SECTION 5g - EXAMPLE - Impact Site

IMPACT SITE EXAMPLE

The following stepwise example uses the same formula described in Section 5. The narrative descriptions for existing conditions are brief. For an actual project, sufficient information should be provided to thoroughly assess the functions of the wetlands that will be affected by the project. For this example, the proximity factor (Px) is not included in the calculations.

Existing Conditions at the project site (refer to the "without project" illustration at the end of this section):

The project site (20 acres) is a mixture of longleaf pine/wire grass upland community and two isolated wetland systems (Wetland Polygon 1 is 3 acres and Wetland Polygon 2 is 10 acres). Neither wetland is severely degraded. Wetland 1 is a herbaceous marsh and Wetland 2 is a cypress dome, intermixed with black gum.

The site is bounded on three sides by undeveloped property; the remaining side is single-family residential. With reference to the undeveloped land, one-third is in improved pasture, and two-thirds is a designated wildlife management area.

Project Plans (refer to the "with project" illustration at the end of this section):

The applicant proposes to construct a retail store with attendant facilities, such as parking, a stormwater retention pond and warehouse. The applicant proposes to fill the herbaceous marsh for a warehouse and three of the 10 acres of the cypress dome for the retail store. The remaining seven acres of the cypress dome will be preserved. Most of the surrounding upland habitat will be converted into parking. The stormwater pond will be excavated from uplands.

Step 1

The applicant should delineate the wetland polygons on an aerial photograph/map and determine the acreage for each wetland. Polygons of similar habitats and condition could be grouped together in order to compute WRAP more quickly. In this example, the two wetlands are dissimilar; therefore, WRAP will be done for both wetlands.

Step 2

Once the wetlands have been delineated, the next step is to verify and describe the wetlands. This step may be combined with the WRAP analysis.

Step 3

Before performing WRAP, however, the weighting factors should be calculated for each variable for each wetland polygon or group of polygons. For this example, the WRAP variables were

determined to be of equal weight; therefore, the assigned and minimum weights are the same (refer to Section 5b).

Step 4

Run WRAP. For each wetland polygon or group of polygons, run the assessment for "without" and "with" project. It will be necessary when assessing the "with" project scenario to delineate additional polygons because of project impacts. For this example, the "without" project has two wetland polygons, and the "with" project has three polygons.

WRAP score for Polygon 1

1) Wildlife Utilization

Without Project: There is optimal representation of species guilds, with evidence of large mammals. There is negligible evidence of human disturbance. The surrounding upland habitat was logged historically, but there has been successful natural longleaf pine regeneration. The score is 3.

With Project: The wetland will be filled for the warehouse. The score is 0.

2) Wetland Overstory/Shrub Canopy of Desirable Species.

The wetland is herbaceous; therefore, the variable is not applicable (NA).

3) Wetland Vegetative Ground Cover of Desirable Species.

Without Project: The wetland has minimal human disturbance and less than 10 percent nuisance/inappropriate plant species. The score is 3.

With Project: The wetland will be filled. The score is 0.

4) Adjacent Upland Buffer

Without Project: The upland habitat is in native longleaf pine/wiregrass. The site has been timbered in the past, but longleaf pine has naturally regenerated. This wetland, however, does not have a 300-foot-wide buffer surrounding it. A third of the buffer is about 50 feet wide on the west side and is adjacent to the residential community. The remaining uplands are longleaf pine/wiregrass. The score is 2.64 (66% scores 3 and 33% scores 2; therefore, .66 x 3= 1.98; .33 x 2=.66; 1.98+.66=2.64)

With Project: The wetland will be filled; therefore, the upland buffer is inconsequential. The score is 0.

5) Field Indicators of Wetland Hydrology

Without Project: The isolated wetland has not been drained. There is no ground water influence, hydrology is a result of unimpeded surficial water. The score is 3.

With Project: The entire wetland will be filled. The score is 0.

6) Water Quality Input and Treatment

Without Project: Under Land Use Category: The surrounding habitat is natural longleaf pine/wiregrass system. The score is 3.

Under Pre-Treatment Category: The descriptor of "natural undeveloped area fits a score of 3. The final score is 3+3/2=3.

With Project: The site will be filled, therefore, the score is 0.

WRAP Score for Polygon 2

Note: As a result of the fill, it was necessary to split polygon 2 into two polygons, 2a which will be preserved and 2b which will be filled. However, the original polygon 2 should be evaluated in total for "without" project. The new polygon delineations are only used for "with" project evaluation. Even though polygon 2a will not be directly impacted by placement of fill, there will be indirect and secondary impacts associated with the fill in polygon 2b. These impacts will be expressed in the WRAP analysis, and will require mitigation.

1) Wildlife Utilization Matrix

Without Project: The cypress dome, other than being timbered in the past, probably in the late 40's, is in very good shape. There is evidence of deer use inside the wetland, and several raptor nests were observed in the taller cypress trees. The score is 3.

With Project: While the applicant will preserve the seven acres (polygon 2a), the score of this wetland decreases because of the adjacent impacts. A score of 1.5 based on the associated human disturbance. Polygon 2b will be filled; therefore, the score is 0.

2) Wetland Overstory/Shrub Canopy of Desirable Species

Without Project: The wetland has not been drained or otherwise disturbed. The cypress had been timbered from the wetland, but as a result of natural regeneration, the cypress have returned. There is good mid-canopy structure.

The score is 3.

With Project: Polygon 2a will be preserved, and should remain in its present condition. While the size of the polygon is less, the vegetative structure should not be affected by the project. A score of 3 is assigned. Polygon 2b will be filled; therefore, the score is 0.

3) Wetland Vegetation Ground Cover of Desirable Species

Without Project: Polygon 2 will remain unaltered, a score of 3 is assigned.

With Project: We anticipate a similar response as described in the overstory variable. A score of 3 is assigned to polygon 2a. Polygon 2b will be filled; therefore, the score assigned is 0.

4) Adjacent Upland/Wetland Buffer

Without Project: There is a 300-foot buffer of longleaf pine/wiregrass plant community. A score of 3 is assigned.

With Project: The buffer adjacent to polygon 2a will be severely altered as a result of the project. Three-quarters of the wetland is surrounded by an adjacent upland buffer, greater than 30 feet but less than 300 feet. However, the west side has no buffer. Therefore, the score is 1.5. Polygon 2b is filled; therefore, the score is 0.

5) Field Indicators of Wetland Hydrology

Without Project: The wetland has not been affected by drainage or other work that would affect the hydroperiod. A score of 3 is assigned.

With Project: The applicant is not proposing to use polygon 2a as part of the stormwater management system; however, surficial flow from the uplands will be affected as a result of the project. We anticipate a shortened hydroperiod. A score of 2 is assigned. Polygon 2b will be filled; therefore, the score is 0.

6) Water Quality Input and Treatment

Without Project: Under Land Use Category, the uplands surrounding this wetland are open space/natural undeveloped areas, a score of 3 is assigned. Under Pre-Treatment, natural undeveloped area scores a 3; therefore, the final score is 3+3/2=3.

With Project: Under Land Use Category, moderate intensity commercial is

appropriate; therefore a score of 1.5 is assigned. Under Pre-Treatment, berms which prevent run-off from entering the wetland scores a 2.5. The final score is 1.5+2.5/2=2 for polygon 2a. Since polygon 2b will be filled, this variable score drops to 0.

Document the WRAP scores and the basis for the scores for "without" and "with" project.

OLYGON NUMBER	WU			VO			VG			AB			HY			WQ		
	W	w/o	D	w	w/o	D	W	w/o	D	w	w/o	D	w	w/o	D	w	w/o	D
P1	0.00	3.00	-1.00	na	na	0.000	0.00	3.00	-1.00	0.00	2.64	-0.88	0.00	3.00	-1.00	0.00	3.00	-1.00
P2a	1.50	3.00	-0.50	3.00	3.00	0.000	3.00	3.00	0.000	1.50	3.00	-0.50	2.00	3.00	-0.333	2.00	3.00	-0.33
P2b	0.00	3.00	-1.00	0.00	3.00	-1.00	0.00	3.00	-1.00	0.00	3.00	-1.00	0.00	3.00	-1.00	0.00	3.00	-1.00
			0.000			0.000			0.000			0.000			0.000			0.000
			0.000			0.000			0.000			0.000			0.000			0.000
			0.000			0.000			0.000			0.000			0.000			0.000
			0.000			0.000			0.000			0.000			0.000			0.000
			0.000			0.000			0.000			0.000			0.000			0.000
			0.000			0.000			0.000			0.000			0.000			0.000

WU = Wildlife Utilization
VO = Vegetation-Overstory
VG = Vegetation-Ground Cover
AB = Adjacent Upland/Wetland Buffer
HY = Hydrology
WQ = Water Quality
D = Raw Delta

Step 5

Calculate the Raw and Adjusted (Adj) Delta for each variable for each polygon(s).

POLYGON NO. P1
POLYGON ACREAGE 3 **FUNCTIONAL UNITS LOST** -2.93

WRAP VARIABLE	RAW DELTA	WT. FACTOR	ADJ. DELTA
WU	-1.000	0.200	-0.200
VO	na	na	0.000
VG	-1.000	0.200	-0.200
AB	-0.880	0.200	-0.176
HY	-1.000	0.200	-0.200
WQ	-1.000	0.200	-0.200
SUM			-0.976

* The Raw Delta is calculated by dividing "without" and "with" project scores individually by 3, (yielding a percentage),and then subtracting the "without" percentage from "with" percentage. For example, for WU, the "with " score is 0/3.0=0, the "without" score is 3/3=1, thus 0-1=-1 for the Raw Delta. Multiply the Calculated Raw Delta by the weighting factor, if appropriate, to yield the Adj. Delta. Remember, no weighting (equal weighting) was used for the impact site, so 1.0/5 (variables) equals .2. If all six WRAP variables were used, the weighting factor for each would be 1.0/6=.167. Alternatively, use the straight WRAP sum and average scoring methodology (when no weighting is involved) as described in WRAP section 2.2.

** Multiply the sum of Adj. Deltas by the acreage of the polygon(s) to yield functional units lost as a result of the project (debits). In this example, for polygon 1, the functional units lost equal -2.93.

POLYGON NO. P2a
POLYGON ACREAGE 7 **FUNCTIONAL UNITS LOST** -1.93

WRAP VARIABLE	RAW DELTA	WT. FACTOR	ADJ. DELTA
WU	-0.500	0.166	-0.083
VO	0.000	0.166	0.000
VG	0.000	0.166	0.000
AB	-0.500	0.166	-0.083
HY	-0.330	0.166	-0.055
WQ	-0.330	0.166	-0.055
SUM			-0.276

POLYGON NO. P2b
POLYGON ACREAGE 3 **FUNCTIONAL UNITS LOST** -2.99

WRAP VARIABLE	RAW DELTA	WT. FACTOR	ADJ. DELTA
WU	-1.000	0.166	-0.166
VO	-1.000	0.166	-0.166
VG	-1.000	0.166	-0.166
AB	-1.000	0.166	-0.166
HY	-1.000	0.166	-0.166
WQ	-1.000	0.166	-0.166
SUM			-0.996

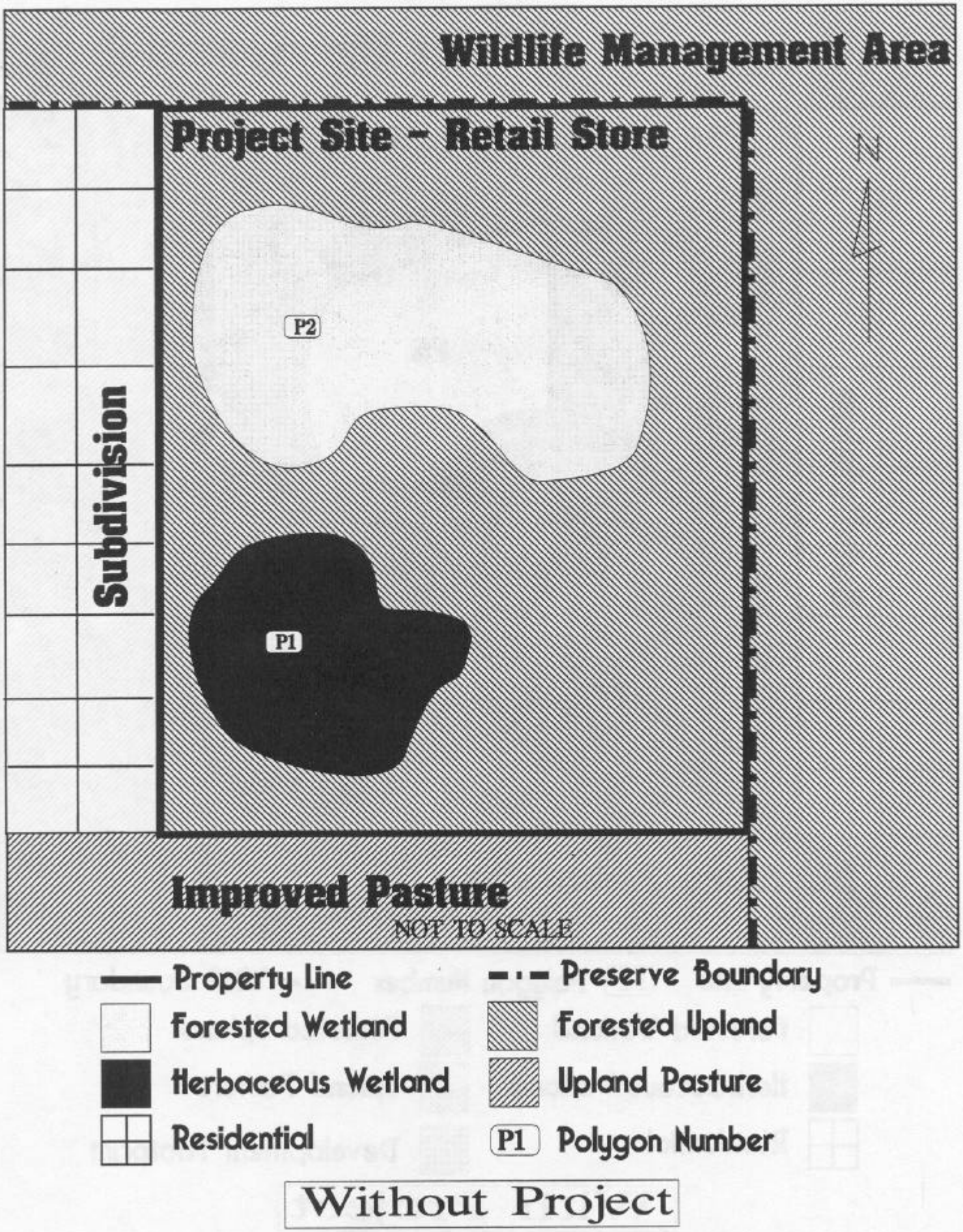
For this example, the summation of the all the polygon functional units that will require mitigation equals -7.85 (-2.93 herbaceous and -4.92 forested).

NOTE:

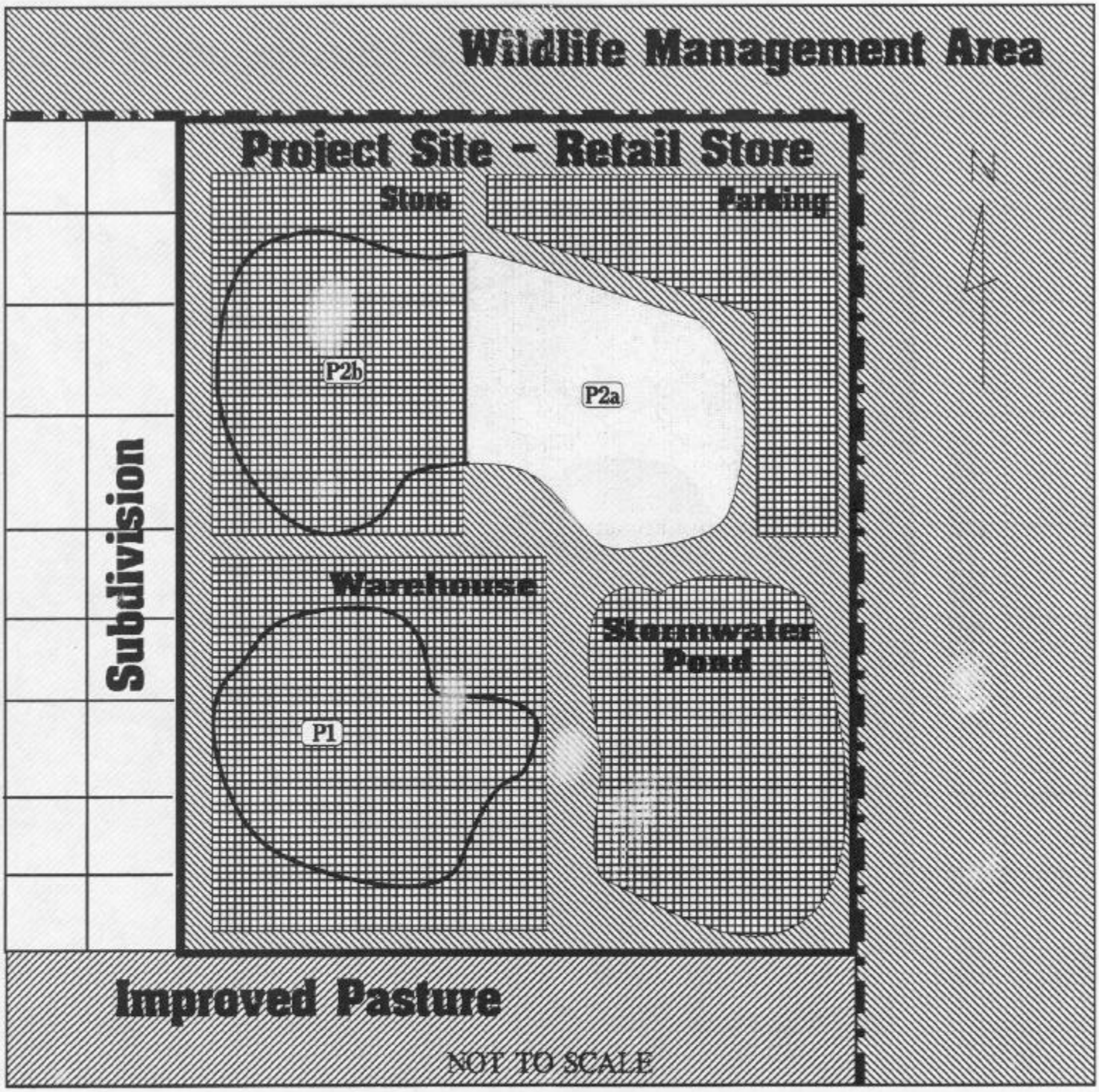
For this example, to mitigate for the wetland loss (-7.85 functional units), it will be necessary to purchase an equal number of functional units by habitat type plus additional functional units based on a calculated proximity factor, if necessary, from an approved mitigation bank. The exchange would be expressed as:

$$(\Delta\text{lift})(\text{acres})(T^*) = \text{credits} \Leftrightarrow \text{debits} = (\Delta\text{loss})(\text{acres})(Px^{**})$$

* Temporal factor, if necessary
** Proximity factor, if necessary



Without Project



Property Line P1 Polygon Number WMA Boundary

Forested Wetland
Herbaceous Wetland
Residential
Forested Upland
Upland Pasture
Development Footprint

With Project