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Standard Development Roadmap	Modified per proposed SCPSC format for RBS	**Standard Development Timeline**
Definitions of Terms Used in Standard		**Definitions of Terms Used in Standard** **Vegetation Inspection** The systematic examination of vegetation conditions on a maintained transmission line Right-of-Way which may be combined with a general line inspection. The current glossary definition of this NERC term is modified to allow both maintenance inspections and vegetation inspections to be performed concurrently. Current definition of Vegetation Inspection: The systematic examination of a transmission corridor to document vegetation conditions.
Effective Dates **5. Effective Dates:** **5.1.** One calendar year from the date of adoption by the NERC Board of Trustees for Requirements 1 and 2. **5.2.** Sixty calendar days from the date of adoption by the NERC Board of Trustees for Requirements 3 and 4.		**Effective Dates** 1. First calendar day of the first calendar quarter one year after applicable regulatory authority approval for all requirements 2. First calendar day of the first calendar quarter one year following Board of Trustees adoption unless governmental authority withholds approval 3. First calendar day of the first calendar quarter that is at least one year following Board of Trustees adoption Exceptions: A line operated below 200kV, designated by the Planning Coordinator as an element of an IROL or as a Major WECC transfer path, becomes subject to this standard 12 months after the date the Planning Coordinator or WECC initially designates the lines as being subject to this standard.

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		An existing transmission line operated at 200kV or higher that is newly acquired by an asset owner and was not previously subject to this standard, becomes subject to this standard 12 months after the acquisition date of the line.
1. Title: Transmission Vegetation Management Program		**1. Title:** Transmission Vegetation Management
2. Number: FAC-003-1		**2. Number:** FAC-003-2
3. Purpose: To improve the reliability of the electric transmission systems by preventing outages from vegetation located on transmission rights-of-way (ROW) and minimizing outages from vegetation located adjacent to ROW, maintaining clearances between transmission lines and vegetation on and along transmission ROW, and reporting vegetation related outages of the transmission systems to the respective Regional Reliability Organizations (RRO) and the North American Electric Reliability Council (NERC).		**3. Objective:** To improve the reliability of the electric Transmission system by preventing those vegetation related outages that could lead to Cascading.
4. Applicability: **4.1.** Transmission Owner **4.2.** Regional Reliability Organization **4.3.** This Standard shall apply to all transmission lines operated at 200 kV and above and to any lower voltage lines designated by the RRO as critical to the reliability of the electric system in the region.		**4. Applicability:** **4.1.** Functional Entities: **4.1.1** Transmission Owners **4.2.** Facilities: Defined below, including but not limited to those that cross lands owned by federal[1], state, provincial, public, private, or tribal entities: **4.2.1.** Transmission lines operated at

[1] EPAct 2005 section 1211c: *"Access approvals by Federal agencies"*

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		200kV or higher. **4.2.2.** Overhead transmission lines operated below 200kV having been identified as included in the definition of an Interconnection Reliability Operating Limit (IROL) under NERC Standard FAC 014 by the Planning Coordinator. **4.2.3.** Overhead transmission lines operated below 200 kV having been identified as included in the definition of one of the *Major WECC Transfer Paths in the Bulk Electric System*. **4.2.4.** This Standard does not apply to Facilities identified above (4.2.1 through 4.2.3) located in the fenced area of a switchyard, station or substation.
		4.3. Enforcement: *The reliability obligations of the applicable entities and facilities are contained within the technical requirements of this standard. [Straw proposal]*
		4.4. Other: This Standard does not apply to any occurrence, non-occurrence, or other set of circumstances that are beyond the control of a Transmission Owner subject to this reliability standard, including acts of God, flood, drought, earthquake, major storms, fire, hurricane, tornado, landslides, ice storms, vehicle contact with tree, human activity involving: removal of, installation of, or digging around vegetation,

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		animals severing trees, lightning, epidemic, strike, war, riot, civil disturbance, sabotage, vandalism, terrorism, wind shear, or fresh gale (or higher wind speed) that restricts or prevents performance to comply with this reliability standard's requirements. Nothing in this section should be construed to limit the Transmission Owner's right to exercise its full legal rights on the active transmission line ROW[2] [2] A strip or corridor of land that is occupied by active transmission facilities. This corridor does not include the parts of the Right-of-Way that are unused or intended for other facilities. However, it is not to be less than the width of the easement itself unless the easement exceeds distances as shown in Table 3 for various voltage classes.
	Added new section titled, "Background" per SCPSC format.	**5. Background** This NERC Vegetation Management Standard ("Standard") uses a defense-in-depth approach to improve the reliability of the electric Transmission system by preventing those vegetation related outages that could lead to Cascading. This Standard is…
R1. The Transmission Owner shall prepare, and keep current, a formal transmission vegetation management program (TVMP). The TVMP shall include the Transmission Owner's objectives, practices, approved procedures, and work specifications1. **R1.1.** The TVMP shall define a schedule for and the type (aerial, ground) of ROW vegetation inspections. This schedule should be flexible enough to adjust for changing conditions. The inspection schedule shall be based on the anticipated growth of vegetation and any other environmental or operational factors that could impact the relationship of vegetation to the Transmission		**R1.** Each Transmission Owner shall manage vegetation to prevent encroachment that could result in a Sustained Outage of any line identified as an element of an Interconnection Reliability Operating Limit (IROL) or Major Western Electricity Coordinating Council (WECC) transfer path (operating within Rating and Rated Electrical Operating Conditions). Types of encroachment include: 1. An encroachment into the Minimum Vegetation Clearance Distance (MVCD) as shown in Table 2, observed in real time, absent a Sustained Outage, 2. An encroachment due to a fall-in from inside the active transmission line ROW that caused a vegetation-related Sustained Outage,

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Owner's transmission lines. **R1.2.** The Transmission Owner, in the TVMP, shall identify and document clearances between vegetation and any overhead, ungrounded supply conductors, taking into consideration transmission line voltage, the effects of ambient temperature on conductor sag under maximum design loading, and the effects of wind velocities on conductor sway. Specifically, the Transmission Owner shall establish clearances to be achieved at the time of vegetation management work identified herein as Clearance 1, and shall also establish and maintain a set of clearances identified herein as Clearance 2 to prevent flashover between vegetation and overhead ungrounded supply conductors. **R1.2.1.** Clearance 1 — The Transmission Owner shall determine and document appropriate clearance distances to be achieved at the time of transmission vegetation management work based upon local conditions and the expected time frame in which the Transmission Owner plans to return for future vegetation management work. Local conditions may include, but are not limited to: operating voltage, appropriate vegetation management techniques, fire risk, reasonably anticipated tree and conductor movement, species types and growth rates, species failure characteristics, local climate and rainfall patterns, line terrain and elevation, location of the vegetation within the span, and worker approach distance requirements. Clearance 1 distances shall be		3. An encroachment due to blowing together of applicable lines and vegetation located inside the active transmission line ROW that caused a vegetation-related Sustained Outage, 4. An encroachment due to a grow-in that caused a vegetation-related Sustained Outage. **R2**. Each Transmission Owner shall manage vegetation to prevent encroachment that could result in a Sustained Outage of applicable lines that are not elements of an Interconnection Reliability Operating Limit (IROL) or Major Western Electricity Coordinating Council (WECC) transfer path (operating within Rating and Rated Electrical Operating Conditions). Types of encroachment include: 1. An encroachment into the Minimum Vegetation Clearance Distance (MVCD) as shown in Table 2, observed in real time, absent a Sustained Outage, 2. An encroachment due to a fall-in from inside the active transmission line ROW that caused a vegetation-related Sustained Outage, 3. An encroachment due to blowing together of applicable lines and vegetation located inside the active transmission line ROW that caused a vegetation-related Sustained Outage, 4. An encroachment due to a grow-in that caused a vegetation-related Sustained Outage. **Rationale (R1 and R2)** The MVCD is a calculated minimum distance stated in feet (meters) to prevent spark-over between conductors and vegetation, for various altitudes and operating voltages. The distances in Table 2 were derived using a proven transmission design method.

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greater than those defined by Clearance 2 below. **R1.2.2.** Clearance 2 — The Transmission Owner shall determine and document specific radial clearances to be maintained between vegetation and conductors under all rated electrical operating conditions. These minimum clearance distances are necessary to prevent flashover between vegetation and conductors and will vary due to such factors as altitude and operating voltage. These Transmission Owner-specific minimum clearance distances shall be no less than those set forth in the Institute of Electrical and Electronics Engineers (IEEE) Standard 516-2003 (*Guide for Maintenance Methods on Energized Power Lines*) and as specified in its Section 4.2.2.3, Minimum Air Insulation Distances without Tools in the Air Gap. **R1.2.2.1** Where transmission system transient overvoltage factors are not known, clearances shall be derived from Table 5, IEEE 516-2003, phase-to-ground distances, with appropriate altitude correction factors applied. **R1.2.2.2** Where transmission system transient overvoltage factors are known, clearances shall be derived from Table 7, IEEE 516-2003, phase-to-phase voltages, with appropriate altitude correction factors applied. **R1.3.** All personnel directly involved in the design and implementation of the TVMP shall hold appropriate qualifications and training, as defined by the Transmission Owner, to perform their duties. **R1.4.** Each Transmission Owner shall		**R3.** Each Transmission Owner shall document the procedures, processes, or specifications it uses to prevent the encroachment of vegetation into the MVCD. Such documentation will incorporate the dynamics of a transmission line conductor's movement throughout its Rating and Rated Electrical Operating Conditions and the inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency, for the Transmission Owner's applicable lines. **Rationale (R3)** Provide a basis for evaluation on the intent and competency of the Transmission Owner in maintaining vegetation. There may be many acceptable approaches to maintain clearances. However, the Transmission Owner should be able to state what its approach is and how it conducts work to maintain clearances. See Figure 1 for an illustration of possible conductor locations. **R4.** Each Transmission Owner, without any intentional time delay, shall notify the control center holding switching authority for the associated transmission line when qualified personnel confirm the existence of a vegetation condition that is likely to cause a Fault at any moment. **Rationale (R4)** To ensure expeditious communication between qualified field personnel and proper operating personnel when a critical situation is confirmed. Qualified field personnel may include lineworkers and utility arborists.

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develop mitigation measures to achieve sufficient clearances for the protection of the transmission facilities when it identifies locations on the ROW where the Transmission Owner is restricted from attaining the clearances specified in Requirement 1.2.1. **R1.5.** Each Transmission Owner shall establish and document a process for the immediate communication of vegetation conditions that present an imminent threat of a transmission line outage. This is so that action (temporary reduction in line rating, switching line out of service, etc.) may be taken until the threat is relieved.		**R5.** Each Transmission Owner shall take corrective action when it is constrained from performing planned vegetation work, where a transmission line is put at potential risk due to the constraint. **Rationale (R5)** Legal actions and other events may occur which result in constraints that prevent the Transmission Owner from performing planned vegetation maintenance work. In cases where the transmission line is put at potential risk due to constraints, the intent is for the Transmission Owner to put interim measures in place, rather than do nothing. For example, in the 2003 NE blackout a Transmission Owner was prevented by a court order from performing planned work. However, when the court order expired, the TO failed to take action to maintain the vegetation resulting in a sustained outage that contributed to the cascade. The corrective action process is not intended to address situations where a planned work methodology cannot be performed but an alternate work methodology can be used.
R2. The Transmission Owner shall create and implement an annual plan for vegetation management work to ensure the reliability of the system. The plan shall describe the methods used, such as manual clearing, mechanical clearing, herbicide treatment, or other actions. The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. Adjustments to the plan shall be		**R7.** Each Transmission Owner shall complete the work in an annual vegetation work plan to ensure no vegetation encroachments occur within the MVCD. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made and documented provided they do not put the transmission system at risk of a vegetation encroachment. Examples of reasons for modification to annual plan may include: • Change in expected growth rate/ environmental factors • Major storms • Rescheduling work between growing seasons

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documented as they occur. The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each Transmission Owner shall have systems and procedures for documenting and tracking the planned vegetation management work and ensuring that the vegetation management work was completed according to work specifications.		• Crew or contractor availability/ Mutual assistance agreements • Identified unanticipated high priority work • Weather conditions/Accessibility • Permitting delays • Land ownership changes/Change in land use by the landowner • Funding adjustments (increase or decrease) • Emerging technologies **Rationale (R7)** This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. An annual vegetation work plan allows for work to be modified for changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors, provided that the changes do not violate the encroachment within the MVCD.
R3. The Transmission Owner shall report quarterly to its RRO, or the RRO's designee, sustained transmission line outages determined by the Transmission Owner to have been caused by vegetation. **R3.1.** Multiple sustained outages on an individual line, if caused by the same vegetation, shall be reported as one outage regardless of the actual number of outages within a 24-hour period. **R3.2.** The Transmission Owner is not required to report to the RRO, or the RRO's		**Additional Compliance Information** ***Periodic Data Submittal:*** The Transmission Owner will submit a quarterly report to its Regional Entity, or the Regional Entity's designee, identifying all Sustained Outages of transmission lines determined by the Transmission Owner to have been caused by vegetation that includes, as a minimum, the following: o The name of the circuit(s), the date, time and duration of the outage; the voltage of the circuit; a description of the cause of the outage; the category associated with the Sustained Outage; other pertinent comments; and any countermeasures taken

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designee, certain sustained transmission line outages caused by vegetation: (1) Vegetation related outages that result from vegetation falling into lines from outside the ROW that result from natural disasters shall not be considered reportable (examples of disasters that could create non-reportable outages include, but are not limited to, earthquakes, fires, tornados, hurricanes, landslides, wind shear, major storms as defined either by the Transmission Owner or an applicable regulatory body, ice storms, and floods), and (2) Vegetation-related outages due to human or animal activity shall not be considered reportable (examples of human or animal activity that could cause a non-reportable outage include, but are not limited to, logging, animal severing tree, vehicle contact with tree, arboricultural activities or horticultural or agricultural activities, or removal or digging of vegetation). **R3.3.** The outage information provided by the Transmission Owner to the RRO, or the RRO's designee, shall include at a minimum: the name of the circuit(s) outaged, the date, time and duration of the outage; a description of the cause of the outage; other pertinent comments; and any countermeasures taken by the Transmission Owner. **R3.4.** An outage shall be categorized as one of the following: **R3.4.1.** Category 1 — Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the ROW; **R3.4.2.** Category 2 — Fall-ins: Outages caused by vegetation falling into lines		by the Transmission Owner. A Sustained Outage is to be categorized as one of the following: o Category 1A — Grow-ins: Sustained Outages caused by vegetation growing into applicable transmission lines, that are identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the active transmission line ROW; o Category 1B — Grow-ins: Sustained Outages caused by vegetation growing into applicable transmission lines, but are not identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the active transmission line ROW; o Category 2 — Fall-ins: Sustained Outages caused by vegetation falling into applicable transmission lines from within the active transmission line ROW; o Category[3]4 — Blowing together: Sustained Outages caused by vegetation and applicable transmission lines blowing together from within the active transmission line ROW. The Regional Entity will report the outage information provided by Transmission Owners, as per the above, quarterly to NERC, as well as any actions taken by the Regional Entity as a result of any of the reported Sustained Outages. [3] Category 3 reporting is eliminated.

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from inside the ROW; **R3.4.3.** Category 3 — Fall-ins: Outages caused by vegetation falling into lines from outside the ROW.		
R4. The RRO shall report the outage information provided to it by Transmission Owner's, as required by Requirement 3, quarterly to NERC, as well as any actions taken by the RRO as a result of any of the reported outages.		