Chapter 1
Section 1.27

Ministry of the Environment, Conservation and Parks
Ministry of Natural Resources and Forestry
Ministry of Agriculture, Food and Rural Affairs

Follow-Up on 2020 Value-for-Money Audit:
Setting Indicators and Targets, and Monitoring Ontario's Environment

RECOMMENDATION STATUS OVERVIEW						
		Status of Actions Recommended				
	# of Actions Recommended	**Fully Implemented**	**In the Process of Being Implemented**	**Little or No Progress**	**Will Not Be Implemented**	**No Longer Applicable**
Recommendation 1	1	0.33	0.66			
Recommendation 2	2	1.66	0.33			
Recommendation 3	1	1				
Recommendation 4	1		0.33	0.66		
Recommendation 5	2	2				
Recommendation 6	1				1	
Recommendation 7	4		2	2		
Recommendation 8	3			3		
Recommendation 9	2				2	
Recommendation 10	2	1		1		
Recommendation 11	1	0.33	0.33		0.33	
Recommendation 12	3		2.33	0.66		
Recommendation 13	2	1.33	0.66			
Recommendation 14	1	1				
Recommendation 15	1	0.33	0.66			
Total	**27**	**8.98**	**7.30**	**7.32**	**3.33**	**0**
%	**100**	**33**	**27**	**27**	**12**	**0**

Note: The Ministry of the Environment, Conservation and Parks was tasked with **Recommendations 1–5, 7, 11, 12, 13** (two action items), and **15**. The Ministry of Natural Resources and Forestry was tasked with **Recommendations 1, 2, 4–6, 9, 11, 12, 13** (one action item), **14**, and **15**. The Ministry of Agriculture, Food and Rural Affairs was tasked with **Recommendations 1, 2, 4, 5, 8, 10–12, 13** (two action items), and **15**.

Overall Conclusion

The Ministry of the Environment, Conservation and Parks (Environment Ministry); the Ministry of Natural Resources and Forestry (Natural Resources Ministry); and the Ministry of Agriculture, Food and Rural Affairs (Agriculture Ministry), as of October 31, 2023, had fully implemented 33% of actions we recommended in our *2020 Annual Report*. The Ministries had made progress in implementing an additional 27% of the recommended actions.

While the three Ministries previously changed over time the set of key performance indicators (KPIs) that they report to the Treasury Board Secretariat, hampering year-over-year performance tracking, all

three have improved their continuation of tracking existing KPIs, allowing for the successive measurement and reporting of ministry performance. Further, the three Ministries have collectively established a means of sharing information with Ministry staff on the objectives, activities and results of their monitoring programs.

The Environment Ministry has also fully implemented recommended actions such as establishing a process for developing outcome-based targets, including all approved KPIs in its published annual plan, and establishing a process for evaluating the use of water quality assessment values from other jurisdictions and organizations. In addition, the Ministry has made some progress toward developing performance measurement frameworks for its monitoring programs and has developed a data management policy that requires data management plans to be established.

The Natural Resources Ministry has also made progress toward developing performance measurement frameworks and data and information management plans for its monitoring programs; establishing a process for developing comprehensive, outcome-based targets to meet its legislated and strategic goals; and has obtained independent assurance of the information technology systems that store Ontario's natural heritage information.

The Agriculture Ministry has fully implemented recommended actions such as establishing a standardized process for developing, reviewing and approving its Apiary Program procedures and guidance documents, and developing and implementing a data management policy. The Ministry has also made progress toward establishing a process for developing outcome-based targets to meet its legislated and strategic goals, reviewing its existing targets, creating a performance measurement framework for its Apiary Inspection Program, developing data and information management plans, and has worked with stakeholders to develop a collaborative implementation plan for Ontario's Agricultural Soil Health and Conservation Strategy.

However, the three Ministries have made little progress on 27% of the recommended actions, some of which involve longer-term commitments or rely on the completion of other actions before they can be initiated, and will not be implementing 12% of them.

The Environment Ministry has made little progress reviewing all its targets to ensure they have meaningful time frames and are based on sound evidence, and establishing a database of actions to protect and recover at-risk species. Moreover, while the Natural Resources and Agriculture Ministries have taken steps to establish processes for developing, reviewing and approving their environmental monitoring protocols, the Environment Ministry indicated that it will not implement this recommendation, asserting that the ability to detect environmental change over time can be achieved through means other than standardized monitoring and surveying. Our Office continues to recommend that the Ministry develop a documented, standardized process for developing, reviewing and approving monitoring and survey protocols.

The Natural Resources Ministry has made little progress reviewing all its existing targets. The Ministry will not be developing an integrated, broad-scale monitoring program of Ontario's biodiversity, or a broad-scale, long-term monitoring program for wild pollinators.

The Agriculture Ministry has made little progress monitoring the impacts of honey bee pests and diseases on wild species that pollinate Ontario's crops, as the Ministry indicated that it has no mandate to do so.

The status of actions taken on each of our recommendations is described in this report.

Background

Ontario's natural environment provides many benefits, including water, food, energy, resources and medicines. The environment, natural resources and agriculture can be affected by pollution, resource

extraction, development, climate change and other pressures. Damage to the environment can have an impact on Ontarians' health, economic productivity and quality of life.

Decision-makers and the public need to have an adequate picture of the state of the environment, knowledge of whether the environment is improving or deteriorating, and awareness of underlying environmental problems and risks. To provide this picture, the Province needs to thoroughly monitor Ontario's environment, natural resources, wildlife and agriculture, and provide clear public reporting.

Protecting the environment effectively requires establishing targets, monitoring the environment and analyzing collected data. Specifically:

- Setting targets based on scientific evidence and with time frames enables the Province to accomplish its environmental goals such as reducing the waste that goes to landfills and reducing Ontario's greenhouse gas emissions, which contribute to global climate change.

- Monitoring alerts the relevant ministries of environmental risks, such as an invasive species threatening the health of forests or algae rising to levels that could reduce oxygen in lakes and pose a threat to fish. Monitoring also helps the Province assess whether its programs have lessened environmental damage and to what degree.

- Establishing data management plans before the data is collected helps to mitigate risks around the ownership, security and future use of the data.

The Province has made strong commitments to protect Ontario's natural environment, including establishing legislation and related regulations, policies and programs to protect against environmental degradation and support better health and quality of life for future generations. Three lead ministries share the responsibility for environmental monitoring to confirm that these commitments are being met. These ministries have mandates related to protecting, conserving and sustaining Ontario's environment, natural resources and agriculture:

- **The Ministry of the Environment, Conservation and Parks (Environment Ministry)** is responsible for protecting Ontario's air, land, water and at-risk species and their habitat; managing provincial parks and conservation reserves; and co-ordinating the Province's response to climate change.

- **The Ministry of Natural Resources and Forestry (Natural Resources Ministry)** is the provincial lead for conserving Ontario's biological diversity (biodiversity) and managing Ontario's natural resources, including its forests; aggregate, oil and gas resources; fish and wildlife; and Crown lands.

- **The Ministry of Agriculture, Food and Rural Affairs (Agriculture Ministry)** has a priority to ensure the sustainability of Ontario's agriculture. The Ministry oversees the province's managed honey bee sector, and has released action plans and strategies to improve the health of pollinators and agricultural soils.

Our audit found that the Environment Ministry's air and water monitoring programs were extensive and responded to legislative and regulatory requirements, inter-jurisdictional agreements and other commitments.

However, we found that the three lead Ministries had not put into place effective systems and processes for setting targets, carrying out effective monitoring practices, and ensuring data quality and data sharing for certain aspects of Ontario's environment.

For example, our audit found that some environmental protection targets lacked deadlines and were not evidence-based. We also found that when the Ministries had set targets, they did not always make them public.

In addition, there was no long-term, broad-scale monitoring of Ontario's biodiversity. In 2012, the government recognized that, while many independent monitoring programs collect data related to biodiversity, there was a need for an integrated, broad-scale monitoring program to cover all aspects of Ontario's biodiversity. Without this, impacts on populations, species, habitats and ecosystems could be occurring without detection. With this in mind, in 2012, the Province committed to developing such a program led

by the Natural Resources Ministry. The Ministry had taken some steps in this direction by the time of our audit in 2020 but had not yet developed the necessary monitoring program.

We made 15 recommendations, consisting of 27 action items, to address our audit findings.

We received commitment from the Ministries that they would take action to address our recommendations.

Status of Actions Taken on Recommendations

We conducted assurance work between April 2022 and October 2023. We obtained written representation from the Environment Ministry, Natural Resources Ministry and Agriculture Ministry that, effective November 14, 2023, they had provided us with a complete update of the status of the recommendations we made in the original audit in November 2020.

Targets Not Set in Some Important Environmental Areas, Including Water Conservation, Invasive and At-Risk Species, and Soil Health

Recommendation 1

To track performance, report on progress and drive continuous improvement toward environmental goals, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs establish and implement a process for developing comprehensive, outcome-based targets to meet the legislated and strategic goals and objectives within their areas of responsibility.

Status:

Environment Ministry – Fully implemented.

Natural Resources Ministry – In the process of being implemented by fall 2023.

Agriculture Ministry – In the process of being implemented by October 2024.

Details

In our 2020 audit, we found that, while the Treasury Board Secretariat (Secretariat) has provided guidance encouraging ministries to set targets to measure program effectiveness, and several pieces of legislation explicitly authorize or require ministers to set targets, these three Ministries lacked targets to achieve several important environmental goals. Further, the Ministries did not have their own documented procedures for developing and establishing indicators and targets.

In our follow-up, we found the following:

- **Environment Ministry:** In January 2021, the Environment Ministry endorsed an approach for its Program Performance Management Framework. As one component of this framework, in June 2021, the Ministry published and distributed an internal guidance document and template to support an annual process for assessing its key performance indicators (KPIs), including the development of outcome-based targets. An intended outcome of this process is to build the Ministry's capacity to develop and implement KPIs through establishing KPI committees. According to the Ministry, as part of its KPI assessment rollout, it has started to review its targets based on this framework (see **Recommendation 4**) and will consider the need for new targets based on scientific evidence, where appropriate. Between June 2021 and March 2022, 10 KPI assessment committees were established and provided guidance, templates and training to complete the assessment process.

- **Natural Resources Ministry:** The Natural Resources Ministry initially indicated that it had finalized a list of indicators for each goal in the Ministry's 2020–2025 strategic plan, *Naturally Resourceful*, and was developing targets for each indicator. However, the Ministry could not provide this finalized list of indicators, nor any documentation of work conducted to develop associated targets (or a process for developing targets). The Ministry later explained that since the 2020–2025 strategic plan and its associated

indicators were developed solely for the Ministry of Natural Resources and Forestry (which merged with the Ministry of Northern Development and Mines in June 2021 to become the Ministry of Northern Development, Mines, Natural Resources and Forestry), the new Ministry would need more time to deliver a performance measurement framework. In June 2022, the merged ministry was split into three: the Ministry of Northern Development, the Ministry of Mines and the Ministry of Natural Resources and Forestry. In June 2023, the Natural Resources Ministry informed us that it had resumed efforts to develop a performance measurement framework for its strategic plan, *Naturally Resourceful*. The Ministry has since drafted a performance measurement framework, including indicators and targets, and prepared a draft internal report with indicator results, which the Ministry expected to finalize by fall 2023.

- **Agriculture Ministry:** In response to recommendations in our 2020 report, in September 2021, the Agriculture Ministry released an internal pilot edition of a Performance Measurement Guide, which included guidance to staff on establishing targets. Further, the Ministry developed an internal Ministry Outcomes and Values Framework, which outlines five priority areas and 13 ultimate outcomes. Together, the guide and framework are intended to steer and support the Ministry in its strategic and operational planning, program design and delivery, establishment of KPIs and baselines, and setting of new or more effective metrics and targets where sufficient evidence exists.

  As reported in our 2020 report, the Ministry is also in the process of drafting an Agri-Food Environment Plan. If the plan is approved for consultation, stakeholders would be engaged on improving performance measurement. Drafts of the plan proposed establishing, through consultation, quantitative performance targets across several metrics such as soil erosion risk, soil organic carbon, soil cover, agriculture greenhouse gas emissions, and hectares of farmland. In 2020, the Ministry anticipated initiating a dialogue with stakeholders during public consultation on the draft plan to establish a process for setting quantitative performance targets.

At the time of our follow-up, progress on the draft Agri-Food Environment Plan was paused. However, the Ministry has continued work on establishing performance indicators as part of the Sustainable Canadian Agriculture Partnership (see **Recommendation 4**) and anticipates tracking and reporting on 50 federal indicators and tracking 40 additional provincial indicators. Work is under way to align these indicators to the 13 ultimate outcomes outlined in the Ministry Outcomes and Values Framework. Targets and performance indicators are expected to be set by October 31, 2024. To support this work, in February 2022, the Minister held a roundtable with agri-food leaders to discuss opportunities for improving environmental performance measurement. The Ministry also identified a number of ongoing data collection and management activities that will support and inform the implementation of the enhanced process for developing metrics and targets.

Recommendation 2

So that key performance indicators are meaningful, transparent and effective at assessing progress toward environmental targets and goals, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs:

- *submit consistent, outcome-based key performance indicators to the Treasury Board Secretariat;*

  Status:
  Environment Ministry – Fully implemented.

  Natural Resources Ministry – Fully implemented.

  Agriculture Ministry – Fully implemented.

Details

We found in our 2020 audit that the three Ministries had developed and submitted KPIs to the Secretariat to measure progress toward desired outcomes and government priorities, but have changed these KPIs and their associated targets over time, adding some and dropping others. While this year-over-year variability may reflect changes to key strategic priorities and goals, it hampers transparent, ongoing tracking of consistent measures for assessing performance.

In our follow-up, we found the following:

- **Environment Ministry:** Since our 2020 audit report, the Environment Ministry added six new government-directed KPIs related to reducing regulatory "red tape," providing digital channels and services to the public, and meeting emergency management planning requirements. The Ministry also kept all its existing KPIs, allowing for the continued measurement and reporting of these indicators over time. The Ministry has indicated that it will continue to assess and submit KPIs and program-level performance measures in alignment with direction from the Secretariat.

- **Natural Resources Ministry:** In 2021/22, the Natural Resources Ministry dropped two KPIs, one on providing recovery assistance to communities affected by floods and/or fires, the other on dollar savings (which was replaced with other measures related to tracking administrative efficiencies). In 2022/23, the Ministry kept all its 2021/22 KPIs, and added 11 more. These new measures include one related to forest regeneration, two related to sharing geospatial data, and others related to mining and petroleum operations (which relate to the part of the previous Ministry of Energy, Northern Development and Mines that merged with the Ministry of Natural Resources and Forestry in June 2021). The Natural Resources Ministry has recommended replacing one KPI (the percentage annual increase in Learn to Fish program participants) with a more outcomes-based measure.

- **Agriculture Ministry:** Since our 2020 audit report, the Agriculture Ministry has not dropped

any KPIs, but added four in 2021/22. These new indicators are related to reducing regulatory compliance requirements for businesses, stimulating the adoption of innovations to mitigate the workforce impacts of COVID-19, delivering digital services, and completing emergency management requirements.

- *include all approved key performance indicators and targets in their published annual plans.*

  Status:
  Environment Ministry – Fully implemented.

  Natural Resources Ministry – Fully implemented.

  Agriculture Ministry – In the process of being implemented by December 2023.

Details

In our 2020 audit, we found that, despite the Secretariat's recommendation that ministry-level outcomes or KPIs be included in annual reports, the three Ministries we audited kept several of these targets and KPIs internal, and did not include them in the published annual plans we reviewed (2017/18 to 2019/20).

In our follow-up, we found the following:

- **Environment Ministry:** In its 2020/21 published plan (released December 2020), the Environment Ministry published just five (or 50%) of its 10 KPIs at the time. The five unpublished KPIs related to public visits to provincial parks, the amount of land regulated as a protected area, and restoring Great Lakes Areas of Concern, amongst other things. In its 2021/22 published plan, the Ministry included all 10 of these KPIs, and added three more (related to reducing regulatory "red tape" and ensuring emergency management plans meet legislated and regulated requirements). The Ministry did not include three other new KPIs (related to digital channels and services) because trend and target data for them were not yet available. In its 2022/23 published plan, the Ministry published 13 (or 81%) of its 16 KPIs, again not publishing the three related to digital channels and services, for which trend and target data were still not available.

- **Natural Resources Ministry:** In its 2020/21 published plan, the Natural Resources Ministry did not include any of its approved KPIs and targets. Since then, the Ministry has made some progress making public its KPIs and targets, but has still not published all of them in its published annual plans. In its 2021/22 published plan, the Ministry included 15 (or 83%) of its 18 KPIs. It omitted three government-directed KPIs (and accompanying targets) related to increasing administrative efficiencies as the data and achievements for these new measures were not yet available. In its 2022/23 published plan, the merged Ministry of Northern Development, Mines, Natural Resources and Forestry included 27 (or 93%) of its 29 KPIs, omitting one on reducing regulatory compliance requirements and one on public participation in the Learn to Fish program (which the Ministry had recommended replacing with a more outcomes-based performance indicator). While not yet released publicly by the Treasury Board Secretariat at the time of our follow-up, the Ministry has included all 21 of its KPIs in its submitted 2023/24 published plan.

- **Agriculture Ministry:** In its 2020/21 published plan, the Agriculture Ministry did not include any of its internal KPIs, including those related to the environment. In its 2021/22 and 2022/23 published plans, the Ministry included only one (or 8%) of its 12 KPIs, which related to the level of adoption of environmentally beneficial best-management practices. While the Ministry has yet to report all of its internal KPIs and targets, the Ministry indicated that it will continue to work with the Treasury Board Secretariat toward including all relevant KPIs as recommended through our 2020 audit and in alignment with Treasury Board Secretariat instructions. The Ministry will also be reassessing its current suite of KPIs and working with the Treasury Board Secretariat on enhancements. The Ministry confirmed with our Office its intent to publish all of its KPIs in the Ministry's 2023/24 published plan.

Recommendation 3

So that the values used in water quality assessments are transparent and adequately substantiated, we recommend that the Ministry of the Environment, Conservation and Parks establish a documented process, similar to that used for air quality, for evaluating the use of assessment values from other jurisdictions and organizations where provincial values do not exist.

Status: **Fully implemented.**

Details

In our 2020 audit, we found that, for monitoring emerging contaminants in drinking water, the Environment Ministry used an informal hierarchy of jurisdictions and organizations from which it obtained contaminant benchmarks for assessing drinking water quality (including those used for monitoring and setting conditions in approvals and permits). The Ministry could not provide us with a documented justification for using this hierarchy. Moreover, the Ministry had not conducted a separate review of the evidence for each contaminant benchmark to substantiate its assumption that all the assessment values from one jurisdiction or organization are superior to all those of another. By contrast, the Ministry followed a well-defined process (described in its *Air Contaminants Benchmark List)* for using values from other jurisdictions in its assessments of local air quality under the *Environmental Protection Act*.

In our follow-up, we found that the Environment Ministry had developed a hierarchy document for selecting water benchmarks (including those for drinking water, surface water, recreational water use, sediment and animal tissue). This hierarchical approach provides a documented process for selecting benchmarks from other jurisdictions and organizations where such benchmarks in Ontario do not exist or when another benchmark may be more appropriate. The Ministry distributed the finalized hierarchy document to its internal users of water benchmarks in April 2022.

Some Targets Do Not Have Specific Time Frames or Are Not Based on Sound Evidence

Recommendation 4

So that set targets are effective at driving and measuring progress toward science-based environmental goals, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs review their existing targets, and ensure that these and new targets have meaningful achievement-focused time frames and are based on sound, scientific evidence.

Status:

Environment Ministry – Little or no progress.

Natural Resources Ministry – Little or no progress.

Agriculture Ministry – In the process of being implemented by October 2024.

Details

In our 2020 audit, we found that some of the targets set by the three Ministries—including those related to protected areas, pollinators and waste disposed per capita—did not have time frames for achievement or were not based on credible evidence. This is at odds with the Secretariat's direction that, to motivate the achievement of specific results and give a clear sense of when progress will be assessed, targets should have specific time frames.

In our follow-up, we found the following:

- **Environment Ministry:** According to the Environment Ministry, it has started reviewing its targets as part of its KPI assessment rollout (see **Recommendation 1**), and will consider the need for new targets based on scientific evidence, where appropriate. At the time of our follow-up, the Ministry had not set optional targets to achieve the goals of the *Water Opportunities Act, 2010* (on water conservation), or the *Clean Water Act, 2006* (on the use of the Great Lakes as a source of drinking water). The Ministry completed the first cycle of KPI assessments and review of targets in 2022 (except for the Ministry's target related to air quality, which the

Ministry intended to complete by summer 2023). While no targets were adjusted during this first assessment cycle, the Ministry plans to continue to review all KPI-associated targets annually to ensure they are based on scientific evidence, where appropriate. According to the Ministry, this review will inform its review of science-based targets in programs that support or contribute to achieving progress on KPIs. However, this review focuses only on targets related to published high-level KPIs, and thus excludes others such as the Ministry's provincial park class targets and the waste diversion targets in Ontario's Food and Organic Waste Policy Statement and the Strategy for a Waste-Free Ontario. According to the Ministry, targets for programs not linked to KPIs will be reviewed in the future, where appropriate.

- **Natural Resources Ministry:** The Natural Resources Ministry has started reviewing its monitoring program targets and drafted an inventory of its monitoring programs. However, the review will only focus on targets related to the Ministry's monitoring programs. The Ministry's development of new targets for monitoring programs will begin after it completes guidance for performance measurement frameworks by September 2023 (see **Recommendation 12**). With respect to broader targets for meeting environmental goals, which were the subject of our recommendation, the Ministry said it is focused on developing targets as part of the performance measurement framework of its strategic plan, *Naturally Resourceful* (see **Recommendation 1**), and does not have plans to set additional environmental targets at this time.

- **Agriculture Ministry:** As described above for **Recommendation 1**, the Agriculture Ministry intends for its newly developed Ministry Outcomes and Values Framework and Performance Measurement Guide to support and guide its strategic and operational planning, program design and delivery, establishment of KPIs and baselines, and setting of new or more effective metrics and targets where sufficient evidence

exists. In developing this framework and guide, the Ministry has met with subject matter experts to review its existing metrics and targets. Further, the Ministry will be working with partners to establish performance measures, including considering targets, as part of the Sustainable Canadian Agricultural Partnership—a five-year (2023–2028) investment by federal, provincial and territorial governments to strengthen and grow Canada's agriculture and agri-food sector. Targets and performance indicators are expected to be set by October 31, 2024.

Little Internal Awareness of or Co-ordination between Ministries' Environmental Monitoring Programs

Recommendation 5

So that staff are able to co-ordinate, collaborate and draw on information collected through monitoring programs within their own and the other two ministries, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs:

- *establish an internal means for sharing information on the objectives, activities and results of monitoring programs; and*
- *require staff to keep the information up to date.*

  Status:
  Environment Ministry – Fully implemented.

  Natural Resources Ministry – Fully implemented.

  Agriculture Ministry – Fully implemented.

Details

In our 2020 audit, we found that there was inconsistent co-ordination of, or little access to information on, the environmental monitoring conducted in other branches, divisions or ministries. We found cases where staff were unaware of what information was being collected within their own ministry or even branch, or of the termination of monitoring relevant to their work. The Environment Ministry and Natural Resources Ministry lacked updated portals or databases to inform

their own and other ministries' staff about the monitoring activities and results of their programs.

In our follow-up, we found that the three Ministries have worked together to create a Tri-Ministry Monitoring Programs site on Microsoft Teams that houses an inventory of their monitoring programs and linkages to their data and reports. The Ministries have produced a standard operating procedure on site governance and updates, which directs staff from each Ministry to review and update the information in the inventory at least annually.

Air and Water Monitoring Extensive; Monitoring Lacking on Biodiversity, Species at Risk, Protected Areas, Pollinators and Soil Health

Recommendation 6

So that Ontario's biodiversity is effectively monitored and the province can make informed decisions to protect and restore it, we recommend that the Ministry of Natural Resources and Forestry develop an integrated, broad-scale monitoring program for all aspects of Ontario's biodiversity.

Status: Will not be implemented.

Details

Our 2020 audit found that, in 2012, the Province recognized that, while many independent monitoring programs across a number of ministries collect biodiversity-related data, there was a need for an integrated, broad-scale monitoring program covering all aspects of Ontario's biodiversity. With this in mind, in its 2012 biodiversity plan (*Biodiversity: It's In Our Nature*), the Province committed to developing such a program led by the Natural Resources Ministry. Specifically, the Ontario government's biodiversity plan included, as one activity, "building on existing programs, develop an integrated, broad-scale monitoring program for all aspects of Ontario's biodiversity." However, more than eight years later, this program had not yet been developed. An integrated, long-term, and broad-scale monitoring of biodiversity would better allow the Ministry to measure the direction and speed

of changes within natural systems, assess the causes and impacts of those changes, and predict and respond to future changes.

In our follow-up, we found that the Natural Resources Ministry will not be implementing this recommendation, though it had initiated work to address this recommended action, including: drafting a jurisdictional scan of Canadian approaches to monitoring and reporting on the state of biodiversity; meeting with external parties (e.g., the Alberta Biodiversity Monitoring Institute, Quebec Biodiversity Monitoring Network); initiating a gap analysis to review the Ministry's existing monitoring and identify opportunities to improve understanding of the state and trends of Ontario's biodiversity; and meeting with staff, scientists and other experts to discuss indicators, emerging technology, and options for biodiversity reporting.

Based on the draft jurisdictional scan, the Ministry concluded that its ability to monitor and report on biodiversity is among the best in Canada, and that the idealistic goal of developing an integrated, broad-scale monitoring program for all aspects of Ontario's biodiversity is not achievable from a technical, operational, or financial perspective. Rather, the Ministry plans to complete the gap analysis and update the jurisdictional scan to reflect the release of a new Ontario Biodiversity Strategy (see Environmental Registry #019-6701); assess the feasibility of implementing opportunities to improve biodiversity monitoring and reporting identified in the gap analysis; and continue to investigate opportunities to address gaps in biodiversity knowledge.

Recommendation 7

For progress to be made on protecting and recovering species at risk, we recommend that the Ministry of the Environment, Conservation and Parks:

- *establish a database of actions contained in government response statements;*
- *use the database to annually track and follow up on progress on actions;*
  Status: Little or no progress.

Details

Our 2020 audit found that, despite the Province identifying the development and implementation of monitoring programs for certain at-risk species as a high priority, these actions had not been initiated for a number of endangered species. As required under the *Endangered Species Act, 2007*, the government has released response statements that summarize and prioritize the actions it intends to take to address recommendations in recovery strategies for endangered and threatened species. Some of these actions involve developing and implementing survey and monitoring protocols for at-risk species. However, we found that the Ministry did not even have a database to track the assignment, implementation and progress of actions in the government response statements. We concluded that, until the Environment Ministry undertakes, delegates, co-ordinates and tracks the implementation of the actions in response statements, including those related to monitoring, little progress will be made toward achieving species recovery goals.

In our follow-up, the Environment Ministry informed us that it is acting on the commitment it made in response to our 2020 report and will explore the feasibility of implementing processes and systems to enhance progress tracking, and following up on actions identified in the government response statements. As part of this work, which is in the process of being completed, Ministry staff held meetings to discuss options, and started drafting a feasibility assessment. The Ministry expected to complete the feasibility assessment by November 2023, but has not committed to establishing a database or other system for tracking progress on the aforementioned actions.

- *execute on high-priority actions to be taken, including monitoring; and*
- *solicit interest from and assign responsibility for certain actions to conservation partners (e.g., organizations, agencies, universities and other stakeholders).*

  Status: In the process of being implemented by November 2023.

Details

Since our 2020 audit, the Ministry has executed or initiated several high-priority actions related to developing survey or monitoring protocols for endangered species. These include protocols for riverine dragonflies (like the riverine clubtail), the false hop sedge (a grass-like plant), Fowler's toad, and the common five-lined skink (a lizard). The Ministry anticipated being able to make the survey protocols for Fowler's toad and the common five-lined skink publicly available by November 2023. The Ministry has also funded projects to develop and implement standardized survey or monitoring protocols for other species, like the branched bartonia (a flowering plant) and at-risk bumblebee species. However, the Ministry has not yet initiated or assigned 10 other high-priority actions identified in our 2020 audit report, such as developing survey and/or monitoring protocols for endangered species like the American badger, barn owl, butternut tree, and king rail (a bird).

The Ministry continues to solicit interest, including through its Species at Risk Stewardship Program, from willing partners to implement certain actions in government response statements. The Ministry awarded funding in 2021/22 to 30 new projects through this program in November 2021. The Ministry supported 67 projects in 2022/23 through this program, and is providing $4.5 million to fund 50 projects in 2023/24.

Recommendation 8

To support the long-term sustainability of Ontario's animal-pollinated crops, we recommend that the Ministry of Agriculture, Food and Rural Affairs:

- *explore and implement opportunities to expand the surveillance of honey bee pests and diseases, and monitor their impacts on wild species that pollinate Ontario's crops;*
- *work with the Ministry of Natural Resources and Forestry to develop and implement a research and monitoring program on wild species that pollinate Ontario's crops;*

  Status: Little or no progress.

Details

Our 2020 audit found that Agriculture Ministry staff had identified and recommended options for surveying American foulbrood and varroa mites (two of the greatest threats to Ontario's managed honey bees) to provide a more informed view of pests and diseases in the managed honey bee population. Further, our audit noted there are opportunities to improve knowledge of the potential spillover effects of honey bee pests and diseases on wild species, including important pollinators of Ontario's crops. In 2015, the Ministry initiated a time-limited Enhanced Apiary Monitoring Project for pests and diseases. That project concluded in 2019, as the Agriculture Ministry had determined that it had collected sufficient data in those five years to have a good baseline understanding of honey bee pests and diseases in Ontario apiaries.

Since then, Ministry staff have expanded and standardized decision-making guidance documents for apiary (managed beehive) inspectors, and broadened them with additional information on honey bee pests and diseases, which may also affect a range of pollinators, to enhance detection efforts and improve response when pests and diseases are found in inspected bee yards. Staff recommended taking a flexible inspection and response approach that balances risk of disease or infestation, logistics and resource requirements.

Our 2020 audit also found that, despite the importance of wild pollinators (such as bees, flies, wasps, butterflies, moths and beetles) to agricultural production (particularly fruit, vegetable and nut crops), Ontario had no comprehensive, long-term program to monitor the health of these wild species or their contribution to the pollination of Ontario's crops. As a result, information on this contribution by pollinators was dated or lacking for many crops (such as soybeans, peas, beans, peaches and sour cherries).

In our follow-up, we found that the Agriculture Ministry has continued work on its five-year Enhanced Apiary Monitoring Project. For instance, it has finalized monitoring summary reports, and added or updated corresponding datasets on the Ontario Data Catalogue

for 2015–2019. The Ministry indicated that the data it collected through this project will be a valuable source for comparison should future, similar studies be needed after policy changes or improvements are made to managed honey bee practices. The Ministry also indicated that it has completed an inventory of honey bee pests and pathogens found in Ontario apiaries. Further, the Ministry has put forward a research proposal that would draw from this and other data to analyze existing data on varroa mites, and potentially other honey bee pests and pathogens, to inform knowledge on their spread, population dynamics, seasonal influence, and timing of sampling, and to develop updated recommendations for honey bee management.

The Agriculture Ministry noted that, while it has no mandate to monitor the impacts of honey bee pests and diseases on wild pollinators, it is responsive and expands its monitoring for honey bee pests and pathogens when warranted. For example, the Ministry reported that its Apiary Program co-ordinated and carried out additional monitoring inspections, sampling and follow-up inspections: in fall 2022 for beekeepers that reported high overwinter mortality in spring 2022; for a European foulbrood outbreak in spring 2023; and for suspected resistant varroa mites in fall 2023. Additionally, the Ministry told us that, for the 2023 beekeeping season, extra monitoring inspections were conducted of yards that have either never been inspected or have not been inspected in over five years.

While the Agriculture Ministry indicated that it will not be initiating a program to monitor the impacts of honey bee pests and diseases on wild species that pollinate Ontario's crops, it is committed to supporting the Natural Resources Ministry in developing and implementing a broad-scale, long-term monitoring program for wild pollinators, including wild pollinators of agricultural crops (see **Recommendation 9**). In response to our 2020 audit, the Natural Resources Ministry committed to developing options for delivery models for wild pollinator monitoring and reporting, and the Agriculture Ministry indicated that it would support the Natural Resources Ministry in such an initiative. However, our follow-up found that the

Natural Resources Ministry will not be developing and implementing a broad-scale, long-term monitoring program for wild pollinators (see **Recommendation 9**).

- *publicly report annually on the results of these monitoring programs.*
  Status: Little or no progress.

For public reporting, the Ministry created an apiculture (beekeeping and honey bee health) landing page to house annual Provincial Apiarist reports, reports on honey bee colony winter mortality, and other related information. However, public reporting on monitoring wild pollinators (see **Recommendation 9**), and information on the impacts of honey bee pests and diseases on these wild species, are unavailable due to the little progress made in these areas.

Recommendation 9

To detect changes in wild pollinator species, and inform actions to be taken on related conservation strategies, we recommend that the Ministry of Natural Resources and Forestry:

- *develop and implement a broad-scale, long-term monitoring program for wild pollinators; and*
- *publicly report annually on the results of this monitoring program and on the status of Ontario's wild pollinators.*

  Status: Will not be implemented.

  The Office of the Auditor General of Ontario continues to support the implementation of this recommendation.

Details

Our 2020 audit found that little information is known and collected on wild pollinators and their pollination of wild plants. Although the Natural Resources Ministry started some monitoring on wild pollinators in 2016, it had not yet processed and summarized the data, and the monitoring was limited to eight sites. Further, while university research groups have conducted research and surveying of wild pollinators, there was no broad-scale, long-term monitoring of

these species, especially in Northern Ontario. A 2017 report commissioned by the Agriculture Ministry concluded that the lack of critical information on the distribution and biodiversity of pollinators in Ontario represents a major obstacle to developing appropriate and sustainable conservation strategies.

In our follow-up, we found that the Natural Resources Ministry will not be implementing this recommendation. The Ministry had previously committed to developing a proposal that would explore a suite of options for delivery models for wild pollinator monitoring and reporting. The Natural Resource Ministry had committed to consulting with the Environment Ministry and the Agriculture Ministry on how to address wild pollinator species within a broader monitoring framework, as pollinators are of interest to all three ministries. It had also indicated its intention to conduct a detailed science and business review, develop sampling protocol options, and carry out a partner review and consultation by November 2022. The Ministry noted that it would likely take at least five years to design, test and implement a new, long-term monitoring program for wild pollinators.

In June 2023, the Ministry indicated to our Office that, based on its partner consultation and science and business review, it had concluded that there are insufficient drivers for development of a broad-scale monitoring program specifically for wild pollinators. The Ministry noted that, because it recognizes that wild pollinators represent a gap in its overall biodiversity monitoring efforts, it will consider the feasibility of limited wild pollinator-related monitoring when it assesses opportunities for improving the Ministry's ability to monitor and report on biodiversity (see **Recommendation 6**).

Recommendation 10

To implement Ontario's Agricultural Soil Health and Conservation Strategy and improve the tracking, measuring, analyzing and reporting on the state of Ontario's agricultural soil health, we recommend that the Ministry of Agriculture, Food and Rural Affairs work with the Soil Action Group to:

- *promptly develop and execute a collaborative implementation plan;*

  Status: Fully implemented.

Details

Our 2020 audit found that, despite the Agriculture Ministry recognizing the need to improve the tracking and measuring of changes in the health of Ontario's agricultural soils, little progress had been made implementing the Province's 2018 *New Horizons: Ontario's Agricultural Soil Health and Conservation Strategy* (Soil Health Strategy). In this strategy, the Ministry noted that province-wide soil assessment tools were not well developed, and that creating Ontario-specific indicators and making them consistent and comparable at different scales (e.g., farm, field, regional, provincial) would allow for a more detailed and useful analysis of Ontario's soil health. The strategy also outlined more than 30 actions related to tracking, measuring, storing and sharing soil health data, with the objectives of developing the capacity to track soil health and ensuring that soil data is well documented, replicable, defensible, comprehensive and publicly available.

However, we found that, two years after the Ministry released the Soil Health Strategy, little progress had been made implementing foundational actions within it. The Soil Action Group—a partnership between government, industry, conservation groups and academics to lead and monitor the strategy's implementation—only first met in January 2020, and its terms of reference were still in draft form as of October 2020. Further, the group had not yet developed any collaborative implementation plans, annual work plans or schedules for progress reporting to co-ordinate and document actions or report on its progress.

In our follow-up, we found that the Soil Action Group (which is co-chaired by a representative from the Agriculture Ministry) had begun a collaborative process to develop a plan for implementing the Soil Health Strategy. In October 2020, the Soil Action Group struck three separate multi-stakeholder Task Teams to identify preliminary priorities for collaborative implementation. In summer 2021, the group developed a refined

short list of priorities on which it sought feedback from its members. Work was conducted to understand and address raised concerns, with an expectation that an implementation plan would be defined by April 2023. In September 2022, the Soil Action Group met and agreed on next steps to develop a detailed implementation plan. In April 2023, five years after the Soil Health Strategy was released, Soil Action Group representatives, including Ministry representatives, endorsed the implementation plan for prioritized goals and activities of the strategy, and agreed to continue working together to address gaps. The Ministry noted that, since 2018, it has committed over $33 million to projects related to soil health, and over 20 Soil Action Group partners have over 60 actions under way to support the Soil Health Strategy's implementation.

- *report annually to the public on progress.*

  Status: Little or no progress.

Details

The Ministry has made progress reporting on implementation of some Soil Health Strategy actions through announcements of various programming efforts under way, and communications from members across the Soil Action Group, that are collectively driving progress on the Soil Health Strategy. Soil Action Group members are working toward more co-ordinated public communications and are exploring approaches for shared communications.

Lack of Standardized Monitoring Protocols Jeopardizes Consistency and Comparability of Collected Data

Recommendation 11

So that monitoring programs are credible, and collect standardized, comparable data that can reliably detect environmental changes over time, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs develop and implement requirements and processes for developing, reviewing and approving the content of standardized monitoring and survey protocols for all their monitoring programs.

Status:
Environment Ministry – Will not be implemented.

The Office of the Auditor General of Ontario continues to believe this is a significant recommendation and continues to recommend that the Environment Ministry develop and implement a standardized process for developing, reviewing and approving monitoring and survey protocols, including standard, basic requirements for protocol content.

Natural Resources Ministry – In the process of being implemented beyond 2025.

Agriculture Ministry – Fully implemented.

Details

In our 2020 audit, we found that the Environment, Natural Resources and Agriculture Ministries did not have standards or direction for the required content or format of their environmental monitoring and survey protocols. To ensure that environmental data collected by different people, in different locations and at different times (sometimes decades apart) is comparable, monitoring protocols should explain in detail how data is to be collected, managed, analyzed and reported. Such protocols are necessary to ensure that changes detected by monitoring are actually occurring in nature and not an artifact of differences in the way that people collected, processed and analyzed the information. Best practices and guidance used by the United States Department of Agriculture, Fish and Wildlife Service, Geological Survey and National Park Service recommend that effective monitoring protocols include standard content, such as that on background information; sampling and survey design; field methods; data management and analysis; reporting; personnel and operational requirements; and procedures for reviewing the monitoring program and revising the protocol.

In our follow-up, we found the following:

- **Environment Ministry:** In 2020, the Environment Ministry indicated that it would not implement this recommendation, asserting

that the ability to detect environmental change over time can be achieved through means other than standardized monitoring and surveying. The Ministry stated that it had specifically designed, and maintains and adapts, its monitoring programs to ensure significant changes can be detected over time and accurate conclusions drawn. Still, both during our audit and at the time of our follow-up, the Ministry did not have a documented, standardized process for developing, reviewing and approving monitoring and survey protocols, nor standard, basic requirements for protocol content. Our Office continues to recommend that the Ministry develop and implement these processes and requirements.

- **Natural Resources Ministry:** The Natural Resources Ministry has drafted a process for developing, reviewing and approving monitoring protocols and a monitoring protocol template for organizing and documenting the details of each monitoring program. After completing the monitoring program template and process document, the Ministry plans to create a timeline for transferring existing monitoring programs to the new template, as time and resources allow (expected November 2023 to beyond 2025). Given the Ministry's large number of complex monitoring programs, transferring all these programs to a new template is expected to take several years—beyond 2025.

- **Agriculture Ministry:** With respect to environmentally related monitoring programs led by the Agriculture Ministry, in July 2021, the Ministry finalized its Apiary Program Protocol, which describes a standardized process for developing, reviewing and approving Apiary Program Standard Operating Procedures and internal guidance documents. The protocol also provides direction on staff responsibilities, records management, document retention, and quality assurance and control.

Few Monitoring Programs Are Measured for Their Effectiveness

Recommendation 12

To assess the effectiveness of monitoring programs at achieving their stated objectives, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs, in adherence with guidance from the Treasury Board Secretariat:

- *develop effective, program-specific performance measurement frameworks for all their monitoring programs;*

  Status:
  Environment Ministry – In the process of being implemented by December 2023.

  Natural Resources Ministry – In the process of being implemented by December 2025.

  Agriculture Ministry – In the process of being implemented by fall 2024.

Details

In our 2020 audit, we reported that, for over a decade, the Secretariat had encouraged ministries to develop performance measurement frameworks—consistent processes to collect, analyze and report information on how programs are performing and whether they are achieving their intended outcomes. However, we found that none of the monitoring programs we reviewed had documented performance measurement frameworks in place.

  In our follow-up, we found the following:

- **Environment Ministry:** In June 2021, the Environment Ministry published and distributed an internal guidance document and template to support its annual process for assessing its KPIs (see **Recommendation 1**). Part of this assessment process includes identifying whether the Ministry needs to develop performance measures for specific programs. According to the Ministry, the assessment results will allow it to prioritize

which program-specific performance measurement frameworks should be implemented and prioritized. The Ministry is developing guidance to support the development and implementation of such frameworks as well as logic models, and has held staff training on how to develop program performance measures. By December 2023, the Ministry expects to complete performance measurement frameworks for two priority programs that monitor Lake Simcoe and ambient air quality, respectively. The Ministry anticipates that this recommendation will take more than three years to implement, subject to available resources.

- **Natural Resources Ministry:** The Natural Resources Ministry planned to complete guidance for establishing program-specific performance measurement frameworks for its monitoring programs (expected December 2023), use this guidance to create frameworks for developing new monitoring programs, and develop a schedule for creating frameworks for existing monitoring programs (expected 2023 to 2025). The Ministry held four meetings in late 2021 and early 2022 to determine the project scope and to begin developing guidance for performance measurement frameworks. The Ministry also developed a one-page overview in late 2021 to guide these discussions.

- **Agriculture Ministry:** In November 2021, Apiary Program staff met with a performance measurement specialist from the Agriculture Ministry to discuss developing performance measures based on regulatory programming. At the time of our audit, Ministry staff were working through the Ministry's new Performance Measurement Guide (see **Recommendation 1**), starting with the initial stage: defining the problem and assessing the situation to provide a rationale for outcomes, goals, objectives and activities. The Ministry has started working identifying potential performance measures specific to its Apiary Inspection Program, which it will then incorporate into

a performance measurement framework for evaluating and reporting on the program's effectiveness. The Ministry expects to complete this work by fall 2024.

- *establish and implement documented processes for regularly, independently and formally evaluating and reporting on the effectiveness of their monitoring programs;*

  Status:
  Environment Ministry – In the process of being implemented by December 2025.

  Natural Resources Ministry – In the process of being implemented by December 2024.

  Agriculture Ministry – Little or no progress.

Details

In our 2020 audit, we found that the Secretariat had repeatedly provided guidance to ministries on conducting program evaluations to assess the effectiveness, efficiency, relevance and sustainability of programs. Independent program evaluations can help objectively identify aspects of a program that are outdated or not working (e.g., field and laboratory methodologies, technologies, software, assumptions, models, analyses); assess whether the program is effectively meeting its objectives; expand understanding of leading practices; and identify opportunities for improvement. However, we found that few of the three Ministries' environmental monitoring programs had undergone formal, documented evaluations. Moreover, some program evaluations were conducted by the monitoring program's staff rather than an independent evaluation unit or third party that could provide an objective analysis and recommendations for improvement.

In our follow-up, we found the following:

- **Environment Ministry:** Developing and implementing program performance measurement frameworks is generally a first step in assessing how well programs are working and why. The second is evaluating and reporting on the programs' effectiveness. While performance

measurement evaluates what has been achieved, program evaluation helps assess what can be fixed in the future. Because the Environment Ministry is still in the process of developing performance measurement frameworks for its monitoring programs, it has not yet established and implemented a process for evaluating their effectiveness. The Ministry anticipates that this recommendation will take more than five years to implement, subject to available resources.

- **Natural Resources Ministry:** Similarly, the Natural Resources Ministry is still in the process of developing guidance for establishing program-specific performance measurement frameworks for its monitoring programs, and has made little progress establishing a process for then evaluating and reporting on the effectiveness of those programs. The Ministry has committed to completing this action by December 2024.

- **Agriculture Ministry:** Apiary Program staff in the Agriculture Ministry have connected with contacts in Regulatory Compliance Ontario and have reached out to other ministries that conduct inspections to gather best practices, lessons learned and established processes for conducting program evaluations. The Ministry has not yet taken other steps to establish and implement documented processes for regularly, independently and formally evaluating and reporting on the Apiary Program's effectiveness. The Ministry engaged the Ontario Animal Health Network (OAHN) regarding the independent evaluation of the Apiary Program in June 2022. However, the OAHN indicated that it does not have the capacity or expertise to perform formal, independent program reviews. Further, the Ministry indicated that is unaware of any other body or organization with the capacity and expertise to perform an independent evaluation of the effectiveness of the Apiary Program's monitoring activities. As a result, the Ministry has made no further progress on this recommendation.

- *periodically undertake a co-ordinated, comprehensive and independent evaluation of their environmental monitoring programs.*

  Status:
  Environment Ministry – In the process of being implemented.

  Natural Resources Ministry – In the process of being implemented beyond 2025.

  Agriculture Ministry – Little or no progress.

- **Environment Ministry:** The Ministry has made some progress toward undertaking a co-ordinated, comprehensive and independent evaluation of its environmental monitoring programs. The Ministry has indicated that it is developing guidance and training to enhance its staff's skills and capacity for conducting program evaluation. For example, the Ministry indicated that it has developed and is piloting a comprehensive program evaluation guidance document, which is expected to be completed by the end of 2023. Training modules based on the guidance are planned to be completed by fall 2024, and live training events rolled out across the Ministry throughout 2025.

- **Natural Resources Ministry:** Because the Natural Resources Ministry is still in the process of developing guidance for establishing program-specific performance measurement frameworks, and establishing a process for evaluating and reporting on monitoring program effectiveness, it has not yet undertaken a comprehensive evaluation of all its environmental monitoring programs. The Ministry has indicated that, because reviews for large programs can take a year or more to complete, addressing this recommended action for all environmental monitoring programs will take five years or more.

- **Agriculture Ministry:** With respect to periodically undertaking a comprehensive evaluation of its environmental monitoring programs, the Ministry indicated that it will consider doing this and related work in the long-term future.

Monitoring Programs Lack Data and Information Plans

Recommendation 13

To improve the integrity, security and effective use of data being used for monitoring purposes, we recommend that:

- *the Ministry of the Environment, Conservation and Parks and Ministry of Agriculture, Food and Rural Affairs develop and implement a data management policy that outlines requirements for establishing data management plans;*

  Status:
  Environment Ministry – Fully implemented.

  Agriculture Ministry – Fully implemented.

Details

In our 2020 audit, we found that neither the Environment Ministry nor the Agriculture Ministry had a data management policy outlining requirements for data management activities, including the planning, collection, use, access, maintenance, security, retention and disposal of collected or acquired data. By contrast, the Natural Resources Ministry released a Data Management Policy in April 2019, requiring program areas responsible for co-ordinating the collection or acquisition of data to prepare a data management plan, release data on the Ontario Data Catalogue according to the requirements of Ontario's Open Data Directive, and identify stakeholders to engage on data access.

In our follow-up, we found the following:

- **Environment Ministry:** In February 2022, senior management at the Environment Ministry approved a Digital Strategy for the Ministry, which includes introducing data management best practices and developing data management plans. In June 2022, the Ministry finalized a data management policy, which requires program areas responsible for co-ordinating the collection or acquisition of data to prepare a data management plan (based on a Ministry data management plan template) within 12 months of the policy's approval.

- **Agriculture Ministry:** In August 2021, the Agriculture Ministry finalized and released a Data Management Policy to guide the implementation of responsible and consistent data management practices across the Ministry. The policy directs Ministry branches that are responsible for co-ordinating the collection or acquisition of data on behalf of the Ministry to prepare data management plans that adhere to all aspects of the policy.

- *the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs develop and implement data and information management plans for their monitoring programs.*

  Status:
  Environment Ministry – Fully implemented.

  Natural Resources Ministry – In the process of being implemented beyond 2025.

  Agriculture Ministry – In the process of being implemented by December 2023.

Details

In our 2020 audit, we found that many of the three Ministries' environmental monitoring programs that we reviewed lacked data and information management plans, jeopardizing the integrity, security and effective use of collected data. Data management plans are important for ensuring that the resources and safeguards needed to manage data throughout their life cycle are identified and documented before the data is collected. Collecting data without a plan in place may result in unclear ownership, inappropriate use and access, and insufficient security and storage of the data. All these factors jeopardize data quality, which may pose risks to data integrity and analysis, and to the reliability of data for decision-making and compliance purposes. Data management plans are meant to mitigate these risks and enable knowledge transfer among

those responsible for collecting, analyzing and managing data. The lack of a documented data management plan not only threatens data security, integrity, and access, but also hinders the identification of opportunities to proactively share collected data with those who would benefit from it.

In our follow-up, we found the following:

- **Environment Ministry:** As part of the Environment Ministry's implementation of its new Digital Strategy and data management policy, the Ministry developed a template for data management plans, which the Ministry indicated were then completed for its monitoring programs in 2022/23.
- **Natural Resources Ministry:** The Natural Resources Ministry provided data management plan training to over 200 staff from nine different sections responsible for data management, and indicated that further training will take place. In addition, the Ministry has developed or drafted data management plans for five monitoring programs, and plans to use its inventory of monitoring programs to further develop data management plans for corresponding datasets, where applicable. The Ministry expects these plans to be completed beyond 2025.
- **Agriculture Ministry:** Following its development of a Data Management Policy, the Agriculture Ministry has created and shared a template for completing data management plans. Some plans have already been completed and are centrally stored as part of the Ministry's Open Data Inventory. The Ministry informed our Office that the creation of data management plans is proceeding slowly across all areas of the Ministry, and that it is working on a new data-governance-reporting structure, with clearer accountabilities for the creation of data management plans—anticipated late fall 2023.

Recommendation 14

To obtain assurance over the security, access and integrity of Ontario's natural heritage information, we recommend that the Ministry of Natural Resources and Forestry obtain and review independent assurance reports annually for the information technology systems used to store this information.

Status: Fully implemented.

Details

Our 2020 audit found that, despite the abundance of important information in its natural heritage database, some of which is highly sensitive, the Natural Resources Ministry had no third-party, independent assurance over the information technology (IT) system used to store this data in the United States. This web-based database, operated by NatureServe, a non-profit organization based in the United States, has stored information about Ontario's natural heritage (such as the locations and conditions of over 2,000 species, plant communities and wildlife concentration areas) since 2005. Although the Ministry is a member of the NatureServe network, it was unable to provide us with a contract with NatureServe or independent assurance over the IT controls, such as the hosting environment (located in Ashburn, Virginia), system backup, and access to and security of Ontario's natural heritage data.

In our follow-up, we found that the Natural Resources Ministry had completed an independent threat risk assessment, including penetration testing (simulated cyberattack), of NatureServe's software and cloud services to identify and remediate any security risks. This threat risk assessment included an assessment of the IT system's technology and operations security; backup measures; hosting environment; network security; and access, authentication and authorization controls. The Ministry has taken actions to reduce risks identified in this assessment to the Ministry's satisfaction.

Recommendation 15

So that the public, researchers and interested stakeholders are able to make effective use of data collected through monitoring programs, we recommend that the Ministry of the Environment, Conservation and Parks; Ministry of Natural Resources and Forestry; and Ministry of Agriculture, Food and Rural Affairs comply with the Open Data Directive and, unless exempted in specified circumstances, release data to the Ontario Data Catalogue in a timely manner.

Status:

Environment Ministry – Fully implemented.

Natural Resources Ministry – In the process of being implemented.

Agriculture Ministry – In the process of being implemented.

Details

In our 2020 audit, we found that, despite requirements in Ontario's Open Data Directive (Directive), not all data collected through the three Ministries' environmental monitoring programs was published in the Ontario Data Catalogue in a timely manner. Since 2016, the Directive has required that all data created, collected and/or managed by ministries and provincial agencies be made public, unless exempt in specified circumstances. The purpose of the Directive is to support government efficiency, effectiveness and innovation, and support public engagement and participation by allowing Ontarians to develop their own analysis, insights and digital products. Under the Directive, ministries are to periodically review and update released datasets to ensure accuracy and timeliness. If a dataset cannot be made accessible to the public as open data, ministries must provide a detailed explanation as to why. Our audit found instances where datasets from entire monitoring categories were not published at all on the Ontario Data Catalogue. In other cases, the Ministries had collected more recent data, but had not updated datasets in a timely manner.

In our follow-up, we found the following:

- **Environment Ministry:** At the time of our follow-up, we found that the Ministry had continued to update its open entries and add new datasets to the Ontario Data Catalogue. As of August 2023, the catalogue housed 74 Ministry open datasets. We initially found six instances where the Environment Ministry had not updated its datasets on the Ontario Data Catalogue in a timely manner. For example, the Ministry had not updated its dataset of large landfill sites since 2011. However, shortly following our inquiries in this area, the Ministry updated its online datasets for large landfill sites (updated to 2021), industrial wastewater discharges (2020 data), municipal treated wastewater effluent (2020 data), and sediment chemistry (2018 data). The Ministry indicated that it had updated 42 of its 68 open datasets in 2021 and expected to continue adding outstanding data to other datasets. Our follow-up also found that Ministry decisions to publicly release several datasets on the Ontario Data Catalogue—including those on water taking, algae monitoring, and lead reporting—had been "under review" since 2017 (2019 and 2020 daily and annual water-taking data was added to the Ontario Data Catalogue in July 2022). The Ministry provided our Office with explanations for this review status, noting that some datasets are provided on other websites, while others were expected to be updated on the Ontario Data Catalogue later in 2022.

- **Natural Resources Ministry:** At the time of our follow-up, we found that 50 (or 18%) of the Natural Resources Ministry's 278 datasets on the Ontario Data Catalogue were "under review," and 11 (or 4%) of them were "restricted." (The Ministry had previously told us that the "under review" status is most often given to datasets where a program area would like to publish the data in the Ontario Data Catalogue but has not yet completed an open data assessment, or the data is not in a machine-readable or open and accessible format fit for publication.) The Ministry indicated that in the last year it has added several new datasets to the Ontario Data Catalogue, and that implementation of this recommended action is in progress, as data

management training is ongoing. The Ministry indicated that it will continue to add datasets to the Ontario Data Catalogue according to Ministry policy.

- **Agriculture Ministry:** The Agriculture Ministry has identified 13 datasets related to its Apiary Program and Enhanced Apiary Monitoring Project (see **Recommendation 8**) that may qualify for posting on the Ontario Data Catalogue. The Ministry is finalizing the list of datasets that will be added to the catalogue and is reviewing and updating the plain-language descriptions for the applicable datasets. These datasets may include those related to honey bee colony winter mortality and responses to in-season honey bee mortality incidents. According to the Ministry, once it finalizes its list of applicable datasets, qualifying datasets will continue to the Open Data Posting process, which includes finalizing the data description form required for each dataset, conducting a risk assessment to determine whether the data can be shared publicly or should be restricted, preparing the data for release and adding the data to the Ontario Data Catalogue. The Ministry indicated that the process of posting the datasets takes time, and the Ministry will continue to progress through the listed data to fulfill this recommendation balanced with other regulatory program obligations.