

Brown Bear Management Report and Plan, Game Management Units 21B, 21C, 21D, and 24:

Report Period 1 July 2014–30 June 2019, and

Plan Period 1 July 2019–30 June 2024

Sara Longson



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Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

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Purpose of this Report

This report provides a record of survey and inventory management activities for brown bear (*Ursus arctos*) in Units 21B, 21C, 21D, and 24 for the 5 regulatory years 2014–2018 and plans for survey and inventory management activities in the following 5 regulatory years, 2019–2023. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY14 = 1 July 2014–30 June 2015). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also provided to the public to inform it of wildlife management activities. In 2016 the Alaska Department of Fish and Game’s (ADF&G, the department) Division of Wildlife Conservation (DWC) launched this 5-year report to more efficiently report on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the brown bear management report of survey and inventory activities that was previously produced every 3 years.

I. RY14–RY18 Management Report

Management Area

Units 21B, 21C, 21D, and 24 are located in Interior Alaska and encompass 51,135 mi². The northern portion consists of the southern Brooks Range, the Kanuti National Wildlife Refuge, and the Koyukuk, Alatna, and John river drainages. The southern portion consists of the Tanana River floodplain, the Kaiyuh flats, the drainages of the middle Yukon, Koyukuk, Melozitna, and Nowitna rivers. Maps for unit boundaries and special management areas are located at <http://www.adfg.alaska.gov/index.cfm?adfg=maps.main>.

Summary of Status, Trend, Management Activities, and History of Brown Bear in Units 21B, 21C, 21D, and 24

Brown bear, also referred to as grizzly bear in Interior Alaska, density is thought to be low (10 bears/1,000 mi²) to moderate (25 bears/1,000 mi²) throughout Units 21B, 21C, and 21D, with the highest densities in mountainous areas. Brown bears are found in moderate numbers throughout Unit 24, with the highest densities (33 bears/1,000 mi²) in mountainous areas of the Brooks Range in northern Unit 24. Previous reports indicated that based on local oral history, bear populations were stable or slowly increasing (Woolington 1997a). Information from studies conducted on the northern slopes of the Brooks Range in Unit 26 (Linderman 1974, Reynolds 1976, Reynolds and Hechtel 1984) and in the southwestern Brooks Range in Unit 23 (Ballard et al. 1988) has been used to describe bear populations in Unit 24. From 1963 to about 2015 annual reported harvest in Units 21B, 21C, and 21D was <10 bears per year with a few exceptions (13 bears were harvested in 1982 and 12 bears were harvested in both 2000 and 2012). Annually, it is estimated that an additional 10 bears per year are killed and not reported as a result of bear-human conflicts. In Unit 24 the reported harvest since 1961 rarely exceeded 15–20 brown bears per year. Unreported kills most likely occurred along the Yukon and Koyukuk rivers during the summer and early fall when fish camps were in operation and bears were attracted to those sites. Historically brown bears were an important source of food and hides, but hunting effort by unit residents, with the exception of Anaktuvuk Pass residents, declined considerably during the 1900s. Although the opening of the Dalton Highway corridor to the public in the 1980s and early

1990s increased the number of potential nonlocal hunters, no increased harvest in Unit 24 was observed.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

There are no management plans for brown bears in Units 21B, 21C, 21D, and 24. Any changes to previous plans can be found in the division's management report series. This publication represents the current plan for brown bear in Units 21B, 21C, 21D, and 24.

GOALS

- G1. Protect, maintain, and enhance the brown bear population while providing a sustained opportunity to participate in viewing and hunting brown bears.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

- C1. There is a positive customary and traditional use finding by the Board of Game for brown bear in Unit 21. The amounts reasonably necessary for subsistence uses was set at 20–25 bears for Units 21 and 22 combined on an annual basis.
- C2. There is a positive customary and traditional use finding by the board for brown bear in Unit 24. The amounts reasonably necessary for subsistence uses was set at 25–35 bears for Units 23, 24, and 26 combined.

Intensive Management

None.

MANAGEMENT OBJECTIVES

- M1. Units 21B, 21C, 21D: Manage a brown bear population that will sustain a 3-year mean harvest of at least 25 bears, with at least 50% males in the reported harvest.
- M2. Unit 24: Manage a brown bear population that will sustain a 3-year mean reported harvest of at least 20 bears in the northern portion of the unit (north of Allakaket) and at least 15 bears in the southern (remaining) portion of the unit, with at least 50% males in the reported harvest.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor harvest data for population information.

Data Needs

Observations, hunter reports, and harvest data can be useful indicators of population trend.

Methods

Field observations, problem bear reports, and hunter sightings indicated the population was stable or slowly increasing since at least 1999. We did not conduct surveys in the area; however, we made population estimates based on known bear densities in similar habitats in other Interior Alaska game management units (Reynolds and Hechtel 1984, Reynolds 1989). Earlier work in similar habitats in Interior and Arctic Alaska provided the basis for these estimates (Reynolds 1976, Reynolds and Hechtel 1984). Data collected during sealing included population information such as sex, location of harvest, skull measurements, and age, if teeth were submitted for aging.

Results and Discussion

We estimated that between 350 and 400 brown bears inhabit Units 21B, 21C, and 21D (approximately 50 in 21B, 100 in 21C, and 200 in 21D), assuming that there are 25 bears per 1,000 mi² in the highest density bear habitat, and 10 bears per 1,000 mi² in the remainder of the reporting area (Woolington 1997b). The Nulato Hills are the best bear habitat in Unit 21D. Unit 21C contained the next best brown bear habitat. However, for both areas, density was likely underestimated because the best habitat in this reporting area included salmon spawning streams that the referenced habitats were lacking (Miller 1993).

In Unit 24, Reynolds (1989) estimated densities of 33 bears per 1,000 mi² within Gates of the Arctic National Park (7,000 mi²), 33 bears per 1,000 mi² in the Brooks Range outside the park (6,500 mi²), and 22–33 bears per 1,000 mi² in the remainder of Unit 24 (to the south; 14,500 mi²). Therefore, it was estimated that there were 450 bears in northern Unit 24 (north of Allakaket) and 320–480 in the remainder of the unit (south of Allakaket). Although these estimates were calculated in the 1980s, this corroborates with the current available data and observations, and the population is likely still within this range.

Recommendations for Activity 1.1.

Continue collecting field observations, problem bear reports, and hunter harvest reports to monitor bear prevalence, conflicts, and population trend.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor and analyze harvest data.

Data Needs

Annual summaries of harvest are needed to assess harvest objectives.

Methods

Harvest was monitored through sealing requirements. Data collected during sealing included information specific to harvest (transportation methods, date of harvest, and commercial services used). Age determination from tooth cementum annuli was conducted by Matson’s Laboratory, Milltown, MT. Data collected from bears harvested under subsistence regulations were limited to sex, location of kill, and date of harvest. Bear-human conflicts were addressed through education, legal harvest of problem bears (e.g., bears perceived as potential threats to human safety or property), and changes in regulations. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY14 = 1 July 2014 through 30 June 2015).

Results and Discussion

Harvest by Hunters

Reported brown bear harvest in Units 21B, 21C, and 21D was low ($\bar{x} = 14$ bears/year), and males were harvested at a higher rate than females during RY14–RY18 (Table 1). Since 1963, among Units 21B, 21C, and 21D, most reported that brown bear harvest occurred in Unit 21D, where most moose hunting also occurred (Stout 2011). Unit 21C has sustained the second greatest harvest, which was supported by the relatively high density of bears in that area. Unit 21C is also a more favorable habitat for hunting due to the openness of the landscape.

Table 1. Units 21B, 21C, and 21D reported brown bear harvest by unit, regulatory years 2014–2018, Interior Alaska.

Regulatory year	Unit 21B		Unit 21C		Unit 21D		Total reported harvest
	Male	Female	Male	Female	Male	Female	
2014	1	0	1	0	4	2	8
2015	0	0	2	0	6	3	11
2016	0	2	2	1	6	5	16
2017	0	0	6	3	7	2	18
2018	0	0	4	3	6	4	17

The unreported brown bear harvest was likely approximately 10 bears per year based on local resident interviews and previously reported values. Most unreported harvest was likely bears taken at fish camps. This would make the combined mean annual harvest during RY14–RY18 approximately 24 bears/year in Units 21B, 21C, and 21D (Table 2). The estimated sustainable harvest rate is at least 5–6% of the population, based on data from other areas of Interior Alaska

Table 2. Units 21B, 21C, and 21D brown bear mortality, regulatory years 2014–2018, Interior Alaska.

Regulatory year	Reported								Estimated kill		Total kill			
	Hunter kill				Nonhunting kill ^a				Unreported	Illegal	M	F	Unk	Total
	M	F	Unk	Total	M	F	Unk	Total						
<i>2014</i>														
Fall 2014	4	1	0	5	0	0	0	0	5	0	4	1	5	10
Spring 2014	2	1	0	3	0	0	0	0	5	0	2	1	5	8
Total	6	2	0	8	0	0	0	0	10	0	6	2	10	18
<i>2015</i>														
Fall 2015	5	3	0	8	0	0	0	0	5	0	5	3	5	13
Spring 2015	3	0	0	3	0	0	0	0	5	0	3	0	5	8
Total	8	3	0	11	0	0	0	0	10	0	8	3	10	21
<i>2016</i>														
Fall 2016	5	5	0	10	0	0	0	0	5	0	5	5	5	15
Spring 2016	3	3	0	6	0	0	0	0	5	0	3	3	5	11
Total	8	8	0	16	0	0	0	0	10	0	8	8	10	26
<i>2017</i>														
Fall 2017	7	5	0	12	0	0	0	0	5	0	7	5	5	17
Spring 2017	6	0	0	6	0	0	0	0	5	0	6	0	5	11
Total	13	5	0	18	0	0	0	0	10	0	13	5	10	28
<i>2018</i>														
Fall 2018	6	6	0	12	0	0	0	0	5	0	6	6	5	17
Spring 2018	4	1	0	5	0	0	0	0	5	0	4	1	5	10
Total	10	7	0	17	0	0	0	0	10	0	10	7	10	27

^a Includes defense of life or property (DLP) kills, research mortalities, and other known human-caused accidental mortality.

(DuBois 1989). Based on this conservative harvest rate, a minimum annual harvest of 18–24 bears can be sustained in Units 21B, 21C, and 21D.

The age and sex composition of the reported harvest in Units 21B, 21C, and 21D shows no indication of overexploitation. From RY14 through RY18 males made up 64% of the reported harvest, which was adequate to maintain recruitment. For comparison, males accounted for 79% of the harvest from 2008–2014 (Stout 2013). In Unit 24 the average annual brown bear harvest reported by hunters during RY14–RY18 was 16 bears (Table 3). The reported average harvest during RY14–RY18 in northern (north of Allakaket) and southern (remaining) Unit 24 were 15 bears and 1 bear, respectively. The number of bears taken by fishers or trappers and not reported is unknown but was likely <6 bears annually. The RY14–RY18 mean annual reported and estimated unreported harvest in the entire unit was 21 bears (Table 4). This was just below the RY11–RY13 average of 23 bears. Of the reported harvest for that same period, 66% were male and 34% were female, a percentage of males identical to the RY11–RY13 harvest. The estimated sustainable harvest rate is at least 5–6% based on data from other areas of Interior Alaska (DuBois 1989). Based on this conservative harvest rate, a minimum annual harvest of 39–56 bears can be sustained in Unit 24.

In RY14–RY18 the average age of harvested brown bears was 9-years old ($n = 130$) in Units 21B, 21C, 21D, and 24.

Table 3. Unit 24 reported brown bear harvest by unit, regulatory years 2014–2018, Interior Alaska.

Regulatory year	Unit 24A		Unit 24B		Unit 24C		Unit 24D		Total reported harvest
	Male	Female	Male	Female	Male	Female	Male	Female	
2014	5	4	6	2	0	0	2	1	20
2015	8	5	3	2	0	0	1	0	19
2016	10	5	3	0	0	0	0	0	18
2017	5	6	0	1	0	0	0	0	12
2018	4	2	6	1	0	0	0	0	13

Season and Bag Limit

Seasons and bag limits for brown bear in Units 21B, 21C, 21D, and 24 were established in Alaska Administrative code 5AAC 85.025 editions 2014–2015, 2015–2016, 2016–2017, 2017–2018, 2018–2019 and are available in the Alaska hunting regulations numbers 54, 55, 56, 57, and 58. Additional state regulations affecting brown bear hunting include special restrictions along the Dalton Highway and can be found in Alaska Administrative code 5AAC 92.530 (7) Dalton Highway Corridor Management Area.

Table 4. Unit 24 brown bear mortality, regulatory years 2014–2018, Interior Alaska.

Regulatory year	Reported								Estimated kill		Total kill			
	Hunter kill				Nonhunting kill ^a				Unreported	Illegal	M	F	Unk	Total
	M	F	Unk	Total	M	F	Unk	Total						
<i>2014</i>														
Fall 2014	11	5	0	16	0	0	0	0	3	2	11	5	5	21
Spring 2014	2	1	0	3	0	1	0	1	0	0	2	2	0	4
Total	13	6	0	19	0	1	0	1	3	2	13	7	5	25
<i>2015</i>														
Fall 2015	11	5	0	16	0	0	0	0	3	2	11	5	5	21
Spring 2015	1	2	0	3	0	0	0	0	0	0	1	2	0	3
Total	12	7	0	19	0	0	0	0	3	2	12	7	5	24
<i>2016</i>														
Fall 2016	9	4	0	13	0	1	0	1	3	2	9	5	5	19
Spring 2016	4	0	0	4	0	0	0	0	0	0	4	0	0	4
Total	13	4	0	17	0	1	0	1	3	2	13	5	5	23
<i>2017</i>														
Fall 2017	5	5	0	10	0	0	0	0	3	2	5	5	5	15
Spring 2017	1	1	0	2	0	0	0	0	0	0	1	1	0	2
Total	6	6	0	12	0	0	0	0	3	2	6	6	5	17
<i>2018</i>														
Fall 2018	7	2	0	9	0	0	0	0	3	2	7	2	5	14
Spring 2018	3	1	0	4	0	0	0	0	0	0	3	1	0	4
Total	10	3	0	13	0	0	0	0	3	2	10	3	5	18

^a Includes defense of life or property (DLP) kills, research mortalities, and other known human-caused accidental mortality.

Permit Hunts

The only brown bear registration permit hunt in the Galena area is the is the RB601 subsistence permit which pertains to Units 21D and 24. Forty-nine hunters obtained this permit from RY14–RY18 and no bears were harvested under this permit during this reporting period. There are no brown bear registration permit hunts in Units 21B and 21C.

Hunter Residency and Success

In Units 21B, 21C, and 21D, nonresident hunters harvested more brown bears than local or nonlocal resident hunters (Table 5). Mean annual harvest during RY14–RY18 in those units was 2 bears for local hunters, 4 for nonlocal residents, and 7 for nonresidents. From RY14–RY18 the mean annual number of successful hunters was 14. This was double the average compared to RY04–RY14 when the mean annual number of successful hunters was 7 (Stout 2013). Increased guiding activity is likely a factor for the increase in successful hunters. In 2017, 14 of the 18 successful hunters were guided.

Table 5. Units 21B, 21C, and 21D brown bear successful hunter residency, regulatory years 2014–2018, Interior Alaska.

Regulatory year	Local resident ^a	Nonlocal resident	Nonresident	Total successful hunters
2014	2	4	2	8
2015	3	4	4	11
2016	2	6	8	16
2017	0	5	13	18
2018	5	2	10	17

^a The term local resident includes residents of Units 21B, 21C, and 21D.

Mean annual harvest during RY14–RY18 in Unit 24 was less than 1 bear for local hunters, 9 for nonlocal residents, and 7 for nonresidents (Table 6). Most of this harvest was incidental to fall moose hunting. Reported harvest in Unit 24 during RY14–RY18 averaged 16 bears, which is consistent with historical levels which range 10–20 bears annually.

Table 6. Unit 24 brown bear successful hunter residency, regulatory years 2014–2018, Interior Alaska.

Regulatory year	Local resident ^a	Nonlocal resident	Nonresident	Total successful hunters
2014	2	10 ^b	8	20
2015	0	13	6	19
2016	0	10	8	18
2017	0	8	4	12
2018	0	4	9	13

^a Unit 24 residents.

^b Includes 1 research kill.

Harvest Chronology and Transport Methods

In Units 21B, 21C, and 21D, most kills occurred during the fall (67%) incidental to hunting other game species. Hunters typically used boats for transportation (63%). Other transportation used during the reporting period included snowmachine (14%), airplane (10%), off-road vehicle (10%), and foot or other methods (3%).

In Unit 24 during RY14–RY18 most kills occurred during the fall (80%), incidental to hunting other game species. Transportation to the hunt area was via airplane (31%), highway vehicle (30%), boat (19%), horseback/dog team (11%), airboat (5%), by foot (3%) or by ORV (1%) and was similar to reported values prior to the reporting period.

Alaska Board of Game Actions and Emergency Orders

Details of Alaska Board of Game (board) actions and emergency orders during 1996–2012 can be found in Stout (2013). The board adopted baiting of brown bears at black bear bait stations in Unit 21D in 2012 and expanded that to Units 24C and 24D in 2014, and further expanded to include Unit 21C (spring baiting only) in 2017.

Recommendations for Activity 2.1

Continue monitoring reported harvest because it is an effective and inexpensive method of gathering information, although there are limitations for using these data.

3. Habitat Assessment-Enhancement

No monitoring activity occurred during RY14–RY19, and no changes are recommended. Hunter numbers and harvest in Units 21B, 21C, 21D, and 24 are low. As a result, ADF&G area managers only monitor reported harvest to assess achievement of our goal for sustained opportunity to participate in hunting brown bear.

Nonregulatory Management Problems or Needs

Data Recording and Archiving

- Harvest data and GeoSpatial Population Estimator (GSPE) survey data will be stored on an internal database housed on ADF&G's Wildlife Information Network (WinfoNet) server (<http://winfonet.alaska.gov/index.cfm>) and archived in WinfoNet under Harvest Information and Survey and Inventory Tools.
- All other electronic files such as survey memoranda, reports, and maps will be located on the Fairbanks server (S:\Longson\brownbear). All hard copy data sheets, paper files, etc. are located in the file cabinet in the area biologist's office.
- In addition, survey memos, reports, and other pertinent electronic survey information (e.g., survey maps, memoranda) will be archived in WinfoNet – Data Archive. Project title: Galena Area Brown Bear. Primary Region: Region III.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

For Units 21B, 21C, and 21D we achieved the management objective to manage for a brown bear population that will sustain a 3-year mean annual harvest of at least 25 bears, with at least 50% males in the reported harvest. The 3-year (RY16–RY18) mean annual reported harvest of 17 bears was below the harvest objective of 25 bears. With the current conservative population estimate of 350–400 bears, a sustainable annual harvest of at least 18–24 brown bears can probably be supported (5–6% of the population). Because males continued to be harvested at a higher rate than females, and the average age of harvested bears was relatively high, the population was most likely maintaining a high level of reproductive potential with a gradually maturing age-class structure. Unless regulations or hunting habits change dramatically, the harvest will have a negligible effect on brown bear populations in these units. The population is likely fluctuating but harvest remains stable. A more accurate assessment of the unreported harvest and a better estimate of the population size should continue to be a management priority.

In Unit 24 we achieved the management objective of maintaining a population that could sustain a 3-year mean annual reported harvest of at least 20 bears in northern Unit 24 (RY16–RY18; \bar{x} = 14). During RY14–RY18, harvest throughout the unit was low and was not a factor influencing the population. Although most harvest took place in northern Unit 24, the population was capable of sustaining that level of harvest. Southern Unit 24 was underutilized at a harvest of 1 bear during RY16–RY18, with 66% of the harvest being males. With the current conservative population estimate of 770–930 bears, a sustainable annual harvest of 39–56 brown bears can probably be supported (5–6% of the population).

Although some localized overhunting could occur in Unit 24, the brown bear population as a whole is not likely to be overharvested because hunting is restricted within the Gates of the Arctic National Park, which has habitat to support a relatively high density of brown bears. Much of the remainder of the unit is more heavily forested and difficult to hunt.

Education, improved reporting compliance, and federal agency cooperative management activities (e.g., regulatory harvest strategies, harvest reporting, population surveys) will continue to be given high priority during the next reporting period. Age and sex ratios of harvested animals are the standard for monitoring large predator populations in the absence of intensive population investigations, and that information will continue to be collected.

An examination, analysis, and evaluation of brown bear population studies and brown bear habitat should be completed, and then adjustments should be made to bear population estimates.

II. Project Review and RY19–RY23 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no changes in the management direction for brown bears in in Units 21B, 21C, 21D and 24. We will continue to monitor annual harvest and listen to public concerns, should any arise.

GOALS

The current goals for brown bear management in Units 21B, 21C, 21D, and 21 are appropriate and will remain unchanged. Specifically, the goals will remain as:

- G1. Protect, maintain, and enhance the brown bear population while providing a sustained opportunity to participate in hunting brown bears.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

- C1. There is a positive customary and traditional use finding by the Board of Game for brown bear in Unit 21. The amounts reasonably necessary for subsistence uses was set at 20–25 bears for Units 21 and 22 combined on an annual basis.
- C2. There is a positive customary and traditional use finding by the Board of Game for brown bear in Unit 24. The amounts reasonably necessary for subsistence uses was set at 25–35 bears for Units 23, 24 and 26 combined.

MANAGEMENT OBJECTIVES

- M1. Units 21B, 21C, 21D: Manage a brown bear population that will sustain a 5-year mean harvest of at least 25 bears, with at least 50% males in the reported harvest.
- M2. Unit 24: Manage a brown bear population that will sustain a 3-year mean reported harvest of at least 20 bears in the northern portion of the unit (north of Allakaket) and at least 15 bears in the southern (remaining) portion of the unit, with at least 50% males in the reported harvest.

Management action will be considered if the harvest exceeds the management objective during the next reporting period. Examples of possible management actions include reducing the bag limit in areas where 2 bears are allowed (21D, 24D), and shortening the season or instituting bear baiting restrictions. If the harvest continues to be lower than above the objective, possible management actions could include lengthening the season, increasing bag limits, or liberalizing areas where brown bears can be taken over bait.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

Population status and trend will not be monitored in Units 21B, 2C, 21D, and 24. Population data is not needed if harvest remains consistent considering the large area with low hunting pressure.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Review annual harvest.

Data Needs

Hunter numbers and harvest in Units 21B, 21C, 21D, and 24 are low. As a result, we only monitor reported harvest to assess achievement of our goal for sustained opportunity to participate in hunting brown bears.

Methods

Data collected during sealing will include population information including sex, location of harvest, skull size, and age (if teeth are submitted for aging). Information specific to the harvest will also be collected including transportation method, date of harvest, and commercial services used (e.g., use of a guide). Age determination from tooth cementum annuli will be conducted by Matson's Laboratory, Milltown, MT. Data collected from bears harvested under subsistence regulations are limited to sex, location of kill, and date of harvest.

3. Habitat Assessment-Enhancement

Brown bear habitat will not be assessed or enhanced during this planning period.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

None.

Data Recording and Archiving

No change from report.

Agreements

None.

Permitting

None.

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