

Appendix C: Project Design Features and Mitigation Measures

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Temporary roads provide access to treaty resources, yet lead to confusion when closed without notice.	D1	The timber sale administrator will post proposed closure dates for temporary roads constructed for access to timber sales.	All stands with temporary roads			
Request not to use Cayuga as name of project	D2	Timber sales will not have "Cayuga" in their name.	All stands	All stands	All stands	All stands
Sensitive Species	E3	Do not improve or maintain existing unclassified road W218202 in Compartment 203. Use unclassified road W219314 to access stands 1 and 5 in Compartment 203.	203-1 203-5	203-1 203-5	203-1 203-5	203-1 203-5
	E4	Allow no harvest activities between February 15 and August 1 in the remainder of Compartment 203, stand 16 (approximately 17 acres), and in the southern 1/3 of Compartment 203, stand 5 (approximately 25 acres).	203-5 203-16	203-5 203-16	203-5 203-16	203-5 203-16
	E5	Reserve all mature, long-lived conifers from cutting (white pine, hemlock, northern white cedar, white spruce)	203-5 203-16	203-5 203-16	203-5 203-16	203-5 203-16

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	E6	Ensure that harvest boundary along the southwestern edge of Compartment 203, stand 5 does not include the conifer transition edge; exclude that area from harvest activity.	203-5	203-5	203-5	203-5
	E7	Utilize winter harvest only (do not harvest between April 1 and October 31) in stands adjacent to the Iron River	178-20 178-21 178-23 178-25	178-20 178-21 178-23 178-25	178-20 178-21 178-23 178-25	178-20 178-21 178-23 178-25
	E8	Reserve several pockets of dense mid-level conifer cover (2-3 reserve islands approximately 1/8-1/2 acre in size).	178-25	178-25	178-25	178-25
	E9	Close or decommission all temporary roads following use for timber harvest, unless needed for additional administrative use. In sites requiring use of temporary road construction across areas of lowland conifer, survey proposed sites prior to construction to determine presence of rare plants; modify road location or design as needed to protect any rare plant sites.	All affected stands and roads			

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	E10	Reserve mature live jack pine and snags within Compartment 124, stands 53 and 56; reserve trees should be in groups (3-5 groups per stand); consider visual impact when designing reserve groups.		124-53 124-56	124-53 124-56	
	E11	Follow Forest guidelines concerning heron rookery protection in terms of protection zones and seasonal restrictions	127-17 200-11	127-17 200-11	127-17 200-11	127-17 200-11
	E12	Do not harvest between May 15 and August 1, to protect nesting birds.	188-18 202-1	188-18 202-1	188-18 202-1	188-18 202-1
	E13	Manage Compartment 179, stand 17 with partial cutting only, to encourage long-lived conifer	179-17	179-17		179-17
Suitable habitat exists for two TES plant species.	E14	Follow W16-W19, except increase basal area to 90 in RMZ, for protection of unknown occurrences of two TES plant species.	200-1 200-2 202-1 204-12	200-1 200-2 202-1 204-12	200-1 200-2 202-1 204-12	200-1 200-2 202-1 204-12
		Note: Additional information concerning mitigation measures by species can be found in the document “TES Species: Recommended Mitigation for Cayuga Project” in the project file.				

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Improvement or maintenance of fish habitat	F1	Keep all slash out of Class I and II trout streams during timber sale activities. (Forest Plan, pp. IV-79)	157-7, 157-8, 158-1, 158-8, 158-9, 158-33, 161-14, 161-15, 180-5, 180-30, 188-6, 188-11, 188-41	157-7, 157-8, 158-1, 158-8, 158-9, 158-33, 161-14, 161-15, 180-5, 180-30, 188-6, 188-11, 188-41	157-7, 157-8, 158-1, 158-8, 158-9, 158-33, 161-14, 161-15, 180-5, 180-30, 188-6, 188-11	157-7, 157-8, 158-1, 158-8, 158-9, 158-33, 161-14, 161-15, 180-5, 180-30, 188-6, 188-11, 188-41
Protection of Heritage (Cultural) Resources	H1	No timber harvesting, road construction, wildlife opening maintenance, or other project would be allowed within a Heritage Resource site and its required buffer zone, as determined by Heritage Resource professional and site protection plan.	All stands with sites	All stands with sites	All stands with sites	All stands with sites
	H2	Existing roads through a site may be used, but no additional soil disturbance within the roadbed and beyond the edge of the existing road would be allowed.	All roads existing on sites	All roads existing on sites	All roads existing on sites	All roads existing on sites
	H3	No landings or storage of equipment or machinery may take place in these sites and their required buffer zone.	All stands with sites	All stands with sites	All stands with sites	All stands with sites
	H4	Sites will be monitored during and after the project to ensure that no site damage has occurred to known and discovered Heritage Resource sites.	All stands and activity areas	All stands and activity areas	All stands and activity areas	All stands and activity areas
In the event that previously unrecorded heritage resources are discovered prior to or during project implementation:	H5	All surface-disturbing activity within and near the discovery will cease. Heritage staff will assess the discovery and any treatment changes needed (in consultation with SHPO) to protect the site would be considered.	All stands and activity areas	All stands and activity areas	All stands and activity areas	All stands and activity areas

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Noxious weeds (from 2001 Forest Service document, "Guide to Noxious Weed Prevention Practices")	N1	Equipment used for timber harvest, wildlife opening construction or maintenance, or road and recreational trail construction on maintenance should either be documented as coming from an area free of noxious weeds or be cleaned prior to use on National Forest lands. Equipment should have all mud, dirt, and plant parts removed before working in the project area.	All treatments with soil disturbance (timber harvest, trail construction, maintenance, and rehabilitation, road construction, maintenance, closure, and obliteration, opening maintenance or creation, watershed restoration, and fish habitat improvement)	All treatments with soil disturbance (timber harvest, trail construction, maintenance, and rehabilitation, road construction, maintenance, closure, and obliteration, opening maintenance or creation)	All treatments with soil disturbance (timber harvest, trail construction, maintenance, and rehabilitation, road construction, maintenance, closure, and obliteration, opening maintenance or creation)	All treatments with soil disturbance (timber harvest, trail construction, maintenance, and rehabilitation, road construction, maintenance, closure, and obliteration, opening maintenance or creation)
	N2	Equipment used in sites within the project area already documented as containing noxious weeds will be cleaned prior to leaving the contaminated site.	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1)
	N3	Fill material sources (sand, gravel, etc.) should be inspected before use in the project area for contamination by noxious weeds. Monitor areas where fill is used annually for a minimum of 3 years to ensure that noxious weeds were not inadvertently established by the activity.	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1)

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	N4	Minimize soil disturbance to the extent practical, consistent with the project objectives.	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).
	N5	Monitor the effectiveness of biological control methods for leafy spurge on an annual basis for a minimum of 3 years. Monitor both the anticipated reduction of leafy spurge and the numbers of flea beetles present at the release site.	In 3 sites with leafy spurge		In 3 sites with leafy spurge	In 3 sites with leafy spurge
	N6	Re-vegetate disturbed soil in a manner that optimizes plant establishment. Use certified weed-free seed and/or mulch where needed.	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).	All treatments with soil disturbance (see description for N1).
Woodland ponds	P1	Protect all woodland ponds that retain water through the summer as breeding habitat for reptiles and amphibians. Maintain dense overstory around woodland ponds. (Forest Plan, pp. IV-78)	All stands	All stands	All stands	All stands
Wildlife	R1	Provide for the retention of some dead and down logs and other ground material necessary to maintain viable populations of reptiles, amphibians, and other animals. (Forest Plan, pp. IV-77)	All stands	All stands	All stands	All stands

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	R2	Reserve small clumps and/or scattered individual trees within clearcut, overstory removal cuts, and other final regeneration harvests. Focus on cover and mast species, such as oak, cedar, hemlock, and white pine, to maintain structural and species diversity within stands. (Forest Plan, pp. IV-78)	All final regeneration harvest areas			
	R3	Reserve at least two live den trees per acre where they are a component of the stand (long-lived species preferred). This measure is designed to maintain habitat features necessary for cavity nesting birds, and animals such as pine marten, flying squirrels, and raccoons. These birds and animals utilize these cavity trees for denning and resting. (Forest Plan, pp. IV-78)	All stands	All stands	All stands	All stands
	R4	Provide interior islands within clearcuts, overstory removal cuts, and other final harvest areas that are greater than 10 acres in size. Establish reserve areas of ½ to 1 acre in size, at the rate of one for every 10 acres in size. Adjustments may be necessary for long narrow cuts, or where reserve trees and clumps have been designated for visual quality.	All final regeneration harvest areas greater than 10 acres in size.	All final regeneration harvest areas greater than 10 acres in size.	All final regeneration harvest areas greater than 10 acres in size.	All final regeneration harvest areas greater than 10 acres in size.

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	R5	Provide for future and existing coarse woody debris by retaining snag trees, live den cavity trees, and other large diameter live trees within all harvest areas.	All stands	All stands	All stands	All stands
	R6	Reserve scattered large canopy red and white pine within ½ mile of major rivers or lakes over 20 acres that have a productive fishery, to maintain nesting and perch trees for eagles and osprey. (Forest Plan, pp. IV-79	124-22 125-30 127-04 127-11 127-17 168-32 170-53 171-06 171-19 171-29	124-03 124-22 124-27 124-53 124-57 125-03 125-30 127-04 127-11 127-17 168-32 170-53 171-06 171-19 127-17 168-32 170-53 171-06 171-19 171-29	124-53 124-57 125-30 127-04 127-17 168-32 170-53 171-06 171-19 171-29	124-22 124-27 125-3 125-30 127-04 127-11 127-17 168-32 170-53 171-06 171-19 171-29
Temporary Roads and landings, skid trails, logging area, site preparation and planting, and haul roads (preferred season- year round) (ELTP- <u>SL/LS4C</u> 3&4V)	S1 S2	Plan erosion control measures for roads and trails within each unit. (Forest Plan, pp.IV- 70) Operate equipment on the contour as much as possible. (Forest Plan, pp. IV-70)	All mitigation measures apply to the following stands: 126-10 157-21 158-15 178-20 199-25	All mitigation measures apply to the following stands: 126-10 157-21 158-15 159-9a 159-9b 178-20 199-25	All mitigation measures apply to the following stands: 126-10 158-15 178-20 199-25	All mitigation measures apply to the following stands: 126-10 157-21 158-15 178-20 199-25

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Temporary Roads and landings, skid trails, logging area, site preparation and planting, and haul roads (preferred season-winter with frozen ground) (ELTP- <u>LS/MCS2A</u> 3 and SL2A)	S3	Use short-term roads and temporary landings when ground is frozen. (Forest Plan, pp. IV-70),	All mitigation measures apply to the following stands: 161-12 161-14 161-33 169-25 170-19 180-5 180-10 188-18	All mitigation measures apply to the following stands: 127-23 127-24 127-28 153-2 161-7 161-12 161-33 169-25 170-19 180-5 180-10 188-18	All mitigation measures apply to the following stands: 161-12 161-14 161-33 180-5 180-10 188-18	All mitigation measures apply to the following stands: 153-2 161-7 161-12 161-14 161-33 169-25 170-19 180-5 180-10 188-18
	S4	or The use of low ground pressure equipment (less than 13 PSI) during July and August will lessen any adverse soil impacts. (Forest Plan, pp. IV-70),				
	S5	and Allow the use of heavy mechanical site preparation equipment during July to September. Avoid October and November. (Forest Plan, pp. IV)				
	S6	Restrict activities to dry periods. (Forest Plan, pp. IV-70)				
Temporary Roads and landings, skid trails, logging area, site preparation and planting, and haul roads (preferred season-winter with frozen ground) (ELTP-M1A))	S7	Use short-term roads and temporary landings when ground is frozen. (Forest Plan, pp. IV-70)	All mitigation measures apply to the following stands: 153-3 153-5 153-11 158-22 158-24a 158-24b	All mitigation measures apply to the following stands: 153-3 153-5 153-11 158-22 158-24a 158-24b 161-30	All mitigation measures apply to the following stands: 153-11	All mitigation measures apply to the following stands: 153-3 153-5 158-22 158-24a 158-24b
	S9	and Encourage winter logging (when ground is frozen). (Forest Plan, pp. IV-70)				
	S10	or Restrict activities to dry periods. (Forest Plan, pp. IV-70)				

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
For all operating periods, on all soil types, operating season may be changed by written agreement with the operator.	S18	The Forest Service Sale administrator will determine when conditions are appropriate for a change from the normal operating period (i.e. drier than normal conditions). If timing restrictions are in place to protect resources other than soils (e.g. TES plants), the operating period would not be changed, unless approved by appropriate specialist. The sale administrator has the authority to shut down sale operations any time that conditions could lead to un-acceptable damage.	All stands	All stands	All stands	All stands
Temporary Roads and landings, skid trails, logging area, site preparation and planting, and haul roads (preferred conditions-dry) (ELTP- <u>SL/3-1B&A</u> 3)	S11	Designate skid trails and landings. (Forest Plan, pp. IV-70)	All mitigation measures apply to the following stands: 157-20 157-21 166-15	All mitigation measures apply to the following stands: 157-20 157-21 166-15	All mitigation measures apply to the following stands: 157-20 166-15	All mitigation measures apply to the following stands: 157-20 157-21 166-15
Temporary Roads and landings, skid trails, logging area, site preparation and planting, and haul roads (preferred conditions-dry) (ELTP- <u>Si/SL3A</u> 3)	S12 S13 S14	Plan erosion control measures for roads and trails within each unit. (Forest Plan, pp. IV-70) Encourage winter logging as much as possible. (Forest Plan, pp. IV-70) Allow the use of heavy mechanical site preparation equipment during July to September. Avoid October and November. (Forest Plan, pp. IV-70)	All mitigation measures apply to the following stand: 171-24	All mitigation measures apply to the following stand: 171-24	All mitigation measures apply to the following stand: 171-24	All mitigation measures apply to the following stand; 171-24

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Temporary Roads and landings, skid trails, logging area, site preparation and planting, and haul roads (preferred conditions-dry) (ELTP- <u>Sil/S12A</u> 3)	S15	Use short-term roads and temporary landings when the ground is frozen. (Forest Plan, pp. IV-70)	All mitigation measures apply to the following stands: 176-33 176-34 176-39 177-11 179-17 202-1 203-25	All mitigation measures apply to the following stands: 176-33 176-34 176-39 177-11 179-17 199-41 202-1 203-25	All mitigation measures apply to the following stands: 202-1 203-25	All mitigation measures apply to the following stands: 176-33 176-34 176-39 177-11 179-17 202-1 203-25
	S16	The use of low ground pressure equipment (less than 13 PSI) during July and August will lessen any adverse soil impacts. (Forest Plan, pp. IV-70)				
	S17	Allow the use of heavy mechanical site preparation equipment during July to September. Avoid October and November. (Forest Plan, pp. IV-70)				
Timber management activities within or adjacent to trails or recreation facilities	T1	Minimize skidding across designated trails. Rehabilitate skid trails upon completion. (Forest Plan, pp. IV-27)	158-1 158-8 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 168-28 169-44 170-41	158-1 158-8 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 169-44 170-41	158-1 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 169-44 170-41	158-1 158-8 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 168-28 169-44 170-41
	T2	Completely remove slash within 50 feet of campsites and picnic area at Day Lake Campground and Picnic Areas (Sensitivity Level 1). (Forest Plan, pp. IV-38)	124-19 124-21	124-19 124-21	124-21	124-19 124-21
	T3	Reduce the depth of slash to 24 inches within 50 to 100 feet of sites and trails in Day Lake Campground and Picnic Areas (Sensitivity Level 1). (Forest Plan, IV-38)	124-19 124-21	124-19 124-21	124-21	124-19 124-21

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	T4	Reduce the depth of slash to 48 inches within 100 to 300 feet of sites and trails in Day Lake Campground and Picnic Areas (Sensitivity Level 1). (Forest Plan, pp. IV-38)	124-19 124-21	124-19 124-21	124-21	124-19 124-21
	T5	Completely remove slash within 50 feet of the Dead Horse Trail (Sensitivity Level 2). (Forest Plan, pp. IV-38)	158-1 158-8 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 166-32 168-28 169-44 170-41	158-1 158-8 158-9 158-33 161-15 161-18 161-19 161-30 162-12 166-28 166-32 166-32 169-44 170-41	158-1 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 169-44 170-41	158-1 158-8 158-9 158-33 161-15 161-18 161-19 162-12 166-28 166-32 166-32 168-28 169-44 170-41
	T6	Conduct harvest activities within Day Lake Campground from December to March to reduce user conflicts and impacts to soils.	124-19 124-21	124-19 124-21	124-21	124-19 124-21

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Timber management activities within the Alternative Management Areas (AMA)	T7	a. Generally the target distribution displayed in Table Y (below) will be applied on uneven-aged hardwood sites within the AMA	All mitigation measures apply to the following stands: 199-35a 200-1 200-2 200-11 202-1 202-8 202-9 202-14 202-15 202-16 203-1 203-4 203-5 203-8 203-14 203-15 203-16 203-19 203-21 203-28 203-30 203-31 204-2 204-7 204-12 204-19	No AMA mitigation measures apply in this Alternative	All mitigation measures apply to the following stands: 199-22a 199-25 199-32 199-35a 199-39 199-43 199-46 200-1 200-2 200-8 200-11 202-1 202-8 202-9 202-14 202-15 202-16 203-1 203-4 203-5 203-8 202-15 202-16 203-1 203-4 203-5 203-8 203-14 203-15 203-16 203-19 203-21 203-28 203-30 203-16 203-19 203-21 203-28 203-30 203-31 204-2 204-7 204-12 204-19	All mitigation measures apply to the following stands: 199-35a 200-1 200-2 200-11 202-1 202-8 202-9 202-14 202-15 202-16 203-1 203-4 203-5 203-8 203-14 203-15 203-16 203-19 203-21 203-28 203-30 203-31 204-2 204-7 204-12 204-19																																										
		<table border="1"> <thead> <tr> <th>Diameter</th> <th>Trees/ ac</th> <th>Basal Area</th> </tr> </thead> <tbody> <tr> <td>25" +</td> <td>1.0</td> <td>4</td> </tr> <tr> <td>23-24.9"</td> <td>2.2</td> <td>7</td> </tr> <tr> <td>21-22.9"</td> <td>2.9</td> <td>8</td> </tr> <tr> <td>19-20.9"</td> <td>3.9</td> <td>8</td> </tr> <tr> <td>17-18.9"</td> <td>5.0</td> <td>9</td> </tr> <tr> <td>15-16.9"</td> <td>6.6</td> <td>9</td> </tr> <tr> <td>13-14.9"</td> <td>8.6</td> <td>9</td> </tr> <tr> <td>11-12.9"</td> <td>11.2</td> <td>9</td> </tr> <tr> <td>9-10.9"</td> <td>14.6</td> <td>8</td> </tr> <tr> <td>7-8.9"</td> <td>19.0</td> <td>7</td> </tr> <tr> <td>5-6.9"</td> <td>24.7</td> <td>5</td> </tr> <tr> <td>1-4.9"</td> <td>192.0</td> <td>7</td> </tr> <tr> <td>TOTAL</td> <td>284.7</td> <td>90</td> </tr> </tbody> </table>					Diameter	Trees/ ac	Basal Area	25" +	1.0	4	23-24.9"	2.2	7	21-22.9"	2.9	8	19-20.9"	3.9	8	17-18.9"	5.0	9	15-16.9"	6.6	9	13-14.9"	8.6	9	11-12.9"	11.2	9	9-10.9"	14.6	8	7-8.9"	19.0	7	5-6.9"	24.7	5	1-4.9"	192.0	7	TOTAL	284.7	90
		Diameter					Trees/ ac	Basal Area																																								
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TOTAL	284.7	90																																														



Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Haul and skid roads on snowmobile trails	T8	From Dec. 1-Mar.31, a snow base will be maintained on haul roads which are also snowmobile trails. Hauling will be prohibited on weekends and holidays during this time period. Ruts on these roads/trails will be kept to less than 4" deep in November to provide a relatively smooth trail surface. Blades used for snow removal must have skid shoes. A packed snow base at least 3" thick must be maintained on these roads/trails when snow conditions permit.	157-3 157-4 157-7 157-8 158-1 158-8 158-9 158-33 161-15 161-18 161-19 162-12 162-20 166-32 166-28 168-28 169-44 170-41	157-3 157-4 157-7 158-1 158-8 158-9 158-33 161-30 161-15 161-16 161-18 162-20 162-12 166-32 166-28 168-28 169-44 170-41	157-3 157-4 157-7 158-1 158-9 158-33 161-15 161-16 161-19 162-12 166-32 168-28 169-44 170-41	157-3 157-4 157-7 157-8 158-1 158-8 158-9 158-33 161-15 161-15 161-16 161-18 161-19 162-12 162-20 166-32 166-28 168-28 169-44 170-41
Visual quality along County Hwy GG (north) and County M	V1 V2 V3	Completely remove slash within 50 feet of County Hwy. GG (Sensitivity Level 1). (Forest Plan, pp. IV-38) Reduce the depth of slash to 24 inches within 50 to 100 feet of Cty. Hwy. GG (Sensitivity Level 1). (Forest Plan, pp. IV-38) Reduce the depth of slash to 48 inches within 100 to 300 feet of Cty. Hwy. GG (Sensitivity Level 1). (Forest Plan, pp. IV-38)	124-19 124-20 126-22 170-54 170-42 170-65 168-1 177-16 176-38 176-36 176-34 177-9 176-33 177-3 188-12 188-1 188-41 198-4 199-37 199-35 199-21 199-22	124-19 124-20 124-27b 124-53 126-22 170-54 126-22 170-54 170-42 170-54 170-42 170-65 168-1 177-16 176-38 168-1 177-16 176-38 176-38 176-36 177-9 188-12 176-36 177-9 199-37 176-33 177-3 199-35 177-3 199-21 188-12 188-1 188-41 198-4 199-37 198-4 199-35 199-37 199-35 199-22	124-20 124-53 126-22 170-54 170-42 168-1 177-16 176-38 176-36 177-9 177-3 188-12 188-1 199-37 199-35 199-21 199-22	124-19 124-20 124-53 126-22 170-54 170-42 170-54 170-42 170-65 168-1 177-16 176-38 176-36 176-38 176-36 177-9 188-12 176-34 177-9 199-37 176-33 177-3 199-35 177-3 199-21 188-12 188-1 188-41 198-4 199-37 199-35 199-37 199-35 199-21 199-22
Visual Quality along Lakes (East and West Twin Lakes)	V4	Maintain a 200 foot wide uncut strip along lakes adjacent to clearcuts	127-17	127-17		127-17

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Visual quality along Lakes (Day and East Twin)	V5	Completely remove slash within 50 feet of the shoreline (Sensitivity Level 1). (Forest Plan, pp. IV-38)	124-19 124-20 124-24 127-4 170-31 170-53	124-19 124-20 124-24 127-4 170-31 170-53	124-20 127-4 170-31 170-53 170-54 171-19a	124-19 124-20 124-24 127-4 170-31 170-53
	V6	Reduce the depth of slash to 24 inches within 50 to 100 feet of the shoreline (Sensitivity Level 1). (Forest Plan, pp. IV-38)	170-54 171-19a 171-29a	170-54 171-19a 171-29a	171-19a 171-29a	170-54 171-19a 171-29a
	V7	Reduce the depth of slash to 48 inches within 100 to 300 feet of the shoreline (Sensitivity Level 1). (Forest Plan, pp. IV-38)				
Best Management Practices	W1	All applicable Best Management Practices (BMP's) as described in "Wisconsin's Forestry Best Management Practices for Water Quality Field Manual, Publication Number FR093, Wisconsin Department of Natural Resources, 1995 will be applied.	All stands and all culvert replacement sites.	All Stands, all culvert replacement sites, and the culvert removal site.	All Stands, all culvert replacement sites, and the culvert removal site.	All stands, all culvert replacement sites, and the culvert removal site.
Wetlands	W2	Equipment operations will not take place in wetlands, except to cross during frozen conditions in order to access areas where no other means of access exists.	All stands	All stands	All Stands	All stands
Wetlands	W3	All logging slash will be kept out of wetlands.	All stands	All stands	All Stands	All stands
Wetlands	W4	Trees will not be removed from wetlands, except where needed for access.	All stands	All stands	All Stands	All stands

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Cold-water streams	W5	Discourage aspen and other vegetation attractive to beaver within 300 feet of Class I and II trout streams. Encourage long-lived timber species such as maple and spruce within the 300 foot zone along, for this project, Brush Creek and McCarthy Creek (Forest Plan, pp. IV-79)	188-11 188-41 180-30 180-28	188-41	188-11	188-11 188-41 180-30 180-28
Riparian areas	W6	Riparian Area buffer zones would run from the ordinary high water mark to the slope break where slopes adjacent to a lake or stream are greater than 10 percent.	157-21 178-20 199-25	157-21 178-20	178-20	157-21 178-20 199-25
Temporary road construction or reconstruction	W7	Designate the location of water diversion structures when it is determined that potentially erosive water runoff will take place in the road construction or reconstruction process.	All stands needing temporary roads.	All stands needing temporary roads.	All stands needing temporary roads.	All stands needing temporary roads.
Erosion prevention construction	W8	Construct erosion prevention structures during the same growing season that ground-disturbing activity occurs. Utilize erosion control practices outlined in the Soil and Water Conservation Handbook (FSH 2509.22), and "Wisconsin's Forestry Best Management Practices for Water Quality" (pub. Number FR093, Wisconsin DNR).	All stands and culvert replacement sites.	All stands, culvert replacement sites, and the culvert removal site.	All Stands, culvert replacement sites, and the culvert removal site.	All Stands, culvert replacement sites, and the culvert removal site.

Condition that Triggers Feature or Mitigation	Design Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Erosion Prevention	W9	Seed mixes for erosion control will consist of non-invasive and short-lived species to encourage native species colonization while meeting the need for erosion control.	All stands and culvert replacement sites	All stands, culvert replacement sites, and the culvert removal site.	All stands, culvert replacement sites, and the culvert removal site.	All stands, culvert replacement sites, and the culvert removal site.
Riparian Management Zone (RMZ) for Lakes and Navigable Perennial Streams* *Navigable streams have bed and banks and can be floated with a canoe on a regular or recurring basis.	W10	For Lakes and Navigable Perennial Streams, the Riparian Management Zone (RMZ) is a strip of land running along the shoreline of lakes and on each side of streams. It begins at the ordinary high water mark and extends a minimum of 100 feet landward. (BMPs, p. 19). This includes treeless areas existing between ponds, lakes, streams and wetlands whether wet or dry.	124-3 124-15 124-24 124-20 124-38 153-5 158-3 157-21 159-2 158-9 161-15 161-14 168-32 161-19 171-53	124-3 124-15 124-24 124-20 124-38 159-2 158-3 157-21 161-7 158-9 161-15 161-2 168-32 161-19 171-53	124-3 124-15 124-24 124-20 124-38 159-2 158-9 157-21 161-7 161-15 168-32 170-31 171-19 177-3	124-3 124-15 124-24 124-20 124-38 153-5 158-3 157-21 159-2 158-9 161-2 161-7 161-15 161-14 168-32
	W11	All logging slash will be kept out of stream and lake riparian management zones, the lakes themselves, stream channels, and away from areas where it may be swept into the water.	170-31 171-19 171-54 177-3 171-29 180-30 180-28 188-41 188-11	170-31 171-19 171-54 177-3 171-29 177-16b 180-30 180-28 188-41 188-41	171-29 177-16b 180-30 188-11 199-37 199-21 199-46 200-1 200-2	161-19 171-53 170-31 171-19 171-19 171-54 171-19 177-3 171-29 177-16 177-16 171-29 180-30
	W12	Within the RMZ, at least 60 square feet of basal area per acre in trees 5 inches dbh (diameter at breast height) and larger, would be left, evenly distributed to promote large woody debris input and prevent rises in temperature of lakes and streams.	199-37 199-21 200-1 200-2 202-1 202-8 203-4 203-14 203-31 203-19 204-2	199-37 199-48 200-1 200-2 202-1 202-8 203-4 203-14 203-31 203-19 204-2	202-1 202-8 203-4 203-14 203-31 203-19 204-2	180-28 188-41 188-11 199-37 199-21 200-1 200-2 200-2 202-1 202-8 203-4 203-14 203-31 203-19 204-2
	W13	Locate log landing areas outside of riparian management zones.				203-14 203-31 203-19 204-2

Condition that Triggers Feature or Mitigation	Design Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Riparian Management Zone (RMZ) for Navigable Intermittent Streams and Non-Navigable Streams ** **Non-navigable streams do not have bed and banks and cannot be floated with a canoe on a regular or recurring basis – even if only during spring runoff.	W14	For Navigable Intermittent Streams and Non-Navigable Streams**, the RMZ is a strip of land on each side of the stream, beginning at the ordinary high water mark and extending a minimum of 35 feet landward. This includes treeless areas existing between ponds, lakes, streams and wetlands whether wet or dry.	153-3	153-3	153-11	153-3
			153-11	153-11	153-11	157-7
			157-7	157-7	157-7	157-20
			157-20	157-20	157-20	157-21
			157-21	157-21	157-21	158-1
			158-1	158-1	158-1	158-8
			158-8	158-8	158-8	158-9
			158-9	158-9	158-9	158-33
			158-33	158-33	158-33	161-14
			161-14	161-14	161-14	177-6
			177-6	177-6	177-6	177-10
			177-10	177-10	177-10	177-11
			177-11	177-11	177-11	178-20
			178-20	178-20	178-20	178-21
	178-21	178-21	178-21	180-5		
	180-5	180-5	180-5	180-6		
	180-6	180-6	180-6	180-7		
	180-7	180-7	180-7	180-10		
	180-10	180-10	180-10	180-27		
	180-27	180-27	180-27	180-28		
	180-28	180-28	180-28	188-11		
	188-11	188-11	188-11	188-18		
	188-18	188-18	188-18	188-18		
	188-41	188-41	188-41	198-17		
	188-41	188-41	188-41	198-17		
	188-41	188-41	188-41	199-22		
	188-41	188-41	188-41	199-22		
	188-41	188-41	188-41	199-24		
	188-41	188-41	188-41	199-24		
	198-17	198-17	198-17	199-25		
	198-24	198-24	198-24	199-25		
	199-22	199-22	199-22	199-30		
	199-24	199-24	199-24	199-30		
	199-25	199-25	199-25	199-32		
	199-25	199-25	199-25	199-32		
	199-25	199-25	199-25	199-35		
	199-30	199-30	199-30	199-35		
	199-32	199-32	199-32	199-37		
	199-32	199-32	199-32	199-37		
	199-35	199-35	199-35	199-39		
	199-35	199-35	199-35	199-39		
	199-37	199-37	199-37	199-43		
	199-37	199-37	199-37	199-43		
	199-39	199-39	199-39	200-1		
	199-39	199-39	199-39	200-2		
	199-43	199-43	199-43	202-1		
	199-43	199-43	199-43	202-1		
200-1	200-1	200-1	202-15			
200-1	200-1	200-1	202-15			
200-2	200-2	200-2	202-16			
202-1	202-1	202-1	203-1			
202-14	202-14	202-14	203-1			
202-15	202-15	202-15	203-19			
202-15	202-15	202-15	203-19			
202-16	202-16	202-16	203-1			
202-16	202-16	202-16	203-1			
202-16	202-16	202-16	204-2			
203-1	203-1	203-1	204-12			
203-19	203-19	203-19	204-2			
204-2	204-2	204-2	204-12			
204-2	204-2	204-2	204-14			
204-12	204-12	204-12	204-14			
204-14	204-14	204-14	204-14			
204-14	204-14	204-14	204-14			

Condition that Triggers Feature or Mitigation	Design Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Lakes or streams	W19	Do not operate wheeled or tracked harvesting equipment within 50 feet of the ordinary high water mark of lakes or streams. (BMPs, p. 1)	124-3 124-15 124-24 124-20 153-5 124-38 158-3 157-21 159-2 158-9 161-15 161-14 168-32 161-19 171-53 170-31 171-19 171-54 177-3 171-29 180-30 180-28 188-41 188-11 199-37 199-21 200-1 200-2 202-1 202-8 203-4 203-14 203-31 203-19 204-12 204-2	124-3 124-15 124-24 124-20 158-3 124-38 159-2 157-21 161-7 158-9 161-15 161-2 168-32 161-19 171-53 171-53 170-31 171-19 171-54 177-3 171-29 180-30 180-28 188-41 199-46 199-37 200-2 200-1 202-8 202-1 203-14 203-4 203-19 203-31 204-12	124-3 124-15 124-24 124-20 158-3 124-38 159-2 158-9 161-15 161-19 168-32 170-31 171-53 171-54 171-19 171-29 177-3 188-11 180-30 199-21 199-37 199-46 200-1 200-2 202-1 202-8 203-4 203-14 203-31 203-19 204-12 204-2	124-3 124-15 124-24 124-20 153-5 124-38 158-3 157-21 159-2 158-9 161-2 161-7 161-15 161-14 168-32 161-14 168-32 161-19 171-53 170-31 171-19 171-54 177-3 188-11 171-19 177-3 171-54 171-29 177-3 171-29 180-30 171-29 188-11 180-30 180-28 188-41 188-11 188-11 199-37 199-21 199-37 199-21 200-1 200-2 200-1 200-2 202-1 200-2 202-1 202-8 202-1 203-4 203-14 203-31 203-19 202-1 202-8 203-4 203-14 203-31 203-19 204-12 204-2

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Streams (Culvert replacements)	W20	<p>Appropriate Federal and State Water Regulatory and Army Corps permits, and Trans. 207 Agreements will be obtained prior to project implementation. A Chapter 30 (Wisconsin State Statute) permit is required to construct a ford or install a culvert or bridge across any navigable perennial or intermittent stream. This applies to modifying, repairing, or expanding existing stream crossings. (p. 9 and 23)</p> <p>The U.S. Army Corps of Engineers regulations will be followed and necessary permits applied for when project involves a wetland or floodplain. (p. 10)</p>	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W21	<p>Use soil stabilization practices on exposed soil at stream crossing. Use seed and mulch and install temporary sediment control structures such as straw bales or silt fences immediately following construction to minimize erosion into streams. Maintain these practices until the soil is permanently stabilized. (p. 24)</p>	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W22	<p>Design, construct and maintain stream crossings to avoid disrupting the migration or movement of fish and other aquatic life. Bridges and arch culverts that retain natural stream bottom and slope are preferred for this reason.</p>	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	W23	Install stream crossings using materials that are clean, non-erodible and non-toxic to aquatic life. (p. 24)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W24	Minimize channel changes and the amount of excavation or fill needed at the crossing. (p. 24)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W25	Limit construction activity in the water to periods of low or normal flow. Keep use of equipment in the stream to a minimum. (p. 24)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W26	Construct a bridge or place fill directly over a culvert higher than the road approach to prevent surface road runoff from draining onto the crossing structure and into the stream. (p. 24)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W27	Divert road drainage into undisturbed vegetation, preferably outside the riparian management zone so that the drainage does not directly enter the stream. (p. 25)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W28	Stabilize approaches to bridge, culvert, and ford crossings with aggregate or other suitable material to reduce sediment entering the stream. (p. 25)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W29	Install pipe culverts long enough so that road fill does not extend beyond the end of a culvert. (pp. 25, 30)	All culvert replacement sites.	All culvert replacements and the culvert removal site.	All culvert replacements and the culvert removal site.	All culvert replacements and the culvert removal site.

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	W30	Install permanent culverts that are large enough to pass flood flows and are a minimum of 12 inches in diameter. Culverts that are too small can plug up with debris and result in the road washing out or in flooding upstream. Wisconsin law states that the landowner and/or contractor are responsible to obtain a flood easement from any affected property owners upstream of culvert crossings that are not designed to pass the 100-year flood. (p. 25)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site
	W31	Install culverts so there is no change in the stream bottom elevation. Culverts should not cause damming or pooling. (p. 26)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site
	W32	Use riprap around the inlet of culverts to prevent water from eroding and undercutting the culvert. For permanent installations, use filter fabric under the riprap. In addition, consider using flared-end culvert sections for inlets. (p. 26)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site
	W33	Keep culvert clear and free of debris so that water can pass unimpeded at all times. This is especially important in areas where beaver are present. (p. 27)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
Where necessary to protect water quality	W34	Install road drainage structures to remove water from the road surface and ditches. Space these structures at intervals close enough to minimize water flow volume and speed. (p. 29)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	W35	Where necessary, provide erosion protection for outflows from road drainage structures to minimize erosion and disperse the water, allowing it to soak into the soil. Riprap, mulch, and/or seeding may be necessary. (p. 29)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W36	Install pipe culverts to provide cross drainage on road grades at regular intervals immediately above steep grades, below bank seepages, and where water will run onto log landings or forest roads. (p. 30)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W37	Install cross drain pipe culverts at grades at least 2% more than the ditch grade and angled 30 to 45 degrees to improve inlet efficiency. (p. 30)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W38	Select the size of cross-drain culverts according to the size of the road and area drained by the ditch. To avoid clogging, permanent culverts should be at least 12 inches in diameter. (p.30) (Nic-3, 5, and 11, Che-7 and 8)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W39	Install pipe culverts on a surface of compacted granular material. Firmly compact fill around culverts, particularly around the bottom half. Cover the top of the culvert with fill to a depth of one third of the pipe diameter, or at least 12 inches (whichever is greater) to prevent crushing. (p. 26, 31)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.

Condition that Triggers Feature or Mitigation	Feature or Measure Number	Project Design Feature or Mitigation Measure	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	W40	Use mulch and/or seed where necessary to minimize soil erosion into streams, lakes and wetlands. (p. 34)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W41	Install sediment control structures where necessary to slow the flow of runoff and to trap sediment until vegetation is established at the sediment source. Sediment control structures include straw bale fencing, silt fencing, and sediment traps. (p. 35)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
	W42	Maintain, clean, or replace sediment control structures until areas of exposed soil are stabilized. (p. 35)	All culvert replacement sites.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.	All culvert replacement sites, and the culvert removal site.
Cold-water streams	W43	No in stream activity will take place between September 15th and April 15th to protect trout spawning areas.	The culvert replacement sites on Brush Creek and the tributary to Brush Creek. Includes the following stands: 188-41 198-27	The culvert replacement sites on Brush Creek and the tributary to Brush Creek. Includes the following stands: 188-41 198-27	The culvert replacement sites on Brush Creek and the tributary to Brush Creek. Includes the following stands: 188-41 198-27	The culvert replacement sites on Brush Creek and the tributary to Brush Creek. Includes the following stands: 188-41 198-27