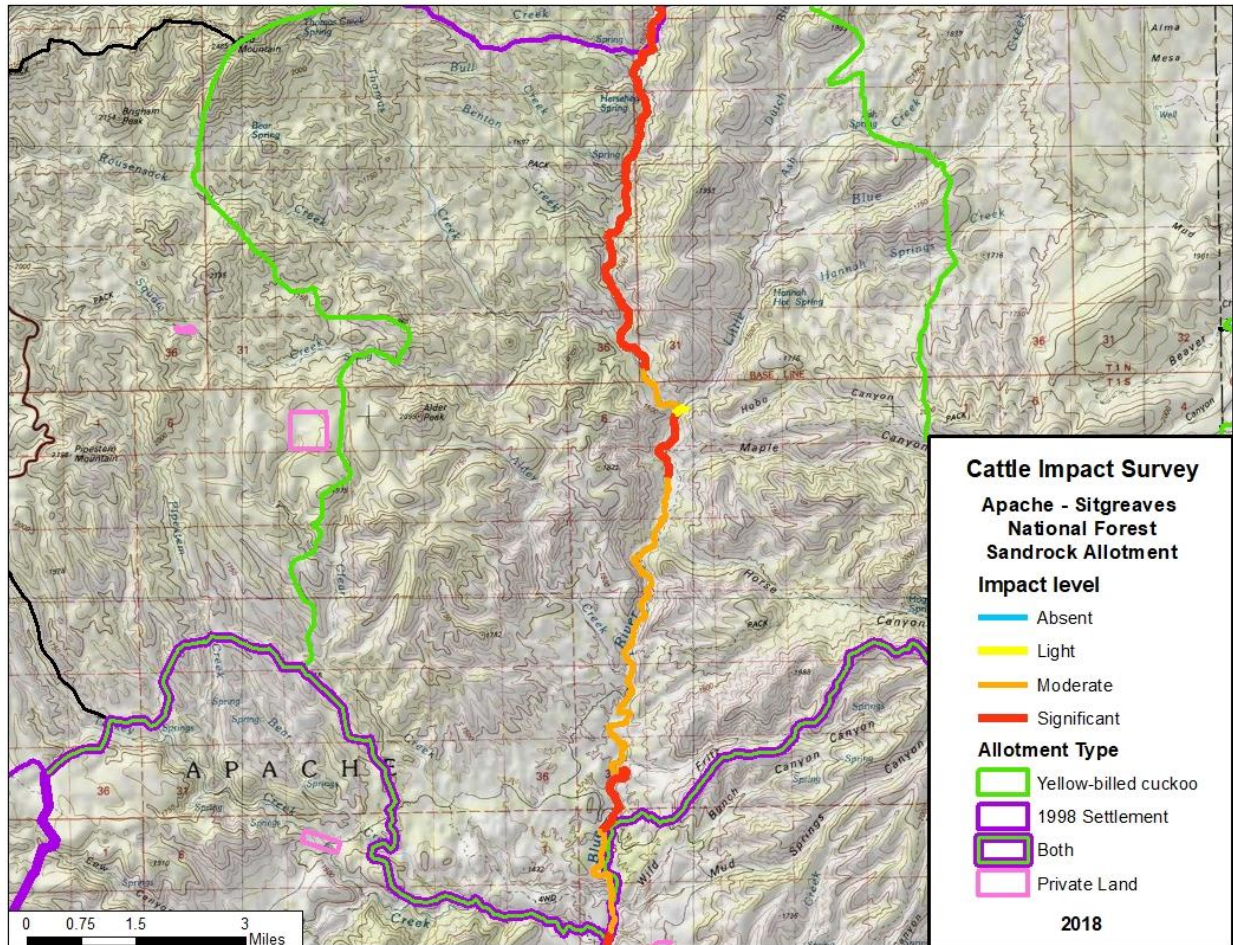


Allotment	Absent	Light	Moderate	Significant	Total
Pigeon				0.6 miles	0.6 miles
Wildbunch			0.9 miles	4.8 miles	5.7 miles

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Clifton
Allotment: Sandrock
Type: Yellow Billed Cuckoo
Drainage: Blue River, Little Blue River
Surveyed: 5/19-5/20/2018
Cattle Seen: **YES**

This remote section of the Blue River stretches from near the confluence of Oak Creek to the confluence of Mud Springs Canyon. At least sixteen head of cattle in two herds were encountered ([photo](#)). While cattle trails and sign were abundant and seen throughout the allotment, the most severely impacted areas were in the wide portions of the canyon south of HU Bar Cabin where upland benches were heavily grazed, creating areas of barren and erosive soils ([photo](#)), as well as numerous examples of trampled streamside herbaceous vegetation and diminished streamside vegetative cover ([photo](#)). A small portion of Little Blue Creek was surveyed where cattle sign was present but limited. Here, the canyon quickly narrowed, likely deterring cattle from moving further upstream into the Little Blue River. Cattle impact decreased in the southern portion of the allotment and appeared more ephemeral in nature.



Absent	Light	Moderate	Significant	Total
	0.2 miles	8.2 miles	7.8 miles	16.2 miles

District: Springerville
Allotment: Greer
Type: 1998 Settlement
Drainage: Benny Creek, Fish Creek, Little Colorado River, South Fork-Little Colorado River
Surveyed: 7/27-7/29/2018
Cattle Seen: NO

Four streams were surveyed within the Greer Allotment:

Benny Creek flows northeast within the southwestern portion of the Greer allotment, running adjacent to a well-used dirt road (FR 87). Terrain is characterized by a gently sloping, high elevation meadow surrounded by mixed conifer forest. The allotment appears to have transient cattle use, as there were some older cow pies observed ([photo](#)). Grazing impact is minimal and there was no obvious damage to streambanks, noticeable trailing, or wallows observed. Grass and forb growth appeared healthy and robust along streambanks and meadows. Elk presence, however, is noteworthy.

The **Little Colorado River** flows north from the River Reservoir and enters a dramatic canyon for approximately 3 miles before widening just upstream from the confluence with the South Fork Little Colorado River ([Photo](#)). Approximately 1.6 miles of the Little Colorado River was surveyed from within the canyon and another mile was surveyed from the canyon rim with binoculars. There was light grazing pressure but no major ground disturbance or impact to streambanks. The remainder of the canyon was devoid of any sign of cattle.

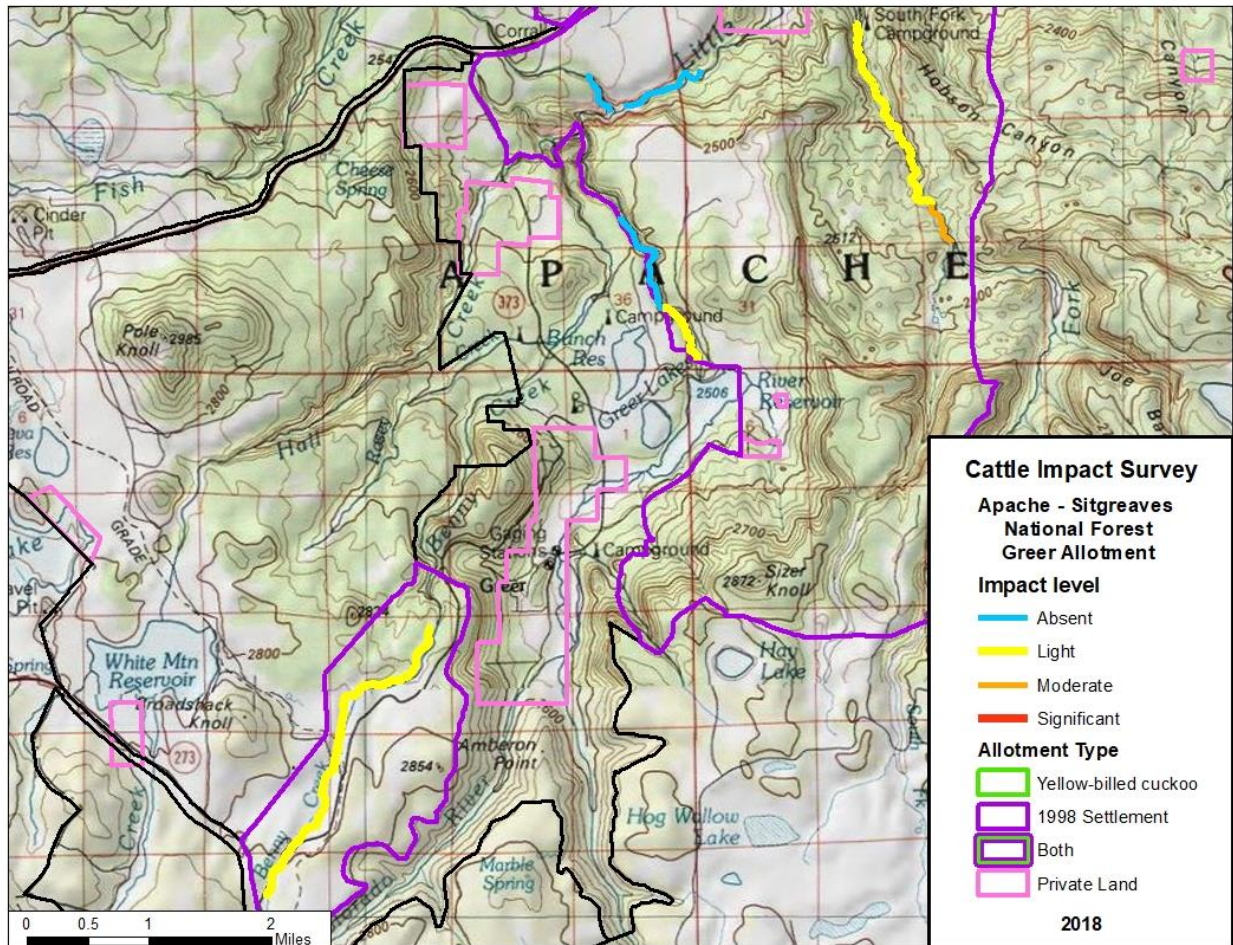
The **South Fork Little Colorado River** runs in a northerly direction and joins the Little Colorado River just beyond the allotments northern boundary. Portions of the forest were heavily burned by the Wallow Fire of 2011, and the area receives substantial recreational traffic with trail #97 following the river. Approximately 2.2 miles of the South Fork was surveyed. This stretch is subject to light to moderate cattle grazing, primarily in the furthest upstream portions ([photo](#)). There were no obvious impacts to streambanks, no wallowing, and no major trailing. Severely burned portions of the forest contain abundant deadfall, thus creating unfavorable conditions for cattle. Streamside vegetation appeared healthy and robust despite severe fire impact.

No sign of grazing was observed in **Fish Creek**.

**see map and table on next page*

RAPID ASSESSMENT OF CATTLE IMPACTS IN RIPARIAN ENCLOSURES ON THE APACHE-SITGREAVES NATIONAL FOREST

District: Springerville
 Allotment: Greer
 Type: 1998 Settlement
 Drainage: Benny Creek, Fish Creek, Little Colorado River, South Fork-Little Colorado River
 Surveyed: 7/27-7/29/2018
 Cattle Seen: NO



Stream	Absent	Light	Moderate	Significant	Total
Benny Creek		3.1 miles			3.1 miles
Fish Creek	0.4 miles				0.4 miles
Little Colorado R.	1.8 miles	0.6 miles			2.4 miles
S. Fk. Little Colorado R.		1.9 miles	0.4 miles		2.3 miles
TOTAL	2.2 miles	5.6 miles	0.4 miles		8.2 miles

METHODS

Cattle Impact Survey Purpose

The purpose of this survey project was to determine if cattle are present in excluded riparian areas on allotments on the Apache-Sitgreaves National Forests and to document the extent and intensity of impacts from cattle across these riparian ecosystems. Based on prior agreements, and in many cases codified in annual operating instructions, the allotments identified for survey should all have intact and functional enclosures to keep cattle out of riparian and aquatic river systems. Further objectives of this assessment were to quantitatively evaluate these impacts in six specific categories and document this data with georeferenced photographs and maps reflecting the overall impacts of cattle throughout allotment drainages.

Cattle Impact Survey Locations

Surveyors walked nearly every foot of more than 100 miles of sixteen named creeks and rivers on the Apache-Sitgreaves National Forest. Aquatic, riparian, xeri-riparian, floodplain, terrace, and upland conditions were carefully investigated and evaluated in accordance with a well-defined protocol. Surveyed areas cover twenty grazing allotments, nineteen of which are included in the 1998 settlement. Four were surveyed for cattle impacts in the last days of December 2017 and into January 2018, including portions of the Blue and San Francisco Rivers in and adjacent to the Wildbunch and Pigeon Allotments, and the San Francisco River within the Pleasant Valley and Hickey Allotments. The remaining allotments were surveyed in spring and summer of 2018. These data are the most comprehensive, quantifiable, and up to date inspections of riparian conditions and cattle occupancy known to exist for this area.

Cattle Impact Survey Field Methods

Data on cattle impacts in riparian areas of enclosure were collected for a total of 159 distinct segments on the Apache-Sitgreaves National Forest, each $\frac{1}{4}$ to 1 mile in length. Surveyors walked the excluded stream reaches of allotments and recorded the levels of impact in the following six categories:

- Grazing impacts on herbaceous vegetation and grasses
- Browsing impacts on streamside (near channel) woody regeneration
- Ground disturbances from trailing, trampling, and wallowing
- Extent and pervasiveness of ground disturbances in enclosure reaches
- Intensity of streambank degradation
- Extent and pervasiveness of streambank erosion levels in enclosure reaches from cattle

Cattle Impact Survey Data Collection

Surveyors used the ARC-GIS compatible COLLECTOR tablet systems to collect field data. An interactive database of all photo points and segment impact data was created. In addition, multiple georeferenced photo points were taken along each segment. For each of the six categories of cattle impact, detailed condition descriptors were determined based on pre-survey sample areas and field observations. Each level of condition was then assigned a severity level of 1-4 (see Table 4). During the field survey a score for each impact category at each segment endpoint was determined based on the severity and intensity of the particular impact. A segment was rated (0) for a particular impact if no evidence of impact was seen.

Cattle Impact Survey Data Compilation

Following field survey, each segment was rated for its “overall impact level”. Overall cattle impacts are defined as absent, light, moderate, or significant. To determine overall impact score, the numerical condition or severity score for each segment endpoint were collated and weighted. Generally, if specific category impacts were light or limited in four categories, the overall impact was considered light. If impact severity in five or more categories were light, then the overall impact was evaluated as moderate. Overall impact scores of moderate also included combinations of limited, light and moderate scores in all six categories. If three or more categories conditions were moderate, then the overall impact level rose to significant. If at least one impact category was severe or pervasive, then the overall impact level was evaluated as significant (see Table 5). At each segment endpoint, a score was determined for each impact. A segment was rated 0 for a particular category if no evidence of impact was seen. Each survey segment was color coded for its overall impact level (Table 5). Segments were linked together across full river extents. From this analysis the totals of absent, light, moderate and significant miles for each allotment were calculated are presented here on a series of maps and summarized in Table 3.

TABLE 3. ASNF 20-ALLOTMENT CATTLE IMPACT SURVEY RESULTS: Overall Impact Levels (2018 Field Season)							
Absent		Light		Moderate		Significant	
Total	% of	Total	% of	Total	% of	Total	% of
Miles	Total	Miles	Total	Miles	Total	Miles	Total
27.70	27.5%	17.00	17%	15.55	15%	40.96	40.5%

TABLE 4. CONDITION DESCRIPTORS AND SEVERITY SCORES FOR SIX CATTLE IMPACT CATEGORIES

Category	Condition 1	Condition 2	Condition 3	Condition 4
Grazing Evidence On Grasses And Herbaceous Growth	LIMITED Less than 1% of the grasses impacted.	LIGHT Few to some patches of grazed area or selective grazing in patches.	MODERATE Multiple grass patches grazed, more than 20% of grass impacted in patches.	SEVERE/HEAVY Multiple patches grazed, low grass heights less than 1 inch. More than 30% grazed in patches
Browse Pressure/Woody Stems	LIMITED Less than 1% of woody stems impacted	LIGHT Browsing limited to multiyear stems	MODERATE Browse pressure on near channel woody recruitment	HEAVY/SEVERE Multiple green-line or near channel recruitment browse
Ground Cover Disturbance/Intensity	LIMITED Limited to transient evidence of use.	LOW Isolated trailing and cow trails developing.	MODERATE Multiple trails and the presence of wallows and rutting areas. Some bare soils.	SEVERE Trails, plus wallows, rutting and compaction leading to denuded ground and larger areas of bare soils.
Ground Cover Disturbance/Extent	LIMITED Few examples of disturbance.	SCATTERED Trails or disturbances in more than one location in segment.	MODERATE Trails meander through entire segment and there are multiple moderate level disturbances (see above).	PERVASIVE Multiple locations of disturbance and multiple types of disturbances, including severe moderate and low (see above).
Streambank Degradation/Intensity	LIMITED No visible signs, but other cattle impact on both sides of river that evidence crossing.	LOW Trails leading to streambank and water's edge.	MODERATE Trailing and trails creating unstable banks, some chiseling, or in low relief banks-muddy compaction	SEVERE Trailing leading to shearing and removal of a portion of the streambank leaving vertical surfaces.
Streambank Degradation/Extent	LIMITED Isolated example of streambank entry.	SCATTERED Bank degradation of any intensity in more than one location.	MODERATE Multiple examples of low and moderate bank degradation (see above).	PERVASIVE Multiple examples of low, moderate, and severe degradation (see above).

TABLE 5. WEIGHTING FOR OVERALL IMPACT LEVELS OF STREAM REACH SEGMENTS BASED ON CONDITION SCORES (0-4) FROM SIX CATEGORIES OF CATTLE IMPACTS.

ABSENT	LIGHT IMPACT	MODERATE IMPACT	SIGNIFICANT IMPACT
All zeros	Any combination of One's & twos & zeros	At least (5) twos with any other number	Any time there are (3) threes with any other combination of numbers
		Any combination of twos, threes, and one's	Any combination of numbers with at least (1) four
	<i>(unless (5) twos-then moderate)</i>	<i>(unless (3) threes-then significant)</i>	
BLUE	YELLOW	ORANGE	RED

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