



AMPHIBIAN RESEARCH AND MONITORING INITIATIVE Northeast Region

VERNAL POOL AMPHIBIAN MONITORING PROTOCOL 2004 Adaptive Cluster Sampling Approach

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INTRODUCTION

The status and trends of populations of vernal pool-associated amphibians in the northeastern United States is poorly understood at the landscape scale. To date, there is no coherent integration of a probabilistic statistical method to provide inference on the status of populations of wood frogs and spotted salamanders. Although research conducted from 2001-2003 at four National Parks and 14 National Wildlife Refuges in the northeastern United States provided information on wood frog and spotted salamander population sizes at a small number of pools, data on the occupancy of available breeding habitat at Park- and Refuge-wide scales needs to be evaluated. Here, we apply a proportion of area occupied (PAO) approach with a modeling framework (PRESENCE, MacKenzie et al. 2002) to estimate the amphibian occupancy of vernal pool habitat at seven National Parks (Acadia National Park, Cape Cod National Seashore, Chesapeake and Ohio Canal National Historical Park, Delaware Water Gap National Recreation Area, Gettysburg National Historical Park, Rock Creek National Park, Shenandoah National Park), 10 National Wildlife Refuges (Canaan Valley, Eastern Massachusetts, Erie, Great Swamp, Iroquois, Lake Umbagog, Moosehorn, Patuxent, Rachel Carson, Wallkill River), and one State Park (Canaan Valley State Park) in the northeastern United States. We will evaluate the relationship of pool occupancy to habitat covariates and provide data that will be useful in managing vernal pool habitats for the conservation of amphibians in these Parks and Refuges. In addition, these data will be incorporated into the PAO dataset within the USGS Amphibian Research and Monitoring Initiative (ARMI), a national monitoring program to assess the status of amphibian populations across the United States.

Specifically, the research collected following the protocol described herein will generate data that can be used for the following objectives:

- determine the distribution of available vernal pool habitat in selected northeastern National Parks and National Wildlife Refuges.
- determine if the proportion of vernal pools occupied by wood frogs and spotted salamanders is:

- a) increasing, decreasing or staying the same over time.
- related to surrounding land use, road density or distance to nearest road, and proximity to or density of other potential breeding sites.
- c) related to water quality variables, hydroperiod, or climatic conditions.
- identify priority areas within individual Parks and Refuges for amphibian habitat management.
- evaluate the roles of Parks and Refuges as important areas for vernal pool-associated wildlife.
- provide information to the public about the role of Parks and Refuges in the conservation of amphibians.

ADAPTIVE CLUSTER SAMPLING PROTOCOL

At Parks and Refuges where the distribution of vernal pools is not known, we will apply an adaptive cluster sampling (ACS) approach with an initial selection of systematic samples, which will ensure a spatially representative sample from within the Park or Refuge (Unit). Adaptive cluster sampling is a probabilistic method designed for sampling items of interest that exhibit spatial clustering (Thompson 1991). Vernal pools exhibit a clustered distribution in the landscape (Brooks et al. 1998, Burne 2001), and thus sampling using an adaptive cluster framework allows more precise estimates of population parameters where traditional methods, such as stratification, are insufficient. We will use this method to develop an understanding of the distribution of vernal pool habitats at the individual Unit level. We will also monitor breeding sites with repeated surveys to satisfy the assumptions of the PRESENCE model and to determine the proportion of available vernal pool habitat that is actively used by amphibians for breeding (MacKenzie et al. 2002).

Three options exist to determine the presence of vernal pools: 1) conducting groundtruthing surveys, 2) evaluating high quality color-infrared aerial photos, or 3) evaluating local geology, topography and soils. Aerial photographic interpretation and information from mapped physiographic features are less reliable than ground-truthing surveys. We will provide a set of systematic points (GPS coordinates) to sample. At each point, a 50 m transect will be marked with a meter tape and surveyed along a northern compass bearing. At the end of this transect, the observer will walk back along this meter tape, surveying for vernal pools along the way. Once the observer returns to the start point, they will survey a 50 m transect along an eastern bearing, then turn and survey a 50 m transect along a northern bearing, and finally complete a fourth 50 m transect along a western bearing, at which point the observer will arrive at the end of the meter tape laid out along the first transect, and will have completed the sample of a 50 m x 50 m plot. If a pool is located in the first (primary) plot sampled, four adjacent (secondary) plots are added to the sample, adjacent to each side of the primary plot (see data sheet example). Groups of adjacent plots are added as pools are found, creating a 'network' of plots that detail the locations of clusters of vernal pools within your Unit. We will use the data from these samples to calculate an unbiased estimate of the number of vernal pools on the landscape, using formulas from Thompson (1991).

A systematic sample frame will be located within each Unit boundary, using the Minnesota DNR Random Sampling Tools extension for ArcView GIS (Loesch 2002). Points will be located 500 m apart, and the total number of sampling points will vary depending on the Unit area. Systematic points will be divided randomly into groups of 20 sampling points. The second set of 20 points will not be sampled until all points in the first sample set have been visited. This will ensure good spatial coverage within the Unit boundary. If a point is located in an area that 1) can not be sampled (i.e., it is located in the middle of a parking lot, large marshland, etc.) or 2) you have intimate knowledge of the area surrounding the point, and know with certainty that

there are no vernal pools there, you must still complete a data sheet for this point, indicating in the "NOTES" section the reasons that you did not have to sample this point. We will still require you to send these datasheets to us, as we will use this information in our estimation of vernal pool density.

LITERATURE CITED

- Brooks, R. T., J. Stone and P. Lyons. 1998. An inventory of seasonal forest ponds on the Quabbin Reservoir watershed, Massachusetts. Northeastern Naturalist 5: 219-230.
- Burne, M. R. 2001. Massachusetts aerial photo survey of potential vernal pools. Natural Heritage and Endangered Species Program, Massachusetts Department of Fisheries and Wildlife, Westborough, MA.
- Loesch, T. N. 2002. DNR random sample generator. ver. 1.1, ArcView extension. Minnesota DNR. Created 21 March 2002, accessed 9 January 2004.
- MacKenzie, D. I., J. D. Nichols, G. B. Lachman, S. Droege, J. A. Royle and C. A. Langtimm. 2002. Estimating site occupancy rates when detection probabilities are less than one. Ecology 83: 2248-2255.
- Thompson, S. K. 1991. Adaptive cluster sampling: designs with primary and secondary units. Biometrics 47: 1103-1115.

DETAILED FIELD METHODS:

- Navigate to each point using your Garmin GPS III+ Personal Navigator (or other approved GPS handheld device). As you navigate, keep an eye on the estimated position error (EPE), and know that you may not get to the exact point. For example, as part of its navigation feature, your GPS tells you how much further you must travel to reach the intended point, but it may never display "0 meters remaining" due to the position error. As you navigate, be sure that the number of meters continues to go down, but if it goes up and you are within the 'error range' of the point (e.g., if your EPE reads +/- 5 m, and your meters remaining doesn't seem to go lower than 10 meters, you can safely stop navigating, and start your plot survey. The exact point matters less than the fact that we are getting good spatial coverage of your Park or Refuge. [Remember that if a point falls in an area that cannot be sampled (see above) or you know with certainty that there are no pools at that point, you must still complete and return a data sheet; record in the "NOTES" section the reasons that you did not sample the plot (see above). Also return a data sheet with explanation in "NOTES" section if no pools are found after completing your first survey plot.] Once the point is located, take a photo facing NE into the plot and record information about the weather and habitat surrounding the point [sky code, wind code, previous day precipitation, and land cover within 50 m of start point (%forest, agriculture/meadow/pasture, developed: residential urban/suburban/industrial, road)] as indicated on the datasheet.
- 2) To lay out the primary plot, sight a northern bearing and walk 50 m, counting paces and laying a meter tape to mark the western boundary of the plot. Walk back along the tape, counting paces again and searching on either side for a vernal pool, paying particular attention to the inside of the plot. You should be able to see about 20-25 meters to each side, though this will vary with terrain, vegetation, and observer differences.
- 3) Map any vernal pools located, label them alphabetically (A, B, C, etc.) on the data sheet in relation to the transect (i.e. distance from plot edge), and record a GPS

point from the center of the pool. Record the distance from the transect on the data sheet. Take a photo of each pool and record photo number in the table on the data sheet. For each pool, record length at maximum, width at maximum and maximum depth. If the pool is less than 14 m² or greater than 3,000 m², do not record additional data. The pool must be isolated, without permanent inflow or outflow (see also the "definition of vernal pool" below). If the pool meets these criteria, record an estimate of the percent cover of submerged aquatic vegetation and percent cover of emergent vegetation on the data sheet (see Variable Definitions below). The amount of vegetation in a pool can affect the ability of observers to detect vernal pools and egg masses in the pools. Other factors, such as heavy cloud cover or turbid water, can also affect the ability to detect egg masses. If visibility was impaired, record this in the "Notes" section of the data sheet along with the letter label for each affected pool.

- 4) Using a plastic beaker, collect a sample of water at the edge of the pool (in a location where the beaker can be fully submerged, and near where egg masses are located, if possible). Use your pH probe to measure the pH and record on the data sheet. Also, record water temperature within a meter of the pool, holding the thermometer 10 cm underwater.
- 5) Estimate the distance to forest and the distance to road, and record on data sheet.
- Search the pool for and count all egg masses of wood frogs (*Rana sylvatica*) and spotted salamanders (*Ambystoma maculatum*). Regardless of the whether or not egg masses for either species are found upon the first visit, the pool **must** be revisited at least once more during the sampling window. This will increase the likelihood that you will detect both wood frog and spotted salamander egg masses if they are present. If no egg masses are found after the second visit, then the pool must be revisited, as feasible, until both species are observed or the sampling window (see below) expires. To facilitate locating and identifying pools to be revisited, we recommend that you flag the vernal pool site (using a wire flag or flagging tape), writing the sampling point number and pool letter code on the flag with a Sharpie pen. Record repeat visit data on the REPEAT VISIT DATA SHEET 2004.
- 7) Do not stray further away from the viewable area outside the plot (~25 m from the plot edge) to investigate potential vernal pools until after the entire cluster sample is complete. Note any potentially distant pools on your plot map, recording them as incidental pools (see below), and investigate them after you have completed surveying the adjacent plots according to the adaptive cluster sampling protocol.
- Return to and finish the transect, searching for and recording vernal pools as in #3-6 above.
- Once you reach the beginning point, sight an eastern transect, and pace 50 m along this transect, visually searching for vernal pools, and repeating the procedure in #3-6. This is the southern boundary of the plot.
- 10) Turn and pace 50 m along a northern bearing, visually searching for vernal pools, repeating the procedure in #3-6 above. This is the eastern boundary of the plot.
- 11) Turn and pace 50 m along a western bearing, searching for and recording vernal pools as in #3-6 above. This is the northern boundary. At the end of this transect, you should reach the end of the meter tape marking the western boundary. You have thus completed the sample of a 50 m x 50 m plot. The actual area sampled will vary based on the topography and density of vegetation, but we estimate that the total area sampled for each plot will be approximately 75 m². We will use this

- information in our calculations to estimate density of vernal pools in each Unit in the northeastern region.
- 12) If no pools were located in the primary (1°) plot, indicate this in the "NOTES" section of the datasheet, and move on to the next sample point.
- 13) If a pool was located while surveying along any of the 50 m transects, you must sample additional (secondary) plots adjacent (N, S, E, and W) to the primary plot boundaries. Map vernal pool locations (if any additional pools are found) on the data sheet for secondary plots surrounding the primary plot, and continue to label these vernal pools alphabetically (e.g., if A and B pools were located in the primary lot, continue labeling adjacent plot pools with C, D, E...AA, BB, CC, etc.). Number the secondary plots sequentially (2, 3, 4, etc.) so they can be linked to each vernal pool on the data sheet. Similarly, if vernal pools are located within the secondary plots, you must sample adjacent (tertiary) plots, and so on (see example data sheet and Powerpoint graphic). These additional plots should be drawn and labeled (continuing with 5, 6, 7, etc.) on the data sheet, and vernal pool locations should be mapped within these plots and data recorded on the data sheet (see example data sheet). Only sample adjacent plots surrounding a plot in which a vernal pool was located. There is no limit to the number of additional plots that can be sampled in this manner. As long as additional vernal pools are located in adjacent plots, continue to sample adjacent plots. This will create a 'network' of vernal pool locations, and will identify areas of importance for amphibian breeding. If a pool is first observed outside the 50 m² plot currently being surveyed, enter the pool on the data sheet as being in an adjacent plot, but draw an arrow from the pool to the current plot from which it was discovered (see Powerpoint graphic example).
- 14) Sample as many points as possible during the first 2-3 weeks of the sampling window, and use the last week of the sampling window to concentrate on revisiting vernal pools. Wood frogs should be depositing egg masses during the first part of the sampling window, and spotted salamander egg masses should be present during the latter. However, wood frog egg masses may be hatched and less detectable by the latter portion of the sampling window. Therefore, if you encounter a pool that has no species present, it is a good idea to revisit such a pool at least twice, early in the sampling window, in order to detect the presence of wood frog egg masses.
- 15) Keep originals and return clean and legible xeroxed copies of the ACS VERNAL POOL DATA SHEETS to Dr. Robin Jung (see address above) at the end of the field season and no later than 15 July 2004.

Incidental vernal pools

- While traveling to and between sample points, you may locate vernal pools "incidentally," i.e. without sampling as above (see definition of a vernal pool in this protocol). These pools are important for the PAO estimation, but, because the probability that they are located in the landscape cannot be easily calculated (their inclusion probability), we cannot include them in the estimation of vernal pool density. Observers should not spend much effort 'searching' for incidental pools along the way to sample points.
- 2) The INCIDENTAL VERNAL POOL DATA SHEET 2004 should be used to record information about any vernal pools located on the way to or between sampling sample points. Use a new section of the data sheet for each day, recording the nearest point (or the point you were traveling towards when you located the

- incidental vernal pool). Number the new pool as "I-n" where n is a number you assign to the incidental vernal pool (1, 2, 3, etc.).
- 3) It is important that a GPS point be taken at every vernal pool that is found.
- 4) Record habitat covariates (pool max. width, max. length, max. depth, % vegetation in the pool, land use(s) surrounding vernal pool), and estimate the number of egg masses of R. sylvatica and A. maculatum as indicated on the data sheet. Be sure to survey the pool at least twice during your sampling window (see below).
- 5) Keep originals and return clean, legible xeroxed copies of the INCIDENTAL VERNAL POOL DATA SHEETS to Dr. Robin Jung (see address above) at the end of the field season and no later than 15 July 2004.

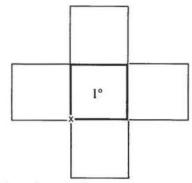
DEFINITION OF VERNAL POOL:

For this study, a vernal pool is defined as: A contained depression, with no surface inflow or outflow except at times of high water (such as snow melt or intense, prolonged rain), and with a total surface area between 14 m² and 3,000 m². In this definition, roadside ditches, pools formed in skid trails, or other man-made or man-altered depressions can be included in the sample.

SAMPLING WINDOW (note: sampling windows provided here are estimates based on previous years; the actual time frame in which you will sample will depend upon this year's particular climate, and may be adjusted as needed.)

Park/Refuge Name	State	Sampling Time Frame
Gettysburg, Erie	PA	22 Mar – 3 May
Patuxent	MD	21 Feb – 4 April
Acadia, Rachel Carson, Moosehorn, Lake Umbagog	ME, NH	4 April – 23 May
Cape Cod, E. Massachusetts	MA	21 Mar – 2 May
Delaware Water Gap, Great Swamp, Wallkill River, Iroquois	NJ, NY	21 Mar – 2 May
Rock Creek, C&O Canal	D.C., MD	19 Mar – 30 April
Shenandoah, Canaan Valley	VA, WV	7 Mar – 18 April

- Visit sampling points provided to you. Finish the first set of 20 points before sampling the second set of points.
- 2) Search a 50 m² area for vernal pools
- 3) If a vernal pool is located, sample four (4) additional 50 m² areas adjacent to the original sample plot in the following layout. The bold line indicates the initial (primary) 50 m² plot, with the X designating the sample point that was provided to you:



- Record information about the habitat surrounding the vernal pool, as well as information about the pool itself on the ACS VERNAL POOL DATA SHEET 2004.
- 5) Count the number of egg masses of wood frogs (R. sylvatica) and spotted salamanders (A. maculatum) in each pool.
- Continue to survey the pool, no fewer than two (2) times during the sampling window.
- 7) Record information about vernal pools located while traveling to and between points on the INCIDENTAL VERNAL POOL 2004 data sheets. Survey these pools for egg masses of both focal species, and return to survey pools at least twice during the sampling window.
- 8) We are hoping to find a minimum of 20 vernal pools per Park/Refuge, but continue to search sets of points for vernal pools even after you locate 20 vernal pools. Be sure to visit all located pools at least twice during your sampling window. This will aid in our estimation of Park-/Refuge- specific occupancy.
- 9) Any questions, call or email Evan Grant 301.497.5842 (evan_grant@usgs.gov), Robin Jung 301.497.5875 (robin_jung@usgs.gov), or Priya Nanjappa 301.497.5811 (priya_nanjappa@usgs.gov).

EQUIPMENT NEEDED
Set of sample points
GPS unit
Two (2) 50-m tapes
meter stick
Thermometer
pH probe/meter
plastic water sample beaker (container)
Camera
Wire flags or Flagging Tape
Sharpie
Data sheets:

ACS VERNAL POOL DATA SHEET 2004
INCIDENTAL VERNAL POOL DATA SHEET 2004
REPEAT VISIT DATA SHEET: ACS VERNAL POOL 2004

VARIABLE DEFINITIONS (explanations of all variables on data sheets):

ACS VERNAL POOL DATA SHEET 2004

Point # (X): given number of random sample point to which you navigate to conduct your 50 m² plot. This relative location of this point to your sample plots is marked in the plot map on the datasheet with an "X"

GPS N/W: given GPS coordinates associated with the point to which you navigate to conduct your 50 m² plot.

Sky code (see back of data sheet for explanations): record sky code.

Wind code (see back of data sheet for explanations): record wind code.

Previous day Precipitation?: was there substantial (≥ 1 cm) precipitation the day prior to the survey (this information is useful for determining the likelihood of amphibian migration to breeding pools).

Land Cover: within a 50 m radius of start point, estimate the % of each land cover type. These values should add to 100%. Check whether the majority of the forest is hardwood or softwood.

Photo number of primary plot: take a photo of the primary plot, standing at the origin and facing NE into the plot. Record the photo number in the "Notes" section.

TABLE

Plot: number of sample plot (according to mapped plot locations drawn by the observer). Plots should be numbered consecutively as they are added to the sample.

Pool: letter of pool discovered while surveying the sample plots. The letters should correspond with mapped locations of vernal pools drawn by the observer.

Photo: record a photo number for each vernal pool discovered.

Latitude/Longitude: record the latitude and longitude from the center of the pool using your GPS unit. Be sure that your GPS units are in meters, the position format is "dd mm ss.ss," and the map datum is set to NAD83. Important!

EPE (m): estimated position error, usually displayed on a GPS device as +/- X meters. Important!

Distance from transect (m): perpendicular distance from the transect to the vernal pool, in meters. Measure with a meter tape.

Water temp: record water temperature within a meter of the edge of the pool, holding the thermometer at least 10 cm underwater.

pH: collect water sample in your beaker/sampling container from an area near egg masses and where the container can be fully submerged, if possible, and use your pH probe/meter to record pH.

Pool max width (m): width of pool at maximum point.

Pool max length (m): length of pool at maximum point.

Pool max depth (cm): depth of pool at deepest point.

%Aq. Veg (SAV / emerg): estimate the percent cover of submerged (SAV) and emergent aquatic vegetation (include duckweed cover with emergent vegetation) and record as SAV "/" emergent (e.g., for 30% SAV, 25% emergent, 15% duckweed record on the data sheet as "30 / 40").

Distance to forest: estimate the nearest distance to forest. Be sure to record the value in meters (m).

Distance to road: estimate the nearest distance to a road. Be sure to record the value in meters (m).

Road type (see back of data sheet for explanations): record the road type.

Road traffic (see back of data sheet for explanations): record the road traffic at night.

Pool permanency (see back of data sheet for explanations): record the permanency of the pool, to the best of your knowledge.

Pool type: (see back of data sheet for explanations): record the pool type, to the best of your knowledge.

RSYL masses: count and record the number of wood frog (Rana sylvatica) egg masses detected in the pool.

AMAC masses: count and record the number of spotted salamander (Ambystoma maculatum) egg masses detected in the pool.

INCIDENTAL VERNAL POOL DATA SHEET 2004

(Most data are recorded according to the variable definitions above)

Nearest Point: record the nearest sample point to the incidental pool, or describe how you encountered the pool in the NOTES section under each record (i.e. "while traveling from point 31 to point 56").

Incidental pool number: label incidental pools with "I-n", where n is a sequential number (as opposed to the vernal pools located in the plot surveys, which are labeled with a letter; e.g., I-4).

Photo: see above

Latitude/Longitude: see above

EPE: see above

Water temp: see above

pH: see above Sky: see above Wind: see above

Pool max width: see above Pool max length: see above Pool max depth: see above % veg in pool: see above.

Dist. To For. (m): see above, variable "Distance to forest"

% For.: estimated percent of the area surrounding the pool that is occupied by forest (within 75 meters of the pool).

% Ag.: estimated percent of the area surrounding the pool that is occupied by agriculture, pasture, or meadow (within 75 m of the pool).

% Developed: estimated percent of the area surrounding the pool that is occupied by residential, urban, mining, or industrial land use (within 75 m of the pool).

% Road/right-of-way: estimated percent of the area surrounding the pool that is occupied by road or powerline right-of-way (within 75 m of the pool).

Dist. to Road: see above, variable "Distance to Road".

Road type: see above Road traffic: see above Pool permanency: see above

Pool type: see above #RSYL masses: see above #AMAC masses: see above

REPEAT VISIT DATA SHEET: ACS VERNAL POOLS 2004

(Most data are recorded according to the variable definitions above)

Date: record the date each time you revisit a pool.

Point: record the nearest point (the "point #" from the ACS VERNAL POOL DATA SHEET 2004, or the "Nearest Point" from the INCIDENTAL VERNAL POOL DATA SHEET 2004).

Plot: If the pool was first located while sampling a plot, record the plot number. If it was an incidental pool, leave this field blank.

Pool: record the pool letter or number here.

Photo: take a photo each time you visit the pool, record the photo number here.

Latitude/longitude: see above

EPE: see above

Water temp: record water temperature within a meter of the edge of the pool, holding the thermometer at least 10 cm underwater.

Prev. day precip?: enter Y for yes or N for no previous day precipitation (see description above for "ACS VERNAL POOL SAMPLING DATA SHEET 2004").

Sky: see above Wind: see above pH: see above

Pool max width: see above Pool max length: see above Pool max depth: see above % Veg. in pool: see above. Pool permanency: see above

Pool type: see above

#RSYL masses: see above **#AMAC masses**: see above

ACS Vernal Pool Data Sheet 2004

				Unit (park or	refuge n	name)														
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Previo	ous day	prec	ipitation (≥1 c	m)? [] YES	[]NO	C														
	Forest Hard Softv Agrice Reside	wood wood ulture ential:	ck appropriate (>75% decidu (<75% decidud/meadow/pasto urban/suburb	ious) ous) ure											Io					
			dental species obs	servations on rever	se):															
Plot	loo	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water temp.	pН	Pool max Width (m)	Pool max Length (m)	Pool max Depth (cm)	% Aq. Veg. (SAV / emerg)	Dist. to Forest (m	Dist. to) Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
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SKY (CODE: Don	ot conduct surveys if sky codes are 6 cr above.
Code		ndition
1	Clear o	r few clouds (< 20% of sky)
2	Partly o	loudy or variable (20-50% of sky)
3		or overcast (> 50% of sky)
4	Fog	Secretary Control of the State of Secretary Control of the Secretary Co
5	Mist	
6	Shower	s or light rain
7	Heavy	
8	Sleet/H	
9	Snow	
WIND	CODE: Do	not conduct surveys if wind codes are 6 or above.
Code	mph	Indicators of Wind Speed
0	< 1	calm, smoke rises vertically
1	2-3	light air movement, smoke drifts
2	4-7	light breeze, wind felt on face, leaves rustle
3	8-12	gentle breeze, leaves/twigs in constant motion, raises dust
4	13-18	moderate breeze, small branches move
5	19-24	fresh breeze, small trees begin to sway
6	25-31	strong breeze, large branches move
7+	> 31	strong winds
POOL T-POOL N B	TYPE: Natural (e.g Beaver-crea	y by Park/Refuge personnel L = Light Traffic (< 10 cars) H = Heavy Traffic (≥ 10 cars) ENCY: les annually) S = semipermanent (sometimes dries) P = permanent (never dries) U = unknown duration ., oxbow, vernal pool)
INCIL	DENTAL SP	ECIES OBSERVATIONS:
Pool	S	Chorus Code Visual only, Handled) Sperma- tophores # Egg Larvae (Y/N) Masses (Y/N) # Juveniles # Adults

CHORUS CODE: Code Description

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).
3	Full chorus, calls continuous and overlapping. Cannot distinguish individuals.

INCIDENTAL VERNAL POOL DATA SHEET 2004

	(dd month) Unit (park or refuge name)													Notes:											
Date (d	ld month)		Un	2																					
Observ	ers (full r	names)																							
Previo	us day pr	recipit	tation? []YES	[]NO								_													
Nearest	Incidental Pool # (1-n)	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Water Temp (°C)	рН	Sky*	Wind*	Pool max Width (m)	Pool max Length (m		% Aq. Veg (SAV / emerg)	Dist. to For. (m)	% For.	% Ag	% Devel- oped	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
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* see ba	ack for de	finitio	ns and codes for tab	ole																					
	dd month) vers (full i			nit (park or refuge name	:)					— :		Notes:													
			tation? []YES	[1NO								55				5.00		-0.10					•	-	
7.77.07.7																								_	
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Nearest Point	Incidental Pool # (1 - n)	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS SS)	EPE (m)	Water Temp (°C)	рН	Sky*	wind*	Pool max Width (m)	Pool max Length (m	Pool max Depth	% Aq. Veg (SAV / emerg)	Dist. to For. (m)	% For.	% Ag	% Devel- oped	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
	1-								_			L	1			_									
Notes:		_						_	_	_				_		_		_					_		
	1-												1												
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	1-										1		1												
Notes:							_	_	_																
	I-												1												

^{*} see back for definitions and codes for table

SKY (CODE: Do	not conduct survey:	s if sky cod	es are 6 cr above.					
Code		ondition							
1		or few clouds (< 20	% of sky)						
2		cloudy or variable		fsky)					
3		y or overcast (> 50							
4	Fog		• *						
5	Mist								
6	Showe	ers or light rain							
7	Heavy								
8	Sleet/I								
9	Snow								
WIND	CODE: D	o not conduct surve	evs if wind	codes are 6 or above.					
Code		Indicators of W							
0	< 1	calm, smoke rise							
1	2-3	light air moveme							
2	4-7	light breeze, win							
3	8-12			in constant motion, raises du	ıst				
4	13-18	moderate breeze							
5	19-24	fresh breeze, sma							
6	25-31	strong breeze, la	rge branche	es move					
7+	> 31	strong winds							
POOL	PERMAN	ENCY:							
T =	= temporary (d	ries annually) $S =$	semiperma	nent (sometimes dries) P	permaner	nt (never	dries) U = u	nknown dura	tion
POOL	TYPE:								
N		g., oxbow, vernal pe	ool)						
В			001)						
1000	Beaver-crea								
A(Iuman-Altered (pic							
	A(B) borro	w/gravel pit A(D) roadside	ditch A(P) farm pond	A(I) impo	undment	A(O) other	er:	
U	Unknown								
INCIL	DENTAL SI	PECIES OBSE	RVATIO	NS:					
					Sperma-		Tadpoles/		
			Chorus	ID method (Auditory only,		# Egg	Larvae		
Pool		Species	Code	Visual only, Handled)	(Y/N)	Masses		# Juveniles	# Adults
		A. C.							

Pool	Species	Chorus Code	ID method (Auditory only, Visual only, Handled)	Sperma- tophores (Y/N)	# Egg Masses	Tadpoles/ Larvae (Y/N)	# Juveniles	# Adults
			•					
			· · · · · · · · · · · · · · · · · · ·					

CHORUS CODE:

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).
3	Full chorus, calls continuous and overlapping. Cannot distinguish individuals.

REPEAT VISIT DATA SHEET: ACS VERNAL POOLS 2004

Unit (P	Unit (Park or Refuge name):							Observers (full names):												
Date (dd month)	e Latitude Longtitude month) Point Plot Pool photo (DDMMSS.SS) (DDMMSS.SS)								Prev. day precip?	Sky*	Wind*	pН	Pool max Width (m)	Pool max Length (m)	Pool max Depth (cm)	% Aq. Veg. (SAV / emerg)	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
																1				
																1				
																1				
	T															1				
																1				
												Т				1				
																1	1			
		T		1			\top									1				
		T		+		†						\vdash			1	1				
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	+	\vdash	\vdash	1			+	\vdash				+-	+	_	+-	1		_		
	+-	+-	\vdash	+		-	+	1			-	\vdash	+		_	1	-			
	+	\vdash	-	+			+-		-			+-	-	-		+ /	-	_		_
	_	\vdash		+-		1	+	<u> </u>				+	_		 	1	1			
	+	\vdash	\vdash				+						†			1				
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	+-	\vdash	-	+		-	+-	-	-	_	\vdash	\vdash	+	-	\vdash	/	-	_		-
	+	+-	-	+		+	+	-		_		+	+		1	1	-			-
	+	\vdash	_	+-	 		+		-	_		+	+	-	+-	1	+	_		
= see back	for defini	tions a	nd code	s for tab	ole									4	1					-
Notes:	Notes:							,						11						

SKY	CODE: Do n	ot conduct survey	s if sky cod	es are 6 or above.					
Code		ondition							
1	Clear	r few clouds (< 20	0% of sky)						
2	artly cl	oudy or variable (20-50% of	sky)					
3	Cloudy	or overcast (> 50	% of sky)						
4	Fog								
5	Mist								
6	Showe	rs or light rain							
7	Heavy								
8	Sleet/H								
9	Snow								
WINI	CODE: Do	not conduct surv	eys if wind	codes are 6 or above.					
Code		Indicators of W							
0	< i	calm, smoke rise	es vertically	(
1	2-3	light air movem							
	4-7	light breeze, wir							
2 3 4	8-12			in constant motion, raises du	st				
4	13-18	moderate breeze			V7.30				
5	19-24	fresh breeze, sm							
6	25-31	strong breeze, la							
7+		strong winds	ge oranient						
ROA	D TYPE:								
		Gravel D = Dirt							
POOL	L PERMAN	y by Park/Refuge ENCY:		$\mathbf{L} = \mathbf{Light} \text{Traffic} (< 10 \text{ca}$ anent (sometimes dries) $\mathbf{P} =$		-	_		ion
POOI N	L TYPE:	., oxbow, vernal p	ool)						
В	Beaver-crea								
-			1.1 1						
A(uman-Altered (pic				¥ 2			
		w/gravel pit A(D) roadside	ditch A(P) farm pond	A(I) impo	undment	A(O) other	er:	
U	Unknown								
TAICH	DENITAL OF	ECIEC OPCE	DVATIO	MC.					
INCH	DENTAL SP	ECIES OBSE	RVAIIC	INS:					
					Sperma-		Tadpoles/		
			Chorus		tophores	# Egg	Larvae		
Pool		Species	Code	Visual only, Handled)	(Y/N)	Masses	(Y/N)	# Juveniles	# Adults
-								-	
-								-	
								1 1	

CHORUS CODE: Code Descrip

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).
3	Full chorus, calls continuous and overlapping. Cannot distinguish individuals.

ACS Vernal Pool Data Sheet 2004

Date (d	id mont	th)		Unit	(park o	or refug	e name)	Wall	kill Riv	er NW	R												
Observ	ers (fi	ıll nan	nes) Ken W	itkowski																			
			PS (dd mm					W															
			Wind o																				
				1 cm)? []	YES	[]]	NO																
Land C	Cover	(with	in 50m of s	start point, es	stimat	es sho	uld ad	d to 1	00%)										7				
			ck appropri						SE 11/080								- 1		1				
			1 (>75% de																				
	Softv	vood	(<75% dec	iduous)															1				
%	Agric	ulture	e/meadow/p	pasture															_				
- %	Reside	ential	: urban/sub	urban													1		1				
%	Road;	desc	ription (roa	d type*	_ traf	fic at	night*	3)									10	1				
_								1											ı		1		
Note	s (reco	rd inc	idental species	s observations	on reve	rse):									_		—-× -		4-				
1																							
1																	1						
1																		_	_				
1																							
DI .		1	c ·	1.4																			
Photo	o num	ber c	of primary p	not:																			
								_															
						_	du									24			*			**	
		2			(E)	fron	Te			A CONTRACTOR OF THE PARTY OF TH	Pool max	and the second second		a.	22	vel-	% Road/	Dist to	Ty	*3	Pool	Typ	7 8
Plot	Pool	photo	(DDMMSS.SS)	(DDMMSS.SS)	EPE (m)	Dist from Transect	Water Temp (°C)	nЦ	Pool max Width (m	The state of the s	Depth (cm)	Veg (SAV / emerg)	For. (m)	For.	% Ag	% Devel-	right-of-	Road (m)	Road Type*	Road Traffic*	Perman- ency*	Pool Type*	# RSYL
	<u>a</u>	_	(DOMINIOS.SS)	(1515/11/100.00)	<u> </u>	Ta-	20	pri	Tridui (iii	/()	(cin)	(chicig)	101. (111)	- %	- 8	% 0	may	()	~	× 1-	circy	-	# 2
-			_	+	-	-	_	_	-	_	_			_	+		_	_		_		_	_

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist from Transect	Water Ten (°C)	pН	Pool max Width (m)	Length		Veg (SAV	Dist. to For. (m)		% Ag	% Devel-	% Road/ right-of- way	Dist to Road (m)	Road Typ	Road Traffic*	Pool Perman- ency*	Pool Type	# RSYL Masses	# AMAC Masses
-	-		_	+	\vdash	-			-	_			-	_	-		-	-		-		_		_
-	-				-	-		-	-					-		-	_	-	-	-	_	_		-
					_				-									-					_	_
											1													

^{*=} see back for definitions and codes for table

SKY (CODE: Do	not conduct surveys	if sky coo	des are 6 or above.									
Code	Sky Condit	ion											
0	Cle	Clear or few clouds (< 20% of sky)											
1	Par	Partly cloudy or variable (20-50% of sky)											
2		oudy or overcast (> 50											
3	Fog												
4	Mi												
5		owers or light rain											
		avy rain											
6													
7 8		Sleet/Hail Snow											
0	Sile	ow.											
				codes are 6 or above.									
Code		licators of Wind Spe											
0	< 1												
1	2-3												
2		light breeze, wi	nd felt or	face, leaves rustle									
3				gs in constant motion, raises	s dust								
4													
5													
6													
7			- 0 uni	anna Titta A.T									
ROAD	TYPE:												
P	= Paved G	= Gravel \mathbf{D} = Dirt											
N B A(Beaver-cre Artificial A(B) borr Unknow	'Human-Altered (pick ow/gravel pit A(D)	best descroadside	e ditch A(P) farm pond	A(I) imp	oundmer	nt A(O) ot	her:					
INCID	ENTALS	FECIES OBSER	VAII	JIAB.	C		T-1-1-/						
Pool		Species	Chorus Code	ID method (Auditory only Visual only, Handled)	Sperma- tophores (Y/N)	# Egg Masses	Tadpoles/ Larvae (Y/N)	# Juveniles	# Adults				
								1					

PoolName	Pool Record Type	Lat	Long
rnwrla &	ACS	41:12:25.5	Long -074:35:20.3 -074:35:18.3 -074:35:12.8 -074:34:07.04
wrnwrlb (ACS	41:12:28.3	-074:35:18.3
wrnwrlc 6	ACS	41:12:29.7	-074:35:12.8
wrnwr15a checked	ACS	41:16:52.53	-074:34:07.04
vrnwr47a ∈	ACS	41:16:02.8	-074:32:60.4
wrnwr47b 0	ACS	41:16:02.2	-074:32:40.3
wrnwr47c 🔿	ACS	41:16:03.7	-074:32:38.7
wrnwr47d O	ACS	41:16:06.2	-074:32:37.6
wrnwr47e 6	ACS	41:16:05.0	-074:32:39.4
wrnwr45a E	ACS	41:17:13.2	-074:32:68.5
wrnwr19A	ACS	41:12:27.5	-074:34:15.0
wrnwr32A	ACS	41:14:57.5	-74:33:23.3
wrnwr32B	ACS	41:14:58.5	-74:33:23.6
wrnwr32C o	ACS	41:14:57.7	-74:33:23.3
wrnwr3A +	ACS	41:11:59.19	-74:34:50.72
wrnwr26A	ACS	41:13:38.2	-74:33:45.68
wrnwr41 I-1	INCIDENTAL	41:14:66.2	-074:32:93.7
wrnwr41 I-2	INCIDENTAL	41:14:68.8	-074:32:90.6
wrnwr4 I-2	INCIDENTAL	41:11:60.3	-074:35:11.0
vrnwr27 I-1 🔘	INCIDENTAL	41:12:33.3	-74:33:49.2
wrnwr34 I-1 E	INCIDENTAL	41:14:19.6	-074:33:15.9
vrnwr31 I-1 0	INCIDENTAL	41:15:16.8	-74:33:35.7
wrnwr27 I-2 ①	INCIDENTAL	41:12:52.4	-74:33:48.2
wrnwr28 I-1	INCIDENTAL	41:12:86.0	-074:33:71.1
wrnwr31 I-2	INCIDENTAL	41:15:14.6	-74:33:34.2
wrnwr4 I-1	INCIDENTAL	41:11:50.4	-074:35:01.2

KUPUPI E

INCIDENTAL

12.255min 1058C

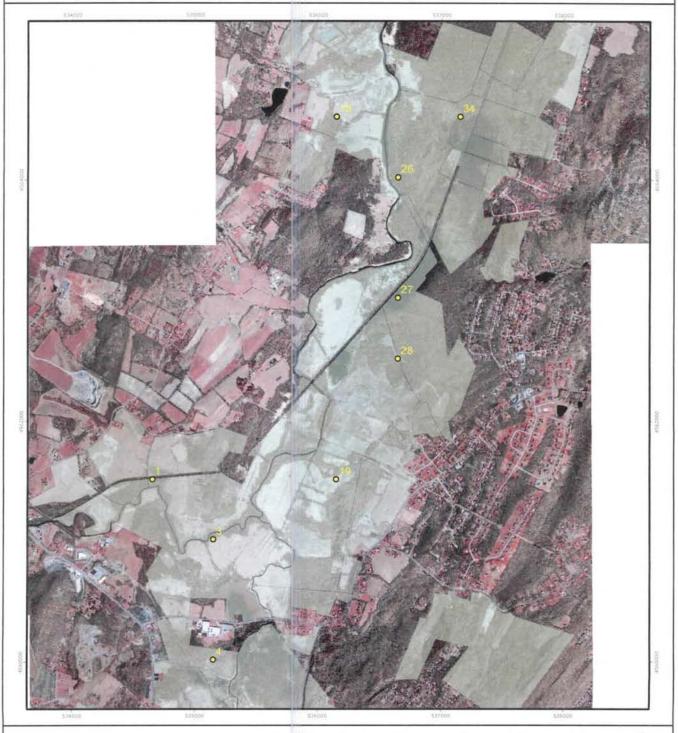
41:19.83.1 -074; 58.49.0 77

input as dec. degrees





Vernal Pool Amphibians - Long Term Monitoring Points



Map Projection: NAD_1983_UTM_Zone_18N
Graticule Units: degrees, minutes, seconds
Map Grid Unit: Meter
C/IG I S Wallicul River(WLK Amphibian Research/Vernal Pool Monitoring mxd: 4/21/2006









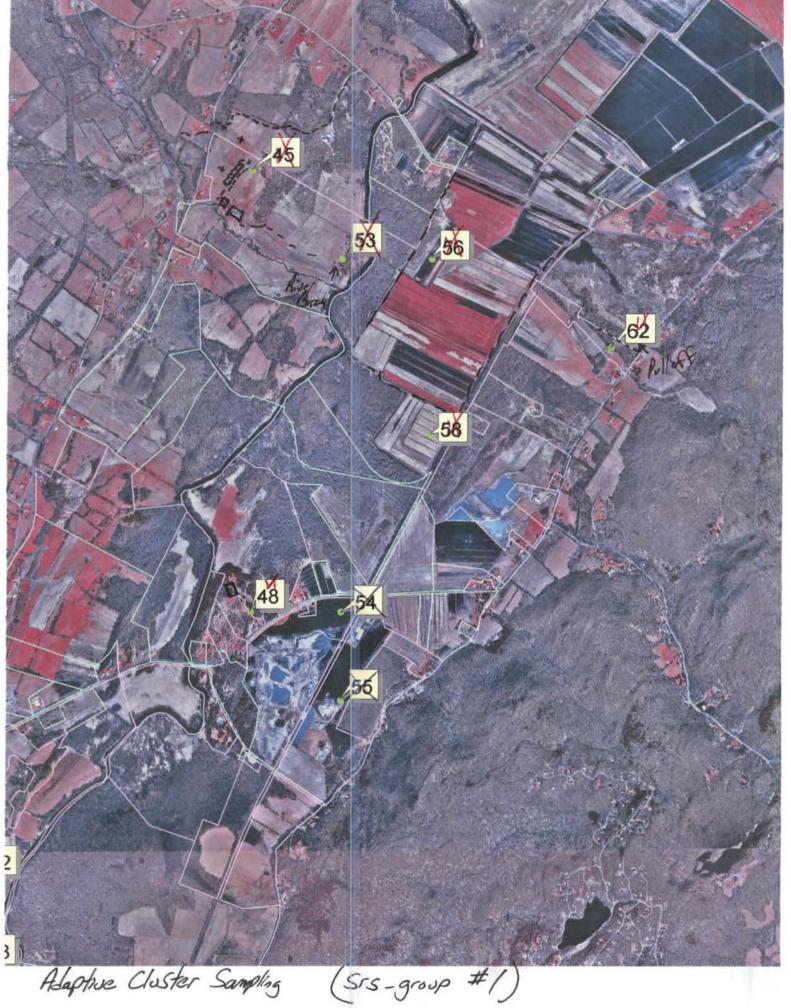
Vernal Pool Amphibians - Long Term Monitoring Points

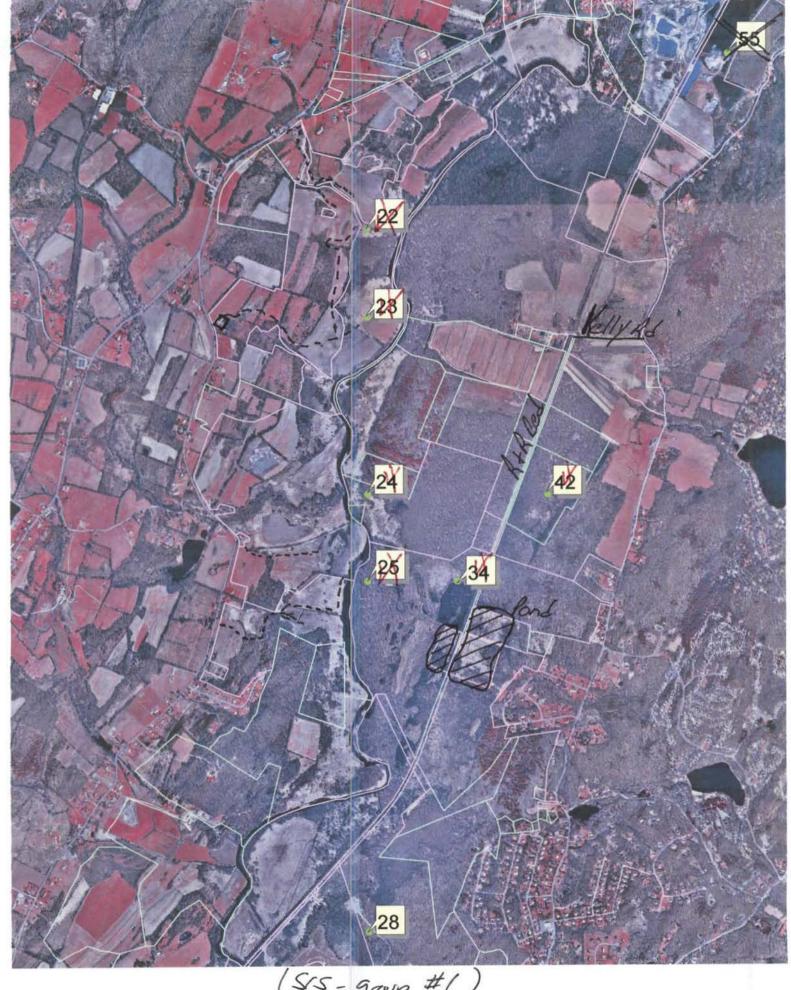


Map Projection. NAD_1983_UTM_Zone_18N Graticule Units: degrees, minutes, seconds Map God Unit Metal. CVG IS Walkioll RiverWLK Amphibian ResearchiVernal Pool Monitoring mxd. 4/21/2006

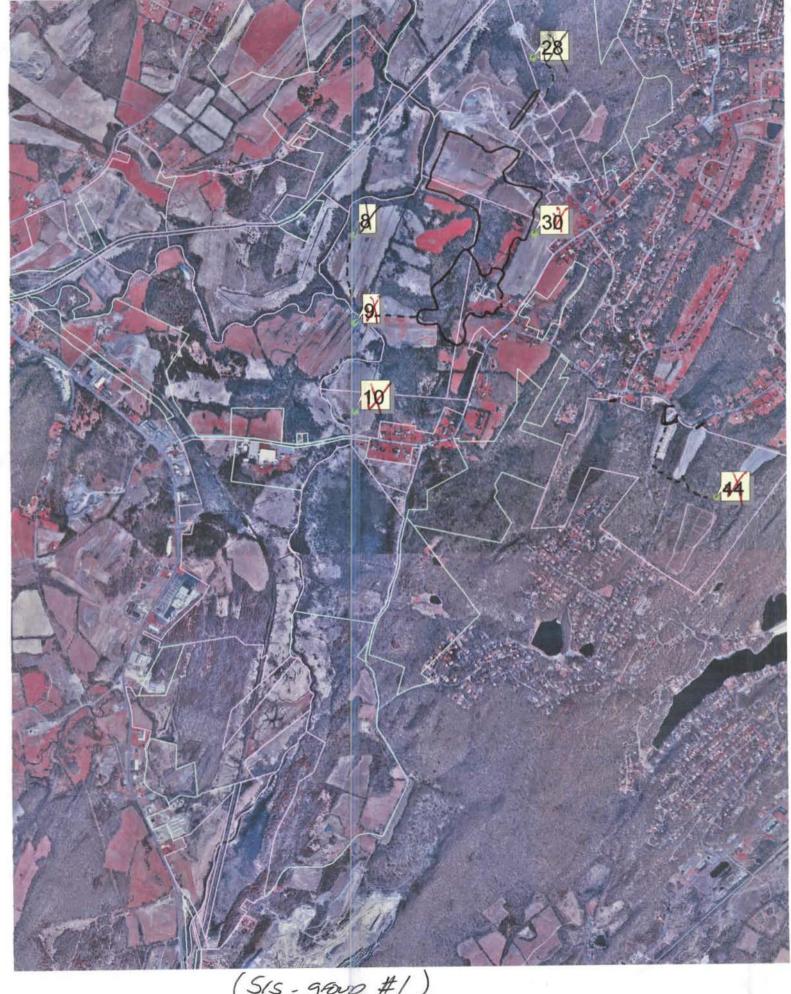




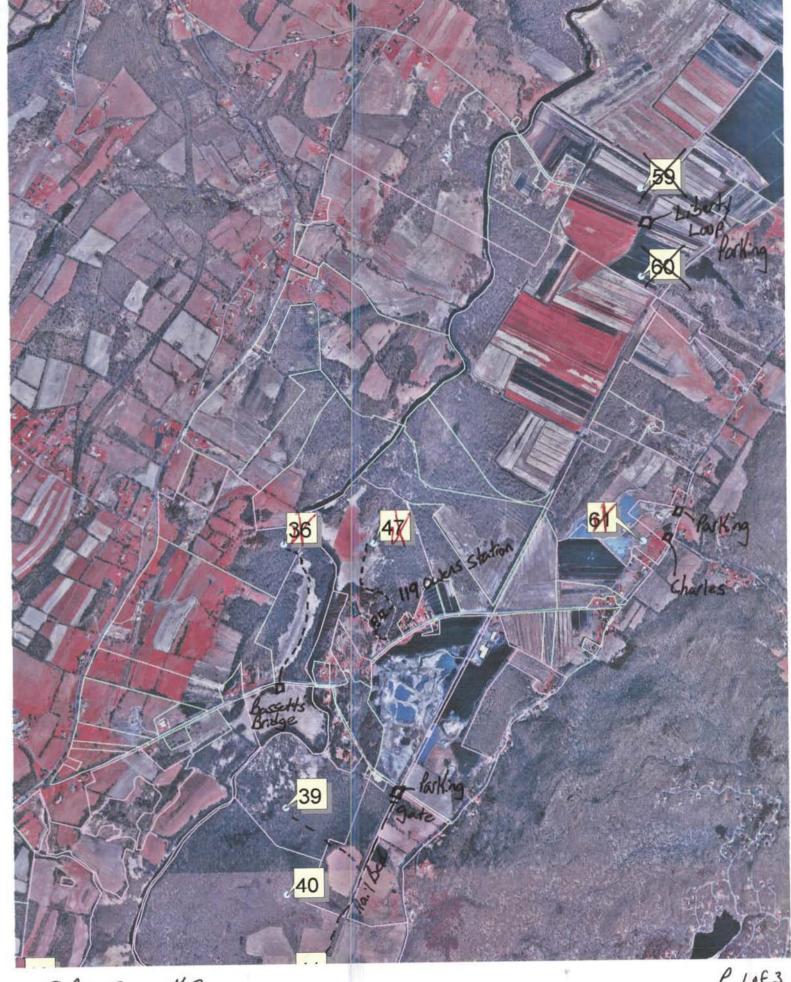




(SS-group #1)

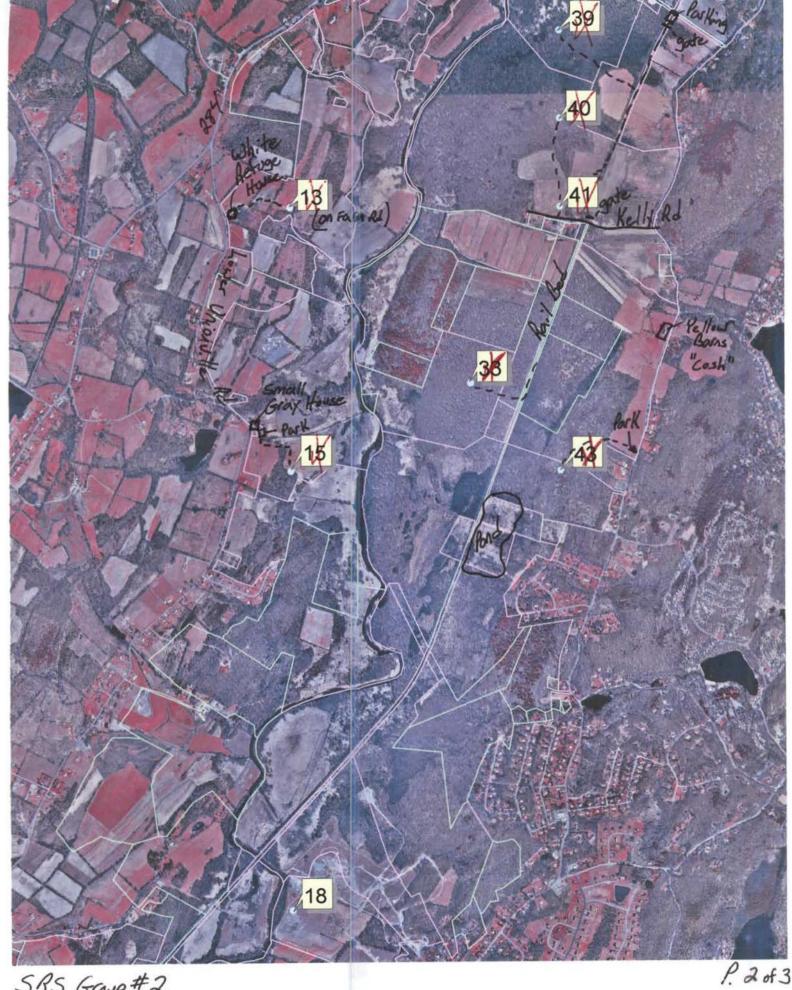


(SIS- group #1)

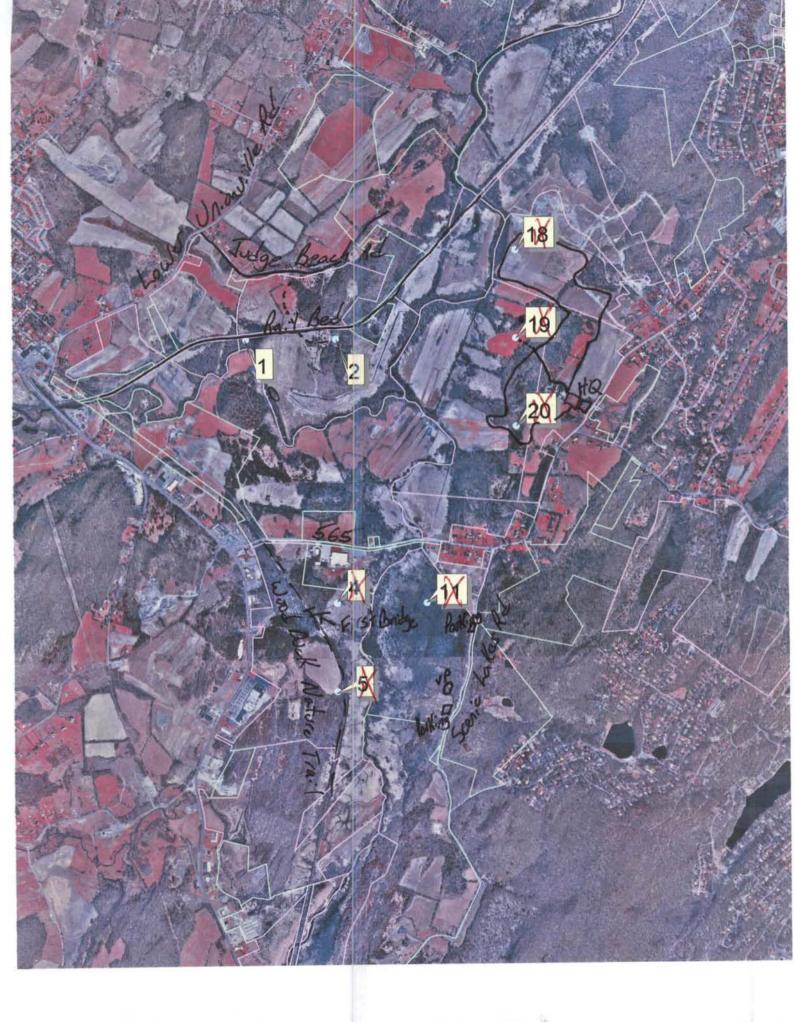


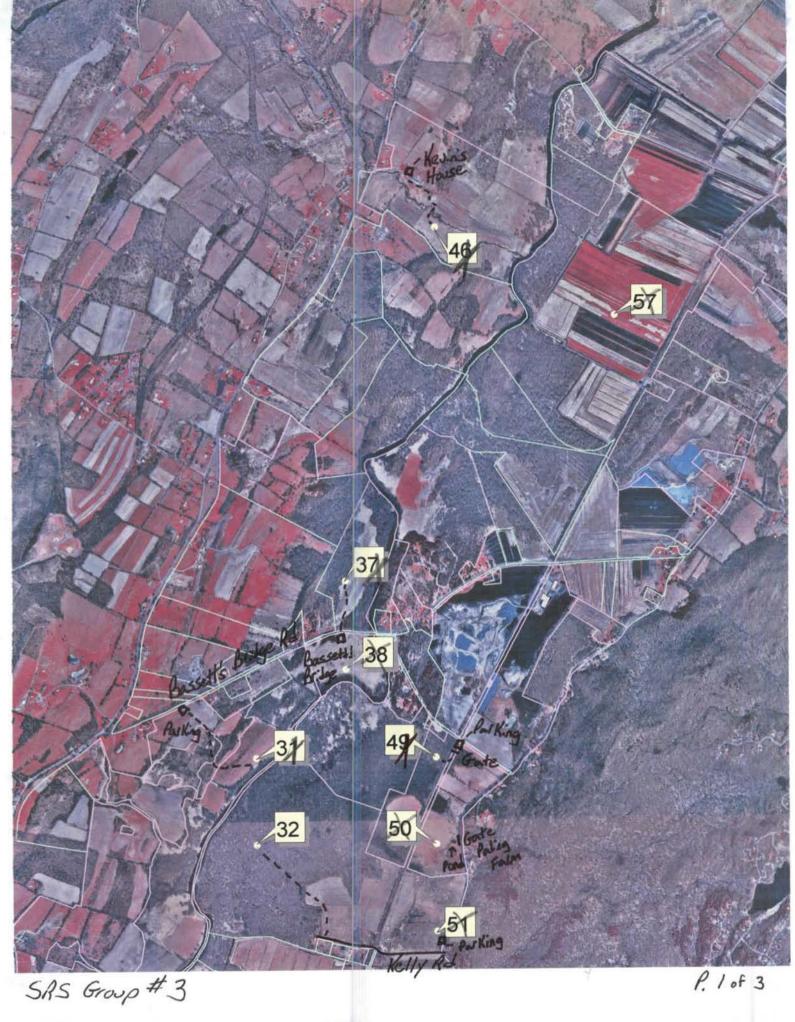
SRS Group#2

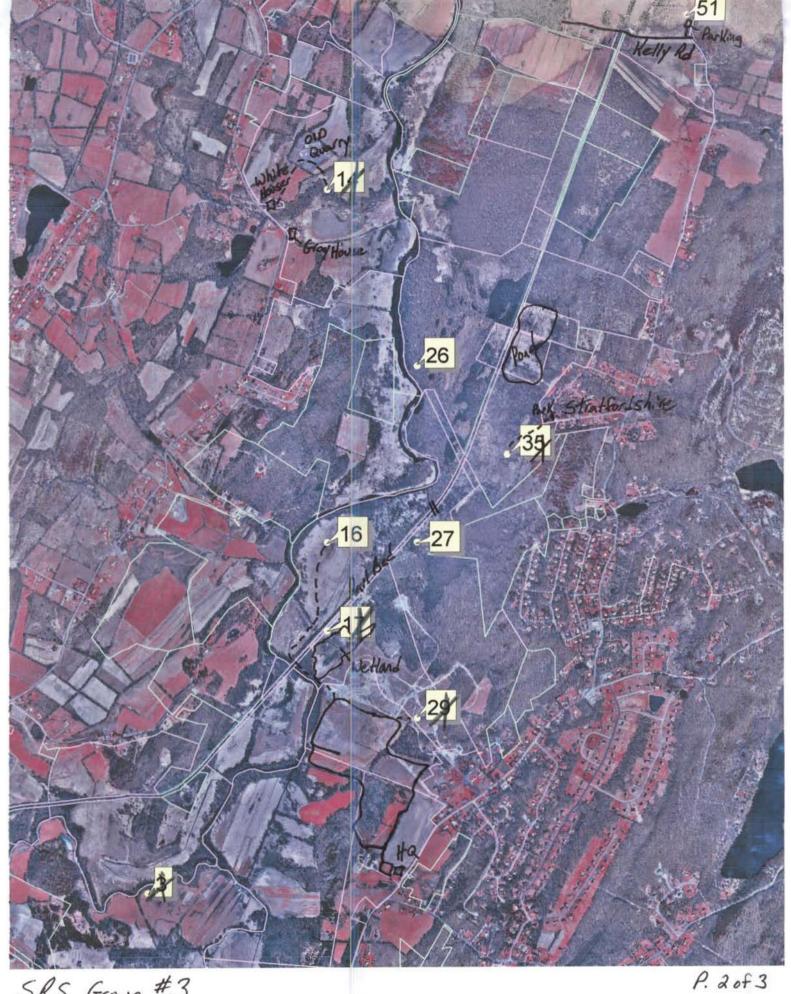
P. 10F3



SRS Group#2





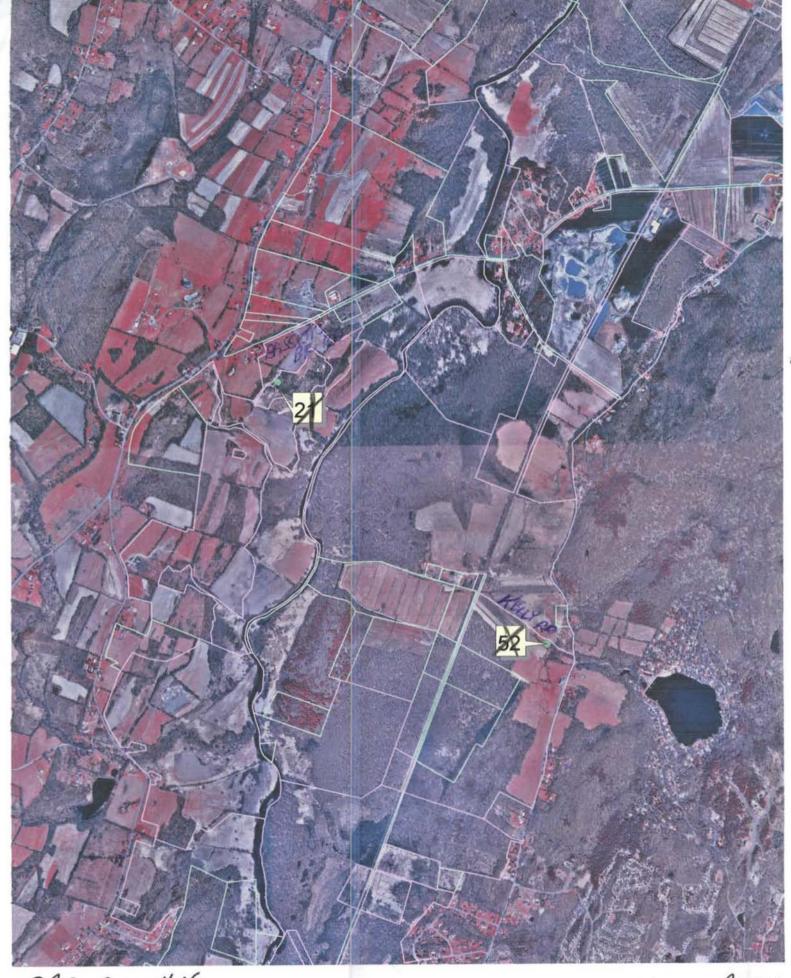


SRS Group #3



SAS Group #3

P3of3



SRS GAUP #4

P1. 0 F /

Wallkill River National Wildlife Refuge 2004 Vernal Pool Study

Observers:

Kevin Holcomb, Wildlife Biologist Ken Witkowski, Volunteer/Contractor

Focal Vernal Pools:

Name	UTM (Zone 18)	Survey Dates
Scenic Lakes Rd. (North #1)	0535757e 4559545n	3/29, 4/8, 4/22
Wood Duck Nature Trail #2	0534953e 4558216n	3/29, 4/8, 4/22

Other Notes:

Please call Kevin Holcomb, Wildlife Biologist at (973) 702-7266 or e-mail kevin_holcomb@fws.gov for questions.

Wallkill River National Wildlife Refuge 2004 Vernal Pool Study

Observers:

Kevin Holcomb, Wildlife Biologist Ken Witkowski, Volunteer/Contractor

Wood Duck Nature Trail #2 Vernal Pool Data

Name Wood Duck Nature Trail #2		16n	Survey Dates 3/29, 4/8, 4/22
Wood Duck Nature Trail #2 Verr	WF	SS	
29-Mar	0	9	
8-Apr	0	19	
22-Apr	0	7	

FOCAL VERNAL POOL LOCATION AND HABITAT DATA SHEET

UNIT: Wallkill River NWR VERNAL POOL NAME: Wood Duck Nature Trail #2
OBSERVER: Kevin Holcomb DATE (DD MONTH): 29 March 2004
DETAILED DIRECTIONS TO SITE: Tract #91 South end of wood Ovek Nature Trail, East
Side of trail / South of field exterence
LATITUDE (DDMMSS.SS): 41°/0'28.3" LONGITUDE (DDMMSS.SS): 24°34'59.6" EPE: +/- 5 m
POOL MAX. LENGTH: 26.6 m POOL MAX. WIDTH: 5,/ m POOL MAX. DEPTH: 26 cm
POOL PERMANENCY: temporary (dries annually) semipermanent (sometimes dries) permanent (never dries)
POND TYPE (Check either Natural, Beaver-created, Artificial/Man-made, or Unknown):
☐ Natural (e.g., oxbow, vernal pool)
☐ Beaver-created
Artificial/Man-Made - If pool is artificial/man-made, pick best description below:
borrow/gravel pit roadside ditch farm pond impoundment other: Side of foliar Rousel as nature to
Unknown
SITE TYPE: upland-isolated (not part of larger wetland)
bottomland-isolated (part of a river or lake floodplain)
wetland complex (associated with a larger wetland complex)
FISH PRESENT: No Yes If Yes, list Species:
DISTANCE TO FOREST FROM WATER'S EDGE: m
DISTANCE TO NEAREST ROAD: 4/5 m
ROAD TYPE: PAVED GRAVEL DIRT
ROAD CONDITIONS AT NIGHT: Refuge/Park use only ☐ Light Traffic (< 10 cars) ☐ Heavy Traffic (≥ 10 cars)
FOR THE FOLLOWING, RANK the amount of pond area in which each type occurs (does not need to sum to 100%): $0=0\%$, $1=1-10\%$, $2=11-25\%$, $3=26-50\%$, $4=51-75\%$, $5=76-100\%$
AQUATIC SUBSTRATE: Leaf Litter _ 5 Sticks/Logs _ 4
AQUATIC VEGETATION: SAV 2 Emergent Shrub 4 Tree 4

LAND USE/COVER AROUND VERNAL POOL: Estimate % of each of the land use/cover categories within 50 m of pool. Estimates should total 100%:
20 % Woodland/Forest
Hardwood (> 75% deciduous)
☐ Softwood (> 75% evergreen)
☐ Mixed Hardwood/Softwood (< 75% each)
If % woodland/forest is entered, record if canopy cover over the vernal pool is heavy or moderate:
Heavy (> 50% canopy cover of trees/shrubs > 6 ft. tall)
Moderate (< 50% canopy cover of trees/shrubs < 6 ft. tall)
79 % Agriculture/Fields/Meadow/Pasture
% Developed: Residential/Urban/Suburban/Mining/Industrial
% Road/Right-of-Way
1 % Other: Nature tra: (Former Rail-road bed)
NOTES:
_

	+4=	7	5,				(Refuge/Pai	
			52				AL POOL	
-		+-	\$3				(DDMonth	Vature Trail # o):
_			54			29	Mary	2004
			55				BEGIN:/	
			56			GRID	END:	IS <u>4</u> m
	. 106	hadres 3				INDIC	ATE Nor	th ON MAP (full name)
-	Speri		57					blomb
-		1	+					(full name)
			1				ATE WITH	Kowski
	BSERVERS S							
Species	# Egg N OBS 1	OBS 2	Species	# Egg N OBS 1	Aasses OBS 2	Species	# Egg ! OBS 1	Masses OBS 2
Switch -	(Marie Control of the			*************			-	
SI								
52				*****				
<u>S3</u>						-		-
55							•	
56								
57	_3_		*****	****	-		-	-

UNIT (Refuge/Pa	rk): Wallkill	River NWR	VERNA	L POOL NA	ME: WOO	Ovek A	lature	Trail #2			
Date (DD Month): 29 Much 2004 Sky Code: O Wind Code: 3 Previous Day Precipitation? YES NO Water Temp.: 13 °C °F Water pH: 202											
Water Temp.:	13	°C □ °F	Water pH:	2.07							
Pool Max. Length	26.6	m Pool M	ax. Width:	5.1	m						
Pool Max Depth:	26	cm									
Along Max Le					ng Max Width						
Depth at linear		3 20	19	l at li	oth 21	26	34	24			
distance	1 6	2 24	25		ance /	2	3	4			
Is Visibility Impair	red During Egg	g Mass Counts?	YES	□ NO							
OTHER AMPHI	BIANS, REPT	TILES, INVER	TEBRATE	S, ETC.:							
SPECIES	Chorus Code	# Mated Pairs	Sperma- tophores	# Egg Masses	Tadpoles/ Larvae	# Juveniles	# Adult	s			
RSYL							3				
RSYL			3/								
10-10-							1				
**************************************					1	-	 				
	naka esimane ni				 	+	1				
					-		-				
							-				
		<u></u>					-				
Shirt Shirt		\$14.00 per 14.00									
NOTES: WG	ter str.	der Smart		1							
CHORUS CODE	No amphibians c	alling		DESCRIPT	TION						
1 2	Individuals can b	e counted, calls not				after code separated					
3		continuous and ove				after code separated	oy nypnen (e.g	3., 2-0)			
OF THE PROPERTY OF THE PARTY OF	***							J			

	FOCAL VERNA	LIOOLEC	IG MASS	COUNTI	MIASH	EE1 200	J4
		$\neg \neg \neg$	T		UNIT	(Refuge/Par	rk):
					Wallk	ill River NV	<u>VR</u>
					VERN	AL POOL	NAME:
		70			Wood	1 OveKA	buture Fail #
		59				(DDMonth	
	1 1	58			8	April	2004
	Spinistanies 1					BEGIN:	
		56				END:	
		35			1		IS_4_ m
-		341	1				th ON MAP
		53					(full name)
-		SZ			Kes	in Ho	lcomb
	32				OBSI	ERVER 2	(full name)
		N					Kowski
		V				CATE WITH	
WHEN O	BSERVERS SWITCH						
Species	# Egg Masses OBS 1 OBS 2	Species	# Egg N OBS 1	Masses OBS 2	Species	# Egg ! OBS 1	Masses OBS 2
51	4		OBST	ODS 2		OBSI	OBS 2
		-					
<u>5</u> 2				-			
		13 11 1 1		· · · · · · · · · · · · · · · · · · ·		3	
54							
55					-		
		· ************************************					
56	<u> </u>	-				-	
57		-		**********	****		
58		-					-
59		1-100000				-	

UNIT (Refuge/Pa	ark): Wallkill	River NWR	VERNA	AL POOL NA	AME: Wood	Duck Na	tore Tail #2
Date (DD Month)	8 Apr. 1	2004 Sky	Code:	_ Wind Code	: 2 Previou		on? YES NO
Water Temp.:	7 :	°C □ °F	Water pH:	207	_		
Pool Max. Length		OHNIG	Max. Width:	5.1	m		
Pool Max Depth:	42	cm					
Along Max Le	ngth				ng Max Width		Market State
Depth					pth		
at linear distance					inear tance		
Is Visibility Impai				□ NO			
SPECIES	Chorus Code	# Mated Pairs	Sperma- tophores	# Egg Masses	Tadpoles/ Larvae	# Juveniles	# Adults
R. Catesbeio	va						/
AMAC			30				
HMAC R. Clamitar	25						/
NOTES: West	er striker Is		45 110 1100				
CHORUS CODE				DESCRIP	TION		
0	No amphibians c		at awarlanning 1	Danced n	Challed And Low	.0	hu humban (a.e. 1.2)
2						after code separated b	
3	1	continuous and o					, ,,,,,,,
9	, valis		LILING. CIMI				

			55			Wallk VERN LLO DATE 22 TIME	Apr./	WR NAME: / Nk Ave Tie 14 h): 2004
			54			GRID INDIC	SPACING	th ON MAP
		62	62			OBS	erver 2	(full name)
WHEN O	BSERVERS	SWITCH	V			75.500.000	CATE WIT	H LINE
Species	# Egg 1 OBS 1	Masses OBS 2	Species	# Egg N OBS 1	Masses OBS 2	Species	# Egg OBS 1	Masses OBS 2
5 <u>1</u> 5 <u>2</u> 5 <u>3</u>	2	+/_				C CONCE		
54								
55								
				***************************************	*******			-
	-		-	-				-
-	******	***************************************	-		X X	****	-	
-							-	-
****	-						-	V.
					e n ener e			-

UNIT (Refuge/Pa	ark): Wallkill	River NWR	VERNA	AL POOL N	AME: WOOL	axK NoT	WE Trait	#2
Date (DD Month)	22 Apr	2 004 Sky	Code:	_ Wind Code	: Previou	s Day Precipitati	on? YES	NO
Water Temp.:								
Pool Max. Length	: 26.8	m Pool N	Max. Width:	5.3	<u>3</u> m			ş.
Pool Max Depth:								
Along Max Le	ength	172		Alc	ong Max Width			
Depth					pth			
at linear distance					linear tance			
Is Visibility Impa			ALL SUNS DATE	□ NO				
SPECIES	Chorus Code	# Mated Pairs	Sperma- tophores	# Egg Masses	Tadpoles/ Larvae	# Juveniles	# Adults	7
R. Clamita	- 1-1						2	1
h. Clomital	25 /-1	 	+		· · · · · · · · · · · · · · · · · · ·		-	+
		 	-			-	ļ	4
								_
CVISHBAR AND INFO]
								1
					1			1
		<u> </u>	-		 			1
					+			+
								-
						1)		
		<u> </u>	-1	·				
NOTES:								
CHORUS CODE	No. 200 - 100 C			DESCRIP	TION	· · · · · · · · · · · · · · · · · · ·		
0	No amphibians c Individuals can b		ot overlapping.	Record number of	of individuals calling	after code separated	by hyphen (e.g., 1-3)	
2	Calls overlap, bu	it individuals are di	stinguishable, R	tecord number of	findividuals calling	after code separated b	y hyphen (e.g., 2-6)	
3	Full chorus, calls	continuous and or	verlapping. Can	not distinguish i	individuals.			

Wallkill River National Wildlife Refuge 2004 Vernal Pool Study

Observers:

Kevin Holcomb, Wildlife Biologist Ken Witkowski, Volunteer/Contractor

22-Apr

Scenic Lakes Rd. (North #1) Vernal Pool Data

The state of the s		Survey Dates 3/29, 4/8, 4/22	
Scenic Lakes Rd. (North #1) Vernal Pool	WF	SS	_
29-Mar	0	4	
8-Apr	0	20	

2

FOCAL VERNAL POOL LOCATION AND HABITAT DATA SHEET

UNIT: Wallkill River NWR VERNAL POOL NAME: Scenic Lakes Rd North #/
OBSERVER: Kesin Holcomb DATE (DD MONTH): 29 March 2004
DETAILED DIRECTIONS TO SITE: Tract # 22 Scenic Lakes AL Refuge Auking Avea #11
walk awith ~ 100 years
LATITUDE (DDMMSS.SS): 4/ 1/ 1/ . 23" LONGITUDE (DDMMSS.SS): 74'35'25.05" EPE: +/-6.2 m
POOL MAX. LENGTH: 45 m POOL MAX. WIDTH: 20 m POOL MAX. DEPTH: 58 cm
POOL PERMANENCY: temporary (dries annually) esemipermanent (sometimes dries) permanent (never dries)
POND TYPE (Check either Natural, Beaver-created, Artificial/Man-made, or Unknown):
Natural (e.g., oxbow, vernal pool)
☐ Beaver-created
Artificial/Man-Made - If pool is artificial/man-made, pick best description below:
□ borrow/gravel pit □ roadside ditch □ farm pond □ impoundment □ other:
☐ Unknown
SITE TYPE: upland-isolated (not part of larger wetland)
bottomland-isolated (part of a river or lake floodplain)
wetland complex (associated with a larger wetland complex)
FISH PRESENT: No Yes If Yes, list Species:
DISTANCE TO FOREST FROM WATER'S EDGE: m
DISTANCE TO NEAREST ROAD: 82 m
ROAD TYPE: PAVED GRAVEL DIRT
ROAD CONDITIONS AT NIGHT: Refuge/Park use only
FOR THE FOLLOWING, RANK the amount of pond area in which each type occurs (does not need to sum to 100%): $0=0\%$, $1=1-10\%$, $2=11-25\%$, $3=26-50\%$, $4=51-75\%$, $5=76-100\%$
AQUATIC SUBSTRATE: Leaf Litter _ Sticks/Logs _ 4_
AQUATIC VEGETATION: SAV / Emergent 4 Shrub 2 Tree 2
Phrag

LAND USE/COVER AROUND VERNAL POOL: Estimate % of each of the land use/cover categories within 50 m of pool. Estimates should total 100%: 80% Woodland/Forest Hardwood (> 75% deciduous) ☐ Softwood (> 75% evergreen) Mixed Hardwood/Softwood (< 75% each) If % woodland/forest is entered, record if canopy cover over the vernal pool is heavy or moderate: Heavy (> 50% canopy cover of trees/shrubs > 6 ft. tall) Moderate (< 50% canopy cover of trees/shrubs < 6 ft. tall) 20% Agriculture/Fields/Meadow/Pasture % Developed: Residential/Urban/Suburban/Mining/Industrial % Road/Right-of-Way % Other: NOTES:

WHEN O	BSERVERS		SPECIN DANEAS	Say	5	Wallk VERN See DATE 29 TIME GRID INDIC	BEGIN: _/ BEGIN: _/ END: _/ SPACING CATE NOTE ERVER 1	NAME: Ses North Ses
Species	# Egg 1	Masses OBS 2	Species	# Egg N OBS 1	fasses OBS 2	Species	# Egg ! OBS 1	Masses OBS 2
51 52	_/							
53 54								
				-	<u> </u>	*	·	
								-

UNIT (Refuge/Pa	rk): <u>Wallkill</u>	River NWR	VERNA	L POOL N	AME: Sorie	Lakes	North #	1
Date (DD Month):	29 Mars	2 004 Sky	Code: O	_ Wind Code	e: 3 Previou	s Day Precipitati	on? YES	, NO
Water Temp.:						¥1		•
Pool Max. Length:	45	m Pool l	Max. Width:	20	m			
Pool Max Depth: _								
Along Max Len	ngth			Ald	ong Max Width			
Depth					epth			William III
at linear distance				100	linear stance			
Is Visibility Impair				П ио				
SPECIES	Chorus Code	# Mated Pairs	Sperma- tophores	# Egg Masses	Tadpoles/ Larvae	# Juveniles	# Adults	7
Herrifer	2			71				1
UNKNOWN				307-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	W		//	1
R591	2						11	1
AMAC			8					
H CNC. Fel UNKNOWN RS9L AMAC C serpentin	a					All All	1	
							ļ	
4470 - may - 12							-	
and the second approximation of the second								
						**		
NOTES:								
CHORUS CODE				DESCRIP	TION	Ne the same		
0	No amphibians c Individuals can b	alling e counted, calls no	ot overlapping. I	Record number of	of individuals calling	after code senarated I	ov hyphen (e.g. 1-3)	
2	Calls overlap, bu	t individuals are di	istinguishable. R	ecord number of	f individuals calling a	fter code separated b	y hyphen (e.g., 2-6)	
3	Full chorus, calls	continuous and ov	verlapping. Can	not distinguish	individuals.			\neg

	T	T		Т		UNIT	(Refuge/Park):
			59	-		Wallk	ill River NWR
		1	3857		1	VERN	IAL POOL NAME:
			(36		1	Scen	ic Lakes aboth #
			55			DATE	(DDMonth):
			54			8	Apr:/ 2004
				SI		1	BEGIN: ///5
		$+ \cap +$		33	++-	TIME	END: 1210
				52 SI		GRID	SPACING IS 6 m
		11 11	51	5/	2		CATE North ON MAP
		11 4					ERVER 1 (full name)
						Kei	in Holcemb
				1	1		ERVER 2 (full name)
	ĺ			1		Ke	a Withowski
			\perp			INDIC	CATE WITH LINE
	BSERVERS						V2.V2.
Species	# Egg ! OBS 1	Masses OBS 2	Species	# Egg 1 OBS 1	OBS 2	Species	# Egg Masses OBS 1 OBS 2
51		+2	5/2		+1		
52	2	4	5/3	2_			
53	2						
54	2				-	-	
55	_/_						
56_	_2_					-	
57					-		
58		+/					
59	2						

UNIT (Refuge/P	ark): Wall	kill River	NWR	VERNA	AL POO	L NAME:	Scento	Lakes	s RJ	Vorth.
Date (DD Month)	: 8 A	OC' / 200	4 Sky Co	ode:	_ Wind	Code: _2	Previous	Day Precipita	ntion?	ES NE
Water Temp.:	8	₽ °C	□ °F	Water pH:	6-1	87			_	_
Pool Max. Length	: <u>45</u>	m	Pool Ma	x. Width:	20	2m				
Pool Max Depth:	_ 56	cm	i.							
Along Max Le	ength					Along Ma	x Width			
Depth	12CM	BEM	24cM	21CM	1	Depth	19	28	20	15
at linear distance	/1m	2 M	43m	44m		at linear distance	Im	2m	18m	190
Is Visibility Impa	ired During	Egg Mass	Counts?	YES	\square N	0				
OTHER AMPH	IBIANS, R	EPTILES,	INVERT	EBRATE	S, ETC.	:				
SPECIES	Chor			Sperma- tophores	# Egg Masses		poles/ vae	# Juveniles	# Adul	ts
SREEN FRO	6						-	1-31-31 W (1 <u>-</u> -111)		
UNKNOWN						100	1		1	
BULLFROS									1	
1127 (20)										
										1
NOTES:						-				
CHORUS CODE					DES	CRIPTION			*****	
0	No amphibi				V					1.0
1 2								er code separate		
3		23				uish individual				

				T T	UNIT (Refuge/Park):
					Wallkill River NWR
-	_				VERNAL POOL NAME:
					Scenic Lakes North#1
			36		DATE (DDMonth):
					22 Apr. 1 2004
			53	WI	TIME BEGIN: 0910
			33		TIME END: 0940
				52	GRID SPACING IS 6 m INDICATE North ON MAP
			51		
					OBSERVER 1 (full name)
-				1-11-	BSERVER 2 (full name)
			-	+	INDICATE WITH LINE
WHEN O	BSERVERS	SWITCH			INDICATE WITH LINE
Species	# Egg OBS 1	Masses OBS 2	Species	# Egg Masses OBS 1 OBS 2	Species # Egg Masses OBS 1 OBS 2
51	1				
52		+/			
53	_2_			*	
54	_3_		-	-	
WI		+2			_
55	/_	+1			
56				,	
		-			

UNIT (Refuge/Par	k): Wallkill	River NWR	VERNA	AL POOL NA	ME: San	ic talles	North	14
Date (DD Month)	22 Apr.	2004 Sky (Code: 2	_ Wind Code:	Previou	s Day Precipitati	on? YES	NO
Water Temp.:	50_ [°C 🗗 °F	Water pH:	6.87	2			*0
Pool Max. Length:	44	m Pool M	lax. Width:	19	m			
Pool Max Depth: _								
Along Max Len	ath	¥:		Alo	ng Max Width			
Depth				Dep		1		
at linear					near			
distance				dist	ance			
Is Visibility Impaire								
SPECIES	Chorus Code	# Mated Pairs	Sperma- tophores	# Egg Masses	Tadpoles/ Larvae	# Juveniles	# Adults	
R. claniton							7	1
n. Clamton	5		-		1	-	19	1
					·	1		1
								1
						<u> </u>		4
			-		 			4
							1	
		-						1
				EXHLUSE EST	ATHEODESITIES CAN BE SEEN			
was samurani samu			-		Constant and		·	+
					1			
					1			1
		Liver to the second second			1			
						4		
							-	4
					1			
		L	1			1		1
NOTES:		entelkeum.Orazsesza						
CHORUS CODE				DESCRIP	TION			\dashv
0	No amphibians c							
1 2	Individuals can b	e counted, calls not	overlapping. I	Record number of	f individuals calling	after code separated b	by hyphen (e.g., 1-3)	\dashv
	A CONTRACTOR OF STREET	continuous and over		ASSESSMENT OF THE PARTY OF THE		aner code separated to	y nypnen (c.g., ∠-0)	-
3	run enorus, calis	Continuous and ove	rrapping. Can	iki distinguish ir	idividuals.			

2004 ACS points









41 IZ



J1058





T1044



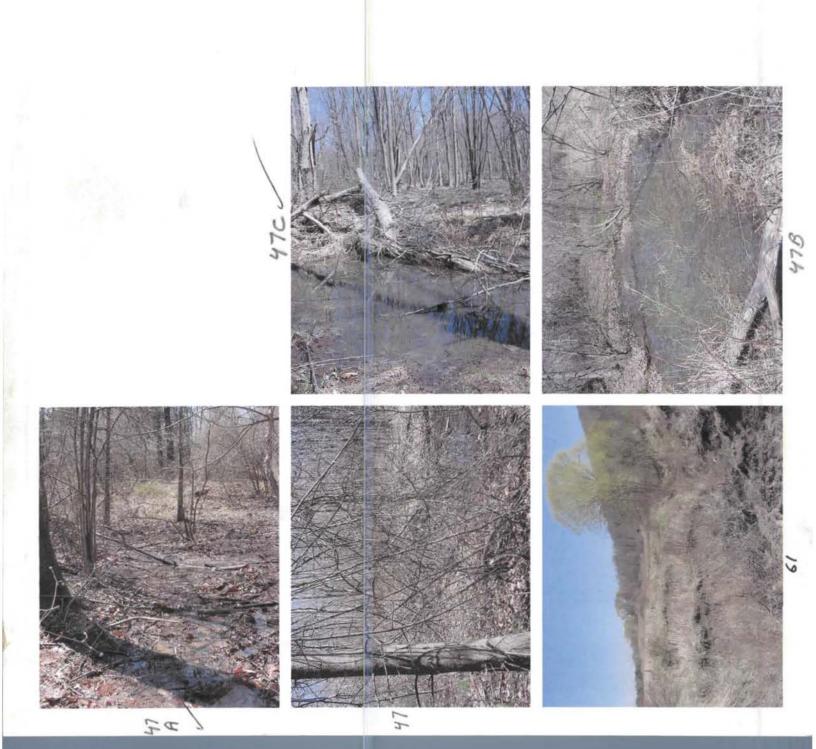


TOU2





2004 ACS paints













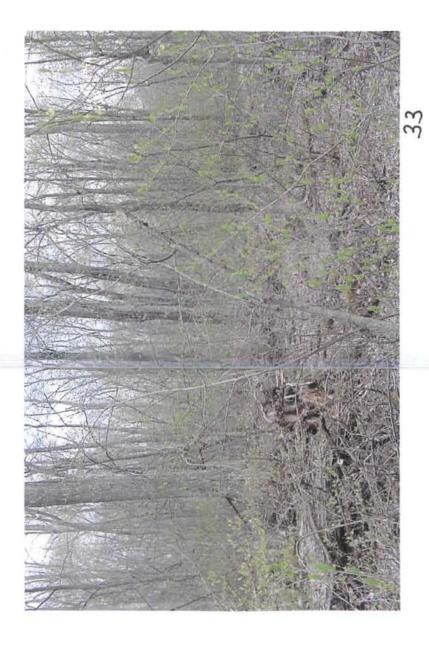




I041















Date (dd month) O2 APR Unit (park or refuge name) Wallkill River NWR		
Observers (full names) Ken Witkowski		
Point # 48 GPS (dd mm ss.ss) N 41° 15 45. 18980 W 74 32 40, 34724		
Sky code* 2 Wind code* 2		
Previous day precipitation (≥1 cm)? [X] YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%)		
% Forest (check appropriate type)		
Hardwood (>75% deciduous)		
X Softwood (<75% deciduous)		
10 %Agriculture/meadow/pasture		
%Residential: urban/suburban		
%Road; description (road type* traffic at night*)	10	1
Notes (record incidental species observations on reverse):		
NO UP LOCATED	1 1	
7.07.20		
NO UP LOCATED RED CEDAR (SCRUB		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Photo number of primary plot: DISK / # 2		
A CONTROL OF THE CONT		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE(m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
				-																	

^{*=} see back for definitions and codes for table

Date (dd month) OF APR Unit (park or refuge name) Wallkill River NWR			
Observers (full names) Ken Witkowski			
Point # 30 GPS (dd mm ss.ss) N 4/° /2 /5.16172 W 74° 33 46.21493			
Sky code* 2 Wind code* 4			
Previous day precipitation (≥1 cm)? [x] YES [] NO			
Land Cover (within 50m of start point, estimates should add to 100%) —— %Forest (check appropriate type)			
Hardwood (>75% deciduous)			
Softwood (<75% deciduous)			
/00%Agriculture/meadow/pasture			1
%Residential: urban/suburban %Road; description (road type* traffic at night*)			
		10	
Note's (record incidental species observations on reverse):			
No Vo			
Grassland Field	١		
Photo number of primary plot: DEKI = 1			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	>	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) OR APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # S GPS (dd mm ss.ss) N 41 /6 17,4464 W 74 3/57, 14090 Sky code* Wind code* Previous day precipitation (>1 cm)? Y YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*)	10	
Notes (record incidental species observations on reverse): NO UP LOCATED ONTCHED AS. FIELD	Ž	A
Photo number of primary plot: 0/5H1#-3		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
							_																
																,							
					-																		

^{*=} see back for definitions and codes for table

Date (dd month) O2 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 62 GPS (dd mm ss.ss) N 41°/6 33.98/38 W 74°3/ 14.04/142 Sky code* 2 Wind code* 2 Previous day precipitation (≥1 cm)? Y YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%) Noo %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type* traffic at night*) Notes (record incidental species observations on reverse):	1°	
NOUP		
Photo number of primary plot: DISK #4		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
														-							

^{*=} see back for definitions and codes for table

Date (dd month)	
Land Cover (within 50m of start point, estimates should add to 100%) ### WForest (check appropriate type) ### Hardwood (>75% deciduous) Softwood (<75% deciduous) #### Agriculture/meadow/pasture	
%Residential: urban/suburban %Road; description (road type* traffic at night*) Notes (record incidental species observations on reverse):	10
UPLAND FOREST SLOPE NO UP	
Photo number of primary plot: DISH 1 #8	

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
																		-					

^{*=} see back for definitions and codes for table

Date (dd month)	
Land Cover (within 50m of start point, estimates should add to 100%) 10 %Forest (check appropriate type) 1	10
Notes (record incidental species observations on reverse): GRASSLAND FIELD - LIGGOED EDGE	
Photo number of primary plot: 0154 2 # 3	

Plot	lool		Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length (m)	(cm)	Veg (SAV / emerg)	For. (m)	× %	%Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
45	A	#4	4112132	074°32.585"	4.60	5M	4406	6.85	12.8	28.2	64CM	30/10	25M	10	90	-	-	DOOM	P	L	P	N	5	-
•																								
															_									
														_	_				_					
					_	_	_						_	_	-	-		_				_	_	_
		_			-			_					_	_	-	-		-		_		-		
-		_			-	_	-		_		-		-	-	-	-	-	-	-	_		-		
		_			_	_			-	-			-		-	-		-			_			
		-			-	-	-			_	-		_	-	-	-		-	-				-	_
-		_		-			-				_			-	-	-		-	_	-		-		
							Leura de		1											-				

^{*=} see back for definitions and codes for table

Date (dd month) 06 APR Unit (park or refuge name) Wallkill River NWR			
Observers (full names) Ken Witkowski			
Point # 53 GPS (dd mm ss.ss) N41° 16 56, 45837 W 74° 32 18, 40297			
Sky code* O Wind code* 5			
Previous day precipitation (≥1 cm)? [] YES NO			
Land Cover (within 50m of start point, estimates should add to 100%)			
25_ %Forest (check appropriate type)			
* Hardwood (>75% deciduous)			
Softwood (<75% deciduous)			
25 %Agriculture/meadow/pasture			
%Residential: urban/suburban	1		
%Road; description (road type* traffic at night*)		10	
Notes (record incidental species observations on reverse):	L		
NO UP			
GRASSLAND FIELD/RIVERBOTTONA	j		
GRASSLAND FIELD / RIVERBOTTOMA FLOOD PLAIN			
4-			
Photo number of primary plot: OISY 2 # 2			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
			-																				

^{*=} see back for definitions and codes for table

Date (dd month) Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 54 GPS (dd mm ss.ss) N 41 15 43.60422 W 74 32 18.88970 Sky code* Wind code* Previous day precipitation (≥1 cm)? [] YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%)	I.c.	
Notes (record incidental species observations on reverse): POINT IN PRIVATE PLOPERTY NO SAMPLING	Ş	
Photo number of primary plot:		

Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max	Length	Depth	Veg (SAV		% For	% Ag			Dist to Road (m)	Road Type.	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
								1															
								†															
								1															
	Pool	Pool	O DMMSS.SS)	Latitude Longtitude (DDMMSS.SS) (DDMMSS.SS)	Latitude Longtitude (DDMMSS.SS) (DDMMSS.SS) UDMMSS.SS) UDMMSS.SS)	Pool Photo Care February (SS.SSWIMMOD) Photo Care Transect Transec	1 1 1	1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1		1 1 1 1 1 1 1 1 1 1 1 1 1	Pool max Pool max % Aq.		Pool max Pool max % Aq. 5 % Road/ Dist to	Pool max Pool max % Aq. 🕏 % Road/ Dist to 💆	Pool max Pool max % Aq.	Pool max Pool max % Aq.	Pool max Pool max Pool max 9% Ag	

^{*=} see back for definitions and codes for table

Date (dd month) Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 55 GPS (dd mm ss.ss) N 4/* 15 29, 39065 W 74°32 18. 97382 Sky code* Wind code* Previous day precipitation (≥1 cm)? [] YES [] NO	
Land Cover (within 50m of start point, estimates should add to 100%)	10
Notes (record incidental species observations on reverse): POINT ON PRIVATE PROPERTY NO SAMPLING	
Photo number of primary plot:	% Road/ Dist to S Pool S

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist to For. (m)	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
				-																	

^{*=} see back for definitions and codes for table

Date (dd month) O6 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 56 GPS (dd mm ss.ss) N 91° 16 50.37164 W 74° 31 \$6.90953 Sky code* ○ Wind code* 5 Previous day precipitation (≥1 cm)? [] YES NO			
Land Cover (within 50m of start point, estimates should add to 100%) Softwood (>75% deciduous) Softwood (<75% deciduous) Magriculture/meadow/pasture			
%Residential: urban/suburban %Road; description (road type* traffic at night*)		I°	
Notes (record incidental species observations on reverse): OITCHEO FIELO - WOO OCO TOGE NO VP	-	Ì	
Photo number of primary plot: 015H2#5			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
																					_

^{*=} see back for definitions and codes for table

Date (dd month) _08 PPR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # _34 GPS (dd mm ss.ss) N 1/ 13 52.36205 W 79 33 24.08972 Sky code* _2 Wind code* _0 Previous day precipitation (\ge 1 cm)? [] YES NO		
Land Cover (within 50m of start point, estimates should add to 100%) /// %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*)	. 10	
Notes (record incidental species observations on reverse): WARLE TO GET TO POINT - EMELGENT METLAND - ENTILE DAER WARE WATER	×	
Photo number of primary plot: NO PROTO		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
				-																		
																						Ξ

^{*=} see back for definitions and codes for table

Date (dd month) 98 APR Unit (park or refuge name) Wallkill River NWR			
Observers (full names) Ken Witkowski			
Point # 9 GPS (dd mm ss.ss) N 41° // 57, 10868 W 74° 34 24, 25685			
Sky code* 2 Wind code* 2			
Previous day precipitation (≥1 cm)? [] YES ★1NO			
Land Cover (within 50m of start point, estimates should add to 100%)	r		
%Forest (check appropriate type)			
Hardwood (>75% deciduous)			
Softwood (<75% deciduous)			
/00 %Agriculture/meadow/pasture			
%Residential: urban/suburban			
%Road; description (road type* traffic at night*)		10	
Notes (record incidental species observations on reverse):			
TRANSECT IS IN THE RIVER			
7			
NO VP			
	Į.		
Photo number of primary plot: OISK 3 # 2			
Thoto number of primary plot. 2747			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) 09 04 Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 42 GPS (dd mm ss.ss) N 4/0 14 08.49246 W 74°33 02.50146 Sky code* 2 Wind code* 0 Previous day precipitation (≥1 cm)? [] YES NO		
Land Cover (within 50m of start point, estimates should add to 100%) /oo %Forest (check appropriate type) X Hardwood (>75% deciduous) Softwood (<75% deciduous)		
%Residential: urban/suburban %Road; description (road type*traffic at night*)	l°	
Notes (record incidental species observations on reverse): UNABLE TO GET TO POINT - EMERGENT WETLAND - ENTIRE RREA UNDER LATER	 <u>.</u>	
THAT ENTRE A MENT UNDER WATER		
Photo number of primary plot: No PHOTO		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Pool max Length (m)	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Devel- oped	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) 09 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 24 GPS (dd mm ss.ss) N 41° 14 08.65788 W 74° 33 45.45896 Sky code* 2 Wind code* 0 Previous day precipitation (≥1 cm)? YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%) /@ %Forest (check appropriate type) X Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*)	Io.	
Notes (record incidental species observations on reverse): NO UP Photo number of primary plot: NISK 3#6	X	

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	Dev ed	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) OF APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 25 GPS (dd mm ss.ss) N 41°13 52.44416 W 74°33 45.56704 Sky code* 2 Wind code* 2			
Previous day precipitation (≥1 cm)? YES [] NO	1.0		
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture			
%Residential: urban/suburban %Road; description (road type*		l°	
Notes (record incidental species observations on reverse): NO UP FURESTED FLOOD PLAIN		Ž	
Photo number of primary plot: 0/54 3 # 8			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% Ag	% Devel- oped	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
				 																			

^{*=} see back for definitions and codes for table

Date (dd month) 39 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 23 GPS (dd mm ss.ss) N 41° 14 41.08524 W 74° 33 45.24775 Sky code* 2 Wind code* 2 Previous day precipitation (≥1 cm)? YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) /oo %Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type* traffic at night*)	1°	
GRASSLAND FIELD/FLIODPLAIN NO UP.		
Photo number of primary plot: OISK 3 49		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) 09 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 22 GPS (dd mm ss.ss) N 4/9/4 57.29888 W 74°33 45.13464 Sky code* 2 Wind code* 2 Previous day precipitation (≥1 cm)? Y YES [] NO	
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) Magriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*)	1º
Notes (record incidental species observations on reverse): NO UP	
Photo number of primary plot: OSK 3 #5	

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length		Veg (SAV	Dist. to For. (m)	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
											175												

^{*=} see back for definitions and codes for table

Date (dd month) Of APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 10 GPS (dd mm ss.ss) N 41 42.99485 W 74 34 29.36179 Sky code* Wind code* Previous day precipitation (≥1 cm)? YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) /// Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type*traffic at night*) Notes (record incidental species observations on reverse):	1°	
FLOOD PLAIN FIELD NO UP		
Photo number of primary plot: OISX 3 #3		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski		
Point # 8 GPS (dd mm ss.ss) N 4/°/2 15. 32250 W 74°34 29. 15/91		
Sky code* 2 Wind code* 2		
Previous day precipitation (≥1 cm)? [] YES ⋈ NO		
Land Cover (within 50m of start point, estimates should add to 100%) Softwood (>75% deciduous) Softwood (<75% deciduous)	3 ,	
%Agriculture/meadow/pasture %Residential: urban/suburban		
	10	
Notes (record incidental species observations on reverse):	<u> </u>	
FLOOD PLAIN		
FLOOD PLAIN NO VP		
Photo number of primary plot: 10/54 3 #9		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	ed o	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) / \(\text{APR} \) Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 28 GPS (dd mm ss.ss) N4/° /2 47.58726 W 74° 3345.49904 Sky code* 2 Wind code* /		
Previous day precipitation (≥1 cm)? [] YES NO		
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type* traffic at night*)	10	
Notes (record incidental species observations on reverse): WOODCAND NO UP (INCENDENTAL POL)	 ×———	
Photo number of primary plot: DISH 3 #10		
Those number of primary proc. 10/07 C 7 C		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
								,															

^{*=} see back for definitions and codes for table

Date (dd month) IS APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 43 GPS (dd mm ss.ss) N 41° 13 52,27822 W 14° 33 02.61245 Sky code* O Wind code* 6 Previous day precipitation (≥1 cm)? YES [] NO			
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture	,		
%Residential: urban/suburban %Road; description (road type*		l°	
NO UP			
Photo number of primary plot: OISY 5 #3			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% Ag	% Devel-	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

	ACS Vernal Pool Data Sheet 2004
Date (dd month) 15 APR Unit (park or refuge name) Wa	Ilkill River NWR
Observers (full names) Ken Witkowski	
Point # 47 GPS (dd mm ss.ss) N 41° /6 0/, 10337 W 7	4°32 40.23460
Sky code* _ O Wind code* _ 5	
Previous day precipitation (≥1 cm)? XYES [] NO	
Land Cover (within 50m of start point, estimates should add to 90 %Forest (check appropriate type)	100%)
%Agriculture/meadow/pasture %Residential: urban/suburban	
%Road; description (road type* traffic at night*	
Notes (record incidental species observations on reverse):	

EXTENSIVE WETLAND
FORESTED WETLAND
1°

Photo number of	primary plot	DISK	4	#	6
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WITH ISOUNTED POOLS

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)		Pool max Width (m)	Length	10.00	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
47	A	4-7	4,0 16.028'	074°32.64		IM		6.14	9,9M	DH	10cm	110	0	90	10		300+	P	H	T	N	-	-
	B	4-8	41016'02.2	074'32'40.3"	3.5	SM	44F	6.26	5.14	624	BCH	150	0	90	10		41	P	H	T	N	-	-
			410/603.7"				44F	5.87	SM	BIM	DON	10/40	0	90	10		0	P	H	T	N	į	-
	0	5-1	419606.2"	074 32 37.6"	9.2	3	4SF	6.22	324	11.44	1/cM	110	0	90	10		1	P	H	T	A(o)	-	-
	É	5-2	41°16'05.0"	074°32'39.4°	70	3	470	5.78	14.74	21.74	17014	140	0	90	10		"	P	#	T	N	~	-
-																							

^{*=} see back for definitions and codes for table

Sky code*	full nar	GPS (dd mn Wind	Vitkowski n ss.ss) N 4/°	170	6.49	727	201.460-2-1-1-1	lkill Rive		-			*									
%Fore Har Sof %Agri %Resi	st (che dwood twood cultur dentia	eck approp d (>75% de l (<75% de e/meadow/ l: urban/su	eciduous) ciduous) pasture														1°		-			
LIBER	08		es observations of							ē		*,								4		
Plot	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m	Length	Pool max Depth (cm)	Veg (SAV	Dist to	% For.	% Ag	% Devel- oped	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSVI

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist to For. (m)		% Ag	 Charles and Carlotte	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
			-	+				-															
							T-HEEK		-					-									
-			-	 	-																		
					_			_		-	-						-						

^{*=} see back for definitions and codes for table

			nes) Ken W	Unit	(park o	r refuge	name)	Wall	kill Rive	er NWI	<u>R</u>													
Point #	60	2 0	PS (dd mm	ss.ss) N 4/	65	0, 283	PO	W 74	3/35,	41613														
Sky co					VEC	r 13	10																	
Previo	us day	pred	cipitation (1 cm)? []	YES	[][VO																	
Land (Cover	(with	in 50m of	start point, es	stimate	es sho	uld ad	d to 1	00%)										_					
%	Forest	(che	eck appropr	iate type)																				
	Hard	wood	d (>75% de	ciduous)													1							
	Softv	vood	(<75% dec	iduous)													İ							
			e/meadow/p																4-					
			l: urban/sub																1					
%	Road;	desc	cription (roa	id type*	traf	fic at r	night*											10	1					
			CONTRACTOR					1									- 1		1					
Note	s (reco	rd inc	idental specie	s observations of	on reve	rse):											×_		-					
0	×		221																					
Po	מוני	1 2	iece ie																					
+				MONATO	٠, ٠	~ —		1									-		+					
43	CRT	Y	MARSH	TIPOUND	145	NI											-		_					
Phot	o num	ber c	of primary r	olot:																				
		2000	7.1					J				-												
		-	1				0	T	T		1	r			-	1	1	т						1
					-	E +	emp		1	Pool max	Pool max	% An				4	10/2 Road/	Dietto	.be.		Dool	8		0
	-	ot	Latitude	Longtitude	E (m	t. fre	ter 1		Pool max	Length	Depth	Veg (SAV	Dist. to	or.	60	Deve d	right-of-	Road	d T)	d Mic*	Perman-	1,	SYL	MA
Plot	Poo	pho	(DDMMSS.SS)	(DDMMSS.SS)	Eb	Dis	Wa Co	pН	Width (m)	(m)	(cm)	/ emerg)	For. (m)	%	1%	1 %	way	(m)	Ros	Roa	ency*	Poo	# R.	* X
1	1																_					_		
			of primary p	Longtitude	EPE (m)	Dist. from	Water Temp (°C)	рН	Pool max Width (m)	Length	The state of the s	Veg (SAV		% For.	% Ag	% Devel- oped	% Road/ right-of- way	100000000000000000000000000000000000000	Road Type*	Road Traffic•	Pool Perman- ency*	Pool Type"	# RSYL Masses	# AMAC

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (r	Dist. f	Water (°C)	рН	Pool max Width (m)	Length (m)	Depth (cm)	Veg (SAV / emerg)	Dist. to For. (m)	% For	% Ag	% Dev	right-of- way	Road (m)	Road 7	Road	Perman- ency*	Pool T	# RSY Masses	# AM,
	-	-		1.	-		-	-	+		+	+			-	-		-	-		_			-
									1															
		-		-	-	-		-	-	-	+	+	-		-	-	-	-	-				_	_
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				<u> </u>	-			-			-	-												
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				1					1															

^{*=} see back for definitions and codes for table

Date (dd month) /5 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 61 GPS (dd mm ss.ss) N 4/° /6 0/.64380 W 74° 3/35.72760 Sky code* O Wind code* 5 Previous day precipitation (≥1 cm)? YES [] NO		
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) \$\delta 0 %Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type*	1°	
STREAM RUNS THROUGH TRANSECT NO UP		
Photo number of primary plot: 0/5/4 9 #5		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Devel- oped	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
				-																				
				-														-						

^{*=} see back for definitions and codes for table

Date (dd month) 20 APR Unit (park or refuge name) Wallkill River NWR	-	
Observers (full names) Ken Witkowski		
Point # 4 GPS (dd mm ss.ss) N 4/° // 26.75969 W 74° 34 50. 93°83		
Sky code* _ Wind code* _ /		
Previous day precipitation (≥1 cm)? [] YES NO		
Land Cover (within 50m of start point, estimates should add to 100%)		-
%Forest (check appropriate type) Hardwood (>75% deciduous)		
Softwood (<75% deciduous)		1
/60 %Agriculture/meadow/pasture		
%Residential: urban/suburban		
%Road; description (road type* traffic at night*)	1°	
	5.55	1
Notes (record incidental species observations on reverse):	×	
10		
NO VR		1
11000		
NO UP FLOSOPLAIN WETLAND (INCIDENTAL POOLS-2)	L	1
(INCIDENTAL POOLS-2)		
21		
Photo number of primary plot: DISKS #10		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
				 																			_

^{*=} see back for definitions and codes for table

Date (dd month) 20 APC Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # GPS (dd mm ss.ss) N 41011 10.54583 W 74034 51.03422 Sky code* Wind code* Previous day precipitation (>1 cm)? [] YES NO	19	
Land Cover (within 50m of start point, estimates should add to 100%) Softwood (>75% deciduous) Softwood (<75% deciduous) Softwood (<75% deciduous)		
%Residential: urban/suburban %Road; description (road type*traffic at night*) Notes (record incidental species observations on reverse):	1°	
PART AG. FIELD / PART EMERGENT WETLAND		
Photo number of primary plot: DISK 6# /		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses

^{*=} see back for definitions and codes for table

Date (dd month) → APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # // GPS (dd mm ss.ss) N 41° // 26,68099 W 74° 34 29.46676 Sky code* ○ Wind code* / Previous day precipitation (≥1 cm)? [] YES NO	an I	
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture %Residential: urban/suburban		
Notes (record incidental species observations on reverse): No UP	1°	
IN EVERY DIRECTION		
Photo number of primary plot: DSH 6 # 4		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longutude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC

^{*=} see back for definitions and codes for table

Date (dd month) APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point #/8 GPS (dd mm ss.ss) N 4/6/12 3/.45644 W 74°34 07. 5769 7 Sky code* Wind code* Previous day precipitation (\geq 1 cm)? [] YES [NO]	-	
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) //O %Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type*	, Io	
AG. FIELD		
Photo number of primary plot: DISK 5 # 6		

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pH.	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% Ag	Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
_																						
_																						
_					_																	

^{*=} see back for definitions and codes for table

Observers (full names) Ken Witkowski Point # _/9 GPS (dd mm ss.ss) N _ 4/°/2 /5.24265 W 74° 34 07.68338 Sky code*O Wind code* Previous day precipitation (≥1 cm)? [] YES NO	
Land Cover (within 50m of start point, estimates should add to 100%) %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) Z5%Agriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*)	8
Notes (record incidental species observations on reverse): FIELD/FOREST W/FLOOPPLAN WETLANDS	
Photo number of primary plot: <i>OISK</i> 5 #4	

Plot	Pool			Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp	pН	Pool max Width (m)	Length (m)	(cm)	Veg (SAV / emerg)	For. (m)	1 %	1 %	% Dev	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
	A	5.5	41'12,275'	074 34.150	6	5M	12	6.45	5.8	9	16cM	_/50	0	50	50				P	H	T	N	-	_
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																							_	

^{*=} see back for definitions and codes for table

			onduct surveys	if sky co	des are 6 or a	above.					
	le Sky Cond										
0	9	Clear or	few clouds (< 2	0% of sl	cy)						
1	1	artly cl	oudy or variable	20-509	% of sky)						
2			or overcast (> 5	0% of sk	y)						
3		og									
4		Mist	1. 1.		1						
5			or light rain								
6 7		Heavy ra									
8		Snow	11						2		
WIN	D CODE:	Do no	t conduct surve	vs if win	d codes are 6	or above					
			rs of Wind Spe		a codes are o	or above.					
COL			calm, smoke ris		ally						
		-3	light air moven								
			light breeze, wi			nistle					
			gentle breeze, l				e duet				
	4 1		moderate breez				s dust				
			fresh breeze, sn								
			strong breeze, l			9					
			strong winds	m Be ora	iones more						
			outong winds								
ROA	D TYPE:										24
	$\mathbf{P} = \mathbf{Paved}$	G = Gra	avel D = Dirt								
ROA	D TRAFF	IC (at	night):								
	N = Road us	ed only	by Park/Refuge	personn	el L = Lig	ght Traffic (< 1	0 cars) H	I = Heav	y Traffic (≥	10 cars)	
POO	L PERMA	NEN	CY:		· a						
	T = tempora	ry (drie	s annually) S :	= semipe	rmanent (son	netimes dries)	P = perma	anent (ne	ver dries) U	= unknown	duration
POO	L TYPE:										
N	Natural (e.g., ox	bow, vernal poo	(Ic							
В											
			n-Altered (pick	heet des	orintian halo).					
A			avel pit A(D)				A(T) imp	oundmer	t A(O) of	har	
			aver pit A(D)	Toadside	ditch A(F) tain pond	A(I) Imp	omininei	A(O) 00		
	U Unkno	own									
NCI	DENTAL	SPEC	IES OBSER	VATIO	ONS:						
1							Sperma-		Tadpoles/		
				Chorus	ID method	Auditory only		# Egg	Larvae		
Pool		Spec	ies	Code	Visual only,		(Y/N)	Masses		# Juveniles	# Adults
19A	AMERICA			1-5	AUDITORY		12.5.7		32	, cu. viiios	
19A	SPRING	rberk	<u> </u>	1-1	AUDITOR	-/					

CHORUS CODE:

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).

Full chorus, calls continuous and overlapping. Cannot distinguish individuals.

Date (dd month) 20 RPR Unit (park or refuge name) Wallkill River NWR		
Observers (full names) Ken Witkowski Point # ② GPS (dd mm ss.ss) N 4/°//59. 04886 W 74°3407. 78984 Sky code* ○ Wind code* / Previous day precipitation (≥1 cm)? [] YES NO	4	
Land Cover (within 50m of start point, estimates should add to 100%) **Porest (check appropriate type) **Hardwood (>75% deciduous) Softwood (<75% deciduous) %*Agriculture/meadow/pasture %*Residential: urban/suburban %*Road; description (road type* traffic at night*)		
Notes (record incidental species observations on reverse): NOUP UPLAND SUPE W/LUNNING WATEL THRY TRANSECT Photo number of primary plot: 0/SHS #9		

10	

2 8	For o	of the second se	Road (m)	Road Type	Pool Permanency*	Pool Typ	Masses Masses
							+
#				#			#
							-
_	+						

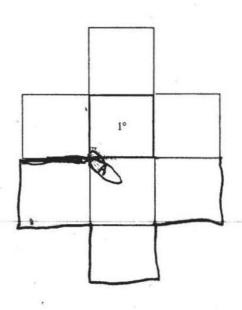
^{*=} see back for definitions and codes for table

Date (dd month)		
Land Cover (within 50m of start point, estimates should add to 100%) 25 %Forest (check appropriate type) Hardwood (>75% deciduous) Softwood (<75% deciduous) **Your Softwood	J.o.	
Notes (record incidental species observations on reverse): NO UP AG. FIELD W/ FORESTED EDGE		
Photo number of primary plot: DISK 6 # 8		

photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. fron Transect	Water Temp (°C)	pН	Pool max	Pool max Length (m)	Depth	Veg (SAV	Dist to For. (m)	% For.	% Ag	Dev	right-of-	Dist to Road (m)	Road Type	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
=																						
	phot	(DDMMSS.SS)	CDMMSS.SS) (DDMMSS.SS)	Entrade Longitude (DDMMSS.SS)	Eminute Longitude H 18 G L	Entrade (DDMMSS.SS) (DDMMSS.SS) (DDMMSS.SS) (DDMMSS.SS)	Distribute (DDMMSS.SS) (DDMMSS	Elandor (DDMMSS.SS) (DDMMSS.SS)	Eminute (DDMMSS.SS) (DDMMSS.SS	Eminute (DDMMSS.SS) (DDMMSS.SS	Elantide (DDMMSS.SS) (DDMMSS.S	Entrance (DDMMSS.SS) (DDMMSS.S	Entrance (DDMMSS.SS) (DDMMSS.SS) CDMMSS.SS)	Estimate (DDMMSS.SS) (DDMMSS.S	Entrance (DDMMSS.SS) (DDMMSS.S	Enaturate (DDMMSS.SS) (DDMMSS.	Estimate (DDMMSS.SS) (DDMMSS.S	Edition (DDMMSS.SS) (DDMMSS.SS) DH Width (m) (m) (cm) /emerg) For. (m) & & & & & & & & & & & & & & & & & & &	E (DDMMSS.SS) (DDMMSS.SS) (DDMMSS.SS) DH Width (m) (m) (cm) /emerg) For. (m) 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Latitude Longtinude (DDMMSS.SS) (DDMMSS.SS	Entraction Components (m) For	E (DDMMSS.SS) (DDMMSS.SS) DDMMSS.SS) DH Width (m) (m) (cm) /emerg) For. (m) 2 2 2 2 ency* O 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

^{*=} see back for definitions and codes for table

Date (dd mor	nth) 22 APR	Unit (park or refug	ge name) W	allkill River NWI
Observers (full names) Ken Witko	wski			
Point# A	GPS (dd mm ss.s	s) N 4/9	13 52.5	2520 W	74 34 07. 0443
Sky code*	Wind code	. 1			
	y precipitation (≥1 cr		YES (X)	NO	
Land Cover	(within 50m of start	point, es	timates she	ould add t	o 100%)
50 %Fores	t (check appropriate	type)			*
	dwood (>75% decidu			2	
	wood (<75% decidud				
	culture/meadow/pastu		1		
	lential: urban/suburba		-		
	; description (road ty		traffic at	night*)
	, (y		-		
Notes (rec	ord incidental species obs	ervations o	n reverse):		
	DC ECGS ALL HATE				
STILLSI	TTING IN ECG !	y asses	BUTS	A	
FEWNIN	OPEONERE FRE	F. Shim	INNE !		
10000	ordinar rid	- 0,000	,,,,,		
Photo nun	nber of primary plot:	DICZ	1#	5	
I note num	noer or primary pro-	ווסיטו	0 -		



Plot	Pool	photo	Latinude (DDMMSS.SS)	Post Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)		Pool max Width (m)	Length (m)	(cm)	Veg (SAV / emerg)	For. (m)	1 %	% Ag	% do	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
1	A	6-6			6.0	M	150	6.61	3.6	37,4	20cm	140	0	50	00			200	P	H	5	N	28	22
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-	-	-			-	-			-			-	_		-	-	-	+	-			\vdash	_	
-	+	-	-		1	-	-										7	1	\vdash					
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^{*=} see back for definitions and codes for table

Date (dd month) 22 PPR Unit (park or refuge name) Wall Observers (full names) Ken Witkowski Point # 39 GPS (dd mm ss.ss) N 41° 13.34764 W79 Sky code* 2 Wind code* Previous day precipitation (≥1 cm)? [] YES NO						
Land Cover (within 50m of start point, estimates should add to 200 %Forest (check appropriate type) X Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*	100%)			Io.		
Notes (record incidental species observations on reverse): SAME NABITAT AS ID40-EXTENSIVE FORESTED WET LAND IN ALL DIRECTIONS			x			
Photo number of primary plot: NO PROTO		to the second was designed as a second with the second as a second				
					·	

Plot	Pool	photo	Latitude (DDMMSS.SS)	· Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist to For. (m)	% For.	% Ag	>	% Road/ right-of- way	Dist to Road (m)	Road Type.	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
		•		-										(4)							-			
									-	-								1						
				-					-									-						

^{*=} see back for definitions and codes for table

Date (dd month) 22 APR Unit (park or refuge name) Wallkill River NWR			
Observers (full names) Ken Witkowski			
Point # 40 GPS (dd mm ss.ss) N 41° 14 57.13343 W 74° 33 02.18824			
Sky code* Wind code* Previous day precipitation (≥1 cm)? [] YES NO			
Land Cover (within 50m of start point, estimates should add to 100%)			
/00 %Forest (check appropriate type)			
Hardwood (>75% deciduous)		1	
Softwood (<75% deciduous)		1	
%Agriculture/meadow/pasture		1	
%Residential: urban/suburban %Road; description (road type* traffic at night*)	1	i !	
		10	
Notes (record incidental species observations on reverse):		.x	
NO UP - POINT LOC. IS SUICNTE! ELEV. SPOT - MOST OF TRANSECT IS PORRESTED		Î	
LAT WATER TO A PORT OF THE PART OF THE PAR			
		11	
WETLAND			
number of the over 7 H			

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Pool max Depth (cm)	% Aq. Veg (SAV / emerg)	Dist to For. (m)	% For.	% Ag	% Devel- oped	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
																		_					

^{*=} see back for definitions and codes for table

Date (dd month)		
Land Cover (within 50m of start point, estimates should add to 100%) **Moreon Property (check appropriate type) **X Hardwood (>75% deciduous) Softwood (<75% deciduous) 96 %Agriculture/meadow/pasture		
%Residential: urban/suburban %Road; description (road type* traffic at night*) Notes (record incidental species observations on reverse):	1°	
Photo number of primary plot: NOSH 6 #10		to the second se

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)		Veg (SAV	Dist to For. (m)	% For.	% Ag	Dev ed	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
								-															

^{*=} see back for definitions and codes for table

Date (dd month) 27 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 33 GPS (dd mm ss.ss) N 4/° 14 08 57573 W 74° 38 23 1802/ Sky code* / Wind code* Previous day precipitation (≥1 cm)? YES [] NO	
Land Cover (within 50m of start point, estimates should add to 100%) /00 %Forest (check appropriate type) X Hardwood (>75% deciduous) Softwood (<75% deciduous) %Agriculture/meadow/pasture %Residential: urban/suburban %Road; description (road type* traffic at night*)	I.o.
Notes (record incidental species observations on reverse): NO VP	× × × × × × × × × × × × × × × × × × ×
Photo number of primary plot: 0/5K 7#3	

Plot	Pool	photo	Latitude (DDMMSS SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	рН	Pool max Width (m)	Length	Veg (SAV	Dist. to For. (m)	% For.	% Ag	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
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								-														

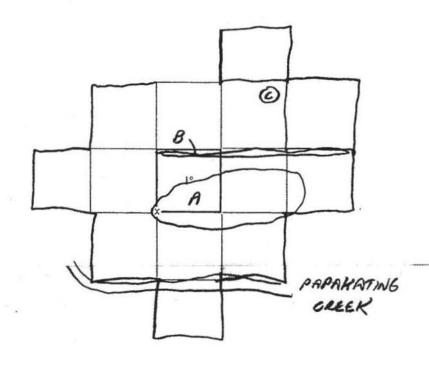
^{*=} see back for definitions and codes for table

Observ Point #	ers (fi 36 de*	ull nar	nes) Ken W iPS (dd mm Wind c	ss.ss) N 41	16 a	1.187	82																	
100 %I - %I	Forest Hard Softv Agrica Reside	wood wood ulture entia	eck appropri d (>75% de (<75% dec e/meadow/p l: urban/sub	ciduous) iduous) asture					00%)								-	1°			7.			+
		No	UP	s observations			in) 25			1.0							 	4						
Photo	o num	ber o	of primary p	olot: OSX			Temp		· 	L	L								• e			*		
Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect) ste	рН	Pool max Width (m)	Length	Pool max Depth (cm)	Veg (SAV	Dist to For. (m)	Sales .	% Ag	% Devel- oped	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Typ	# RSYL Masses	# AMAC Masses

Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m	Dist. fro Transec	Water T	pН	Pool max Width (m)	Length	Depth (cm)	Veg (SAV	Dist to For. (m)		% Ag	% Deve	right-of- way		Road Ty	Road Traffic*	Perman- ency*	Pool Ty	# RSYL Masses	# AMA Masses
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^{*=} see back for definitions and codes for table

Date (dd month) 28 NPK Unit (park or refuge name) Wallkill River NW Observers (full names) Ken Witkowski Point # GPS (dd mm ss.ss) N4/12/15.4788/ W 74/35/12.08 Sky code* Wind code*	
Previous day precipitation (≥1 cm)? [] YES NO	
Land Cover (within 50m of start point, estimates should add to 100%) **Morest (check appropriate type) **Mardwood (>75% deciduous) Softwood (<75% deciduous) **Magriculture/meadow/pasture %*Residential: urban/suburban %*Road; description (road type* traffic at night*)	
Notes (record incidental species observations on reverse): LARGE UP AT POINT	
Photo number of primary plot: PISH 2#7	



Plot	Pool	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Dist. from Transect	Water Temp (°C)	pН	Pool max Width (m)	Length	TO STATE OF THE PARTY OF THE PA	Veg (SAV	Dist to	1 14	% Ag	1 0	% Road/ right-of- way	Dist to Road (m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
1	A	9-1	41712.255	74° 35. 203	51	0	6.6	6.56	41.1	116,5	82CM	50/30	0	100				325	P	1	P	N	-	-
1	B	9-2	41012283	740 35.185	5.8	0	10.8	6.76	11.8	150	22 CN	20/50	0				1016	266	P	1	5	N	-	-
2	C	9:3	41012283	74 35/28	4.4	2/1	11.8	6.29	19.2	26.7	296H	180	0	50	50			325	P	6	5	N	-	7
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		_			-	-		-			-				-			-	-	-				_
																	-1512							-

^{*=} see back for definitions and codes for table

SKY	CODE:	Do not	conduct survey	s if sky co	des are 6 or above.					
Cod	le Sky Co	ondition								
0		Clear	or few clouds (<	20% of sl	cy)					
1		Partly	cloudy or variab	le (20-509	% of sky)					
2		Cloudy	y or overcast (> 5	50% of sk	y)					
3		Fog								
4		Mist								
5			rs or light rain							
6		Heavy	rain							
7		Sleet/H	lail							
8		Snow								
WIN	D CODI	E: Don	ot conduct surve	vs if win	d codes are 6 or above.					
Co	de mph		tors of Wind Sp		a codes me o or above.					
	0	< 1	calm, smoke ri		ally					
	1	2-3	light air mover							
		4-7			n face, leaves rustle					
	2	8-12			igs in constant motion, raise	o dust				
	4	13-18	moderate breeze			s dust				
	5	19-24	fresh breeze, si							
	6	25-31	strong breeze,							
	7+	> 31	strong winds	iaige biai	iches move					
			buong winds							
	D TYPE									
	P = Paved	G = G	ravel $\mathbf{D} = \text{Dirt}$							
ROA	D TRAF	TEIC (a	et night).							
NO.				e personn	el L = Light Traffic (< 1	0 cars) H	I = Heav	y Traffic (>	10 cars)	
n 00								•		
POO	L PERM					22				
	I = tempo	orary (dri	es annually) S	= semipe	rmanent (sometimes dries)	P = perm	anent (ne	ver dries) L	J = unknown o	duration
POO	L TYPE	:								
N	Natura	al (e g c	xbow, vernal po	(loc						
В		r-created		101)						
					W 100 120 120 120					
A			nan-Altered (pick			1000				
		2.00 to 50 t	ravel pit A(D)	roadside	ditch A(P) farm pond	A(I) imp	oundmer	it $A(O)$ of	her:	
	U Unk	cnown								
INCI	DENTA	L SPE	CIES OBSEI	RVATIO	ONS:					
						Sperma-		Tadpoles/	Г	
				Chorus	ID method (Auditory only		# Egg	Larvae	1	
Pool		Sp	ecies	Code	Visual only, Handled)	(Y/N)	Masses		# Juveniles	# Adults
10	COSENI	***						·		,

CHORUS CODE:

11

IC UNKNOWN

18

10

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).
3	Full chorus, calls continuous and overlapping. Cannot distinguish individuals.

///

Date (dd month) 28 APR Unit (park or refuge name) Wallkill River NWR Observers (full names) Ken Witkowski Point # 2 GPS (dd mm ss.ss) N 4/° /2 15.40/20 W74° 34 50,62044 Sky code* Wind code* 6 Previous day precipitation (≥1 cm)? [] YES NO	3	**	
Land Cover (within 50m of start point, estimates should add to 100%) /26 %Forest (check appropriate type) **Mardwood (>75% deciduous) Softwood (<75% deciduous) **Agriculture/meadow/pasture			
%Residential: urban/suburban %Road; description (road type* traffic at night*) Notes (record incidental species observations on reverse):		1°	
NOUP			+
Photo number of primary plot: OSK 2 # 6		FL.	

7	EPE (m)	Dist. fr Transe	Water (°C)	pН	Width (m)		Depth (cm)	Veg (SAV / emerg)	Dist to For (m)	% For.	% Ag	56	Dist to Road (m)	Road Type	Road	Pool Perman- ency*	Pool Type	# RSYL Masses	# AMA
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 lefinitions and co	lefinitions and codes for table																		

REPEAT VISIT DATA SHEET: ACS VERNAL POOLS 2004

1/8

Unit (Park or Refuge name): WALLKILL RIVER

Observers (full names): KEN WITKOWSK!

Point	Plot		photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	water temp (°C)	Prev. day precip?	Sky*	Wind*	pН	Pool max Width (m)	Pool max Length (m)	Pool max Depth (cm)	% Aq. Veg. (SAV / emerg)	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
28		11	5-7	41° 12,860	024 33.711	6.4	130	N	0			25	150	18CM	50 /30	5	N	,	/3
45	1	A	6-9	41.17.132	024.32.685	4.6	180	N	2	1	6.85	13	28	6ден	10 120	ρ	N	-	-
34		1-1	7-4	410 14.121	74° 33.165	6.7	110	P	1	1	6,34	2.7	20.1	130M		_	N	-	_
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^{*=} see back for definitions and codes for table

Notes: 20 APR - TO2811 - ALL WED O FRE GEGS HARCHEO OUT

22 APR - IOUSA - WATER OF EP + OARK - LOW UIS/BILITY

SKY (CODE: Don	ot conduct survey	s if sky cod	les are 6 or above.					
Code	Sky C	ondition							
1	Clear	r few clouds (< 20	0% of sky)						
2	Partly	cloudy or variable	(20-50% o	f sky)					
3	Cloudy	or overcast (> 50	% of sky)						
4	Fog								
5	Mist								
6	Showe	rs or light rain							
7	Heavy	rain							
8	Sleet/H	ail							
9	Snow								
WIND	CODE: Do	not conduct surv	evs if wind	codes are 6 or above.					
Code		Indicators of W							
0	< 1	calm, smoke rise							
1	2-3	light air moveme							
2	4-7	light breeze, wir							
3	8-12			in constant motion, raises du	ist				
4	13-18	moderate breeze							
5	19-24	fresh breeze, sm							
6	25-31	strong breeze, la							
7+	> 31	strong winds	age oranien						3
POOL	PERMANI	ENCY:							
T =	= temporary (dr	ies annually) $S =$	semiperma	anent (sometimes dries) P =	permaner	nt (never	dries) U = u	nknown dura	tion
POOL	TYPE:	**							
N		, oxbow, vernal p	ool)						
В	Beaver-creat		001)						
A(uman-Altered (pic			W.550227 18	72 153			
	The second secon	v/gravel pit A(D) roadside	ditch A(P) farm pond	A(I) impo	undment	A(O) other	er:	
U	Unknown								
INCID	DENTAL SP	ECIES OBSE	RVATIO	NS:					
T		,			Sperma-		Tadpoles/		
			Chorus	ID method (Auditory only		# Egg	Larvae		
Pool		Species					and the same of th	# Juveniles	# Adults
U	A(B) borrow Unknown DENTAL SP) roadside	ditch A(P) farm pond	Sperma-	# Egg	Tadpoles/	# Juveniles	# Adult

IN

Pool	Species	Chorus Code	ID method (Auditory only, Visual only, Handled)	Sperma- tophores (Y/N)	# Egg Masses	Tadpoles/ Larvae (Y/N)	# Juveniles	# Adults
211	LOCO FROG							
						16000	\	
,								
	7							

CHORUS CODE: Code Description

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).
3	Full chorus, calls continuous and overlapping. Cannot distinguish individuals.

REPEAT VISIT DATA SHEET: ACS-VERNAL POOLS 2004

3/9

Unit (Park or Refuge name): WAUKIU RIVER NUR

Observers (full names): KEN UITKOWSKI HEUN HOLCOMB

Date (dd month)	Point	Plot	Pool	photo	Lattude (DD MSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	water temp (°C)	Prev. day precip?	Sky*	Wind*	pН	Pool max Width (m)	Pool max Length (m)	Pool max Depth (cm)	% Aq. Veg. (SAV / emerg)	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
BAPR	47	1	1	7-5	4/0 16.03	074°32,690	6.6	140	Y	/	1	6.14	2.7	17	9cm	/20	5	N	1	-
MAPR	47	1	B	8-4	410 16.036	074 32.674	7.1	16c °	Y	1	1	6.26	6.6	7.2	18cm		5	N	-	_
26 APR	47	1	0	2-1	47 16. 066	074032.649	5.9	176	y	1	1	5.87	5.4	59.5			5	N	-	-
SAPR	47	2	0	2.2	410 16,092	074032.638	5,9	140	7	1	1	6.22	3,5	12.9		1	5	A(0)	-	_
HARR	47	2	E	8-3	71 /6.089	074 32,655	<u>37</u>	17°	4	1	1	5.78		9.5	8cm	140		N	1	
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= see back fo						3						_				/		1		

*= see back for definitions and codes for table

Notes:

2		Partly	cloudy or variable (20-50% o	f sky)					
3			or overcast (> 50%							
4		Fog		•						
5		Mist								
6		Showe	rs or light rain							
7		Heavy	rain							
8		Sleet/H	ail							
9		Snow								
WIN	D CO	DE: Do	not conduct surve	vs if wind	codes are 6 or above.					
Cod	le	mph	Indicators of Wi	ind Speed						
0		< 1	calm, smoke rises							
1		2-3	light air moveme							
2		4-7	light breeze, wind							
3		8-12			in constant motion, raises du	ist				
4		13-18	moderate breeze,	small bran	nches move					
5		19-24	fresh breeze, sma	Il trees be	gin to swav					
6		25-31	strong breeze, lar	ge branch	es move					
7+	+	> 31	strong winds							
		RMANI								
1	= temp	orary (dr	es annually) S =	semiperm	anent (sometimes dries) P =	permaner	nt (never	dries) $U = u$	nknown dura	ion *
POO	LTY	PE:								
N	Na	tural (e.g.	, oxbow, vernal po	ol)						
В		aver-creat		(0)						
A	() Ar	tificial/H	uman-Altered (pick	best desc	cription below):					
					ditch A(P) farm pond	A(I) impo	undment	A(O) othe	er:	
U		known						(-)		
					×					
INCI	DENT	TAL SP	ECIES OBSE	RVATIO	ONS:					
				T		Sperma-		Tadpoles/	T	
				Chorus	ID method (Auditory only,		# Egg	Larvae	1	
Pool			Species	Code	Visual only, Handled)	(Y/N)	Masses		# Juveniles	# Adults
470	an.	TOR		1-1	, want only, randows)	(1/1/)	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(2/14)	suromics	
.10	14.1	, JUNI	J	11						

SKY CODE: Do not conduct surveys if sky codes are 6 or above.

Clear or few clouds (< 20% of sky)

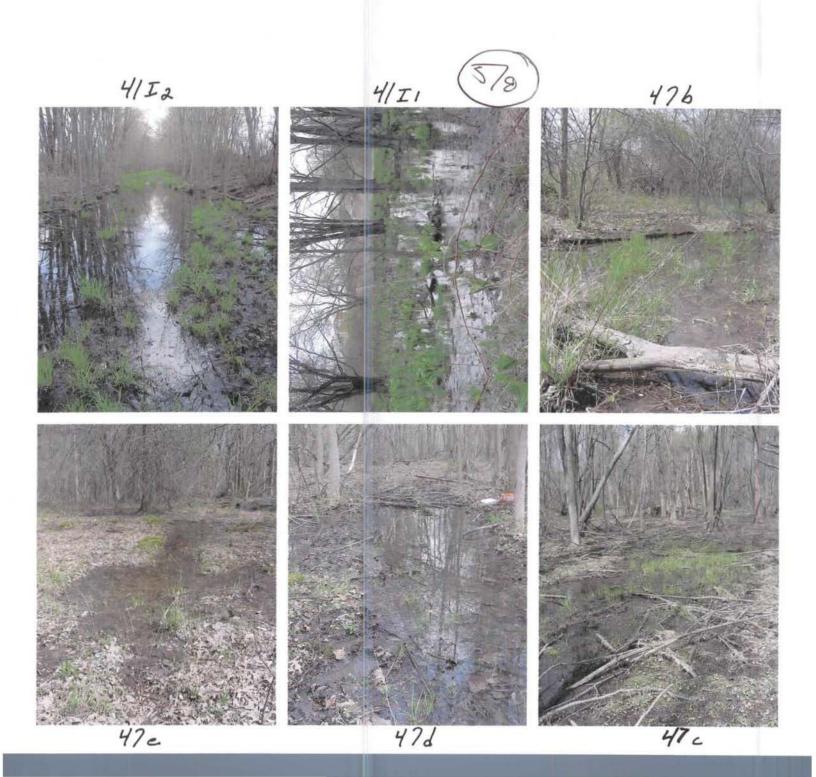
Sky Condition

Code

1

CHORUS CODE:

Code	Description
0	No amphibians calling.
1	Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen).
2	Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).
3	Full chorus, calls continuous and overlapping. Cannot distinguish individuals.







34 Il revisit

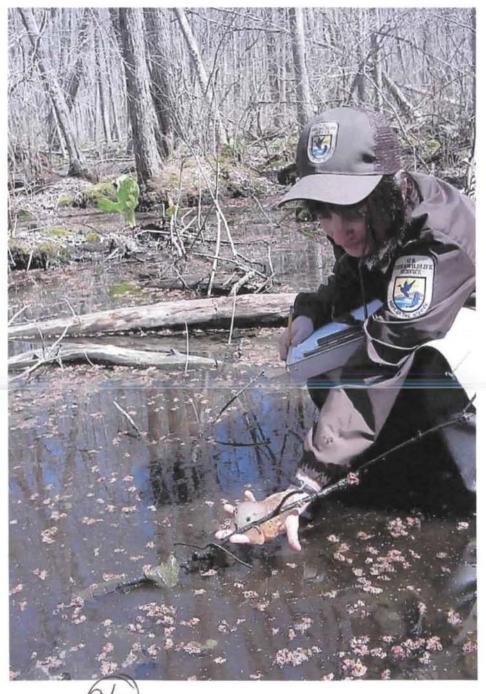
47 a revisit



45 A REVISIT



28 I-1 levs.+



Notes: Notes: Notes: * see back for definitions and codes for table Date (dd month) _____ Unit (park or refuge name) _ Observers (full names) Previous day precipitation? []YES []NO Pool max (SAV / For. Longtitude (DDMMSS.SS) Length (m) (cm) Notes: Notes: Notes: Notes: Notes: Notes:

Notes:

^{*} see back for definitions and codes for table

INCIDENTAL VERNAL POOL DATA SHEET 2004

_		.)	A00			211	د در	0	ive	2		Notes:				_	_	_				-			
Date (d	d month)	10	710 N Un	it (park or refuge name WITKONSK) NI	YUU	166	- K	1 0 601	_				-	-	-				_	_				
Observ	ers (full n	ames)	NOV.	MIKONSK			-							-	-	_	_								
Previo	is day pro	ecipit	ation? []YES	NO																					
Nearest	Incidental Pool # (I - n)	photo		Longtitude (DDMMSS.SS)	EPE (m)	Water Temp (°C)	рН	Sky*	Wind*	Pool max Width (m)	Pool max Length (m)(cm)	(SAV / emerg)	(m)	% For	% A8	% Devel- dped	% Road right-of way	(m)	Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC Masses
28	1-1	4-1	410,17.800.	074"33.711"	28	48	7.06	2	1	25H	150 M	14CM	60120	0	100				300H	P	H	2	N	56	1
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	sck for de	finitio	ns and codes for tab	le		Only on) THE														-		
	id month)			nit (park or refuge name	:)					_		Notes:			-								_		
			tation? []YES	[]NO												_		-						_	_
Nearest Point	Incidental Pool # (1-n)	photo	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Water Temp	рН	Sky*	Wind*	Pool max Width (m)	Pool max Length (n	Pool max Depth	% Aq. Veg (SAV / emerg)	Dist. to For. (m)	% For.	% Ag	% Devel- oped	% Road right-of way	Dist to Road (m)	Road Type*	Road Traffic* ;	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
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Notes:							_																		
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140(62	5																								

^{*} see back for definitions and codes for table

INCIDENTAL VERNAL POOL DATA SHEET 2004

				ere er			,,,	n	0			Notes:				_									
Date (d	d month)	20	APR Un	it (park or refuge name UITKOWSKI UNO) Wh	UKI	W/	SIVE	K	-										_					
Observ	ers (full a	names)	MENK	JITKOWSKI	-				-																
Previou	is day pi	recipi	tation? []YES	NO																					
	1	Т				4				Т	Г	Г	% Aq.					_			_	r			_
_	la la	4.,	72.		2	Water Temp				Pool max		Pool max	Veg	Dist. to			ㅎ	% Road	Dist to	Road Type	١.	Pool	28	٠. د	Q.
Nearest	ol #	96	A	Longtitude (DDMMSS.SS)	E (t	O ater	l	*	Wind*	Width	Pool max		(SAV /	For.	% For.	% A8	% Developed	right-of-		Dad T	Road Traffic*	Perman-	ool Type	SSY 1886	AM
ZÃ	HA C	100	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	国 6.6	3 8	pH	0	3	(m)	Length (m))(cm)	emerg)		_	%	% g	way	(m)	200	A.F	ency*	8	# RSYL Masses	7 ×
4	1-	10-4	41° 11. 504'	074" 35.0/3	3.0	1116	5.86			100M	JOM	40cm	60	0	100				2504	1	M	75	N		7/
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4	1-0	63	41 11.603'	074 35.110'	7.6	1/96	6.64	0		1334	SIM	TICH	70110	0	100	_			45M	r	H	5	N	-	
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* see ba	ack for de	efinitio	ons and codes for tab	le								and the second second													
Observ	ers (full	names)	tation? []YES	nit (park or refuge name	e)			_	_	-			-										_		_
ricvio	us uay p	recipi	tation: []125	[]110																					
		_				1.0	_			,	г —		1		_					U no	_				
Vearest	Incidental Pool # (1-n)	ohoto	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	EPE (m)	Water Temp	рН	Sky*	wind.	Pool max Width (m)	Pool max Length (m		% Aq. Veg (SAV / emerg)	Dist. to For. (m)	% For.	% A8	% Devel- oped	% Road/ right-of- way		Road Type*	Road Traffic*	Pool Perman- ency*	Pool Type*	# RSYL Masses	# AMAC
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Notac			1		_	_														-					_
Notes:																									

^{*} see back for definitions and codes for table

1	Clear	r few clouds (< 209	% of sky)								
2		oudy or variable (2		sky)							
3		or overcast (> 50%		,							
4	Fog		, ,		1						
5	Mist										
6	Shower	rs or light rain									
7	Heavy										
8	Sleet/H										
9	Snow										
WIN	D CODE: Do	not conduct surve	ve if wind	codes a	• 6 or above						
Cod		Indicators of Wi			o or above.						
0	< 1	calm, smoke rises									
1	2-3	light air movemen									
2	4-7	light breeze, wind			e rustle						
2 3 4	8-12				ant motion, raises du	ist					
4	13-18	moderate breeze,				i.S.c					
5	19-24	fresh breeze, sma									
6	25-31	strong breeze, lar									
7-		strong winds	Se oranem	o mo v							
DOA	D TYPE:										
	= Paved $G = 0$	Gravel D = Dirt						*			
•	14100 0	naver 15 Dat									
ROA	D TRAFFIC	(at night):									
			ersonnel	L = L	ight Traffic (< 10 ca	ers) H=H	Heavy Tr	affic (> 10 ca	ars)		
POO	L PERMANI	ENCY:									
T	= temporary (dr	ies annually) $S = s$	semiperma	ment (so	metimes dries) P =	permaner	t (never	dries) U = u	nknown durat	tion	
			10000			F					
POO	L TYPE:										
N	Natural (e.g.	, oxbow, vernal po	ol)								
В											
			. b d		alam A.						
A		uman-Altered (pick				A (T) immer		A(O) other	27		
		v/gravei pit A(D)	roadside	ditch	A(P) farm pond	A(I) impor	inament	A(O) otne	г:		_
U	Unknown										
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INCI	DENTAL SE	ECIES OBSER	VAIIC	145.		0		m 1 1 1			
			01	m .	171 11	Sperma-	""	Tadpoles/			
					hod (Auditory only,		# Egg	Larvae			
Pool		Species	Code	Visual	only, Handled)	(Y/N)	Masses	(Y/N)	# Juveniles	# Adults	
71-1	SPOTTEDT	URTLE									
			+								
			1								

Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen). Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen).

Full charus calls continuous and overlanning Cannot distinguish individuals

SKY CODE: Do not conduct surveys if sky codes are 6 or above.

Sky Condition

Code

CHORUS CODE:

Description

No amphibians calling.

Code

0

2

INCIDENTAL VERNAL POOL DATA SHEET 2004

(1)		
2/11		
(10)		
	RELLIGIOUS VES	

Data (2/	D00 11m	i+ (All	MI	1.0	IIIE	0		Notes:				_	<u>ث</u>							_	
Obsert	vers (full n	ames)	MEN WI	it (park or refuge name	Keu	IN H	bLC	OME	3	_				3150	-			4	-						
Previo	us day pr	ecipit	tation? NYES	[]NO														-		_	-		*****		
**********			-1	V.Carety								-		- 70			2500					N// cat			
						T 6	т	_					1	_	_	r		_	_		т—		1		
	=			a	-	Water Temp (%C)				Pool max		Pool max	% Aq. Veg	Dist. to			+	% Road	Dist to	Road Type		Pool	18		o
Nearest Point	iden n)	96			EPE (m)	ate (Wind*	Width	Pool max	Depth	(SAV /	For.	% For.	% Ag	% Devel- oped	right-of-	Road	T pe	Road Traffic*	Perman-	ool Type	# RSYL Masses	AMA SSCS
N O	P P			Longtitude (DDMMSS.SS)		38	pH	Sky.	3	-	Length (m		emerg)				% do	way	(m)	Ro	188	ency*	, a	Z Z	* 2
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41		8-6	147 14.688	074°32,906	17.0	160	6,31	12		7.6M	MOON	135	/70	0	70	30	0	9	SOM	ρ	1	5	A6	1 -	-
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* see b	ack for de	finitio	ns and codes for tab	le															5,1				University of the Control		
Obser	dd month) vers (full 1	names)		nit (park or refuge name	e)					-		Notes:													
Previo	ous day pi	recipii	tation? []YES	[]NO											-						*	^-	-		
		,	,		,		_	_	_						_								_		
Nearest	Incidental Pool # (1-n)	hoto	no.		EPE (m)	Water Temp			Wind*	Pool max Width	Pool max	Pool max Depth	(SAV/		% For.	% Ag	% Devel- oped	% Road	Dist to	Road Type*	Road Traffic*	Pool Perman-	ool Type*	# RSYL Masses	AMAC 38es
Z &	3	- de	Latitude (DDMMSS.SS)	Longtitude (DDMMSS.SS)	苗	138	pH	Sky	3	(m)	Length (m)(cm)	emerg)	(m)	%	%	% 6	way	(m)	8	% F	ency*	Š.	# 2	* 2
	I-	L	1	<u> </u>				_		1		<u></u>	1			1	_				L				
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ine steel Fish	1-					I	Γ	Γ		T.			1												

^{*} see back for definitions and codes for table

SKY	CODE: Do	not conduct surveys i	f sky cod	es are 6 or above	46)				
Code		Condition							
1		or few clouds (< 20%	of sky)						
2		cloudy or variable (20		sky)					
3		y or overcast (> 50%		sky)					
4	Fog	y or overeast (= 50%	OI SKY)						
5	Mist								
6		ara or light rain							2
7		ers or light rain							
	Heavy								
8	Sleet/I								
9	Snow								
WIN	D CODE: D	o not conduct survey	s if wind	codes are 6 or above.					
Cod		Indicators of Win							
0	< 1	calm, smoke rises							
1	2-3	light air movemen							
2	4-7	light breeze, wind							
3	8-12			in constant motion, raises du	et				
4	13-18				ist.				
5	19-24								
6	25-31								
7-		•	e oranche	s move					
/-	/ 31	strong winds							
ROA	D TYPE:								
P	= Paved G =	Gravel D = Dirt							
ROA	D TRAFFIC	C (at night):							
			ersonnel	L = Light Traffic (< 10 ca	rs) H = I	Heavy Tr	affic (≥ 10 ca	ars)	
200	* ******	The Car							
	L PERMAN								
T	= temporary (d	ries annually) $S = sc$	emiperma	anent (sometimes dries) P =	permaner	it (never	dries) $U = u$	nknown durat	ion
BOO	TWDE								
	L TYPE:								
N	Natural (e.	g., oxbow, vernal poo	d)						
B	Beaver-crea	ated							
A	() Artificial/F	Human-Altered (pick	hest desc	rintion below):					
				ditch A(P) farm pond	A(I) impo	undment	A(O) othe	· ·	
*1		wigiaver pit A(D)	Todaside	diten A(1) ham pond	ra(1) mipo	andment	14(0) 0010	·	
U	Unknown								
INCI	DENTAL SI	PECIES OBSER	VATIO	NC.	Φ.				
INCI	DENTALS	ECIES OBSER	VAIIC	7113.	Cnoma		Tadpoles/		
			01	ID 4 1 (4 1'4 1	Sperma-	# F			
		•	Chorus	, , , , , ,	tophores	# Egg	Larvae	# 7	# 4 4 10
Pool		Species	Code	Visual only, Handled)	(Y/N)	Masses	(Y/N)	# Juveniles	# Adults
4152	WOOD PROG			1			Y		
4111	M SPRING WINKNOW	PEEPER	2	3-2-3-3-3-3-4					
4.1-		1					V		
4129	MONHON	W							
1	II.		le d						

CHORUS CODE:

Code	Description
0	No amphibians c

- 0
- Individuals can be counted, calls not overlapping (record number of individuals after the code, separated by hyphen). Calls overlap, but individuals are distinguishable (record number of individuals after the code, separated by hyphen). Full characteristic calls continuous and overlapping. Cannot distinguish individuals 2