Strategy in Brief:

**FREP Mission:** Collect and communicate the best available natural resource monitoring information to inform decision making, improve resource management outcomes and provide evidence of government’s commitment to environmental sustainability.

**FREP Objectives:**
1. Assess the impacts of forest and range development on the 11 FRPA resource values to determine if on-the-ground results are sustainable[^1]
2. Identify resource value status, trends and causal factors, and
3. Identify opportunities for continued improvement of practices, policies and legislation.

FREP is a foundation in the governance of the *Forests and Range Practices Act*. FREP supports government’s stewardship and resource development objectives in five key ways:

1. Fulfils government’s commitment to monitor
2. Provides evidence for government’s commitment to environmental sustainability and industry competitiveness
3. Supports decision makers and professional reliance
4. Provides science-based evidence to guide continued improvement of practices, policies and legislation
5. Is an opportunity to meaningfully engage First Nations in sustainable resource management through participation in resource stewardship monitoring

**Key FREP Focus Areas:**
- Collecting high quality data
- Communicating results
- Continuous improvement
- Recognizing people
- Collaboration
- First Nations engagement

**FREP monitoring data collection and reporting principles and targets**
- There is a five year rolling target of 30 resource stewardship monitoring field samples for each of the following resource values: riparian, water quality, wildlife and stand-level biodiversity
- There is a five year rolling target of 30 resource stewardship monitoring field samples for each of the following resource values; however, these values have greater flexibility in when/where they are collected (e.g., using a region as the sample area may be more suitable in some circumstances): Cultural Heritage, visual quality, stand-development monitoring (SDM2.0) and resource features (karst)
- Monitoring for the remaining FRPA resource values will for the most part be a mix of contractors, specialists, and range branch staff

[^1]: as defined by “very low” and “low” resource development impact ratings used in MRVA reports and defined in [https://www.for.gov.bc.ca/ftp/HFP/external/IPublish/frep/technical/FREP_Technical_Note_06.pdf](https://www.for.gov.bc.ca/ftp/HFP/external/IPublish/frep/technical/FREP_Technical_Note_06.pdf)
Forest and Range Evaluation Program (FREP) 3 year Strategic Plan: April 19, 2016

This strategy will be re-examined annually to ensure it remains current and relevant. Appendices will be updated annually.

Background Context:
FREP is a foundation in the governance of the *Forests and Range Practices Act*. FREP supports government’s stewardship and resource development objectives in five key ways:

1. Fulfils government’s commitment to monitor
2. Provides evidence for government’s commitment to environmental sustainability and industry competitiveness
3. Supports decision makers and professional reliance
4. Provides science-based evidence to guide continued improvement of practices, policies and legislation
5. Is an opportunity to meaningfully engage First Nations in sustainable resource management through participation in resource stewardship monitoring

Introduction:
This strategy is aligned with the government of BC Strategic Plan (protect the environment and create jobs, increasing rigour of environmental assessments, First Nations becoming partners in forestry), the FLNRO Service Plan (long term vision of economic prosperity and environmental sustainability, management of resources at sustainable levels for their continued use and development, best information available to make sound and durable resource management decisions) and the FLNRO Competitiveness Strategy (communicating environmental and social benefits of BC’s forest management regime).

British Columbia’s Forest and Range Evaluation Program (FREP) is led by the Ministry of Forests, Lands and Natural Resource Operations (FLNRO), in partnership with the Ministry of Environment (MOE). The *Forests and Range Practices Act* and Regulations provide for a results-based, forest and range management framework in British Columbia that includes professional reliance as a foundational principle. Under the results-based model, government evaluates compliance with the law (compliance and enforcement) and evaluates the effectiveness of forest and range practices in achieving management objectives, including sustainable resource management (FREP).
**FREP Mission:** Collect and communicate the best available natural resource monitoring information to inform decision making, improve resource management outcomes and provide evidence of government’s commitment to environmental sustainability.

**FREP Objectives:**
1. Assess the impacts of forest and range development on the 11 FRPA resource values to determine if on-the-ground results are sustainable\(^1\)
2. Identify resource value status, trends and causal factors, and
3. Identify opportunities for continued improvement of practices, policies and legislation.

**FREP Guiding Principles:**
- Collect and analyze **high quality** monitoring data for all FRPA resource values that is fully relevant to resource professionals and natural resource management decision makers
- **Communicate** science-based information to enhance the knowledge of resource managers, resource professionals, First Nations and others to inform balanced decision making and continuous improvement of British Columbia’s forest and range practices, policies and legislation
- Ensure **continuous improvement** of a high-quality program that is as effective and efficient as possible and provides maximum value for resources invested (including informing decisions related to policy, practice and legislative change)
- Recognize and develop the **people** who deliver FREP
- **Collaborate and link** with cumulative effects assessments, the NRS monitoring and evaluation collaborative and climate change monitoring needs
- Develop a meaningful and collaborative role for **First Nations** in natural resource monitoring and evaluation

An annual FREP improvement plan /work plan guides FREP implementation and is based on:
- Quality assurance surveys and ongoing lessons learned
- Staffing levels
- Program budget
- An annual continuous improvement workshop, and
- Other input from partners and stakeholders.

The improvement plan /work plan can be found on the FREP website.

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\(^1\) as defined by “very low” and “low” resource development impact ratings used in MRVA reports and defined in [https://www.for.gov.bc.ca/ftp/HFP/external/!publish/frep/technical/FREP_Technical_Note_06.pdf](https://www.for.gov.bc.ca/ftp/HFP/external/!publish/frep/technical/FREP_Technical_Note_06.pdf)
FREP monitoring data collection overview:
This three year strategy maintains and expands upon the initial core FREP design without eroding the strength of it. It maintains data compatibility over time and considers temporal dynamics. This approach also addresses some of the substantial needs and interests that users have identified as not formerly being met, including:

- Achieving full and ongoing coverage across all values and geographic areas
- Providing recent, up-to-date data for assessing current condition
- Allowing the flexibility to address district-specific priorities

In brief, the key requirements for district-led sampling are:
1. A minimum threshold of 30 samples per value, per district, over a rolling 5 year window
2. Firm minimum targets for biodiversity, riparian, water quality and wildlife, while targets for cultural heritage, stand development monitoring, visual quality and karst are more flexible
3. Each value does not need to sampled each year, but must not have a gap of more than one year
4. Any district targeted sampling should follow the Guidance on Implementation of District Targeted Sampling section on page 6 of this document

FREP monitoring data collection and reporting principles and targets

- Sampling targets for each natural resource district are shown in Appendix 3, Annual District Sampling Targets by Value by Year. Appendix 3 details the target FREP samples by value per year. Any additional “district priority” samples should follow the “Guidance on implementation of district targeted sampling” on page 6, so that all samples can be used in analysis and reporting.

- There is a five year rolling target of 30 resource stewardship monitoring field samples for each of the following resource values:
  - Riparian
  - Water quality
  - Wildlife
  - Stand-level biodiversity

- There is a five year rolling target of 30 resource stewardship monitoring field samples for each of the following resource values; however, these values have greater flexibility in when/where they are collected (e.g., using a region as the sample area may be more suitable in some circumstances -- see notes below):
  - Cultural Heritage*
  - Visual Quality*
  - Stand-development monitoring (SDM2.0)*
  - Resource Features (karst)*

- Each district should develop a district-specific sampling plan that will achieve 30 samples per value by the end of the 2018 field season (stand-level biodiversity, water quality,
riparian), 2019 (visual quality, cultural heritage), 2021 (SDM2.0, wildlife habitat) as described in Appendix 3. Districts may wish to vary from the specific annual sampling targets in Appendix 3 due to local priorities and resources; however, the 30 samples per value targets over a rolling five year window should still be achieved.

- Monitoring for:
  a. Soils, recreation, water quality (community watersheds), wildlife (landscape-level), biodiversity (landscape-level) will be primarily delivered by government specialists and/or contractors
  b. Range/forage (stream and upland) will be delivered by Range Branch staff, and
  c. Karst, where it exists, will be delivered by district staff
- Training – Every field crew must have at least one fully trained assessor. Where a value has been skipped in a district for a year, it is strongly suggested that refresher training and/or mentoring is done prior to/concurrent with sampling
- A minimum of two communication events per district per year (e.g., licensee and/or First Nations meetings etc.)
- As a minimum, publication of the annual Assistant Deputy Minister’s Report, the FREP year in review, full client availability of current FREP data, MRVA2 reports as requested; and district updates to MRVA reports on a two year cycle

Notes for sampling related to cultural heritage, visual quality, stand development monitoring and karst:
For cultural heritage, visual quality, stand development monitoring and karst resource values, there is flexibility related to when and where they are monitored. It is preferred that districts follow the 30 samples over 5 years for each of these values using the FREP random lists for each district; however, there will be local circumstances and/or priorities where a district/region-specific approach is preferred. Examples of district/region-specific approaches include:

- A coordinated regional approach where past visual quality results have been acceptable to decision makers and the future risk is seen as low. An appropriate approach in this situation may be to select sites from a regional random list requiring fewer samples per district. Results would then be reported regionally versus by district.
- Values with consistent results (low levels of variation) may require fewer than 30 samples to be statistically significant.
- A regional approach to cultural heritage monitoring based on traditional territories and First Nations engagement using a customized random list. Results would then be reported by traditional territory versus by district.

Please consult FREP staff in Resource Practices Branch if you will be taking a district/regional specific approach to these values. Following the “targeted sampling” steps outlined on page 5-6
will help ensure that data collected through district/region-specific approaches can be used in the larger FREP data set.

In general:
* Cultural Heritage – Sample this value where there are known cultural heritage resource features within sample population
* Visual Quality – Sample this value where there are VQOs within the sampling population
* Stand-development monitoring (SDM2.0) – Sample where there are expected forest health concerns and/or insufficient YSM data for specific stand types within the sampling population
* Karst – only for districts where karst exists and is a potential management concern

District Targeted Sampling:
The primary focus of the FREP program is to implement the core design across all districts. However, some districts have expressed a strong desire to direct a portion of their sampling effort toward local priorities such as issues identified through cumulative effects assessments. It would not be appropriate to modify the overall sampling design to address these district-specific priorities because they vary substantially among districts, they may change over time, and any specialization of the sampling design (e.g., pre-stratification, subsampling, preferential selection, etc.) would be at the expense of the flexibility of the overall provincial design. However, in order to accommodate this interest, the following approach allows districts to have some flexibility in addressing local priorities provided the minimum sampling requirements for the core design are achieved. District flexibility is not about reducing sampling targets, it is about addressing high priority issues of immediate/urgent concern.

Guidance on Implementation of District Targeted Sampling:
When determining if and how to allocate priority samples to address district-specific questions, districts should consider the following five steps. These steps provide a conceptual generic process to follow, rather than a detailed guidebook or prescriptive template. Following these steps will help ensure “targeted data” can be used in the larger FREP data set. Specific monitoring questions will vary by district in important ways that can fundamentally influence the optimal sampling design (e.g., scale of the question, temporal dynamics, required precision, sample and population sizes, how the data will be applied to management decisions, etc.). However, the following provides a summary of core concepts for good sampling design. When addressing district-specific priorities, districts should both consider these issues and consult with an expert in sampling design. Please consult Resource Practices Branch FREP staff when initiating targeted sampling.

1) **QUESTION:** What is the question of interest?
   - It is critical that the question is clearly defined
     - What are the outcome(s) or performance measure(s) of interest?
     - Under what conditions and/or in what types of sites?
• What level of precision/power is acceptable? (i.e., level of confidence necessary for the information to be useful)
• What time period is acceptable?
• Consider the trade-offs among precision/power, time, and sample size

2) **EXISTING DATA:** How much data relevant to addressing this question is currently available?
• Also consider future data likely to be collected (i.e., anticipated sampling)
• Is there (or will there soon be) sufficient “core FREP data” to address the question without additional sampling (e.g., post-stratification)?
• Are there sufficient data to inform the development of a sampling plan and/or to help refine the question?

3) **SAMPLING DESIGN:** Determine appropriate sampling design
• Define the strata of interest (e.g., rare or special strata; BEC subzone or variant), population and sampling unit (cutblock, as per FREP sampling design)
• Define the sample frame
  • In general for sampling design – sampling frame must be rigorously defined, documented, repeatable,
  • In this case – it needs to be a subset of the existing sample frame
    o Temporal definition – same as existing sample frame (i.e., ≤3 years since harvest)
    o Spatial definition – may be limited to strata of interest
• Define selection method
  • Simple random selection should be used (in the majority of cases)
  • Every sampling unit in the sample frame must have a chance of being selected
• Sample size
  • Will be dependent on how much sampling effort is available beyond obligations to the core FREP sampling
• Define how the resultant data will be analyzed to answer the initial question

4) **EVALUATE BENEFIT:** Will it be possible to adequately answer the question?
• Will the sampling design for utilizing the prospectively available “priority samples” provide an acceptable level of precision or power?
• If sampling will be insufficient to answer the question with an acceptable level of precision, consider other approaches for addressing the question (e.g., do not waste sampling effort on collecting inadequate information)

5) **EVALUATE COMMITMENT:** Is the district committed to addressing this question and to collecting the necessary data over the required number of years?
• Will the districts priorities change over a shorter period than that required to collect sufficient data to address this question?
• Must have commitment to direct surplus samples to this question for however long is necessary to get the desired information
• Must not be a short-lived priority (i.e., ad hoc priorities that change every year or two)
6) **DATA COLLECTION:** Plan and implement data collection
   - Only if “yes” to both decisions in #4 and #5
### Program-level Projects and Deliverables

<table>
<thead>
<tr>
<th>Program</th>
<th>Value Specific Deliverables</th>
<th>2015/16</th>
<th>2016/17</th>
<th>2017/18</th>
<th>2018/19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic plan and work plan</td>
<td>completion</td>
<td></td>
<td></td>
<td>implementation</td>
<td></td>
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<tr>
<td>Sampling design refresh</td>
<td>completion</td>
<td></td>
<td></td>
<td>implementation</td>
<td></td>
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<tr>
<td>Timber Value monitoring strategy</td>
<td>start</td>
<td></td>
<td>Complete and begin implementation</td>
<td>implementation</td>
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<tr>
<td>Licensee outreach strategy</td>
<td>start</td>
<td></td>
<td>Complete and begin implementation based on Forest Practices Board report recommendations</td>
<td>implementation</td>
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<tr>
<td>Digital imagery</td>
<td>Google Earth soils project</td>
<td>Develop test approach (e.g., air photo plots, Google earth) for one or more values</td>
<td>Pilot one or more values</td>
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<tr>
<td>Extension</td>
<td>Ongoing status quo</td>
<td>Expand extension activities into more active approaches, e.g., specific topic such as small stream road shows</td>
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<tr>
<td>Policy and legislation change proposals</td>
<td>none</td>
<td>Develop an Executive approved process for facilitating needed Chief Forester Guidance, policy and/or legislation changes based on monitoring outcomes Complete assessment for all values of needed policy and/or legislation changes</td>
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<tr>
<td>Program management (QP, program CI, CI session, equipment, etc.)</td>
<td>Ongoing Incorporating FP Board assessment</td>
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<td>Possible informal LEAN project</td>
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<tr>
<td>NRS monitoring and evaluation collaborative</td>
<td>Baseline inventory, framework, strategy</td>
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<tr>
<td>Resource Value</td>
<td>Value Specific Deliverables</td>
<td>2015/16</td>
<td>2016/17</td>
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<tr>
<td><strong>Biodiversity</strong></td>
<td>Stand-level -- Resource Stewardship Monitoring</td>
<td>Continued implementation and reporting</td>
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<td></td>
<td>Landscape level</td>
<td>Completion of protocol and initial reporting via MRVA</td>
<td>Ongoing implementation to cover province and reporting via MRVA – includes linkage with CEA</td>
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<td></td>
<td>OGMAs</td>
<td>Continue working on protocol (link with CEA)</td>
<td>Complete protocol</td>
<td>Implementation</td>
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<tr>
<td><strong>Wildlife</strong></td>
<td>WHA Office-Based Assessments</td>
<td>Piloting office-based methods in 3 TSAs</td>
<td>Finalizing methods. Additional assessments (TSAs) will be completed (funding dependant)</td>
<td>Ongoing assessments (TSAs)</td>
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<tr>
<td></td>
<td>Stand-level wildlife habitat monitoring -- Resource Stewardship Monitoring</td>
<td>Develop wildlife habitat protocols for ungulates (deer, moose, elk), cavity nesters (includes marten and fisher), amphibians</td>
<td>Partial/initial implementation and CI</td>
<td>Implementation and reporting</td>
<td>Protocol development of additional species - range species, mountain goat, caribou and grizzly</td>
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<tr>
<td><strong>Cultural Heritage</strong></td>
<td>Resource Stewardship Monitoring</td>
<td>Expanded implementation and reporting</td>
<td></td>
<td></td>
<td>FN data collection field crew assistants proposal</td>
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<td>Traditional Ecological Knowledge (TEK). Review of how TEK could be incorporated into FREP assessments and/or reporting</td>
<td>Initiate project – literature review, meeting with Lake Babine Nation in Skeena Region, explore what mandate would look like in this area</td>
<td>Continue project provided mandate is given</td>
<td>Pilot partial implementation</td>
<td>Implementation</td>
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<tr>
<td><strong>Riparian</strong></td>
<td>Resource Stewardship Monitoring</td>
<td>Continued implementation and reporting</td>
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<td></td>
<td>Special project</td>
<td>Small streams outreach</td>
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<tr>
<td>Resource Value</td>
<td>Value Specific Deliverables</td>
<td>2015/16</td>
<td>2016/17</td>
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<td>Watershed status evaluations (FSW)</td>
<td>Complete 3 watershed reports (intensive evaluations)</td>
<td>Ongoing priority watershed assessments (intensive evaluations)</td>
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<td>Water Quality</td>
<td>Resource Stewardship Monitoring</td>
<td>Continued implementation and reporting</td>
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<td>Community Watershed Assessment procedure</td>
<td>Develop protocol and initial application (e.g., watershed sensitivity tier 1) – possible reporting</td>
<td>Operational piloting CI and reporting of sampling</td>
<td>Continued implementation and reporting</td>
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<tr>
<td>Visual Quality</td>
<td>RSM</td>
<td>Continued implementation and reporting</td>
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<td>Soils</td>
<td>Google Earth 4000 ha tile project</td>
<td>24 districts to be assessed and initial reporting of results</td>
<td>Ground truth and final report</td>
<td>24 districts to be assessed and initial report</td>
<td>Ground truth and final report</td>
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<td>Intensive evaluation</td>
<td>Intensive evaluation and final report on steep slope logging</td>
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<tr>
<td>Timber</td>
<td>Stand Development Monitoring 2.0 (SDM2.0)</td>
<td>Review and CI of SDM protocol, data analysis</td>
<td>Operational piloting of SDM2.0 Reporting out of SDM1.0 results</td>
<td>Continued implementation and reporting – SDM 2.0</td>
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<td></td>
<td>Other TBD (e.g., cedar, waste, partial cutting)</td>
<td>No action</td>
<td>Planning intensive evaluation</td>
<td>Intensive evaluation</td>
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<tr>
<td>Karst (resource features)</td>
<td>Resource Stewardship Monitoring</td>
<td>Completion of field protocol</td>
<td>Partial/initial implementation and CI and reporting</td>
<td>Implementation and reporting</td>
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<tr>
<td>Recreation</td>
<td>trails</td>
<td>No action</td>
<td>No action</td>
<td>Intensive evaluation of trails</td>
<td>No action</td>
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<td>Range</td>
<td>Upland and riparian monitoring</td>
<td>On-going implementation and reporting (primarily via MRVA)</td>
<td>Ongoing implementation via Range Branch</td>
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