



Enhanced Forest Resource Inventory Knowledge Transfer and Tool Development Program Call for Proposals

Introduction

The Forestry Futures Trust Committee (FFTC) is pleased to announce its Round 2 Call for Proposals for eligible projects under the Enhanced Forest Resource Inventory (eFRI) Knowledge Transfer and Tool Development (KTTD) Program. Up to \$1,000,000 will be allocated in this Round for projects up to two years in duration. The Program is open to all interested applicants including, but not limited to, university and private sector researchers, federal and provincial applied researchers, private consultants, non-governmental organizations, forest company staff, who can provide expertise in the areas of:

- digital land and provincial forest imagery (Ontario)
- forest inventory development within the context of Ontario's Crown forests
- processes to link imagery with land or forest inventory to meet operational or management needs at the local to provincial scales (applicable to Ontario's forests)
- creative solutions for developing and utilizing digital imagery and forest inventory

Program Themes

Projects will be developed under the framework of the [Ministry of Natural Resources and Forestry \(MNRF\) 2017-2026 Strategic Focus for the Forest Resources Inventory Program¹](#) and fall under one or more of the following four themes:

1. Tools and Products to Enhance the Production of the eFRI
2. Tools and Products for Clients and Stakeholders
3. LiDAR (single photon)
4. Integrating Monitoring Framework

A list of example topics that are relevant for each theme can be found in Appendix A. **Proposals, however, are *not* limited to these ideas.** Please note that all projects must include a knowledge and technology transfer component.

¹ Document can be found at www.forestryfutures.ca under the eFRI and KTTD link within the Programs menu



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Application Process and Funding Requirements

Note:

The information collected in this Call for Proposals is collected under the authority of the Crown Forest Sustainability Act and is subject to the Freedom of Information and Privacy Protection Act. The results of all projects funded by the Program are deemed to be in the public domain.

The application process differs for small and larger projects.

- A. Small scale projects ($\leq \$25,000$ and ≤ 12 months) Application Process "A"
- B. Large scale projects or projects ($> \$25,000$ and ≤ 24 months) Application Process "B"

Application Process "A" - Small Scale Projects

This application process is for projects requesting funding less than or equal to \$25,000 and less than 12 months in duration (may overlap into two fiscal years). All applicants are required to submit an electronic version of Application Form "A" to the FFTC as per the submission guidelines found in Appendix C. The total application should not exceed 5-7 pages (not including budget forms and Curriculum Vitae) and must include the following:

1. Project Description
2. Project Team
3. Design and Methods
4. Schedule
5. Project Budget
6. Knowledge and Technology Transfer
7. References

Please also identify two potential independent external reviewers who are recognized for their knowledge and expertise in the project area.

1. Project Description

The applicant should provide a brief overview of the project including a description of the objective(s) and the contribution that the project makes to the enhanced forest resource inventory, forest management and/or operational planning processes. The description should provide the rationale for undertaking this project, applicability of the project outcomes, scope of the work and a good understanding of the target audience. Applicants should also list any relevant literature or companion work that supports the need for this project, as applicable.

2. Project Team

The applicant should provide the following:

- Project lead(s) and qualifications (including curriculum vitae not to exceed two pages)
- Project team and qualifications
- Roles and responsibilities of each member of the team



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- Partnerships and/or collaborators, if applicable

3. Design and Methodology

The applicant should provide a summary of the design and methodology for the project that includes:

Design

- Rationale for project design
- Engagement of contractors, consultants, or other parties, if applicable
- Sequence of steps to be followed

Methodology

- Rationale for project methodology
- Data collection, statistical tests, equipment, data management and sharing (where appropriate)

4. Schedule

The applicant should provide a detailed schedule for the project that includes:

- Start and completion dates
- Measurable deliverables with target dates that represent progress towards meeting project objectives

5. Project Budget

Funding details will be provided on the Budget Forms available on the Forestry Futures website (www.forestryfutures.ca). Only projects spanning 12 months or less may be included under Application Process "A". These projects may overlap into two fiscal years (fiscal year runs from April 1 to March 31). The request for funding must include a list of contributions from partners (cash and in-kind). A list of eligible expenses for the KTTD Program can be found in Appendix B.

The project budget may include an initial disbursement of up to 30% of the project funds. Actual spending of this initial disbursement must be described in detail and accounted for in a progress report (or other means as agreed to by the FFTC on a case-by-case basis) before further disbursements will be made available. Up to six disbursements per fiscal year will be considered.

Twenty percent (20%) of the funds awarded to each project will be held in reserve and released upon receipt of the final progress report. If any project has funds remaining at the end, these surplus funds will be released back to the Trust.

6. Knowledge and Technology Transfer

The transfer of knowledge and/or technology and must be included as a component of each project. Applications that propose stand-alone transfer projects to train forest management practitioners, or other relevant parties, in using the imagery, inventory, or technology already available will also be considered for funding.

The applicant should outline the knowledge and technology plan including:

- The knowledge transfer plan including a description of the methods used and the audience
- The project's potential to build capacity in the natural resources sector through the on-going sharing of results and transfer of knowledge and technology.



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- A discussion of the feasibility of implementation by relevant parties including potential obstacles and proposed solutions

7. References

The applicant should provide contact information for two individuals who are familiar with their work.

Application Process “B” – Large Scale Projects

This section is to be completed for large scale projects requesting funding greater than \$25,000 and 24 months or less in duration (may overlap into three fiscal years). This application process is two-staged. Applicants are first required to submit a Letter of Intent to the FFTC including a brief outline of the proposed project. The Letter of Intent will be evaluated by the FFTC and successful applicants will be invited to submit a full project proposal.

STEP 1 – LETTER OF INTENT

Applicants are required to submit a Letter of Intent (LOI) to the FFTC as per the submission guidelines found in Appendix C. The purpose of the Letter of Intent is to provide an initial screen for selecting projects of merit and to establish priorities for funding. The Letter of Intent should range from 2 to 5 pages in length (including a budget) and no smaller than 10 point font. Please note, any text beyond 5 pages will not be considered in the review of the LOI submission.

The Letter of Intent must include:

1. Project Description

- Brief overview of the project including a description of the objective(s) and relevance to program themes
- Description of the scope of the work
- Description of rationale for undertaking this project and listing of relevant literature or companion work that supports the need for this project
- Description of the target audience and applicability of project outcomes

2. Project Plan

- Identify the Project Lead and their qualifications
- Brief description of the design and proposed methodology
- Schedule including start and completion dates and expected deliverables
- Brief description of the knowledge and technology transfer approaches

3. Project Budget

- Complete the Letter of Intent budget form as described in the submission guidelines found in Appendix C

4. Partnerships (if applicable)

- List the names and affiliation of partners involved in the project and the nature of the partnership



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5. References

- The applicant should provide contact information for two individuals who are familiar with their work

The FFTC will notify all applicants that successfully make it through the initial screening based on the Letter of Intent. The applicant will then be eligible to provide a full project proposal for consideration for funding. Submission guidelines are outlined in Appendix C.

STEP 2 – FULL PROJECT PROPOSAL

The full proposal will address the following:

1. Project Description
2. Incremental Value
3. Project Team
4. Design and Methods
5. Schedule
6. Project Budget
7. Partnerships (if applicable)
8. Knowledge Transfer
9. External Reviewers
10. References

As per the submission guidelines found in Appendix C the full project proposal must not exceed 12 pages (excluding CVs and budget pages).

1. Project Description

The applicant should provide a brief overview of the project including a description of the objective(s) and the contribution that the project makes to Ontario's land or forest imagery interpretation, resource inventory, resource management and/or operational planning. The description should provide the rationale for undertaking this project, applicability of the project outcomes, scope of the work and a good understanding of the target audience.

2. Incremental Value

The applicant should provide the context of the proposed work by listing any relevant literature or companion work (e.g. conducted by government agencies, industry or other) that supports or complements the project. Specifically, provide evidence and describe how the proposed project will fill a knowledge gap or add value to previous or ongoing work in Ontario or elsewhere.

3. Project Team

The applicant should provide the following:

- Project lead(s) and qualifications (including curriculum vitae not to exceed two pages)
- Project team and qualifications (including curriculum vitae not to exceed two pages per person)
- Roles and responsibilities of each member of the team
- Partnerships and/or collaborators and their roles, if applicable
- Letters of commitment and support from each partner



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4. Design and Methodology

The applicant should provide a summary of the design and methodology for the project that includes:

Design

- Rationale for project design
- Engagement of contractors, consultants, or other parties, if applicable
- Sequence of steps to be followed

Methodology

- Rationale for project methodology
- Data collection, statistical tests, equipment, data management and sharing, where appropriate

5. Schedule

The applicant should provide a detailed schedule for the project that includes:

- Start and completion dates
- Work plan including lead participant for each stage and staff allocations
- Measurable deliverables with target dates that represent progress towards meeting project objectives
- Contingency plan for any delays in achieving deliverables

6. Project Budget

Funding details will be provided on the Budget Forms available on the Forestry Futures website (www.forestryfutures.ca). Only projects spanning 24 months or less may be included under Application Process "B". These projects may overlap into three fiscal years (fiscal year runs from April 1 to March 31). A breakdown of the request for funding, by year, and a list of annual contributions from partners (cash and in-kind) must be included. A list of eligible expenses can be found in Appendix B.

The project budget may include an initial disbursement of up to 30% of the project funds. Actual spending of this initial disbursement must be described in detail and accounted for in a progress report (or other means as agreed to by the FFTC on a case-by-case basis) before further disbursements will be made available. Up to six disbursements per fiscal year will be considered.

For multi-year projects, the release of funds for year two will be contingent upon submission of acceptable progress reports. Twenty percent (20%) of the funds awarded to each project will be held in reserve and released upon receipt of the final progress report. If any project has funds remaining at the end, these surplus funds will be released back to the Trust.

7. Partnerships

The KTTD Program encourages creative partnerships and collaboration which bring leveraged funding to projects. Provide the following information for all project partners and/or collaborators:

- Identify the partnerships
- Describe the roles and responsibilities
- Provide letters of commitment and support



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8. Knowledge and Technology Transfer

Knowledge and/or technology transfer must be included as a component of each project. Applications that propose stand-alone transfer projects to train forest management practitioners, or other relevant parties, in using the imagery, inventory, or technology already available will also be considered for funding.

The applicant should outline the knowledge and technology plan including:

- A description of the knowledge transfer plan including a description of methods used and the audience
- The project's potential to build capacity in the natural resources sector through the on-going sharing of results and transfer of knowledge and technology.
- The feasibility of implementation by relevant parties including potential obstacles and proposed solutions
- Applicants should identify a multiple product approach to technology or knowledge transfer

9. External Review

- Identify two potential independent external peer reviewers and their contact information
- Peer reviewers should be recognized researchers or practitioners with extensive knowledge of the proposed subject area

10. References

Provide the contact information for two individuals who are familiar with the applicant's work.

Review and Assessment Procedures

Project applications will be collected and reviewed by the FFTC for completeness and eligibility under the Program. The review process for Application Process "A" (small scale projects) and Application Process "B" (large scale projects) differ as follows.

APPLICATION PROCESS "A" - Small Scale Projects

Small-scale projects submitted under Application Process "A" will be reviewed by the FFTC and may be reviewed by two external reviewers that are recognized researchers and/or practitioners with extensive knowledge of the proposed subject area. These external reviewers (as required) will present the results of their review to the FFTC. Final decisions on funding will be made by the FFTC and notification will be provided to the applicant.

Projects will be reviewed and scored based on Application Form "A" components and their respective assigned percentages, described below. During the initial review, the project application is deemed to be incomplete, or if the Project Description is deemed to not be eligible under the KTTD Program the application may not be subject to a full review at the discretion of the FFTC. The FFTC reserves the right to make all final funding decisions.



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Scoring Matrix

The reviewers will evaluate the application based on the information provided in each section as per Table 1.

Table 1. Scoring Matrix for Projects submitted through Application Process "A".

Section	Value
Project Description	15%
Project Team	20%
Design and Methodology	25%
Schedule	10%
Funding	15%
Knowledge and Technology Transfer	15%

APPLICATION PROCESS "B" - Large Scale Projects

Large-scale projects submitted under Application Process "B" will be reviewed in two stages: 1) an initial review of the Letter of Intent by the FFTC (drawing on expert opinion where needed), and 2) a review and assessment of the full project proposal by at least two qualified external reviewers followed by a program meeting for final project funding decisions.

LETTER OF INTENT

The Letter of Intent will be reviewed by the FFTC and may be reviewed by up to two external reviewers that are recognized researchers or practitioners with extensive knowledge of the proposed subject area. These external reviewers (as required) will present the results of their review to the FFTC. Final decisions on acceptance of the Letter of Intent will be made by the FFTC based on the completeness and merit of the proposal. Notification of acceptance of the Letter of Intent and feedback (if applicable) will be provided to the applicant.

FULL PROJECT PROPOSAL

Full project proposals submitted under Application Process "B" (after acceptance of the Letter of Intent) will be reviewed for completeness by the FFTC. Review of the full project proposal will be conducted by an External Review Team. This review team will be comprised of individuals from the following groups: MNRF eFRI staff, other MNRF business groups (if relevant), Provincial Forest Inventory Advisory Committee industry member(s), and other specialists including, but not limited to, research scientists, technologists, practitioners and educators. Each application will be distributed to a minimum of two members of the External Review Team. The external reviewers for each project will be selected based on their knowledge and expertise in the project area. All members of the External Review Team must disclose any potential or perceived conflicts of interest and will not be eligible to review applications where a conflict is identified.



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Projects will be reviewed and scored based on the project proposal components (as described in Application Process and Funding Requirements) and their respective assigned percentages, described below. During the initial review, if the project application is deemed to be incomplete, or if the Project Description is deemed to not be eligible under the KTTD Program the application may not be subject to a full review at the discretion of the FFTC. The FFTC reserves the right to make all final funding decisions.

Scoring Matrix

The reviewers will evaluate the application based on the information provided in each section as per Table 2.

Table 2. Scoring Matrix for Projects submitted through Application Process "B".

Section	Value
Project Description and Incremental Value	15%
Project Team and Partnerships	20%
Design and Methodology	25%
Schedule	10%
Funding	15%
Knowledge and Technology Transfer	15%



Appendix A – Examples of Topics²

Theme 1: Tools and Products to Enhance the Production of the eFRI

- a. Business process update
 - i. 'Build' and 'update' business processes
- b. Automation
 - i. Attribution
 - ii. Delineation
- c. Mobile applications
 - i. Handhelds
 - 1. Digital Forms:
 - A. Assessment Establishment and Audit
 - B. Calibration Establishment and Audit
 - C. Integrated Monitoring Framework consideration
 - 2. Preferred platform or format
 - A. Revision schedule
 - 3. Validation routine (s)
 - A. Revision schedule
 - ii. Update of Height Curve Maker
 - 1. Already a field data collection form
 - 2. Already a field collection protocol
 - A. Is it applicable for calibration?
 - iii. Testing variable radius plots with stem map versus fixed radius (11.28 m)
 - iv. Caliper diameters (Bluetooth enabled) versus diameter tape
 - 1. Electronic versus manual measurements
- d. Sampling design for FRI calibration program
 - i. Ties to the Integrated Monitoring Framework
 - ii. Incorporates validation of collected point cloud information
 - 1. Digital Elevation Model
 - 2. Digital Surface Model
- e. Accuracy assessment
 - i. Field calibration data
 - ii. Quality control and assessment of interpretation
 - 1. Random Forest application
 - A. Predictive analysis for species composition (maybe just lead and second) as a quality control assessment method
 - 2. Predictive ecosite and moisture tool
- f. Other client requirements
 - i. Land Use Carbon Inventory, Carbon Offset Protocols, and Climate Change
 - 1. Analysis tools
 - 2. Biomass curves
 - 3. Field calibration and assessment procedures
 - ii. Caribou habitat assessment
 - 1. Key management decision nodes influenced by the FRI
 - A. Age assignment

² This is a list of topics that are relevant to the four themes and are provided as examples of potential projects. **Proposals, however, are *not* limited to these ideas and others will be considered.**



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- B. Tree species compositions
- C. Spatial distribution of trees within polygons and fragmentation of landscape polygons
- D. Minimum polygon specifications i.e., road delineation guidelines, protocols, and responsibility
- E. Other research opportunities
- iii. Wood product opportunities
 - 1. Large diameter core collection
 - 2. Handling and measurement protocols
 - 3. Collection, storage, and analyses protocols and responsibilities
- iv. Dendrochronology and climate change records can be collected with core collections
 - 1. Do these relate to the Strategic Direction?
- v. Source water protection
 - 1. Capture of single line streams from FRI source data
 - 2. Delineation and identification of wetlands from the FRI interpreted dataset
 - 3. Watershed identification and assessment from FRI source data
- vi. Wetlands
 - 1. Delineation and identification of wetlands from the FRI interpreted dataset
 - 2. Source, Sink, and Reservoir assessment from the FRI interpreted dataset

Theme 2: Tools and Products for Client and Stakeholders

- a. Wildlife
 - i. Habitat identification, critical and suitable
 - ii. Assessment of the T1 FRI interpreted dataset
 - iii. From the FRI source data
 - iv. Procedure modifications for T2
 - v. Key decision nodes to incorporate into FRI business process
 - vi. Primary, secondary, and tertiary road delineation and identification
- b. Landscape and silviculture guides
 - i. Establishment and performance surveys
 - 1. How to apply field survey protocols to a remote sensing procedures
 - ii. Key decision nodes to incorporate into FRI business process
- c. Public
 - i. What are the requirements to fulfill the Public Focus Area in the Strategic Direction?
 - 1. Communications
 - 2. Access to FRI source data
 - 3. Access to FRI products
 - ii. Business process modifications to enable meeting this Focus Area
- d. Ontario Hydrological Network
 - i. Water Classification Tool
 - 1. Recoding
 - 2. New tool development
 - ii. Aquatic Resource Area determination tool
 - 1. Recoding
 - 2. New tool development



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- iii. Single line streams
 - 1. Automation
 - 2. Modelled single lines when not visible
- iv. Water crossing inventory
 - 1. Automation
- e. Modelling Inventory Support Tool
 - i. Site index
 - 1. Model augmentation with calibration data
 - ii. Stocking
 - 1. Model augmentation with calibration data
 - 2. Can attribute be removed or updated
 - iii. Site class
 - 1. Model augmentation with calibration data
 - 2. Can attribute be removed or updated
 - iv. Normal BA
 - 1. Model augmentation with calibration data
 - 2. Can attribute be removed or updated
 - 3. Normal BA tables developed for each species
- f. Ownership and other values integration
 - i. Automated tool development

Theme 3: LiDAR (single photon)

- a. FRI calibration design
 - i. Species composition
 - ii. Ages (wood properties, dendrochronology, growth rates)
 - iii. Validation of point clouds
- b. Roads
 - i. Automated feature extraction
 - ii. Process development
- c. Single line streams
 - i. Automated feature extraction
 - ii. Process development
- d. Automation - Attributes
 - i. Crown closure
 - 1. Process development and documentation
 - ii. Horizontal pattern
 - 1. Process development and documentation
 - iii. Vertical structure
 - 1. Process development and documentation
 - iv. Stocking (if required)
 - 1. Process development and documentation
- v. Heights (top height (for site index), stand heights (99th percentile, 95th percentile))
 - 1. Process development and documentation

Theme 4: Integrated Monitoring Framework

- a. Growth and Yield - reinforce linkages to eFRI
- b. Nested data collection within the FRI calibration
 - i. Down woody debris
 - ii. Standing dead trees



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- iii. Small trees
- iv. Vegetation
- v. Provincial ecological land classification
- vi. Cruiser call grading and net factoring process (pathology and estimated products)
- vii. Sampling design
 - 1. Simple random
 - 2. Stratified random
 - 3. Probability proportional to size
 - A. With or without replacement
 - 4. Strata
 - 5. Sample size
 - 6. Error and confidence levels
 - 7. Tied to National Forest Inventory Grid



Appendix B – Eligible Expenses

- Salaries directly related to project, e.g., graduate and undergraduate students, forest technicians, photo interpreters, etc.
- Consultant/sub-contractor fees directly related to the project
- Reasonable travel costs for work directly related to the project
 - Mileage and per diem meal expenses may not exceed current provincial reimbursement rates
 - Economy accommodation and airfare (if applicable)
- Fixed capital costs including:
 - Related equipment lease/purchase costs (must be specialized equipment directly related to project outcomes and must be purchased/leased/acquired during the first half of the project)
 - Supplies directly related to the project
- Teleconferencing costs
- Report production
- Overhead or administrative costs (up to a maximum of 10 percent)

Please note the following items are ineligible as in-kind expenses or for reimbursement under this Program:

- Preparation of application for funding
- Fixed capital costs that are not specialized equipment, excluding those as defined above
- Costs incurred prior to approved project date



Appendix C – Submission Guidelines

Submission Guidelines

Program Schedule

Issuing of Request for Proposal	December 14, 2017
Deadline for receipt of Small-Scale Projects (Application Process A)	January 29, 2018-12am
Deadline for Letter of Intent (LOI) for Large-Scale Projects (Application Process B)	January 29, 2018–12am
Decision on successful Small-Scale Projects and Letters of Intent	February 20, 2018
Notification to successful Small-Scale Project applicants	February 27, 2018
Notification to LOI applicants of acceptance to proceed	February 27, 2018
Deadline for receipt of full proposals for Large-Scale Projects	April 2, 2018
Decision on successful proposals for Large-Scale Projects	April 23, 2018
Notification to successful Large-Scale Project applicants	April 30, 2018

Submission

Letters of Intent and Project Proposals must be submitted electronically by midnight of January 29, 2018 to admin@forestryfutures.com. Acknowledgement of receipt will be provided within 48 hours. Only those submissions received by the deadline will be considered. Electronic versions must be in PDF format with Budget Forms also provided in Microsoft Excel.

All documents must be submitted as per the forms available on the Forestry Futures website (www.forestryfutures.ca). This includes the Small Scale Application (“A”), Letter of Intent, Full Project Proposal (“B”), and Budget Forms. Proposals not submitted on the provided forms, or incomplete proposals will be deemed ineligible. The FFTC, at their discretion, may contact applicants to make the required corrections and be considered eligible for funding.

DOCUMENT CONTROL

In the interest of efficiency, the following document length restrictions apply to all submissions:

Note: All submissions must be 10 point font or larger on letter size paper.

Application Process “A”

- *Application* should be 5-7 pages (not including budget forms and Curriculum Vitae)

Application Process “B”

- *Letter of Intent* should range from 2 to 5 pages (including a broad budget)
- *Full Project Proposal* must not exceed twelve pages (excluding CVs and budget forms)
- *Curriculum Vitae* for each team member should not exceed two pages
- *Literature Cited* should not exceed two pages