APPENDIX A. GLOSSARY

Acidity	The capacity of water for neutralizing a basic solution.
Agricultural Preservation Areas	Lands enrolled in a statewide program that has been established to promote the conservation and preservation of agricultural lands and the agricultural community.
Air Pollutant	Any substance in the air that causes damage to life, ecosystems, or property.
Airsheds	Geographic areas responsible for emitting 75 percent of the air pollution reaching a body of water.
All Terrain Vehicle	A small, open motor vehicle having one seat and three or more wheels fitted with large tires. It is designed chiefly for recreational use over roadless, rugged terrain.
Atmospheric Deposition	The process of airborne pollutants falling to the ground.
Basicity	The extent to which a substance is a base, which is defined as having a pH over seven.
Bedrock	The solid rock that underlies the soil and other unconsolidated material, or that is exposed at the surface.
Best Management Practices	Refer to the most environmentally appropriate techniques for agriculture, forestry, mining, development, urban storm water management, and other practices that are potential threats to natural resources.
Biological Diversity	The number and variety of organisms found within a specific geographic region, or a particular habitat; the variability among living organisms on the earth, including the variability within and between species and within and between ecosystems.
Biological Diversity Area	An area of land recognized as supporting populations of state, nationally, or globally significant species or natural communities, high-quality examples of natural communities or ecosystems, or natural exceptional native diversity.
Canal	A man-made waterway that is usually used to connect existing bodies of water.
Carbon Monoxide	A colorless, odorless, poisonous gas that results from the incomplete burning of carbon fuels.

Comprehensive Plans	A general policy guide for the physical development of a municipality, taking into account many factors including locations, character, and timing of future development.
Concentrated Animal Feeding Operation	A farm where large quantities of livestock or poultry are housed inside buildings or a confined area and all units of production, including feed, wastes and dead animals are concentrated in one area.
Conservation	The maintenance of environmental quality and resources; resources include physical, biological, or cultural. Ecosystem management within given social and economic constraints; producing goods and services for humans without depleting natural ecosystem diversity, and acknowledging the natural character of biological systems.
Conservation Lands	Public or private lands with management plans that include the protection of natural areas as a primary objective.
Dedicated Area	An area of land recognized because of an owner's specific intention to protect it, which could result in the improving to become either a biological diversity area in the future or an even better high-quality area within an already designated biological diversity area.
Degradation	A degeneration to a poorer quality, condition or state.
Direct Deposition	Occurs when pollutants enter a waterway by falling directly into it.
Drainage Pattern	The arrangement of streams in a landscape in response to local topography and subsurface geology.
Easement	A deed restriction that landowners may voluntarily place of their property to protect its future uses.
Eco-region	A geographical unit based on associations of those biotic and environmental factors that directly affect or indirectly express energy, moisture, and nutrients regulating the structure and function of ecosystems.
Ecosystems	An area and its living and non-living components.
Environmental Education	A learning process that increases knowledge and awareness of the environment and associated challenges, develops skills and expertise to address these challenges, and fosters attitudes, motivation, and commitment to make informed decisions and take responsible actions.
Erosion	The processes by which solids are displaced from the earth's surface; includes weathering, dissolution, abrasion, corrosion, and transportation.

Factory Farms	Larger, corporate-based farms that emphasize high volume and profit.
Family Farms	Smaller farms that have been in operation for several generations.
Floodplain	The level land among the course of a river or stream formed by the deposition of sediment during periodic floods.
Forest Management	The art and science of treating a forest to promote a desired outcome.
Frack	To hydrologically—use water to—fracture the shale within the Marcellus shale formation to release the gases for collection.
Geology	Geology is the science that deals with the study of the earth and its history, and is the name of the natural features of our plant.
Ground-level Ozone	A harmful secondary pollutant formed in the atmosphere when nitrogen oxide (NOx) combines and reacts with volatile organic compounds in the presence of sunlight and warm temperatures.
Groundwater	Water beneath the earth's surface; found in pore spaces in rock material. Supplies wells and springs as a source of drinking water for many; also
High-Grading	Involves cutting of only the biggest, most profitable trees in a stand; considered a non-sustainable practice.
Hydric Soils	Soils that are adequately moist in the upper section to cultivate anaerobic conditions during the growing season.
Hydrologic Unit Code	A system for organizing watersheds of the United States that divides and subdivides the watershed into successively smaller hydrologic units and is then assigned an identifying number.
Hydrology	The study of movement of water on the earth; includes surface water and groundwater.
Indirect Deposition	Occurs when a pollutant enters a waterway by falling onto land and being washed into waterbodies as runoff.
Invasive species	Environmentally noxious weeds that grow aggressively, spread easily, and displaces other plants.
Karst	An area of limestone marked by irregularities such as sinkholes, fissures, caves, and underground streams, which are created by erosion.
Landscape Conservation Area	A larger area of land that contains minimal human disturbance and allows ecosystems to function on a landscape level.
Landslide	Ground movements that change the stability of slope from stable to unstable are landslides

Lichens	A symbiosis between a fungal and algal life form that usually grows on trees or rocks.
Major Employers	Companies having a minimum of 200 employees.
Management Recommendations	Non-regulatory suggestions to improve the quality of life.
Methylmercury	A neurotoxin formed by the transformation of mercury by certain microorganisms; it is highly toxic and easily accumulates in fish, shellfish and animals that eat fish.
Natural Heritage Inventories	A method of assessing areas of important plants, animals, and ecological communities.
Natural Resources	A naturally-occurring material with economic value.
Nonpoint Source	Pollutants that have no readily visible source and often require detailed analysis and research to discern the source.
Ozone	A colorless, odorless, gas that forms in the atmosphere.
Ozone Layer	A colorless, odorless, gas located in the upper atmospheric layer that filters the sun's harmful ultraviolet rays.
Particular Matter	Tiny drops of liquid or small particles of dust, metal or other materials that float in the air.
Physiographic Provinces	A region with a particular type of landscape and geology.
Point Source	Pollutants that can be easily traced to their source.
Precipitation	Any form of water that falls from the sky, including, rain, snow, sleet, fog, and hail.
Preservation	The act or process of keeping something safe from harm or injury; the act of maintaining or reserving.
Prime Agricultural Soils	Soils that are extremely well suited for agricultural uses and meet certain physical, chemical, and slope characteristics.
Red beds	Stratosphere of reddish-colored sedimentary rocks, such as sandstone, siltstone, and shale.
Restoration	Returning to its original state or condition.
Riparian Areas	Areas of protective vegetation next to a body of water that serves as a barrier against polluted runoff and provides habitat corridors for wildlife.
Runoff	Rainfall or snowmelt not absorbed by soil that flows over the surface of the ground to a receiving waterway.

Secondary Pollutant	A new air pollutant formed when primary pollutants react in the atmosphere.
Sedimentary Rock	Rocks formed by the deposition of sediment.
Sedimentation	The deposit of particles moved by erosion.
Silviculture	The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands.
Smart Growth Practices	A current movement that focuses on redevelopment of established urban areas and other ways to reduce sprawl pressures on undeveloped countrysides.
Soil Associations	A classification of soil types that comprise two to three major soil types and a few minor soil types.
Stormwater	Water that runs off the land into surface waters during and immediately following periods of precipitation.
Stormwater Management Plan	Planning for surface runoff into streams and river systems during rain and/or snowmelt events.
Streambed	The channel base of a stream or river or creek; it serves as an interchange between groundwater and surface water.
Subsidence	The downward movement of surface material involving little or no horizontal movement.
Sustainable	The ability to provide for the needs of the world's current population without damaging the ability of future generations to provide for themselves. When a process is sustainable, it can be carried out over and over without negative environmental effects or impossibly high costs to anyone involved.
Symbiosis	An alliance between two or more species that benefits each member.
Synthetic Processes	Human-controlled processes, such as burning fossil fuels.
Temperate Continental Climate	A climate without extremes of temperatures or precipitation.
Topography	Describes landscape features of an area.
Total Maximum Daily Load (TMDL)	A limit for pollutant load placed on a waterway by Department of Environmental Protection. TMDLs are determined for a waterway based on how much pollutant it is determined that the waterway can assimilate and still meet its designated use criteria. TMDLs will be used to regulate the percentage of total pollutant load that each source in a watershed can contribute.
Unemployment Rate	The percentage of people of the total labor force that are actively seeking a job but cannot find employment.
Value Added	The additional value added to a product at a stage of production.

Water Gap	An opening or notch which occurs when a section of a ridge has a weaker geological structure and a stream essentially cuts through a ridge to end up
Water Quality Trading	A program which allows facilities with higher pollution control costs to purchase the right to pollute from facilities that have reduced their pollution output below their required limits.
Watershed	The area of land that drains to a particular point along a stream. Each stream has its own watershed. Topography is the key element affecting this area of land. The boundary of a watershed is defined by the highest elevations surrounding the stream. A drop of water falling outside of the boundary will drain to another watershed.
Wetland	An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
Wildlife Management Areas	Areas dedicated to wildlife management activities and low-intensity, wildlife-related recreation, including hunting and wildlife observation.
Zoning	A legal mechanism by which government bodies, for the sake of protecting public health, safety, morals and general welfare, can limit a landowner's right to use privately owned land by dividing land into districts and creating land-use regulations.

APPENDIX B. PLANNING COMMITTEES

Allegheny River Headwaters Watershed Conservation Plan Steering Committee

Jack Fleckenstein	Potter County Conservation District
Heather McKean	McKean County Conservation District
Charlotte Dietrich	Potter County Planning Commission
Frank Weeks	Upper Allegheny Watershed Association
Chris Nicholas	Susquehannock State Forest
William Daisley	Seneca Chapter Trout Unlimited
Jim Clark	Penn State Cooperative Extension
John Dzemyan	Pennsylvania Game Commission
Wes Fahringer	Pennsylvania Department of Conservation and Natural Resources, Northcentral Region
Kim McCullough	Pennsylvania Department of Conservation and Natural Resources, Northwest Region
Stan Hess	Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry
Deborah Lunden	McKean County Planning Commission
Denise Mitcheltree	Pennsylvania Game Commission
Jennifer A. Stambaugh	Hemlock Springs
Bob Volkmar	God's Country T.U., Duquesne University

Allegheny River Headwaters Watershed Conservation Plan Advisory Committees

Project Area Characteristics

Marlene Eaton	Concerned Citizen
Roger Klenovich	Kinzua Valley Trail Club

Land Resources

Marlene Eaton	Concerned Citizen
Gary Fleeger	Pennsylvania Geological Survey
Roger Klenovich	Kinzua Valley Trail Club
Dr. Peter Ryan	God's Country Trout Unlimited
Jennifer Smith	Kinzua Valley Trail Club
John Snyder	North Central Forest Landowners Association

Water Resources

Marlene Eaton	Concerned Citizen
Gary Fleeger	Pennsylvania Geological Survey
Roger Klenovich	Kinzua Valley Trail Club
Dr. Peter Ryan	God's Country Trout Unlimited
Jennifer Smith	Kinzua Valley Trail Club

Biological Resources

Marlene Eaton	Concerned Citizen
Roger Klenovich	Kinzua Valley Trail Club
Dr. Peter Ryan	God's Country Trout Unlimited
Sue Swanson	McKean County Conservation District

Cultural Resources

Marlene Eaton	Concerned Citizen
Roger Klenovich	Kinzua Valley Trail Club
Sue Swanson	McKean County Conservation District

APPENDIX C. EMERGENCY SERVICES

Hospitals	Address	City	State
Bradford Regional Medical Center	116 Interstate Parkway	Bradford	PA
Charles Cole Memorial Hospital	1001 East Second Street	Coudersport	PA

Police Departments	Address	City	State
Bradford City Police Department	18 Kennedy Street	Bradford	PA
Bradford Township Police Department	136 Hemlock Street	Bradford	PA
Coudersport Borough Polilce Department	201 South West Street	Coudersport	PA
Foster Township Police Department	1185 East Main Street	Bradford	PA
Mt. Jewett Police Department	P.O. Box 7215	Mt. Jewett	PA
Otto-Eldred Regional Police Department	3 Bennett Street	Eldred	PA
Pennsylvania State Police	3178 Route 219	Kane	PA
Pennsylvania State Police	3140 East Second Street	Coudersport	PA
Port Allegany Police Department	1 Maple Street	Port Allegany	PA
Shinglehouse Borough Police Department	P.O. Box 156	Shinglehouse	PA
Smethport Borough Police Department	201 West Main Street	Smethport	PA
Sweeden Township Police Department	121 Faith Street	Coudersport	PA

Fire Departments	Address	City	State
Austin Volunteer Fire Company, Inc	42 Main Street, P.O.Box 328	Austin	PA
Bradford City Fire Department-Kennedy Street Station	24 Kennedy Street	Bradford	PA
Bradford City Fire Department-Main Street Station	East Main Street	Bradford	PA
Bradford Township Volunteer Fire Department-Interstate Parkway	368 Interstate Parkway	Bradford	PA
Bradford Township Volunteer Fire Department-West Washington Street	West Washington Street	Bradford	PA
Coundersport Volunteer Fire Department, Inc & Ambulance Association	West Second Street, P.O. Box 203	Coudersport	PA
Eldred Fire Department	5 Platt Street	Eldred	PA
Eldred TownshipVolunteer Fire Department	RR 1	Eldred	PA
Foster Township-Derrick City Volunteer Fire Department	P.O. Box 58	Derrick City	PA
Foster Township-Rew Volunteer Fire Department	Main Street	Rew	PA
Genesee Volunteer Fire Department	P.O. Box 235	Genesee	PA
Hamlin Township Volunteer Fire Department	P.O. Box 144	Hazelhurst	PA
Hilltop Volunteer Fire Department			PA
Lafayette Township Volunteer Fire Department-Westline #2	Westline #2		PA
Lafayette Township Volunteer Fire Department	SR 59, west of Lafayette		PA

Fire Departments (continued)	**Address**	**City**	**State**
Lewis Run Borough Volunteer Fire Department	46 Main Street	Lewis Run	PA
Mt. Jewett Volunteer Fire Department		Mt Jewett	PA
Norwich Volunteer Fire Department	P.O. Box 97	Crosby	PA
Otto Township Volunteer Fire Department	P.O. Box 192	Duke Center	PA
Roulette Volunteer Fire & Ambulance	P.O. Box 173, River Street	Roulette	PA
Sergeant Township-Clermont	Star Route	Clermont	PA
Shinglehouse Volunteer Fire Department	P.O. Box 475	Shinglehouse	PA
Smethport Volunteer Fire Department		Smethport	PA
Star Hose Company No.1 & Port Allegany Volunteer Fire Department	65 West Maple Street	Port Allegany	PA
Tri-Town Volunteer Fire & Ambulance	408 North Water Wtreet	Ulysses	PA

EMS	**Address**	**City**	**State**
Austin Volunteer Fire Company, Inc	42 Main Street, P.O.Box 328	Austin	PA
Bradford City Fire Department	25 Chestnut Street	Bradford	PA
Bradford Z Stat Ambulance Service	26 Pike Street	Bradford	PA
Coundersport Volunteer Fire Department, Inc & Ambulance Association	West Second Street, P.O. Box 203	Coudersport	PA
Eldred Borough Fire Department Ambulance	P.O. Box 146	Eldred	PA
Genesee Ambulance Association	P.O. Box 9	Genesee	PA
Mt. Jewett Area Ambulance Association	39 East Main Street, P.O. Box 154	Mt. Jewett	PA
Otto Township Ambulance Association	118 Sweitzer Drive, P.O. Box 315	Duke Center	PA
Port Allegany Ambulance Service	22279 Route 6, P.O. Box 223	Port Allegany	PA
Priority Care Ambulance	P.O. Box 344	Smethport	PA
Roulette Volunteer Fire & Ambulance	P.O. Box 173, River Street	Roulette	PA
Shinglehouse Ambulance Association	P.O. Box 98	Shinglehouse	PA
Tri-Town Volunteer Fire & Ambulance	408 North Water Wtreet	Ulysses	PA

(Sources: McKean County Planning Commission, 2007; Potter County Planning Commission, 2005, Municipal Surveys, 2009)

APPENDIX D. AGRICULTURAL SOILS

Prime Farmland

McKean County

Map Symbol	Soil Name	Slope Character (% slope)
AbB	Albrights silt loam	3 to 8
Ba	Barbour loam	
Bb	Basher silt loam	
BeB	Braceville silt loam	3 to 8
BuB	Buchanan silt loam	3 to 8
CbB	Castile gravelly silt loam	3 to 8
ChB	Chenango gravelly loam	3 to 8
ClB	Clymer loam	3 to 8
CoA	Cookport loam	0 to 3
CoB	Cookport loam	3 to 8
GnB	Gilpin channery silt loam	3 to 8
HbB	Hazleton channery loam	3 to 8
KnB	Kinzua channery silt loam	3 to 8
LeB	Leck Kill channery silt loam	3 to 8
Ph	Philo silt loam	
Po	Pope loam	
WaB	Wharton silt loam	3 to 8

Potter County

Map Symbol	Soil Name	Slope Character (% slope)
Ba	Barbour fine sandy loam	0 to 3
Bb	Barbour fine sandy loam, high bottom phase	0 to 3
Bc	Barbour gravelly fine sandy loam	0 to 3
Bd	Basher sandy loam	0 to 3
Be	Basher silt loam	0 to 3
Bf	Basher silt loam, high bottom phase	0 to 3
BhB	Bath channery silt loam	0 to 12
Bn	Braceville gravelly silt loam	0 to 5

Potter County (continued)

Map Symbol	Soil Name	Slope Character (% slope)
CfB	Chenango gravelly loam	0 to 12
ClB	Clymer channery loam	0 to 12
CoB	Cookport channery loam	0 to 8
Ha	Holly sandy loam	0 to 3
HaB	Hartleton channery silt loam	3 to 15
HuB	Hustontown channery silt loam	3 to 8
HxB	Hazleton channery loam,	3 to 15
LaB	Lackawanna channery loam	3 to 8
LdC	Laidig channery loam	0 to 15
LkB	Leck Kill channery loam	3 to 15
LoB	Lordstown channery silt loam	0 to 12
MaB	Mardin channery silt loam	0 to 8
Me	Middlebury sandy loam	0 to 3
Mf	Middlebury silt	0 to 3
Mg	Middlebury silt loam, high bottom phase	0 to 3
ScA	Scio fine sandy loam-silt loam	0 to 3
TaA	Tioga fine sandy loam	0 to 3
TgA	Tioga gravelly loam	0 to 3
CoA	Cookport loam	0 to 3
CoB	Cookport loam	3 to 8
ThA	Tioga fine sandy loam, high bottom phase	0 to 3
TuB	Tunkhannock gravelly loam	0 to 12
UfA	Unadilla fine sandy loam	0 to 3
UnA	Unadilla silt loam	0 to 3
WeB	Wellsboro channery silt loam	0 to 8
WhB	Wharton channery silt loam	0 to 12

Farmland of Statwide Importance

McKean County

Map Symbol	Soil Name	Slope Character (% slope)
AbC	Albrights silt loam	8 to 15
At	Atkins silt loam	
BuC	Buchanan silt loam	8 to 15
CaA	Cavode silt loam	0 to 3
CaB	Cavode silt loam	3 to 8
CeC	Ceres channery silt loam	8 to 15
CoC	Cookport loam	8 to 15
EdB	Eldred silt loam	3 to 8
ElB	Elko silt loam	3 to 8
ElC	Elko silt loam	8 to 15
GnC	Gilpin channery silt loam	8 to 15
HaB	Hartleton channery silt loam	3 to 8
HaC	Hartleton channery silt loam	8 to 15
HbC	Hazleton channery loam	8 to 15
KnC	Kinzua channery silt loam	8 to 15
LeC	Leck Kill channery silt loam	8 to 15
MaB	Mandy channery silt loam	3 to 8
MaC	Mandy channery silt loam	8 to 15
OnC	Onoville silt loam	8 to 15
PoB	Portville silty clay loam	3 to 8
ReA	Rexford silt loam	0 to 3
ShB	Shongo silt loam	3 to 8
WaC	Wharton silt loam	8 to 15

(Source: USDA NRCS, 2008)

68 soils designated as prime farmland

39 soils designated as farmland of statewide importance

U.S. Department of Agriculture Natural Resource Conservation Service. (2008). Electronic field office technical guide. Retrieved April 2, 2009 from Natural Resource Conservation Service website: http://www.nrcs.usda.gov/technical/efotg.

Potter County

Map Symbol	Soil Name	Slope Character (% slope)
AbA	Albrights silt loam	0 to 3
AbB	Albrights silt loam	3 to 8
AbC	Albrights silt loam	8 to 15
AbD	Albrights silt loam	15 to 35
At	Atkins silt loam	
BhD	Bath channery silt loam	12 to 20
CaB	Cavode silt loam	0 to 8
CaC	Cavode silt loam	8 to 15
CbB	Cavode channery silt loam	0 to 8
CbC	Cavode channery silt loam	8 to 15
CfD	Chenango gravelly loam	12 to 20
ClD	Clymer channery loam	12 to 20
CoC	Cookport channery loam	8 to 15
CrA	Craigsville gravelly loam	
DfB	Dekalb fine sandy loam	0 to 12
DfD	Dekalb fine sandy loam	12 to 20
DkB	Dekalb channery loam, 10 to 25 inches deep	0 to 12
DkD	Dekalb channery loam, 10 to 25 inces deep	12 to 20
HaD	Hartleton channery silt loam	15 to 25
HuC	Hustontown channery silt loam	8 to 15
LaC	Lackawanna channery loam	8 to 15
LoD	Lordstown channery silt loam	12 to 20
LwB	Lehew silt loam	3 to 8
LwC	Lehew silt loam	8 to 15
LwD	Lehew silt loam	15 to 25
MaC	Mardin channery silt loam	8 to 15
MoA	Morris silt loam	0 to 3
MoB	Morris silt loam	3 to 8
MoD	Morris silt loam	15 to 25
OaB	Oquaga channery loam	0 to 12
OaD	Oquaga channery loam	12 to 20
SoB	Solon channery silt loam	0 to 15
SoD	Solon channery silt loam	15 to 35
TuD	Tunkhannock gravelly loam	12 to 20
VoA	Volusia channery silt loam	0 to 3
VoB	Volusia channery silt loam	3 to 8
VoC	Volusia channery silt loam	8 to 15
WeC	Wellsboro channery silt loam	8 to 15
WhD	Wharton channery silt loam	12 to 20

APPENDIX E. ACTIVE INDUSTRIAL MINING PERMITS

County	Municipality	Type	Mine Name	Company	Permit #
McKean	Annin	Large surface	Turtlepoint Mine	GL Carson Incorporated	4675SM18
McKean	Annin	Bluestone surface	Marcy 2 Mine	Carl Marcy Jr.	42070802
McKean	Annin	Bluestone surface	Annin 1 Mine	David D. Marcy	42000801
McKean	Annin	Bluestone surface	Nelson Mine	James Tucker	42040802
McKean	Annin	Small surface	Albaney Mine	Joseph Johnson	42060803
McKean	Annin	Bluestone surface	Bigley McDivitt Mine	Lois Barker	42070801
McKean	Annin	Bluestone surface	Knapp Mine	Ron F. Onufry Jr.	42060805
McKean	Annin	Small surface	Rock Run Mine	GL Carson Incorporated	42092802
McKean	Annin	Small surface	Culver Mine	William R. Culver	42080810
McKean	Annin	Short term construction	SR 6 Sect A02 & A03 Mine	Glen O. Hawbraker	42081006
McKean	Ceres	Large surface	Shinglehouse Mine	Glen O. Hawbraker	42950301
McKean	Ceres	Large surface	Faulkner Mine	Wayne Gravel Product	42850302
McKean	Eldred	Small surface	Frost Mine	William K. Robinson	42050801
McKean	Foster	Bluestone surface	Brent Schoonover Mine	Brent Schoonover	42080804
McKean	Keating	Large surface	John Peter Castelli Mine	John Peter Castelli	42820303
McKean	Keating	Small surface	Duffy III Mine	Duffy Incorporated	42910801
McKean	Lafayette	Small surface	Cherry Ridge Stone Mine	Kessel Construction Incorporated	42082802
McKean	Liberty	Small surface	Culver Mine	Bradley A. Greenman	42082807
McKean	Liberty	Large surface	Port Allegany Mine	Duffy Incorporated	42040301
McKean	Liberty	Bluestone surface & Small surface	Schulze Mine	James Tucker	42060806
McKean	Liberty	Small surface	Campbell Hollow Mine	Robert J. Ostrom	42060802
McKean	Liberty	Bluestone surface	Mill Street Mine	Robert J. Ostrom	42080801
McKean	Liberty	Small surface	Caulkins Mine	William K. Robinson	42060801
McKean	Mount Jewett	Small surface	Sees Soil & Aggregate Mine	Brian Sees	42002802
McKean	Port Allegany	Bluestone surface	Walter Miles Stone Mine	Walter D. Miles	42080803
Potter	Allegany	Bluestone surface	Carl Quarry	Samuel A. Treat	53080806
Potter	Allegany	Small surface	Robert Teuscher Quarry	Todd McCoy	53070803
Potter	Clara	Small surface	Carroll M. Winseck Quarry	Harriet Winseck	53020802
Potter	Clara	Bluestone surface	Fisk #1	Richard A. Davis	53080802
Potter	Eulalia	Small surface	Wildfire Quarry	Gaberseck Brothers	53960803
Potter	Eulalia	Bluestone surface	Crosby 1 Quarry	Kelly Crosby	53950802
Potter	Genese	Small surface	Dr. Reed Quarry	Donald R. Reed	53930801
Potter	Oswayo	Bluestone surface	Hyde Stone Quarry	Hyde Stone Quarry Incorporated	53060803

County	Municipality	Type	Mine Name	Company	Permit #
Potter	Roulette	Small surface	Fessenden Quarry	Fessenden Construction Company Incorporated	53012802
Potter	Roulette	Small surface	Railroad Avenue Mine	Fessenden Construction Company Incorporated	53032801
Potter	Roulette	Small surface	Goodwin & Son Gravel Pit	Goodwin & Son Gravel Pit	53890808
Potter	Roulette	Bluestone surface	Groff Quarry	Groff Family Enterprises Incorporated	53010805
Potter	Roulette	Bluestone surface	Barney Quarry	Joseph E. Johnson	53990804
Potter	Roulette	Small surface	Cornelius Quarry #2	Randy Cornelius	53080803
Potter	Roulette	Bluestone surface	Cornelius Quarry	Randy Cornelius	53080801
Potter	Roulette	Bluestone surface	Lloyd Quarry	Richard A. Davis	53080803
Potter	Roulette	Bluestone surface	Green Quarry	Robert H. Ostrom	53030802
Potter	Roulette	Small surface	Anderson Quarry	Robert H. Ostrom	53950803
Potter	Roulette	Small surface	Savers Quarry	Robert H. Ostrom	53950804
Potter	Roulette	Small surface	Drabert Quarry	Robert H. Ostrom	53960804
Potter	Roulette	Small surface	Drabert 2 Quarry	Robert H. Ostrom	53030803
Potter	Roulette	Small surface	Burtville Gravel Quarry	Robert H. Ostrom	53900801
Potter	Roulette	Small surface	Seymore Flagstone Quarry 1	Seymore Stone & Wood Product Incorporated	53060801
Potter	Sharon	Small surface	Coole Quarry	Lawrence T. Coole	53910803
Potter	Sharon	Small surface	Blauvelt Quarry	Paul Blauvelt	53080801
Potter	Sweden	Bluestone surface	Reese Quarry	Gary L. Reese	53040801

(Source: DEP, 2009c)

APPENDIX F. RESOURCE CONSERVATION RECOVERY ACT SITES

Handler	Permit #	Type	Address	City	State	Zip	Lat.	Long
Allegheny Store Fixtures	PAD083538033	CESQG	57 Holley Avenue	Bradford	PA	16701	41.98237	-78.654606
Allegheny Store Fixtures	PAR000028167	Unspec	500 Chestnut Street	Bradford	PA	16701	41.970344	-78.627213
Amer Ref Group Bradford	PAD001604693	CA	77 North Kendall Avenue	Bradford	PA	16701	41.966389	-78.62944
Amer Ref Group Bradford	PAD001604693	HWBR	77 North Kendall Avenue	Bradford	PA	16701	41.966389	-78.62944
Amer Ref Group Bradford	PAD001604693	LQG	77 North Kendall Avenue	Bradford	PA	16701	41.966389	-78.62944
Amer Ref Group Foster Brook	PAD000780171	Unspec	Bolivar Drive	Bradford	PA	16701	41.98237	-78.654606
American Heterocyclic Research	PAR000043331	CESQG	101 Mill Street	Bradford	PA	16701	41.963817	-78.638411
American Heterocyclic Research	PAD000619200	CESQG	20 Russell Boulvard	Bradford	PA	16701	41.973238	-78.620839
Barrets Auto Body	PAD987357258	SQG	485 East Main Street	Bradford	PA	16701	41.965567	-78.624783
Bauschard Daodge	PAR000035832	CESQG	170 Seward Avenue	Bradford	PA	16701	41.974062	-78.629373
Bay Chevrolet	PAD981744410	SQG	880 East Main Street	Bradford	PA	16701	41.975458	-78.61729
Beckith Mach Bradford	PAD038636965	SQG	361-369 Congress Street	Bradford	PA	16701	41.944123	-78.65146
Bovaird	PAD987321940	SQG	181 Main Street	Bradford	PA	16701	41.955995	-78.645999
Bradford Area Sr. High School	PAD982568693	SQG	81 Interstate Parkway	Bradford	PA	16701	41.958142	-78.658105
Bradford Armory	PA0000960138	CESQG	38 Barbour Street	Bradford	PA	16701	41.95639	-78.652464
Bradford Electronics	PAD046762258	CA	550 High Street	Bradford	PA	16701	41.946008	-78.643727
Bradford Firestone Store	PAD987399268	CESQG	One Bradford Mail	Bradford	PA	16701	41.977149	-78.618752
Bradford Laundry & Drycleaning	PAD987389772	SQG	210 Longmaid Lane	Bradford	PA	16701	41.942715	-78.679799
Bradford Regional Medical Center	PAD074026378	CESQG	116 Interstate Parkway	Bradford	PA	16701	41.963008	-78.662083
Bradford Sewage Treatment Plant	PAD000413302	Unspec	City Hall, 24 Kendall Street	Bradford	PA	16701	41.93	-78.744722
Browns Machine Shop	PAR000016535	CESQG	311 High Street	Bradford	PA	16701	41.950687	-78.643328
Bureau of Prisions FCI McKean	PAR000031740	SQG	Big Shanty Road & Route 59	Bradford	PA	16701		
Clayts Body Shop	PAR00000244	CESQG	591 South Avenue	Bradford	PA	16701	41.929651	-78.652893
Clayts Body Shop	PAR00000244	Trans	591 South Avenue	Bradford	PA	16701	41.929651	-78.652893
CTC Analytical Services, Inc.	PAR000043141	SQG	550 Chestnut Street	Bradford	PA	16701	41.949719	-78.648705
CTC Analytical Services, Inc.	PAR000025858	SQG	1 Amalie Way	Bradford	PA	16701		
Dexter's Service Center	PAD987393873	SQG	156 West Washington Street	Bradford	PA	16701	41.957223	-78.660407
Dresser Industries	PAD980550297	Unspec	36 Davis Street	Bradford	PA	16701	41.960869	-78.645345
Dresser Manufacturing Division	PAD002124360	SQG	41 Fisher Avenue	Bradford	PA	16701	41.962764	-78.632769
Fairway Ford	PAD013892369	SQG	472 East Main Street	Bradford	PA	16701	41.965358	-78.625024
Georgia Pacific Bradford	PAD002124378	CESQG	1 Owens Way	Bradford	PA	16701	41.929328	-78.650566
Graham Packaging	PAD048386809	CESQG	105 Bolivar Drive	Bradford	PA	16701	41.976791	-78.630296
Halliburton Service	PAD079941324	CESQG	350 High Street Extension	Bradford	PA	16701	41.949928	-78.643215

Handler	Permit #	Type	Address	City	State	Zip	Lat.	Long
Halliburton Service	PAD079941324	Trans	350 High Street Extension	Bradford	PA	16701	41.949928	-78.643215
Hoffman Carbon	PAR000025544	CESQG	105 Lafferty Hollow Road	Bradford	PA	16701	41.95494	-78.594612
K-Mart 9609	PAR000002402	Trans	1001 East Main Street	Bradford	PA	16701	41.981184	-78.61771
KOA Speer Electronics	PAD987346715	SQG	Bolivar Drive	Bradford	PA	16701	41.99736	-78.67502
Kwikfill M131	PAD987333267	CESQG	713 South Avenue	Bradford	PA	16701	41.920458	-78.651067
Kwikfill M61	PAD987333341	CESQG	227 East Main Street	Bradford	PA	16701	41.961176	-78.634357
McCort Label Cabinet Company	PAD002125219	SQG	42-54 Bennett Street	Bradford	PA	16701	41.93	-78.655611
McKinney Furniture Restoration	PAR000038240	CESQG	68 Derrick Road	Bradford	PA	16701	41.975631	-78.610861
Microbac Lab Bradford	PAR000003350	CESQG	West Corydon Lane & Clark Lane	Bradford	PA	16701	41.937574	-78.675276
Monroe Muffler Brake 21	PAD982577033	SQG	1030 Main Street Extension	Bradford	PA	16701	41.982525	-78.617807
Penelec Bradford District	PAD013894340	Unspec	68 Chestnut Street	Bradford	PA	16701	41.954235	-78.648054
Penelec Bradford District Office	PAR000022632	CESQG	475 High Street	Bradford	PA	16701	41.947479	-78.643689
Penn Hills Club	PAR000029297	CESQG	146 Pennhills Drive	Bradford	PA	16701	41.901763	-78.619029
Penn Hills Country Club	PAR000029397	SQG	440 Minard Run Road	Bradford	PA	16701	41.902307	-78.611669
Pure Sil	PAD982677072	Unspec	1 Silicon Way	Bradford	PA	16701	41.966348	-78.625188
Rink Brothers Chrysler Plymouth	PAD987360591	CESQG	900 East Main Street	Bradford	PA	16701	41.976515	-78.617125
Rink Brothers Chrysler Plymouth	PAD987364783	Unspec	900 East Main Street	Bradford	PA	16701	41.976515	-78.617125
Schlumberger Well Service	PAD982700114	SQG	95 Rutherford Run Road	Bradford	PA	16701	41.925439	-78.614111
Servco Services Incorporated	PAD982570681	SQG	35 Mill Street	Bradford	PA	16701	41.96436	-78.639097
SJS Creative Wood Designs	PAR000029504	CESQG	693 South Kendall Aveune	Bradford	PA	16701	41.954034	-78.60817
Sunoco Service Station-Bradford	PAD000774257	Unspec	419 South Avenue	Bradford	PA	16701	41.939943	-78.654077
Sunoco Service Station-Bradford	PAD000774240	Unspec	535 East Main Street	Bradford	PA	16701	41.966418	-78.623863
Sunoco Service Station-Bradford	PAD00774265	Unspec	111 South Avenue	Bradford	PA	16701	41.934876	-78.653432
Tuna Valley Printing & Graphics	PAR000033712	CESQG	80-90 Mechanic Street	Bradford	PA	16701	41.958264	-78.651485
University of Pittsburgh-Bradford	PAD074041088	SQG	300 Campus Drive	Bradford	PA	16701	41.947667	-78.669592
Varikleen Industries	PAD982699761	SQG	1020 East Main Street	Bradford	PA	16701	41.982039	-78.617803
Varikleen Industries	PAD982699761	Unspec	1020 East Main Street	Bradford	PA	16701	41.982039	-78.617803
Walmart Supercenter No. 3514	PAR000505891	CESQG	50 Foster Brook Boulvard	Bradford	PA	16701	41.980884	-78.617136
Werzalit of America Maunfacturing	PAD000437848	Unspec	40 Holley Avenue	Bradford	PA	16701	41.970673	-78.627145
Charles Cole Memorial Hospital	PAR000043323	CESQG	1001 East Second Street	Coudersport	PA	16915	41.774467	-78.018046
Chucks Auto Body	PA0000827188	CESQG	Route 6 East	Coudersport	PA	16915	41.77825	-78.020701
Coudersport Area Jr./Sr. High School	PAR000021899	CESQG	698 Dwight Street	Coudersport	PA	16915	41.77383	-78.011567
Coudersport PA Store	PAD982577538	SQG	202 South Main Street	Coudersport	PA	16915	41.770675	-78.021333
Damascus Tanning Company	PAD001035740	Unspec	Port Allegany Road	Coudersport	PA	16915	41.7692	-78.026569

Handler	Permit #	Type	Address	City	State	Zip	Lat.	Long
Encon Eye Protection, Inc.	PAR000030536	CESQG	3 Arch Street	Coudersport	PA	16915	41.766389	-77.963333
Encon Eye Protection, Inc.	PAR000256255	Unspec	412 North East Street	Coudersport	PA	16915	41.776482	-78.019604
Jenigens Auto Body	PA0000815910	CESQG	383 East Second Street	Coudersport	PA	16915	41.774512	-78.01913
Kightlinger Motors	PAR000502963	CESQG	336 Port Allegany Road	Coudersport	PA	16915	41.765081	-78.032912
Kightlinger Motors, Inc.	PAD17750081	CESQG	1 Mill Street	Coudersport	PA	16915	41.774373	-78.016153
Kwikfill M0151 183	PAD987337821	CESQG	302 Port Allegany Road	Coudersport	PA	16915	41.765563	-78.032125
L.H. Lincoln & Sons, Inc.	PAD067541255	Unspec	Vine & Cherry Streets	Coudersport	PA	16915	41.76802	-78.024426
Morgan AM&T	PAD002103273	CA	East Second Street	Coudersport	PA	16915	41.775314	-78.002412
Morgan AM&T	PAD002103273	HWBR	East Second Street	Coudersport	PA	16915	41.775314	-78.002412
Morgan AM&T	PAD002103273	LQG	East Second Street	Coudersport	PA	16915	41.775314	-78.002412
PA DOT 0260	PAD982575763	CESQG	101 Locust Street	Coudersport	PA	16915	41.765273	-78.024173
Sheetz Store No 165	PAR000526392	SQG	208 South Main Street	Coudersport	PA	16915	41.770593	-78.02125
Street Machines	PAD982580243	CESQG	Route 6 West, P.O. Box 494	Coudersport	PA	16915	41.716944	-77.952222
TC Specialist Printing	PAR000502658	Unspec	17 South Main Street	Coudersport	PA	16915	41.772602	-78.02126
Tennesse Gas Pipeline Company 313 Coudersport	PAD000765891	HWBR	197 Tennessee Road	Coudersport	PA	16915	41.853056	-78.000556
Tennesse Gas Pipeline Company 313 Coudersport	PAD000765891	SQG	197 Tennessee Road	Coudersport	PA	16915	41.853056	-78.000556
Tennesse Gas Pipeline Company 313 Coudersport	PAD000765891	Unspec	197 Tennessee Road	Coudersport	PA	16915	41.853056	-78.000556
Tennesse Gas Pipeline Company Hebron Storage	PAD987324357	CESQG	896 State Route 44 North	Coudersport	PA	16915	41.732843	-77.938224
Truck Lite Company, Inc.	PAD987357274	SQG	100 East Market Street	Coudersport	PA	16915	41.762778	-78.036111
McKean Manufacturing	PAD097643894	Unspec	Industrial Development Park	Custer City	PA	16725	41.899444	-78.688611
Varikleen Industries	PAR000042978	CESQG	2 Susquehanna Road	Custer City	PA	16725		
Witco Corporation Oil & Gas Division	PAD98111032	SQG	Route 464	Derrick City	PA	16727	41.983056	-78.57
Andrews Trucking	PAD982364945	Trans	Main Street	Duke Center	PA	16729	41.957196	-78.501337
Atlantic Recovery Systems, Inc.	PAD096303862	Trans	Main Street	Duke Center	PA	16729	41.957196	-78.501337
Eldred Paint & Body	PAD030209902	SQG	Main Street	Eldred	PA	16731	41.962955	-78.385247
Ethan Allen Incorporated/Eldred Plant	PAD982675316	CESQG	Route 446	Eldred	PA	16731	41.925037	-78.3761
Honeywell Speciality Chemicals	PAR000042804	HWBR	RD 3 (Intersection of routes 46 & 446)	Keating Summit	PA	16749		
Honeywell Speciality Chemicals	PAR000042804	LQG	RD 3 (Intersection of routes 46 & 446)	Keating Summit	PA	16749		

Handler	Permit #	Type	Address	City	State	Zip	Lat.	Long
PA Department of Transporation 0250	PAD982515656	SQG	Route 4003 (.25 miles east Bradford)	Lafayette Township	PA	16726	41.8225	-78.572778
Allegheny Bradford Manufacturing	PAD987284924	HWBR	1522 South Avenue	Lewis Run	PA	16738	41.947378	-78.648448
Allegheny Bradford Manufacturing	PAD987284924	SQG	1522 South Avenue	Lewis Run	PA	16738	41.867783	-78.66688
Control Chief Corporation	PAD990752685	Unspec		Lewis Run	PA	16738	41.816389	-78.695833
IA Construction Corporation McKean Plant	PAR000508069	UOP	7024 Highway Route 59	Lewis Run	PA	16738		
Jim Shields Auto Body	PAR000002352	CESQG	15 Irvine Street	Lewis Run	PA	16738	41.876218	-78.663686
McCort Label	PAD038634341	CESQG	20 Egbert Lane	Lewis Run	PA	16738	41.872266	-78.744722
TSA Bradford Regional Airport	PAR000512269	CESQG	212 Airport Drive Suite E	Lewis Run	PA	16738		
National Fuel Gas Clermont Field	PAD987329513	CESQG	Route 12 (8.9 miles east)	Mt. Jewett	PA	16740		
Applebys Dry Cleaners	PA0000943696	CESQG	801 North Main Street	Port Allegany	PA	16743	41.823004	-78.290102
Ed Daughertys Body Shop	PAD987390317	SQG	RD 1 Box 612	Port Allegany	PA	16743		
IA Construction Corporation Port Allegany	PAD002106979	SQG	Route 6	Port Allegany	PA	16743	41.812565	-78.278902
Kwikfill M145	PAD987333267	CESQG	36 South Main Street	Port Allegany	PA	16743	41.813313	-78.282072
Sheetx Store 166	PAR000526400	SQG	1 South Main Street	Port Allegany	PA	16743	41.815232	-78.283719
St. Bobain Containers	PAD045167053	HWBR	One Glass Place	Port Allegany	PA	16743	41.817415	-78.2888447
St. Bobain Containers	PAD045167053	LQG	One Glass Place	Port Allegany	PA	16743	41.817415	-78.2888447
Witter Gas & Oil	PAD987335205	SQG	27 Pearl Street	Port Allegany	PA	16743	41.815132	-78.284971
Quaker State Oil-Burger Hollow	PAD980918346	CESQG	Route 246	Rixford	PA	16745	41.930408	-78.455165
Forest House Hotel	PAD987392024	CESQG	1746 U.S. Route 6 West	Roulette	PA	16746	41.762115	-78.114968
Norms Collision	PA0000826867	CESQG	Maple Street (1 mile south Center Street)	Roulette	PA	16746	41.773573	-78.155167
Daves Body Shop	PAD094174349	CESQG	Sunnyside Road	Shinglehouse	PA	16748	41.952942	-78.187449
Dominion Trasnporation Incorporated Sharon M&R	PAR000513317	LQG	982 Plank Road	Shinglehouse	PA	16748	41.973326	-78.109139
Eds Services	PAR000025981	CESQG	Route 44 & Honeoye Street	Shinglehouse	PA	16748	41.962525	-78.198775
John Hewitt Auto Body	PAR000018606	CESQG	Fairgrounds Road (100 feet W Route 44)	Shinglehouse	PA	16748		
Unimart Corporation	PAR000027250	CESQG	109 Oswayo & Honeoye Street	Shinglehouse	PA	16748	41.9621	-78.1984
Wayne Paving & Contracting	PAR000000315	CESQG	Ceres Street	Shinglehouse	PA	16748		
Dons Body Shop	PAR000036103	CESQG	Route 6 (1 mile south Hazelhurst)	Smethport	PA	16749		
Internatioal Waxes Plant	PAD046761763	CA	Intersection of Routes 46 & 446	Smethport	PA	16749	41.857925	-78.440185
Internatioal Waxes Plant	PAD046761763	HWBR	Intersection of Routes 46 & 446	Smethport	PA	16749	41.857925	-78.440185

Handler	Permit #	Type	Address	City	State	Zip	Lat.	Long
Internatioal Waxes Plant	PAD046761763	SQG	Intersection of Routes 46 & 446	Smethport	PA	16749	41.857925	-78.440185
Kwikfill M146	PAD987337854	CESQG	326 West Main Street	Smethport	PA	16749	41.809527	-78.445838
Seneca Highlands 109	PA0000928820	CESQG	PO Box 1566	Smethport	PA	16749		
Smethport Auto Parts	PAD987302593	SQG	400 Main Street	Smethport	PA	16749	41.810567	-78.439447
Smethport Collision	PAR000022178	CESQG	106 Mechanic Street	Smethport	PA	16749	41.807119	-78.441614
Hawbreaker Glen O. Inc. Plant 7	PAR000008763	SQG	Route 155 & 1002	Turtlepoint	PA	16750		

LQG=Large Quantity Generator
SQG=Small Quantity Generator
Trans=Transporter
CA=Corrective Action
HWBR=Hazardous Waste Biennial Reporter
CESQG=Conditionally Exempt Small Quantity
UOP=Used Oil Program

APPENDIX G. ILLEGAL DUMPSITES

Dumpsite Characteristics

Site ID	Dumpsite	Municipality	Tons	Proximity to Waterway	Visibility from Road	Terrain	Recent Activity
McKean County							
01	Birch Run Road	Annin Township	0.5	No waterway nearby	Yes	Steep slope	Yes
02	Pine Grove Road	Annin Township	0.5	50 to 100 feet	Yes	Extremely steep	Yes
11	High Street Site 1	Bradford Township	1	50 to 100 feet	Yes	Gently sloped	Yes
12	High Street Site 2	Bradford Township	1	50 to 100 feet	Yes	Gently sloped	Yes
05	Niles Hollow	Bradford Township	2.5	No waterway nearby	Yes	Steep slope	Yes
06	Songbird Road	Bradford Township	2.5	In waterway/wetland	Yes	Medium slope	Yes
07	State Route 770 Site 1	Bradford Township	0.5	50 to 100 feet	Yes	Medium slope	Yes
08	State Route 770 Site 2	Bradford Township	1.5	More than 100 feet	Yes	Gently sloped	Yes
09	State Route 770 Site 3	Bradford Township	2.5	More than 100 feet	Yes	Gently sloped	Yes
10	State Route 770 Site 4	Bradford Township	0.5	More than 100 feet	No	Gently sloped	Yes
04	West Corydon Street	Bradford Township	1.5	More than 100 feet	Yes	Gently sloped	Yes
03	West Washington Street	Bradford Township	3	In waterway/wetland	Yes	Flat	Yes
13	Annin Creek Croad	Ceres Township	10	More than 100 feet	Yes	Extremely steep	Yes
19	Barbertown Road	Ceres Township	2	More than 100 feet	Yes	Steep slope	Yes
18	Bardern Brook	Ceres Township	3	More than 100 feet	Yes	Steep slope	Yes
16	Hanson Hollow	Ceres Township	0.5	Within 50 feet	Partial	Gently sloped	No
14	Newell Creek Road	Ceres Township	1	No waterway nearby	Yes	Steep slope	Yes
17	State Route 44	Ceres Township	1.5	50 to 100 feet	Yes	Steep slope	Yes
15	Whitetail Road	Ceres Township	2.5	No waterway nearby	Yes	Steep slope	Yes
26	Artline Road	Eldred Township	0.5	More than 100 feet	Yes	Medium slope	Yes
25	State Game Lands 301	Eldred Township	15	In waterway/wetland	No	Gently sloped	No
24	West Eldred Road Site 1	Eldred Township	1.5	More than 100 feet	No	Medium slope	No
28	West Eldred Road Site 2	Eldred Township	4	More than 100 feet	Yes	Medium slope	Yes
27	Windfall Road	Eldred Township	12.5	In waterway/wetland	Partial	Flat	Yes
31	Bolivar Dirve	Foster Township	2.5	50 to 100 feet	Yes	Flat	Yes
33	Derrick Road	Foster Township	1.5	No waterway nearby	Yes	Medium slope	Yes
32	Harrisburg Run	Foster Township	1.5	Within 50 feet	Yes	Gently sloped	Yes
29	Hedgehog Lane	Foster Township	5	More than 100 feet	Yes	Steep slope	Yes
30	Interstate Parkway	Foster Township	1	More than 100 feet	Yes	Medium slope	Yes

Dumpsite Characteristics (continued)

Site ID	Dumpsite	Municipality	Tons	Proximity to Waterway	Visibility from Road	Terrain	Recent Activity
34	Looker Mountain Trail	Foster Township	10	No waterway nearby	Yes	Medium slope	Yes
35	Pratt Hollow Site 1	Foster Township	3	No waterway nearby	Yes	Flat	Yes
36	Pratt Hollow Site 2	Foster Township	1.5	No waterway nearby	Yes	Gently sloped	No
46	Baker Road at Route 6	Keating Townhsip	0.5	No waterway nearby	Partial	Extremely steep	Yes
50	Bordell Road	Keating Townhsip	0.5	No waterway nearby	Partial	Gently sloped	No
49	East Valley Road	Keating Townhsip	4	More than 100 feet	No	Steep slope	Yes
48	Kent Hollow	Keating Townhsip	1.5	In waterway/wetland	Partial	Steep slope	No
47	Stickles Hollow Road	Keating Townhsip	2.5	No waterway nearby	Yes	Gently sloped	Yes
37	Big Shanty Road	Lafayette Township	0.5	No waterway nearby	Partial	Gently sloped	Yes
56	Bush Hill Road	Liberty Township	1.5	In waterway/wetland	Yes	Steep slope	Yes
58	Bush Hill Road/Baker Road	Liberty Township	0.5	No waterway nearby	Partial	Gently sloped	Yes
59	Coleman Mill Road Site 1	Liberty Township	5	In waterway/wetland	Yes	Steep slope	Yes
60	Coleman Mill Road Site 2	Liberty Township	5	50 to 100 feet	Yes	Extremely steep	Yes
55	Lillbridge Creek Road	Liberty Township	0.5	No waterway nearby	Partial	Steep slope	Yes
61	Strang Hollow Road Site 1	Liberty Township	6	More than 100 feet	No	Gently sloped	Yes
62	Strang Hollow Road Site 2	Liberty Township	1	50 to 100 feet	Partial	Medium slope	Yes
57	Upper Portage Road	Liberty Township	1	Within 50 feet	Yes	Steep slope	Yes
64	Christian Hollow	Norwich Township	1	No waterway nearby	Yes	Steep slope	Yes
63	Combs Creek Road	Norwich Township	2	No waterway nearby	Partial	Steep slope	Yes
65	West Valley Road	Norwich Township	1.5	More than 100 feet	No	Steep slope	Yes
68	Columbia Hill Road	Otto Township	1	No waterway nearby	Partial	Steep slope	Yes
70	Idlewild Road	Otto Township	2.5	No waterway nearby	No	Medium slope	No
69	Kansas Branch Road	Otto Township	1.5	Within 50 feet	Yes	Steep slope	Yes
66	Moody Hollow	Otto Township	1	No waterway nearby	Yes	Steep slope	Yes
67	State Route 646	Otto Township	1	No waterway nearby	No	Steep slope	Yes
73	Bank Street/West Valley Road	Smethport Borough	0.5	More than 100 feet	Yes	Gently sloped	Yes

Waste Characteristics at Dumpsites

Site ID	Dumpsite	Tires	Appliances	Electronics	TVs	Furniture	Mattresses	Car Batteries	Car Parts	Bag Trash	Household Waste	Recyclables	Houshold Hazardous Waste	Clean Fill	Construction/ Demolition Waste	Yard Waste
McKean County																
01	Birch Run Road	3	2	1	1	1	0	0	No	No	Yes	Yes	No	No	No	No
02	Pine Grove Road	3	0	1	0	0	1	0	Yes	Yes	Yes	Yes	No	No	No	No
11	High Street Site 1	8	0	1	0	0	0	0	No	Yes	Yes	Yes	No	No	Yes	Yes
12	High Street Site 2	3	1	0	0	0	0	0	No	Yes	Yes	No	No	No	Yes	Yes
05	Niles Hollow	25	10	5	5	3	0	0	Yes	Yes	No	No	Yes	Yes	Yes	Yes
06	Songbird Road	0	0	0	0	0	1	0	No	Yes	Yes	Yes	No	Yes	Yes	Yes
07	State Route 770 Site 1	6	0	0	2	0	0	0	No	No	Yes	No	No	No	Yes	Yes
08	State Route 770 Site 2	0	0	1	1	0	0	0	No	Yes	No	No	No	No	Yes	Yes
09	State Route 770 Site 3	0	2	0	0	0	0	0	No	Yes	No	No	No	No	Yes	Yes
10	State Route 770 Site 4	0	0	0	0	0	0	0	No	No	Yes	No	No	No	No	No
04	West Corydon Street	3	0	0	0	0	0	0	No	No	Yes	No	No	No	No	Yes
03	West Washington Street	1	0	0	0	0	0	0	No	No	No	No	No	No	Yes	Yes
13	Annin Creek Croad	35	5	0	1	15	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
19	Barbertown Road	1	1	0	1	3	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No
18	Bardern Brook	25	3	0	0	4	2	0	Yes	Yes	Yes	Yes	No	Yes	Yes	No
16	Hanson Hollow	1	1	0	0	0	0	0	No	No	Yes	Yes	No	No	No	No
14	Newell Creek Road	2	2	0	0	0	0	0	Yes	Yes	Yes	Yes	No	No	No	No
17	State Route 44	4	1	0	0	2	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
15	Whitetail Road	15	0	0	0	3	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
26	Artline Road	1	0	0	1	1	0	0	No	Yes	Yes	Yes	No	No	No	No
25	State Game Lands 301	25	6	0	0	0	0	0	Yes	No	Yes	Yes	No	No	No	No
24	West Eldred Road Site 1	8	5	0	0	0	0	0	Yes	Yes	Yes	Yes	No	No	No	No
28	West Eldred Road Site 2	60	1	0	0	0	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
27	Windfall Road	40	10	2	3	3	0	0	Yes	Yes	Yes	Yes	No	No	Yes	Yes
31	Bolivar Dirve	0	0	0	0	0	0	0	No	Yes	Yes	Yes	No	No	Yes	Yes
33	Derrick Road	8	0	0	0	0	0	0	No	No	No	No	No	No	Yes	Yes
32	Harrisburg Run	3	1	0	0	0	0	0	No	No	No	No	No	No	Yes	Yes

Waste Characteristics at Dumpsites

Site ID	Dumpsite	Tires	Appliances	Electronics	TVs	Furniture	Mattresses	Car Batteries	Car Parts	Bag Trash	Household Waste	Recyclables	Houshold Hazardous Waste	Clean Fill	Construction/ Demolition Waste	Yard Waste
29	Hedgehog Lane	7	0	0	0	0	0	0	No	Yes	No	Yes	No	Yes	Yes	Yes
30	Interstate Parkway	0	0	0	0	0	0	0	No	No	No	No	No	No	No	Yes
34	Looker Mountain Trail	100	5	1	0	0	10	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	Pratt Hollow Site 1	0	2	0	0	0	0	0	No	Yes	Yes	Yes	No	No	Yes	No
36	Pratt Hollow Site 2	9	3	0	2	0	0	0	No	No	No	No	No	No	Yes	Yes
46	Baker Road at Route 6	1	1	0	0	2	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
50	Bordell Road	6	1	0	0	1	0	0	Yes	No	Yes	No	No	No	No	No
49	East Valley Road	20	5	1	1	4	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
48	Kent Hollow	15	1	1	0	1	0	0	Yes	Yes	Yes	No	No	Yes	Yes	No
47	Stickles Hollow Road	12	2	0	0	3	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
37	Big Shanty Road	0	0	0	0	0	0	0	Yes	Yes	No	No	No	No	No	No
56	Bush Hill Road	0	0	1	0	1	0	0	No	Yes	Yes	No	No	No	No	No
58	Bush Hill Road/Baker Road	0	1	1	0	3	0	0	No	Yes	Yes	Yes	No	No	No	No
59	Coleman Mill Road Site 1	40	8	0	1	5	1	0	Yes	Yes	Yes	Yes	No	No	Yes	No
60	Coleman Mill Road Site 2	20	10	0	3	20	2	0	Yes	Yes	Yes	Yes	No	No	Yes	Yes
55	Lillbridge Creek Road	3	0	0	1	0	0	0	Yes	Yes	Yes	Yes	No	No	No	No
61	Strang Hollow Road Site 1	15	5	2	3	5	1	4	Yes	Yes	Yes	Yes	No	No	Yes	Yes
62	Strang Hollow Road Site 2	2	0	1	0	3	0	0	Yes	Yes	Yes	Yes	No	No	No	No
57	Upper Portage Road	2	2	0	1	6	1	0	Yes	No	Yes	Yes	No	No	No	No
64	Christian Hollow	6	3	1	0	1	0	0	Yes	Yes	Yes	Yes	No	No	No	No
63	Combs Creek Road	3	7	1	0	1	0	0	Yes	Yes	Yes	Yes	No	No	No	No
65	West Valley Road	10	3	0	0	1	0	0	Yes	Yes	Yes	Yes	No	Yes	Yes	No
68	Columbia Hill Road	15	1	1	3	2	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
70	Idlewild Road	0	0	0	0	0	0	0	Yes	No	No	Yes	No	No	No	No
69	Kansas Branch Road	12	1	0	0	0	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
66	Moody Hollow	3	1	0	1	1	0	0	Yes	Yes	Yes	Yes	No	Yes	Yes	No
67	State Route 646	4	1	0	2	1	0	0	Yes	Yes	Yes	Yes	No	No	Yes	No
73	Bank Street/West Valley Road	3	1	0	0	1	0	0	No	Yes	Yes	Yes	No	Yes	Yes	Yes

(Source: PA CleanWays, 2008)

APPENDIX H. WATERWAY DESIGNATIONS

Waterway	Designation
Allegheny River Watershed	
Woodcock Creek	**HQ-CWF**
Gross Hollow	**CWF**
Wambold Hollow	**HQ-CWF**
Pigeon Hollow	**CWF**
Toombs Hollow	**CWF**
Kohler Hollow	**CWF**
Dwight Creek	**HQ-CWF**
Peet Brook	**CWF**
Lent Hollow	**CWF**
Prosser Hollow	**CWF**
Baker Creek	**CWF**
Steer Run	**HQ-CWF**
Reese Hollow	**CWF**
Mill Creek-Source to North Hollow	**HQ-CWF**
Mill Creek-North Hollow to Mouth	**CWF**
Dingman Run	**HQ-CWF**
Earl Hollow	**CWF**
Pump Station Hollow	**CWF**
Elm Flat	**CWF**
Gleason Hollow	**CWF**
Reed Run	**HQ-CWF**
Trout Brook	**CWF**
Laninger Creek	**HQ-CWF**
Fishing Creek	**CWF**
East Branch Fishing Creek	HQ-CWF
Card Creek	**CWF**
Sartwell Creek	**CWF**
Allegheny Portage Creek-Source to Brown Hollow & Scaffold Lick Run to mouth	**TSF**
Allegheny Portage Creek-Brown Hollow to Scaffold Lick Run	**HQ-CWF**
Planning Mill Hollow	CWF
Brown Hollow	HQ-CWF
Indian Run	CWF
Heath Hollow	CWF
Fair Run	HQ-CWF
Rock Run	CWF
Scaffold Lick Run	CWF
Cady Hollow	CWF
Hamilton Run	CWF
Tramroad Hollow	CWF
Combs Creek	CWF
Lillibridge Creek	CWF

Waterway	Designation
Allegheny River Watershed (continued)	
Skinner Creek	**HQ-CWF**
Two Mile Creek	**CWF**
Anin Creek	**CWF**
Rock Run	**CWF**
Open Brook	
Newell Creek	**CWF**
Potato Creek-Confluence of East Branch and Havens Run to Cole Creek	**TSF**
Potato Creek-Cole Creek to Mouth	**WWF**
East Branch Potato Creek	HQ-CWF
Havens Run	CWF
Indian Run	CWF
Frog Camp Hollow	CWF
Kimball Hollow	CWF
West Branch Potato Creek	HQ-CWF
Sackett Hollow	CWF
Brewer Run	HQ-CWF
Evans Hollow	CWF
Red Mill Brook	CWF
Wernwag hollow	*HQ-CWF*
Browns Mill	*CWF*
Combs Creek	*CWF*
Colegrove Brook	HQ-CWF
Robbins Brook	HQ-CWF
Walcott Brook	CWF
Bayer Brook	HQ-CWF
Daly Brook	HQ-CWF
Marvin Creek	CWF
Sherman Run	*HQ-CWF*
Santeen Run	*HQ-CWF*
Wildcat Hollow	*CWF*
Warner Brook	*HQ-CWF*
Stanton Brook	*HQ-CWF*
Bloonster Hollow	*CWF*
Blacksmith Run- Source to Smethport Water Intake	*HQ-CWF*
Blacksmith Run- Smethport Water Intake to Mouth	*CWF*
Cole Creek	CWF
South Branch Cole Creek	*EV*
Pierce Brook	CWF
Carpenter Creek	**CWF**
Canfield Creek	**CWF**
Barden Brook	**CWF**

Waterway	Designation
Allegheny River Watershed (continued)	
Knapp Creek	**CWF**
Tram Hollow Run	CWF
Kansas Branch	CWF
South Branch Knapp Creek	CWF
Indian Creek	**CWF**
North Branch Indian Creek	CWF
Mix Creek	**CWF**
McCrea Run	**CWF**
Oswayo Creek-Source to Brizzee Hollow; Clara Creek to Honeoye Creek	**CWF**
Oswayo Creek-Brizzee Hollow to Clara Creek	**HQ-CWF**
Brizzee Hollow	HQ-CWF
South Branch Oswayo Creek	EV
Clara Creek	CWF
Bradley Run	*HQ-CWF*
Elevenmile Creek	HQ-CWF
Canada Run	CWF
Wildcat Creek	CWF
Cow Run	HQ-CWF
Honeoye Creek	CWF
Butter Creek	*HQ-CWF*
Plank Creek	*CWF*
Janders Run	HQ-CWF
Horse Run	CWF
Bell Run	CWF
Shaytown Branch	*CWF*
Chapman Brook	*CWF*
Taylor Brook	*HQ-CWF*
Kings Run	CWF
Tunungwant Creek	**WWF**
McCrea Run	CWF
East Branch Tunungwant Creek-Source to SR 4002 Bridge	HQ-CWF
East Branch Tunungwant Creek-SR 4002 Bridge to confluence with West Branch	CWF
Railroad Run	*EV*
Sheppard Run	*CWF*
Minard Run	*EV*
West Branch Tunungwant Creek-Source to Marilla Brook	HQ-CWF
West Branch Tunungwant Creek-Marilla Brook to confluence with East Branch	CWF
Marilla Brook- Source to Marilla Brook Reservoir Dam	*HQ-CWF*
Marilla Brook- Marilla Brook Reservoir Dam to Mouth	*CWF*
Gilbert Brook	*HQ-CWF*
Kendall Creek	WWF
Bolivar Run	CWF
Foster Brook	CWF

APPENDIX I. IMPAIRED WATERWAYS

Waterway	Use Designation	Length (miles)	Source	Cause	Date Listed	TMDL Date
Allegheny River	Fish Consumption	14.91	Unknown	Mercury	2002	2015
	Fish Consumption	13.58	Unknown	Mercury	2002	2015
	Aquatic Life	2.08	Unknown	Metals	2006	2019
	Recreational	9.22	Unknown	Pathogens	2010	2023
Unnamed Trib #112367505 to Allegheny River	Aquatic Life	0.31	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112367605 to Allegheny River	Aquatic Life	0.51	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112367609 to Allegheny River	Aquatic Life	0.21	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112367381 to Allegheny River	Aquatic Life	0.24	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112367485 to Allegheny River	Aquatic Life	0..48	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112367585 to Allegheny River	Aquatic Life	1.15	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Barden Brook	Aquatic Life	3.64	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112363733 to Barden Brook	Aquatic Life	0.68	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112363751 to Barden Brook	Aquatic Life	0.96	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112363799 to Barden Brook	Aquatic Life	0.64	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112363347 to Barden Brook	Aquatic Life	0.65	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112363349 to Barden Brook	Aquatic Life	0.41	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Canfield Creek	Aquatic Life	2.24	Agriculture	Siltation	2006	2019
Unnamed Trib #112364911 to Canfield Creek	Aquatic Life	0.74	Agriculture	Siltation	2006	2019

Waterway	Use Designation	Length (miles)	Source	Cause	Date Listed	TMDL Date
Unnamed Trib #112364933 to Canfield Creek	Aquatic Life	0.63	Agriculture	Siltation	2006	2019
Unnamed Trib #112374193 to Combs Creek	Aquatic Life	0.54	Road Runoff	Siltation	2006	2019
Unnamed Trib #112374551 to Combs Creek	Aquatic Life	0.6	Road Runoff	Siltation	2006	2019
Unnamed Trib #112374803 to Combs Creek	Aquatic Life	0.72	Road Runoff	Siltation	2006	2019
Unnamed Trib #112374915 to Combs Creek	Aquatic Life	0.52	Road Runoff	Siltation	2006	2019
Unnamed Trib #112374035 to Combs Creek	Aquatic Life	2.02	Road Runoff	Siltation	2006	2019
Foster Brook	Aquatic Life	2.36	Small Residential Runoff	Nutrients	2006	2019
				Siltation	2006	2019
Foster Brook	Aquatic Life	3.05	Petroleum Activities	Nutrients	2006	2019
				Siltation	2006	2019
			Road Runoff	Nutrients	2006	2019
				Siltation	2006	2019
			Small Residential Runoff	Nutrients	2006	2019
				Siltation	2006	2019
Unnamed Trib #112364717 to Foster Brook	Aquatic Life	0.57	Petroleum Activities	Nutrients	2006	2019
				Siltation	2006	2019
			Road Runoff	Nutrients	2006	2019
				Siltation	2006	2019
			Small Residential Runoff	Nutrients	2006	2019
				Siltation	2006	2019
Unnamed Trib #112364813 to Foster Brook	Aquatic Life	0.37	Petroleum Activities	Nutrients	2006	2019
				Siltation	2006	2019
			Road Runoff	Nutrients	2006	2019
				Siltation	2006	2019
			Small Residential Runoff	Nutrients	2006	2019
				Siltation	2006	2019
Lillibridge Creek	Aquatic Life	3.67	Grazing Related Agriculture	Siltation	2006	2019
	Aquatic Life	1.04	Small Residential Runoff	Siltation	2006	2019

Waterway	Use Designation	Length (miles)	Source	Cause	Date Listed	TMDL Date
Unnamed Trib #112368415 to Lillibridge Creek	Aquatic Life	0.39	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib #112368599 to Lillibridge Creek	Aquatic Life	0.38	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib #112369095 to Lillibridge Creek	Aquatic Life	0.47	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib #112369597 to Lillibridge Creek	Aquatic Life	0.51	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib #112369747 to Lillibridge Creek	Aquatic Life	0.61	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib #112370031 to Lillibridge Creek	Aquatic Life	1.19	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib #112373765 to Marvin Creek	Aquatic Life	1.41	Unknown	Nutrients	2006	2019
				Siltation	2006	2019
Newell Creek	Aquatic Life	6.01	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112364993 to Newell Creek	Aquatic Life	0.42	Road Runoff	Siltation	2006	2019
Unnamed Trib #112365813 to Newell Creek	Aquatic Life	0.34	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112365181 to Newell Creek	Aquatic Life	0.94	Road Runoff	Siltation	2006	2019
Unnamed Trib #112365337 to Newell Creek	Aquatic Life	0.56	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112365605 to Newell Creek	Aquatic Life	1.09	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112365717 to Newell Creek	Aquatic Life	1.09	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112365895 to Newell Creek	Aquatic Life	0.38	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112365949 to Newell Creek	Aquatic Life	0.75	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019
Unnamed Trib #112365173 to Newell Creek	Aquatic Life	0.12	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2006	2019

Waterway	Use Designation	Length (miles)	Source	Cause	Date Listed	TMDL Date
Railroad Run	Aquatic Life	2.77	Abandoned Mine Drainage	pH	2006	2019
Unnamed Trib #112377017 to Railroad Run	Aquatic Life	0.58	Abandoned Mine Drainage	pH	2006	2019
Unnamed Trib #112377057 to Railroad Run	Aquatic Life	1.05	Abandoned Mine Drainage	pH	2006	2019
Rock Run	Aquatic Life	6.02	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112365829 to Rock Run	Aquatic Life	0.55	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112365885 to Rock Run	Aquatic Life	0.37	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112366159 to Rock Run	Aquatic Life	0.52	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112366415 to Rock Run	Aquatic Life	0.87	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112366663 to Rock Run	Aquatic Life	0.47	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112366723 to Rock Run	Aquatic Life	0.65	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112367273 to Rock Run	Aquatic Life	0.4	Grazing Related Agriculture	Siltation	2006	2019
Unnamed Trib # 112367945 to Rock Run	Aquatic Life	0.25	Grazing Related Agriculture	Siltation	2006	2019
			Road Runoff	Siltation	2003	2019
Scaffold Lick Run	Aquatic Life	6.69	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375003 to Scaffold Lick Run	Aquatic Life	0.35	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375169 to Scaffold Lick Run	Aquatic Life	0.7	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375213 to Scaffold Lick Run	Aquatic Life	0.42	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375747 to Scaffold Lick Run	Aquatic Life	0.13	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375099 to Scaffold Lick Run	Aquatic Life	0.97	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011

Waterway	Use Designation	Length (miles)	Source	Cause	Date Listed	TMDL Date
Unnamed Trib #112375379 to Scaffold Lick Run	Aquatic Life	2.41	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375591 to Scaffold Lick Run	Aquatic Life	0.17	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375755 to Scaffold Lick Run	Aquatic Life	0.61	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375815 to Scaffold Lick Run	Aquatic Life	0.69	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375817 to Scaffold Lick Run	Aquatic Life	0.72	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112375969 to Scaffold Lick Run	Aquatic Life	1.09	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112376189 to Scaffold Lick Run	Aquatic Life	0.67	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Unnamed Trib #112376223 to Scaffold Lick Run	Aquatic Life	0.72	Abandoned Mine Drainage	Organic Enrichment/Low D.O.	1998	2011
				pH	1998	2011
Tunungwant Creek	Fish Consumption	4.55	Unknown	Mercury	2002	2015
	Aquatic Life	4.74	Channelization	Unknown	2006	2019
			Industrial Point Source	Unknown	2006	2019
			Removal of Vegetation	Unknown	2006	2019
West Branch Tunungwant Creek	Aquatic Life	0.76	Other	Nutrients	2006	2019
			Upstream Impoundment	Nutrients	2006	2019
Unnamed Trib #112366341 to West Branch Tunungwant Creek	Aquatic Life	0.83	Petroleum Activities	Metals	2006	2019

APPENDIX J. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Handler	Permit #	Type	Address	City	State	Zip	Expiration Date
Allegheny Highlands Council	PA0032042	Minor	BSA-Elk Lick Scout Reserve	Smethport	PA	16749	4/11/2004
American Refing Group, Inc.	PA0002674	Major	77 North Kendall Avenue	Bradford	PA	16701	4/20/2010
American Refining Group, Inc	PAG108308	Minor	77 North Kendall Avenue	Bradford	PA	16701	6/7/2012
Bazzoui, Wadid SFTP	PA0209945	Minor	656 Minard Run Road	Bradford	PA	16701	6/9/2012
Bradford City Authority Water Treatment Plant	PA0101621	Minor	West Corydon Street Extension	Bradford	PA	16701	11/29/2010
Bradford Forest Products	PA0210625	Minor	444 High Street	Bradford	PA	16701	6/28/2012
Bradford Sanitary Authority Sewage Treatment Plant	PA0026379	Major	410 Seward Ave	Bradford	PA	16701	5/20/2012
Coudersport Area Municipal Authority	PA0043419	Minor	Tolls Hollow Road	Coudersport	PA	16915	12/31/2010
Daily Bread Cafe	PA0104035	Minor	2906 State Rout 155	Port Allegany	PA	16743	9/30/2012
Dresser Piping Specialities, Inc	PA0002461	Minor	41 Fisher Ave	Bradford	PA	16701	9/27/2010
Eldred Borough Municipal Authority	PA0020052	Minor	Route 446	Eldred	PA	16731	2/27/2010
Glen O. Hawbaker Incorporated	PAR708307	Minor	Turtlepoint Asphalt Plant 7	Turtlepoint	PA	16750	9/5/2012
Graham Packaging	PAR238312	Minor	105 Bolivar Drive	Bradford	PA	16701	4/15/2014
Hamlin Township Sewer Plant	PA0210781	Minor	664 Dewey Avenue	Hazel Hurst	PA	16749	9/30/2013
International Waxes Farmers-Valley Plant	PA0002372	Major	Intersection of Routes 46 & 446	Smethport	PA	16749	4/24/2010
Morgan Advance Materials & Technology	PA0003565	Minor	East Second Street	Coudersport	PA	16915	6/30/2010
PA DOT-McKean County Maintenance Facility	PA0035581	Minor	Bingham Road	Cyclone	PA	16726	10/3/2011
Pithold Water Association	PA0220906	Minor	Pithold Road	Cyclone	PA	16726	1/14/2013
Pittsburgh Corning Corporation	PA0002151	Minor	723 North Main Street	Port Allegany	PA	16743	3/10/2013
Port Allegany Borough	PA0025739	Minor	Glass Place	Port Allegany	PA	16743	7/19/2010
Roulette Township	PA0209066	Minor	State Route 4003	Roulette	PA	16746	1/31/2010
Saint Gobain Containers	PA0001872	Minor	One Glass Place	Port Allegany	PA	16743	10/26/2010
Shinglehouse Borough WWTP	PA0036773	Minor	Wolcott Drive	Shinglehouse	PA	16748	2/28/2011

Handler	Permit #	Type	Address	City	State	Zip	Expiration Date
Smethport Wastewater Treatment Plant	PA0021521	Minor	Route 46 North	Smethport	PA	16749	2/14/2011
Zippo Manufacturing Company	PA0002976	Major	Congress Street Extension	Bradford	PA	16701	11/28/2009
Limestone (v) Wastewater Treatment Plan	NY0029068	Minor	Rt 219 Railroad Street	Limestone	NY	14753	9/30/2012
Portville (v) Wastewater Treatment Plan	NY0020966	Minor	1 Main Street	Portville	NY	14770	9/30/2011
Indeck-Olson Energy Center	NY0245089	Minor	140 Moore Avenue	Olean	NY	14770	5/31/2012
Olean (c) Wastewater Treatment Plant	NY0027162	Major	174 South 19th Street	Olean	NY	14770	8/31/2011
Olean (c) Water Treatment Plan	NY0258890	Minor	River Rioad & East Pine Street	Olean	NY	14760	4/30/2011
Cutco Cutery Corporation	NY0101583	Minor	116 East Street	Olean	NY	14770	11/30/2012

(Sources: U.S. EPA, 2009)

APPENDIX K. WILDLIFE LISTING

Common Name	Scientific Name
Amphibitans	
bullfrog	*Rana catesbeiana*
American toad	*Bufo americanus*
eastern gray treefrog	*Hyla versicolor*
eastern hellbender	*Cryptobranchus alleganiensis alleganiensis*
four-toed salamander	*Hemidactylium scutatum*
jefferson salamander	*Ambystoma jeffersonianum*
longtail salamander	*Eurycea longicauda*
marbled salamander	*Ambystoma opacum*
mountain dusky salamander	*Desmognathus ochrophaeus*
mudpuppy	*Necturus maculosus*
northern two-lined salamander	*Eurycea bislineata*
northern dusky salamander	*Desmognathus fuscus*
northern green frog	*Rana clamitans*
northern leopard frog	*Rana pipiens*
northern red salamander	*Pseudotriton ruber*
northern spring peeper	*Pseudacris crucifer*
northern spring salamander	*Gyrinophilus porphyriticus*
pickerel frog	*Rana palustris*
redback salamander	*Plethodon cinereus*
red-spotted newt	*Notophthalmus viridescens*
slimy salamander	*Plethodon glutinosus*
spotted salamander	*Ambystoma maculatum*
Wehrle's salamander	*Plethodon wehrlei*
wood frog	*Rana sylvatica*

Birds	
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
American woodcock	*Scolopax minor*
bald eagle	*Haliaeetus leucocephalus*
Baltimore oriole	*Icterus galbula*
barn owl	*Tyto alba*
barred owl	*Strix varia*
black-capped chickadee	*Poecile atricapillus*
black-throated green warbler	*Dendroica virens*
blue jay	*Cyanocitta cristata*
blue-gray gnatcatcher	*Poliptila caerulea*
bohemian waxwing	*Bombycilla garrulus*
broad-winged hawk	*Buteo platypterus*
brown thrasher	*Toxostoma rufum*
brown-headed cowbird	*Molothrus ater*
Canada goose	*Branta canadensis*

Common Name	Scientific Name
Birds (continued)	
Carolina chickadee	*Poecile carolinensis*
cedar waxwing	*Bombycillus cedrorum*
cerulean warbler	*Dendroica cerulea*
chestnut sided warbler	*Dendroica pensylvanica*
common grackle	*Quiscalus quiscula*
common yellow throat	*Geothlypis trichas*
Cooper's hawk	*Accipiter cooperil*
Dark-eyed junco	*Junco hyemalis*
downy wood pecker	*Picoides pubescens*
eastern bluebird	*Sialia sialis*
eastern screech owl	*Megascops asio*
eastern screech owl	*Otus asio*
great blue heron	*Ardea herodias*
great horned owl	*Bubo virginianus*
green heron	*Butorides virescens*
house finch	*Carpodacus mexicanus*
house wren	*Troglodytes aedon*
indigo bunting	*Passerina cyanea*
killdeer	*Charadrius vociferus*
mallard duck	*Anas platyrhynchos*
mourning dove	*Zenaida macroura*
mourning warbler	*Oporonis philadelphia*
northern cardinal	*Cardinalis cardinalis*
northern flicker	*Colaptes auratus*
northern goshawk	*Accipiter gentillis*
northern mocking bird	*Mimus polyglottos*
northern saw-wheat owl	*Aegolius acadicus*
osprey	*Pandion haliaetus*
pileated wood pecker	*Dryocopus pileatus*
purple finch	*Carpodacus purpureaus*
red-bellied wood pecker	*Melanerpes carolinus*
red-shouldered hawk	*Buteo lineatus*
red-tail hawk	*Buteo jamaicensis*
red-winged black bird	*Agelaius phoeniceus*
ruby-throated hummingbird	*Archilochus colubris*
ruffed grouse	*Bonasa umbellus*
scarlet tanger	*Piranga olivacea*
song sparrow	*Melospiza melodia*
Swainson's Thrush	*Catharus ustulatus*
tree swallow	*Tachycineta bicolor*
tufted titmouse	*Baeolophus bicolor*
turkey vulture	*Cathartes aura*
white breasted nut hatch	*Sitta carolinensis*
white throated sparrow	*Zonotrichia albicollis*

Common Name	Scientific Name
Birds (continued)	
wild turkey	*Meleagris gallopavo*
Wilson's Snipe	*Gallinago delicata*
wood duck	*Aix sponsa*
yellow-bellied sapsucker	*Sphyrapicus varius*

Fish

Lamprey: Family Petromyzontidae

American brook lamprey	*Lampetra appendix*
mountain brook lamprey	*Ichthyomyzon greeleyi*
Ohio lamprey	*Icthyomyzon bdellium*

Rocklings: Family Lotidae

burbot	*Lota lota*

Pikes: Family Esocidae

muskellunge	*Esox masquinongy*
northern pike	*Esox lucius*
tiger muskellunge	*Esox lucius cross Esox masquinongy*

Catfish: Family Ictaluridae

channel catfish	*Ictalurus punctatus*

Minnows: Family Cyprinidae

bigmouth shiner	*Notropis dorsalis*
southern redbelly dace	*Phoxinus erythrogaster*

Perches: Family Percidae

channel darter	*Percina copelandi*
longhead darter	*Percina macrocephala*
yellow perch	*Perca flavescens*
walleye	*Sander vitreus*

Trout: Family Salmonidae

brook trout	*Salvelinus fontinalis*
brown trout	*Salmo trutta*
rainbow trout	*Oncorhynchus mykiss*

Sunfish: Family Centrarchidae

black crappie	*Pomoxis nigromaculatus*
bluegill	*Lepomis macrochirus*
largemouth bass	*Micropterus salmoides*
pumpkin seed	*Lepomis gibbosus*
rock bass	*Ambloplites ruperstris*
small mouth bass	*Micropterus dolomieu*

Common Name	Scientific Name
Fish (continued)	
Sunfish: Family Centrarchidae (continued)	
white crappie	*Pomoxis annularis*
Temperate Basses: Family Percichthydae	
white bass	*Morone chrysops*
Mammals	
American beaver	*Castor canadensis*
American black bear	*Ursus americanus*
American mink	*Mustela vison*
Appalachian Cottontail	*Sylvilagus obscurus*
big brown bat	*Eptesicus fuscus*
bobcat	*Lynx rufus*
boreal redback vole	*Clethrionomys gapperi*
coyote	*Canis latrans*
deer mouse	*Peromyscus maniculatus*
eastern chipmunk	*Tamias striatus*
eastern cottontail	*Sylvilagus floridanus*
eastern fox squirrel	*Sciurus niger*
eastern gray squirrel	*Sciurus carolinensis*
eastern pipistrel	*Pipistrellus subflavus*
Eastern small-footed bat	*Myotis leibii*
eastern woodrat	*Neotoma floridana*
elk	*Cervus canadensis*
gray fox	*Urocyon cinereoargenteus*
hairy-tailed mole	*Parascalops breweri*
hoary bat	*Lasiurus cinereus*
Indiana bat	*Myotis sodalis*
keen myotis	*Myotis keenii*
least shrew	*Cryptotis parva*
least weasel	*Mustela nivalis*
little brown bat	*Myotis lucifugus*
long-tailed shrew	*Sorex dispar*
long-tailed weasel	*Mustela frenata*
masked shrew	*Sorex cinereus*
meadow jumping mouse	*Zapus hudsonius*
meadow vole	*Microtus pennsylvanicus*
muskrat	*Ondatra zibethicus*
New England cottontail	*Sylvilagus transitionalis*
North American porcupine	*Erethizon dorasatum*
northern flying squirrel	*Glaucomys sabrinus*
northern myotis	*Myotis septentrionalis*
northern raccoon	*Procyon lotor*
northern river otter	*Lontra canadensis*

Common Name	Scientific Name
Mammals (continued)	
northern short-tailed shrew	*Blarina brevicauda*
pine vole	*Microtus pinetorum*
pygmy shrew	*Sorex hoyi*
red bat	*Lasiurus borealis*
red fox	*vulpes vulpes*
red squirrel	*Tamiasciurus hudsonicus*
short-tailed weasel	*Mustela erminea*
silver-haired bat	*Lasionycteris noctivagans*
smoky shrew	*Sorex fumeus*
snowshoe hare	*Lepus americanus*
southern bog lemming	*Synaptomys cooperi*
southern flying squirrel	*Claucomys volans*
star-nosed mole	*Condylura cristata*
striped skunk	*Mephitis mephitis*
Virginia opossum	*Didelphis virginiana*
water shrew	*Sorex palustris*
white-footed mouse	*Perocyscus leucopus*
whitetail deer	*Odocoileus virginianus*
woodchuck	*Marmota monax*
woodland jumping mouse	*Napaeozapus insignis*
Reptiles	
black rat snake	*Elaphe obsoleta*
common snapping turtle	*Chelydraserpentina*
eastern garter snake	*Thamnophis sirtalis*
eastern milk snake	*Lampropeltis triangulum*
eastern spiny softshell	*Apalone spinifera spinifera*
midland painted turtle	*Chrysemys picta marginata*
mountain earth snake	*Virginia pulchra*
northern coal skink	*Eumeces anthracinus anthracinus*
northern black racer	*Coluber constrictor constrictor*
northern brown snake	*Storeria dekayi dekayi*
northern redbelly snake	*Storeria occipitomaculata occipitomaculata*
northern ringneck snake	*Diadophis punctatus edwardsii*
northern water snake	*Nerodia sipedon*
queen snake	*Regina septemvittata*
ribbon snake	*Thamnophis sauritus*
shorthead garter snake	*Thamnophis brachystoma*
smooth earth snake	*Virginia valeriae*
smooth green snake	*Opheodrys vernalis*
timber rattlesnake	*Crotalus horridus*
wood turtle	*Clemmys insculpta*

APPENDIX L. Aquatic Community Classifications

Subwatershed	Fish Community	Macroinvertebrate Community	Mussel Community
Bell Run	Coolwater Stream Community	Common Large Stream Community	
Allegheny River-Knapp Creek	Warmwater Community	High Quality Small Stream Community	
East Branch Tunungwant Creek	Coldwater Community	High Quality Large Stream Community	
Potato Creek	Warmwater Community		spike mussel
Marvin Creek	Coolwater Stream Community	Common Large Stream Community	
Allegheny River-Fishing Creek	Warmwater Community	High Quality Small Stream Community	
Allegheny River-Allegheny Portage Creek	Large River Community		spike mussel
West Branch Tunungwant Creek	Coldwater Community		
Honeoye Creek	Coolwater Stream Community		
Elevenmile Creek	Coolwater Stream Community		
Oswago Creek-Elevenmile Creek	Coolwater Stream Community		
Cole Creek	Coolwater Stream Community		
South Branch Oswayo Creek	Large River Community		
Allegheny River-Annin Creek	Coldwater Community		
Sartwell Creek	Coolwater Stream Community		
Fishing Creek	Coolwater Stream Community		
Allegheny River-Mill Creek	Coolwater Stream Community		
Allegheny Portage Creek	Coolwater Stream Community	High Quality Large Stream Community	
Mill Creek	Coldwater Community	High Quality Small Stream Community	
Potato Creek-Walcott Brook	Coolwater Stream Community		
Potato Creek-Sackett Hollow	Coolwater Stream Community		
Oswayo Creek	Warmwater Community		spike mussel

APPENDIX M. SPECIES OF CONCERN

Plants

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location McKean	Location Potter
American Fever-few	G5	S1	TU	PE		X	
Appalachian Blue Violet	G3	S2	PT	TU			X
Backward Sedge	G5	S1	PE	PE			X
Case's Ladies'-tressers	G4	S1	PE	PE		X	X
Cranesbill	G5	S1	PE	PE			X
Creeping Snowberry	G5	S3	PR	PR		X	X
Downy Willow-herb	G5?	S3	PE	PR		X	X
Great-spurred Violet	G5?	S3S4	N	PR		X	X
Highbush-cranberry	G5T5	S3S4	TU	PR		X	
Large Toothwort	G5	S2	N	PT		X	X
Mountain Starwort	G5	S1S2	N	TU			X
Northern Water-plantain	G5	S1	PE	PE		X	X
Oblong-fruited Serviceberry	G5	S1	PE	PE		X	
Purple-fringeless Orchid	G5	S2	TU	PT			X
Queen-of-the-prairie	G4G5	S1S2	TU	TU		X	
Red Currant	G5	S2	PT	PT		X	X
Roan Mountain Sedge	G3	S1		TU			X
Soft-leaved Sedge	G5	S3	PR	PR			X
Spike Sedge	G4	S2	N	PT		X	
Stalked Bulrush	G4	S1	PT	PT		X	X
Strawberry Goosefoot	G5	SH	TU	PE			X
Thread Rush	G5	S3	PR	PR		X	
White Twisted-stalk	G5	S1	PT	PE		X	X

Vertebrates

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location McKean	Location Potter
American Bittern	G4	S1B	PE	PE			X
American Brook Lamprey	G4	S3	PC	CP		X	X
Appalachian Cottontail	G4	SU				X	X
Bald Eagle	G5	S2B	PT	PT		X	
Bigmouth Shiner	G5	S2	PT	PT		X	X
Burbot	G5	S1S2	PE	PE		X	X
Channel Darter	G4	S2		PT		X	X
Coal Skink	G5	S3				X	X
Great Blue Heron	G5	S3S4B,S4N				X	X
Longhead Darter	G3	S2S3		PT		X	X
Mountain Brook Lamprey	G3G4	S2	PT	PT		X	X
Mountain Earth Snake	4	S3					X

Vertebrates (continued)

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location	
						McKean	Potter
Northern Flying Squirrel	G5	SU	PE			X	X
Northern Goshawk	G5	S2S3B,S3N		CR		X	X
Northern Myotis	G4	S3B,S3N		CR		X	
Ohio Lamprey	G3G4	S2S3	PC	CP		X	X
Osprey	G5	S2B	PT	PT		X	
Shorthead Garter Snake	G4	S3				X	X
Silver-haired Bat	G5	SUB		CR		X	
Smooth Green Snake	G5	S3S4				X	
Southern Redbelly Dace	G5	S1	PT	PT		X	
Swainson's Thrush	G5	S2S3B,S5N		CR		X	X
Timber Rattlesnake	G4	S3S4	PC	CA		X	X
Water Shrew	G5T5	S3		CR		X	X
Wilson's Snipe	G5	S3B,S3N		CR		X	

Invertebrates

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location	
						McKean	Potter
American Emerald	G5	S3S4				X	
Atlantis Fritillary	G5	S3				X	
Baltimore	G4	S3					X
Black-tipped Darner	G4	S2S3				X	
Blue-tipped Dancer	G5	S1				X	
Bronze Copper	G5	S3				X	
Brush-tipped Emerald	G5	S2				X	
Creek Heelsplitter	G5	S2S3		CR		X	
Elktoe	G4	S4		N		X	
Eyed Brown	G4	S3				X	
Forcipate Emerald	G5	S2				X	
Green-striped Darner	G5	S3S4				X	
Harpoon Clubtail	G4	S1S2				X	X
Harris' Checkerspot	G4	S3				X	X
Indian Skipper	G5	S3				X	
Leonard's Skipper	G4	S3				X	
Long-solid	G3	S1		PE		X	X
Maine Snaketail	G4	S3				X	X
Northern Bluet	G5	S3					X
Northern Pygmy Clubtail	G4	S3S4				X	X
Ocellated Darner	G5	S3				X	X
Red-waisted Whiteface	G5	S2				X	
Riffle Snaketail	G5	S2S3					X
Round Pigtoe	G4G5	S2		PE		X	X

Invertebrates (continued)

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location McKean	Location Potter
Sable Clubtail	G4	S1					X
Silver Bordered Fritillary	G5T5	S3				X	
Ski-tailed Emerald	G5	S2				X	
Superb Jewelwing	G4	S2S3				X	X
Wavy-rayed Lampmussel	G5	S4		N		X	
West Virginia White	G3G4	S2S3					X
White-faced Meadowhawk	G5	S3S4				X	
Zebra Clubtail	G4	S1				X	

Geological Features

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location McKean	Location Potter
Erosional Remnant	GNR	SNR				X	

Natural Communities

Common Name	Global Rank	State Rank	State Status	Proposed State Status	Federal Status	Location McKean	Location Potter
Ephemeral/fluctuating Natural Pool	GNR	S3					X
Hemlock Palustrine Forest	GNR	S3					X
High-gradient Clearwater Creek	GNR	S3				X	X
White Pine Forest	GNR	SNR					X

Basic Global Rank Codes and Definitions

Rank Code	Description	Definition
GX	Presumed Extinct	Believed to be extinct throughout its range. Not located despite intensive searches of historic sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
GH	Possibly Extinct	Known from only historical occurrences. Still some hope of rediscovery.
G1	Critically Imperiled	Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or stream miles (<10).
G2	Imperiled	Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or stream miles (10 to 50).
G3	Vulnerable	Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.
G4	Apparently Secure	Uncommon but not rare, and usually widespread. Possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.
G5	Secure	Common, typically widespread and abundant. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
G#G#	Range Rank	A numeric range rank (e.g., G2G3) is used to indicate uncertainty about the exact status of a taxon.
T	Infraspecific Taxon (trinomial)	The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A "T" subrank cannot imply the subspecies or variety is more abundant than the species= basic rank (e.g.., a G1T2 subrank should not occur). A population (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T rank to denote the taxon's questionable taxonomic status.

Global Rank Qualifiers

Qualifier	Description	Definition
?	Inexact Numeric Rank	Denotes inexact numeric rank.
Q	Questionable Taxonomy	Taxonomic status is questionable; numeric rank may change with taxonomy.
C	Captive or Cultivated Only	Taxon at present is extant only in captivity or cultivation, or as a reintroduced population not yet established.

State Rank Codes and Definitions

Rank Code	Description	Definition
SX	Extirpated	Element is believed to be extirpated from the "state" (or province or other subnational unit).
SH	Historical	Element occurred historically in the state (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 years, and suspected to be still extant. Naturally, an element would become SH without such a 20-year delay if the only known occurrences in a state were destroyed or if it had been extensively and unsuccessfully looked for. Upon verification of an extant occurrence, SH-ranked elements would typically receive an S1 rank. The SH rank should be reserved for elements for which some effort has been made to relocate occurrences, rather than simply ranking all Elements not known from verified extant occurrences with this rank.
S1	Critically Imperiled	Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer occurrences or very few remaining
S2	Imperiled	Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals or acres.
S3	Vulnerable	Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically
S4	Apparently Secure	Uncommon but not rare, and usually widespread in the state. Usually more than 100 occurrences.
S5	Secure	Demonstrably widespread, abundant, and secure in the state, and essentially ineradicable under present conditions.
S?	Unranked	State rank is not yet assessed.
SU	Unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible, the most likely rank is assigned and a question mark added (e.g.., S2?) to express uncertainty, or a range rank (e.g.., S2S3) is used to delineate the limits (range) of uncertainty.

State Rank Codes and Definitions (continued)

Rank Code	Description	Definition
S#S#	Range Rank	A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the Element. Ranges cannot skip more than one rank (e.g.., SU should be used rather than S1S4).
HYB	Hybrid	Element represents an interspecific hybrid.
SE	Exotic	An exotic established in the state; may be native in nearby regions (e.g.., house finch or catalpa in eastern U.S.).
SE#	Exotic Numeric	An exotic established in the state that has been assigned a numeric rank to indicate its status, as with S1 through S5.
SA	Accidental	Accidental or casual in the state (i.e., infrequent and outside usual range). Includes species (usually birds or butterflies) recorded once or only a few times. A few of these species may have bred on the one or two occasions they were recorded. Examples include European strays or western birds on the East Coast and vice-versa.
SZ	Zero Occurrences	Not of practical conservation concern in the state because there are no definable occurrences, although the taxon is native and appears regularly in the state. This rank will generally be used for long distance migrants whose occurrences during their migrations have little or no conservation value for the migrant as they are typically too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped, and protected. Typically, the SZ rank applies to a non-breeding population in the subnation -- for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population, for example certain Lepidoptera which regularly die out every year with no significant return migration. Although the SZ rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an SZ rank. SZ only applies when the migrants occur in an irregular, transitory, and dispersed manner.
SP	Potential	Potential that Element occurs in the state but no extant or historic occurrences reported.
SR	Reported	Element reported in the state but without a basis for either accepting or rejecting the report. Some of these are very recent discoveries for which the program hasn't yet received first-hand information; others are old, obscure reports.
SRF	Reported Falsely	Element erroneously reported in the state (e.g., misidentified specimen) and the error has persisted in the literature
SSYN	Synonym	Element reported as occurring in the state, but state does not recognize the taxon; therefore the Element is not ranked by the state.
*		S rank has been assigned and is under review. Contact the individual state Natural Heritage program for assigned rank.

State Rank Codes and Definitions (continued)

Rank Code	Description	Definition
Not Provided		Species is known to occur in this state. Contact the individual state Natural Heritage program for assigned rank.

State Rank Qualifiers

Qualifier	Description	Definition
80	Breeding	Basic rank refers to the breeding population of the Element in the state.
N	Non-breeding	Basic rank refers to the non-breeding population of the Element in the state.
?	Inexact or Uncertain	Denotes inexact or uncertain numeric rank. For SE denotes uncertainty of exotic status. (The ? qualifies the character immediately preceding it in the SRANK.)
C	Captive or Cultivated	Element is presently extant in the state only in captivity or cultivation, or as a reintroduced population not yet established.
NOTE - A breeding status subrank is only used for species that have distinct breeding and/or non-breeding		

Pennsylvania State Status - Invertebrates

Status	Description	Definition
N		No current legal status but is under review for future listing.

Pennsylvania Status Definitions - Plants

Status	Description	Definition
PE	Pennsylvania Endangered	Plant species which are in danger of extinction throughout most of their natural range within this Commonwealth, if critical habitat is not maintained or if the species is greatly exploited by man. This classification shall also include any populations of plant species that have been classified as Pennsylvania Extirpated, but which subsequently are found to exist in this Commonwealth.
PT	Pennsylvania Threatened	Plant species which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent their future decline, or if the species is greatly exploited by man.
PR	Pennsylvania Rare	Plant species, which are uncommon within this Commonwealth. All species of the native wild plants classified as Disjunct, Endemic, Limit of Range and Restricted are included within the Pennsylvania Rare classification.

Pennsylvania Status Definitions - Plants (continued)

Status	Description	Definition
PR	Disjunct	Significantly separated from their main area of distribution
	Endemic	Confined to a specialized habitat.
	Limit of Range	At or near the periphery of their natural distribution
	Restricted	Found in specialized habitats or habitats infrequent in Pennsylvania.
PX	Pennsylvania Extirpated	Plant species believed by the Department to be extinct within this Commonwealth. These plants may or may not be in existence outside the Commonwealth.
PV	Pennsylvania Vulnerable	Plant species which are in danger of population decline within Commonwealth because of their beauty, economic value, use as a cultivar, or other factors which indicate that persons may seek to remove these species from their native habitats.
TU	Tentatively Undetermined	A classification of plant species which are believed to be in danger of population decline, but which cannot presently be included within another classification due to taxanomic uncertainties, limited evidence within historical records, or insufficient data.
N		No current legal status exists, but is under review for future listing.

Pennsylvania State Status - Wild Birds and Mammals

Status	Description	Definition
PE	Pennsylvania Endangered	Species in imminent danger of extinction or extirpation throughout their range in Pennsylvania if the deleterious factors affecting them continue to operate. These are: 1) species whose numbers have already been reduced to a critically low level or whose habitat has been so drastically reduced or degraded that immediate action is required to prevent their extirpation from the Commonwealth; or 2) species whose extreme rarity or peripherality places them in potential danger of precipitous declines or sudden extirpation throughout their range in Pennsylvania; or 3) species that have been classified as "Pennsylvania Extirpated", but which are subsequently found to exist in Pennsylvania as long as the above conditions 1 or 2 are met; or 4) species determined to be "Endangered" pursuant to the Endangered Species Act of 1973, Public Law 93 205 (87 Stat. 884), as amended.

Pennsylvania State Status - Wild Birds and Mammals (continued)

Status	Description	Definition
PT	Pennsylvania Threatened	Species that may become endangered within the foreseeable future throughout their range in Pennsylvania unless the casual factors affecting the organism are abated. These are: 1) species whose populations within the Commonwealth are decreasing or have been heavily depleted by adverse factors and while not actually endangered, are still in critical condition; 2) species whose populations may be relatively abundant in the Commonwealth but are under severe threat from serious adverse factors that have been identified and documented; or 3) species whose populations are rare or peripheral and in possible danger of severe decline throughout their range in Pennsylvania; or 4) species determined to be "Threatened" pursuant to the Endangered Species Act of 1973, Public Law 93205 (87 Stat. 884), as amended, that are not listed as "Pennsylvania Endangered".
N		No current legal status but is under review for future listing.

Pennsylvania State Status - Fish, Amphibians, Reptiles, and Aquatic Organisms

Status	Description	Definition
PE	Pennsylvania Endangered	All species declared by: 1) the Secretary of the United States Department of the Interior to be threatened with extinction and appear on the Endangered Species List or the Native Endangered Species List published in the Federal Register; or 2) have been declared by the Pennsylvania Fish Commission, Executive Director to be threatened with extinction and appear on the Pennsylvania Endangered Species List published by the Pennsylvania Bulletin.
PT	Pennsylvania Threatened	All species declared by: 1) the Secretary of the United States Department of the Interior to be in such small numbers throughout their range that they may become endangered if their environment worsens, and appear on a Threatened Species List published in the Federal Register; or 2) have been declared by the Pennsylvania Fish Commission Executive Director to be in such small numbers throughout their range that they may become endangered if their environment worsens and appear on the Pennsylvania Threatened Species List published in the Pennsylvania Bulletin.
PC		Animals that could become endangered or threatened in the future. All of these are uncommon, have restricted distribution or are at risk because of certain aspects of their biology.
N		No current legal status, but is under review for future listing.

Pennsylvania Biological Survey Suggested Status Definitions

Status	Description	Definition
PE	Pennsylvania Endangered	Species in imminent danger of extinction or extirpation throughout their range in Pennsylvania if the deleterious factors affecting them continue to operate. These are: 1) species whose numbers have already been reduced to a critically low level or whose habitat has been so drastically reduced or degraded that immediate action is required to prevent their extirpation from the Commonwealth; or 2) species whose extreme rarity or peripherality places them in potential danger of precipitous declines or sudden extirpation throughout their range in Pennsylvania; or 3) species that have been classified as "Pennsylvania Extirpated", but which are subsequently found to exist in Pennsylvania as long as the above conditions 1 or 2 are met; or 4) species determined to be "Endangered" pursuant to the Endangered Species Act of 1973, Public Law 93 205 (87 Stat. 884), as amended.
PT	Pennsylvania Threatened	Species that may become endangered within the foreseeable future throughout their range in Pennsylvania unless the casual factors affecting the organism are abated. These are: 1) species whose populations within the Commonwealth are decreasing or have been heavily depleted by adverse factors and while not actually endangered, are still in critical condition; 2) species whose populations may be relatively abundant in the Commonwealth but are under severe threat from serious adverse factors that have been identified and documented; or 3) species whose populations are rare or peripheral and in possible danger of severe decline throughout their range in Pennsylvania; or 4) species determined to be "Threatened" pursuant to the Endangered Species Act of 1973, Public Law 93205 (87 Stat. 884), as amended, that are not listed as "Pennsylvania Endangered".
PR	Pennsylvania Rare	Plant species which are uncommon within this Commonwealth. All species of the native wild plants classified as Disjunct, Endemic, Limit of Range and Restricted are included within the Pennsylvania Rare classification.
	Disjunct	Significantly separated from their main area of distribution
	Endemic	Confined to a specialized habitat.
	Limit of Range	At or near the periphery of their natural distribution
CP	Candidate Proposed	Species comprising taxa for which the Pennsylvania Biological Survey (PBS) currently has substantial information on hand to support the biological appropriateness of proposing to list as Endangered or Threatened.
CA	Candidate at Risk	Species that although relatively abundant now are particularly vulnerable to certain types of exploitation or environmental modification.
CR	Candidate Rare	Species which exist only in one of a few restricted geographic areas or habitats within Pennsylvania, or they occur in low numbers over a relatively broad area of the Commonwealth.

Pennsylvania Biological Survey Suggested Status Definitions (continued)

Status	Description	Definition
CU	Condition Undetermined	Species for which there is insufficient data available to provide an adequate basis for their assignment to other classes or categories.
PX	Pennsylvania Extirpated	Species that have disappeared from Pennsylvania since 1600 but still exist elsewhere.
DL	Delisted	Species which were once listed but are now cited for delisting.
N		No current legal status, but is under study for future listing.

Federal Status Codes and Definitions

Status	Description	Definition
LE	Listed Endangered	A species which is in danger of extinction throughout all or a significant portion of its range.
LT	Listed Threatened	Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
LELT	Listed Endangered in part of range; listed Threatened in the remaining part.	
PE	Proposed Endangered	Taxa proposed to be listed as endangered.
PT	Proposed Threatened	Taxa proposed to be listed as threatened
PEPT		Proposed Endangered in part of range; proposed Threatened in the remaining part.
C	Candidate for listing.	
E(S/A)		Treat as Endangered because of similarity of appearance.
T(S/A)		Treat as Threatened because of similarity of appearance.
XE	Essential Experimental population	
XN	Nonessential Experimental population	
"xy" (mixed status)		Status varies for different populations or parts of range.
"x" NL		Status varies for different populations or parts of range with at least one part not listed.

Class A Wild Trout Streams	Miles	Section Limits	Trout Fishery
Allegheny River			
Dingman Run	4	Headwaters to Mouth	Brown
Dwight Creek	2.4	Headwaters to Mouth	Mixed
Mill Creek	5.9	Bridge at Coudersport Country Club to mouth	Brown
Reed Run	1.8	Confluence of Reed Run right fork downstream to mouth	Brook
Allegheny Portage Creek			
Allegheny Portage Creek	1.9	Brown Hollow to confluence with Scaffold Lick Run	Brown
Oswayo Creek			
Elevenmile Creek	4.5	Headwaters to Turkey Path Road	Brown
Oswayo Creek	5.5	Lower hatchery property line to confluence of Clara Creek	Brown
Tunungwant Creek			
Lewis Run	5	Headwater downstream to mouth	Brown
East Branch Tunungwant Creek	3	Confluence of Pigeon Run to main street	Brown
East Branch Tunungwant Creek	1	Bridge in Lewis Run downstream to 331 bridge at Howard	Brown
East Branch Tunungwant Creek	3.5	Bridge at Howard to SR 4002 bridge	Brown

Approved Trout Waters	Section Limits
Allegheny River	
Allegheny River	Headwaters to Route 155 bridge east of Port Allegany
East Branch Fishing Creek	Headwaters to mouth
Fishing Creek	Headwaters to mouth
Unamed Tributary to Fishing Creek	Headwaters to mouth
Sartwell Creek	Headwaters to mouth
Allegheny Portage Creek	
Combs Creek	Headwaters to mouth
Skinner Creek	Headwaters to mouth
Potato Creek	
Potato Creek	Marvin Creek to confluence of East Branch Potato Creek and Havens Run
Havens Run	Headwaters to mouth
West Branch Potato Creek	Headwaters to mouth
Brewer Run	Headwaters to mouth
Red Mill Brook	Headwaters to mouth
Marvin Creek	Headwaters to mouth
Hamlin Lake	Entire Reservoir

Approved Trout Waters	Section Limits
Oswayo Creek	
South Branch Oswayo Creek	Headwaters to mouth
Oswayo Creek	Clara Creek to Sharon Center Bridge
Elevenmile Creek	Turkey Path Road to mouth
Bell Run	Headwaters to mouth
Tunungwant Creek	
Marilla Brook Reservoir	Entire Reservoir

APPENDIX O. FUNDING SOURCES

Sponsoring Organization	Description / Restrictions	Contact
BMP		
State Conservation Commission-Dirt and Gravel Roads Maintenance	Available to local municipalities and state agencies for projects dealing with the BMPs for erosion and sedimentation control problems and fugitive dust in watersheds; dirt and gravel road jurisdiction required.	www.pacd.org
Community		
Pittsburgh Foundation	Economic, community development and the environment. Activities that increase employment, build strong neighborhoods, and promote civic engagement by all segments of the population. Funds for quality of life.	www.pittsburghfoundation.org
Energy		
DEP - Alternative Fuels	The Alternative Fuels Incentive Grants program continues to fund a considerable number of projects that use alternative fueled energy sources to reduce air pollution and our dependence on foreign oil. Alternative fuels include compressed natural gas	www.dep.state.pa.us
Environmental		
Beldon II Fund	Support environmental organizations working at the state-level. Some grants are made to regional and national organizations for efforts that support the work of state level groups.	www.beldon.org
Ben & Jerry's Foundation	Grant applications need to demonstrate that the project will lead to environmental change, address the root causes of environmental problems, and must help ameliorate an unjust or destructive situation by empowering constituents and facilitating leadership	www.benjerry.com
Eddie Bauer	Fund projects in certain local areas that support environmental goals such as clean rivers and streams or beautifying parks and school grounds. Must be 501(c) 3 and proposal should be kept between 2-3 pages.	www.eddiebauer.com

Sponsoring Organization	Description / Restrictions	Contact
Environmental (continued)		
Howard Heinz Endowment	This program promotes environmental quality and sustainable development by supporting efforts to eliminate waste, harness the power of the market, and create a restorative economy. Should Promote sustainable urban design. Concentrated in Western Pennsylvania.	www.heinz.org
Raymond Proffitt Foundation	The foundation's purpose is to protect and restore the quality of the natural and human environment by informing and educating the general public about the impact of human endeavors upon the natural environment. The RPF strives to advance this understanding	www.rayproffitt.org
Surdna Foundation	The foundation's goal is to prevent damage to the environment and to promote more efficient, economically sound, environmentally beneficial, and equitable use of land and natural resources. Does not fund environmental education, sustainable agriculture, food production or toxic and hazardous waste.	www.surdna.org
Vira I Heinz Endowment	This program promotes environmental quality and sustainable development by supporting efforts to eliminate waste, harness the power of the market, and create a restorative economy. The program's goal is to promote sustainable urban design. Western Pennsylvania watersheds only.	www.heinz.org
Environmental/Watershed		
EPA-Clean Water State Revolving Fund	May also contact: Beverly Reinhold (717) 783-6589. Infrastructure Investment Authority, Keystone Building 22 South Third Street, Harrisburg, PA 17101. email: breinhold@state.pa.us or Peter Slack, (717) 772-4054; DEP 400 Market Street, Harrisburg, PA 17105	(717) 772-4054
WREN - Conference/Training Scholarships	The activities funded must be educational and relate to drinking water source protection or watershed education. Applicant is required to provide a five percent match.	www.pa.lwv.org/wren
River Network Watershed Assistance Grants	Watershed projects and group start-ups.	www.rivernetwork.org
Foundation for Pennsylvania Watersheds	Provides funding to grassroots organizations and watershed associations for specific watershed remediation in Pennsylvania.	

Environmental Education

Sponsoring Organization	Description / Restrictions	Contact
Captain Planet	Supports hands-on environmental projects for children and youth to encourage innovative programs that empower children and youth around the world to work individually and collectively to solve environmental problems. Only for environmental education of children. Online only.	www.turner.com/cpf
DEP Environmental Education Grants	Open to schools, conservation districts, and non-profits. Open in summer, awarded in spring. Final application due dates vary. Application available online. Requires twenty percent match and reimbursement program.	www.dep.state.pa.us
Education Mini Projects Program	Small grants for Pennsylvania-based grassroots educational projects that address non-point source watershed concepts.	(717) 236-1006
Emerson Charitable Trust	Strong emphasis on cultural aspects and youth education, also science and education.	(314) 553-3722
EPA Environmental Education Grants Region III	Grants awarded to small non-profit groups for various projects in Region III.	(215) 566-5546
National Environmental Education and Training Foundation	To increase environmental awareness, environmental education, partnerships, etc. May also be reached at (202) 261-6464. Proposal deadlines: Jan. 1, March 1, July 15, and Sept. 1	(202) 833-2933
PACD - Mini Projects	The objectives of the Educational Mini-Project must promote the We All Live Downstream message by: stimulating an awareness of and interest in Pennsylvania's non-point source water pollution problems and solutions; salaries are not an approved expenditure	www.pacd.org
Project Wild	Project Wild is an interdisciplinary supplementary environmental and conservation program for educators of children in grades K-12. Small grants only.	www.projectwild.org
The Dunn Foundation	Promote the issues of the negative effect that sprawl, visual pollution, and poorly planned development have on the visual environment of communities and the resulting loss of quality of life. Encourage dialogue within and between communities. Do not fund property acquisition, capital improvement projects, capital campaigns, endowments, individuals, religious groups, or political organizations	www.dunnfoundation.org

Environmental Education (continued)

Sponsoring Organization	Description / Restrictions	Contact
The Pathways to Nature Conservation Fund - National Fish and Wildlife Foundation	A partnership between the more than 270 Wild Birds Unlimited, Inc. franchises and the National Fish and Wildlife Foundation. The Pathways to Nature Conservation Fund offers grants to enhance environmental education activities and bird and wildlife viewing opportunities at significant sites.	www.nfwf.org
Water Resources Education Network - LWV	Funding to develop education programs for water issues facing communities. Local contact is shrerenehess@yourinter.net, Indiana PA, 724-465-2595. Must be 501(c)3	www.pa.lwv.org/wren
WREN - Opportunity Grants	The activities funded must be educational and relate to drinking water source protection or watershed education.	www.pa.lwv.org/wren

Environmental Justice

EPA-Environmental Justice Small Grant Program	The program provides financial assistance to eligible affected local community-based organizations working on or planning to work on projects to address local environmental and/or public health concerns.	(202) 564-0152
Nathan Cummings Foundation	The foundation's purpose is to facilitate environmental justice and environmentally sustainable communities by supporting the accountability of corporations, governments, and other institutions for their environmental practices. Does not fund individuals, scholarships, or capital or endowment campaigns	www.ncf.org
Norman Foundation	Support efforts that strengthen the ability of communities to determine their own economic, environmental, and social well-being, and that help people control those forces that affect their lives. Only fund in U.S. They do not fund individuals, universities, conferences, scholarships, research, films, media, arts projects, capital campaigns, fundraising drives, or direct social service programs	www.normanfdn.org

Environmental Planning

Coldwater Heritage Partnership	Grants for prioritizing watersheds in need of protection, for assessment of coldwater ecosystems, and for the development of watershed conservation plans.	(717) 787-2316

Sponsoring Organization	Description / Restrictions	Contact
Environmental Planning (continued)		
DEP Nonpoint Source Control	Grants for planning and non-point source pollution control projects.	(717) 787-5259
DCNR - Community Conservation Partnership Program	Available to organizations that conserve and enhance river resources. Planning grants are available to identify significant natural and cultural resources, threats, concerns, and special opportunities, and the development of river	www.dcnr.state.pa.us
NRCS Watershed Surveys and Planning	Providing assistance for planning in water and coordinated water and related land resource programs in watersheds and river basins. Types of surveys and plans funded include watershed plans, river basin surveys and studies, flood hazard analyses, and floodplain studies.	www.nrcs.usda.gov
Flood Protection		
DEP Flood Protection Grant Program	Open to communities that need to perform non-routine maintenance or improvements to already existing flood protection projects. Also applies to the purchase of specialized equipment. Open to communities that have flood protection projects that are deemed operable.	(717) 787-7432
General		
Archer-Daniels-Midland Foundation	Proposals can be sent in letter form containing: 1) Description of the organization applying. 2) Description of the project/What funding would be used for. 3) A budget including how much is going to administrative costs. Emphasis is given to corporate operating locations.	www.admworld.com
Audrey Hillman Fisher Foundation, Inc.	Must refer to Application Procedures for more information. Preference given to southwestern Pennsylvania and central New Hampshire.	(412) 338-3466
Eureka Company	No specific interest, but, general focus is on social services, health, and the environment (wildlife, fisheries, habitat, and sustainable community development)	www.electrolux.se
Henry Hillman Foundation	Preference is given to organizations in the Pittsburgh/southwestern Pennsylvania area.	www.guidestar.org
Patagonia, Inc. Environmental Grants Program	Supports small grassroots organizations. Does not fund land acquisition.	www.patagonia.com

Sponsoring Organization	Description / Restrictions	Contact
General (continued)		
The Boeing Company	Provides contributions for capital campaigns, seed money (one-time grants) for new programs or projects that address community needs and priorities, and one-time grants to buy equipment, improve facilities, or enable special projects.	www.boeing.com/community
The Education Foundation for America	EFA's priorities include supporting the monitoring of the utility restructuring process as it impacts the environment, combating the growth of the "wise-use" movement, opposing large-scale live-stock confinement, and cutting federal "pollution ". Letter limited to two pages	www.efaw.org
The Prospect Hill Foundation	The foundation's environmental grant making concentrates on habitat and water protection in the northeastern region of the United States. Must have 501(c)3. The organization does not fund individuals, basic research, sectarian religious	http://fdncenter.org/grantmaker/prospecthill/
GIS		
DEP-GIS Software Grant	The grants consist of the latest commercial release of ArcView GIS software; several texts about utilizing GIS for environmental applications and land-use planning; CD-ROM containing spatial data about the commonwealth. Only issue 10 per quarter	www.dep.state.pa.us
Habitat		
General Challenge Grant Program -National Fish and Wildlife Foundation	Requires non-federal match of 2:1. Address actions promoting fish and wildlife conservation and habitat; should involve conservation and community interest; leverage available funding and evaluate project outcomes.	www.nwf.org
Keep the Wild Alive (KWA) Species Recovery Fund	Fund on-the-ground projects that directly improve conditions for the endangered species highlighted in the KWA campaign. Current National Wildlife Federation employees are ineligible and applications must be submitted in English	www.nwf.org/wildalive
Small Grants Program - National Fish and Wildlife Foundation	Address priority actions promoting fish and wildlife conservation and the habitats on which they depend; work proactively to involve other conservation and community interest; leverage available funding, and evaluate project outcomes. A 2:1 match of non-federal funds is required	www.nwf.org

Sponsoring Organization	Description / Restrictions	Contact
Internship		
Office of Surface Mining Intern Program	Candidates must organize their work, work well with community groups and on their own, quickly internalize the requirements of acid mine drainage remediation and the national Clean Streams program, write well and enjoy public presentations. Academic credit. Can be undergraduate or graduate student. Positions available in AL, IL, IN, IA, KY, MD, MS, OH, OK, PA, TN, VA, WV. Must provide housing for interns.	(202) 208-2836
Land Protection		
DCNR Community Conservation Partnership Program	Conserve and enhance river resources by offering planning grants, technical assistance, implementation grants, development grants, and acquisition grants.	www.dcnr.state.pa.us
Lowes Charitable Foundation	Environmental initiatives that support the continued enhancement of the natural landscape, natural environment enhancers, and/or park improvement projects. Must apply online. Must be a 501(c)3.	www.lowes.com
Michael D. Ferguson Charitable Foundation	General environment, wildlife, fisheries, habitat, sustainable community, and development.	http://michaeldfergusonfoundation.com/
Nationals Parks Service - Land & Water Conservation Fund	Provide federal grants for land acquisition and conservation to federal and state agencies.	(303) 969-2500
The Wilderness Society	To preserve wilderness and wildlife, protect America's prime forest, parks, rivers, and shore lands, and foster an American land ethic. Alternate address Montana Regional Office, 105 West Main St., Suite E, Bozeman, MT 59715-4689	www.wilderness.org
Town Creek Foundation	Environmental issues of interest to the foundation include: 1) Preserving the ecological richness of our natural heritage, with a major focus on our federal public lands. 2) Promoting policies and practices to protect the land, estuaries, and coastal bays.	www.towncreekfdn.org

Sponsoring Organization	Description / Restrictions	Contact
Loan		
Environmental Loan Fund	The loan can be used for membership development, creating and implementing a workplace giving program, cause-related marketing, donor development, special events, direct mail campaigns, mission related business enterprises, or capital campaign work.	www.envsc.org
Pennsylvania Infrastructure Investment Authority Drinking Water Loans	Must show water quality impact, must have qualified loan candidate. Loans to stormwater projects and non-point source projects. Interest is 1-2.8 percent over 20 years.	(717) 787-813
Multiple		
Acorn Foundation	Interested in small and innovative community-based projects which preserve and restore habitats supporting biological diversity and wildlife, and advocate for environmental justice. Does not fund the following: direct services, capital expenditure, construction or renovation programs, programs undertaken by tax-supported institutions or government initiatives, emergency funding, scholarship funds, or other individual aid.	www.commoncounsel.org/ pages/foundation.html
Allegheny Foundation	The Allegheny Foundation concentrates its giving in the western Pennsylvania area and confines its grant awards to programs for historic preservation, civic development, and education. No event sponsoring. Does not fund individuals.	www.scaife.com
Anne & George Clapp Charitable & Educational Trust	Fields of interest include education, social services, youth and child welfare, and aging. Limited support for cultural programs, historic preservation, and conservation. Southwestern Pennsylvania only; grants are not made to individuals. No grants are made for medical research, research projects, filmmaking, conferences, or field trips.	(412) 234-1634
Charlotte and Donald Teast Foundation	Sustainable communities, arts, humanities, civic and public affairs, education, the environment, health, and social services.	(214) 373-6039
Ford Foundation	Interested in general/operating support, continuing support, endowment funds, program development, conferences/seminars, professorships, publication, seed money, fellowships, internships, research, technical assistance, consulting services, and program-related investments.	http://jefferson.village.virginia. edu/readings/ford.html

Multiple (continued)

Sponsoring Organization	Description / Restrictions	Contact
Max and Victoria Dreyfus Foundation	Consider support for museums, schools, educational and skill training projects, programs for youth, seniors, and the handicapped. Must be located in the U.S.	(914) 682-2008
National Fish and Wildlife Fund -Five Star Restoration Challenge	Projects must involve diverse partnerships of, ideally, five organizations that contribute funding, land, technical assistance, workforce support, and/or other in-kind services. Projects involving only research, monitoring, or planning are not eligible. No mitigation work.	www.nfwf.org
National Parks Foundation	Education, training, preservation, and conservation. The grants that are available change often. See the website for current funding opportunities. Projects must connect with National Parks, be located on or next to National	www.nationalparks.org
Native Plant Conservation Initiative - National Fish and Wildlife Foundation	Through this initiative, grants of federal dollars will be provided to non-profit organizations and agencies at all levels of government to promote the conservation of native plants. There is a strong preference for "on-the-ground" projects that involve local communities and citizen volunteers in the restoration	www.nfwf.org
Public Welfare Foundation	The Public Welfare Foundation supports organizations that address human needs in disadvantaged communities, with strong emphasis on organizations that include service, advocacy and empowerment in their approach: service that remedies specific problems; advocacy that addresses those problems in a systemic way through changes in public policy; and strategies to empower	www.publicwelfare.org
Robert Shaw Charitable Foundation	Money to assist those organizations who work to enhance the educational, health and welfare, cultural, youth development, social welfare, and community development needs of the area. Only one grant per year will be	(724) 832-7578
Scaife Family Foundation	Grants awarded will support programs that strengthen families, address the health and welfare of women and children, or promote animal welfare. No event sponsorships, endowments, capital campaigns, renovations, or government agencies. No grants to individuals.	www.scaife.com
The Lawrence Foundation	The mission of The Lawrence Foundation is to make a difference in the world by providing contributions and grants to organizations that are working to solve pressing educational, environmental, health, and other issues.	wwwthelawrencefoundation.org

Sponsoring Organization	Description / Restrictions	Contact
Multiple (continued)		
The Max and Anna Levinson Foundation	Interested in the environment, including preservation of ecosystems and biological diversity, but also environmental justice, alternative energy, alternative agriculture, and toxics. Must have 501(c)3 status. Rarely fund organizations with budgets in excess of $500,000.	www.levinsonfoundation.org
Turner Foundation	Supports activities to preserve the environment, conserve natural resources, protect wildlife, and develop and implement sound population policies. Interested in protecting rivers, lakes, wetlands, aquifers, oceans. Does not provide funding for buildings, land acquisition, endowments, start-up funds, films, books, magazines, or other specific media projects. Alternate Phone: 404-681-0172.	www.turnerfoundation.org
Natural Resources		
Beneficia Foundation	Only applications for projects focusing on conservation of the environment or the arts will be considered. Beneficia has no geographic preferences, but favors requests for project support over general support and does not look favorably	www.beneficiafoundation.org
Canaan Valley Institute	Promotes the development and growth of local associations committed to improving or maintaining the natural resources of their watersheds in the Mid-	www.canaanvi.org
Charles A. and Anne Morrow Lindburgh Foundation	Grants awarded for the conservation of natural resources and water resource management. Grants are awarded to individuals for research and educational programs, not to organizations for institutional programs.	www.lindberghfoundation.org
Dana Corporation	Will consider funding air quality, environment, general, and water resources projects. Emphasis is given to areas where the corporation operates.	www.dana.com
Home Depot	Assistance is provided to non-profit organizations that direct effort toward protecting our natural systems. The grant program focuses on forestry and ecology, clean up, and recycling, green building design, and lead poisoning prevention.	www.homedepot.com
W. Alton Jones Foundation, Inc.	The goals of the foundation are to build a sustainable world by developing new ways for humanity to interact responsibly with the planet's ecological systems, and build a secure world by eliminating the possibility of nuclear war by	www.wajones.com

Natural Resources (continued)

Sponsoring Organization	Description / Restrictions	Contact
Leo Model Foundation	Grants for habitat conservation, watershed conservation, and species preservation in the U.S.	(215) 546-8058
National Fish and Wildlife Fund Challenge Grants for Conservation	The foundation, in partnership with the NRCS and NACD (National Association of Conservation Districts) provides challenge grants. Primary goal of the program is to support model projects which positively engage private landowners.	www.nfwf.org
Rivers, Trails and Conservation Assistance Program	Grants to work with National Park Service to conserve land and river resources, and provides funding for various projects dealing with the conservation of these resources, including the development of trails and greenways.	(215) 597-1581
The River Restoration - NOAA	Submittal by email whenever possible. Encourage contact to discuss project prior to submitting application. Formal non-federal matches not required, but encouraged. Dam removal and fish passage. Available in northeast, Mid-Atlantic, and California.	www.amrivers.org/feature/restorationgrants.htm
The Watershed Protection and Flood Prevention Act	Plan development for natural resource concerns within a watershed area; cost sharing available to carry out plan.	(717) 782-4429
The William C. Kenney Watershed Protection Foundation	Protecting the remaining wild rivers of the west and ensuring the effectiveness of small environmental organizations.	www.kenneyfdn.org

Other

Charles Stewart Mott Foundation	The environmental program is devoted to reform of international lending and trade policies. Projects must be part of a national demonstration when out of the Flint, Michigan area.	www.mott.org
North American Fund for Environmental Cooperation	Funds community based projects in Canada, Mexico and the U.S. to enhance regional co-operation, prevent environmental and trade disputes, and to	(514) 350-4357
PA DEP Brownfields Inventory	Grantees will be paid $1,000 for each site registered into the PA Site finder. Municipalities and economic development agencies may apply for the grant by submitting an application.	(717) 783-7816
Retired and Senior Volunteer Program (RSVP)	Provides a variety of opportunities for people aged 55+ to volunteer in the management of trails, rivers, and open space. Grants can be used for staff	www.nationalservice.org/senior/index.html

Sponsoring Organization	Description / Restrictions	Contact
Plantings		
National 4-H Council	Grants are used to stimulate community tree planting and/or reforestation projects. Awarded to communities in support of on-going community planting/reforestation project or to stimulate new and creative youth-led projects. Organization must secure matching funds or in-kind contributions from other sources equal to the amount requested.	www.fourhcouncil.edu
National Gardening Association	One hundred grants to be awarded to start-up programs involving children, and 300 will be awarded to established programs. Covers tools, seeds, plant materials, products, and educational resources. Grant restricted to programs involving children. There is a $10.00 administrative fee.	www.kidsgardening.com
Plant Material Centers	American Indian Liaison Resource Conservation and Community Assistance Division of USDA/NRCS. PMC select and grow plants that grow naturally and provide them to those people who wish to grow native plants.	(202) 720-8576
Remediation/Restoration		
Abandoned Mine Land Reclamation Program - Office of Surface Mining	Applications accepted anytime. Provides for the restoration of eligible lands and waters that have been mined, abandoned, or left inadequately restored. Two different grants are available. Protects land and corrects environmental damage caused by coal mining.	www.osmre.gov
AMD Watershed Assessment - Bureau of Mining and Reclamation	Must be a municipality, municipal authority or incorporated non-profit. AMD projects only.	(717) 787-7007
American Canoe Association CFS Grants	For grassroots organizations to improve waterways. Cleanups, riparian corridor, and water quality monitoring projects. Very flexible as long as it is improving waterways and fish habitat. Can not be used to pay staff. However, it can be used to pay a contractor. Must use volunteer help.	www.acnet.org
PA DEP - BAMR Abandoned Mine Reclamation Grants	Funds must be used for project development, design, construction, and directly related expenses. Site chosen must be located in a watershed or area with an approved rehabilitation plan . No administrative cost. Must be a municipality, municipal authority, or incorporated 501(c)3.	(814) 472-1800
Bring Back the Natives - National Fish and Wildlife Foundation	Supports on-the-ground habitat restoration projects that benefit native aquatic species in their historic range.	www.nfwf.org

Remediation/Restoration (continued)

Sponsoring Organization	Description / Restrictions	Contact
Community Foundation	Projects related to abandoned mine drainage remediation, alkaline discharges, streambank preservation, removal of spoil piles, and other issues related to water quality are of interest to the foundation's board of advisors.	(814) 669-4847
EPA - Nonpoint Source Implementation Grants	Funds are provided to the state to carry out non-point source projects and programs pursuant to Section 319 of the Clean Water Act as amended by the Water Quality Act of 1987. Grants are awarded to a single agency in each state, designated by the governor. 40 percent non-federally funded match required. Only one administered to each state.	www.cfda.gov/static/p66460.htm
NOAA Fish Habitat Restoration Program	Financial assistance for community-based habitat restoration projects, to	www.habitat.noaa.gov
Office of Surface Mining Clean Stream Initiative	This grant is used to treat AMD. Design and administration is covered but the bulk of funding must go into construction. Must have funding partners. Applications available upon request. Review period takes 2.5-3 months, depending on eligibility. Must be a cooperative agreement.	(717) 782-2285
PA DEP -Stream Improvement Project Reimbursements	Provides assistance in an instance where a stream is posing a treat to structures, such as homes or businesses. Must pose threat to structure. Must be applied for by a conservation group or municipality.	(717) 783-7480
PA Fish and Boat Commission	Habitat improvement and technical assistance.	(814) 359-5158
Partnership with the U.S. Army Corps of Engineers	To foster cooperation on projects of mutual interest, such as fish and wildlife habitat restoration, non-structural flood control opportunities, wetland restoration, and endangered species protection.	www.nfwf.org
Pinellas County Environmental Foundation - National Fish and Wildlife Foundation	A partnership between Pinellas County and the National Fish and Wildlife Foundation. These two groups share the common goals of actively pursuing the protection, restoration and enhancement of fish and wildlife habitat, and developing creative and sustainable solutions to natural resource issues.	www.nfwf.org

Research

Sponsoring Organization	Description / Restrictions	Contact
Conservation & Research Foundation at Connecticut College	The conservation and enlightened use of the earth's resources to encourage research to deepen the understanding of the intricate relationship between people and the environment. Will support higher education, individuals, museums, non-profits, and research. Unsolicited proposals are not accepted; however, letters of inquiry including a budget may be sent.	http://conservationresearch.wordpress.com/
USDA - Nutrient Science for Improved Watershed Management	Funds for integrated research in extension management of nutrients on a watershed level. Nutrients of interest are nitrogen and phosphorous. Please note that a research foundation maintained by a college or university is not eligible. These grants are for research.	http://www.reeusda.gov/1700/funding/ourfund.htm

Stormwater Management

DEP Stormwater Management Program	Watershed planning for stormwater control and implementation of programs at local levels.	(717) 772-4048

Streambank Fencing

Ducks Unlimited - PA Stewardship Program	Provides strong incentives to landowners to create wooded stream buffers, create wider than minimum buffers, and fence cattle out of the stream. Grant is available for fencing and tree planting.	(814) 386-3458
Fish America Foundation	Grants awarded for streambank stabilization materials, instream habitat improvements, contracted heavy equipment, and stream morphology work. Match not required, but is highly recommended.	www.asafishing.org
Partners for Fish and Wildlife Program	The Partners for Fish and Wildlife Program provides technical and financial assistance to private landowners for habitat restoration on their lands. A variety of habitats can be restored to benefit Federal trust species (for example, migratory birds and fish and threatened and endangered species.) Normally the cost share is 50 percent (the Service and the landowner each pay half of the project costs), but the percentage is flexible. Services or labor can qualify for cost sharing.	(724) 938-4215
US Fish and Wildlife Service	Assists landowners in installation of high-tensile electric fence to exclude livestock from streams and wetlands. No buffer requirements.	www.fws.gov

Sponsoring Organization	Description / Restrictions	Contact
Streambank Fencing		
USDA Conservation Reserve Program	Statewide costshare program for creating stream buffers. A 40 percent practice incentive as well as a $10/acre incentive. Buffers of 35-180 feet per side of the stream. Land must have been pasture.	Regional USDA office (see Appendix Q)
USDA - Environmental Quality Incentives Program	A statewide program based on environmental problems. It addresses all environmental problems on a farm. They fund BMPs.	Regional USDA office (see Appendix Q)
USDA Project Grass	A co-operative effort of local farmers, conservation districts, with assistance from USDA, to improve agriculture productivity in southwestern Pennsylvania. For local contacts see information brochure on file. Contact: james.harrold@pasomerset.fsc.usda.gov	Regional USDA office (see Appendix Q)
Technical Assistance		
Watershed Assistance Grants	Funding supports organizational development and capacity building for watershed partnerships with diverse membership. Match requested but not required. Non-profits, tribes, and local government only.	www.rivernetwork.org
Volunteers		
3M Foundation	3M sponsors a volunteer program called Community Action Retired Employee Service (CARES). Company favors projects that impact 3M communities. Alternate Phone: 612-737-3061	www.mmm.com
Wetlands		
U.S. Fish and Wildlife Service	For wetland Conservation projects. Must have 50 percent non-federal match in small-grant program with North American Wetlands Conservation Council.	www.fws.gov
Wetlands Reserve Program USDA Natural Resources Conservation Service	Restore and protect wetlands on private property; provide landowners with financial incentives to enhance wetlands in exchange for retiring marginal agricultural land.	Regional USDA office (see Appendix Q)

APPENDIX P. USEFUL WEBSITES

Source	Data	Website
Project Area Characterisitics		
Bureau of Labor Statistics	Unemployment Rate	http://www.bls.gov/home.htm
Free Demographics	Population and Economic Data	http://www.freedemographics.com
Green Media Toolshed	Pollution in Your Community	http://www.scorecards.com
Natural Lands Trust	Conservation by Design	http://www.natlands.org
Pa. Department of Community and Economic Development	Zoning and Comprehensive Planning	http://www.elibrary.state.pa.us
Pa. Department of Education	School Report Cards	http://www.paprofiles.org
Smart Growth Partnership	Smart Growth	http://www.smartgrowth.org
United States Census Bureau	Population and Economic Data	http://www.census.gov
Land Resources		
Conservation Reserve Enhancement Program	Conservation Practices	http://www.creppa.org
Natural Resources Conservation Service	Soil Characteristics	http://www.nrcs.usda.gov/technical/efotg
Pa. Department of Environmental Protection	Permits, Violations	http://www.dep.state.pa.us/efacts/default.asp
Pa. Geological Survey	Environmental Geology	http://www.dcnr.state.pa.us/topogeo/pub/environmental.aspx
Pa. Geological Survey	Geological Characteristics	http://www.dcnr.state.pa.us/topogeo/index.aspx
Pa. Geological Survey	Mineral Resources	http://www.dcnr.state.pa.us/topogeo/pub/mineral.aspx
Pa. Geological Survey	Environmental Geology for Land Use Planning	http://www.dcnr.state.pa.us/topogeo/education/landuse/landuseplan.aspx
Pa. Spatial Data Access (PASDA)	Geographic Information System Data	http://www.pasda.psu.edu/
United States Environmental Protection Agency	Brownfields	http://www.epa.gov/brownfields
United States Environmental Protection Agency	Superfund	http://www.epa.gov/superfund
United States Environmental Protection Agency - ECHO	Enforcement and Compliance History	http://www.epa-echo.gov/echo/
United States Environmental Protection Agency - Envirofacts	Federal Permits, Violations, Wastesites	http://www.epa.gov/enviro/
Water Resources		
Center for Dirt & Gravel Road Studies		http://www.mri.psu.edu/centers/cdgrs/Index.html
Coldwater Heritage Partnership		http://www.coldwaterheritage.org/
Environmental Protection Agency	Surf Your Watershed	http://cfpub.epa.gov/surf/huc.cfm?huc_code=05030105
Federal Emergency Management Agency	National Flood Insurance Program	http://www.fema.gov/business/nfip/

Source	Data	Website
Water Resources (continued)		
Keystone Chapter Soil and Water Conservation Society		http://www.keystoneswcs.com/index.html
League of Women Voters	Groundwater Primer for Pa.ns	http://pa.lwv.org/wren/pubs/primer.html
Pa. American Water		http://www.amwater.com/awpr1/paaw/default.html
Pa. Department of Environmental Protection	Stormwater Management Program	http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1437&Q=518682&PM=1
Pa. Department of Environmental Protection	Water Resources Plan	http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/WaterResources/docs/WaterResourcesExecutiveSummary.htm
Pa. Department of Environmental Protection	Watershed Management	http://www.depweb.state.pa.us/watershedmgmt/site/default.asp
Pa. Department of Environmental Protection	State Water Planning Resource Center	http://www.dep.state.pa.us/dep/deputate/watermgt/wc/act220/default.htm
Pa. Fish and Boat Commission	Wild Trout Waters	http://www.fish.state.pa.us/classa98.htm
Pa. Geological Survey:	Water Resources Reports	http://www.dcnr.state.pa.us/topogeo/groundwater/gwlist.aspx
Pa. Geological Survey:	Geology of Groundwater in Pa.	http://www.dcnr.state.pa.us/topoeo/education/es3.pdf
Pa. Geological Survey:	Hydrogeologic and well-construction characteristics of the rocks of Pa.	http://www.dcnr.state.pa.us/topogeo/pub/w69recent.aspx
Pa. Geological Survey:	Pa. Groundwater Information System	http://www.dcnr.state.pa.us/topogeo/groundwater/PaGWIS/PaGWISMenu.asp?c=t
Pa. Trout	Wilderness Trout Streams	http://www.patrout.org/wildernesstroutstreams.htm
Stroud Water Research Center		http://www.stroudcenter.org/
U.S. Geological Survey	Water Resources Links	http://water.usgs.gov/lookup/getwatershed?05030105
United States Environmental Protection Agency	Water Quality Trading	http://www.epa.gov/owow/watershed/trading.htm
University of Pittsburgh	Regional Water Management Task Force	http://www.iop.pitt.edu/water/index.htm

Biological Resources

Biodiversity

Ecological Society of America	Biodiversity	http://www.esa.org/
NatureServe	Biodiversity	http://www.natureserve.org/
Pa. Biodiversity Partnership	Biodiversity	http://www.pabiodiversity.org/index.html
Pa. Biological Survey (PABS)	Biodiversity	http://alpha.dickinson.edu/prorg/pabs/index.htm
Pa. GAP Analysis Project	Biodiversity	http://www.orser.psu.edu/PAGAP/gappage.htm

Source	Data	Website
Biological Resources (continued)		
Invasive Species		
Aquatic Invasive Species of Pa.	Invasive Species	http://www.pserie.psu.edu/seagrant/ais/
Common Invasive Plant in Riparian Areas	Invasive Species	http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/streamreleaf/Docs/Invasive%20Plants.pdf
Invasive Plants of Pa.	Invasive Species	http://www.dcnr.state.pa.us/forestry/wildplant/invasive.aspx
Invasive Plants of the Eastern United States	Plant Invaders of Mid-Atlantic Natural Areas	http://www.invasive.org/eastern/midatlantic/intro.html
Invasive Species	Invasive Species	www.invasive.org
Invasive Species in Pa.	Invasive Species	http://www.biodiversitypartners.org/invasive/factsheets/PA.pdf
Mid-Atlantic Exotic Pest Plant Council		http://www.ma-eppc.org/
U.S. Department of Agriculture:	National Agricultural Library – Pa. Invasive Species Resources	http://www.invasivespeciesinfo.gov/unitedstates/pa.shtml
Native Plants and Landscaping		
American Chestnut Foundation	Pa. Chapter	www.patacf.org
Arbor Day Foundation	Backyard Woods	http://www.arborday.org/backyardwoods/guide.cfm
Arbor Day Foundation	Tree City U.S.A.	http://www.arborday.org/programs/treeCityUSA.cfm
Carnegie Library of Pittsburgh	Books on Native Plants	http://www.carnegielibrary.org/subject/gardening/nativeplants.html
Ernst Conservation Seeds	Native Plant Sales and Landscaping Information	www.ernstseed.com
Pa. Department of Conservation and Natural Resources	Pa. Community Forests	http://www.dcnr.state.pa.us/forestry/pucfc/
Pa. Flora Database		http://www.paflora.org/Web3/Speciesbywatershed_search_form.asp
Pa. Native Plant Society	Useful Links and Information Regarding Native Plants	http://www.pawildflower.org/04_links/links.htm
Sylvania Natives	Native Plant Sales	www.sylvanianatives.com
U.S. Department of Energy	Energy Efficient Landscaping	http://www.eere.energy.gov/consumer/your_home/landscaping/index.cfm/mytopic=11910
Western Pa. Audubon Society	List of plants native to Allegheny County and surrounding region	http://www.aswp.org/files/allegheny_county_Pa._native_plants_aswp.pdf
Pa. Invertebrate Biodiversity Project		http://www.ento.psu.edu/home/frost/pinbiop/about.html
Pa. Natural Heritage Program		http://www.naturalheritage.state.pa.us/
U.S. Environmental Protection Agency	Ecoregions	http://www.epa.gov/wed/pages/ecoregions/reg3_eco.htm

Source	Data	Website
Biological Resources (continued)		
Wildlife		
Animal Rescue League of Western Pa.	Wildlife Rehabilitation	http://www.pawildlifecenter.org/about-pwc.htm
Audubon Society	Important Bird Areas	http://pa.audubon.org/iba/maps.html
Carnegie Museum of Natural History	2nd Pa. Breeding Bird Atlas	http://www.carnegiemnh.org/atlas/about_book.htm
Carnegie Museum of Natural History	Pa. Mammals	http://www.carnegiemnh.org/mammals/index.html
Field Guides		http://www.enature.com/fieldguides/index.asp
National Biological Information Infrastructure		http://www.nbii.gov/portal/server.pt
National Wildlife Federation		http://www.nwf.org/nationalwildlife/article.cfm?articleid=292&issueid=31
North American Pollinator Protection Campaign		http://www.nappc.org/
Pa. Audubon		http://pa.audubon.org/
Pa. Biological Survey	Important Mammal Areas	http://www.pawildlife.org/imap.htm
Pa. Department of Conservation and Natural Resources	Endangered and Threatened Species of Pa.	http://www.dcnr.state.pa.us/wrcf/contents.aspx
Pa. Fish and Boat Commission	Pa. Fishes	http://www.fish.state.pa.us/pafish/fishhtms/chapindx.htm
Pa. Wildlife Federation		http://www.pawildlife.org/
Species Profiles		http://www.fcps.edu/StratfordLandingES/Ecology/mpages/organism_menu.htm
The Wildlife Society		http://joomla.wildlife.org/?CFID=13824013&CFTOKEN=85052420
Wildbird Recovery	Songbird Rehabilitation Center	http://www.stormpages.com/wildbird/index.html
Cultural Resources		
National Parks Service	National Register of Historic Places	http://www.nps.gov/history/nr/research/nris.htm
PA Roots	Historical Information	http://www.pa-roots.com/
Pa. Department of Education	Environment and Ecology Standards	http://www.pde.state.pa.us/k12/lib/k12/envec.pdf
Pa. Fish and Boat Commission	Fishing Regulations	http://www.fish.state.pa.us/regs_fish.htm

Appendix Q. Resource Guide

Conservation Groups

Alleghany Archery
22 Miller Lane
Smethport, PA 16749
Phone: 814-887-5333

Allegheny Defense Project
117 West Wood Lane
Kane, PA 16735
Phone: 814-221-1408

Allegheny Mountain Arrow Woods
106 Cherry Springs Road
Coudersport, PA 16915
Phone: 814-274-2282

Allegheny Outdoors
509 Seaward Avenue
Bradford, PA 16701
Phone: 814-368-8608

Allegheny Outdoor Club/Tuna Valley Trail Association
1279 High Street
Bradford, PA 16701
Phone: 814-368-6728

Black Forest Conservation Association
391 Nelson Run Lane
Coudersport, PA 16915
Phone: 814-274-0424
Website: www.pottercountybfca.com

Canoe Place Fish & Game Club
311 E Arnold Ave Apt 1
Port Allegany, PA 16743
Phone: 814-642-7522

Coudersport Aboretum Committee
Coudersport, PA16915
Phone: 814-274-8769

Eldred Conservation Club
Barden Brook Road
Eldred, PA 16731
Phone: 814-225-4924

Forestry Consultant
46 Tennessee Avenue
Coudersport, PA 16915
Phone: 814-274-8561

God's Country Trout Unlimited
Duquesne University
P.O. Box 421
443 West Branch Fishing Creek Road
Roulette, PA 16746
Phone: 814-544-7174

Keating Sportsman Club
9737 Route 46
Smethport, PA 16749
Phone: 814-887-2271

Kinzua Valley Trail Association and Friends of Allegheny Wilderness
P.O. Box 407
Lewis Run, PA 16738
Phone: 724-456-3847

McKean County Conservation District
17137 Route 6
Smethport, PA 16749
Phone: 814-887-4003

Mount Jewett Sportsman Club
RR 1
Division Street Extension
Mount Jewett, PA 16740
Phone: 814-778-7323

North Central Forest Landowners Association
1550 East Second Street
Coudersport, PA 16915

Penn State Cooperative Extension
P.O. Box 1504
Smethport, PA 16749
Phone: 814-887-5613

Potter County Bird Club
115 North Main Street
Coudersport, PA 16915
Phone: 814-274-9825

Conservation Groups (continued)

Potter County Conservation District
107 Market Street
Coudersport, PA 16915
Phone: 814-274-8411
Website: www.pottercd.com

Rainbow Paradise Trout Farm
1660 East Second Street Route 6 East
Coudersport, PA 1691
Phone: 814-274-8309

Ruffed Grouse Society Allegheny Chapter
1016 Long Level Road
Johnsonburg, PA 15845
Phone: 814-512-2101

Seneca Chapter Trout Unlimited
36 Hamilton Run Road
Port Allegany, PA 16743
Phone: 814-642-9155

Seneca Nation
P.O. Box 231
Salamanca, NY 14779
Phone: 716-945-1790

Sierra Club, Pennsylvania Chapter
P.O. Box 663
Harrisburg, PA 17108
Phone: 717-232-0101
Website: www.pennsylvania.sierraclub.org

Smethport Borough; Potato Creek Trail Association
201 West Main Street
Smethport, PA 16749
Phone: 814-887-5815

Tiadaghton Audubon Society (Tioga & Potter Counties)
P.O. Box 605
Wellsboro, PA 16901

Tuna Valley Trail Association
P.O. Box 1003
Bradford, PA 16701

Upper Allegheny Watershed Association
P.O. Box 89
Roulette, PA 16746
Phone: 814-544-7365

Western Pennsylvania Conservancy
159 Main Street
Ridgway, PA 15853
Phone: 814-776-1114

Wildflower Weekends
2912 Hickox/Ulysses Road
Genesee, PA 16923
Phone: 814-848-9905

Historical Societies

Allegheny Arms and Armor Museum
505 ½ West Main Street
Smethport, PA 16749
Phone: 814-887-0947

Bradford Landmark Society
45 East Corydon Street
Bradford, PA 16701
Phone: 814-362-3906

Eldred World War II Museum
201 Main Street; P.O. Box 273
Eldred, PA 16731
Phone: 814-225-2220

McKean County Historical Society
502 West King Street
Smethport, PA 16749
Phone: 814-887-5142

Potter County Historical Society
308 N Main Street
Coudersport, PA 16915
Phone: 814-274-8124

Seneca Iroquis National Museum
814 Broad Street
Salamanca, NY 14779
Phone: 716-945-1738

Smethport Memorial Recreation Center
100 West Willow Street
Smethport, PA 16749
Phone: 814-887-5790

Historical Societies (continued)

Smethport Visitors Center
119 West Main Street
Smethport, PA 16749

Zippo Case Museum
1932 Zippo Drive
Bradford, PA 16701

Regional Planning Commissions

Northcentral Regional Planning and Development Commission
651 Montmorenci Road
Ridgway, PA 15853
Phone: 814-773-3162
http://web2.ncentral.com/ncentral/index.html

State Agencies

DCNR/Bureau of Forestry
P.O. Box 673
3150 East Second Street (Denton Hill)
Coudersport, PA 16915
Phone: 814-274-3600

DCNR – Region 4 – Northcentral – Williamsport Regional Office
330 Pine Street
Suite 400
Williamsport, PA 17701
Phone: 570-326-3521

DCNR – Region 6 – Northwest – Erie Regional Office
230 Chestnut Street
Meadville, PA 16335-3481
Phone: 814-332-6190

Department of Environmental Protection (DEP) Headquarters
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
Phone: 717-783-2300
Website: www.dep.state.pa.us

PA DCNR Bureau of Forestry
P.O. Box 673
Coudersport, PA 16915
Phone: 814-274-3600

Old Red Schoolhouse Wildlife and Nature Center
Route 44
Shinglehouse, PA 16748

PA Department of Conservation and Natural Resources
Rachel Carson State Office Building
6th Floor, P.O. Box 8475
Harrisburg, PA 17105-8475

PA Fish and Boat Commission
P.O. Box 71
Smethport, PA 16749
Phone: 814-359-5250

PA Game Commission
466 Bloomster Road
Smethport, PA 16749
Phone: 814-887-7739

PA Geological Survey
3240 Schoolhouse Road
Middletown, PA 17057-3534
Phone: 717-702-2045

PA Senate
315 Second Avenue
Suite 203
Warren, PA 16365
Phone: 814-726-7201

PA State Conservation Commission
2301 North Cameron Street
Harrisburg, PA 17110
Phone: 717-787-8821
Fax: 717-705-3778
Website: www.pascc.state.pa.us

State Agencies (continued)

Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126
Phone: 717-783-6788
Website: www.pde.state.pa.us/

PA Department of Emergency Management
Eastern Area Office
Hamburg Center
Hamburg, PA 19526
Phone: 610 562-3003
Fax: 610 562-7222
Website: www.pema.state.pa.us/

PA Department of Labor and Industry
Room 1700
651 Boas Street
Harrisburg, PA 17121
Phone: 717-787-5279
Website: www.dli.state.pa.us/

PA Department of Community and Economic Development
400 Forum Building
Room 357
Harrisburg, PA 17120
Phone: 717-783-8950
Website: http://www.dced.state.pa.us/

PA Department of Health
Health & Welfare Building
7th & Forster Streets
Harrisburg, PA 17120
Phone: 1-877-PA-HEALTH
Website:
www.portal.state.pa.us/portal/server.../department_of_health.../17457

PA Historical and Museum Commission
State Museum Building
300 North Street
Harrisburg, PA 17120
Phone: 717-787-3362
Fax: 717-783-9924
Website: www.phmc.state.pa.us/

PennVEST
22 S. Third Street
Harrisburg, PA 17101
Phone: 717-783-6798
Website:
www.portal.state.pa.us/portal/server.pt/.../**pennvest**/9242

Susquehannock State Forest
P.O. Box 673
Coudersport, PA 16915
Phone: 814-274-3600

State Legislators

(Legislators in office 2010; see General Assembly website: www.legis.state.pa.us for current information)

House of Representatives - District 67
Hon. Martin T. Causer
107 South Main Street
Room 1
Coudersport, PA 16915
Phone: 814-274-3631
Fax: 814-274-8159
Website: http://www.repcauser.com

House of Representatives - District 65
Hon. Kathy L. Rapp
404 Market Street
Warren, PA 16365
Phone: 814-723-5203
Fax: 814-728-3564
Website: http://www.reprapp.com

Federal Agencies

Environmental Protection Agency (EPA)
EPA Region 3 Regional Office
1650 Arch Street
Philadelphia, PA 19103
Phone: 1-800-438-2474
Website: www.epa.gov

United States Army Corps of Engineers
Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715
Phone: 410-962-7608
Website http://www.nab.usace.army.mil/

Federal Agencies (continued)

United States Department of Energy
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
P.O. Box 3265
Harrisburg, PA 17105
Website: www.puc.state.pa.us

United States Department of Energy
National Energy Technology Laboratory
Pittsburgh Research Center
626 Cochrans Mill Road, P.O. Box 10940
Pittsburgh, PA 15236
Phone: 412-386-6569
Fax: 412-386-5917
Website: www.netl.doe.gov

United States Fish and Wildlife Service
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, PA 16801
Phone: 814-234-4090
Fax: 814-234-0748
Website: www.fws.gov

U.S. Department of Agriculture (USDA)
Animal and Plant Health Inspection Service (APHIS) – Pennsylvania Wildlife Services
P.O. Box 60827
Harrisburg, PA 17106
Phone: 717-236-9451
Website:
www.aphis.usda.gov/wildlife_damage

USDA Farm Service Agency
Potter County Farm Service Agency
105 Market Street
Coudersport, PA 16915
Phone: 814-274-8522
Website: www.fsa.usda.gov

USDA Farm Service Agency
Pennsylvania State Farm Service Agency
1 Credit Union Place
Harrisburg, PA 17110
Phone: 717-237-2117
Website: www.fsa.usda.gov

USDA Natural Resources Conservation Service (NRCS) Pennsylvania State Office
One Credit Union Place, Suite 340
Harrisburg, PA 17110
Phone: 717-237-2100
Fax: 717-237-2238
Website: www.pa.nrcs.usda.gov

USDA-NRCS Coudersport Field Office (Potter and McKean County)
105 Market Street
Coudersport, PA 16915
Phone: 814-274-8166

USDA-NRCS Soil Survey Office
216 Spring Run Road
Mill Hall, PA 17751
Phone: 570-726-3196 ext. 122

U.S. Forest Service Ranger Station
29 Forest Service Dr.
Bradford, PA 16701
Phone: 814-362-4613

U.S. Forest Service-Allegheny National Forest
4 Farm Colony Drive
Warren, PA 16365
Phone: 814-728-6168

McKean County

Annin Township
P.O. Box 143
Turtlepoint, PA 16750
Phone: 814-642-7959

Bradford City
24 Kennedy Street
Bradford, PA 16701
Phone: 814-362-3884 ext:11

Bradford Township
136 Hemlock Street
Bradford, PA 16701
Phone: 814-368-3564

Ceres Township
12 Barbertown Road
Shinglehouse, PA 16748
Phone: 814-697-6948

McKean County (continued)

Eldred Borough
3 South Bennett Street
Eldred, PA 16731
Phone: 814-225-4777

Eldred Township
1834 West Eldred Road
Eldred, PA 16731
Phone: 814-225-4704

Foster Township
1185 East Main Street
Bradford, PA 16701
Phone: 814-362-4656

Hamlin Township
22 Park Road
Kane, PA 16735
Phone: 814-778-5855

Keating Township
7160 Route 46
Ease Smethport, PA 16730
Phone: 814-887-9921

Lafayette Township
7534 Route 59
Lewis Run, PA 16738
Phone: 814-368-5030

Lewis Run Borough
P.O. Box 265
Lewis Run, PA 16738
Phone: 814-368-5030

Liberty Township
Portage Road
Port Allegany, PA 16743
Phone: 814-642-2445

McKean County Commissioners
McKean County Commissioners
500 W. Main Street
Smethport, PA 16749
Phone: 814.887.3200

McKean County Conservation District
17137 Route 6
Smethport, PA 16749
Phone**:** 814-887-4001

McKean County Recycling Program
Recycling Coordinator
17137 Route 6
Smethport, PA 16749
Phone: 814.887.4004

McKean County Planning Commission
17137 Route 6
Smethport, PA 16749
Phone: 814-887-2754

Mount Jewett Borough
P.O. Box 7215
Mount Jewett, PA 16740
Phone: 814-778-5701

Norwich Township
3853 West Valley Road
Smethport, PA 16749
Phone: 814-887-2732

Otto Township
695 Main Street
Duke Center, PA 16729
Phone: 814-966-3553

Port Allegany Borough
45 West Maple Street
Port Allegany, PA 16743
Phone: 814-642-2526

Sergeant Township
126 Circle Drive
Mt. Jewell, PA 16740
Phone: 814-778-5525

Smethport Borough
201 West Main Street
Smethport, PA 16749
Phone: 814-887-5815

Potter County

Alleghany Township
92 Cobb Hill Road
Genesee, PA 16923
Phone: 814-848-5030

Clara Township
621 Clara Road
Shinglehouse, PA 16748
Phone: 814-698-2217

Coudersport Borough
201 South West Street
Coudersport, PA 16915
Phone: 814-274-9776

Eulalia Township
1160 East Second Street
Coudersport, PA 16915
Phone: 814-274-8102

Genesee Township
120 Hickox Road
Genesee, PA 16923
Phone: 814- 228-3366

Hebron Township
786 Baker Creek Road
Coudersport, PA 16915
Phone: 814-274-7306

Hebron Township Supervisor
1854 SR 44
Shinglehouse, PA 16748
Phone: 814-698-2140

Homer Township
348 Southwoods Road
Coudersport, PA 16915
Phone: 814-274-7629

Keating Township
P. O. Box 385
Austin, PA 16720
Phone: 814-642-2291

Oswayo Borough
115 Rumsey Street
Oswayo, PA 16915
Phone: 814-698-2665

Oswayo Township
Eleven Mile Road
Shinglehouse, PA 16748
Phone: 814-698-2745

Pleasant Valley Township
2324 Startwell Creek Road
Port Allegany, PA 16743
Phone: 814-544-8892

Potter County Conservation District
107 Market Street
Coudersport, PA 16915
Phone: 814-274-8411
Website: www.pottercd.com

Potter County Planning Commission
24 Maple View Lane
Coudersport, PA 16915
Phone: 814-274-8254

Commissioners Office of Potter County
Gunzburger Building
One North Main Street
Coudersport, PA 16915
Phone: 814-274-8290

Roulette Township
80 Railroad Avenue
P.O. Box 253
Roulette, PA 16746
Phone: 814-544-7549

Sharon Township
RD 1 Box 96
Shinglehouse, PA 16748
Phone: 814-697-7316

Shinglehouse Borough
P.O. Box 156
Shinglehouse, PA 16748
Phone: 814-697-6711

Summit Township
3401 Big Moores Run Road
Austin, PA 16720
Phone: 814-647-4381

Potter County (continued)

Sweden Township
121 Faith Street
Coudersport, PA 16915
Phone: 814-274-8829

Tourism Promotion Agencies

Allegheny Recreational Rentals, LLC/Bottorf Embroidery
217 W. Washington St
Bradford, PA 16701
Phone: 814-817-1283

Allegheny River Campground
1737 Route 6 W.
Roulette, PA 16746
Phone: 814-544-8844

Beechwood Camp
Brizze Hollow
Shinglehouse, PA 16748
Phone: 814-698-2336

Black Bear Campground
4930 Route 59
Lewis Run, PA 16738
Phone: 814-362-1394

Bradford Creative and Performing Arts Center
P.O. Box 153
10 Marilyn Horn Way
Bradford, PA 16701
Phone: 814-362-2522

Coudersport Country Club
839 Cherry Spring Road
Coudersport, PA 16915
Phone: 814-274-9122

God's Country Visitors Association
118 North Main Street
P.O. Box 245
Coudersport, PA 16915
Phone: 814-274-3365
Fax: 814-274-4334
Website: www.pottercountypa.org

Hemlock Springs
P.O. Box 421
Port Allegany, PA 16743
Phone: 814-545-1205
Website: www.hemlockscenter.org

Indian Echo Country Club Inc.
41 Indian Echo Drive
Port Allegany, PA 16743
Phone: 814-642-7544

Kinzua East KOA Campground
Kinzua Heights
Bradford, PA 16701
Phone: 814-368-3662

Northcentral Regional Planning and Development Commission
651 Montmorenci Road
Ridgway, PA 15853
Phone: 814-773-3162
Website: web2.ncentral.com

Old Tee Pee Campground
RD 1 Box 255e
Roulette, PA 16746
Phone: 814-544-7324

PA Route 6 Tourist Association
20 Bridge Street
P.O. Box 180
Galeton, PA 16922
Phone: 814-435-7706

Penn Brad Oil Museum
50 Parkway Lane
Bradford, PA 16701
Phone: 814-362-1955

Potter County Family Campground
3075 East Second Street
Coudersport, PA 16915
Phone: 814-274-5010

Potter County Snowmobile Association
P.O. Box 82
Coudersport, PA 16915
Phone: 814-274-9639

Tourism Promotion Agencies (continued)

Potter County Visitors Association
118 North Main Street
P.O. Box 245
Coudersport, PA 16915
Phone: 814-274-3365

Saint Marys Area Chamber of Commerce
53 South Saint Marys Street
Saint Marys, PA 15857
Phone: 814-781-3804
Fax: 814-781-7302

Seneca Highlands Snowmobile Club
361 Hamlin Street
Smethport, PA 16749

Smethport Country Club
13065 Route 59
Smethport, PA 16749
Phone: 814-887-5641

Sunset Vue Campground
140 Sunset Vue Dr.
Smethport, PA 16749
Phone: 814-887-2527

The Center for Rural Pennsylvania
625 Forster Street
Harrisburg, PA 17120
Phone: 717-787-95553
Fax: 717-772-3587
Website: www.ruralpa.org

The Inn on Maple Street
115 East Maple Street
Port Allegany, PA 16743
Phone: 814-642-5171

Willow Bay Campground
4001 West Washington Street
Bradford, PA 16701
Phone: 814-368-4158

Woodhaven Campgrounds
3295 Route 59
Bradford, PA 16701
Phone: 814-368-6806

Schools

Austin Elementary School District
138 Costello Avenue
Austin, PA 16720
Phone: 814-647-8603

Bradford Area High School
81 Interstate Parkway
Bradford, PA 16701
Phone: 814-362-3845

Coudersport Area Junior & Senior High School
698 Dwight Street
Coudersport, PA 16915
Phone: 814-274-8500

Coudersport Elementary School
802 Vine Street
Coudersport, PA 16915
Phone: 814-274-8055

Floyd C Fretz Middle School
140 Lorana Avenue
Bradford, PA 16701
Phone: 814-362-3508

George G. Blaisdell Elementary
265 Constitution Avenue
Bradford, PA 16701
Phone: 814-362-6834

Oswayo Valley School District
277 South Oswayo Street
Shinglehouse, PA 16748
Phone: 814-697-7175

Otto-Eldred School District
143 Sweitzer Drive
Duke Center, PA 16729
Phone: 814-966-3214

Port Allegany Junior & Senior High School
20 Oak Street
Port Allegany, PA 16743
Phone: 814-642-2544

Schools (continued)

School Street Elementary
76 School Street
Bradford, PA 16701
Phone: 814-368-3183

Smethport Elementary
414 South Mechanic Street
Smethport, PA 16749
Phone: 814-887-5012

Smethport High School
412 South Mechanic Street
Smethport, PA 16749
Phone: 814-887-5545

University of Pittsburgh at Bradford
300 Campus Drive
Bradford, PA 16701
Phone: 814-362-7500

Media/Outreach

Black Forest Broadcasting
13 Atkins Road
Roulette, PA 16746

Endeavor Media
P.O. Box 87
Coudersport, PA 16915

WBRR - FM Cool 100
1490 Saint Francis Drive
P.O. Box 545
Bradford, PA 16701
Phone: 814-368-4141

WESB Inc. News Radio
1490 Saint Francis Drive
P.O. Box 545
Bradford, PA 16701
Phone: 814-368-4141

WFRM Radio
9 South Main Street
Coudersport, PA 16915
Phone: 814-274-8600

WPIG Radio
3163 NYSRT 417
Olean, NY 14760
Phone: 716-372-0161

WQRM
211 West Main Street
Smethport, PA 16749
Phone: 814-887-1977

Zito Media
611 Vader Hill Road
Coudersport, PA 16915
Phone: 814-260-9575

APPENDIX R. NATIVE PLANT GUIDE

Common Name(s)	*Scientific Name*	Dry Area Plant	Shady Area Plant	Shady Rain Garden Plant	Sunny Area Plant	Sunny Rain Garden Plant	Plant well suited for Banks	Cut Flower Garden Plant	Plant for near Lakes, Ponds or Streams	Soil Stabilizing Plant	Wet Area Plant	Plant for Wooded Areas	Deer Resistant Plant	Drought Tolerant Plant	Bee Attractant Plant	Bird Attractant Plant	Wildlife Attractant Plant	Butterfly Attractant Plant	Hummingbird Attractant Plant
balsam fir	*Abies balsamea*																X		
fraser fir	*Abies fraseri*																X		
box-elder	*Acer negundo*	X	X		X			X				X	X						
Norway maple	*Acer platanoides*																X		
red maple	*Acer rubrum*				X											X	X		
silver maple	*Acer saccharinum*		X	X		X	X		X			X							
sugar maple	*Acer saccharum*										X				X				
mountain maple	*Acer spicatum*			X	X	X		X	X		X		X						
maple	*Acer* spp											X					X		
common yarrow	*Achillea millefolium*				X														
monkshood	*Aconitum uncinatum*										X								
sweetflag	*Acorus americanus*	X			X											X			
doll's eyes, white bugbane, white baneberry	*Actaea pachypoda*		X		X	X						X							
black cohosh, black bugbane, black	*Actaea racemosa*											X	X			X			
red baneberry	*Actaea rubra*									X									
northern maidenhair fern, maidenhair fern	*Adiantum pedatum*				X														
bottlebrush buckeye	*Aesculus parviflora*				X														
red buckeye, buckeye	*Aesculus pavia*	X			X	X				X			X	X		X			
false foxglove	*Agalinis purpurea*											X	X						

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blue giant hyssop, anise hyssop	*Agastache foeniculum*	X			X							X		X					
yellow giant hyssop	*Agastache nepetoides*		X																
giant purple hyssop	*Agastache scrophulariifolia*	X			X			X					X	X	X	X			
white snakeroot	*Ageratina altissima*												X						
small agrimony	*Agrimonia parviflora*				X	X					X					X			
red top	*Agrostis alba*	X			X														
hollyhock	*Alcea rosea*																X		
northern water plantain	*Alisma triviale*												X						
nodding onion, wild onion/leek	*Allium cernuum*									X									X
ramps, wild leeks	*Allium tricoccum*												X						
speckled alder	*Alnus rugosa*									X							X		
smooth alder	*Alnus serrulata*								X			X					X		
azalea	*Alnus serrulata*																X		
ragweed	*Ambrosia*																X		
downy serviceberry	*Amelanchier arborea*	X			X									X		X			
serviceberry, shadblow serviceberry, shadbush	*Amelanchier canadensis*														X			X	
allegheny serviceberry	*Amelanchier laevis*				X	X					X					X			
serviceberries, shadbush	*Amelanchier* spp.															X	X		
lead plant	*Amorpha canescens*			X	X		X		X			X				X			
Arkansas blue star flower	*Amsonia hubrectii*												X						
blue star, common blue star, eastern blue	*Amsonia tabernaemontana*						X					X						X	

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big bluestem grass, turkeyfoot	*Andropogon gerardii*	X	X		X	X					X	X	X			X	X		
little bluestem grass	*Andropogon scoparius*	X			X	X		X				X	X	X	X	X			
broom sedge	*Andropogon virginicus*				X								X				X		
meadow anemone, Canada anemone	*Anemone canadensis*		X									X							
pasque flower	*Anemone patens*		X		X	X		X	X		X	X	X			X			
wood anemone	*Anemone quinguefolia*												X			X			
thimbleweed, tall anemone	*Anemone virginiana*		X		X														
pussytoes, woman's tobacco, plantain-leaved pussytoes	*Antennaria plantaginifolia*		X																
wild columbine, eastern columbine, Canadian columbine, indianhemp	*Aquilegia canadensis*										X						X	X	X
wild sarsaparilla	*Aralia nudicaulis*				X	X			X		X								
spikenard	*Aralia racemosa*					X									X	X	X		
bearberry	*Arctostaphylos uva-ursil*				X														
redtop grass	*Argostis gigantean*	X	X	X	X								X						
jack-in-the-pulpit	*Arisaema triphyllum*					X													
dutchmans pipevine	*Aristolochia macrophylla*														X			X	
red chokeberry	*Aronia arbutifolia*				X														
black chokeberry	*Aronia melanocarpa*											X							
goatsbeard, bride's feathers	*Aruncus dioicus*									X									
wild ginger	*Asarum canadense*		X									X							
poke milkweed, tall milkweed	*Asclepias exaltata*		X								X		X					X	

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swamp milkweed, pink milkweed, white swamp milkweed	*Asclepias incarnata*	X																X	
purple milkweed	*Asclepias purpurascens*	X			X	X		X										X	
common milkweed	*Asclepias syriaca*		X											X			X	X	
butterflyweed, butterfly flower	*Asclepias tuberosa*					X					X					X		X	
whorled milkweed, horsetail milkweed	*Asclepias verticillata*		X				X					X						X	
pawpaw	*Asimina triloba*	X			X							X	X	X		X		X	
ebony spleenwort	*Asplenium platyneuron*				X	X		X					X	X					
blue wood aster, wood aster	*Aster cordifolius*					X					X		X		X			X	
white wood aster	*Aster divaricatus*	X	X								X	X						X	
heath aster	*Aster ericoides*				X						X							X	
smooth aster	*Aster laevis*	X						X					X						
dark leaf calico aster	*Aster lateriflorus*		X								X							X	
stiff-leaf aster, flaxleaf whitetop aster	*Aster linariifolius*										X			X					
big leaf aster	*Aster macrophyllus*		X		X				X										
New England aster	*Aster novae-angliae*				X						X		X			X	X	X	
New York aster	*Aster novi-belgii*					X					X							X	
aromatic aster	*Aster oblongifolius*		X									X	X					X	
purple-stemmed aster	*Aster puniceus*	X			X													X	
silky aster	*Aster sericeus*				X														
aster	*Aster* spp								X		X							X	
flat-topped aster	*Aster umbellatus*		X					X				X	X		X	X		X	

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lady fern	*Athyrium filix-femina*				X	X					X								
white wild indigo	*Baptisia alba*		X				X					X							
blue false indigo, wild indigo, false blue indigo	*Baptisia australis*												X					X	
cream wild indigo	*Baptisia leucophaea*		X										X			X			
dwarf wild indigo	*Baptisia minor*		X									X							
flare false indigo	*Baptisia solar*		X			X												X	
yellow wild indigo	*Baptisia sphaerocarpa*				X														
prairieblues wild indigo	*Baptisia starlite*		X									X	X	X		X		X	
yellow birch	*Betula alleghaniensis*																X		
birch	*Betula lenta*															X	X		
river birch	*Betula nigra*															X	X		
gray birch	*Betula populifolia*	X	X									X			X		X		
cross Vine	*Bignonia capreolata*	X			X			X					X	X		X			
boltonia, false aster	*Boltonia asteroides*	X			X														
sideoats grama	*Bouteloua curtipendula*												X				X		
bluejoint reedgrass	*Calamagrostis canadensis*	X	X		X								X						
American beautyberry	*Calicarpa americana*															X			
purple poppy mallow, winecups	*Callirhoe involucrata*							X											
bottlebrush	*Callistemon* spp.				X						X								
marsh marigold, marsh yellow marigold, cowslip	*Caltha palustris*				X	X	X				X		X		X				

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sweetshrub, Carolina allspice	*Calycanthus floridus*		X		X											X			
tall bellflower	*Campanula americana*				X														
creeping bellflower	*Campanula rapunculoides*	X	X		X	X						X	X			X		X	
trumpet vine, trumpet-creepe	*Campsis radicans*				X												X		
cut-leaf toothwort	*Cardamine concatenata*											X							
creek sedge	*Carex amphibola*											X			X				
appalachian sedge	*Carex appalachica*	X	X		X	X		X	X			X	X		X	X			
fringed sedge	*Carex crinita*	X	X		X			X				X							
bristleleaf sedge	*Carex eburnea*														X				
blue wood sedge	*Carex glaucoidea*														X				
gray's sedge	*Carex grayi*					X					X								
Ohio sedge	*Carex muskingumensis*								X										
Pennsylvania sedge	*Carex pensylvanica*				X	X					X								
plantainleaf sedge, seersucker sedge	*Carex plantaginea*				X														
silver sedge	*Carex platyphylla*					X					X								
broad-leaf sedge	*Carex siderosticha*	X			X								X	X					
sedges	*Carex spp.*				X												X		
owl-fruit sedge	*Carex stipata*				X											X			
upright sedge, tussock sedge	*Carex stricta*		X																
fox sedge	*Carex volpinoidea*		X		X					X			X				X		
American hornbeam, ironwood	*Carpinus caroliniana*		X		X		X					X	X		X				
hornbeam	*Carpinus* spp.				X													X	

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sweet pignut hickory	*Carya glabra*															X			
shagbark hickory	*Carya ovata*				X	X					X					X	X	X	
hickories	*Carya* spp.		X	X			X					X	X		X		X		
mockernut hickory	*Carya tomentosa*		X									X						X	
blue cohosh, papoose root	*Caulophyullum thalictroides*															X			
wild lilac or New Jersey tea	*Ceanothus americanus*				X													X	X
American bittersweet	*Celastrus scandens*		X	X	X	X			X		X	X	X				X	X	
hackberry, sugarberry	*Celtis occidentalis*	X			X				X		X		X				X	X	
buttonbush	*Cephalanthus occidentalis*		X		X	X		X	X		X		X	X		X	X		
eastern redbud	*Cercis canadensis*				X								X				X		
partridge pea	*Chamaecrista fasciculata*											X							
wild sensitive-plant	*Chamaecrista nictitans*				X			X						X					
atlantic white cedar	*Chamaecyparis thyoides*	X			X														
leatherleaf	*Chamaedaphne calyculata*	X																	
river oats, northern sea oats, indian woodoats	*Chasmanthium latifolium*		X										X			X			
white turtlehead	*Chelone glabra*															X			X
pink turtlehead	*Chelone lyonii*		X	X			X					X	X						
turtlehead	*Chelone* spp.	X			X	X		X	X		X		X		X				
fringetree	*Chionanthus virginicus*									X									
green-and-gold, gold star	*Chrysogonum virginianum*			X		X						X	X						
southern green and gold	*Chrysogonum virginianum var. australe*				X								X						

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Maryland golden aster, golden aster	*Chrysopsis mariana*		X								X	X	X						
hairy golden aster	*Chrysopsis villosa*											X							
chicory	*Cichorium intybus*		X		X	X				X			X	X		X			
mountain bugbane, American bugbane	*Cimicifuga americanus*	X	X					X	X					X					
fairy candles	*Cimicifuga racemosa*		X								X								
field thistle	*Cirsium discolort*		X									X	X			X			
spring beauty	*Claytonia virginica*	X	X				X						X		X			X	
virgin's bower, devil's darning needles, clematis	*Clematis virginiana*											X							
summersweet, sweet pepperbush	*Clethra alnifolia*	X			X														
bluebeard-lily, corn-lily	*Clintonia borealis*	X																	
blue-eyed mary	*Collinsia verna*		X		X	X			X		X	X	X			X		X	
sweet-fern	*Comptonia peregrina*		X									X	X			X			
blue mistflower	*Conoclinium coelestinum*											X							
sand coreopsis, lanceleaf tickseed	*Coreopsis lanceolata*										X							X	
passion tickseed	*Coreopsis limerock*												X					X	
prairie coreopsis	*Coreopsis palmata*		X		X	X			X		X	X	X			X			
tickseed	*Coreopsis pubescens*												X			X		X	
pink coreopsis, pink tickseed	*Coreopsis rosea*										X								
tickseed	*Coreopsis* spp.										X					X			
coreopsis, tall tickseed	*Coreopsis tripteris*		X				X		X			X	X		X				

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threadleaf coreopsis, threadleaf tickseed, whorled coreopsis	*Coreopsis verticillata*															X			
pagoda dogwood	*Cornus alternifolia*	X																	
silky dogwood	*Cornus amomum*	X			X								X				X		
flowering dogwood	*Cornus florida*												X				X		
swamp dogwood, stiff dogwood	*Cornus foemina*	X			X	X		X			X		X						
cornelian	*Cornus mas*																X		
gray dogwood, red panicled dogwood	*Cornus racemosa*		X									X	X			X	X		
red osier dogwood, redtwig dogwood	*Cornus sericea*	X	X				X				X	X	X	X		X	X		
dogwoods	*Cornus* spp.																X		
yellow harlequin	*Corydalis flavula*															X			
rock harlequin	*Corydalis sempervirens*															X			
American hazelnut, American filbert	*Corylus americana*															X			
cockspur hawthorn	*Crataegus crusgalli*															X			
Washington hawthrorn	*Crataegus phaenopyrum*	X			X											X			
dotted hawthorn	*Crataegus punctata*			X	X						X	X	X						
hawthorn	*Crataegus* spp.												X				X		
crocus	*Crocus* spp.																X		
orchard grass	*Dactylis glomerata*																X		
white prairie clover	*Dalea candida*		X		X	X		X	X		X	X	X		X				
tall larkspur	*Delphinium exaltatum*															X			
dwarf larkspur	*Delphinium tricorne*								X		X								

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hayscented fern	*Dennstaedtia punctilobula*							X											
hairgrass	*Deshampias flexuosa*		X				X					X	X						
sweet william	*Dianthus barbatus*				X	X										X			
squirrel corn	*Dicentra canadensis*	X										X				X			
dutchmans breeches	*Dicentra cucullaria*	X			X					X						X			
wild bleeding heart, turkeycorn, fringed bleeding heart	*Dicentra exemia*	X			X					X						X			
bush honeysuckle	*Diervilla lonicera*				X	X							X	X	X				
persimmon	*Diospyros virginiana*				X	X										X	X	X	
leatherwood	*Dirca palustris*				X	X					X		X			X			
shooting-star, American cowslips	*Dodecatheon meadia*	X													X				
parasol whitetop aster	*Doellingeria umbellata*				X						X								
goldie's wood fern	*Dryopteris goldiana*											X							
leather wood fern, marginal wood fern, evergreen wood fern, eastern wood fern	*Dryopteris marginalis*	X			X								X					X	
shield fern	*Dryopteris* spp.				X								X			X			
pale coneflower	*Echinacea pallida*											X	X						
yellow coneflower	*Echinacea paradoxa*					X							X						
purple coneflower	*Echinacea purpurea*			X	X	X							X		X	X	X		
coneflower	*Echinacea* spp.	X															X	X	
wild millet	*Echinochloa crus-galli*															X			
Canada wildrye	*Elymus canadensis*				X								X						

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bottlebrush grass	*Elymus hystrix*	X			X	X		X					X	X					
riverbank wild rye grass	*Elymus riparius*		X									X			X				
wild rye	*Elymus virginicus*	X																	
fireweed	*Epilobium angustifolium*				X														
horsetail	*Equisetum species*	X			X					X			X			X			
blue love grass	*Eragrostis elliottii*	X			X							X	X						
purple love grass, showy love grass	*Eragrostis spectabilis*										X							X	
daisy fleabane	*Erigeron strigosus*		X		X	X					X								
rattlesnake master	*Eryngium yuccifolium*				X	X		X			X	X	X			X		X	
trout lily, dogtooth violet, yellow trout lily, adder's tongue	*Erythronium americanum*																	X	
strawberry-bush	*Euonymus americanus*					X			X		X		X		X			X	
joe-pye weed, trumpetweed	*Eupatoriadelphus fistulosus*		X															X	
mistflower, blue mistflower, hardy ageratum	*Eupatorium coelestinum*				X	X		X			X		X		X			X	
little joe-pye weed	*Eupatorium dubium*				X	X					X		X		X	X		X	
hyssop-leaved boneset, thoroughwort	*Eupatorium hyssopifolium*	X			X			X						X				X	
gateway	*Eupatorium maculatum*											X							
spotted joe-pye weed	*Eupatorium maculatum*		X									X	X		X				
boneset, thoroughwort	*Eupatorium perfoliatum*												X			X			
purple joe-pyeweed, joe pye flower, sweetcented joe-pyeweed	*Eupatorium purpureum*		X		X	X							X			X			
snakeroot	*Eupatorium rugosm*		X			X					X		X						

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joe-pye-weed	*Eupatorium* spp.		X				X					X					X	X	
flowering spurge	*Euphorbia corollata*	X			X	X			X				X	X	X				
white wood aster	*Eurybia divaricata*				X							X	X		X			X	
flat-top goldentop	*Euthamia graminifolia*	X					X					X	X			X			
American beech	*Fagus grandiflora*		X			X		X	X			X	X				X		
beech	*Fagus* spp.	X															X		
queen-of-the-prairie	*Filipendula rubra*	X	X									X	X	X					
dwarf fothergilla	*Fothergilla gardenii*				X								X			X			
wild strawberry	*Fragaria virginiana*					X					X								
white ash	*Fraxinus americana*				X												X		
black ash	*Fraxinus nigra*															X			
green ash	*Fraxinus pennsylvanica*		X		X											X			
ash	*Fraxinus* spp.	X			X		X						X						
wandflower, beetleweed	*Galax urceolata*		X			X										X		X	
wintergreen, eastern teaberry	*Gaultheria procumbens*				X	X		X			X	X	X			X			
windflower	*Gaura lindheimeri*		X					X				X	X						
huckleberry	*Gaylussacia baccata*												X			X			
boxhuckleberry	*Gaylussacia brachycera*	X			X	X						X							
evening trumpet flower, Carolina jessamine	*Gelsemium sempervirens*		X		X						X	X				X			

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bottle gentian, closed gentian, blind gentian	*Gentiana clausa*				X	X										X			
wild geranium, wild cranesbill, wood geranium	*Geranium maculatum*				X													X	
cranesbill geranium	*Geranium sanguineum*																X		
prairie smoke	*Geum triflorum*	X			X	X		X					X			X		X	
American ipecac	*Gillenia stipulata*		X	X								X	X			X			
honey locust	*Gleditsia triacanthos*			X	X	X					X		X		X			X	
fowl mannagrass	*Glyceria striata*																X		
downy rattlesnake plantain	*Goodyera pubescens*		X									X						X	
Carolina silverbell	*Halesia caroliana*	X	X		X								X			X		X	
witchhazel, American witch hazel	*Hamamelis virginiana*				X											X		X	
english ivy	*Hedera helix*																X		
helen's flower; common sneezeweed, dog-tooth daisy	*Helenium autumnale*		X												X				
sneezeweed, purple-headed helen's flower	*Helenium flexuosum*		X		X	X					X		X			X		X	
swamp sunflower	*Helianthus angustifolius*	X			X	X							X		X	X		X	
thin-leaf sunflower	*Helianthus decapetalus*	X														X		X	
woodland sunflower	*Helianthus divaricatus*	X	X		X		X					X		X		X			
tall sunflower, giant sunflower	*Helianthus giganteus*		X									X	X						
small-headed sunflower	*Helianthus microcephalus*				X														
western sunflower	*Helianthus occidentalis*				X							X			X				
dwarf perennial sunflower	*Helianthus salicifolius*		X																

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sunflower	*Helianthus* spp.	X	X									X	X	X			X		
oxeye daisy, smooth oxeye, false sunflower	*Heliopsis helianthoides*	X			X								X			X		X	
swamp pink	*Helonias bullata*		X		X								X						
daylily	*Hemerocallis*																X		
roundlobe hepatica, sharplobe hepatica	*Hepatica acutiloba*	X																	
alumroot, coral bells	*Heuchera americana*		X									X							
hairy alum root	*Heuchera villosa*	X																	
shuttleworth's ginger	*Hexastylis shuttewortii*				X	X			X				X						
scarlet rose mallow	*Hibiscus coccenius*				X	X					X		X			X			
swamp rose mallow, marsh hibiscus	*Hibiscus moscheutos*			X					X		X	X	X				X		
rattlesnake weed	*Hieracium venosum*											X							
bluets	*Houstonia caerulea*				X						X								
wood hyacinth	*Hyacinthoides hispanica*																X		
wild hydrangea	*Hydrangea arborescens*				X											X			
oakleaf hydrangea	*Hydrangea quercifolia*		X																
goldenseal, yellow root	*Hydrastis canadensis*						X					X		X					
maple-leaved waterleaf, broad-leaved waterleaf	*Hydrophyllum canadense*										X		X						
Virginia waterleaf, eastern waterleaf	*Hydrophyllum virginianum*		X						X			X	X						
saint john's wort	*Hypericum calycinum*			X	X	X					X		X	X		X			
dense hypericum	*Hypericum densiflorum*		X			X							X			X			
shrubby saint john’s wort	*Hypericum prolificum*		X	X		X					X		X			X			

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great saint john's wort	*Hypericum pyramidatum*		X				X	X				X	X						
yellow star-grass	*Hypoxis hirsuta*		X	X	X				X					X		X			
inkberry	*Ilex glabra*				X	X											X		
American holly	*Ilex opaca*				X	X		X	X		X		X	X			X		
winterberry	*Ilex verticillata*						X					X	X				X		
jewelweed	*Impatiens capensis*														X				
pale jewelweed, touch-me-not	*Impatiens pallida*															X			
impatiens	*Impatiens* spp.																X		
crested iris	*Iris cristata*		X		X						X	X				X			
white crested iris	*Iris cristata alba*	X			X								X						
slender blue flag	*Iris prismatica*	X			X								X	X		X			
iris	*Iris* spp.																X		
blue flag iris, northern blue flag	*Iris versicolor*										X								
Virginia sweetspire, tassle-white	*Itea virginiana*	X			X						X			X		X			
twinleaf	*Jeffersonia diphylla*				X	X			X	X	X					X			
butternut	*Juglans cinerea*																X		
black walnut	*Juglans nigra*	X	X									X							
Canada rush	*Juncus canadensis*			X	X				X						X				
soft rush	*Juncus effusus*	X																	
eastern red cedar	*Juniperus virginiana*				X											X	X		
mountain laurel	*Kalmia latifolia*				X											X			
june grass	*Koehleria cristata*	X								X									

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false boneset	*Kuhnia eupatorioides*				X														
flatpea	*Lathyrus sylvestris*	X			X	X									X				
rice cutgrass	*Leersia oryzoides*					X							X			X	X		
round headed bush clover	*Lespedeza capitata*				X				X	X									
fetterbush	*Leucothoe racemosa*			X	X	X		X	X		X							X	
rough blazing star	*Liatris aspera*	X			X								X						
cylindrical blazing star	*Liatris cylindracea*				X	X					X		X			X			
meadow blazing star	*Liatris ligulistylis*		X	X								X	X					X	
appalachian blazing star	*Liatris microcephala*			X			X												
prarie blazing star	*Liatris pycnostachya*	X			X							X	X	X				X	
northern blazing star	*Liatris scariosa*														X				
dense blazing-star, gayfeather, spike gayfeather	*Liatris spicata*				X													X	X
blazing-star, gayfeather	*Liatris* spp.	X	X															X	
button blazing star, scaly blazing star, gayfeather	*Liatris squarrosa*											X							
wood lily	*Lilium philadelphicum*				X													X	
lily	*Lilium* spp.																X		
turk's cap lily	*Lilium superbum*				X	X					X		X			X			
Canada lily, wild yellow	*Lillium canadense*			X					X							X		X	
spicebush	*Lindera benzoin*														X				
sweetgum	*Liquidambar styraciflua*	X			X		X						X	X					
tuliptree	*Liriodendron tulipifera*															X			X

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cardinal flower, red cardinal flower	*Lobelia cardinalis*														X		X		X
beechwood blend	*Lobelia cardinalis x siphilitica*	X	X									X	X					X	X
indian tobacco	*Lobelia inflata*	X																	
great blue lobelia	*Lobelia siphilitica*							X											X
pale spiked lobelia	*Lobelia spicata*		X		X								X			X			
trumpet honeysuckle, coral honeysuckle	*Lonicera sempervirens*					X			X	X	X					X	X		X
birdsfoot trefoil	*Lotus corniculatus*																X		
seedbox	*Ludwigia alternifolia*	X			X	X		X			X		X			X			
wild lupine, indian beet, old maids bonnets, blue lupine, sundial lupine	*Lupinus perennis*	X		X		X									X				
hairy woodrush, woodrush	*Luzula acuminata*	X			X							X	X		X				
magnolia	*Magnolia* spp.		X													X			
sweetbay magnolia	*Magnolia virginiana*	X																	
Canada mayflower	*Maianthemum canadense*	X	X				X					X	X			X			
feathery false lily of valley	*Maianthemum racemosum*		X		X											X			
American crabapple	*Malus glaucescens*																X		
apple	*Malus* spp.																X		
barbara's buttons	*Marshallia grandiflora*				X								X			X		X	
ostrich fern	*Matteuccia struthiopteris*		X		X	X			X			X	X	X				X	
meehan's mint, creping ground mint	*Meehania cordata*											X						X	
Virginia bluebells	*Mertensia virginica*				X													X	

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sharpwing monkeyflower, winged monkey	*Mimulus alatus*		X									X	X						
monkey flower, square-stemmed monkey flower	*Mimulus ringens*															X		X	
partridgeberry	*Mitchella repens*				X														
bishops cap, mitrewort	*Mitella diphylla*		X		X						X			X					
basil balm	*Monarda clinopodia*	X			X														X
bee balm, oswego tea, bergamot, scarlet bee balm	*Monarda didyma*	X										X						X	X
wild bergamot, lavendar bergamot, bee balm	*Monarda fistulosa*		X	X	X	X				X	X		X	X		X			X
purple bergamot	*Monarda media*		X	X		X		X	X			X	X						X
spotted bee balm	*Monarda punctata*				X	X			X		X		X						
beebalm, monarda	*Monarda* spp.	X															X		X
red mulberry	*Morus rubra*				X			X									X		
pink muhly grass	*Muhlenbergia capillaris*					X							X						
bayberry, northern bayberry	*Myrica pennsylvanica*		X								X	X					X		
black gum, tupelo, sour gum	*Nyssa sylvatica*	X															X		
sharp-leaved aster, whorled aster	*Oclemena acuminatus*		X	X			X					X	X						
evening primrose, common evening	*Oenothera biennis*											X							
sundrops, fireworks	*Oenothera fruticosa*				X				X	X									
stiff goldenrod	*Oligoneuron rigidum*				X											X			
sensitive fern	*Onoclea sensibilis*															X			

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pricklypear, eastern pricklypear cactus, devil's tongue	*Opuntia humifusa*				X				X		X		X			X			
aniseroot	*Osmorhiza longistylis*	X			X	X	X					X	X	X					
cinnamon fern	*Osmunda cinnamomea*				X														
interrupted fern	*Osmunda claytoniana*				X	X			X		X		X		X				
royal fern	*Osmunda regalis*	X				X							X						
hop-hornbeam	*Ostrya virginiana*											X				X			
sourwood	*Oxydendrum arboreum*															X			
allegheny pachysandra, allegheny spurge	*Pachysandra procumbens*				X														
goldenragwort	*Packera aurea*		X					X											
peony	*Paeonia* spp.																X		
American ginseng	*Panax quinquefolius*				X											X			
atlantic costal panic grass	*Panicum amarulum*															X			
panic grass	*Panicum* spp.																X		
switch grass, panic grass	*Panicum virgatum (amarum)*				X	X											X		
wild quinine	*Parthenium integrifolium*	X	X																
Virginia creeper	*Parthenocissus quinquefolia*		X								X		X				X		
wild passion vine	*Passiflora incarnata*				X	X							X		X			X	
passionflower	*Passiflora* spp.		X															X	
arrow arum	*Peltandra virginica*																X		
talus slope penstemon																			

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hairy beardtongue	*Penstemon hirsutus*				X													X	X
small's beardtongue	*Penstemon smallii*	X	X						X			X	X						
beardstongue	*Penstemon* spp.		X																X
ditch stonecrop	*Penthorum sedoides*				X														
Carolina phlox	*Phlox carolina*															X			
woodland phlox, wild sweet william, meadow phlox, blue wood phlox	*Phlox divaricata*	X	X						X			X	X						
meadow phlox	*Phlox maculata*											X							
summer phlox, garden phlox, perennial phlox	*Phlox paniculata*															X			X
downy phlox	*Phlox pilosa*	X			X	X					X				X	X			X
phlox	*Phlox* spp.																X		
creeping phlox, summer phlox	*Phlox stolonifera*															X			
moss phlox, mountain phlox, moss pink	*Phlox subulata*												X						
ninebark	*Physocarpus opulifolius*				X	X					X			X		X			
obedient plant, false dragonhead	*Physostegia virginiana*			X					X			X	X						
pokeweed	*Phytolacca dodecandra*																X		
shortleaf pine	*Pinus echinata*				X	X					X				X				
pond pine	*Pinus palustris*						X					X			X				
pitch pine	*Pinus rigida*	X			X			X					X		X	X	X		
pines	*Pinus* spp.	X															X		
eastern white pine	*Pinus strobus*														X		X		
Virginia pine	*Pinus virginiana*							X											

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American sycamore	*Platanus occidentalis*		X								X	X							
Kentucky blue-grass	*Poa pratensis*																X		
roughstalk bluegrass	*Poa trivialis*										X								
mayapple, mandrake	*Podophyllum peltatum*		X					X				X	X				X		
greek valerian, jacob's ladder, greek valerian, spreading jacob's ladder	*Polemonium reptans*			X	X	X			X		X		X						
variegated native jacob's ladder	*Polemonium* spp.				X	X													
smooth solomon seal	*Polygonatum biflorum*				X														
solomon's seal, giant solomon's seal	*Polygonatum canaliculatum*		X		X				X		X		X						
downy solomon's seal	*Polygonatum pubescens*	X														X			
Pennsylvania smartweed	*Polygonum pensylvanicum*																X		
christmas fern	*Polystichum acrostichoides*															X			
tassel fern	*Polystichum polyblepherum*															X			
pickerelweed	*Pontederia cordata*															X		X	
aspen	*Populus* spp.																X		
bowman's root, indian physic, American ipecac	*Porteranthus trifoliata*															X			
long-leaf pondweed	*Potamogeton nodosus*																X		
sago pondweed	*Potamogeton pectinatus*																X		
prairie cinquefoil	*Potentilla arguta*				X														
bush cinquefoil, shrubby cinquefoil	*Potentilla fruticosa*				X	X					X					X			
Norwegian cinquefoil	*Potentilla norvegicia*	X			X								X	X		X			
three-toothed cinquefoil	*Potentilla tridentata*		X								X		X					X	

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common selfheal	*Prunella vulgaris*			X					X			X							
wild plum	*Prunus americana*	X										X							
pin cherry	*Prunus pensylvanica*		X											X					
black cherry, wild cherry	*Prunus serotina*				X					X	X					X	X		
cherries	*Prunus* spp.			X			X		X			X	X				X		
choke cherry	*Prunus virginiana*		X										X			X	X		
hoary mountain mint	*Pycnanthemum incanum*				X	X		X				X	X	X	X	X			
showy mountain mint, clustered mountain mint, mountain mint	*Pycnanthemum muticum*									X									
slenderleaf mountain mint	*Pycnanthemum tenuifolium*		X										X			X			
Virginia mountain mint	*Pycnanthemum virginianum*				X														
white oak	*Quercus alba*				X	X											X		
swamp oak, swamp white oak	*Quercus bicolor*	X			X		X						X		X		X		
scarlet oak	*Quercus coccinea*					X											X		
bur oak	*Quercus macrocarpa*	X																	
pin oak	*Quercus palustris*												X				X		
willow oak	*Quercus phellos*															X	X		
chestnut oak	*Quercus prinus*																X		
red oak	*Quercus rubra*				X	X		X	X		X		X			X	X		
oaks	*Quercus* spp.																X		
black oak	*Quercus velutina*															X			
prairie coneflower	*Ratibida pinnata*	X	X																
Maryland meadow beauty	*Rhexia mariana*				X										X				

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meadow beauty, handsome hairy	*Rhexia virginica*	X			X						X								
sweet azalea	*Rhododendron arborescens*					X					X								
rosebay rhododendron	*Rhododendron maximum*		X									X						X	
swamp azalea	*Rhododendron viscosum*	X			X								X	X		X			
rhododendron	*Rhododendron* spp.																X		
swamp azalea	*Rhododendron viscosum*	X			X								X	X		X			
rhododendron	*Rhododendron* spp.																X		
fragrant sumac	*Rhus aromatica*															X			
dwarf-winged sumac	*Rhus copalina*				X					X							X		
smooth sumac	*Rhus glabra*				X												X		
sumacs	*Rhus* spp.	X			X			X						X		X	X		
staghorn sumac	*Rhus typhina*		X									X					X		
pasture rose, Carolina rose	*Rosa Carolina*		X		X		X					X	X	X	X		X		
swamp rose	*Rosa palustris*					X							X				X	X	
rose	*Rosa* spp.																X		
Virginia rose	*Rosa virginiana*	X	X											X			X		
common blackberry	*Rubus allegheniensis*		X									X	X				X		
flowering raspberry	*Rubus odoratus*	X			X			X						X			X		
thimbleberry	*Rubus parviflorus*		X			X					X		X			X			
blackberry, raspberry	*Rubus* spp.																X		
eastern coneflower, organe coneflower	*Rudbeckia fulgida*		X																
black-eyed susan	*Rudbeckia hirta*		X	X					X		X	X	X			X			

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green-headed coneflower, cutleaf coneflower	*Rudbeckia lanciniata*											X							
great coneflower	*Rudbeckia maxima*														X				
sweet coneflower	*Rudbeckia subtomentosa*	X	X		X		X					X	X	X				X	
brown-eyed-susan, three lobed coneflower	*Rudbeckia triloba*		X										X			X			
Carolina wild petunia	*Ruellia caroliniensis*										X								
fringe-leaved petunia, hairy wild petunia, wild petunia	*Ruellia humilis*		X				X		X		X	X	X		X				
limestone petunia	*Ruellia strepens*	X			X														
pussy willow	*Salix discolor*		X				X					X	X	X					
sandbar willow	*Salix exigua*		X					X				X	X			X			
black willow	*Salix nigra*			X	X			X				X	X	X			X		
silky willow	*Salix sericea*									X	X				X		X		
willow	*Salix* spp.															X			
lyreleaf sage, purple knockout	*Salvia lyrata*				X											X			
elderberry, American elder, common elderberry	*Sambucus canadensis*	X	X		X		X	X				X	X	X	X	X	X		
red-berried elder	*Sambucus racemosa ssp. pubens*	X																X	
bloodroot	*Sanguinaria canadensis*		X																
swamp burnet	*Sanguisorba canadense*	X																	
sassafras	*Sassafras albidum*										X							X	
water dragon, swamp lily, lizards tail	*Saururus cernuus*	X			X							X							
swamp saxifrage	*Saxifraga pensylvanica*														X				
early saxifrage	*Saxifraga virginiensis*				X	X		X	X		X				X				

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little bluestem	*Schizachyrium scoparium*					X			X		X		X				X	X	
hardstem bullrush	*Scirpus acutus*		X		X												X		
black bullrush, green bullrush	*Scirpus atrovirens*		X									X							
wool grass, wool rush	*Scirpus cyperinus*				X														
three-square bullrush	*Scirpus pungens*											X					X		
softstem bullrush	*Scirpus tabermontanii*									X	X						X		
hoary skullcap, hyssop skullcap, skullcap	*Scutellaria incana*								X			X							
hyssop skullcap	*Scutellaria integrifolia*															X			
Allegheney skullcap	*Scutellaria serrata*				X	X			X		X								
sedum	*Sedum* spp.																X		
wild stonecrop, woodland stonecrop, stonecrop	*Sedum ternatum*															X			
golden ragwort, golden groundseal, squaw-weed	*Senecio aureus*											X						X	
northern wild senna, wild senna, American	*Senna hebecarpa*	X	X									X	X		X				
Maryland senna	*Senna marilandica*	X																	
bristlegrass	*Setaria* spp.																X		
wild pink, pink campion	*Silene caroliniana*				X	X				X			X			X		X	
royal catchfly	*Silene regia*	X																X	
starry campion	*Silene stellata*		X	X	X						X	X	X						
fire pink	*Silene virginica*		X									X	X						
compass plant	*Silphium laciniatum*												X						
cup plant	*Silphium perfoliatum*	X	X		X								X						

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prairie dock	*Silphium terebinthinaceum*														X				
whorled rosenweed	*Silphium trifoliatum*				X											X		X	
blue-eyed grass, select blue-eyed grass	*Sisyrinchium angustifolium*	X										X							
false solomon's seal	*Smilacina racemosa*						X					X						X	
greenbriar	*Smilax* spp.																X		
silverrod, white goldenrod	*Solidago bicolor*				X												X		
bluestem goldenrod, wreath goldenrod	*Solidago caesia*				X											X	X		
zigzag goldenrod	*Solidago flexicaulis*		X		X											X	X	X	
flat top goldenrod	*Solidago graminifolia*	X	X	X	X							X	X		X	X			
early goldenrod	*Solidago juncea*												X						
gray goldenrod	*Solidago nemoralis*				X														
anisescented goldenroad	*Solidago odora*		X				X												
roughleaf goldenrod	*Solidago patula*				X													X	
riddell's goldenrod	*Solidago reddellii*												X						
stiff goldenrod	*Solidago rigida*					X							X					X	
wrinkleleaf goldenrod, rough-stemmed goldenrod	*Solidago rugosa*				X												X		
seaside goldenrod	*Solidago sempervirens*												X						
blue-stemmed, grey, or showy goldenrod	*Solidago speciosa*			X			X					X							
short-pappus goldenrod, autumn goldenrod	*Solidago sphacelata*		X									X	X						
goldenrod	*Solidago* spp.	X			X								X				X	X	
American mountain ash	*Sorbus americana*																X		
indian grass	*Sorghastrum nutans*															X	X		

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American bur-reed	*Sparganium americanum*			X								X	X			X			
giant bur-reed	*Sparganium eurycarpum*									X							X		
prairie cord grass	*Spartina pectinata*		X	X							X	X	X		X	X			
indian pink	*Spigelia marilandica*				X				X		X								
meadowsweet	*Spiraea alba*		X									X							
steeplebush	*Spiraea tomentosa*	X																	X
nodding ladies tresses	*Spiranthes cernua*										X								
fragrant lady's tresses	*Spiranthes cernua var. odorata*	X			X									X	X			X	
lady's tresses orchid	*Spiranthes odorata*	X	X		X	X	X			X		X	X	X	X	X		X	
narrow-leaved meadowsweet	*Spirea alba*				X	X					X			X		X		X	
broad-leaved meadowsweet	*Spirea latifolia*		X																
tall dropseed, rough dropseed, meadow dropseed	*Sporobolus compositus*				X								X						
prairie dropseed	*Sporobolus heterolepis*															X		X	
American bladdernut	*Staphylea trifolia*															X			
porcupine grass	*Stipa spartea*				X											X			
stokes' aster	*Stokesia laevis*								X	X	X								
wood poppy, celandine poppy	*Stylophorum diphyllum*				X														
snowberry	*Symphoriacarops*	X			X							X		X					
coralberry	*Symphoricarpos orbiculatus*		X									X					X		
blue heart-leaved aster	*Symphotrichum cordifolium*				X											X			
crooked-stem aster	*Symphotrichum prenanthoides*				X											X		X	
purple-stemmed aster	*Symphotrichum puniceum*	X			X														

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short's aster	*Symphotrichum shortii*					X					X	X		X	X	X			
reclining aster	*Symphyotrichum ericoides*									X									
calico aster	*Symphyotrichum lateriflorum*														X				
white or frost aster	*Symphyotrichum porteri*											X	X						
skunk cabbage	*Symplocarpus foetidus*				X	X			X	X						X			
bald cypress	*Taxodium distichum*	X			X							X							
yew	*Taxus* spp.																X		
meadow rue	*Thalictrum aquilegifolium*																X		
early meadow rue	*Thalictrum dioicum*				X						X								
tall meadow rue	*Thalictrum pubescens*				X											X			
rue anemone	*Thalictrum thalictroides*										X								
New York fern	*Thelypteris noveboracensis*	X			X								X		X	X			
foamflower, creeping foamflower	*Tiarella cordifolia*					X													
American linden or basswood	*Tilia americana*					X											X		
Mexican sunflower	*Tithonia rotundifolia*																X		
poison ivy	*Toxicodendron radicans*																X		
Ohio spiderwort, spiderwort	*Tradescantia ohiensis*				X											X			
spiderwort, Virginia spiderwort, common spiderwort	*Tradescantia virginiana*				X														
tassel rue	*Trautvetteria caroliniensis*		X																
blue curls	*Trichostema dichotomum*	X	X		X		X			X			X	X					
purple-top	*Tridens flavus*		X		X											X			
red clover	*Trifolium pratense*																X		

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white dutch clover	*Trifolium repens*																X		
southern trillium	*Trillium cuneatum*	X										X							
purple trillium, red trillium, wake robin, stinking benjamin, squawroot	*Trillium erectum*				X							X	X			X		X	
declined trillium, white wake-robin, drooping trillium	*Trillium flexipes*															X			
showy trillium, large flowering trillium	*Trillium grandiflorum*	X	X		X		X						X	X					
yellow trillium, southern	*Trillium luteum*			X								X							
prairie trillium, bloody noses	*Trillium recurvatum*		X			X					X	X	X			X			
toadshade, toad trillium	*Trillium sessile*	X	X		X	X		X			X		X	X	X	X		X	
trillium	*Trillium* spp.				X				X	X							X		
spreading globeflower	*Trollius laxus*	X														X			
eastern hemlock	*Tsuga canadensis*				X											X	X		
hemlock	*Tsuga Carrière*																X		
tulip	*Tulipa* spp.																X		
showy merrybells, large-flowered bellwort, wild oats	*Uvularia grandiflora*		X															X	
bellwort, merrybells	*Uvularia perfoliata*	X		X	X	X										X		X	
wild oats	*Uvularia sessilifolia*				X								X						
lowbush blueberry	*Vaccinium angustifolium*				X								X				X		
highbush blueberry	*Vaccinium corymbosum*				X								X			X	X		
blueberries	*Vaccinium* spp.												X				X		
deerbery	*Vaccinium staminium*				X	X					X					X	X		

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regal lingonberry	*Vaccinium vitiis-idaea*										X								
wild celery	*Vallisneria Americana*																X		
purple vervain	*Verbena canadensis*				X					X	X					X			
blue vervain, simpler's joy, swamp verbena, blue verbena	*Verbena hastata*			X									X		X				
hoary vervain	*Verbena stricta*															X			
tall ironweed	*Vernonia gigantea*				X						X					X			
tawny ironweed, upland ironweed	*Vernonia glauca*											X							
New York ironweed, broadleaf ironweed	*Vernonia noveboracensis*												X						
culver's root	*Veronicastrum virginicum*															X			
giant ironweed	*Veronia gigantea*														X	X			
mapleleaf viburnum	*Viburnum acerifolium*		X													X			
witherod, wild raisin	*Viburnum cassinoides*				X								X						
arrowood viburnum, southern arrowwood	*Viburnum dentatum*		X														X		
nannyberry viburnum	*Viburnum lentago*										X								
possumhaw, witherod viburnum	*Viburnum nudum*		X									X							
blackhaw viburnum, black haw	*Viburnum prunifolium*												X			X	X		
viburnums	*Viburnum* spp.		X			X										X	X		
cranberry bush, highbush cranberry	*Viburnum trilobum*			X	X							X					X		
white violet, Canada violet	*Viola canadensis*					X					X	X	X				X	X	
marsh blue violet	*Viola cucullaria*																	X	
halberdleaf yellow violet	*Viola hastata*																	X	
labrador violet	*Viola labradorica*																	X	

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common blue birdfoot violet	*Viola pedata*																	X	
smooth yellow violet	*Viola pensylvanica*																	X	
downy yellow violet	*Viola pubescens*																	X	
long-spurred violet	*Viola rostrata*																X	X	
wild blue violet	*Viola sororia*																	X	
pansy	*Viola* spp.																X		
creamy violet	*Viola striata*																X	X	
grape, wild grape	*Vitis* spp.																X		
barren strawberry	*Waldsteinia fragarioides*																	X	
Virginia chain fern	*Woodwardia virginica*																	X	
yellow root	*Xanthorhiza simplicissima*																	X	
golden alexanders, zizia	*Zizia aurea*																	X	

APPENDIX S: ENHANCING FISH HABITAT

Habitat is defined as the place where an organism lives or is naturally found. Enhancing habitat in an aquatic ecosystem improves the over all health and quality of a given waterway. By doing so, it in turn benefits everyone who enjoys outdoor recreation weather it be fishing, boating, or just an outdoor enthusiast.

Aquatic habitat enhancement can be constructed in both streams and lakes and is designed to improve habitat for everything from fish to various reptiles. As well as having a wide range of organisms that habitat enhancement structures benefit there is also a diverse variety of artificial habitat purposes and designs that Pennsylvania Fish and Boat Commission (PFBC) has come up with to suit the needs of Pennsylvania's wildlife. In order to perform a Fish Habitat improvement project the proper permits must first be required from Pennsylvania's Department of Environmental Protection (PA DEP). Once the permits are acquired grants are applied for to provide funding.

The primary objective of artificial fish habitat is to use resources such as wood and rock rubble to increase the abundance of submerged native habitat using designs engineered to mimic Pennsylvania's naturally occurring resources. Artificial fish habitat also provides excellent fishing opportunities for anglers if they are aware of the locations of the structures.

PFBC offers Lake Habitat Improvement Maps for all the state and federal owned lakes where habitat improvement projects have been completed. These maps show the general shape of the lake and indicate where all man made structures are located along with how many are present and the depth of their location. If read correctly these maps provide a very efficient way for anglers to navigate the structures and ultimately find fish (PFBC[2]).

Habitat Enhancing Structures for Cover

Man-made aquatic habitat structures are designed to serve several different purposes for aquatic life, each one being necessary for a successful aquatic environment. One purpose for artificial habitat is to provide smaller prey fish with cover from predators where preexisting cover is nonexistent. Most needs for this type of habitat structure is in the early man made lakes that can be found scattered across Pennsylvania. This is because in earlier years when many lakes were being formed it was thought that the lake bottom should be bare, therefore all debris was cleared from the area leaving little to no cover remaining for aquatic organisms. There are many variations for this form of habitat that use all types of materials ranging from wooden poles to large sandstone rocks. Examples of this type of habitat structure are the Porcupine Crib, Porcupine Crib Jr., Post Stump, Post Stump Plus, Post Cluster, Post Cluster Plus, Rock Star, Vertical Plank Structure, Spider Hump, Stake Tree, Felled Shoreline Tree, and Rock Rubble Humps.

Porcupine Crib and Porcupine Crib Jr.

Porcupine Crib and Porcupine Crib Jr. are two habitat structures that are very alike in their design. They are constructed using 4ft. 2×2 pieces of rough timber, 8×8×16 concrete blocks, nails, and a nylon banding strap with steel buckle. The 4 ft. pieces of wood are nailed to one another while slowly steeping inward in the shape of a pyramid with the concrete blocks placed at the bottom for weights and the nylon banding strap used for added strength. Once completed the cribs are placed at the bottom of the lake at a minimum depth of about 10 ft. and are normally placed in clusters. Once submerged the Porcupine Crib and Crib Jr. form what serves as a wooden cage like structure with openings between the boards allowing smaller bait fish to swim in and out ultimately providing them with cover. At the same time the Porcupine Crib provides places for predatory fish to hunt due to the large amounts of bait fish that are drawn to

them. Porcupine cribs serve as excellent areas for fishermen seeking various species of pan fish as well as the larger game fish species that are drawn in too feed on them (PFBC[1]).

Post Stump and Post Stump Plus

The Post Stump and Post Stump Plus have a simple design which involves nothing more that two to three 4ft. sections of 6 inch wide aquatic posts and are normally placed at a depth of about 4ft. of water. The Post Stump is made by pounding two sections the aquatic posts into the lake bottom until they are submerged about two feet below the surface. The two pieces of post can be placed straight up and down or at an angle depending on preference. The Post Stump Plus is constructed the same way as the plain Post Stump but involves a laterally positioned post that is bolted to the vertical posts underneath the waters surface for added cover. This Habitat structure is designed to benefit an array of aquatic organisms. The submerged posts act as artificial submerged stumps providing cover for predatory and prey fish alike. Being that this type of habitat structure is placed in shallower waters it creates fishing sites for anglers that are accessing the lakes from shore banks (PFBC[1]).

Post Cluster and Post Cluster Plus

The Post Cluster and Post Cluster Plus are very similar in design and purpose to the Post Stump and Post Stump Plus. This type of habitat is made with 8ft. long sections of 6 inch wide aquatic posts and normally involves the use of heavy equipment to build. The Post Cluster is placed in about 4ft. of water and is constructed by inserting the 8ft. sections of aquatic posts about two feet into the lakes bottom allowing the tops to protrude from the waters surface. The Post Cluster can include as many poles in each cluster as preferred and can be arranged in any shape that is desired. The Post Cluster Plus is constructed the same as The Post Cluster except it involves laterally positioned posts that are bolted to the vertical posts underneath the waters surface for added cover. Once completed the clusters of protruding posts replicate what acts as submerged woodland. This habitat structure is designed to benefit an array of aquatic organisms. As well as providing cover for fish of all sizes the exposed post above the surface of the water serve as excellent perch sites for fish hunting birds. Also the Post Clusters exposed portions tend to eventually attract aquatic plant growth such as lily pads which in turn attracts organisms like frogs and dragonflies that fish and other organisms can feed on. This type of habitat structure draws in all types of fish species thus providing favorable fishing for boating and shore fishermen alike. The post clusters also act as a barrier between the shore and open water by breaking up waves decreasing shore line erosion (PFBC[1]).

Rock Star

The Rock Star is a man made habitat structure that involves the use of both rough cut timber and sandstone rocks. To construct this type of structure you need seven tons of sand stone, seven eight ft. 2×6 sections of rough cut timber, and nails. A rock star consists of a two ton pile of sandstone encircled by five surrounding one ton piles of sandstone that is connected by five sections of 2×6 rough timber in the general shape of a star. The connecting pieces of rough cut timber should be buried in the rock piles and elevated from the lakes bottom for aquatic organisms to use for cover. After the star shaped structure is completed the last two sections of eight ft. 2×6 are nailed into the others that are already placed connecting any two of the pieces of boards for additional cover. These structures can be placed at any depth and are designed to provide cover for all types of aquatic organisms. Rock Stars can also double as spawning sites for some species of fish (PFBC[1]).

Vertical Plank Structure

The vertical Plank Structure is a wooden box designed to provide cover for large and small fish alike. The structure consists of 59 sections of rough cut timber that rang from 1×4×24 to 2×3×48, nine concrete blocks to allow it to sink to the bottom, and nails. Small conifer trees may also be placed in the box once built to add additional cover. This habitat structure is used much the same as the Porcupine crib.

Placement is normally at a minimum depth of 10ft. and more often then not they are placed in clusters. The main difference being the Vertical plank structure has openings that are much larger in size allowing larger fish and other aquatic organisms to enter them. If located the Vertical Plank structure is an excellent place for anglers to try their luck for not only does it provide cover for bait fish but larger sized fish as well (PFBC[1]).

Spider Hump and Rock Rubble Hump

The Rock Rubble Hump is the simplest artificial habitat structure there is as far as its general design is concerned. It consists of a pile of sandstone rock that stands anywhere from one to three ft. high and can be placed at any depth that is preferred. The Spider Hump is a more complex modification of the Rock Rubble Hump that is constructed using sandstone rocks, spikes, and 8ft. aquatic posts. A square is built with 8ft. posts then fastened down with spikes. Then 16 more evenly spaced posts are laid in the square and fastened down with all of the bottoms meeting in the center of the box. Once the posts are all placed three tons of rock is dumped onto the center of the structure to form a rock pile with wooden posts protruding providing excellent cover for all types of aquatic organisms. These habitat enhancement structures also provide excellent areas for fish species that prefer spawning in rocky areas (PFBC[1]).

Stake Tree

The Stake Tree is constructed using a five gallon plastic bucket, 2×2 wooden stakes (varying in length), and concrete. To create a Stake Tree simply arrange 6 to 8 wooden stakes in any random order in the bucket then pour in concrete to harden and hold them in place. When completed place it anywhere where it's deep enough for it to become totally submerged and once placed it will replicate a submerged tree with branches. The Stake Tree can be placed in level or slightly steeping areas and in normally situated in groups of 10 to 30 structures or 50 to 60 per acre in a circular arrangement. These structures are excellent for attracting pan fish such as crappie and bluegill and are sure to provide fishing hot spots (PFBC[1]).

Felled Shoreline Tree

The Felled Shoreline Tree habitat enhancement uses trees surrounding a lake or other body of water, a chain saw, and a steel cable to create ideal aquatic habitat. A Felled Shoreline Tree is formed but cutting down a tree along the edge of a body of water and angling it so it falls into the water. Once cut down the tree is fastened to the stump that is remaining with the steel cable to keep it in place. Although this is already a naturally occurring process among aquatic ecosystems it speeds up the process and allows the person creating the habitat to place the downed trees in favorable locations. The Felled Shoreline Tree structure is to be placed where the tree will fall into water that has a steep droop off and has a minimum depth of 10ft. towards the where the top of the tree will fall. These structures provide habitat for fish of all species and sizes (PFBC[1]).

Habitat Enhancing Structures for Spawning and Nesting

Another purpose that Habitat enhancement structures are designed to improve is spawning and nesting sites available to aquatic organisms. There are several types of structures that are designed to provide nesting areas for specific types of fish species in Pennsylvania. These types of structures include the Black Bass Nesting Structure, Fathead Minnow Spawning Cover, and Channel Catfish Spawning Box. These three types of habitat structures all are designed to enable specific species of fish to reproduce efficiently buy building them the necessary habitat for each of their unique forms of breeding or nesting habits.

Black Bass Nesting Structure

The Black Bass Nesting Structure is built from wood, nails, and concrete blocks and when completed forms a table looking structure. It's constructed by building a base out of 4ft. pieces of 2×2 rough cut timber to place the concrete blocks in just as you would a porcupine box. Once the Blocks are in place for weights to make the structure sink to the bottom five 8ft. pieces of 1×8 rough cut timber are laid across the top with equal lengths of over hang on each side and nailed in place. The structures are placed in depths of about 5ft. and will provide ideal nesting sites for black bass species including the much sought after large mouth bass. The overhanging edges on opposing sides of the structure are about 14 inches from the bottom allowing bass to nest and lay their eggs underneath the cover it provides (PFBC[1]).

Fathead Minnow Spawning Cover

The Fathead Minnow Cover habitat structure is very simple to construct and consists of nothing more then a 2ft. long 1×8 with one end being pointed and the other flat. To build Fathead Minnow Spawning Cover you use a sledge to pound the piece of 1×8 into the bank of a lake or other body of water at a depth of 1 to 2ft. The structure is to be driven into the substrate 3 to 6in. at a slight upward angle. For ideal success the recommended density of this structure is six per acre. Like most other fish species Fathead Minnows spawn seasonally occurring during the month of June therefore the structures may be removed once the spawning time period has expired (PFBC[1]).

Channel Catfish Spawning Box

The Channel Catfish Spawning Box has one of the more complex structural designs, among the materials need to build this structure are 8ft. 1×8 boards, 16×16 concrete blocks, nails, and lag screws with washers. Using the boards a rectangle is constructed that is 32in. long 16in. wide and 10in. high. The box has a entrance hole 6in in diameter and two ½ in. air release holes on the top of the box towards the entrance hole. Two 16×16 concrete blocks are fastened to the bottom of the structure for anchors using the lag screws. Once completed the Channel Catfish Spawning Box is placed in 3 to 5ft. of water. When placed the structure will provide the Channel Catfish with a place to spawn or simply use for cover (PFBC[1]).

Habitat Enhancing Structures for Basking

These types of structures are designed primarily for reptile species and are essentially small floating dock like structures anchored down to provide organisms like turtles with an island refuge from the water. Basking structures benefit more then just the organisms that use them for retreat form the water. They also provide cover for fish just the same as a boat dock would. There is one main type of basking structure design in Pennsylvania and it's called the Turtle Basking Platform.

Turtle Basking Platform

The Turtle Basking Platform involves quite a variety of materials to construct. Materials needed to build this structure are 2ft. and 4ft. 1×8 rough cut lumber, 4ft. 4×4 rough cut lumber, various screws and bolts, stainless steel rope wire and cable clamp, PVC pipe and caps, sealer, conduit hangers, and 8×8×16 cement blocks. A 4ft. × 4ft. dock like structure is constructed form the rough cut timber and two capped PVC pipes serving as floats. The steel cables are then attached to opposing sides of the structure and the cement blocks are attached to the steel cables acting as anchors. These structures are placed in about 5ft. of water and can be placed alone or in clusters (PFBC[1]).

Habitat Enhancing Structures for Erosion Control

These types of structures are designed to eliminate shoreline erosion and act as wave deflectors. They also deplete the amount of sediment eroded into the water and create a buffer zone for nutrient

saturation. This is accomplished by laying seeded jute matting above the banks where the habitat enhancement is constructed. Jute Matting will reinforce the shoreline and add plant growth to absorb nutrients. Along with the water quality benefits this type of habitat enhancement offers it also provides more desirable cover for fish that prefer shallow waters along the shoreline. Therefore these structures benefit anglers that fish from shore as well as the aquatic organisms that live there. There are two types of erosion controlling or deflecting habitat enhancement designs in Pennsylvania, the Saw-Toothed Deflector and the Stone Framed Deflector.

Saw-Toothed Deflector and Stone Framed Deflector

These two types of structures are not only very similar in design and appearance but involve the use of all the same materials. Both are constructed using large sandstone or limestone boulders to form an outline and smaller sandstone or limestone rocks to fill in the interior of the structures. Also pre-seeded jute matting is used in the construction of these structures along the shore where rock meets dirt for accelerated plant growth and bank stability. The Saw-Toothed Deflector uses the rocks to form an irregular pattern along the shore where erosion is occurring. The Stone Framed Deflector places rocks in a triangular pattern consisting of a 30 degree angle from shore that meets a 90 degree angle coming back towards shore. The long face of the triangle should be facing the direction in which the wind and waves are coming from. Stone Framed Deflectors extend further out into the lake then Saw-Toothed Deflector thus provide more availability in the relation to fish habitat. Along with the construction of these habitat structures riparian buffers are often put in place where stone deflectors are located (PFBC[1]).

Habitat Enhancement Structures for Streams

All of Pennsylvania's Rivers and streams are ever changing as the years go on. These changes develop naturally and can occur over the course of several years or just a couple days if flooding is sever enough. Changes among rivers and streams are caused by the systems natural urge to find equilibrium or the most stable direction of flow. This natural urge can cause the river or stream to wind back and forth and ultimately ruin the systems livability for more demanding aquatic organisms like trout. This is because constant bends and breaks in a running waterway causes it to become shallow, slow moving, and can in turn limit livable space for aquatic organisms. For this reason the Pennsylvania Fish and Boat Commission along with other conservation groups have developed ways to improve the course of a moving system while respecting the desired course of the waterway at the same time. These improvements often involve the use of heavy equipment and are constructed from natural materials such as wood and rock. A common solution that man made habitat enhancement structures provide for a moving aquatic ecosystems is straightening of its natural flow. By straightening the systems flow the river or stream will eventually move faster and deepen over the span of several years in turn providing more livable space and desirable habitat. Many of the created habitat structures also serve a double purpose for aquatic organisms by offering cover for them to hide amongst (Lutz, 2007).

There are various aquatic enhancements and habitat structures that are installed in Pennsylvania's streams and river systems. Sometimes they just involve stream bank stabilization or placement of woody debris for fish cover, but there are several man made habitat structures that involve quite elaborate designs and a lot of work to construct. All habitat structures require proper permits to build and place just as the habitat structures constructed for lakes. The most common types of structures that are constructed within streams are deflectors and Vanes. Both are mainly constructed to divert channel flow. There are also channel blocking structures that are made to block off side channels that drain from the main flow. And lastly there structures designed to provide habitat cover for aquatic organisms. These consist of Water Jacks, Cribs, and random rock or log structures (Lutz, 2007).

Channel Deflecting Structures

Deflectors are triangular structures of all different sizes that serve several purposes and can be constructed from all sorts of materials ranging from rocks to brush and even tree roots. One thing that a deflector does for a stream is adjust the main current back to the center of the waterway. While doing so the deflector narrows the channel of flow and collects substrate and debris along the bank below the structure which also deepens the waterway. Deflectors also provide some habitat cover for aquatic species such as fish. Another type of habitat structure designed for streams are Vanes. A Vane serves the same purpose as a Deflector and is constructed from basically the same materials. Types of Vane and Deflector structures include Saw-Toothed Deflectors, Stone Deflectors, Stone Deflector with Single Log, Log framed Deflector, Overhead Deflector, Log Faced Stone Deflector, Stacked Deflector, Brush Deflector, Root Wad Deflector, Single Log Vane, Single Log Vane with Root Wad, Multi-Log Vane, Rock Vane, Rock Vane with J Hook, Log Cross Vane, Rock Cross Vane.

Saw-Toothed Deflectors, Stone Deflectors, and Stone Deflector with Single Log

Saw-Toothed Deflectors are made form stone and are the simplest of the deflectors to construct. This habitat structure is made by dumping rock in the formation of triangles along the stream bank with a 30 degree angle facing the upstream end to center the current. They are to extend 5ft. out into the stream and are placed in groups of anywhere from three to as many needed. Stone Deflectors are built the same as the Saw-Toothed but tend to be larger and are placed alone instead of in groups. The Stone Deflector with Single Log is modified slightly from the others having a log buried in the rock pile that protrudes out from the tip of the deflector angling upstream against the flow. This is just to provide additional cover for fish and other aquatic organisms (PFBC[1]).

Log framed Deflector, Overhead Deflector, Log Faced Stone Deflector, and Stacked Deflector

The Log Framed Deflector is designed to server the same purpose as the Stone Deflector and is constructed the same way just with a triangular frame built from logs. The main log is placed along the face against the flow at a 30 degree angle and the brace log is put along the back side. The two logs are buried in the bank on the shore side and are pinned down at the tip with rebar. The Overhead Deflector is the same design but uses planking to fill in the deflector before the rock place as filler. As for the Log Faced Stone Deflector it's nothing more then a Stone Deflector one or two logs placed on the 30 degree face of the structure that diverts the current. The face log or logs are fastened to sill logs that are buried under the stone inside the structure. All three of these habitat enhancement structures are designed for current diversion and can double as cover for fish and other organisms like macro invertebrates (PFBC[1]).

Brush Deflector and Root Wad Deflector

The Brush Deflector is a type of deflector that has many benefits. It's constructed from wooded stakes and brushy debris. This type of deflector is built by pounding the stakes into the bottom of the stream leaving about 2×2ft. square spaces in between. The stakes should form a triangle pointing towards the middle of the stream and each stake should protrude about 6 inches from the streams surface. Once the stakes are in place the spaces between stakes are stuffed with bundles of brush until it's built up to above normal water level. This structure will eventually develop growth over of the brush pile and become land that can be walked on forming a permanent deflector. The Root Wad Deflector is simply a root wad or lower portion of a tree that is placed with the root mass in the water and the trunk buried within the streams bank. This habitat structure acts as a deflector for current but server more as a cover provider. Aquatic Organisms use the entangled mass of roots for cover from predators (PFBC[1]).

Single Log Vane, Single Log Vane with Root Wad, and Multi-Log Vane

The Single Log Vane and Single Log Vane with Root Wad are current deflecting structures and are designed to center the streams flow, prevent stream bank erosion, and provide cover for aquatic organisms. These habitat structures are constructed from logs and rock. A Single Log Vane is built by burying a log in the stream bank then pouring stone over the end that is stuck in the back to hold it in place. A larger stone is also placed behind the tip of the log in the stream for added strength. The log is to be pointed upstream against the flow at a 20 to 30 degree angle. Single Log Vane with Root Wad is the same structure with a root wad deflector added on the downstream side of the structure for added cover and current deflection. The Multi-Log Vane is another similar structure that is built the same as the single log vane but as the name states multiple logs are placed in the stream bank to protrude into the stream instead of a single log. This structure may be used when there are stronger currents or larger streams for added stability (PFBC[1]).

Rock Vane and Rock Vane with J Hook

The Rock Vane and Rock Vane with J Hook are two other vane structures that are constructed from only rock. A Rock Vane is built by making a line of larger stone out into the stream at a 90 degree angle. Then the upstream side of the structure is filled in with smaller rock forming a triangle. The Rock Vane with J Hook is the same structure just with a hook made from stone coming off the tip of the vane that curves downstream. These structures tend to deflect the current and form deep slow pools for aquatic habitat (PFBC[1]).

Log Cross Vane and Rock Cross Vane

The Log Cross Vane and Rock Cross Vane are designed to center flow and create a deepened pool with a fast moving current on the down stream end of the structure. These can form damming barriers in low water conditions but when water levels are normal to high the water is carried over the structure and cuts into the bottom forming deep holes that are desirable for anglers. These structures are nothing more then two vanes built on opposing sides of a stream with their tips meeting in the middle to be fastened down. Log Cross Vane being made up of two opposing Single Log Vanes and the Rock Cross Vane being made up of two opposing Rock Vanes (PFBC[1]).

Channel Blocking Structures

Channel blocking structures are habitat structures that are constructed to divert the flow of a stream back to its main channel. Over time streams can develop side channels from flooding that can deplete the amount of water as well as strength of current from the main channel. This can cause poor habitat for fish and other organisms that desire cool fast flowing waters and at the same time can impact the health of the stream. Channel blocking structures use natural materials to block these side channels off and correct the flow. There are two types of channel blocking structures these being the Stone Channel Block and The Log Frame Channel Block.

Stone Channel Block and Log Frame Channel Block

The Stone Channel Blocker is simply a wall build from piling rock to block off side channels. A pile of larger rock is dumped right where the side channel flows out then a layer of smaller rock and another layer of the larger rock. The rocks are piled slightly higher then the normal water level and should not be piled higher then the surrounding stream banks. The Log Framed Channel Blocker is built in the same way but involves log frame for added strength. The log frame consists of 2 logs placed across the side channel perpendicularly that are connecter by several brace logs that are fastened down with rebar. Once the frame is in place large rocks are poured over the edged and along the structures down stream face in the side channel. Then smaller filler rocks are dumped on to fill in the frame and other remaining space.

These structures keep the main flow of the stream going in the proper direction improving the overall quality of the stream (PFBC[1]).

Cover Providing Structures

There are several different variations of habitat structures that provide aquatic organisms with cover. The simplest forms of these structures are the Random Boulder Placement and the Half Log Structure. Both are quick and easy to construct and their soul purpose is to provide cover for organisms such as fish. Another type of habitat structure that is designed to provide cover is the cribbing structure. There are several different types of these structures including Bank Cover Cribbing, Bank Cover Cribbing with Root Wad, Mud Sill Cribbing, and Modified Mud Sill Cribbing all of which including the same basic design. These structures are designed to be placed along stream banks to allow fish and other organisms to swim under them for cover while also doubling as bank stabilizers.

Random Boulder Placement and Half Log Structure

Random Boulder structures are just as they sound. The Structures consist of boulders that are large enough to withstand flooding conditions being placed in the middle third of the wetted width of a stream. The boulders should protrude from the water's surface and should not be placed in a way that they would deflect the current of the stream towards the bank causing erosion. These habitat structures are very basic and easy to construct. The Half Log Structure consists of rebar, two 6 to 8 inch spacer logs, and a 3 to 4 foot long half log to be placed as the top. To construct this habitat structure the spacers and top are put in place and then fastened into place by pounding rebar through the top piece and spacer right into the stream bottom using preexisting drilled holes. The structure is to be placed parallel to the flow of the stream with the top slightly protruding from the water's surface. Both of these habitat structures are excellent for providing fish cover as well as cover for other aquatic organisms (PFBC[1]).

Brookie Water Jack and Water Jack

The Water Jack and Brookie Water Jack are similar structures that basically serve the same purpose. Both are designed to dam up and center stream flow eventually creating a deepened pool on the down stream side of the structure for organisms to live in. The Brookie Water Jack is smaller and a little simpler to construct because it is designed to be built in small fast moving streams that inhabit brook trout thus giving it the name. These structures are built from logs, rock, and a sheet of hemlock planking. A single log is placed across the stream and buried in the ground on both sides for strength. Then the sheet of planking is placed on the upstream face of the structure forcing the water to flow up and over. A notch is also to be cut in the middle of the sheet of planking so that water is still able to flow in low water conditions and when high will center the streams flow. On each side of the log along the bank rock deflectors are placed over the log to center the flow and add strength. The Basic Water Jack is a more elaborate habitat structure designed to be placed in larger streams yet is designed to serve the same purpose. It consists of the same materials the Brookie Water Jack does but it uses more logs. At the center two logs are placed along the stream perpendicular to the flow and another is placed up stream in the same way. Then the piece of wooden planking is placed over the logs at an upward steeping angle connection the gap to force the flow of water up and over the structure. Once this part is completed wing logs are placed along the sides forming structures similar to Log Framed Deflectors that keep the flow of the stream centered and the stream banks from eroding. The water jack structures provide deep pools of cold fast moving water for all sorts of aquatic organisms to thrive in. these structures also server as bank erosion controllers and channel deflecting structures. Overall they are very beneficial to a streams habitat and are very beneficial (PFBC[1]).

Bank Cover Cribbing and Bank Cover Cribbing with Root Wad

Cribbing structures are made from logs rock and planking boards. A Bank Cover Crib is constructed along the bank of the stream and is designed to act as an undercut bank for fish to hide under. This habitat structure is build by taking planking boards and driving them into the stream bank in a row to form a platform that extends out over the stream about 2 feet. With the platform in place a logs are fastened to the top and bottom of the platforms edge that hangs over the stream. The portions of the logs that extend further then the platform are buried in the ground for added support. Once there is a sturdy overhanging platform structure completed rocks are dumped over the plank platform to build it up to level with the stream bank. The Bank Cover Cribbing with Root Wad is build the same way as the Bank Cover Cribbing but has root wads protruding from under the structure for added cover. The root wads are buried in the stream bank and extend out from underneath the providing excellent habitat for aquatic organisms to hide amongst (PFBC[1]).

Mud Sill Cribbing and Modified Mud Sill Cribbing

The Mud Sill and Modified Mud Sill Cribbing are similar I design to Bank cover Cribbing structures. The Mud Sill Cribbing is built in 8ft. sections and is made from oak planking, logs, and rock. To construct this type of habitat structure you must first dig ditches in the stream bank for the logs to lie in. Once the logs have been laid a platform is built over the part of the structure that hangs over the stream using the oak planking. When the platform is completed rocks are dumped over the top of the structure at an angle leveling it off with the stream bank. The Modified Mud Sill Cribbing it constructed in the same fashion but instead of being designed so the current can freely flow underneath the structure the up stream and down stream ends of the structure are brought down all the way to the bottom of the stream just leaving an undercut that can be gotten under from the front. Also a log is placed protruding into the water on the downstream end of the structure to deflect the current back under the structure and create an undercut. These habitat structures are very efficient in creating cover for organisms like trout and other fish species serving as good fishing spots for anglers. The Mud Sill and Modified Mud Sill Cribbing structures also prevent stream bank erosion and provide bank stability (PFBC[1]).

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APPENDIX T. SUMMARY OF HYDRAULIC FRACTURE SOLUTIONS-MARCELLUS SHALE

TABLE 1

SUMMARY OF HYDRAULIC FRACTURE SOLUTIONS - MARCELLUS SHALE

Product Vendor	Application Sequence	Product Name	Hazardous Components (From MSDS)	Hazardous Ingredient Weight %	Pounds of hazardous ingredient / pound water	Gallons of Frac solution per stage	Concentration in Frac Solution (ppm)	EPA Risk Based Concentration - Residential Tapwater (ppm)
BJS	1	HCl	Hydrochloric Acid	8%	0.015834	2000	83.68	
		CI-14	Propargyl Alcohol	5%	0.00004327	2000	0.23	0.073
			Methanol	68%	0.000588472	2000	3.11	18
		Ferrotrol 300L	Citric Acid	70%	0.0035	2000	18.50	
	2	XLW-32	Methanol	90%	0.001593	42000	176.79	18
			Boric Oxide	20%	0.000354	42000	39.29	
		GW-3LDF	Petroleum Distallate Blend	60%	0.00321	42000	356.24	
			Polysaccharide	60%	0.00321	42000	356.24	
		GBW-20C	no hazardous ingredients	0%	0	42000	0.00	
		BF-7L	Potassium Carbonate	100%	0.0005725	42000	63.53	
		GBW-15L	Sodium Chloride	14%	0.000154	42000	17.09	
	3	FRW-14	Hydrotreated light distillate	40%	0.000424	334000	374.20	
			Ethoxylated Alcohol	5%	0.000053	334000	46.77	
		Alpha 125	Glutaraldehyde	30%	0.0000798	334000	70.43	
Fractech	1	HCL	Hydrochloric Acid	8%	0.0168896	2000	89.26	
		40 HTL	Methanol	10%	0.0002	2000	1.06	18
		NE100	Methanol	5%	0.0000485	2000	0.26	18
		FE100L	no hazardous ingredients	0%	0	2000	0.00	
	2	HVG-04	no hazardous ingredients	0%	0	42000	0.00	
		B9	Potassium Hydroxide	20%	0.000206	42000	22.86	
		BXL-2	Potassium Hydroxide	10%	0.000117	42000	12.98	

SUMMARY OF HYDRAULIC FRACTURE SOLUTIONS - MARCELLUS SHALE								
Product Vendor	Application Sequence	Product Name	Hazardous Components (From MSDS)	Hazardous Ingredient Weight %	Pounds of hazardous ingredient / pound water	Gallons of Frac solution per stage	Concentration in Frac Solution (ppm)	EPA Risk Based Concentration - Residential Tapwater (ppm)
	3	ICI-3240	Dazomet	24%	0.0000696	334000	61.42	
			Sodium Hydroxide	4%	0.0000116	334000	10.24	
		ICI-150	Glutaraldehyde	50%	0.00014125	334000	124.66	
			Methanol	5%	0.000014125	334000	12.47	18
		FRW-50	Diesel (use discontinued)	20%	0.000194	334000	171.21	
		FRW-25	no hazardous ingredients (used in place of FRW-50)	0%	0	334000	0.00	
Universal	1	Iron Check	no hazardous ingredients	0%	0	2000	0.00	
		HCl	Hydrochloric Acid	8%	0.0168896	2000	89.26	
	2	Unilink 8.5	Ethylene Glycol	40%	0.00111	42000	123.19	73
			Boric Acid	7%	0.00019425	42000	21.56	
		GBL-8x	n/a	0%	0	42000	0.00	
		Unigel 19XL	no hazardous ingredients (guar gum)	0%	0	42000	0.00	
	3	FRP-21	no hazardous ingredients	0%	0	334000	0.00	
		Bioclear 200	2,2-Dibromo-3-Nitrilopropionamide	20%	0.0000625	334000	55.16	
			Polyethylene Glycol Mixture	60%	0.0001875	334000	165.48	
Halliburton	1	HAI-OS	Methanol	60%	0.001068	2000	5.64	18
			Propargyl Alcohol	10%	0.000178	2000	0.94	0.073
		FE-1A	Acetic Acid	60%	0.001235042	2000	6.53	
			Acetic Anhydride	100%	0.002184454	2000	11.54	
		HCl	Hydrochloric Acid	8%	0.0168896	2000	89.26	
	2	K-34	Sodium Bicarbonate	100%	0.001271735	42000	141.13	
		BC 140	Monoethanolamine	30%	0.000523988	42000	58.15	
			Ethylene Glycol	30%	0.000566485	42000	62.87	73
			Boric Acid	30%	0.000608982	42000	67.58	
		Delta Frac 140	no hazardous ingredients	0%	0	42000	0.00	

SUMMARY OF HYDRAULIC FRACTURE SOLUTIONS - MARCELLUS SHALE								
Product Vendor	Application Sequence	Product Name	Hazardous Components (From MSDS)	Hazardous Ingredient Weight %	Pounds of hazardous ingredient / pound water	Gallons of Frac solution per stage	Concentration in Frac Solution (ppm)	EPA Risk Based Concentration - Residential Tapwater (ppm)
	3	FR-46	Ammonium Bisulfate	30%	0.000375	334000	330.95	
		Aldacide G	Glutaraldehyde	30%	0.0000798	334000	70.43	
Superior	1	AI-2	Glycol Ether (ethylene glycol monobutylether)	30%	0.000291	2000	1.54	18
			Propargyl Alcohol	30%	0.000291	2000	1.54	0.073
			Isopropyl Alcohol	30%	0.000291	2000	1.54	
			Proprietary Component	7%	0.0000679	2000	0.36	
		IC-100L	Cirtic Acid	100%	0.00154	2000	8.14	
		OB-Fe	Propylene Glycol	40%	0.000452	2000	2.39	730
			Ferrous Sulfate, Heptahydrate	30%	0.000339	2000	1.79	
		Super OW-3	Isopropyl Alcohol	40%	0.00018	2000	0.95	
			Methanol	13%	0.0000585	2000	0.31	18
		Super Pen 2000	Ethylhexanol	70%	0.000322	2000	1.70	
			Proprietary Component	30%	0.000138	2000	0.73	
		Super 100NE	Isopropyl Alcohol	30%	0.00015525	2000	0.82	
			Glycol Ethers	7%	0.00007245	2000	0.38	18
		HCl	Hydrochloric Acid	8%	0.0168896	2000	89.26	
	3	Bioclear 200	2,2-Dibromo-3-Nitrilopropionamide	20%	0.0000625	334000	55.16	
			Polyethylene Glycol Mixture	60%	0.0001875	334000	165.48	
		SAS-2	Hydrotreated Light Distillate	30%	0.000306	334000	270.06	
			Mineral Spirits	25%	0.000255	334000	225.05	
			Propylene Glycol	25%	0.000255	334000	225.05	730
			Ethoxylated Alcohols	4%	0.0000408	334000	36.01	

Source: http://www.dep.state.pa.us/dep/deputate/minres/oilgas/FractListing.pdf

APPENDIX U. INTERVIEW AND SURVEY QUESTIONS

Interview Questions

1. How has the area changed in the past 10 years in terms of…? Were these changes good, bad, indifferent?

2. How do the following meet the needs of the community? (Are the quantities sufficient, insufficient, or satisfactory? Are they in good condition or in need of repair/improvement?) Do you have any proposed solutions or management recommendations?

    a. Transportation –area roads, public transportation, availability or ease of using alternative transportation (biking, walking trails, etc.) to get around the area
    b. Infrastructure – water and sewer lines, communications (cell phone reception, Internet service, etc.)
    c. Employment opportunities
    d. Educational opportunities
    e. Land-use ordinances & zoning

3. Do the recreational opportunities currently meet the needs of the community and visitors?
    (Are there too many, not enough, or a sufficient number? What condition are they in? Are they easy to access?) Do you suggest any improvements or additions to the recreational opportunities throughout the area?

    a. Parks/Picnic Sites
    b. Hiking/Biking Trails
    c. Off- Road Vehicle Riding
    d. Scenic Vistas/Photography
    e. Wildlife/Bird Watching
    f. Hunting/Fishing
    g. Boating/Swimming
    h. Historical Sites/Structures
    i. Other
    j. Winter Recreation

4. What are some of the positive features of the watershed/area? (Please consider both ecology and social/community features in your answer, from water quality to economics.) What is one of the strongest or most attractive features/characteristic of the watershed area?

5. What impacts (positive or negative) are currently affecting the land, water, and biological resources? What positive/negative impacts are affecting the community character of the region? What impacts are affecting the local economy?

6. Do you have any specific projects or type of projects you would like to see identified in the plan? (Examples: Stream access locations for fishing/paddling; Erosion control projects; Trail development or linkages; Dirt and gravel road improvements; Restoration

of a particular site or area affected by abandoned mines or mine refuse; Illegal dumpsites to be cleaned-up; Invasive plant infestations to control; Important natural areas to protect.)

7. What must the watershed conservation plan include to be successful?

8. Do you have any other concerns that we have not discussed?

9. Do you know of any other people we should ask to interview?

10. Do you have any questions or comments before we conclude this interview?

Survey Questions

Municipal Surveys

1.) Does your municipality have a comprehensive plan? **YES or NO**
If yes, what is the name of the plan(s) and when was it adopted?

2.) Does your municipality currently utilize zoning? **YES or NO**
Does your municipality currently utilizing subdivision ordinances? **YES or NO**
Does your municipality have floodplain ordinances? YES or NO

3.) Are there any municipal parks in your municipality? If yes, please list them?

4.) a. Does your municipality have any public water services in the project area? **YES or NO**
Supplier_____

b. Do you foresee the need to upgrade or establish a public water supply in your municipality in the project area within the next ten years? **YES or NO**

5.) a. Does your municipality have any public sewage systems in the project area? **YES or NO**
Treatment System _____

b. Do you foresee the need to upgrade or establish a public sewage system in your municipality in the project area within the next ten years? **YES or NO**

6.) Who provides emergency services, such as:
Police _____
Fire _____
EMS _____

7.) Is there anything unique, or well known about your municipality that you would like to have highlighted in the plan?

8.) Comments

Public Surveys

Residents & Visitors

Continued

*** Please use the following scale for the next three questions, each number can be used more than once.**

5 = Very Important
4 = Somewhat Important
3 = Neutral
2 = Not very Important
1 = Not Important

3. Please indicate the importance of the following watershed values.

_____ Attractive Natural Settings
_____ Community Activities
_____ Educational Opportunities
_____ New Business/Jobs
_____ Preserving History/Culture
_____ Recreation Opportunities
_____ Residential Development
_____ Water Quality
_____ Other _____

4. Please indicate the importance of the following recreational activities in the region.

_____ ATV Riding
_____ Biking
_____ Bird/Wildlife Watching
_____ Boating
_____ Canoeing/Kayaking
_____ Fishing
_____ Hiking
_____ Horseback Riding
_____ Hunting
_____ Organized Sports
_____ Photography
_____ Picnicking
_____ Snowmobiles
_____ Swimming
_____ Visiting Public Parks
_____ Visiting Public Vistas
_____ Other _____

Residents & Visitors

5. Please indicate the importance of addressing the following issues in this plan.

_____ Preserving Agricultural Lands
_____ ATV/Snowmobile Conflicts
_____ Infrastructure (roads, water/sewage, etc.)
_____ Economic Development
_____ Environmental Education
_____ Erosion & Sedimentation
_____ Flooding
_____ Forestry Techniques
_____ Historical & Cultural Heritage
_____ Illegal Dumping & Litter
_____ Invasive Species
_____ Mine Drainage/Mine Lands
_____ Storm Water Runoff
_____ Tourism Impacts
_____ Waste Sites/Hazardous Spills
_____ Water Quality/Quantity
_____ Wildlife/Fisheries Habitats
_____ Other _____

6. What are the top 3 services/amenities that are lacking within the watershed? (i.e. restaurants, public restrooms, gas stations, emergency services, etc.)

1. _____
2. _____
3. _____

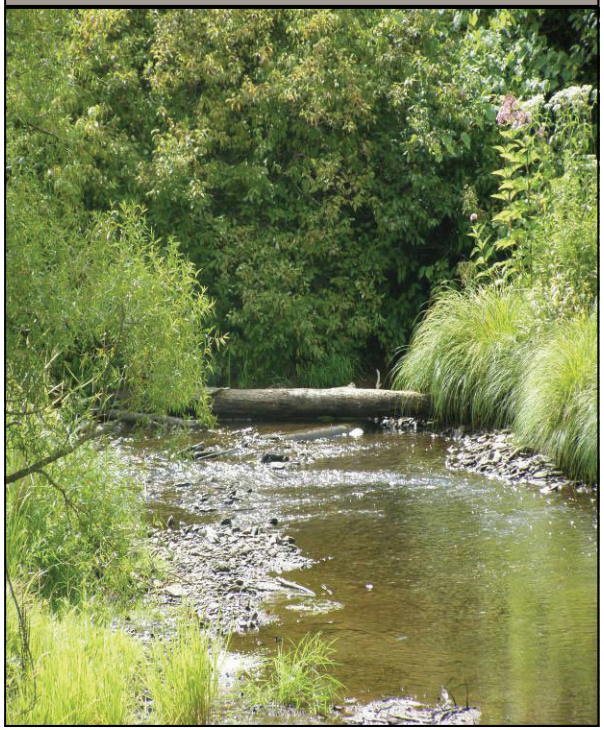
7. Other comments or concerns.

_____
_____
_____
_____
_____
_____

Thank you for completing this survey.

<u>Return Instructions</u>:
You may cut off and keep the informative panel with our contact information. Next, please refold the pamphlet, tape (do not staple), and place it in the mail with proper postage (one first class stamp).

Allegheny River Headwaters Conservation Plan



Complete a Survey and You Could Win!

Prize package includes donated items from local project partners

The goal of the Allegheny River Headwaters Watershed Conservation Plan is to engage the public to educate and encourage stewardship of natural resources and to foster cooperation between local conservation partners and communities to improve the quality of life throughout the region.

Residents

Only individuals with **permanent residence** within the project area (see map on left)

Please Mark One

1. **In what county and municipality do you reside?**
   County _____
   Municipality _____

2. **Near what part of the Allegheny River watershed do you reside?**

◊ Allegheny River
◊ Oswayo Creek
◊ Potato Creek
◊ Tunungwant (a.k.a. Tuna) Creek
◊ Don't Know
◊ Other _____

3. **How long have you lived in the area?**

◊ Less than 1 year
◊ 1-10 years
◊ 11-20 years
◊ 21-30 years
◊ 31-40 years
◊ 41-50 years
◊ 51-60 years
◊ 60+ years

4. **How far do you travel to work?**

◊ Less than 1 mile
◊ 1-15 miles
◊ 16-30 miles
◊ 31-45 miles
◊ 46-60 miles
◊ N/A
◊ Farther _____

Please continue with "Residents & Visitors" at far right

Visitors

1. **Do you own property in the Allegheny River headwaters region?**

◊ Yes ◊ No

2. **How far did you travel to visit?**

◊ Less than 1 mile
◊ 1-30 miles
◊ 31-60 miles
◊ 61-90 miles
◊ 91-120 miles
◊ 121-150 miles
◊ 151-180 miles
◊ Farther _____

3. **How long did you stay on this trip?**

◊ Less than one day
◊ 1-2 days
◊ 3-4 days
◊ 5-6 days
◊ One week
◊ A week and a half
◊ Two weeks
◊ Longer _____

4. **Approximately how much money did you spend?**

◊ Less than 100 dollars
◊ 100-500 dollars
◊ 500-1,000 dollars
◊ 1,000-2,000 dollars
◊ 2,000-3,000 dollars
◊ 3,000-5,000 dollars
◊ 5,000+ dollars

5. **What were your two biggest expenses?**

◊ Travel/Gas
◊ Food/Lodging
◊ Recreation/Supplies
◊ Souvenirs
◊ Others _____

6. **What was your reason for visiting?**

◊ Business
◊ Family/Friends
◊ Passing through
◊ Recreation/Vacation
◊ Other _____

7. **How often do you visit?**

◊ First time
◊ Seasonal
◊ Yearly
◊ Occasionally (every 2-5 years)
◊ Every 5+ years

8. **Do you plan to return to this area?**

◊ Yes ◊ No

Demographics

(Optional)

1. **What is your gender?**

◊ Male ◊ Female

2. **What is your age?**

◊ 17 & under
◊ 18-25
◊ 26-45
◊ 46-65
◊ 66 & up

Residents & Visitors

1. **What do you think are the two most important land uses in the Allegheny Headwaters region?**

◊ Agricultural
◊ Commercial
◊ Forested
◊ Other _____
◊ Industrial
◊ Recreation
◊ Residential

2. **Where did you obtain this survey?**

◊ Business/Restaurant
◊ Event _____
◊ State park/state forest
◊ Watershed group
◊ Website
◊ Other _____

Please continue with "Residents & Visitors" on reverse

* **If you would like to be entered to win a prize package from our project sponsors and receive project updates, please complete the information below. Entrees must be received by December 31, 2009.**

Name _____
Address _____
_____
E-mail _____
Home Phone _____
Work Phone _____

APPENDIX V. PUBLIC COMMENTS

Public Meetings

Issue, concern, or comment	Action taken
Add Sierra Club, Pennsylvania chapter to Appendix Q.	Added
Address radioactivity of Marcellus shale gas extraction.	Marcellus shale sections in Chapter 2 and Chapter 3 were amended
Distinguish between active, abandoned, and Marcellus shale gas wells on map 2-4.	Map revised
Address further concerns related to Marcellus shale gas exploration, including wastewater management, inter-basin transfer of water, lack of a river basin commission to regulate Ohio Basin, water quantity/availability, etc.	Marcellus shale sections in Chapter 2 and Chapter 3 were amended
Reword Management Recommendation Goal 2-7, Objective 1 from "…'redevelop' golf course…" to "…'restore' golf course area to a more natural open space setting.	Objective reworded
Page 5-2, Andy Pantuso Memorial Ball Field misspelled	Corrected
Appendix G. illegal dumpsite #29 Hedghog Lane misspelled in two places	Corrected
Appendix R. page 21 forward, table extends to next page causing formatting errors	Corrected
Page 6-15 Pantuso misspelled again	Corrected
Page 6-21 section header for Land-use Ordinances and Zoning separated from body of text below.	Corrected
Add "frack" to Appendix A. Glossary.	Added
Add gridlines to Appendix H to make it easier to read corresponding designation.	Reformatted
Amphibians is misspelled in Appendix K.	Corrected
Emphasize education in management recommendations	Recommendations specifically related to education and funding are included throughout chapter 7

Individual

(Bill Knight)

Chapter 1 – Project Area Characteristics – Socioeconomic Profile – Transportation and Safety: please expand the Public Transportation section to detail services offered by the Area Transportation Authority of North Central Pennsylvania (ATA) http://www.rideata.net and Fullington Trailways (FT) http://www.fullingtontours.com. Currently, the ATA has limited fixed route and/or call a bus service within all counties of the Allegheny River Headwaters Conservation Plan. One daily round trip from Pittsburgh to Buffalo, via route 219 is scheduled by FT.	Section amended to include this additional information
Chapter 3 – Water Resources – Location – Tunungwant Creek: please include the warm water fishery (WWF) tributary of Kendall Creek within the Tunungwant Creek summary paragraph.	Kendall Creek was added to the summary

Issue, concern, or comment	Action taken
Pennsylvania Department of Conservation and Natural Resources – Bureau of Recreation and Conservation	
Please check the captions in the text for consistency regarding the use of periods and capitalization.	All captions reviewed and corrected
Priorities need to be listed for the goals and objectives listed in the Management Recommendations chapter.	Management recommendations were prioritized by the public during the draft review period and added to Chapter 7
Please list the contact information for all of the funding sources listed in Appendix M.	Contact information was included for all funding sources
Roulette Township	
Our correct address is: Roulette Township 80 Railroad Ave. P.O. Box 253 Roulette, PA 16746	Address corrected in Appendix Q and on distribution list for final plan mailing

Western Pennsylvania Conservancy

water, land, life.

Conservation Guidance for Landowners on Natural Gas Development
June 2010

Natural gas exploration and extraction activity have increased significantly across western Pennsylvania in recent years. Extraction of natural gas, much like any extractive activity, can have negative effects including serious environmental impacts. Western Pennsylvania Conservancy believes that conservation of the landscape and landowner management goals should be carefully considered prior to entering into a natural resource extraction lease agreement. Conservation features on the property that may need additional protection measures include but are not limited to the following: any water features such as streams, springs, seeps, and wetlands; steep slopes (generally those having a slope of 20% or greater); intact forests; wildlife habitat; native flora and fauna; natural vegetation and floodplain areas; recreational activities and scenic vistas.

It is important for the landowner to be aware of any potential negative impacts, as well as their rights as a landowner to control and guide any potential extractive use on their land. More specifically, in order to conserve the landscape, landowners should work with the land agent to carefully establish guidelines and develop an addendum to the lease agreement that permits recovery of this resource while at the same time promoting protection of ecologically-sensitive landscapes that include natural communities and species habitat.

Site visit

Upon request for a lease, the landowner should meet with the interested party and conduct a site visit on the property to identify potential impacts to the ecological resources on the land. This evaluation should consider:

- Conservation of natural communities, wildlife habitat, species of special concern
- Impacts to recreational opportunities and scenic vistas
- Degree of landscape fragmentation
- Potential effects upon hydrology, water quality, air and noise pollution
- Ability to significantly improve or restore degraded natural resources

The developer should use available data to locate plant and animal species of special concern (including without limitation searches or surveys the developer otherwise may be required to conduct pursuant to applicable environmental laws, or any searches or surveys conducted by a governmental entity). The site visit should occur prior to the start

of seismic work. A seismic plan should be submitted to the landowner which includes a map showing all proposed seismic lines and test hole locations, as well as conservation values and features as identified in the site visit.

For Marcellus gas development, one well pad can now be used with directional drilling technology to extract natural gas from more than one square mile of shale that is located over a mile underground. Therefore, a landowner may decide to sign a lease but not allow any surface drilling or other infrastructure such as roads and pipelines on the property, but allow the gas to be extracted from another property nearby. This may result in lower payments from the developer, but it may better protect ecological resources on the property. The remainder of these conservation considerations focuses mostly on leases where drilling or other surface activities are permitted on the land owners' property.

If a significant gas source is found and a project moves forward, the developer should coordinate with the landowner as to the location of all proposed development including placement of a well or wells, access roads and pipelines and any other facility or equipment that will support the proposed operation. If the developer proceeds with extraction, the landowner should make sure the following details are addressed:

- Indicate parameters where no drilling is to occur;
- Identify maximum number of wells drilled per site;
- Require lease to include erosion and sediment control plan to be completed by developer and approved by the landowner prior to any earthmoving activity including well site clearing, well pad construction, pipeline construction and access road enhancement; and
- Require submission of a restoration and re-vegetation plan to be completed by developer and approved by landowner which identifies specific steps taken to minimize site disturbance, and addresses any alterations in the land associated with the extraction or transmission activities.

Lease Agreement

All new leases should obtain a comprehensive insurance provision, indemnification and hold harmless clause to protect the landowner against degradation of ecological resources. Leases with an insurance provision should be enforced by the landowner (i.e. both proof of insurance and the landowner listed on the policy as an additional insured). The landowner should also require a performance bond to ensure the developer meets the terms of the agreement. All activities and operations must be in accordance with the laws of the Commonwealth of Pennsylvania. The developer must obtain and follow the appropriate permit application process, and secure a performance bond to ensure parameters for drilling are met.

Specific recommendations for items to include in the addendum to the lease agreement:

Master Site Plan – The developer should submit a master site plan to the landowner which would include the following:

(a) a map or plat indicating the location of each and every well drilled or proposed for drilling;
(b) a map or plat indicating the location of each existing potable and non-potable water well;
(c) a map or plat indicating the location of each potable and non-potable water well drilled or to be drilled;
(d) a route map indicating the location of each pipeline laid or to be laid;
(e) a map or plat indicating the location of each existing road proposed for use;
(f) a map or plat indicating the location of each bridge, drain pipe or culvert pipe to be constructed;
(g) a plat, diagram and/or schematics indicating the location, design, construction of each slush pit to be constructed together with a corresponding maintenance plan for each such pit;
(h) a map or plat indicating the location of stream, creek, brook, or wetland together with the location of each proposed drilling site and proposed clearing site near each such stream, creek, brook, or wetland; and
(i) a map or plat that contains information regarding locations of plant and animal species of special concern, as well as locations of natural communities.

Erosion and Sedimentation Control Plan – This plan should include the following:

(a) existing topographic features of the site;
(b) contours, ditches and other excavations;
(c) water bars or diversion channels for surface runoff to prevent siltation;
(d) settling basins;
(e) spreading of gravel or shale on intercepting dips;
(f) installation of silt fences;
(g) stabilization of cut slopes;
(h) stabilization of highwalls; and
(i) restoration and revegetation of the property as described in a restoration and re-vegetation plan.

Wells – To reduce fragmentation and invasive plant pathways, the developer should locate wells closer to previously disturbed or developed footprint (such as landings, roads, barrow pits, pipelines and wells). Such wells should be camouflaged or screened with native plants to reduce aesthetic impacts.

Water – *Water quality and quantity should be carefully considered and monitored prior to and following the extraction activity.* The developer should not contaminate or pollute springs, brooks, streams, wetlands, vernal pools or other waters on the property. Any water well usage should be restricted to drilling processes only. Water well usage should not be used for frac, stimulation or completion processes. The developer or its contractors and subcontractors should not construct earthen dams across

any stream to obtain a water supply for its operations. Developer should remove all water used in drilling and fracing processes from the property including water developed from the well. In addition, the developer must supply the landowner with a plan to address water source pollution in the event of a leak.

Well Plugging – At its own expense, developer should properly and effectively plug all wells on the leased premises before abandoning, in accordance with the regulations of the Department of Environmental Protection's Bureau of Oil and Gas Management and all applicable laws of the Commonwealth. A copy of the Certificate of Well Plugging showing the plugging procedure used and submitted to the Bureau of Oil and Gas Management should be supplied to the landowner for each well plugged and abandoned. Parameters should be established to determine acceptable production rates. If production falls below the rate and is determined to be uneconomic (i.e., not in paying quantities) to maintain and operate, then developer should (a) plug and abandon the well and (b) restore the well site and access road to the satisfaction of landowner within a specified timeframe.

At the end of production, whether or not oil or gas is produced, the developer is required to cover all costs to plug the wells (according to Section 601.210 of the Oil and Gas Act) and restore all disturbed acres. All wells no longer in use should be plugged by the operator(s).

Pipelines – Where possible, pipelines should be laid within the boundaries of existing roads or rights of way, such as existing pipelines and transmission lines. Developer should submit a route map for each pipeline to the landowner for review and approval as to location prior to the laying of any line. Developer should keep the pipeline and right-of-way in good repair and appearance.

Drilling – It is best to limit the number of wells and number of disturbed acres. It is recommended that a buffer area (e.g. 300 feet) be included for all water sources (rivers, creeks, streams, wetlands, etc.) to prohibit drilling in certain areas. Clearing on steep slopes (those greater than 20%) should also be restricted.

Pits – Developer should prevent access of wildlife to pits or excavations dug for Developer's operations by erecting and maintaining fences. Developer should have thirty (30) days from date of completion of a well to reclaim the pit. Pits must be lined with an impervious liner, not merely clay. When drilling is complete, pit liner and its contents should be properly disposed offsite. Developer should ensure that each slush pit will consist of two (2) compartments; one to contain fluids materials from the drilling operations and the second to contain surface runoff from the drilling site. Appropriate buffers should be established for pits as well.

Roads – All road locations and grades must be identified in the Master Site Plan. The landowner should limit the size of all new roads (e.g., determine an appropriate road width to be 20 feet). The location of drilling operations should be close to existing roads to prevent further fragmentation of the property. Developer should construct access roads to drilling sites along existing pipeline rights-of-way, provided that a ten percent

(10%) grade can be maintained, as described in the Erosion and Sedimentation Control Plan. Road drainage structures should conform to the Environmental Sensitive Maintenance Principles of Penn State's Center for Dirt and Gravel Roads program.

Erosion Sedimentation and Grading – Topsoil disturbed during construction shall be stored on uphill side of disturbed area, saved and put back during reclamation. Developer should regrade and refill to contour any areas of land cleared for construction and infrastructure placement within ten (10) working days following disturbance and should reseed according to the restoration and revegetation plan. Temporary seedling should be required, in addition to permanent revegetation. Gravel or shale should be spread on intercepting dips that become subject to erosion. Further, the developer should, at its own expense, secure, plant and maintain native species (consisting of grasses and/or trees or shrub seedlings) on all well sites, retired access roads, pipeline rights-of-way and other cleared areas.

Use of Department of Conservation and Natural Resources Gas Lease – The landowner may need to enter into a lease agreement that has more stringent terms than the standard lease agreement provided by the developer. WPC recommends using DCNR's 2007 gas lease as a guiding document.

Nothing in this document constitutes legal advice. Western Pennsylvania Conservancy recommends that any landowner considering entering into a natural gas lease agreement should obtain the advice of an attorney and a consultant specializing in natural gas leasing. In addition, many resources are available online that can provide basic information and education.

Penn State College of Agricultural Sciences Cooperative Extension:
http://extension.psu.edu/naturalgas/publications

DEP, Bureau of Oil and Gas Management, Marcellus Shale
http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new_forms/marcellus/marcellus.htm

DEP, fact sheet *Landowners and Oil and Gas Leases in Pennsylvania*
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-44185/5500-FS-DEP2834.pdf

DCNR, Marcellus Shale research in Pennsylvania
http://www.dcnr.state.pa.us/topogeo/oilandgas/marcellus.aspx