Climate Change Resilience and Carbon Storage Silvicultural Prescriptions for the Acadian Forest Region

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Key 1: Stand Age Structure

Is the stand dominated by a single effective age?

No

Go to Key 3: Multi-Aged Stands

Yes

Go to Key 2: Single-Cohort-Dominated Stands

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Key 2: Single-Cohort-Dominated Stands

Is the stand in the stand initiation stage?

No

Is the stand in the stem exclusion stage?

No

Go to Key 3: Multi-Aged Stands

Yes

Go to Key 2a: Stand Initiation Stages

Yes

Go to Key 2b: Stem Exclusion Stages

Does the stand have unique old forest conservation value that can only be maintained free of silvicultural treatment?

No

Yes

Recommended Treatment: Consider managing the stand as a protected area free of silvicultural treatment.
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Key 2a: Stand Initiation Stages

Is the stand on a non-forested site (e.g. abandoned field)?

- Yes
  - Is the stand adequately stocked to low-risk species?
    - No
      - Is the stand expected to become dominated by hardwoods as it reaches the stem exclusion stage?
        - No
          - Reassess once the stand has reached the stem exclusion stage.
        - Yes
          - Recommended Treatment: Cleaning/weeding/release of desirable growing stock.
    - Yes
      - Is the desirable growing stock at risk of being out-competed to the point of unacceptable mortality?
        - No
          - Reassess once the stand has reached the stem exclusion stage.
        - Yes
          - Recommended Treatment: Fill-plant with intermediate to shade-tolerant low-risk species.
  - No
    - Is the tree composition dominated by hardwoods?
      - No
        - Recommended Treatment: Full-planting to low-risk species – site preparation if necessary.
      - Yes
        - Reassess in 5 years.
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Key 2b: Stem Exclusion Stages

Is the canopy composition acceptable (i.e. adequately stocked to low-risk species)?

Yes

No

Is the understory and/or regeneration layer acceptable (i.e. adequately stocked to low-risk species)?

Yes

Go to Key 3: Multi-Aged Stands

No

Can desirable (i.e. low-risk) natural regeneration be established through silvicultural treatment?

Yes

No

Is the stand “mature” and has reached the ideal time to regenerate the stand, and/or there are no desirable crop trees to work with?

Yes

Go to Key 3c: Two-Age Silvicultural Systems

No

Are desirable growing stock/crop trees suppressed and in decline?

Yes

Recommended Treatment: Crop tree release cutting.

No

Recommended Treatment: Thinning.

Is thinning feasible/desirable and does not conflict with carbon storage objective?

Yes

No

Reassess in 5 years.
Key 3: Multi-Aged Stands

Is the stand truly uneven-aged— with at least 3 distinct effective ages (i.e. multiple cohorts)?

No

Is the canopy composition acceptable (i.e. adequately stocked to low-risk species)?

Yes

Is the regeneration layer present and desirable (i.e. sufficiently stocked to low-risk species)?

Yes

Does desirable regeneration require full sunlight to develop?

Yes

Go to Key 3c: Two-Age Silvicultural Systems

No

Go to Key 3a: Irregular Silvicultural Systems

No

Go to Key 3b: Uneven-age Silvicultural Systems
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Key 3a: Irregular Silvicultural Systems

Is the regeneration layer desirable (i.e. sufficiently stocked to low-risk species)?

Yes

Recommended Treatment: Group/patch shelterwood cutting – with regeneration protection.

No

Is the stand “mature” and has reached the ideal time to regenerate the stand, and/or there are no desirable crop trees to work with?

Yes

Recommended Treatment: Group/patch shelterwood cutting – with regeneration protection.

No

Are desirable growing stock/crop trees suppressed and in decline?

Yes

Is thinning feasible/desirable and does not conflict with carbon storage objective?

Yes

Recommended Treatment: Understory tree planting of low-risk intermediate to shade-tolerant species.

No

Recommended Treatment: Crop tree release cutting.

No

Recommended Treatment: Thinning.

Yes

Recommended Treatment: Reassess in 5 years.

Can desirable (i.e. low-risk) natural regeneration be established through silvicultural treatment?

Yes

Is partial timber harvest feasible/desirable?

Yes

Recommended Treatment: Group/patch shelterwood cutting – with understory and site preparation treatments, if necessary.

No

Recommended Treatment: Understory and/or site preparation treatments.

No

Yes

Recommended Treatment: Understory tree planting of low-risk intermediate to shade-tolerant species.
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Key 3b: Uneven-age Silvicultural Systems

Is the regeneration layer and ingrowth in the stand acceptable/desirable (i.e. adequately stocked to low-risk species)?

- Yes
  - Is the present or projected dominant shade-tolerant species in the regeneration layer low-risk?
    - Yes
      - Is maintaining shade-intolerant to moderately-shade-tolerant species not desirable?
        - Yes
          - Is the development of significant canopy gaps not desirable?
            - Yes
              - Are intensive, frequent cutting cycles desirable/feasible and do not conflict with carbon storage objective?
                - Yes
                  - Is intensive tending of pre-commercial trees desirable/feasible?
                    - Yes
                      - Recommended Treatment: Use single tree selection system.
                    - No
                      - No
                        - Recommended Treatment: Use single tree selection system.
                - No
                  - No
                    - No
                      - Recommended Treatment: Use single tree selection system.
                  - Yes
                    - Recommended Treatment: Use group selection system.
    - No
      - Is uniform cutting desirable/feasible?
        - Yes
          - Recommended Treatment: Use single tree selection system.
        - No
          - No
            - Is artificial regeneration of low-risk species feasible?
              - Yes
                - Is desirable (i.e. low-risk) natural regeneration feasible through site preparation and/or vegetation management?
                  - Yes
                    - Recommended Treatment: Use group selection system.
                  - No
                    - No
                      - No
                        - Recommended Treatment: Use group selection system.
                      - Yes
                        - Recommended Treatment: Use group selection system.
            - No
              - No
                - Recommended Treatment: Use group selection system.
              - Yes
                - Recommended Treatment: Use group selection system.
      - No
        - Recommended Treatment: Use group selection system.

Go to Key 3a: Irregular Silvicultural Systems
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Key 3c: Two-age Silvicultural Systems

Is the stand “mature” and/or has reached the ideal time to regenerate the stand?

Yes

No

Are desirable growing stock/crop trees suppressed and in decline?

Yes

Recommended Treatment: Crop tree release cutting.

No

Recommended Treatment: Thinning.

Is thinning feasible/desirable and does not conflict with carbon storage objective?

Yes

Recommended Treatment: Final removal cutting with reserves – with understory and/or site preparation, if necessary.

No

Recommended Treatment: Final removal cutting with reserves – full planting to desired species – with site preparation, if necessary.

Is establishment of desirable (i.e. low-risk) natural regeneration feasible?

Yes

No

Reassess in 5 years.
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