Comments submitted by the Canadian Biotechnology Action Network (CBAN)

To the United States Department of Agriculture, APHIS

re: The State University of New York College of Environmental Studies and Forestry Petition (19-309-01p) for Determination of Nonregulated Status for Blight-Tolerant Darling 58 American Chestnut - Draft Environmental Impact Statement & Draft Plant Pest Risk Assessment

Contact: Kaitlyn Duthie-Kannikkatt, Canadian Biotechnology Action Network, trees@cban.ca – www.cban.ca/trees

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The Canadian Biotechnology Action Network (CBAN) appreciates this opportunity to comment on the question of United States Department of Agriculture (USDA) deregulation (approval) of the genetically engineered (GE or genetically modified) American chestnut tree "Darling 58" for release into the wild.

At issue is the request from the State University of New York College of Environmental Studies and Forestry (ESF) to approve a genetically engineered American chestnut tree for intentional release into the wild. We are concerned about the possible negative impacts of releasing the Darling 58 in North America, impacts which may not be known for decades and/or centuries. The introduction of this genetically engineered tree would add potential new threats ecosystems and forests that are already vulnerable and stressed.

In particular, the impacts of a USDA decision to allow planting of this genetically modified organism (GMO) would reach across the national border into Canada. Release of this GE tree in the United States would directly affect the environment in Canada, could threaten the endangered American chestnut in Canada, and could undermine the future of American chestnut restoration efforts in Canada.

CBAN brings together 15 groups to research, monitor and raise awareness about issues relating to genetic engineering in food and farming in Canada. CBAN members include farmer associations, environmental and social justice organizations, and regional coalitions of grassroots groups. CBAN has over a decade of experience in researching and monitoring the impacts of genetically modified organism (GMOs), including examining the issues raised by the possible release of genetically engineered trees. CBAN is a project of MakeWay's shared platform.

"Planting of Darling 58 American chestnut would not be considered a short-term use of the environment since the trees can live hundreds of years."

– USDA APHIS Draft Environmental Impact Statement, page 4-41

Overview

The request of the proponents (ESF) is for USDA deregulation to allow release of the genetically modified organism (GMO) "Darling 58" into the wild, in order to spread these genetically engineered (GE) trees across the Eastern United States.

- This release would have long-term impacts across, and beyond, the natural range of the American chestnut in North America, including in Canada.
- The timescale involved in this release and the vast uncertainties and unknown outcomes demand the use of the Precautionary Principle to ultimately conclude that this release cannot be permitted.
- The American chestnut restoration efforts underway in both Canada and the US provide hope for the future of wild American chestnuts. These efforts should be supported rather than placed in jeopardy by the release of a genetically engineered tree.
- A decision to permit release of this GE tree would set a dangerous precedent for the release of other GMOs into the wild as well as the deregulation of other GE trees, where cumulative environment impacts are likely to increase over time as more GMOs are released.

The USDA APHIS analysis is lacking:

- The timeframe and scope of the USDA assessment is limited and cannot account for the possible future impacts of releasing Darling 58.
- Despite explicitly acknowledging the difficulty of predicting the impacts on biodiversity, the assessment makes conclusions about benefits - without equally addressing risk.
- The assessment underestimates the degree and speed of seed movement, and role of human intervention in the spread of Darling 58.
- The assessment does not examine the question of restoration. As such, it overlooks the potential of current wild American chestnut restoration efforts and does not examine the impacts of a Darling 58 release on those restoration strategies.

Introduction

We are writing to share our serious concerns about the risks posed by USDA deregulation of the genetically engineered tree "Darling 58" to the Canadian environment, the endangered American chestnut *(Castanea dentata)* in Canada, and chestnut restoration efforts.

We contend that, because the intention of the release of this genetically engineered tree is to spread in the wild, across the full range of the American chestnut, the unconfined release of Darling 58 American chestnut trees represents, by definition, a plant pest risk as a potential invasive. This spread of Darling 58 would occur across many ecosystems and landscapes including in Canada.

The American chestnut is classified as an endangered species in Canada and is protected under the federal Species at Risk Act[1] and the Government of Ontario's Endangered Species Act.[2] The range of the American chestnut tree extends in the east of North America into southern Ontario and is projected to move into the Maritimes due to climate change.[3] However, the tree can also grow outside its range. In fact, the largest American chestnut tree in Canada is growing in the province of Nova Scotia. Sites of American chestnut have been identified and/or initiated by conservationists in eastern Ontario, Quebec, Nova Scotia, Prince Edward Island, and British Columbia.

In Canada, there is promising restoration work led by non-profit conservation groups and teams of many dedicated volunteers. This work has been underway for decades in a Canadian context, supported by projects to identify wild individuals and break isolation in order to encourage propagation.[4] This work is guided by the American chestnut recovery strategies of the Government of Canada[5] and the Province of Ontario.[6] Good prospects remain for recovery of the American chestnut in Canada using these existing strategies that do not involve genetic engineering. Contamination from the Darling 58 tree, and even the implementation of measures to prevent such contamination, could put these restoration efforts at risk.

The release of Darling 58 poses risks in the long-term across a wide geography that crosses our national border as well as the territorial borders of many Indigenous nations who have not been consulted on this issue. The dispersal and spread of the Darling 58, through gene flow and human intervention, cannot be monitored or controlled now and in the future, and the impacts of its release may never be fully known or understood.

The release of this GE tree is contested in both Canada and the US, however a USDA decision to allow its use would be made on behalf of everyone in the relevant ecozones, and on behalf of many future generations. The forests, ecosystems, and wild landscapes of the Eastern North American range of the American chestnut are a common heritage and, as stated in the assessment, the outcome of releasing this GE tree may not be known for centuries. A decision to release Darling 58 is, therefore, a momentous responsibility. Yet, the environmental impact assessment is limited in both the scope and timescale. The wide range of this large-scale release and spread is not considered, and the potential long-term impacts are not assessed.

Assessing the request to release Darling 58 requires use of the Precautionary Principle

The petition request is for the first-ever intentional release of a genetically engineered plant into the wild. Such a decision would be a national, North American, and global first. The important precedents that would be set by this decision need to be considered because of their significant environmental and social implications.

The question of this release is complex and profound because the impacts are far-reaching in time and space. The timescale involved reaches beyond our sight to impact many future generations, and the release has the potential to impact ecosystems at the far-reaches of where the American chestnut can grow in North America.

The question necessitates use of the Precautionary Principle which allows for protective action where there is scientific uncertainty about risks. In this case, in addition to the uncertainties surrounding genetic engineering, environmental assessment is complicated by our ignorance of forest ecology. In the context of the climate and biodiversity crises, the stakes involved are also particularly high, where the introduction of this GE tree could add yet another stress on vulnerable species and ecosystems.

A comprehensive assessment of the environmental impacts of planting genetically engineered trees in the wild is not possible given the complexity of trees and their long life, and the complexity of forest ecosystems and size of the habitats involved.[7] The limitations of our tools and knowledge for assessing the environmental risks of US-wide or continent-wide open release of this GE tree need to be explicitly acknowledged.

The Precautionary Principle also demands consideration of the need for the use of this technology in relation to the alternatives. In the case of the American chestnut, there are significant ongoing restoration efforts in both Canada and the US that show potential for success while also avoiding the unique and complex risks presented by using genetic engineering.

The following features of the proposed release of Darling 58, as discussed below, should trigger use of the Precautionary Principle:

- The timescale reaches far into the future
- The scope and geographical spread of potential impacts are wide
- There are vast uncertainties and unknowns
- Impacts could be irreversible and profound
- Spread cannot be monitored and controlled
- Release will threaten wild American chestnut restoration efforts

The timescale and scope of USDA assessment is inappropriately constrained

If released, the future of Darling 58 would be entangled with the future of many ecosystems and landscapes, and many generations of species, including humans. The long timeframe and wide scale of this release should trigger use of the Precautionary Principle. Instead, the analysis presented in the USDA APHIS Draft Environmental Impact Statement (dEIS) is based on a very limited timescale and scope that overlooks potential, widespread future risks.

The dEIS states that, "Planting of Darling 58 American chestnut would not be considered a short-term use of the environment since the trees can live hundreds of years" (page 4-41) and the agency says that it is tasked with considering both "short- and long-term effects" (page 4-15). However, the assessment does not consider the long-term effects. Despite stating that, "Impacts/effects may occur soon after the Agency decision or occur later in time" (page 4-15) the assessment does not fully quantify and consider "later in time."

At the outset, the assessment accepts the intention of the petitioner (ESF) as "ecological restoration" along with their proposal that "initial distribution will consist of long-term research plots and relatively small-scale horticultural plantings and will focus on areas where there are surviving small remnant American chestnut populations." (page vi) However, at the same time, the dEIS refers to future larger scale planting in forests as is explicitly designed in the purpose of the Darling 58 project: "Restoration with Darling 58

American chestnut is expected to occur on long-term research plots and relatively small-scale public horticultural lands before being planted on a larger scale in eastern forests and utilize similar resources as other forest trees." (page 4-41) The assessment states that, "Without aggressive restoration efforts, requiring considerable effort and coordination at landscape scales, it may require centuries before American chestnut becomes a significant presence in the landscape." (p v). However, the proponents explicitly propose aggressive restoration efforts.

In assessing the economic impacts, the analysis concludes with an "expectation" that the Darling 58 will not be used in commercial plantations in the "foreseeable future." This conclusion leaves commercial production in the future as an open question, with the long-term seemingly not considered relevant to the assessment of economic impacts.

The dEIS acknowledges that any long-term impacts would not be measurable for decades or longer and yet makes conclusions about these impacts. On balance, there also appears to be a deemphasis on risks, where benefits are mentioned without equally commenting on risks. For example, the statement made that, "Any long-term benefits wouldn't be measurable for decades or longer. As such, no effects are expected to listed and proposed T&E species and critical habitat where Darling 58 American chestnut would be planted." (page 4-53) However, the flip-side is that any long-term risks would also not be measurable for decades or longer.

The scope of analysis is also constrained to impacts that are "reasonably foreseeable." The scope of analysis is partly described thus:

> "Pursuant to CEQ regulations (40 CFR § 1508.1(g), impacts/effects considered are those that are reasonably foreseeable and have a reasonably close causal relationship to the petition decision. Impacts/effects may occur soon after the Agency decision or occur later in time. Potential impacts/effects include ecological (such as the effects on natural resources and on the components and functioning of affected ecosystems), historic, cultural, social, or effects on public health. Economic effects, such as those on employment or markets, may also be considered. Impacts/effects include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial (40 CFR § 1508.1(g))." (page 4-15)

However, the core challenge of this question is the future impacts that may be beyond sight.

Furthermore, the assessment does not consider the precedent that would be set by a decision to allow the first GMO release into the wild in relation to other GMO releases i.e. How many GMOs will government agencies approve for release into the wild and for what purpose? Currently, each GMO release is assessed individually, on a case-by-case basis, without reference to others or attention to possible cumulative impacts. As discussed by Jack A. Heinemann et al., safety and risk relating to the use of gene technologies correlate with scale, where harm increases with the increased use of the technology and exposure to it.[8]

In fact, the GE American chestnut has been described by some supporters as a "test tree" or "poster child" that could be used to build public support for the use of other genetically engineered trees for industrial purposes.[9] There is a range of research and development into genetically engineering tree species for commercial use.[10] The possible impact of this decision on the future of GE trees is critical because, as concluded by Fundación Ambiente y

Recursos Naturales (FARN); Huni Kui Peoples' Federation of Acre, Brazil; Indigenous Environmental Network; Ecoropa; Global Forest Coalition; Global Justice Ecology Project; Biofuelwatch; and the Canadian Biotechnology Action Network, "Genetically engineered trees are a threat to a sustainable future. Genetic engineering provides a distraction from real solutions and its deployment would pose a concrete danger to forest ecosystems."[11]

The vast uncertainties and unknowns of Darling 58 release

The Precautionary Principle is available to assist decision-making in the face of uncertainties and unknowns. The dEIS acknowledges the it is difficult to predict what impacts the Darling 58 American chestnut will have on forest biodiversity. This inability to predict the impacts should trigger the Precautionary Principle and lead to a determination to regulate the Darling 58 (not approve release) in order to avoid environmental harm.

Forest ecosystems are highly complex and poorly understood, and this incredible complexity increases the unknowns and uncertainties of introducing a GE tree. Assessing how the release of Darling 58 would affect other trees, understory plants, insects, soils, fungi, wildlife and human communities over time, would require a far better understanding of forest ecology than we currently have.

Furthermore, it is not possible to assess the risks because we do not know what will happen in complex ecosystems that are subject to climate change, over multiple generations of American chestnut trees, which can live for over 200 years. The impacts of release on ecosystems are unknown, and cannot be known, until they are observed in the wild over decades and/or centuries.

However, in the face of the acknowledged inability to predict the impacts, the dEIS, instead, makes conclusions of benefit. For example, "While it is difficult to predict what impacts Darling 58 American chestnut will have on forest biodiversity, in the long term if American chestnut were to become a dominant species again, it is reasonable to believe there are likely to be positive impacts on the biodiversity of animal species…"

The conclusions made in the assessment about the lack of impacts on biodiversity are weak and qualified. Such qualifications are necessary given the perfunctory attention to these questions in the assessment and our inability to know the impacts in the long-term. Statements made about the possible negative impacts on biodiversity simultaneously recognize uncertainty and gloss over it. For example:

- **"**While **it is difficult to predict what impacts Darling 58 American chestnut will have on forest biodiversity**, especially since the overall ecosystem has changed since American chestnut disappeared from the landscape, **it is reasonable to believe** that if Darling 58 American chestnut shows enhanced tolerance to chestnut blight and the trees are able to establish and spread, in the long term it will have positive impacts on increasing the biodiversity of animals and micro-organisms while decreasing the abundance of some tree species such as oaks (Paillet 2002)." (bolding added)
- "As discussed throughout this EIS, the impacts of a determination of nonregulated status for Darling 58 American chestnut are **unlikely to be adverse**." (bolding added) (page 4-45)

With so much at stake, into the future, these conclusions are not robust enough to allow for deregulation.

The uncertainties of genetic engineering

The processes involved in genetic engineering commonly result in unintended changes to DNA and traits.[12] Altering or introducing genes can result in changes, not only to the target gene(s) but also elsewhere, in unexpected, often surprising, and unpredictable ways that can have profound impacts on the organism.[13] For example, unintended traits are commonly observed in commercialized GE crops.[14]

With long-lived organisms such as trees, detecting unintended traits is more challenging. The dEIS states that, "According to information submitted by the petitioner and reviewed by APHIS, Darling 58 American chestnut is phenotypically and biochemically comparable to conventional American Chestnut (ESF 2019)," (4-49) however it is not possible to conclude from the studies available that the GE tree is comparable to non-GE. Further study and observation over time may find meaningful differences with implications for biodiversity.

If the Darling 58 is released, the GE tree may be later found to exhibit characteristics that are not comparable to wild American chestnuts. Genes do not function as isolated units but interact with each other and their environment in complex ways that are not well understood or predictable. Changes made to any of the genes involved can have far-reaching impacts, even on seemingly unrelated traits. Unexpected traits can be the product of gene-environment interactions and may only become apparent, for example, during times of environmental stress such as drought.

The intended GE trait of blight tolerance could also fail to function over time. The studies submitted to as part of the petition for approval offer limited information about the future performance of the GE trait. The tests have all been on young trees grown in the laboratory and short-term field tests, even though it is known that younger trees are naturally more resistant to the blight. American chestnut trees can live for over 200 years, and the performance of the GE trait, or the expression of new characteristics, can be affected by environmental conditions experienced over the lifespan of a tree, such as drought, flood, heat, pests, as well as by basic changes associated with aging.

There has been no study through the full lifecycle of Darling 58 trees or, further, with multiple generations. Instead, the petitioner relies on studies of three-year-old Darling 58 trees along with data from studies using earlier Darling research. This data is not sufficient for risk assessment and it is not sufficient to assess the stability of the GE blight-tolerant trait over time.

The impacts may be profound and irreversible

Just as the timescale of the impacts needs to be considered, so does the nature of the impacts i.e. what type of impacts, and of what significance. The release of the GE American chestnut tree is likely to be irreversible. **The nature of the release is one that cannot be monitored or controlled, and may be difficult or impossible to recall.**

The DEIS states the need to consider irreversible impacts in the following way: "An irreversible or irretrievable commitment of resources refers to impacts on or losses of resources that cannot be recovered or reversed. Irreversible commitments of resources are those that cause either direct or indirect use of natural resources such that the resources cannot be restored or returned to their original condition. Irreversible impacts entail the loss of future options, and applies primarily to the use of non-renewable resources such as fossil fuels, and resources that are renewable only over long timespans. Irretrievable is a term that involves the loss of productive value or use of resources. For example, certain opportunities can be foregone during the conduct of a proposed action, during which a resource cannot be used. These actions may be reversible or temporary, but the utilization opportunities foregone during the action are irretrievable." We contend that the impact of the Darling 58 on the future of wild American chestnut in Canada could be irreversible, where the **restoration of wild American chestnuts is lost as a future option**.

Distribution and spread is unknown, and will be unmonitored and uncontrolled

Release of the Darling 58 in the United States would ultimately result in unknown, unmonitored, and uncontrolled (and uncontrollable) spread and distribution of this genetically engineered tree across the US and into Canada.

The spread and distribution of Darling 58 may be much faster than assumed in the dEIS assessment and could mean that the Darling 58 becomes a plant pest risk. The USDA concludes that, "The American chestnut is not considered an invasive, fast colonizing tree, and the OxO gene will not change these traits. Therefore, Darling 58 American chestnut is not expected to invade or alter critical habitat in ways that would be detrimental to T&E species." However, the Darling 58 could become invasive in Canada.

The dEIS states that "Potential effects on the environment will depend on the success of Darling 58 chestnut to survive and spread over time" (page 4-15) but the analysis of potential impacts relies on incorrect assumptions about limited distribution in the short and mid-term. We argue that the analysis makes a number of incorrect assumptions including that, "Areas that are not intentionally planted with blight-tolerant chestnuts will likely remain without chestnuts for decades or longer (ESF 2019)"(page 4-49) and that "Darling 58 American chestnut could effectively be excluded from critical habitat if needed."(page 4-49)

Critically, this projection of limited distribution (dependent on human intervention) conflicts with the intended use of the Darling 58 as restated by the USDA in Appendix 1 of the dEIS that, "Darling 58 American chestnut is intended to be used as a restoration tree to establish and colonize much of the eastern United States...." (page 4-49). In their 2020 petition, the proponent states that, "If Darling 58 American chestnuts are granted nonregulated status, they will be made available for not-for-profit distribution to the public, and to groups including private, indigenous, state, and federal restoration programs, depending on the goals and preferences of these various groups." (ESF petition, page 5) The proponents stress that the GE tree is not patented "so as not to impede any American chestnut distribution or restoration efforts." In fact, the proponents stress the role of "citizen scientists" and say that the efforts towards outcrossing Darling 58 with wild chestnuts will "rely on the public" and "Researchers will continually seek feedback, but **the public will ultimately be able to propagate these trees, share them and plant them as they wish**" (bolding added). In our view, these statements, along with varying experience with the spread of AC (please see below), contradict the ESF argument that "successful colonization by transgenic chestnuts in areas beyond where they are intentionally planted will be relatively slow and manageable, depending on the preference of land managers." (ESF petition, page 5)

Since there is no apparent intention for government regulation and monitoring of the distribution, the spread of Darling 58 cannot be assumed to follow any stated plan of proponents. In fact, the distribution and the spread of Darling 58 is unknown, cannot be fully unmonitored, and cannot be fully controlled.

Our experience with GMOs in North America, and with invasives, demonstrates the difficulty of managing and recalling GMOs.[15] A clear lesson from this experience is the role of human behaviour in unwanted spread of GMOs, and the role of human error. In some cases, the cause of unintended GMO escape remains undetermined. The dEIS does not examine the upper limits of how far and wide, and how quickly, the Darling 58 could be distributed and spread.

Monitoring and managing the spread of this GE tree in the US would be important in order to track the risk of contamination and prevent any contamination into Canada. Such monitoring would be also vital to observing and tracking any potential adverse environmental impacts, and to maintaining an ability to recall the GE tree if impacts are observed. If monitoring and management of spread is not possible (including not enforceable), then the risks of Darling 58 increase. Because the American chestnut is such a long-lived organism and its spread may be slow, any adverse impacts may only be observed over decades or centuries, by which time the GE tree may be widely dispersed and recalling it may not be possible.

Release of Darling 58 would threaten an endangered species in Canada and jeopardize restoration

Release of the Darling 58 in the United States would threaten the wild American chestnut in Canada, which has legal protection as an endangered species. Furthermore, Northern spread of this GE tree from the United States would undermine promising American chestnut restoration efforts in Canada.

The USDA assessment repeats the petitioner's description that their intention is "ecological restoration" but we contend that the Darling 58 cannot be actually understood as a "restoration tree." A genetically engineered tree would replace rather than restore the American chestnut.

The USDA repeats the petitioner's depiction of the Darling 58 as a "restoration tree" but does not assess the restoration claim. Though not examining the ability of the tree to meet this stated goal of restoration, the general assumption of restoration appears embedded in the assessment. For example, the assessment includes the statement that, "Unlike field crops, Darling 58 American chestnut was developed with the intent of restoring a native tree to its former range", however, from a risk assessment point of view, this statement should be written: Unlike field crops, Darling 58 American chestnut was developed with the intent of release and spread through the wild.

The dEIS recognizes the reality that even if the Darling 58 works as intended, to be successfully and stably tolerant to the blight *Cryphonectria parasitica* across generations, it will face the same disease pressures as any other American chestnut ("Its attributes have yet to be established and it is susceptible to other diseases such as ink disease caused by *Phytophthora cinnamomi* (ESF 2019)." (page v.)) These pressures may sabotage the intended use of Darling 58. Furthermore, the dEIS states, "As the climate and ecology of the eastern forests have changed in the last hundred years it is unknown whether Darling 58

American chestnuts will ever regain the dominance it exhibited in the nineteenth century." (Page Vi) Furthermore, such efforts to genetically engineer pathogen resistance are likely to be unsuccessful over time simply because pathogens quickly evolve to overcome plant defenses.[16] The ability of the Darling 58 to function as intended is therefore not assured, and yet its release would disadvantage other restoration efforts.

The assessment does not acknowledge and consider the potential of existing restoration efforts in the US and Canada to secure a future for the American chestnut. The assessment concludes that if release of Darling 58 is not authorized, "American chestnut would remain stumps and small understory shrubs (Elliott and Swank 2008; Dalgleish et al. 2015b) in the forests of the eastern United States where populations persist." The assessment states that, "American chestnuts are still found wherever American chestnut was a canopy tree before the blight" but adds that, "They persist as stumps and small trees, often multi-stemmed, as a result of the blight, and no longer occupy a dominant canopy position." (Page 4-18) However, there are naturally blight tolerant individuals in both countries and these trees hold potential for restoration. In fact, **there is a greater proportion of large American chestnut trees and trees with reproductive capacity in Canada than in the US**.[17]

There is ongoing restoration work in both Canada and the US that relies on remaining wild American chestnuts and does not use, and does not support the use of, genetic engineering. In fact, there is hope in Canada that communities of conservationists will succeed in their long-term work to establish plots of naturally blight tolerant American chestnuts. This vision for restoration of the American chestnut without genetic engineering is shared by many communities across the US and Canada and has been supported by decades of work by dedicated volunteers who have been identifying and studying blight-tolerant individuals in the wild. This restoration work would be threatened by the release of a genetically engineered tree.

These efforts would be undermined by the release of a genetically engineered American chestnut tree that would spread and could cross-breed.[18] The release of this GE tree in the United States would pose a major management concern for Canadian restoration efforts. Implementing measures to stop gene flow from the Darling 58 trees could, at the very least, slow down restoration efforts, and, at worst, undermine or destroy them. The Darling 58 release into the Eastern US will likely spread across the range of American chestnut into Canada and the Darling 58 may also be planted and successfully grow outside its natural range. The use of the Darling 58 is not approved in Canada and the movement of this tree into Canada is currently illegal. The American chestnut has protection in Canada as an endangered species and its restoration has been supported by provincial and federal government strategic plans.

The dEIS mentions that the spread of Darling 58 could take centuries - this timeframe should equally be applied to considering the potential of ongoing non-GE restoration efforts. **The work of chestnut restoration demands a long-term commitment and it is too soon to abandon this important work to the release of a genetically engineered tree.** The release of Darling 58 could remove this possible future option of restoration with wild American chestnuts. Further, the spread of Darling 58 could actually facilitate the extinction of the American chestnut.

Conclusion

Rather than restoring the American chestnut, the release of this genetically engineered tree would threaten the future of the American chestnut. The release of Darling 58 is explicitly designed to breed with and replace remaining wild American chestnuts. The genetically engineered Darling 58 tree is currently illegal in Canada and its spread would represent a direct threat to the wild American chestnut which has legal protection in Canada as an endangered species. The release of Darling 58 in the US would require the design and implementation of new management strategies in Canada to stop the spread of this invasive. Such contamination management would incur costs that would slow promising restoration efforts, and containment measures are likely to fail over time. Ultimately, instead of securing a future for the American chestnut, the Darling 58 could be responsible for its extinction.

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