

COMPLAINT INVESTIGATION

Livestock Grazing in the South Okanagan and White Lake Grasslands Protected Areas

> OCTOBER 2023 FPB/IRC/250



Forest Practices Board BC'S INDEPENDENT WATCHDOG FOR SOUND FOREST & RANGE PRACTICES

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Board Commentary

In 2001, the BC Government established the South Okanagan and White Lake Grasslands Protected Areas. These areas are important to Indigenous peoples. They support rare and endangered plants and wildlife and provide other important cultural and ecological values. Tenured livestock grazing was allowed to continue when these protected areas were established. Approximately 300 parks and protected areas in BC allow livestock grazing.

The Forest Practices Board (the Board) investigated two public complaints about livestock grazing and government management of the range resource within these two protected areas. The Board found that, on the Mt. Kobau site of the South Okanagan Grasslands Protected Area (SOGPA), a range agreement holder did not comply with *Forest and Range Practices Act* (FRPA) requirements to protect plant communities, riparian and upland areas, and to maintain range fencing.

The Board found that the Ministry of Forests (MoF) did not comply with FRPA requirements to obtain authorizations to construct range developments, and it caused damage to the environment when it constructed a water diversion. The Board found the MoF to be in compliance with FRPA's requirement to revegetate exposed soils with ecologically suitable species. However, the term "ecologically suitable species" is not defined in FRPA, creating uncertainty about the specific intent and expectations of this requirement.

In the two protected areas, compliance and enforcement are the responsibility of three agencies within two government ministries, the MoF and the Ministry of Environment and Climate Change Strategy. Overall, the Board found that government's enforcement of FRPA requirements in the SOGPA was not appropriate to achieve compliance.

A memorandum of understanding (MOU) between BC Parks and the MoF provides comprehensive policy direction to the agencies for how livestock grazing should occur in parks and protected areas. The Board found that little progress has been made in achieving the MOU's goals, and the agencies did not follow the associated policy/guidance document. This is concerning to the Board because if the agencies had followed the MOU, it is likely that the findings of non-compliance could have been avoided. The Board also believes that the management of livestock grazing in the SOGPA would benefit if the land managers collaborated in preparing and implementing an overarching management plan.

The SOGPA is part of a much larger area being considered by First Nations and the provincial and federal governments as a national park reserve. Through the process of investigating the two complaints, the Board heard from the Lower Similkameen Indian Band (LSIB) Chief and Council that they assert the right to manage the land base, including approving livestock grazing. Chief and Council told the Board that they disagree with the findings of non-compliance of the range agreement holder within the Mt. Kobau site.

The Board acknowledges and respects the views of the LSIB; however, the Board is required to make its findings in relation to requirements under FRPA. It is important to ensure that planning for the management of range use in protected areas, which prioritizes cultural and ecosystem values, is achieved through a collaborative process that fully involves Indigenous nations who have asserted their rights to these areas.

In accordance with section 131(2) of FRPA, the Board makes the following recommendations to government:

1. Define 'ecologically suitable species' in FRPA to ensure consistent application for forest and range practices. Prepare and implement appropriate guidance for selecting ecologically suitable species.

2. In collaboration with First Nations, prepare and implement a long-term, comprehensive management plan for the SOGPA that integrates livestock grazing and the protection of cultural and ecosystem values. The plan should include (i) a field-based assessment of forage availability and range condition across the protected area, and (ii) strategies that will be implemented to restore areas negatively impacted by livestock grazing and the construction of range developments. The applicable *Range Act* agreements and range use plans should be amended to be consistent with the content of the management plan.

In accordance with section 132 of FRPA, the Board requests the Ministry of Forests respond by March 31, 2024, and state whether or not government accepts, partially accepts, or rejects these recommendations, and describe the actions it intends to take to address them.

Introduction

The Complaint

On January 27, 2021, the Board received a complaint from a member of the public (referred to as Complainant 1) about livestock grazing in the South Okanagan Grasslands Protected Area (SOGPA) and White Lake Grasslands Protected Area (WLGPA). Complainant 1 is concerned that:

- 1. Range agreement holders are not following Forest and Range Practices Act (FRPA) requirements;
- 2. The Ministry of Forests Okanagan Shuswap Natural Resource District (referred to hereafter as the MoF) constructed range developments without authorization and caused damage to the environment;
- 3. Government is not enforcing FRPA requirements; and
- 4. BC Parks staff and MoF district range staff are not adhering to an interagency agreement on managing and administering livestock grazing in parks and protected areas.

On July 7, 2021, the Board received a joint complaint from a member of the public and a person representing a local non-government organization (referred to as Complainant 2) that livestock grazing has damaged the riparian and upland area around Blue Lake in the SOGPA.

Both complaints are investigated in this report.

Background

Description of the Protected Areas

The SOGPA and WLGPA are located south of Penticton on the west side of the Okanagan Valley (see Figure 1). They consist entirely of provincially and nationally significant ecosystems, including the hottest and driest biogeoclimatic variants in the province. Both protected areas support species at risk ranked by BC's Conservation Data Centre and listed under the federal *Species at Risk Act*.

The protected areas exist amongst a complex of private land, some of which is held by provincial and federal government agencies and land trusts and managed for conservation purposes. The protected areas are of significant importance to Indigenous peoples and are within the territories of the Lower Similkameen Indian Band, Osoyoos Indian Band, and Penticton Indian Band. The areas are popular destinations for wildlife viewing, mountain biking, and horseback riding.

The SOGPA is located about 11 kilometres north and west of Osoyoos and covers an area of 9370 hectares. The protected area includes four geographically separate areas, referred to by BC Parks as "sites": Chopaka East, Chopaka West, Kilpoola, and Mt. Kobau.¹

The WLGPA is located 20 kilometres southwest of Penticton and has an area of 3764 hectares. It is used for longterm wildlife research and is part of a larger "biodiversity ranch"—an initiative of a land trust to coordinate and manage range use of lands it holds along with provincial and federal public land.

In 2019, First Nations and the provincial and federal governments entered into an agreement to establish a national park reserve that would include the SOGPA. Under the terms of the agreement, existing licenses and agreements including livestock grazing—will be allowed to continue once the national park reserve is established.

¹ Refer to BC Parks management direction statements for information about the four sites within the SOGPA, including ecosystem attributes https://bcparks.ca/explore/parkpgs/s_ok_grassland/

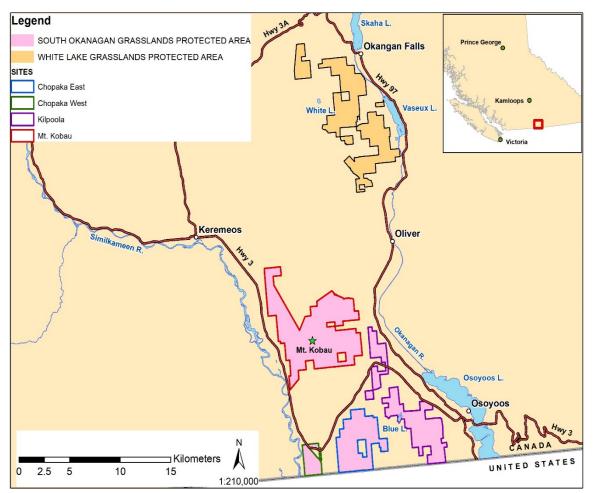


Figure 1. Location of the South Okanagan and White Lake Grasslands Protected Areas (note the four "sites" within the South Grasslands Protected Area).

Livestock Grazing in the Protected Areas

The SOGPA and WLGPA were established as protected areas in 2001, and the *Park Act*² applies. The *Park Act* authorizes livestock grazing to continue if the grazing was authorized before the park or protected area was established.ⁱ There is a long history of livestock grazing before the protected areas were established. Currently, five range agreements for livestock grazing overlap the SOGPA, and three overlap the WLGPA.

The *Park Act* requires that livestock grazing in parks and protected areas be administered and managed under the *Range Act* and FRPA. BC Parks³ is responsible for administering park-related legislation in all parks and protected areas. The MoF is responsible for administering and enforcing *Range Act* agreements in the parks and protected areas that allow livestock grazing.⁴ The Compliance and Enforcement Branch (CEB) is responsible for enforcing FRPA.

About 290 of BC's 1037 parks and protected areas (28 percent) allow livestock grazing. A memorandum of understanding (MOU) between BC Parks and the MoF directs the management of livestock grazing within these areas.

In protected areas that allow livestock grazing, several agencies have a role in compliance and enforcement:

- 1) CEB is responsible for enforcing FRPA.
- 2) The MoF district manager is responsible for enforcing the *Range Act*.
- BC Parks is the lead for enforcing the park-related legislation with support from the Conservation Officer Service and CEB.

² The Park Act provides for the establishment, classification and management of parks, conservancies and recreation areas (source: BC Parks).

³ BC Parks is a division of the Ministry of Environment and Climate Change Strategy.

⁴ BC Parks staff do not have the authority to enforce the *Range Act* or FRPA. However, along with the MoF and CEB, the agency is part of government's compliance and enforcement framework.

2015 Testalinden Wildfire and Construction of Range Developments

In 2015, the 5,200-hectare Testalinden wildfire burned about half of the Mt. Kobau site. The fire affected forests, rare and endangered wildlife and plant communities, and damaged a significant amount of range developments, including barbed-wire fencing.

In 2016 and 2017, the MoF constructed 22 kilometres of new and replacement barbed-wire and debris fence. Two temporary electric fences were installed, and an exclosure⁵ was built in the Kobau subalpine for monitoring the post-wildfire recovery of plant communities. Two water diversions⁶—which provide water for livestock—were reconstructed after the wildfire. In 2017, the MoF reconstructed the Testalinden water diversion. In 2020, the MoF began construction of the Middle Mountain water diversion, and work was completed in 2021.

Legislation Applicable to the Complaint

Several sections of FRPA, the *Forest Planning and Practices Regulation* (FPPR), and the *Range Planning and Practices Regulation* (RPPR) apply to this investigation. Provisions of the *Range Act* are also examined as they relate to obtaining authorizations to construct range developments. Appendix 1 lists the legislation relevant to the investigation.

The Investigation

Issue 1: Did range agreement holders comply with FRPA requirements?

Complainant 1 was concerned that range agreement holders are not following FRPA requirements for adhering to the grazing schedule of the range use plan and ensuring that livestock do not overgraze the land. Complainant 1 cited two specific examples:

- 1. The Mt. Kobau site of the SOGPA. The site mostly overlaps the range agreement area held by Elkink Ranch Ltd. (RAN077401).
- 2. The area between White Lake and Mahoney Lake in the WLGPA. The range agreement is held by W.W. Clifton, B.R. Clifton and W.R. Clifton (RAN077311), and is referred to as Clifton Ranch.

Complainant 2 was concerned about livestock damage at Blue Lake in the Kilpoola site of the SOGPA. That range agreement area is held by 69 Ranch Partnership (RAN077176).

To investigate the complaints, the Board examined the planning and practices of Elkink Ranch Ltd., Clifton Ranch and 69 Ranch Partnership in relation to FRPA requirements.

Range Plan

A range agreement holder must have a valid range use plan that meets content requirements [sections 32(1) and 33 of FRPA].

Compliance with the Range Plan (Grazing Schedule)

A range agreement holder must follow their range use plan [section 45(1) of FRPA]. In its investigation, the Board examined the grazing schedule of the range plan. The schedule specifies the number and class of livestock, the period of use, and the number of animal unit months for each pasture.

⁵ An exclosure is a fenced area that prevents livestock access.

⁶ The two water diversions were originally constructed in 1979 and had not been functional for many years, including prior to the 2015 Testalinden wildfire.

Removal from Grazing

A range agreement holder must ensure that the grazing of herbaceous plants by livestock does not occur in a manner that, if continued, will result in a deterioration of plant communities [section 29(2) of RPPR]. FRPA does not define "deterioration of plant communities." However, there are several indicators that, if present, signal the initial stages of livestock-caused plant community deterioration. The indicators include:

- 1) the presence of plant species that have encroached on and/or invaded the natural plant community; and/or
- 2) damage to or mortality of native plants caused by overgrazing or by trampling.

Protection of Riparian and Upland Areas

A range agreement holder must not carry out a range practice if it would cause a material adverse impact on a riparian area [section 30 of RPPR].

To field-assess compliance with riparian and upland areas, Board investigators use a health assessment referred to as a "proper functioning condition" assessment. The assessment determines the current condition of the riparian or upland area as being functional, functional at risk, functional at high risk, or not functional. If a riparian or upland area is determined to be not functional, the Board considers that there has been a material adverse effect on the ability of the riparian or upland areas to achieve their intended functions⁷ and therefore is in non-compliance with FRPA requirements.

Maintenance of Range Developments

Section 40 of the RPPR requires a range agreement holder to maintain range developments in an "effective operating condition." Range developments are defined in FRPA and include any structure (e.g., barbed-wire fencing or corral) or an excavation (e.g., a dugout to provide water for livestock).

Although the term "effective operating condition" is not defined in FRPA, the Board considers that compliance is achieved when the range development is maintained in a manner that it functions as intended. For example, the purpose of four-strand barbed-wire fencing may be to ensure that livestock cannot leave an area. If the fencing does not restrict livestock movement because one or more wires are broken—and there has been no action to maintain the fencing—then it is not being maintained in an effective operating condition.

Board investigators visited the SOGPA on June 17 and July 21-22, 2021, and the WLGPA on June 16, 2021.

Appendix 1 states FRPA's full legal requirements for the range planning and practices examined in this investigation.

Mt. Kobau site of the SOGPA (Elkink Ranch Ltd.)

Range Plan

The agreement holder has an approved range use plan that meets the content requirements in FRPA.

Finding: Elkink Ranch complied with sections 32(1) and 33 of FRPA.

Compliance with the Range Plan (Grazing Schedule)

Investigators assessed the agreement holder's compliance with the grazing schedule in three pastures on two separate dates. On June 17, 2021, investigators observed multiple livestock⁸ in two pastures approximately 44 days before the date authorized (i.e., August 1) in the grazing schedule.

Finding: On June 17, 2021, Elkink Ranch did not comply with section 45(1) of FRPA.

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⁷ See Appendix 1, sections 30 and 31 of the *Range Planning and Practices Regulation*.

⁸ The livestock observed by Board investigators were branded with the agreement holder's registered brand.

Removal from Grazing

Investigators assessed compliance with FRPA requirements to remove livestock from grazing before deterioration to plant communities occurs on an approximately 120-hectare area of the Sawmill Lake pasture. Investigators selected the area for assessment based on Google Earth imagery, which showed indicators of potentially heavy use by livestock. The 120-hectare area⁹ is known to support red-listed and blue-listed plant species.¹⁰

Over a 15-hectare area of open forest dominated by sagebrush, investigators observed evidence of prolonged and heavy livestock use. There was a widespread presence of plant species that had encroached on or invaded the natural plant community (see Figure 2), and most sagebrush plants had broken stems or branches due to livestock trampling. Within this 15-hectare area, livestock use has caused a deterioration of plant communities.

Finding: Elkink Ranch did not comply with section 29(2) of the RPPR on the 15-hectare area inspected.

Protection of Riparian Areas

Investigators examined two riparian areas. A 200-metre section of Richter Creek (non fish-bearing) that flows through the same 120-hectare area assessed for removal from grazing requirements showed heavy and long-term livestock trampling of riparian vegetation and damage to the stream and channel banks. The first 100 metres of the riparian area examined was not functional (see Figure 3). The remaining 100 metres of riparian area was functional but at high risk of becoming not functional if heavy use by livestock continues.

Investigators also examined a 1200-metre-long section of Swartz Creek (non fish-bearing).ⁱⁱ For 75 metres downstream of the road, investigators observed heavy and long-term livestock trampling of riparian vegetation and damage to the stream and channel banks to the extent that the riparian area is not functional.

For the remaining 1125 metres downstream of Mt. Kobau road, investigators observed livestock-trampled riparian vegetation and damage to stream channel banks at multiple points, but not continuously along the stream. Overall, the riparian area is functional, but is at risk of becoming not functional if livestock use in the riparian area is not properly managed.

Finding: On over 175 metres of riparian area, Elkink Ranch did not comply with section 30 of the RPPR.



Figure 1. Prolonged and heavy livestock grazing has resulted in soil disturbance. As a result, introduced species such as dandelion (visible in foreground) have invaded the area and contributed to a deterioration of the plant community.



Figure 2. Board investigators determined that a 100meter section of Richter Creek is not functional and therefore not compliant with FRPA requirements to protect riparian areas.

⁹ The 120-hectare assessment area supports the following plant communities: bluebunch wheatgrass-junegrass (red-listed); prairie rose-Idaho fescue (red-listed); hybrid white spruce/ black gooseberry (blue-listed); Vasey's sagebrush/pinegrass community (red-listed). Source: BC Parks pers. comm.

¹⁰ Red-listed species include any native species, subspecies or ecosystem community that have or are candidates for extirpated, endangered or threatened status in BC. Blue-listed species is any species of special concern in BC (source: BC Conservation Data Centre).

Protection of Upland Areas

Board investigators examined protection of upland areas over the same 15 hectares where livestock grazing had caused a deterioration of plant communities (see Removal from Grazing section). Over the 15 hectares, Board investigators observed that livestock caused excessive soil compaction and disturbance, decreasing the productivity and infiltration of the soils. In some treed areas—where livestock seek shelter—there were large patches of exposed and disturbed soils (see Figure 2). Over the 15 hectares, the upland area is not functional.

Finding: On 15 hectares within the Sawmill Lake pasture, Elkink Ranch did not comply with section 31 of the RPPR.

Maintenance of Range Developments

Investigators examined a 1.5-kilometre-long section of barbed-wire fence between the Sawmill Lake and Swartz Creek pastures. Although the fence is relatively new (constructed in 2016), overall, it is not in an effective operating condition as required by the RPPR (see Figure 4). Investigators observed livestock moving through the fence into the adjacent Swartz Creek pasture, where they were not permitted to graze at the time.

Finding: For 1.5 kilometres of barbed-wire fence, Elkink Ranch did not comply with section 40 of the RPPR.

Area Between White Lake and Mahoney Lake in the WLGPA (Clifton Ranch)

Range Plan

The agreement holder has an approved range use plan that meets the content requirements in FRPA.

Finding: Clifton Ranch complied with sections 32(1) and 33 of FRPA.

Compliance with the Range Plan (Grazing Schedule)

On June 16, 2021, investigators examined the agreement holder's compliance with the grazing schedule in White Lake, Kearn, and Mahoney pastures. At the time of the assessment, livestock were permitted to graze in the Kearn pasture. No livestock were observed in any of the three pastures assessed.

Finding: On June 16, 2021, Clifton Ranch complied with section 45(1) of FRPA.

Removal from grazing, protection of riparian areas and upland areas

Investigators examined an approximately 120-hectare area extending east of White Lake south to the boundary of the Mahoney Lake Ecological Reserve.

Board investigators did not observe any indicators that livestock grazing had deteriorated plant communities in the portion of the range agreement area examined. Therefore, the agreement holder met removal from grazing requirements. Both riparian and upland areas were in functioning condition, with only light to moderate livestock use observed (see Figure 5).

Finding: Clifton Ranch complied with sections 29(2), 30, and 31 of the RPPR.

Figure 4. This riparian area and adjacent upland area were found by Board investigators to be functional with light to moderate grazing by livestock.

Figure 3. The fencing between the Sawmill Lake and Swartz Creek pastures is not in an effective operating condition. Broken wires allow livestock to freely move between pastures.



Maintenance of range developments

Investigators examined approximately five kilometres of barbed-wire fence and found it to be in an effective operating condition.

Finding: Clifton Ranch complied with section 40 of the RPPR.

Blue Lake within the Kilpoola site of the SOGPA (69 Ranch Partnership)

On July 21, 2021, Board investigators observed livestock grazing around Blue Lake, outside the period of May 1 to June 15 authorized in the range use plan (see Figure 1 for the location of Blue Lake). Investigators also observed that livestock had caused soil disturbance in the riparian area surrounding the north end of Blue Lake (see Figure 6), and

there were indicators that grazing contributed to a deterioration of the natural alkali saltgrass plant community.

The agreement holder told investigators that he had not put his livestock into the Blue Lake area for the last three years, and MoF district range staff confirmed that. As the ownership of the livestock observed at Blue Lake was unknown, investigators informed MoF district range staff of a suspected trespass (e.g., livestock from adjacent private land grazing on public land without authority).

Finding: Livestock damaged the riparian area surrounding Blue Lake, and livestock were not removed before causing a deterioration to plant communities. However, the Board determined that the livestock did not belong to the range agreement holder.



Figure 5. Board investigators observed evidence of livestock-caused soil disturbance in a riparian area at the north end of Blue Lake.

Issue 2: Did the MoF comply with FRPA requirements?

Complainant 1 stated that the MoF did not obtain authorization to construct range developments, soils exposed during construction were not properly revegetated, and the construction of a water diversion caused excessive soil damage and erosion.

The investigation examined whether the MoF:

- obtained authorization to construct range developments (section 51 of FRPA)
- caused damage to the environment (section 46 of FRPA) when it constructed the Middle Mountain water diversion
- revegetated exposed soils with ecologically suitable species (section 41 of the RPPR) following the construction of range developments

Was the MoF authorized to construct range developments?

Section 51 of FRPA requires authorization to construct a range development, and section 8 of the *Range Act* enables the minister to authorize improvements to Crown range and construct range developments. The requirement to obtain authorization to construct a range development is binding on the provincial government, including the MoF.ⁱⁱⁱ The investigation revealed that the MoF did not obtain an authorization to construct 19 kilometres of barbed-wire fence and 2 water diversions.¹¹

Finding: The MoF did not comply with section 51 of FRPA because it did not obtain authorization to construct range developments.

¹¹ The Testalinden water diversion includes 3.5 kilometres of waterline providing water to 6 livestock watering troughs. The Middle Mountain water diversion, which is partly located within the SOGPA, includes 5 kilometres of waterline providing water to 7 livestock watering troughs. Both water diversions have a clearing width of approximately 4 metres.

Did the MoF cause damage to the environment when it constructed the Middle Mountain water diversion?

Section 46(1) of FRPA requires that a person must not carry out a forest practice, range practice or another activity that damages the environment unless the practice was authorized and they did not know, and could not reasonably be expected to know, that the damage would occur based on weather conditions or site factors. Section 3 of the FPPR defines "damage" as one of seven disturbances that adversely alters an ecosystem. To be in non-compliance, the damage must be adverse and alter an ecosystem. The disturbances include changes to soil.

On June 2, 2021, investigators examined a 500-metre section of the Middle Mountain water diversion extending from the point of stream diversion on Hester Creek near to where the diversion first enters the protected area. A water diversion is a common range development, and its construction and maintenance is a range practice.

Board investigators observed multiple issues with the construction of the water diversion. A berm, consisting of soil, was constructed across the stream, and water from the stream was diverted to a waterline buried along the access trail.¹² The soil berm was showing signs of instability, including erosion and sloughing.

Along the 500 linear metres of access trail examined by investigators, approximately 2000 cubic metres of soil was excavated and mostly side-cast onto the steep slopes below the access trail. Near the point of diversion, the side-cast soil had entered the stream. In other areas, the soil was deposited in the riparian area of the stream. At two stream crossings along the access trail, logs were placed into the stream channel and covered with soil, some of which had eroded.^{iv}

In relation to the definition of "damage" in section 3 of the FPPR, the excavation and side casting of soil caused "changes to soil"—one of the seven listed disturbances in section 3 of the FPPR.¹³ Changes to soil adversely altered the ecosystem¹⁴ in two ways:



Figure 6. Government caused damage to the environment when it constructed this unauthorized trail for a water diversion.

1) the excavated soil was removed from its previously undisturbed location, and, when side cast, the soil layers were irreparably altered. There was no attempt to first salvage the organic layer-the most productive soil horizon-for future restoration. As a result, the productivity of the soils has likely declined significantly.

2) the side-casted soil covered and damaged or destroyed native plant communities, including red-listed and blue-listed plant species.

Finding: In constructing the Middle Mountain water diversion, the MoF did not comply with section 46(1) of FRPA because it caused damage to the environment.

¹² Following the Board's field assessment, it was determined that the MoF or the range agreement holder did not have the required authorization under the Water Sustainability Act to divert water from the stream.

¹³ BC Parks told investigators it is concerned about the withdrawal of water from Hester Creek and potential impacts to aquatic and riparian ecosystems within the SOGPA. However, changes to water quantity do not meet the definition of "damage" under section 3 of the FPPR.

¹⁴ The ecosystem that was altered is the interior Douglas-fir dry cool biogeoclimatic subzone at approximately 1500 metres elevation and is dominated by native bunchgrasses and sagebrush on steep terrain with shallow soils (soils are classified as "eluviated eutric brunisol").

Did the MoF revegetate exposed soil with ecologically suitable species?

Section 41 of the RPPR requires that a person who constructs a range development must ensure any exposed soil is revegetated with "ecologically suitable species" within two years.

MoF staff seeded exposed soils both inside and outside of the SOGPA within the required two-year period. The seed mix included 13 non-native grass and forb species.^v At the time of the Board's June 2, 2021, inspection of a portion of the Middle Mountain water diversion, seed on exposed soils had begun germinating.

MoF staff told investigators that the seed mix was ecologically suitable because it includes species that will grow at the site and, once established, are intended to reduce soil erosion while also providing forage for livestock. While the seed mix was commonly used at the time, MoF staff acknowledged that some of the species in the seed mix have invasive and persistent characteristics, including one species—alfalfa—that they said should not have been in the seed mix and that they would no longer use it. MoF staff did not consult BC Parks before revegetating areas within the SOGPA.

BC Parks staff told investigators that the seed mix used by the MoF is neither ecologically suitable nor appropriate for the restoration and conservation of the rare ecosystems that exist adjacent to and amongst the range developments. BC Parks staff told Board investigators that the plant species in the seed mix present a long-term risk to rare ecosystem values in the protected area because of their invasive and persistent characteristics.

In the absence of a definition of ecologically suitable species for revegetation of exposed soils on range developments, the Board defines species in a seed mix as ecologically suitable if they are adapted to a site's growing conditions. Using the *BC Rangeland Seeding Manual*,^{vi} Board investigators verified that each of the species in the seed mix is adapted for growing within the interior Douglas-fir biogeoclimatic zone.

Although the seed mix used is ecologically suitable, the Board is concerned that MoF staff did not fully consider the invasive or persistent characteristics of the species in the seed mix and its potential short and long-term effects on rare and endangered plant communities that exist within and adjacent to—the areas that were revegetated. In addition, within the protected area, MoF staff acknowledge that they did not adhere to the MOU between BC Parks and the MoF concerning the selection of an appropriate seed mix.

Finding: The MoF complied with section 41 of the RPPR. Exposed soils were revegetated with ecologically suitable species. However, for revegetation within the SOGPA, MoF staff did not consult with BC Parks and did not adhere to the MOU regarding the selection of an appropriate seed mix. The Board considers this to be an unsound practice.

UNSOUND PRACTICE

In a finding, the Board may conclude that a forest or range practice is compliant with FRPA or the *Wildfire Act* but is an "unsound practice". This most often occurs when the Board has identified a significant practice issue and there is no corresponding requirement for that practice in FRPA or the *Wildfire Act*.

Issue 3: Was government enforcement of livestock use appropriate?

The purpose of enforcement is to promote compliance with legal requirements. Under section 5(1) of the *Forest Practices Board Regulation*, the Board may investigate complaints related to compliance with FRPA and/or appropriateness of government enforcement. Appropriate is defined by the Cambridge-Oxford Dictionary as "suitable or right for a particular situation or circumstance." If enforcement is deemed appropriate, then it is effective in achieving compliance with FRPA requirements.

To determine the appropriateness of government enforcement, the Board applies three criteria:

- 1. Were government inspections and monitoring adequate to detect issues?
- 2. If non-compliance was detected, was an appropriate range of enforcement measures used to achieve compliance?
- 3. Were enforcement measures effective in achieving compliance?

BC Parks, MoF, and CEB all have roles in government's compliance and enforcement regime of livestock use within the protected areas. BC Parks does not have authority under FRPA to enforce livestock use in protected areas. However, they have an active role in compliance monitoring through inspections. MoF district range staff monitor range activities in the field and communicate issues to range agreement holders. The MoF district manager has enforcement authority under FRPA and the *Range Act*.

While CEB receives complaints through the Natural Resources Violation Reporting (NRVR) system, it often refers them to MoF district range staff for advice or resolution. CEB does not conduct routine inspections but may undertake investigations and, when appropriate, take enforcement action.

1. Were government inspections and monitoring adequate to detect issues?

Table 2 shows the number of government field inspections in the SOGPA and WLGPA between 2016 and 2021. Government staff visited the SOGPA 75 times and the WLGPA four times. Forty-one visits were inspections, 34 were aimed at monitoring range condition, and 4 were visits to examine range developments. All but three of the field visits to the SOGPA were to Mt. Kobau, where Elkink Ranch Ltd. holds a range agreement.

YEAR	FIELD VISITS BY AGENCY			TOTAL FIELD VISITS	
	BC Parks	MoF	СЕВ	Multi-agency	TOTAL HELD VISITS
2016	11	8	1	3 (BC Parks/MoF)	23
2017	5	12	2	7 (BC Parks/MoF)	26
2018	3	6	0	0	9
2019	7	0	0	2 (BC Parks/MoF)	9
2020	0	0	1	1 (BC Parks/MoF)	2
2021	7	2	0	1 (BC Parks/MoF/CEB)	10
Total	33	28	4	14	79

Table 2. Number of Inspections and Monitoring by Agency

BC Parks and MoF staff visited the SOGPA an average of five times per year. Since 2018, BC Parks visited the SOGPA 14 times and MoF twice. In the same period, four multi-agency field visits to the SOGPA occurred.

MoF staff explained that the low number of field visits to the SOGPA since 2018 was to respect a declaration made by the Lower Similkameen Indian Band (LSIB) that it is the land manager for the Mt. Kobau site. As part of the declaration, the LSIB requested that agency staff be accompanied by and pay for a LSIB guide when entering the area. The MoF said it was unable to secure funding to pay for an LSIB guide.

During 32 of the 41 inspections, agency staff (mostly BC Parks) observed livestock grazing at times when they were not permitted. Overall, the frequency of government inspections of the Mt. Kobau site was sufficient to detect issues.

Three of the other site visits to the SOGPA occurred within the Chopaka East, Chopaka West or Kilpoola sites of the SOGPA. The three site visits were undertaken in response to concerns about livestock grazing without authorization or outside the period of use specified in the range use plan. In its investigation of livestock grazing around Blue Lake (within the Kilpoola site of the SOGPA), the Board also found that livestock were grazing without authorization. As the problem appears to be ongoing, three visits in six years is insufficient to detect issues. In the six-year period between 2016 and 2021, government made two visits to the WLGPA.

Over six years, four site visits to the WLGPA and three site visits to the Chopaka East, Chopaka West, and Kilpoola sites of the SOGPA was not sufficient to detect issues.

2. If non-compliance was detected, was an appropriate range of enforcement measures used to achieve compliance?

Enforcement measures generally begin with monitoring and inspections. If problems are discovered, there are a series of options, escalating in severity, that are available to government to encourage compliance. These options include education and awareness, written instructions, warnings, compliance notice, stop-work orders, violation tickets, administrative penalties, prosecution, and licence cancellation, among others. The general philosophy is to use the least punitive measure available to encourage compliance.

In its 2009 report *Range Planning under the Forest and Range Practices Act*, ^{vii} the Board found that many MoF range staff place a high priority on developing and maintaining long-term, working relationships with range agreement holders and that these relationships significantly influence how government can effect change on the ground. MoF district range staff interviewed for this complaint investigation expressed similar sentiments—the goal is to work with licensees to achieve compliance and to ensure good stewardship of the range resource rather than taking enforcement measures.

In most cases, when BC Parks staff observed suspected non-compliance, they reported their observations directly to MoF district range staff. In some cases, they also reported their observations to CEB via the NRVR.¹⁵ Almost all observations of suspected non-compliance made by BC Parks staff were related to the grazing practices of Elkink Ranch.

Records show that MoF district range staff usually took action when informed by BC Parks staff of suspected noncompliance. Between 2016 and 2021, MoF district range staff contacted Elkink Ranch Ltd. by phone or email 28 times and held 4 meetings with the purpose of encouraging compliance.

Between 2016 and 2021, both the MoF and CEB escalated enforcement actions with Elkink Ranch Ltd., including warning letters, violation tickets and orders.

The range of escalating enforcement actions was appropriate.

¹⁵ In 2021, for example, BC Parks submitted seven NRVR's of suspected range-related non-compliance within the SOGPA.

3. Were enforcement measures effective in achieving compliance?

Most of the range-related compliance and enforcement issues in the protected areas concern one range agreement holder. Non-compliance by the range agreement holder was persistent, and there were no signs that compliance with FRPA requirements was improving, despite the numerous attempts by agency staff to encourage the range agreement holder to comply.

Escalating enforcement measures such as letters warning of grazing licence suspension, violation tickets, and nonuse orders have not been effective in achieving compliance.

Summary

Government inspections and monitoring were adequate in the Kobau site of the SOGPA to detect issues. Noncompliances were detected, and a range of enforcement measures (e.g., violation tickets to orders) were used to encourage compliance; however, additional enforcement options could have been considered. Overall, government enforcement was not appropriate because the enforcement measures taken were not effective in achieving compliance.

There were few monitoring and inspections by government in the WLGPA and the East Chopaka, West Chopaka, and Kilpoola sites of the SOGPA. In these areas, government enforcement was not appropriate because the low number of inspections and monitoring were not adequate to detect issues.

Finding: Government enforcement in the protected areas was not appropriate.

Discussion: Implementation of the MOU between BC Parks and the MoF

Since 1997, BC Parks and the MoF Range Program have had a provincial MOU for administering and managing *Range Act* agreements in parks and protected areas. The MOU was updated in 2017 and includes seven goals to ensure that livestock grazing within protected areas provides for healthy ecosystems, park values, and viable ranching operations. The MOU includes a process for resolving disputes that arise between the agencies. A companion operational policy/guidance document provides direction for the construction of range developments, monitoring, compliance and enforcement, and First Nations consultation and engagement.

Complainant 1 told Board investigators that the agencies are not following the MOU. As the MOU is directly related to achievement of FRPA requirements, the Board decided to examine whether the MOU has been effectively implemented within the SOGPA. The Board also examined implementation of the associated policy/guidance document with a focus on the construction of two water diversions (range developments) and monitoring livestock use.

The investigation found that little progress has been made in achieving the seven goals in the MOU (the goals are listed in Appendix 2). The Board found that the MoF did not follow the actions in the policy/guidance document for the two water diversions, and both the MoF and BC Parks have made limited progress in achieving the actions for monitoring livestock use. While communication and collaboration between the agencies has been less than ideal, staff from both agencies told the Board there have been some recent improvements. Agency staff now meet more frequently to discuss livestock grazing.

Finally, there is no over-arching management plan for the SOGPA that integrates the protection of cultural and ecosystem values and livestock grazing consistent with the goals of the MOU and direction in the policy/guidance document. The park management plan was last updated in 2003, and there is little information on livestock use. Likewise, the applicable range use plans include little information on the location and protection of park values.

Conclusions

1. Did range agreement holders comply with FRPA requirements?

Within the Mt. Kobau site of the SOGPA, the Board found that Elkink Ranch complied with FRPA planning requirements [section 32(1) of FRPA] but did not comply with practice requirements to:

- follow the grazing schedule of the range plan [section 45(1) of FRPA];
- remove livestock from grazing [section 29(2) of the RPPR];
- protect riparian areas [section 30 of the RPPR];
- protect upland areas [section 31 of the RPPR]; and
- maintain range developments [section 40 of the RPPR].

In the WLGPA, the Board found that Clifton Ranch complied with FRPA requirements.

At Blue Lake within the SOGPA, the Board found that livestock grazing damaged riparian and upland areas. However, as the ownership of the livestock was unknown, the Board reported the matter to the MoF.

2. Did the MoF comply with legal requirements when it constructed range developments?

The Board found that the MoF did not obtain authorization to construct 19 kilometres of barbed-wire fence and 2 water diversions, and therefore did not comply with section 51 of FRPA. In constructing a portion of one water diversion, the MoF caused damage to the environment and therefore did not comply with section 46(1) of FRPA. The MoF revegetated exposed soils with ecologically suitable species within two years of constructing the range developments and therefore complied with section 41 of the RPPR. However, contrary to the guidance in the MOU, they did not consult BC Parks prior to revegetating exposed soils within the SOGPA. The Board considers this to be an unsound practice.

3. Was government enforcement of livestock use appropriate?

The Board found that government inspections and monitoring were adequate in the Kobau site of the SOGPA to detect issues. Non-compliances were detected, and a range of enforcement measures (e.g., violation tickets to orders) were used to encourage compliance. Overall, however, government enforcement was not appropriate because the enforcement measures taken were not effective in achieving compliance.

In the WLGPA and the East Chopaka, West Chopaka, and Kilpoola sites of the SOGPA, the Board found that there were few monitoring and inspections by government. In these areas, the Board found that government enforcement was not appropriate because the low number of inspections and monitoring were not adequate to detect issues.

Discussion: Implementation of the MOU between BC Parks and the MoF

Although not a legal requirement, the investigation discussed the MOU between BC Parks and the MoF because it sets out a framework for cooperation and dispute resolution and could be useful in addressing the issues raised in this complaint. The Board found that the MOU and associated policy/guidance document is not being effectively implemented. Staff within the agencies have different views about livestock grazing in the SOGPA and there is no plan for integrating livestock use with the protection of cultural and ecosystem values.

Appendix 1: Legislation Applicable to the Investigation

Forest and Range Practices Act

- 2 (1) A reference in this Act to the minister or his or her designate, or to the minister or a person authorized by the minister, or any similar reference, does not mean that a reference to the minister alone requires the minister to deal with the matter personally, and a reference to the minister alone means a reference to the minister or an appropriate official of the ministry of the minister responsible for the administration of this Act.
 - (2) and (3) [Repealed 2007-18-75.]
 - (4) Section 14 (2) of the Interpretation Act does not apply to this Act.
 - (5) Sections 71 (2) to (7) and 87 of this Act do not apply to the government.
- **32** (1) Before the holder of an agreement under the *Range Act* grazes livestock or cuts hay on Crown range to which the agreement applies, the holder must prepare, and obtain the minister's approval of,
 - (a) a range use plan, or
 - (b) if subsection (2) applies, a range stewardship plan

that includes the area on which the grazing or hay cutting will occur.

- 33 (1) A range use plan for grazing of livestock must
 - (a) include a map of a scale and format satisfactory to the minister that
 - (i) shows the area for the agreement under the Range Act that pertains to the plan,
 - (ii) specifies the location and type of range developments in that area, and
 - (iii) specifies the pastures that are in that area,
 - (b) include a schedule that describes for each pasture to be used for grazing of livestock,
 - (i) the livestock class,
 - (ii) the number of livestock, and
 - (iii) the period of use,
 - (c) specify actions to be carried out in the area under the plan to deal with issues identified by the minister,
 - (d) conform to prescribed requirements, and
 - (e) be consistent with objectives set by government and other objectives that are established under this Act and that pertain to all or part of the area subject to the plan.
 - (2) A range use plan for grazing of livestock or an amendment to a range use plan for grazing of livestock must be signed by the person required to prepare the plan, if an individual or, if a corporation, by an individual or the individuals authorized to sign on behalf of the corporation.
- **45** (1) A person¹⁶ who grazes livestock, cuts hay or carries out or maintains a range development on Crown range must do so in accordance with
 - (a) this Act, the regulations and the standards, and
 - (b) the applicable range use or range stewardship plan.
- **46** (1) A person must not carry out a forest practice, a range practice or another activity that results in damage¹⁷ to the environment, unless in doing so
 - (a) the person
 - (i) is acting in accordance with a plan, authorization or permit under this Act,

¹⁶ Government is a person for the purposes of section 51 on the basis of section 2(4) of FRPA and section 14(1) of the Interpretation Act.

¹⁷ 'Damage' means anything from the list in section 3 FPPR that adversely alters an ecosystem. An example of damage to the environment could be changes to soil that adversely alter an ecosystem.

- (ii) is not required to hold a plan or permit because of an exemption under this Act and is acting in accordance with this Act, the regulations and the standards, or
- (iii) [Repealed 2007-18-80.]
- (iv) is acting in accordance with another enactment, and
- (b) the person does not know and cannot reasonably be expected to know that, because of weather conditions or site factors, the carrying out of the forest practice, range practice or other activity may result, directly or indirectly, in damage specified by regulation.
- 50 (1) A person must not cause or permit livestock to be driven on or to graze on Crown range unless
 - (a) authorized to do so under an agreement under the Range Act or under the regulations under this Act, and
 - (b) the person acts in accordance with this Act, the regulations, the standards and any applicable range use plan or range stewardship plan.
- 51 (1) Unless authorized in writing by the minister, a person must not
 - (a) store hay on Crown range, or
 - (b) carry out, construct, modify, remove, damage or destroy a range development on Crown range.
 - (2) A person, other than the holder of an agreement under the *Range Act*, must obtain the authorization of the minister before maintaining a range development on Crown land.
 - (3) The minister may
 - (a) require a person seeking authorization under this section to submit the matter for which the authorization is sought for review in accordance with prescribed requirements, and for comments by interested parties during the course of the review,
 - (b) grant or refuse the authorization, depending on the outcome of a review required under paragraph (a), and
 - (c) impose pre-conditions or conditions of an authorization that the minister considers necessary or desirable, to be met by the person, including, but not limited to, requiring that the person provide security.
 - (4) The minister may grant an authorization under this section only if
 - (a) it is consistent with any range use plans, range stewardship plans and objectives set by government for the area covered by the authorization, and
 - (b) the minister is satisfied that the authorization will adequately provide for the range resources of the area to which it applies.
 - (5) If the minister requires security under subsection (3) (c), the minister may specify
 - (a) when the security must be paid,
 - (b) the amount of security that is required,
 - (c) the form of the security, and
 - (d) the circumstances under which the security may be realized.
 - (6) A person who obtains an authorization under this section must comply with any conditions of the authorization.
 - (7) If the minister determines under section 71 that a person has contravened subsection (1) or (6), the minister may order the person to
 - (a) remove or destroy or remove and destroy the stored hay or the range development,
 - (b) restore the land under the stored hay or the range development, or both, or
 - (c) repair or rehabilitate the range development.
 - (8) If satisfied that a range development is not effective, or is no longer needed for its original purpose, the minister may order the person responsible for the range development to remove it and rehabilitate areas that were affected by it.
 - (9) The minister may revoke or vary an authorization under this section.

Forest Planning and Practices Regulation

- **3** (1) For the purpose of section 46 (1) and (1.1) [protection of the environment] of the Act, "damage" means any of the
 - following that adversely alters an ecosystem:
 - (a) a landslide;
 - (b) a gully process on the Coast;
 - (c) a fan destabilization on the Coast;
 - (d) soil disturbance;
 - (e) the deposit into a stream, wetland or lake of
 - (i) a petroleum product,
 - (ii) a fluid used to service industrial equipment, or
 - (iii) any other similar harmful substance;
 - (f) a debris torrent that enters a fish stream;
 - (g) changes to soil.

Range Planning and Practices Regulation (RPPR)

- **29** (1) Subject to section 36 *[general wildlife measures]*, if a range agreement holder grazes livestock on an area of Crown range, the holder must remove the livestock on the first to occur of the following:
 - (a) the date specified in the holder's range use plan or range stewardship plan for the removal of livestock;
 - (b) the average stubble height on the area is the stubble height, if any, that is specified in the holder's plan;
 - (c) the average browse use level by livestock on that area is
 - (i) the percentage of the current annual growth specified in the applicable plan, if any, or (ii) 25% of the current annual growth, if subparagraph (i) does not apply.
 - (2) A range agreement holder who grazes livestock on Crown range must ensure that the grazing of herbaceous plants by the livestock does not occur in a manner that, if continued, will result in deterioration of plant communities located on the grazing area.
- **30** A range agreement holder must not carry out a range practice if it would result in a material adverse affect on the ability of the riparian area to
 - (a) withstand normal peak flow events without accelerated soil loss, channel movement or bank movement,
 - (b) filter runoff,
 - (c) store and safely release water, and
 - (d) conserve wildlife habitat values in the area.

31 A range agreement holder must not carry out a range practice on an upland area if the range practice would result in a material adverse affect on the upland area by substantially

- (a) accelerating the rate of soil loss from the area,
- (b) diminishing infiltration of water on the area,
- (c) reducing moisture storage on the area, or
- (d) decreasing stability of the area.

40 (1) A range agreement holder must maintain any range development located on an area that is subject to the agreement in an effective operating condition.

- (2) The minister may exempt a range agreement holder from the requirement of subsection (1) if
 - (a) another person has obtained authorization from the minister under section 51 (2) [range developments] of the Act to maintain the range development,
 - (b) another person is required to maintain the range development and that person is not exempted under this subsection,
 - (c) another person has entered into an agreement referred to in section 118 (2) (a.1) [power to enter into agreements] of the Act, or
 - (d) the minister is satisfied that it is not in the public interest to maintain the range development.
- **41** (1) A person who constructs a range development must ensure that any exposed soil is revegetated with ecologically suitable species within 2 years after the construction is completed.
 - (2) The minister may exempt a person from the requirement of subsection (1) if the minister is satisfied that a failure to revegetate is consistent with the objective set by government for soils as set out in section 6 (c) *[objectives set by government for soils]*.

Range Act

- 8 (1) The minister may issue authorizations to
 - (a) persons employed in the ministry, acting in the course of their duties, and
 - (b) agents of the government acting in accordance with the terms of the agency authorizing them to use Crown range to improve the condition of the Crown range for grazing, cutting hay or range conservation or management.
 - (2) An authorization issued under subsection (1)
 - (a) is an agreement under this Act for the purposes of
 - (i) the definition of "range practice" in the Forest and Range Practices Act, and
 - (ii) section 50 of the Forest and Range Practices Act,
 - (b) is an authorization of the minister for the purposes of section 51 of the Forest and Range Practices Act, and
 - (c) must include terms and conditions that the minister considers appropriate and that are consistent with this Act and the regulations and with the Forest and Range Practices Act and the regulations and standards under that Act.

Interpretation Act

14 (1) Unless it specifically provides otherwise, an enactment is binding on the government.

(2) Despite subsection (1), an enactment that would bind or affect the government in the use or development of land, or in the planning, construction, alteration, servicing, maintenance or use of improvements, as defined in the *Assessment Act*, does not bind or affect the government.

Assessment Act

"improvements" means any building, fixture, structure or similar thing constructed or placed on or in land, or water over land, or on or in another improvement, but does not include any of the following things unless that thing is a building or is deemed to be included in this definition by subsection (2):

- (a) production machinery;
- (b) anything intended to be moved as a complete unit in its day to day use;

(c) furniture and equipment that is not affixed for any purpose other than its own stability and that is easily moved by hand.

Appendix 2: MOU Goals

MOU GOAL	DESCRIPTION OF GOAL		
Establishing a common vision	The agencies commit to the vision of "inter-agency collaboration that achieves exceptional outcomes through the integration of conservation values, grazing and recreation in parks and protected areas."		
Taking a long-term view	The agencies manage ecosystems to steward the land for generations to come.		
Giving mutual support	The agencies recognize and respect their specific mandates and values, and they cooperate for shared success.		
Valuing relationships and professional expertise	The agencies treat each other's staff with respect. Staff always act professionally and value each other's professional expertise. They connect with each other both formally (e.g., through the collaborative framework process) and informally.		
Communicating clearly and honestly	The agencies provide timely feedback of both endorsements and critiques. Staff communicate on a proactive, "for your information" basis, rather than on a reactive, "as needed" basis.		
Providing information	The agencies share information freely with each other (e.g., range use plans, park management plans, monitoring information, assessments, etc.).		
Sharing values	The agencies manage according to objectives in the <i>Forest and Range Practices Act</i> , items listed in section 3 of the <i>Park Act</i> , and the presence and needs of species at risk.		

ENDNOTES

¹ In 1993, the BC Government published the provincial Protected Areas Strategy which provided a framework for identifying areas in land use plans that would contribute towards ecological representation within the province. The framework also included policy direction on activities, including grazing of livestock, that would be allowed to continue once the protected areas were established. Approximately 28 percent of parks and protected areas in BC enable the grazing of livestock.

ⁱⁱ The 1.2-kilometre-long riparian assessment area includes the following red-listed plant communities (source: BC Parks pers. comm.):

- Bluebunch wheatgrass-balsamroot
- Douglas fir-Ponderosa pine/bluebunch wheatgrass
- Douglas fir/common snowberry birch leaved spirea
- Douglas fir/Douglas maple- red-osier dogwood

^{III} Section 14 (1) of the *Interpretation Act* generally binds government to provincial enactments although there are some exceptions as stated in section 14(2). Exceptions include enactments that regulate the use or development of land, or in the planning, construction, alteration, servicing, maintenance or use of improvements, as defined in the *Assessment Act* (note: range developments, such as fencing and water diversions, are included within the scope of "improvements" as defined under the *Assessment Act*).

Section 2(4) of FRPA states that the exceptions in section 14(2) of the *Interpretation Act* do not apply. In effect, under FRPA, government is required to obtain authorizations for forest and range practices where specified, including the requirement to construct a range development under section 51. The inclusion of government being subject to FRPA is further clarified in section 179(1)(a) of the Act.

^{iv} Following the site assessment, investigators reported their observations to the district manager of the Okanagan Shuswap Natural Resource District. In response, the district manager retained a professional geoscientist to complete an assessment which confirmed the Board's observations. In a final report, the geoscientist made recommendations to remediate the water diversion. In November 2021, district range staff—together with a machine operator—undertook works to remediate the site. The MOF has not determined whether the works that were completed under the supervision of district range staff followed the geoscientist's recommendations.

^v The species in the seed mix includes: creeping red fescue, tall fescue, dahurian wildryegrass, Canada bluegrass, perennial ryegrass, crested wheatgrass, orchard grass, red clover, alfalfa, slender wheatgrass, timothy, white clover, alsike clover.

^{vi} Dobb, A., S. Burton, 2013. Rangeland Seeding Manual for British Columbia, BC Ministry of Agriculture, Sustainable Agriculture Management Branch, Abbotsford, BC. Available at <u>https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/rangelands/bc_rl_seeding_manual_web_single_150dpi0904.pdf</u>

vii Available at https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR26-Range-Planning-under-FRPA.pdf



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