CONE COLLECTING METHODS AND SAFETY

Don Pigott (Yellow Point Propagation) – June 2018

COLLECTION METHODS

The method of collection will be determined largely by the species (i.e. size of cones), quantity of cones, and the size and shape of trees in the stand. At the present time, the most common methods are by climbing, felling, and helicopter rake or topper. Other methods used are collecting from ladders (in seed orchards), collecting with pole pruners, collecting from squirrel caches and occasionally by shooting.

GENERAL SAFETY RECOMMENDATIONS/REQUIREMENTS FOR ALL COLLECTION METHODS

- Suitable clothing must be worn – especially in respect to headwear and footwear. During hunting season, wear brightly coloured clothing.
- Pay attention to ground conditions and avoid walking on logs.
- Watch for loose bark on windfalls.
- Stay away from logs that may roll.
- Be alert for wasp and bee nests.
- Horseplay and running in the collections areas is prohibited. So is rushing, crowding and jumping onto or from vehicles.
- Don't get lost! Check local landmarks; know the location of your vehicle and mustering area.
- Return promptly if call-in signal is sounded.
- Don't work alone; use the 'buddy' system.
- Stay within the designated collecting area.
- Keep clear of power lines.
- Don't loiter under or near trees in which climbers are working. (Hard hats are to be worn by those on the ground.)
- Pick cones only from trees designated by the foreman.
- Avoid over-exertion when carrying or dragging sacks of cones.
- When loading cones, lift with the legs not with the back.
- Avoid rubbing eyes when hands are covered with pitch.
- Do not use liquid solvents, such as gasoline, for cleaning hands; use commercial jelly- type cleaners and clean rags.
- Be careful with fires at all times. Smoke only in areas approved by the foreman and make sure cigarette butts are completely extinguished.

FALLING TREES

Cones may be collected from trees felled for this purpose or as part of a logging or clearing operation. If cones are to be collected, certain requirements must be satisfied, regardless of the primary reason for felling. First, cones should only be collected from trees having suitable characteristics. Ideally, only these trees should be felled until cones have been collected, after which remaining trees can be removed if appropriate. Second, felling of trees for cone collection should be delayed until seeds are sufficiently mature and cones should be collected as soon after felling as possible. Third, trees should be felled in a manner to facilitate recovery of cones. This is best done by placing crowns across unused roads, landings or other areas cleared of brush. To ensure crew safety when trees are being felled, pickers must remain at least 3 tree lengths from the site of felling.

Where collections are to be made on active cutting-permit areas, prior agreements must be made with the licensee or landowner. Cone collection permits, which were issued under the Code, are no longer necessary in order to collect cones, seed and vegetative material from Crown land. However, persons who cut damage or destroy Crown timber for the purposes of collecting cones etc. must have the appropriate authority prescribed in section 52 of the *Forest and Range Practices Act* (FRPA.).

Division 2 — Unauthorized Timber Harvesting, Trespass and Tree Spiking
Unauthorized timber harvesting.
52 (1) A person must not cut, damage or destroy Crown timber unless authorized to do so
(a) under this Act, the *Forest Act* or an agreement under the *Forest Act*,
(b) by the minister, for silviculture, stand tending, forest health, abating a fire hazard related to wildfires or another purpose.

Felled trees should be utilized. If silviculturally appropriate, undesirable residual trees within the collection area should be utilized. Trees should be felled in a manner to facilitate recovery of cones. This is best done by placing crowns across unused roads, landings or other areas cleared of brush.

- Avoid steep ground where the possibility of roll overs is increased.
- Falling selected trees within a stand increases the chance of branches hanging up. Be cognizant and wear a hard hat at all times.
- When trees are being felled, pickers must remain at least 3 tree lengths from the site of felling.
- It is important that trees are felled in accordance with cutting-permit specifications **by certified fallers** approved by the logging foreman.
- Fallers must be briefed on specific requirements for the cone collecting operation. Limb trees prior to cone pickers commencing work.
- Feller-bunchers are particularly useful when making collections, as a good operator can set the trees down gently without knocking off as many cones, and in a manner to facilitate safety and ease of picking. Pickers should be 3 tree lengths from machine
- Pickers will find that many cones will be knocked off by felling and can be easily gathered, provided that ground conditions are favourable. For collecting small cones, cone rakes may

be used as described above. It is easier to collect cones in pails, and then transfer them to sacks.

- Fall trees to minimize roll-overs. Buck tree into length that minimize this prior to cone collectors.
- Collection of cones from felled trees can be facilitated by lopping cone-bearing branches as picking progresses. However, it stems are to be utilized, de-limbing must be done flush with the main stem so that no branch stubs protrude and should be done only by someone competent with an axe or chain saw.
- Wear appropriate safety clothing and footwear as approved by the supervisor. Safety vests must be worn at all times

CLIMBING STANDING TREES FOR CONE COLLECTION

Climbing trees to pick cones is practical in immature stands of species having medium to large cones (i.e. Douglas fir, Ponderosa pine and larch). Individual trees should be pre-selected on the basis of phenotype and safety. The picker should climb as high as is safely practical (the main stem should be no smaller than 8 cm at face level) and pick cones as he works his way down and around the tree crown. Except for brief periods when moving from one level to another, his safety belt must be attached around the main stem of the tree. Using a short hooked stick, the picker pulls the branches upward and inward, gathers the cones and drops them into a sack which is suspended from a branch by means of an 'S' shaped hook. The mouth of the sack may be kept open by tying it around a large open-ended tin can. Cones on uppermost branches may be knocked off with the stick. Another method is to set a tarp beneath the tree, then rake the cones off the branches. The cones can then be gathered from the tarp and placed in sacks.

Climbing is somewhat physically demanding and should be done only by people who are agile and comfortable at some height from the ground.

CLIMBING SAFETY

- Suitable clothing must be worn – especially in respect to headwear and footwear. During hunting season, wear brightly coloured clothing.
- Always check your safety belt and strap before climbing.
- Use both hands to climb.
- Be sure of a good hold with your hands before moving your feet – and vice versa.
- Stand on or grip branches as close to the main stem as possible.
- Watch for brittle branches – test doubtful branches before putting your weight on them.
- Watch for bark peeling from limbs under footholds – these are slippery.
- Broken, dead branch stubs can snag your clothing and cause bad scrapes, especially when coming down from the tree.
- Don't be tempted too far up a tree. The diameter of the main stem should not be less than 8 cm (3 inches) at face level.
- Except when climbing, your safety belt must be attached to the main stem of the tree.

- While attaching safety strap, keep one arm securely around tree until strap is fastened to D-ring. Make sure strap is not twisted.
- Test weight against safety strap before letting go of tree.
- When picking near the top of a tree, keep your body close to the trunk so that your weight bears down, not outward.
- When in tree crowns, avoid quick head movements which could result in a twig poking your eye.
- Make sure the area below is clear before dropping equipment or sacks of cones. Call a warning first.
- Before detaching safety strap, wrap arm securely around tree.
- Never slide down or jump from a tree, no matter how close the ground may seem.

AERIAL HARVESTING

At the present time, the only aerial harvesting systems approved for use are the hydraulic shear and cone rakes. Both systems have been shown to be an efficient means of collecting cones provided the following criteria are met:

Helicopter

- Performance specifications and load capacity equal to or (preferably) exceeding those of Bell 206 B

Pilot

- Trained, experienced, capable and willing; extensive experience with vertical reference work.

Species

- Those species on which cones occur mainly in the upper portion (ie. top 3 metres) of the crown – spruces, true firs, mountain hemlock, and in some instances Douglas fir.

Stand Characteristics

- Inaccessible to normal collection methods but within 2 minutes flight time from landing area (2 – 3 miles).
- Even canopy height or within desired species in dominant stand position.
- Heavy or bumper cone crop.
  Many cone-bearing trees per hectare.
- Target trees with narrow conical tops.

Landing Area

- Large enough for regular set-down in addition to fuel storage, servicing machine and unloading harvested material by crew.
- Clear approach for helicopter.
- Preferably gravel or stoney ground to minimize blowing dust, etc.

During aerial cone harvesting, the success of the operation will depend largely on pilot-ground supervisor cooperation and ingenuity. Basic helicopter and WCB safety procedures must be strictly followed at all times.

Part of the pre-organization for an aerial harvest may involve a joint trial flight with the harvester over the proposed collection area. This will serve a number of purposes:

To acquaint the pilot with

- the boundary of the collection area
- the location of the landing and dumping site(s) to be used
- the species and type of tree to be collected from
- the difference between light and heavy tree crops
- the trees which have the ripest cones (to be picked first)

To acquaint the supervisor with

- how the harvester works
- approximate turn-around times
- what difficulties the pilot might encounter The aerial collection operation can be broken down into two phases:
    - **Air operations** will be the responsibility of the helicopter pilot. It will consist of flying the aircraft, locating trees to be harvested, applying the harvesting equipment to collect the cones and delivering the load to the dumping sites.
    - **Ground operations** supervised by the collection supervisor have to do with assisting in the unloading of the harvester, separating the cones from the foliage material, measuring and sacking clean cones and keeping the dump site clean of rubbish.

SAFETY PLAN FOR AERIAL CONE RAKING OPERATIONS

The following safety plan pertains only to the use of an unmanned aerial cone or foliage collection device suspended beneath a helicopter and attached thereto by the cargo release hook only.

It must be emphasized that all personnel working on this operation be fully instructed in and understand all phases of helicopter safety and the location of emergency equipment.

All aerial cone or foliage harvesting employing helicopters shall be subject to the regulatory requirements of the WCB Industrial Health & Safety Regulation 33 (1978). Such activities shall further comply with relevant jurisdictional regulations issued by the Ministry of Transport (Canada), these being the 'Air Navigation Orders' and the 'Air Regulations and Aeronautics Act'. The pilot will instruct all personnel involved with the collection as to the safety requirements and operations while working around the helicopter.

Pilot and Helicopter

- The helicopter pilot must be fully trained and experienced in hovering over the forest canopy and around the tops of trees. In particular, the pilot must have good vertical depth perception.
- Rest periods for pilot(s) shall amount to not less than twenty minutes per hour of flying. Where possible, two pilots can be used spelling each other off one cycle at a time.

Mechanical Equipment

- The harvesting device and rigging will be thoroughly checked by the ground supervisor and the pilot prior to each day's operation and after any hang-up or other incident which may have damaged the unit or affected its ability to function properly. No flight will be carried out with an unsafe or inoperable device.
- In particular, the function of the release mechanism (cargo hook) shall be checked prior to each flight (i.e. after the aircraft has landed and before lifting off with the harvesting unit).
- The load line from the helicopter to the harvesting device shall be of a length judged by the pilot to be suitable to the conditions under which the flying and harvesting will be done, but shall be long enough to minimize the 'downwash' effect on the tree tops.
- Rigging shall be designed and shall function so that upon release from the cargo hook, it will fall free of the helicopter without touching or hanging up on the undercarriage.
- The harvesting device shall not be carried beneath the helicopter over populated area.

Clothing and Protective Equipment

- Suitable clothing, including footwear, shall be worn by all ground personnel as approved by the ground supervisor.
- Personnel working near the helicopter during dumping of loads, landings, or lift-offs shall be provided with and shall wear (properly affixed):
    - suitable fog-proof and shatterproof eye protection
    - safety headgear with chin-straps
    - ear protection
- The ground supervisor shall be identified by a distinctive hardhat (white) or vest.
- All other ground personnel on the operation shall wear safety headgear.
- All workers shall wear safety vests

Communication

- An approved radio communication system and agreed procedures shall be used between the helicopter pilot and the ground supervisor.
- Radio communication shall also be established between the work site and the appropriate Forest Service, Company, or Helicopter Service provider office.
- Any persons working, living near or passing by an active helicopter harvesting operation must be informed of the nature of the work and the hazards. 'No Hunting' and 'Active Helicopter Operations' signs should be posted at a safe distance from the work site with phone number.

Landings and Work Sites

- As far as is practical, the landing or work site shall be cleared and kept clean of debris, garbage, stones and other material likely to be blown towards workmen or ingested by the helicopter engine during touchdowns,
- landings, or lift-offs. In some cases tarps may be used but they must be very securely held down by rocks, logs, etc.

- The landing area shall be level, well-marked, and large enough to provide safe access and egress by the helicopter and harvesting device.
- An area shall be reserved to one side of the landing for the storage of aircraft fuel, supplies and equipment.
- A separate area shall be marked off on or near the landing for the cleaning and packaging of collected cones or foliage, if such is carried on concurrently with the flying operation.

Operating Conditions

- The approximate total weight of the harvesting device and rigging must be known prior to any operation.
- A helicopter judged by the chief pilot to be adequate to the job shall be used.
- The pilot shall be the sole judge of the suitability of the weather conditions to the flying operation.
- Sufficient clearance must exist around each tree selected for harvesting to permit the safe and efficient use of the harvesting device. The pilot shall have the final authority in making this decision.

Operating Procedures

- Upon completing the harvesting phase of each flight, the pilot will radio the ground supervisor advising of his return. The ground supervisor will immediately alert the ground crew.
- Only personnel designated by the ground supervisor will attend to the harvesting device, rigging, or the hook-up during dumping or setting down of the load. Sling cables and rigging will be visually checked by ground crew prior to each lift-off.
- Ground crew shall stand well clear of harvester during setting down and lifting-off of harvester. Ground crew will not approach the harvester until it has been grounded or until advised it is safe to do so by the ground supervisor. Only the ground supervisor will direct the pilot as to set down and lift off. He will have a distinctive coloured hardhat or vest.

Emergency Reporting Procedures

- The helicopter personnel shall be equipped and trained to take proper action in the event of an emergency (Ministry of Transportation Regulation 403 in Air Regulations Act).
- Unless prior arrangement has been made with the ground monitoring station, a helicopter will be considered overdue if no communication has been received for a period of 30 minutes.
- In the event of an overdue or downed helicopter, the ground supervisor will immediately notify the forestry office or headquarters who will in turn notify, immediately:
    - the nearest Air Traffic Control Centre
    - the helicopter company's office
    - the appropriate Forest Service office

The following information should be reported by the ground supervisor in the event of an overdue or downed aircraft:

- Nature of the emergency

- Helicopter type and registration
- Charter firm
- Date and time of last communication
- Details of last position report
- General area of flight
- Names of personnel involved
- Emergency equipment carried
- Nature of injuries or damage
- Equipment damaged or lost

ON SITE ACCIDENT PROCEDURE

1. Personnel on site will immediately render first aid to the injured.
2. Injuries will be reported to the ground supervisor who will follow the procedures outlined in Section (h).
3. Under no circumstances will personnel leave the crash site until rescue is completed.
4. After being rescued, injured personnel must be taken to a hospital for examination and treatment.

CONE COLLECTION USING LADDERS

- Ladders are used mainly for collections in seed orchards, but can be used in young, easily accessible stands with minimal ground cover..
- Ensure that ladders are in good condition.
- When using 3-legged orchard ladders, ensure that the middle leg is directly in centre.
- To avoid a ladder falling backwards, do not have it at too steep an angle. If it is necessary for a steep angle, secure ladder to the tree.
- Do not stand on the top two rungs of the ladder.
- Never climb ladders, particularly aluminum ones, during a lightning storm.
- Use‘s’ hooks to attach cone sacks or buckets to the ladder or to the branches of the tree.
- Use a 5’ long stick with a hook to pull branches closer to pick the cones.
- Avoid reaching too far or pulling branches too hard, which may cause the ladder to topple.
- When dropping filled sacks of cones to the ground, alert any ground personnel and ensure that the drop zone is clear.
- *Make sure the ladder is stable and secure before ascending.*
- Check for wildlife and bee/wasp nests before climbing a tree. Do not climb if either is present. Mark the tree with ribbon and inform co-workers.

CONE COLLECTIONS USING POLE PRUNERS

Occasionally, small collections of cones or seed are made from young trees (less than 30 feet or 10 metres) using pole pruners. Branches containing cones are clipped from the tree and dropped to the ground where the operator, or co-workers, removes the cones from the branches. This method is used mostly for hardwoods such as alder, birch, and maple.

- Never use pruners near power lines or during electrical storms.

- Make sure co-workers are aware where and when the branches are being dropped
- Always keep the pruner clean and sharp to avoid incomplete detachment of branches.
- To avoid striking a co-worker, use caution when erecting, lowering, or moving the pole pruner.

COLLECTING FROM SQUIRREL CACHES

- Collecting from squirrel caches may be used when quotas cannot be met through other collection methods, provided that the source stand is of good quality.
- It may be advisable to have a two-man crew reconnoiter areas and mark locations of caches for the pickers to gather later. Squirrels usually locate their caches year after year in the same places. Typically, they are found in damp areas near springs, small creeks or marshes, on northern exposures, and in decayed wood or duff or around old dead and down logs or fallen trees. Fresh cones on the ground are a sign of squirrel activity; piles of cone scales and cores mark where they have been sampling cones and may indicate a nearby cache.
- It is preferable to work in pairs, but if working alone ensure that you are familiar with the area, have a map and compass, and regularly report your location to the office.

COLLECTING CONES BY SHOOTING

- Tops may also be brought down with a high-powered rifle. Stem diameters of up to 15 cm may be severed with only a few well-placed shots. Accurate shooting is essential; rifles used for this purpose must have telescopic sights. To achieve maximum effect, soft-nosed bullets should be used. Shooting is always down at a steep angle (never flat) and away from any potential worksites or populated area.
- This method must never be used near populated areas, in conjunction with tree climbing, or where other forestry activities occur. All personnel must be well clear of the line of fire and falling tree tops. Bullets must never be fired in the direction of other woods crews or even distant communities. The necessary firearms license must be secured in advance. The area must be posted and local Forest Managers or operators notified.