OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

*****POLICY/PROCEDURE DIRECTIVE*****

REGULATORY 95-1

(Replaces Regulatory 93-3 Remove From Notebook)

Subject: *Planting plans for areas for which the approved postmining land use is fish and wildlife habitat.*

Effective: *April 5, 1993 (Revised November, 1995)*

Purpose: *To provide standard criteria, including tree and shrub species, stocking levels, herbaceous species, and planting configurations for revegetation plans on areas for which the approved postmining land use is fish and wildlife habitat.*

The Division, after consultation with and concurrance from the Division of Wildlife, has developed the following criteria for tree and shrub species, stocking levels, herbaceous species and planting configurations which shall provide the basis for evaluation of planting plans on areas for which the approved postmining land use is fish and wildlife habitat. The criteria shall be used by the Permitting Section for review and approval of planting plans submitted at the time of permit application or at the time an Application to Revise a Permit (ARP) is requested, and by the Inspection and Enforcement Section for approval of tree and shrub plantings prior to bond release.

Tree and Shrub Stocking Levels and Planting Spacing

Paragraph (L)(1)(a) of OAC Rule 1501: 13-9-15 requires a minimum of 600 trees and shrubs per affected acre (or stems when direct seeded) be planted for Phase II bond release. This can be accomplished through direct seeding or by the planting of bare root or containerized seedlings. Seedlings can be planted by hand or machine, and should be planted at approximately an 8 foot by 8 foot spacing to meet this stocking requirement.

As stated in paragraph (L)(2)(b) of OAC Rule 1501: 13-9-15 the Phase III bond release requirement is the survival of at least 250 tree and/or shrubs per affected acre, of which 80 percent have been in place for at least 60% of the period of extended responsibility.

Tree and Shrub Species for Hand or Machine Planting

Tree and shrub species acceptable for planting when the post mining land use is "fish and wildlife" include:

Conifers (pick at least one)

Austrian Pine (Pinus nigra)
Eastern White Pine (Pinus strobus)
Red Pine (Pinus resinosa)
Virginia Pine (Pinus virginiana)
Scotch Pine (Pinus sylvestris)
Norway Spruce (Picea abies)

-AND-

Shrubs and Hardwoods (pick at least four)

European Black Alder (Alnus glutinosa)
White Ash (Fraxinus americana)
Green Ash (Fraxinus pennsylvanica)
Quaking Aspen (Populus tremuloides)
** River Birch (Betula nigra)*
Black Chokeberry (Aroniamelancarpa)
American Crabapple (Malus spp)
American Cranberry (Viburnum trilobum)
Gray Dogwood (Cornus racemosa)
Silky Dogwood (Cornus amomum)
Washington Hawthorne (Crataegus spp.)
Indigobush (Amorpha fruticosa)
Bicolor Lespedeza (Lespedeza bicolor)
 # Black Locust (Robinia pseudoacacia)
Bristly Locust (Robinia hispidus)
Sugar Maple (Acer saccharum)
Red Oak (Quercus rubra)
** White Oak (Quercus alba)*
Sweetgum (Liquidambar styraciflua)
** American Sycamore (Plantanus occidentalis)*
Tuliptree (Liriodendron tulipifera)

** species do best when planted on lower slopes or along streams*

 # recommend planting in a mixture with other species

Species other than those listed above may be utilized if the application identifies which species are being substituted and the Division of Wildlife concurs with their suitability for wildlife.

Direct Seeding Tree and Shrub Species

Some tree and shrub species can be established with the revegetation mixture by direct seeding. Many pioneer species which would naturally invade cleared areas can be established by hydroseeding. These species typically are light-seeded, intolerant of shade, and have rapid juvenile growth. Care should be taken not to sow tree and shrub seed with competitive grasses and legumes. Trees and shrubs to be hydroseeded must include:

PICK AT LEAST TWO

Shrubs	*lbs/acre*
Bristly Locust	*1- 2*
Silky Dogwood	*1*
Bicolor Lespedeza	*1*
Indigobush	*0.5 - 1*

-AND-

PICK AT LEAST TWO

Trees	
Black Locust	*0.25 - 0.5*
Green Ash	*2*
Virginia Pine	*0.25 - 0.5*
White Ash	*1*
Sycamore	*1*
Black Cherry	*1*

Prior to hydroseeding, tree and shrub seed may require stratification (cold storage 35-40F) or scarification (seed agitated in concentrated H_2SO_4 and rinsed). Consult the following table for recommended treatment:

Species	*Stratification (Cold Storage) (days)*	*Scarification (minutes)*
Green Ash	*60*	*none*
Silky Dogwood	*30*	*none*
Indigobush	*30*	*6*
Bicolor Lespedeza	*none*	*25*
Bristly Locust	*none*	*30*
Black Locust	*none*	*25*
*Virginia Pine **	*20*	*none*

** pine seed may require repellent to discourage rodent or avian damage*

Planting Configurations

Several planting configurations are acceptable for areas designated for fish and wildlife habitat post mining land use. Conifer seedlings should be planted in blocks to provide wildlife cover. Each block should not exceed two acres in size. In addition, block plantings should not comprise more than 50 percent of the total

seedlings needed for the permit. The remaining seedlings to be planted must consist of at least four different hardwood or shrub species. These seedling species can be planted in any location or configuration as long as an 8 foot by 8 foot spacing is maintained.

At the time the application is submitted, the mine operator shall indicate the proposed species and quantities to be planted or direct seeded. At least one week prior to planting, the mine operator shall submit, to the Division inspector, an exact list of species and quantities to be planted or direct seeded on that yearly segment. This list shall be attached to the "Planting Report" form and be included in the permit file. The Planting Report should be submitted to the Division inspector immediately following seeding or planting for verification.

Herbaceous Cover

Herbaceous mixes for wildlife habitat do not vary much from conventional reclamation revegetation mixes. The only notable difference is that neither Kentucky 31 Fescue (Festuca arundinacea) nor Sericea Lespedeza (Lespedeza cuneata) will be accepted in any revegetation mix. Neither species benefits wildlife and neither is compatible with tree planting efforts.

For areas for which the approved postmining land use is determined to be fish and wildlife, several revegetation mixtures are acceptable. One or more of the following mixtures should be utilized on permits with a post mining land use of fish and wildlife habitat:

Mixture #1

lbs/ac	Annual Grass
10-15	Foxtail Millet (Setaria italica)
	Perennial Grasses (pick one)
2-4	Redtop (Agrostis gigantea)
5-10	Perennial Ryegrass (Lolium perenne)
2-3	Weeping Lovegrass (Eragrostis curvula)
	Legumes (pick two)
4-6	Ladino Clover (Trifolium repens var "ladino")
5-8	Birdsfoot Trefoil (Lotus corniculatus) (may be allelopathic)
5-8	Kobe Lespedeza (Lespedeza striata var "kobe")
5	Appalow Lespedeza (Lespedeza cuneata var "appalow")

Mixture #2 (fall seeding 8/15 - 9/15)

10	Orchard Grass (Dactylis glomerata)
12	Timothy (Phleum pratense)
10	Ladino Clover (Trifolium repens)
8	Birdsfoot Trefoil (Lotus corniculatus) (may be allelopathic)
5	Annual Ryegrass (Lolium multiflorum)

Mixture #3 (spring seeding 3/15 4/15)
(for slopes 3:1 or less)

5	Timothy (Phleum pratense)
10	Orchard Grass (Dactylis glomerata)
4	Ladino Clover (Trifolium repens)
6	Alsike Clover (Trifolium hybridum)
10	Smooth Brome Grass (Bromus inermis)
10 *	Appalow Lespedeza (Lespedeza cuneata var "appalow")

* where pH can be maintained above 6.0 substitute 6lbs. Sweet Clover (Melilotus alba or officinalis)

Mixture #4 (dormant or spring seeding 1/15 - 5/15)

15 (pls) Switchgrass (Panicum virgatum) *
* may be sown without the addition of fertilizer to establish the stand

Reduced Tree and Shrub Planting Quantities

Requests to reduce the stocking level of tree and shrub plantings required for permits with a post mining land use designation of fish and wildlife habitat will not be accepted without the approval of the Division of Wildlife. The Division of Reclamation recognizes that there may be special situations which would warrant (1) "compressed plantings" of 1200 seedlings per acre, at a 6 foot by 6 foot spacing, planted on 50 percent of the affected acres with the incorporation of brushpiles or (2) inclusion of other enhancement features such as wetlands or permanent impoundments of adequate size and depth to support fish and wildlife. These special situations, resulting in the reduction of the amount of trees and shrubs being planted on the permit, will only be approved after the operator has submitted a request for consideration to the Environmental Review Section of the Division of Wildlife and they provided written approval to the Division of Reclamation. The Division of Wildlife will be given 30 days to review and comment.

Lisa J. Morris, Chief

LJM/BJ/jt