

FIG. 3

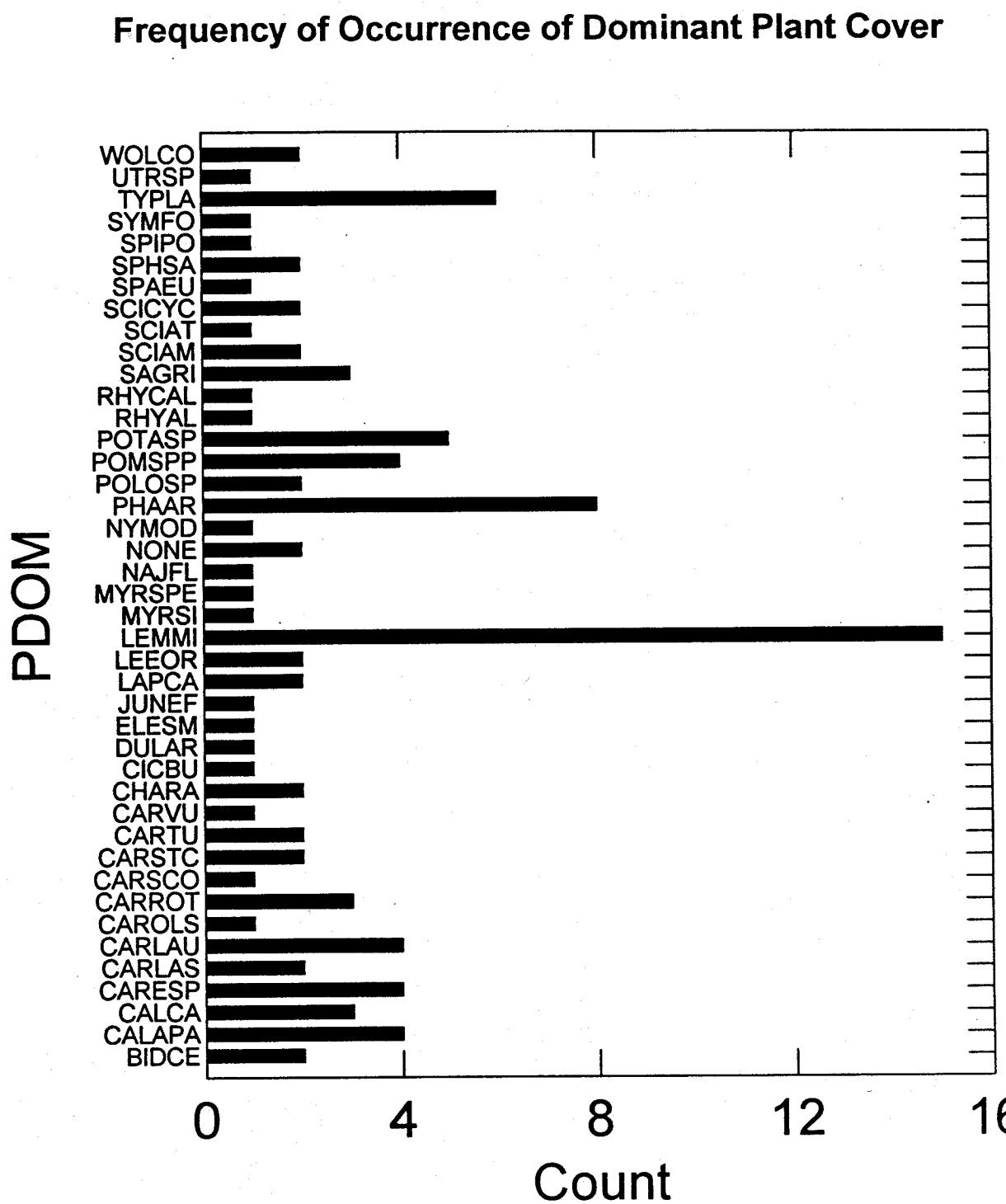


FIG. 4

Frequency of Occurrence of 2nd dominant plant cover

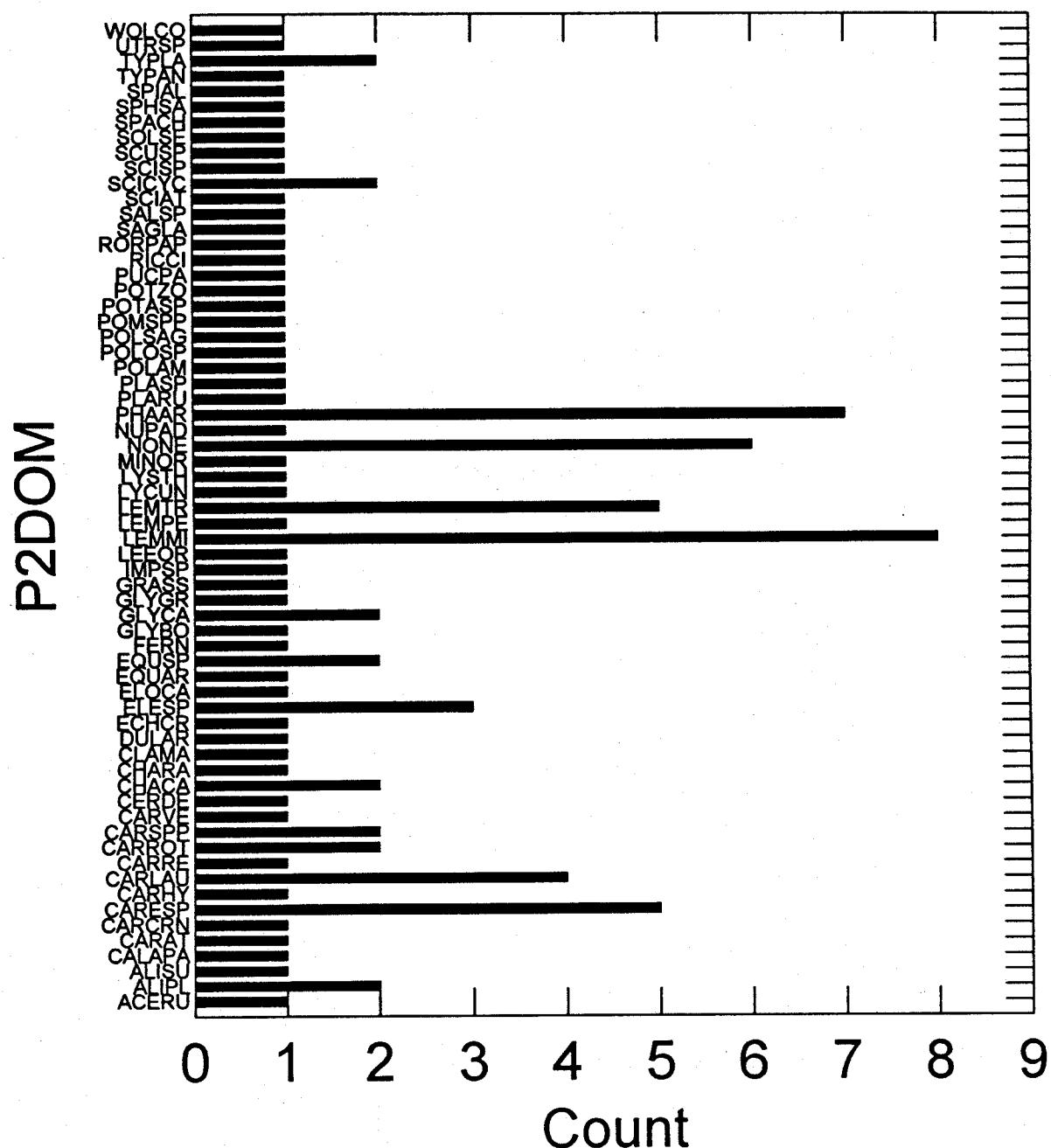


FIG. 5

Frequency of Occurrence of 3rd major dominant plant cover

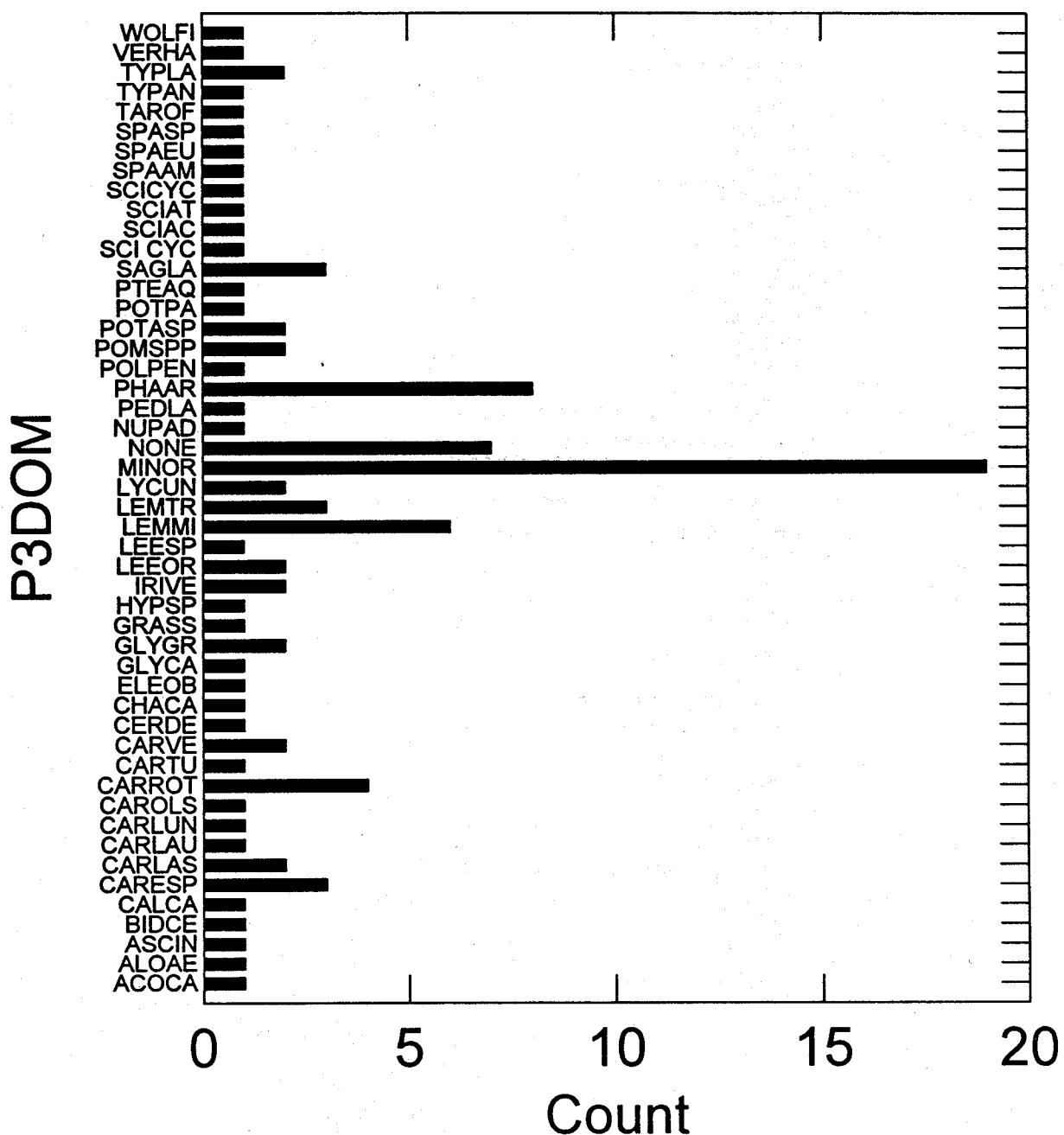
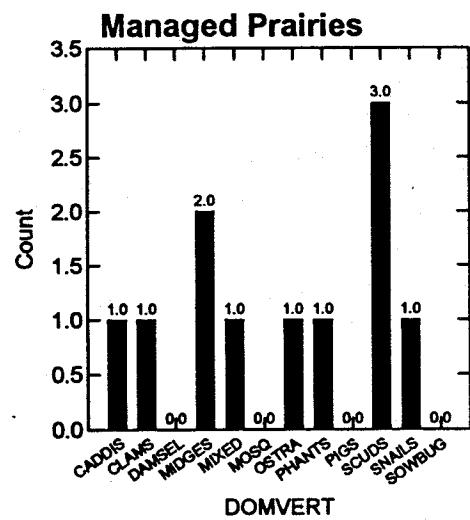
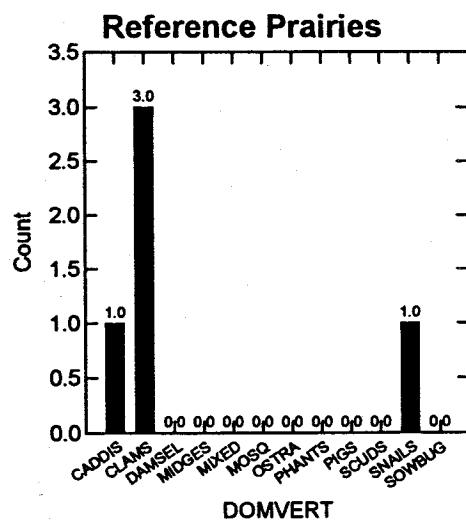


FIG. 6

M



P



Q

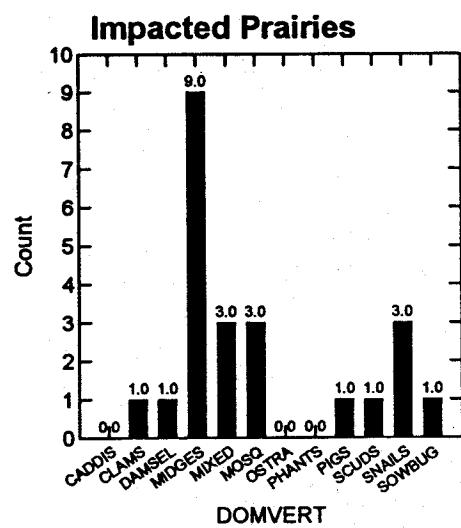


Figure ___. Frequency of occurrence of macroinvertebrate dominance within prairie type wetlands (April 1998 data)

FIG. 7

Figure ___. Frequency of occurrence of macroinvertebrate dominance within kettles (April 1998 data)

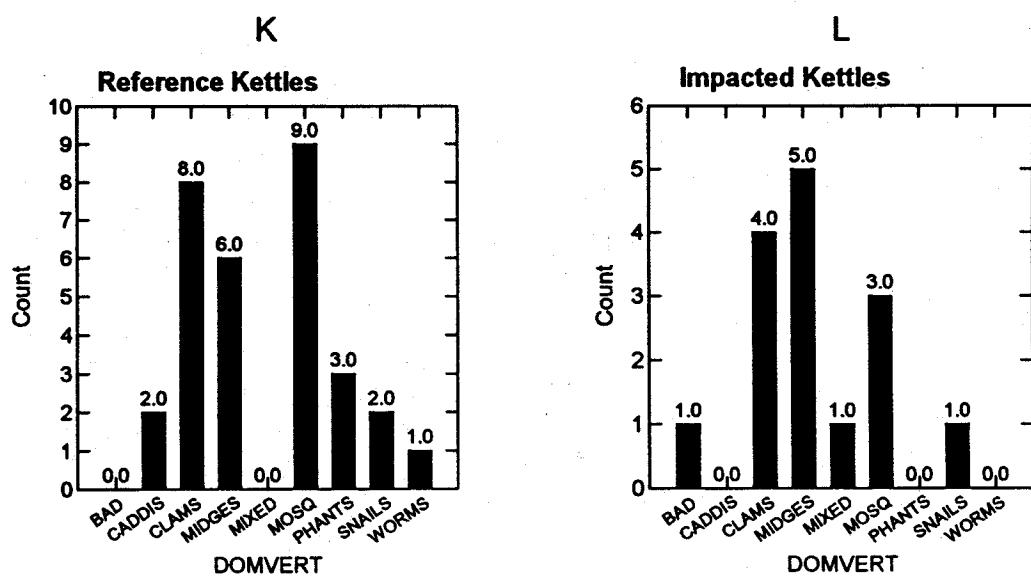


FIG. 8

Figure ___. Frequency of occurrence of dominant macroinvertebrates in bogs and 'other' wetland classes.

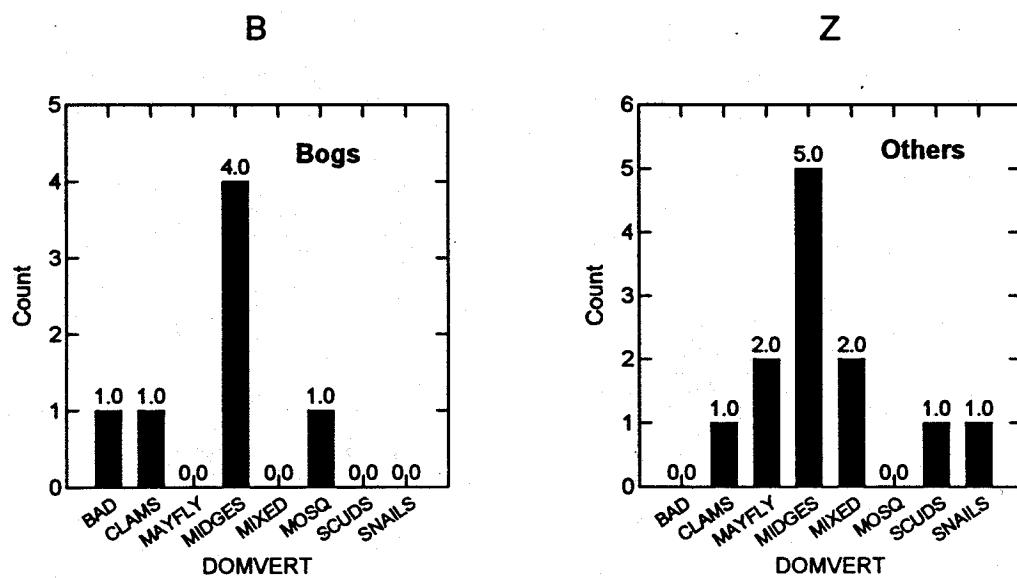


FIG. 9

Figure ___. Frequency of occurrence of dominant macroinvertebrates by wetland history classification (mixed prairies and kettles).

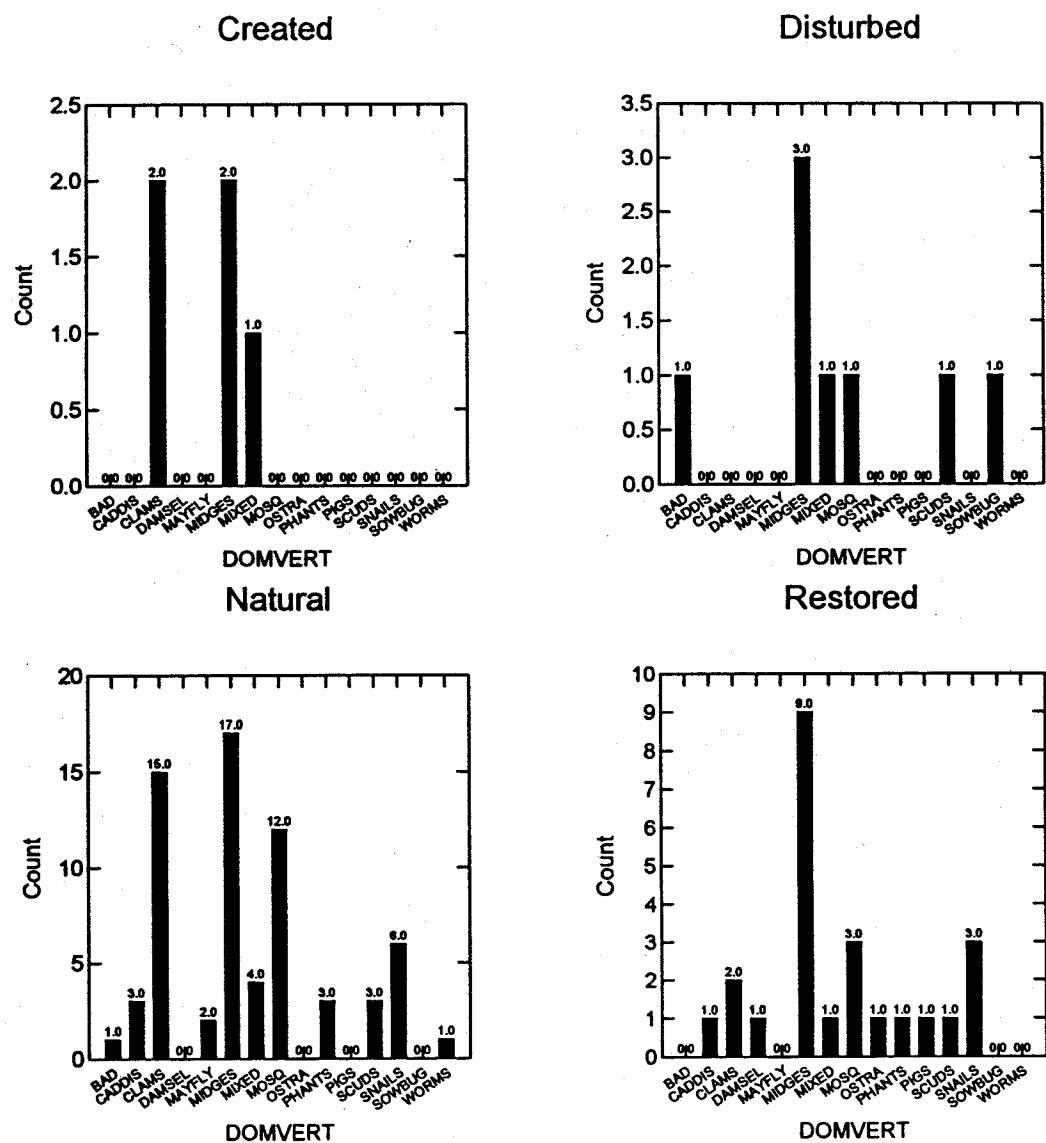


FIG. 10

Figure _____. Influence of water duration on frequency of occurrence of dominant macroinvertebrates (Prairie and kettle wetlands combined).

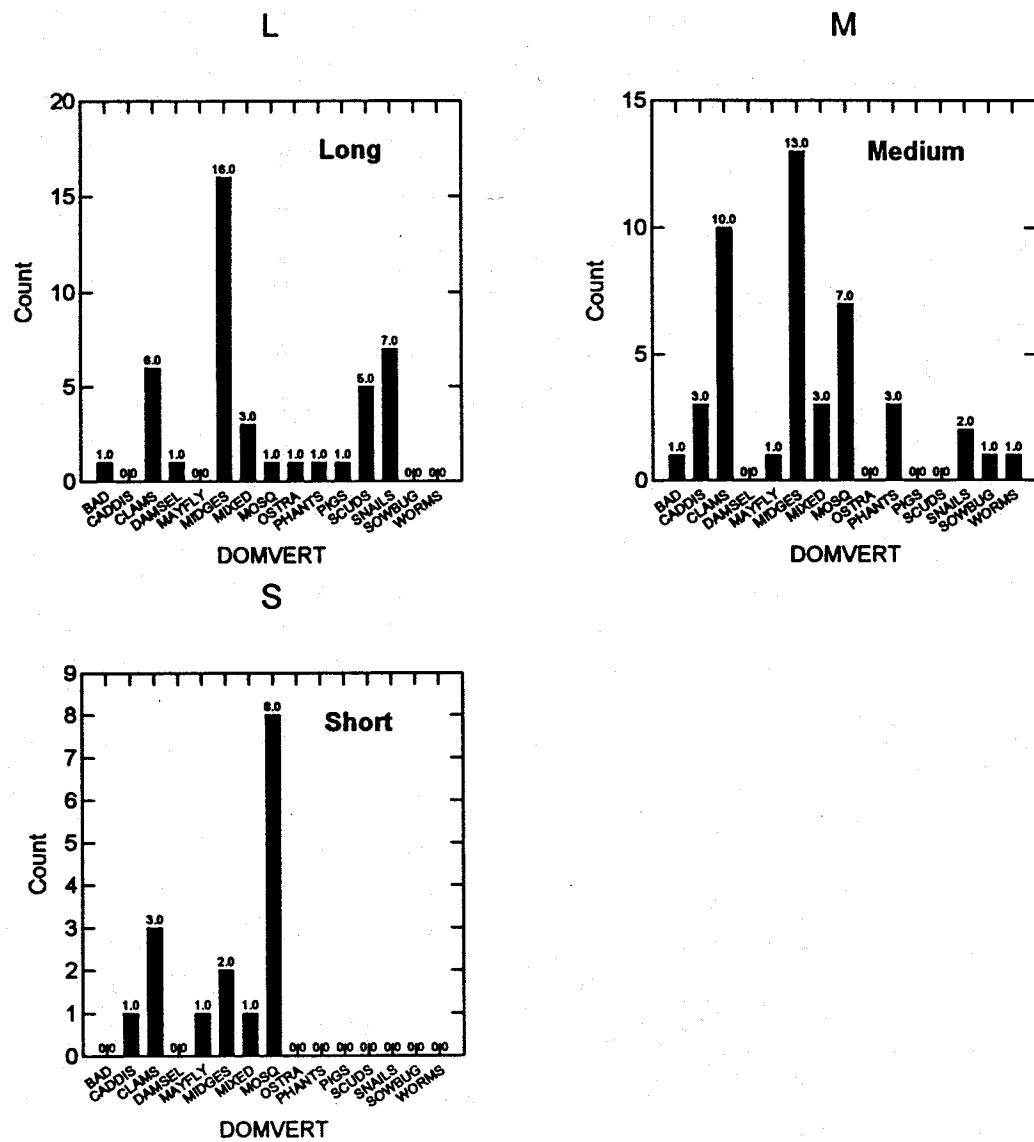


FIG. 11

Figure _____. Frequency of occurrence of dominant macroinvertebrates by ecoregion - combined prairie and kettle wetlands.

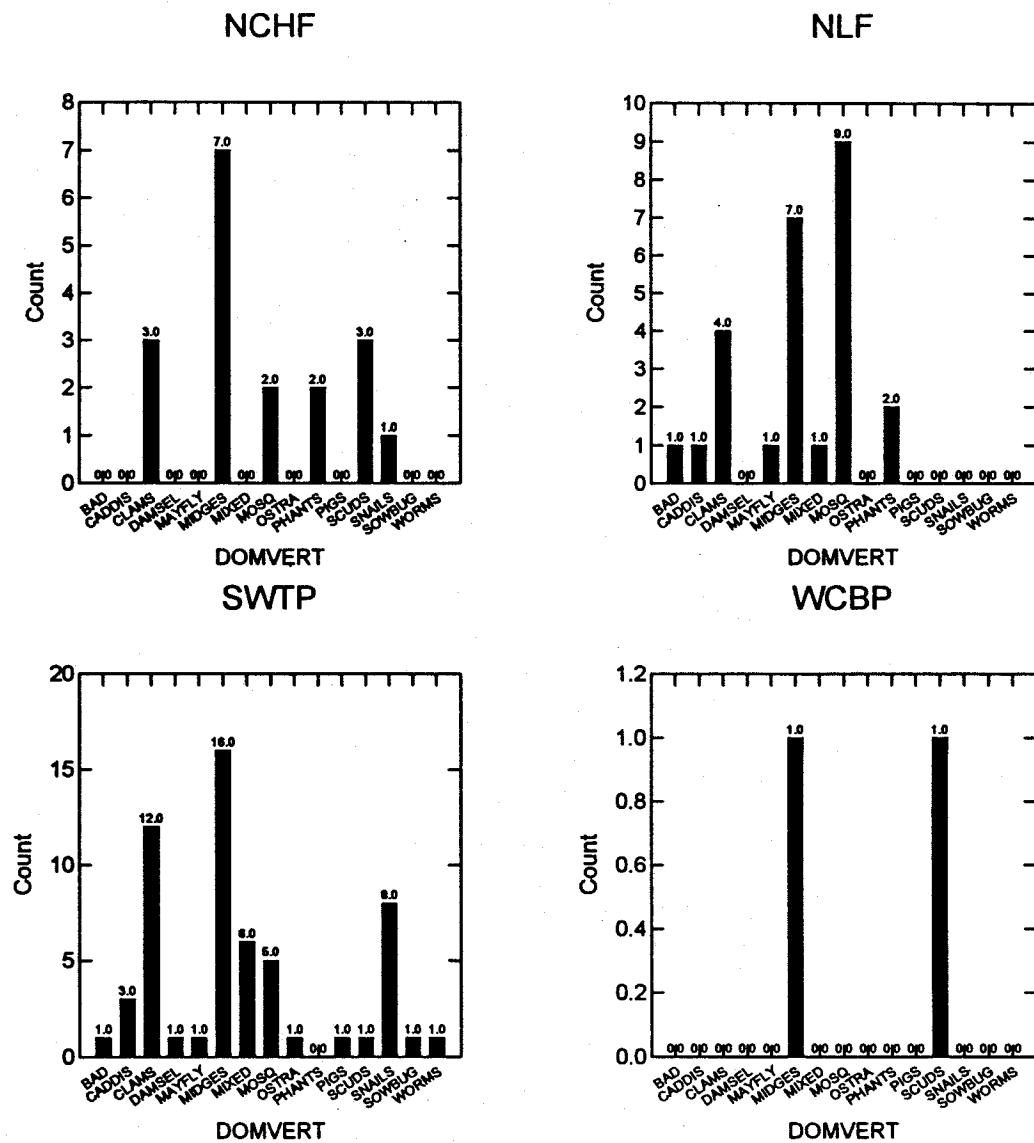


FIG. 12

Wisconsin Wetland Biotic Index by Reference type.

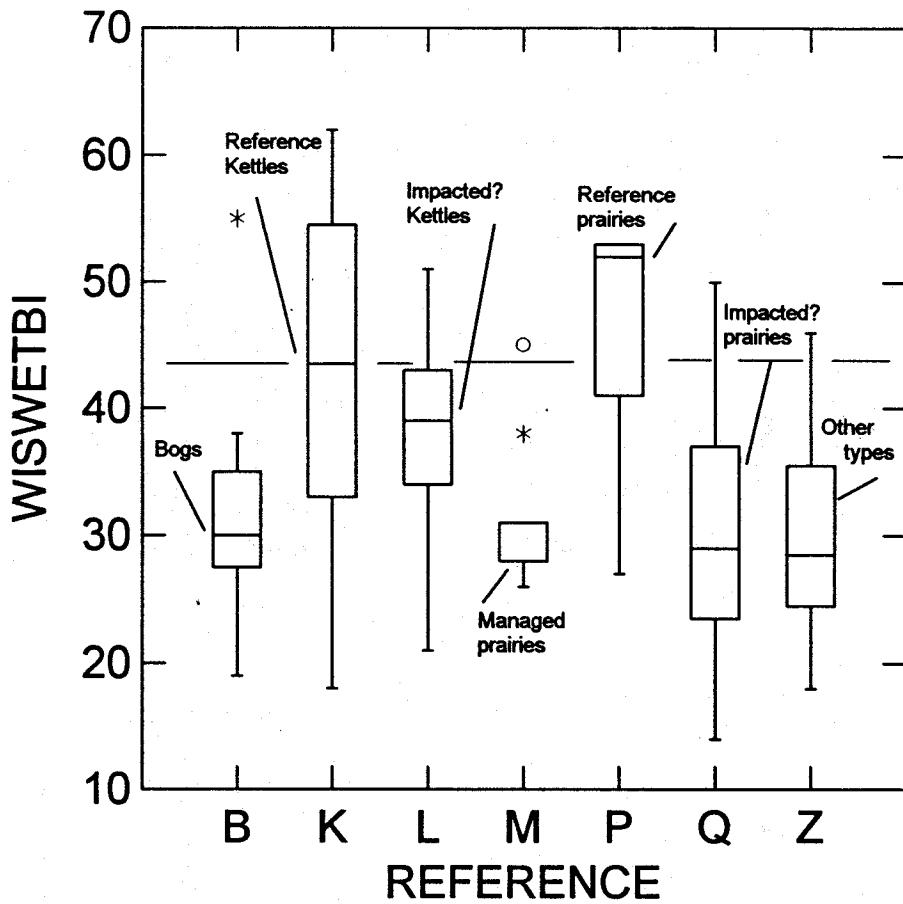


FIG. 13

Wisconsin Wetland Biotic Index by Reference Type –
Data restricted to medium and short duration wetlands only.

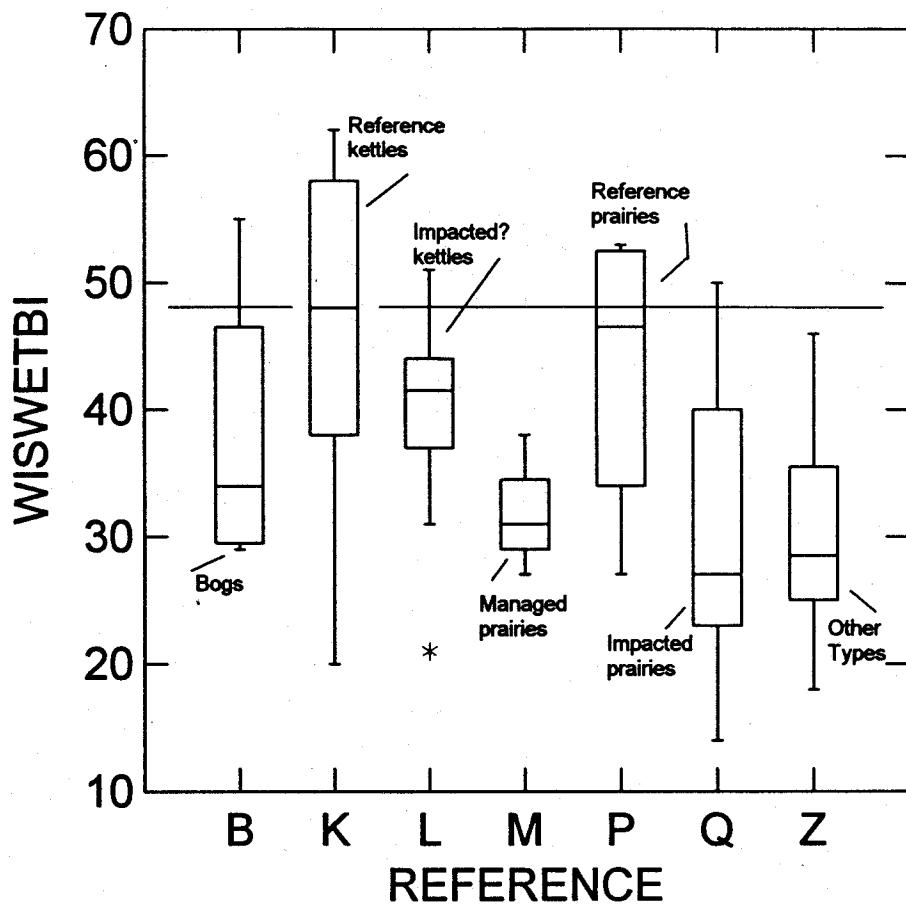


FIG. 14

Influence of water duration on WBI within wetland types

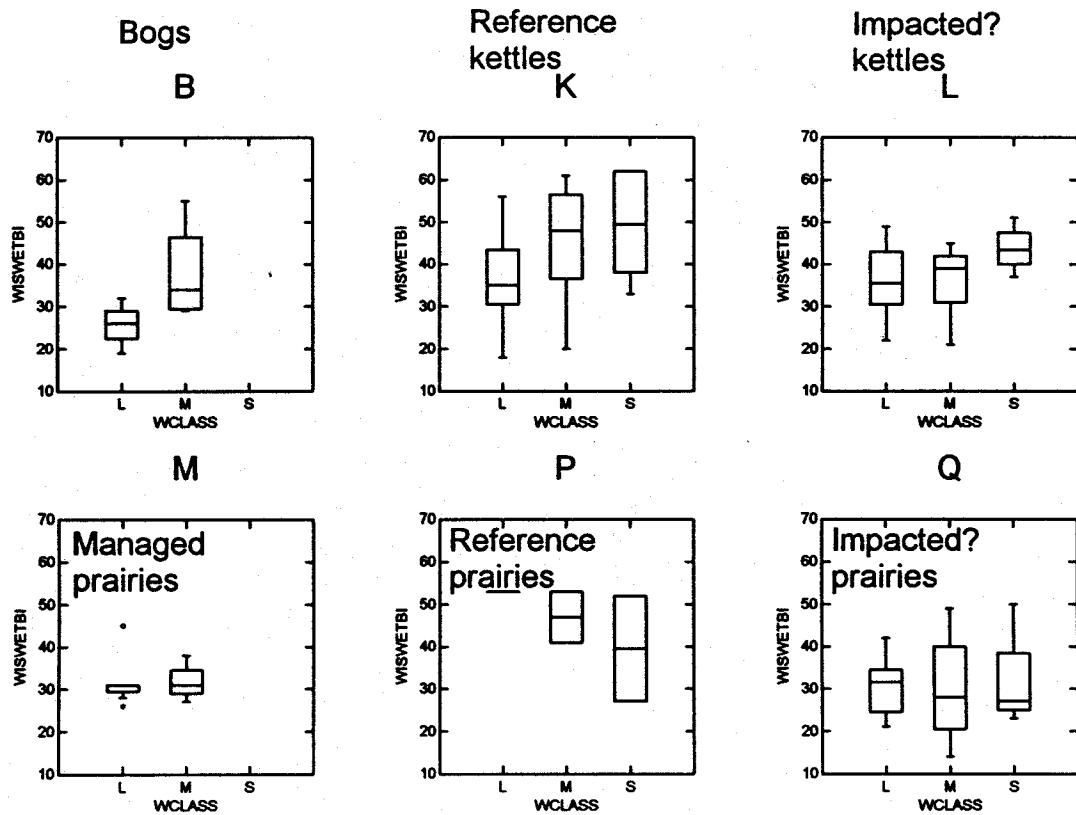


FIG. 15

Distribution of data by "History" classification

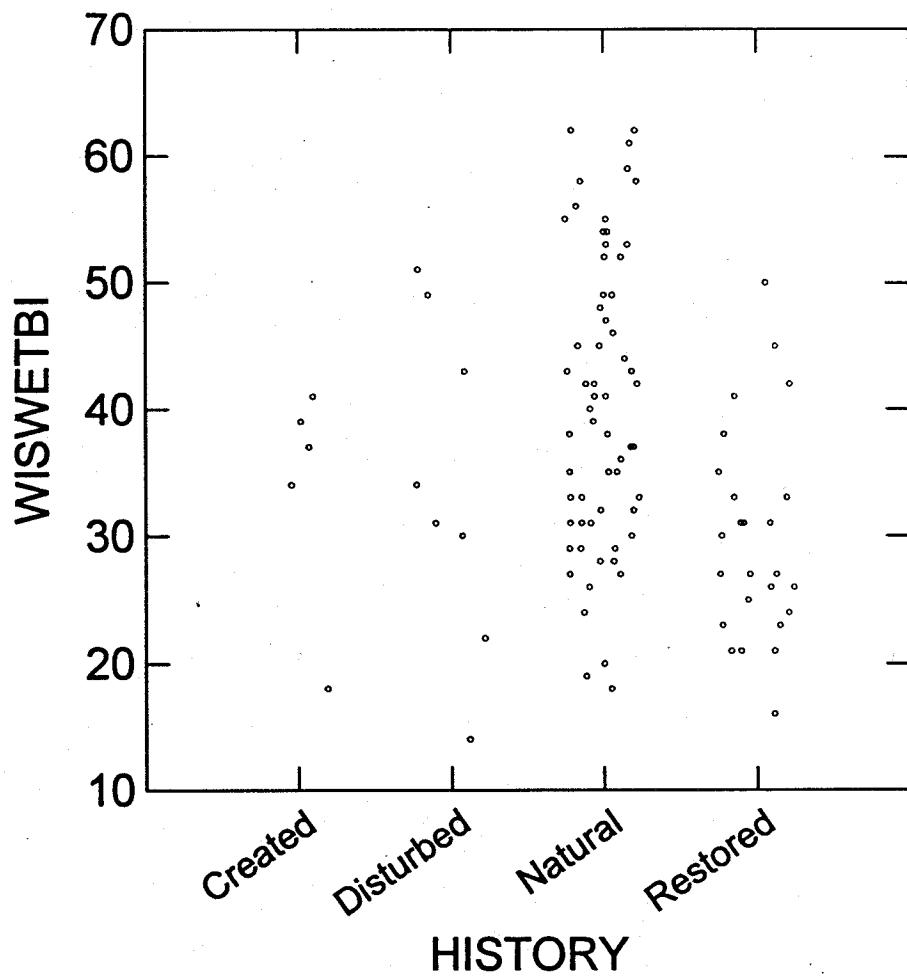


FIG. 16

Wisconsin Wetland Biotic Index performance by wetland type and history

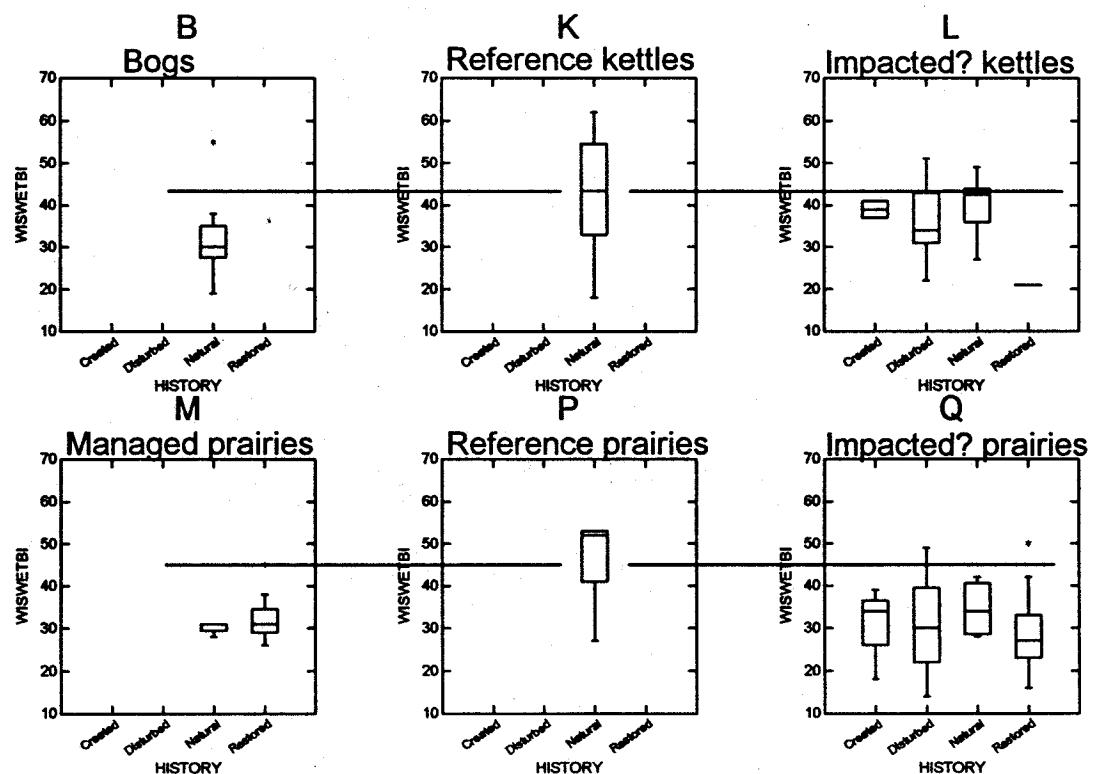
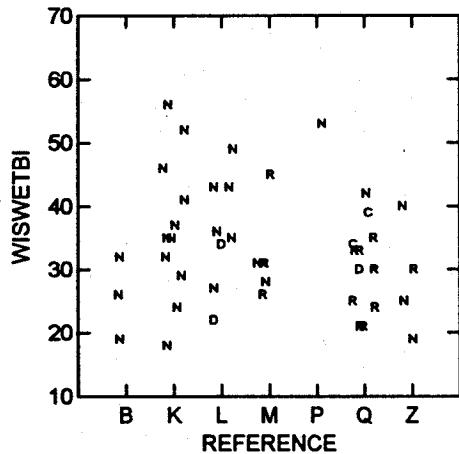
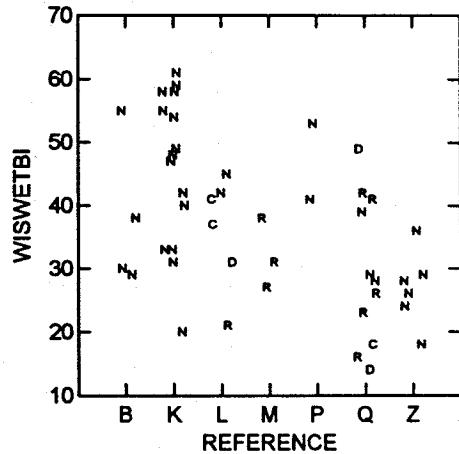


FIG. 17

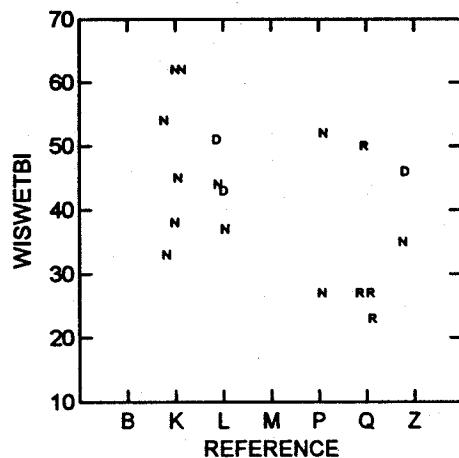
L =long



M =medium



S =short



Codes: N=natural, D=disturbed, C=created, and R=restored.

B=bogs, K=reference kettles, L=disturbed kettles, M=managed prairies, P=reference prairies, Q=disturbed prairies, and Z=other wetland types.

FIG. 18

The WBI tends to decline among longer duration wetlands?

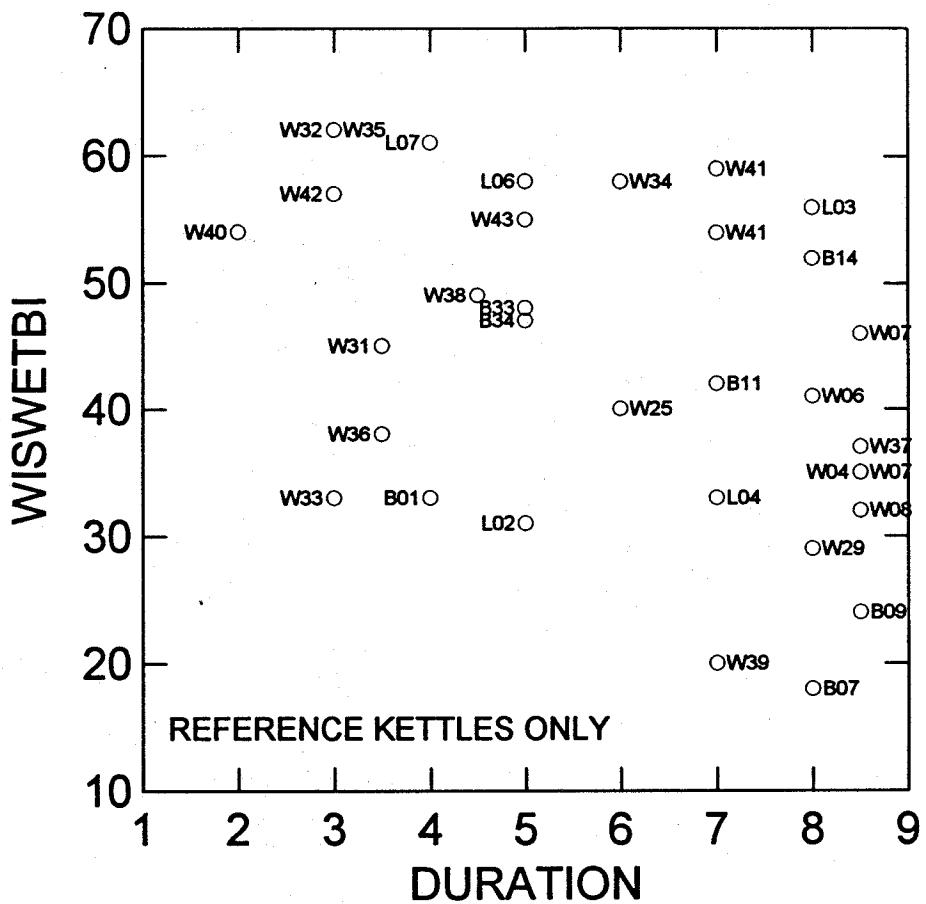


FIG. 19

Wisconsin Wetland Biotic Index performance by wetland type and disturbance history.

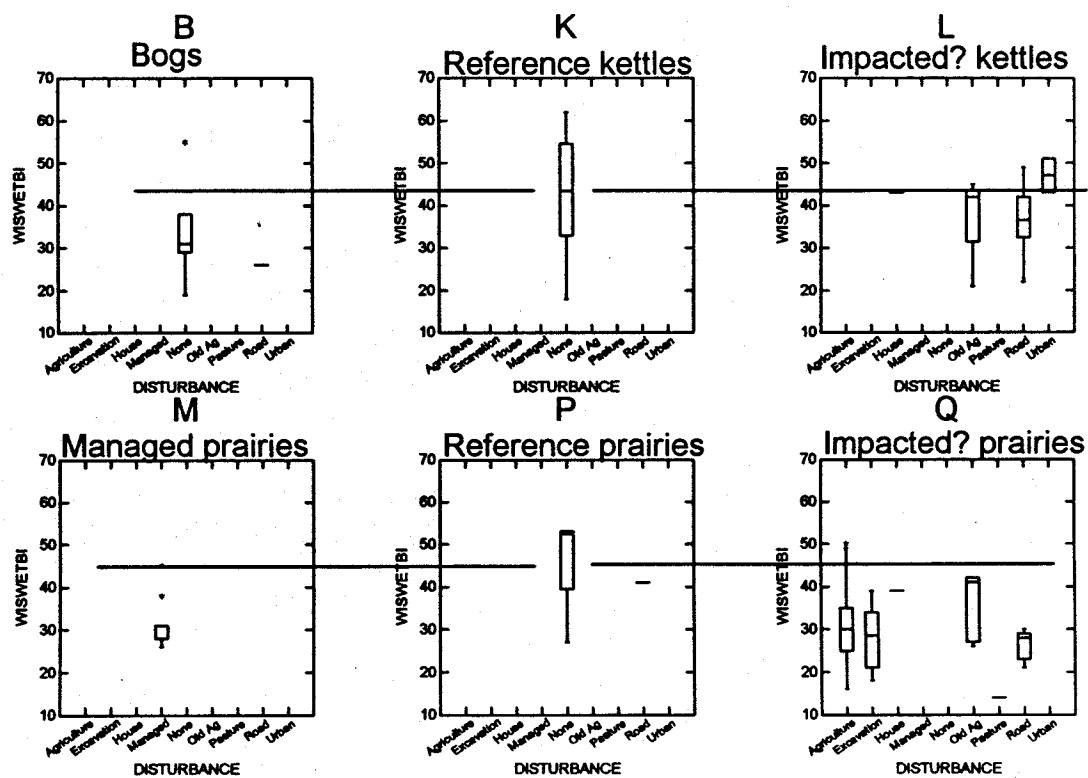
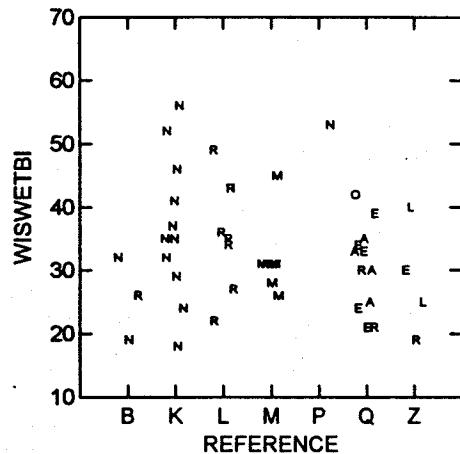
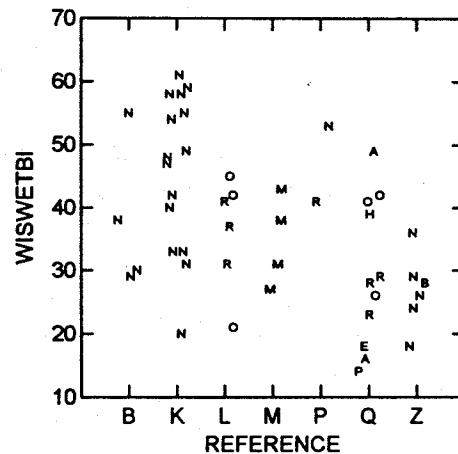


FIG. 20

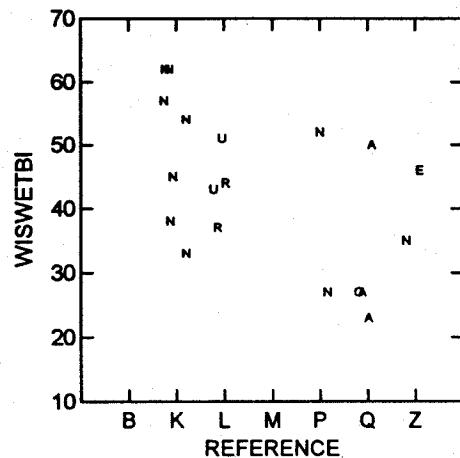
L =long



M =medium



S =short



Codes: N=none, R=road, A=agriculture, O=old agriculture, L=lake, M=managed, B=beaver dam, E=excavation, P=pasture, U=urban, H=house

Reference codes: B=bogs, K=reference kettles, L=impacted kettles, M=managed prairie wetlands, P=reference prairies, Q=impacted prairies, and Z=other types.

FIG. 21

Relationships between WBI and selected environmental attributes (all data).

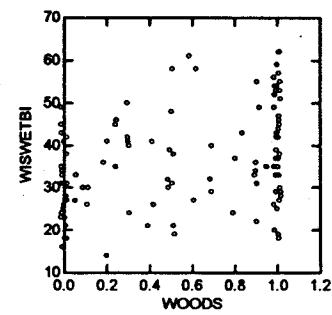
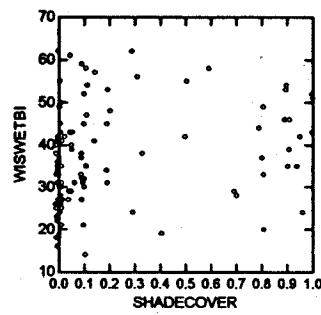
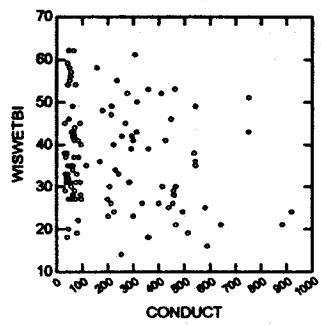
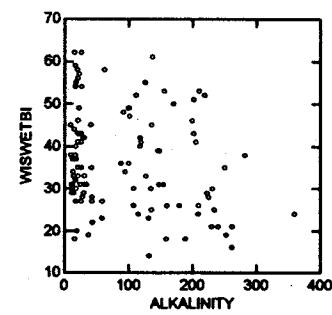
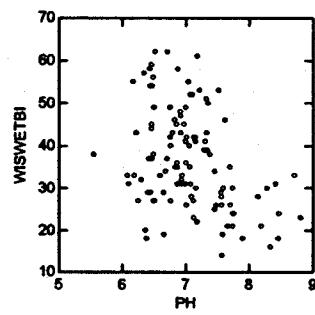
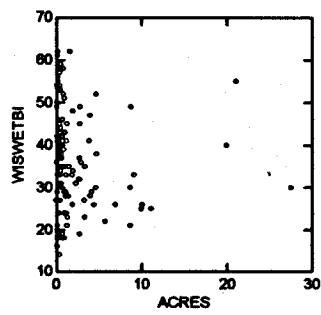
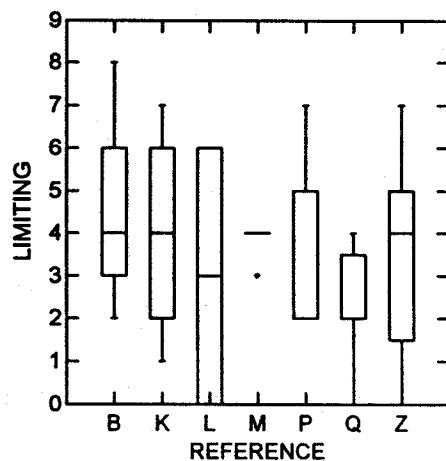
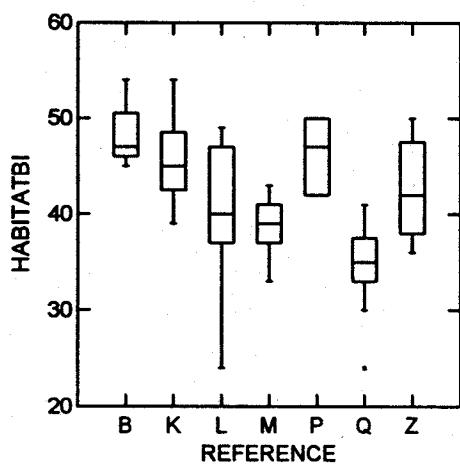


FIG. 22

Predicted conditions for macroinvertebrate production using the Habitat Index (average of six factors) and the Limiting Resource Index (minimum of six factors included in Habitat Index).



B= bogs, K = kettles-ref., L = kettles-imp., M = managed prairies,
P = prairies-ref., Q = prairies-imp., and Z = other wetland types.

FIG. 23

Relationships between WBI and individual Habitat metrics (all data).

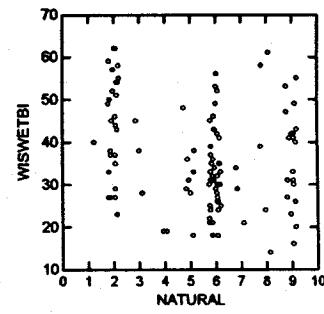
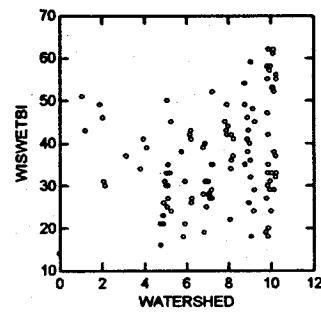
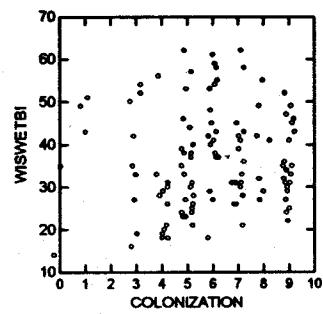
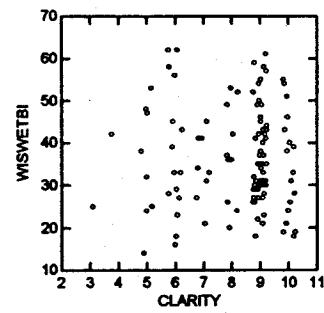
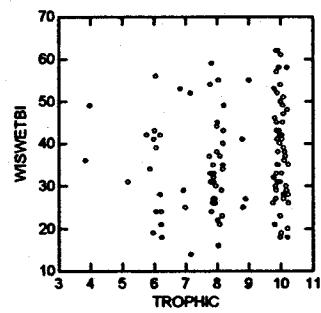
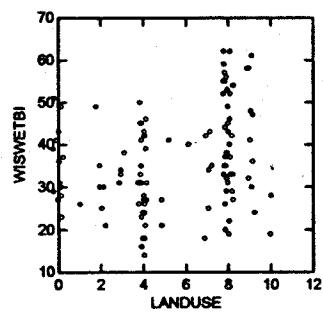


FIG. 24

Relationship between WBI and individual Habitat metrics.

NOTE: Reference (least-disturbed) kettle type wetlands only.

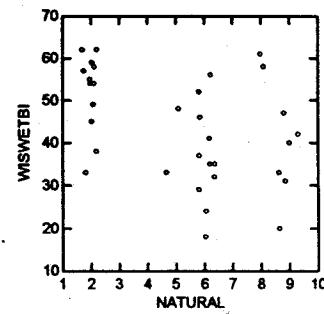
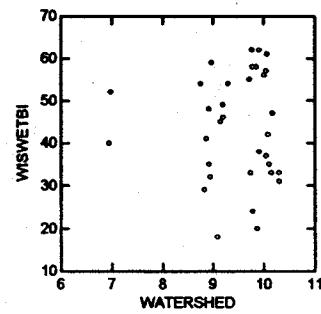
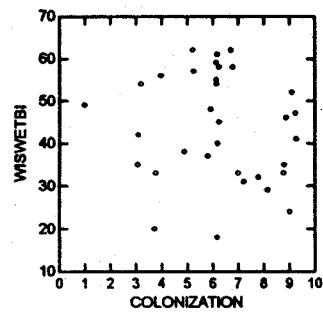
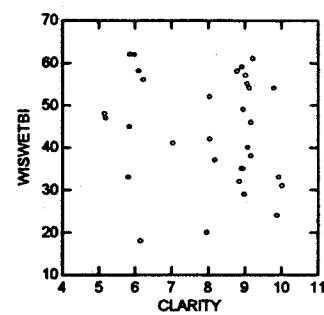
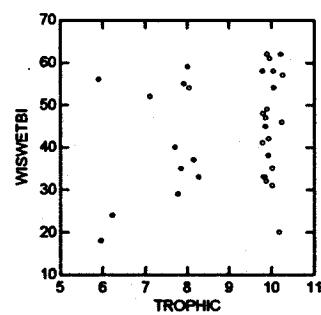
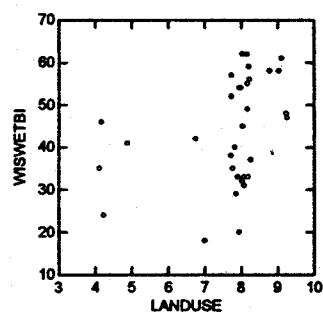


FIG. 2.5

Correspondence between WWMBI and subjective habitat Index

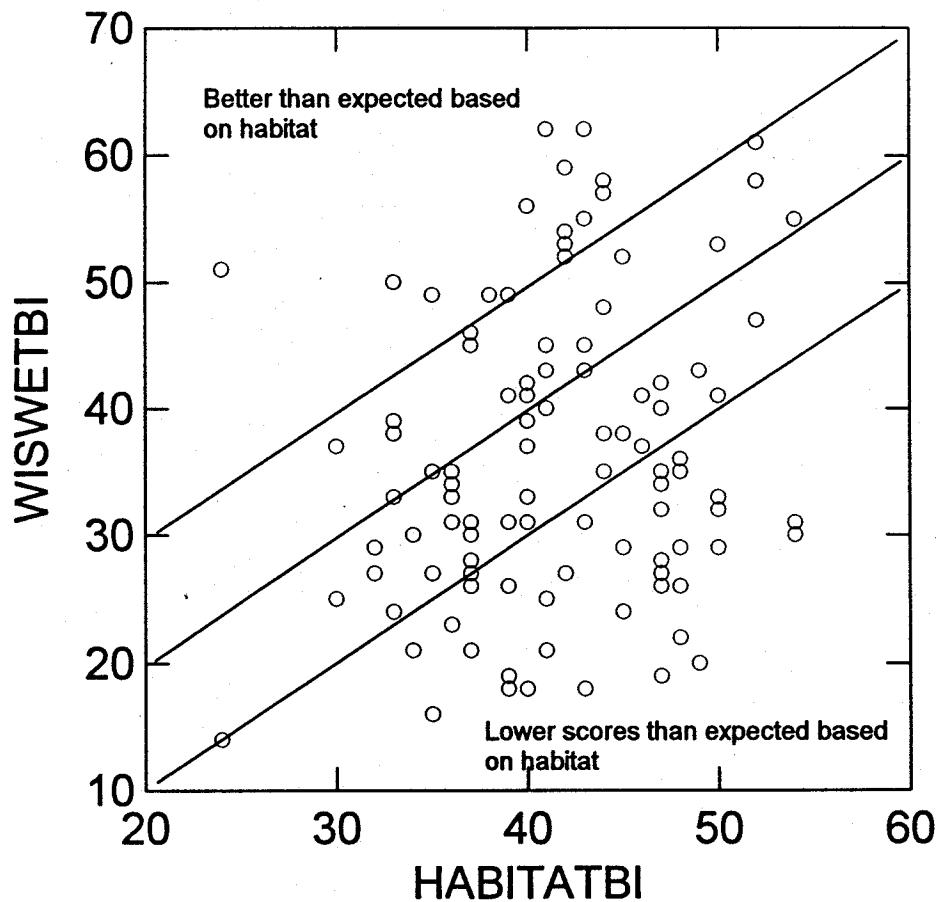


FIG. 26

Relationship between WWMBI and Habitat Index: wetlands identified by history classification. Kettles and Prairies only.

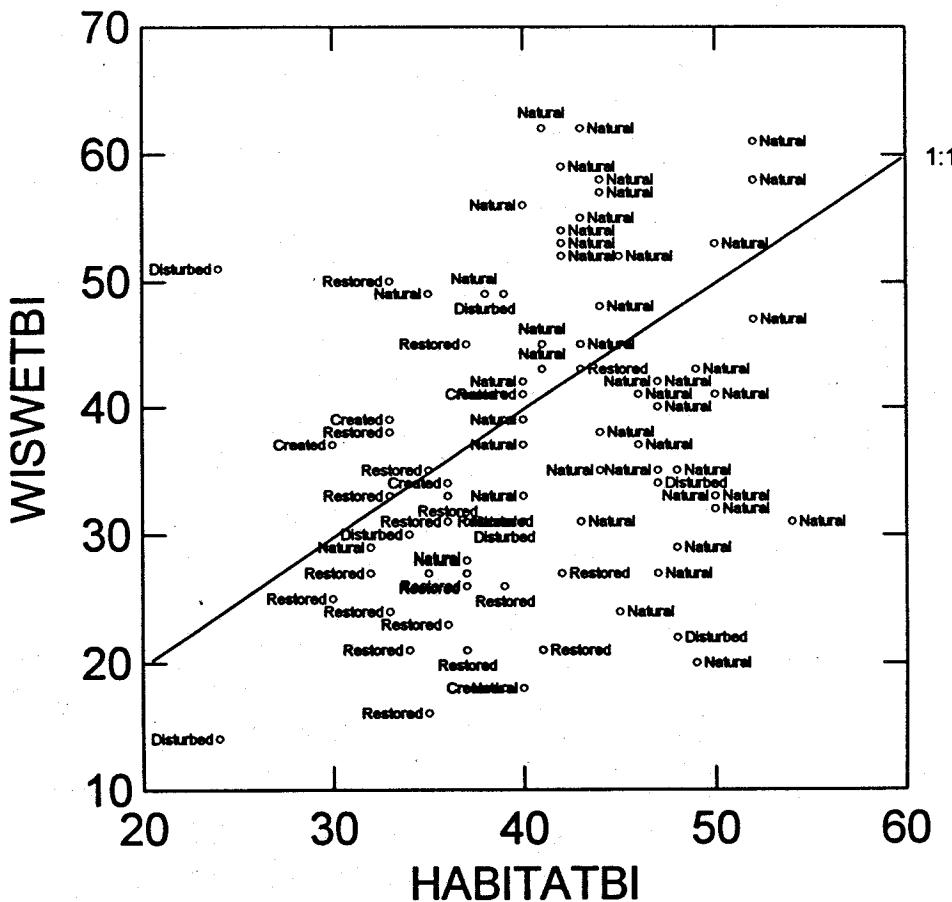


FIG. 27

**Relationship between WWMBl and limiting habitat resources
(lowest individual habitat metric score per wetland)**

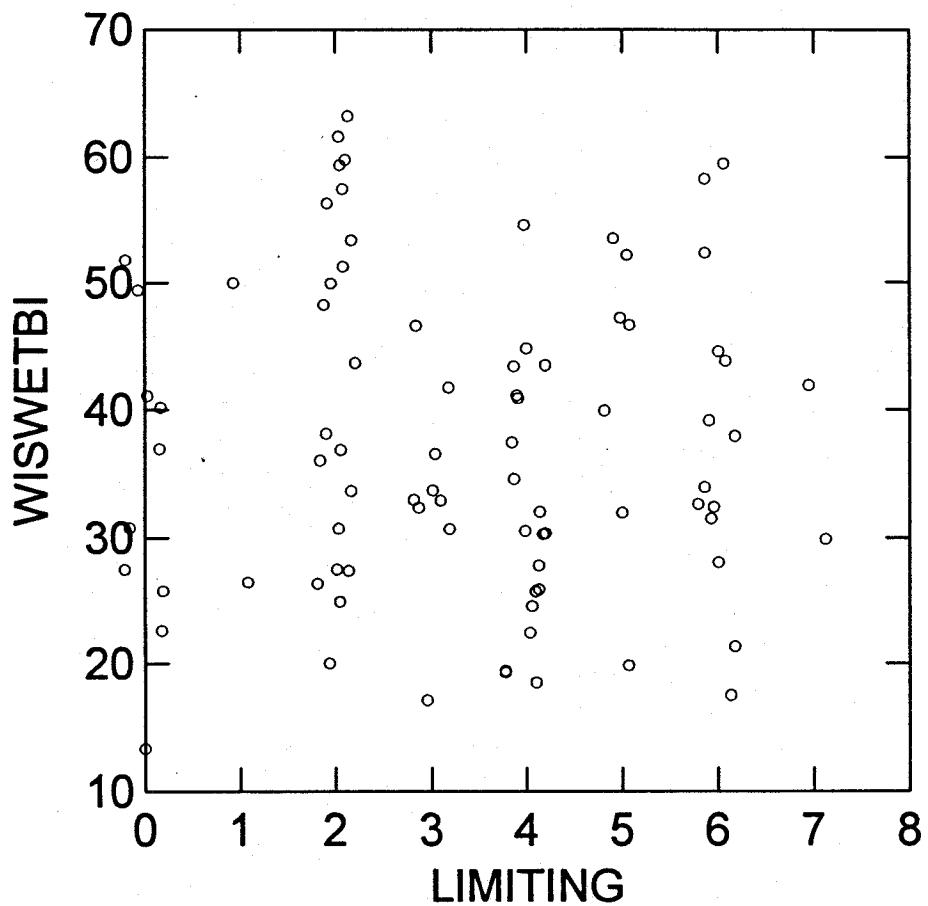


FIG. 28

WWMBI versus limiting habitat resources: wetlands identified by history class

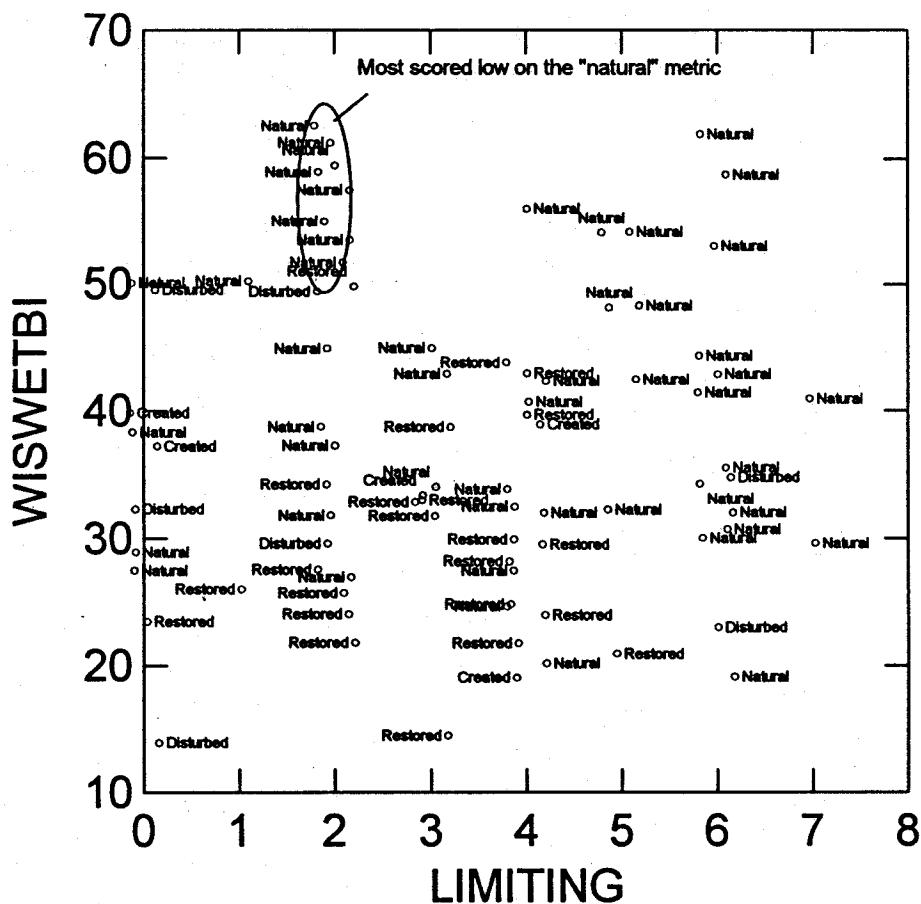


FIG. 29

Response of Non-Insect metrics by wetland class

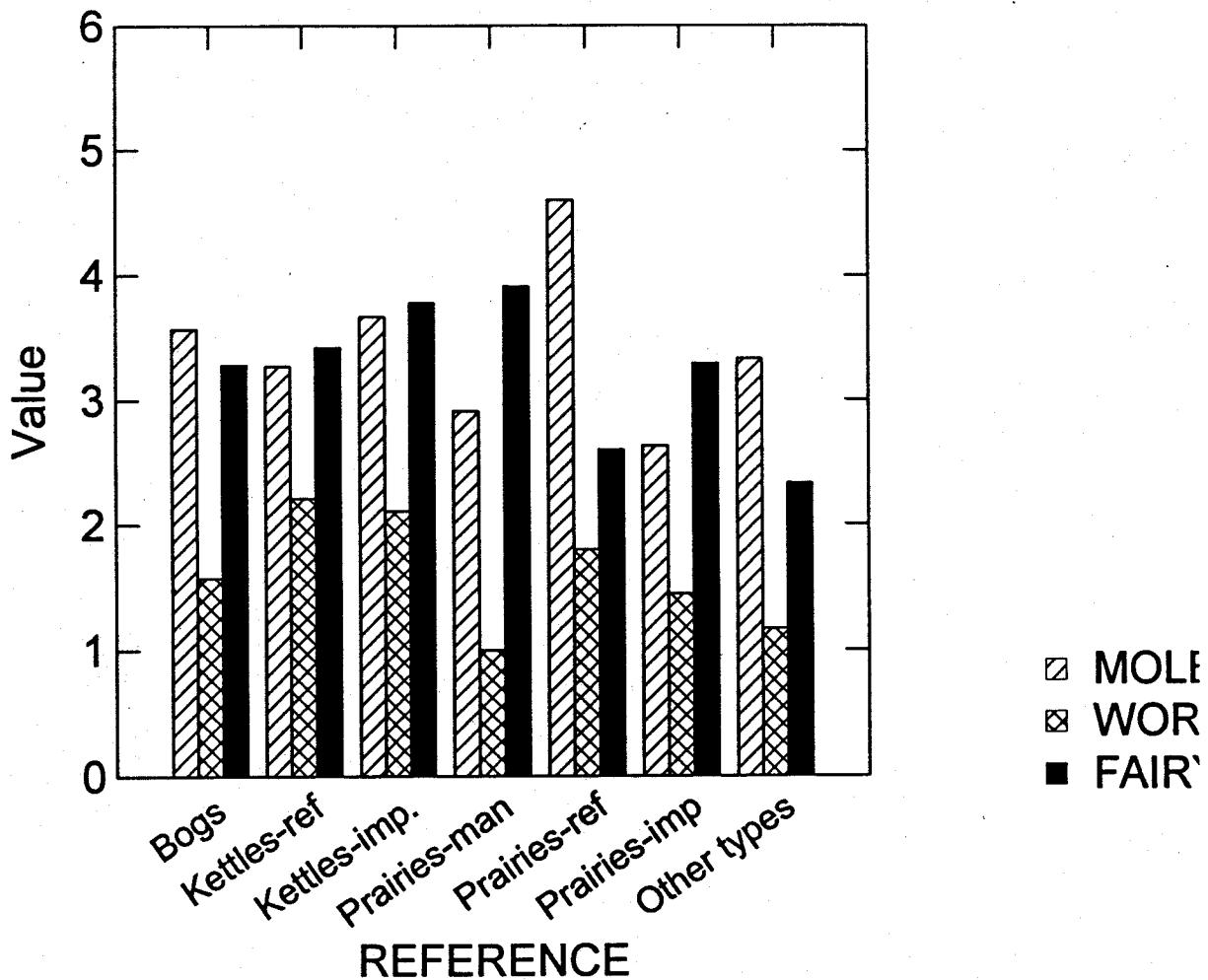


FIG. 30

Response of Non-Insect metrics by History Classification

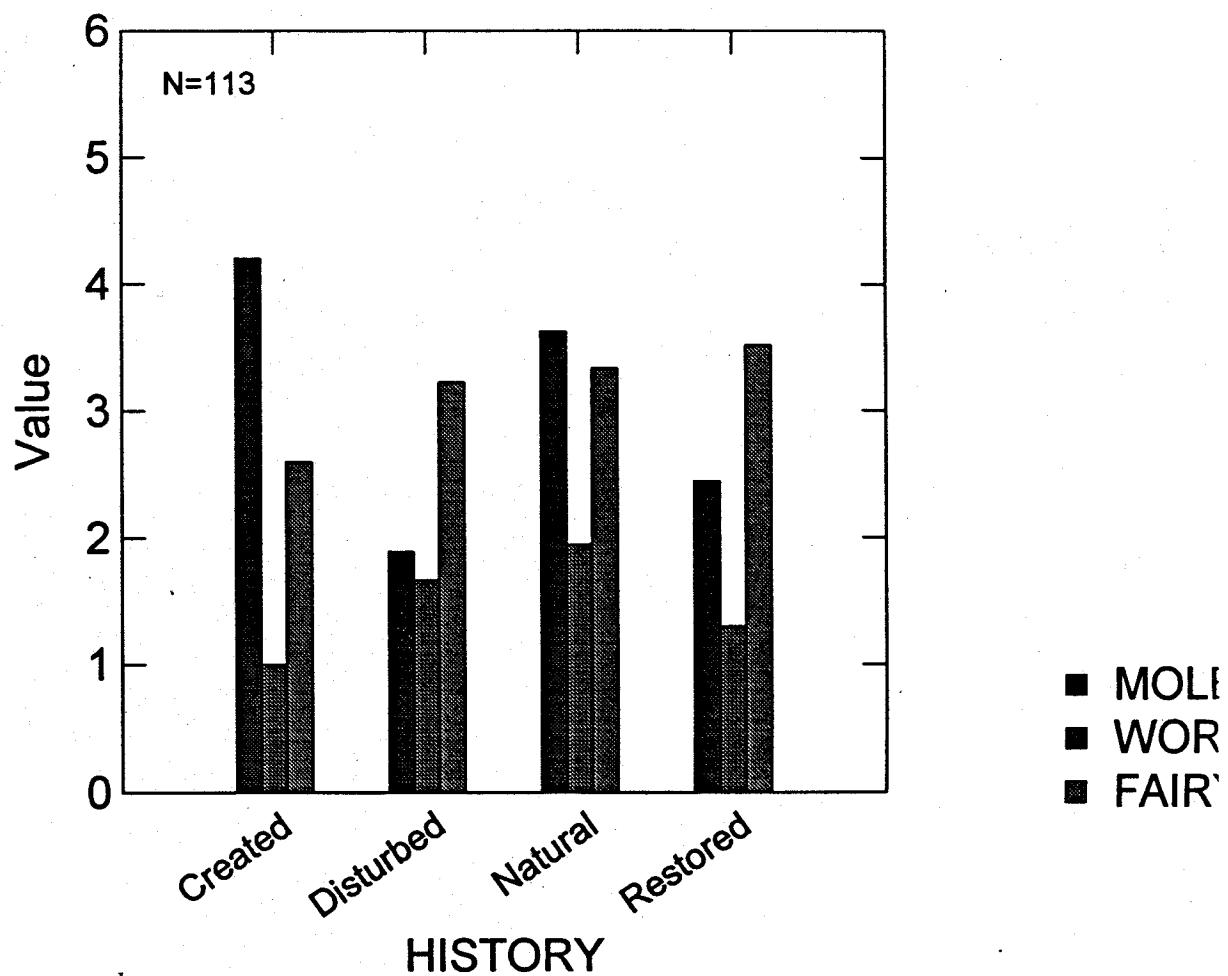


FIG. 31

Response on Nonsect Taxa by wetland class

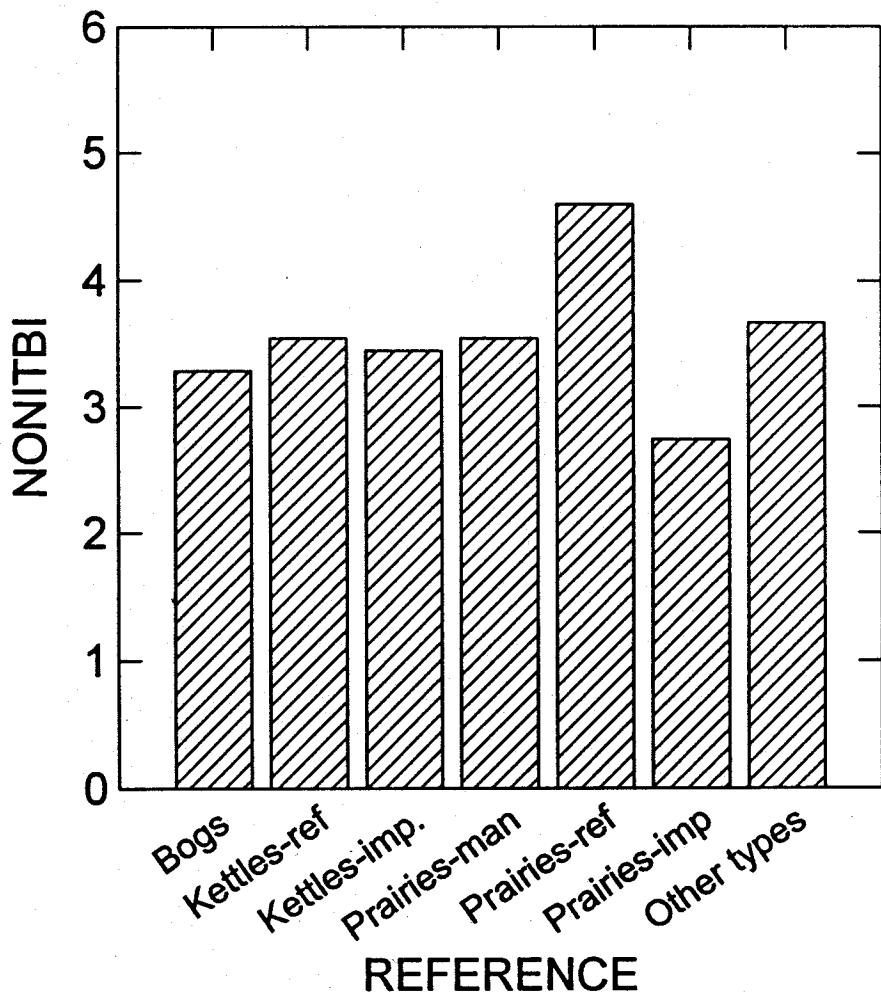
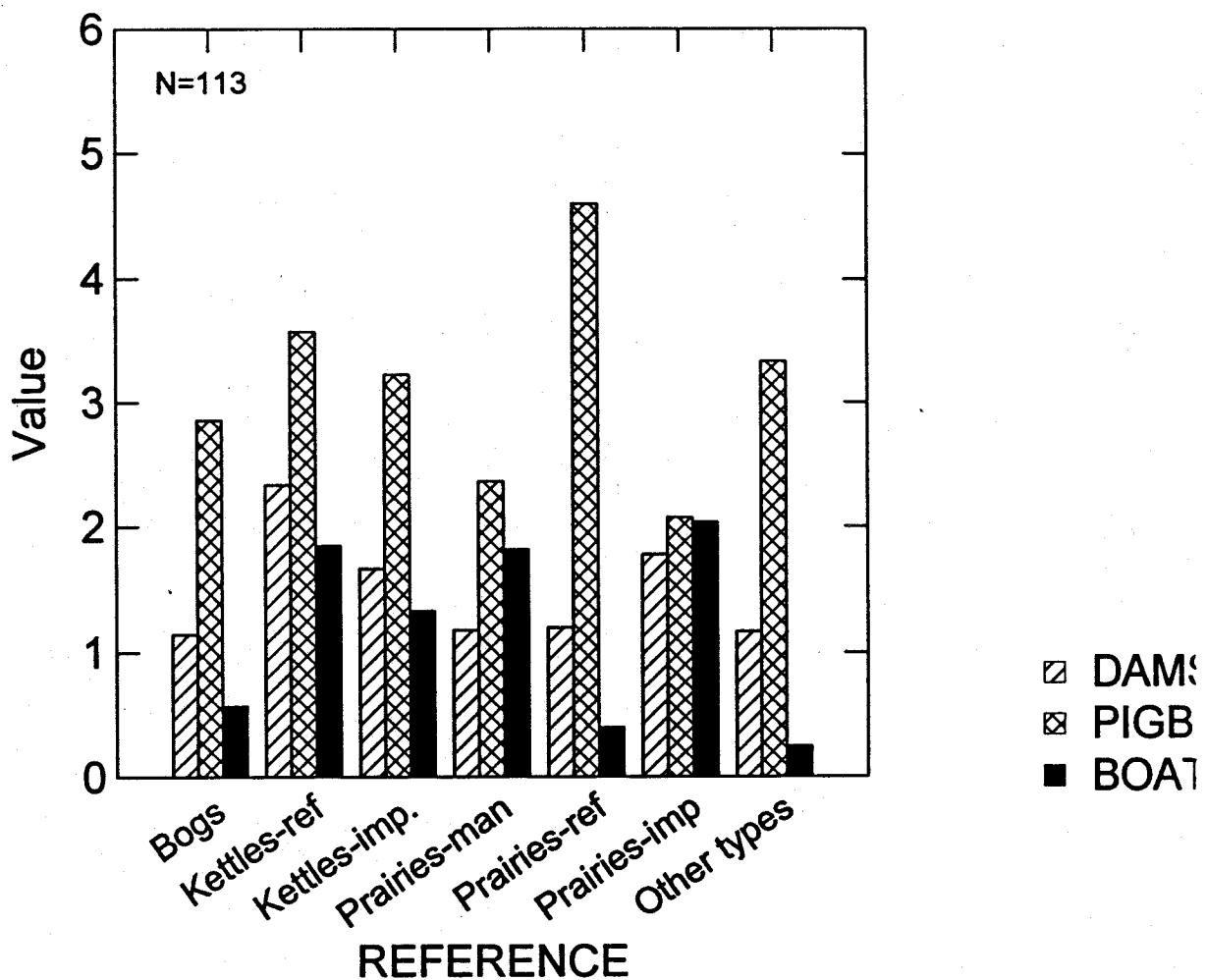


FIG. 32

Response of Damselfly, Pigmy backswimmer (negative),
and Water Boatmen metrics by wetland class.



Response of Caddisfly metrics by wetland class. Metrics include percent of total invertebrates (CADCENTBI), abundance of total caddisflies and limnephelids only.

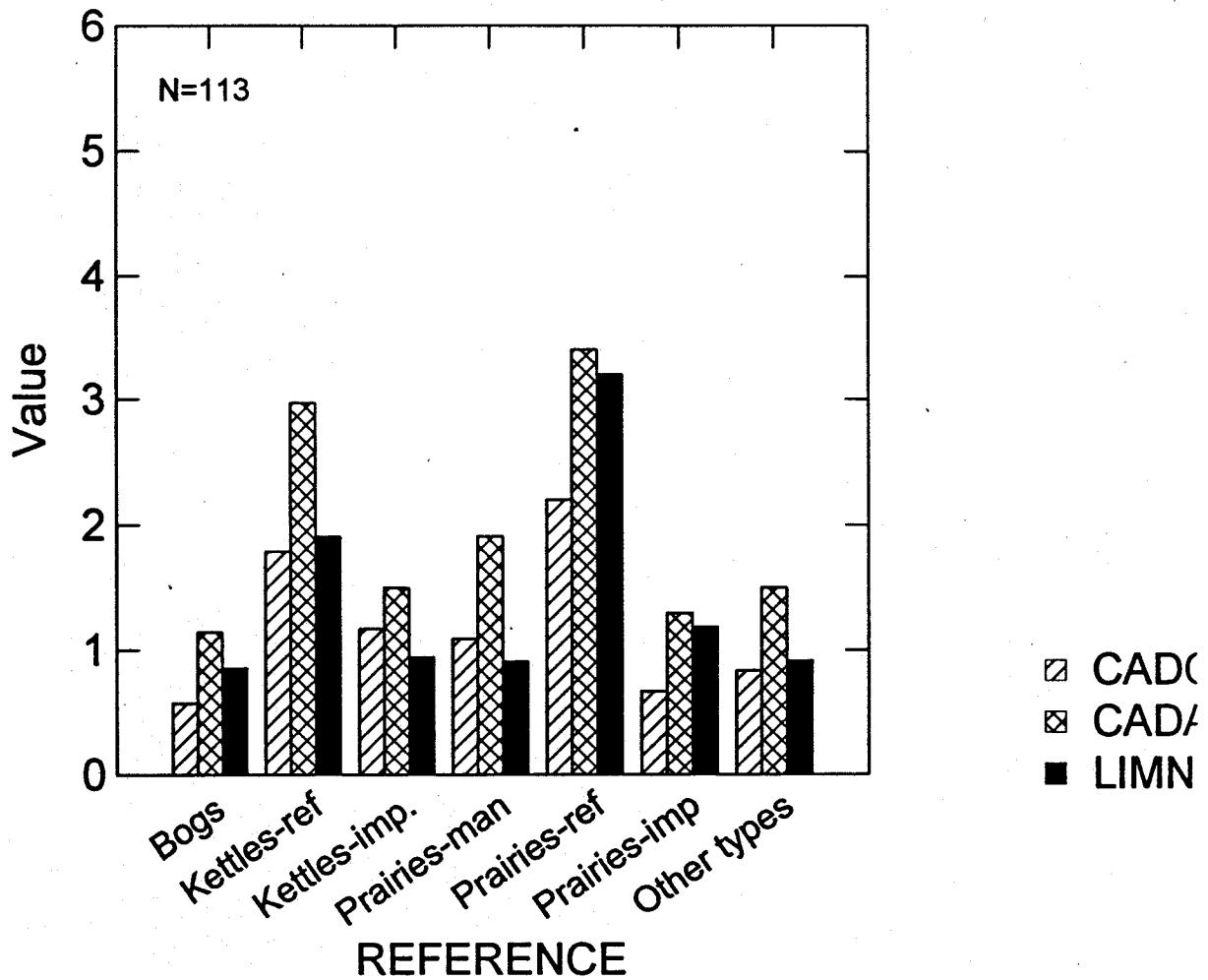


FIG. 34

Response of Diptera metrics by wetland class, including Phantom midges, Mosquitoes, and Soldier fly larvae.

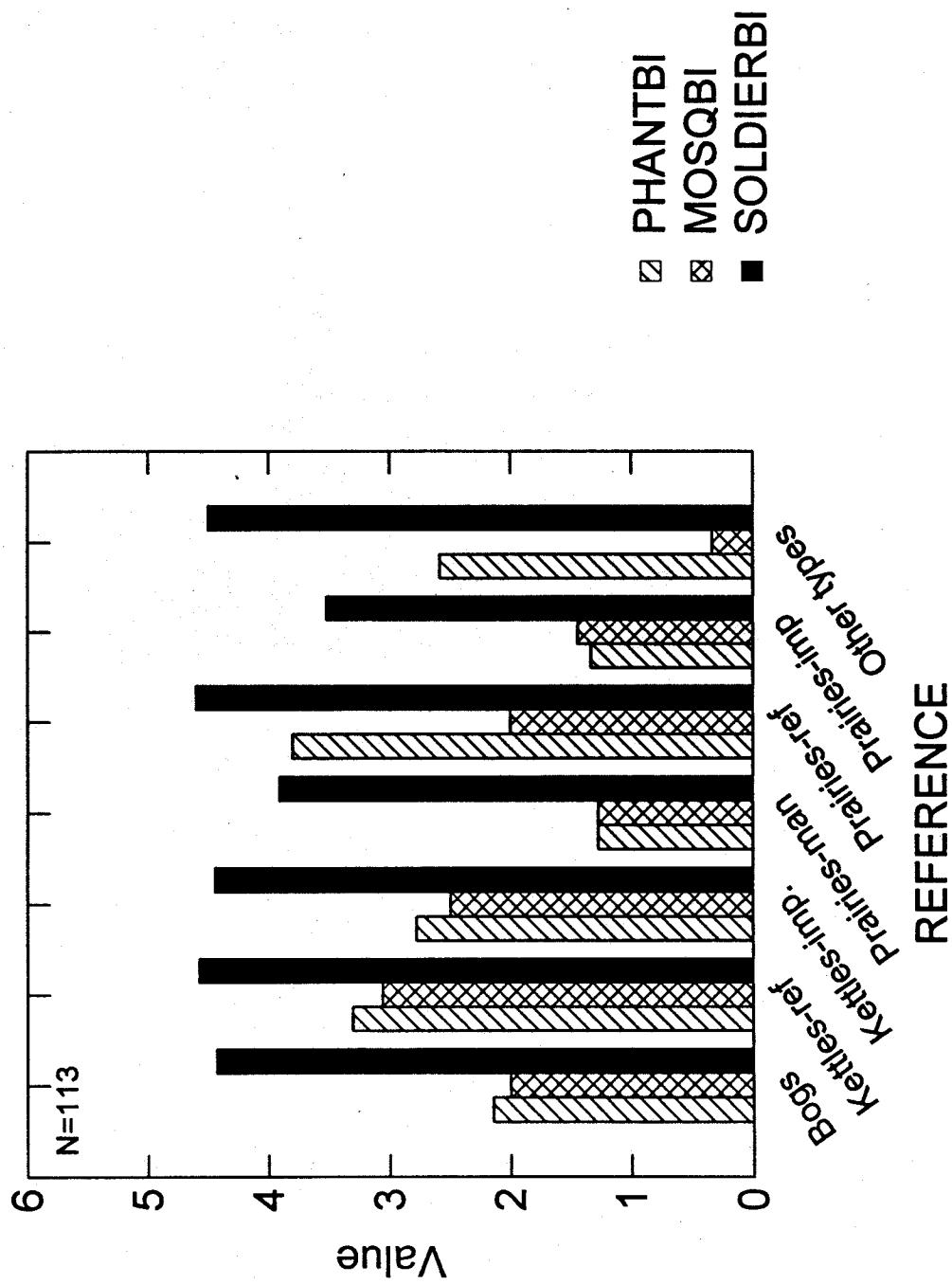
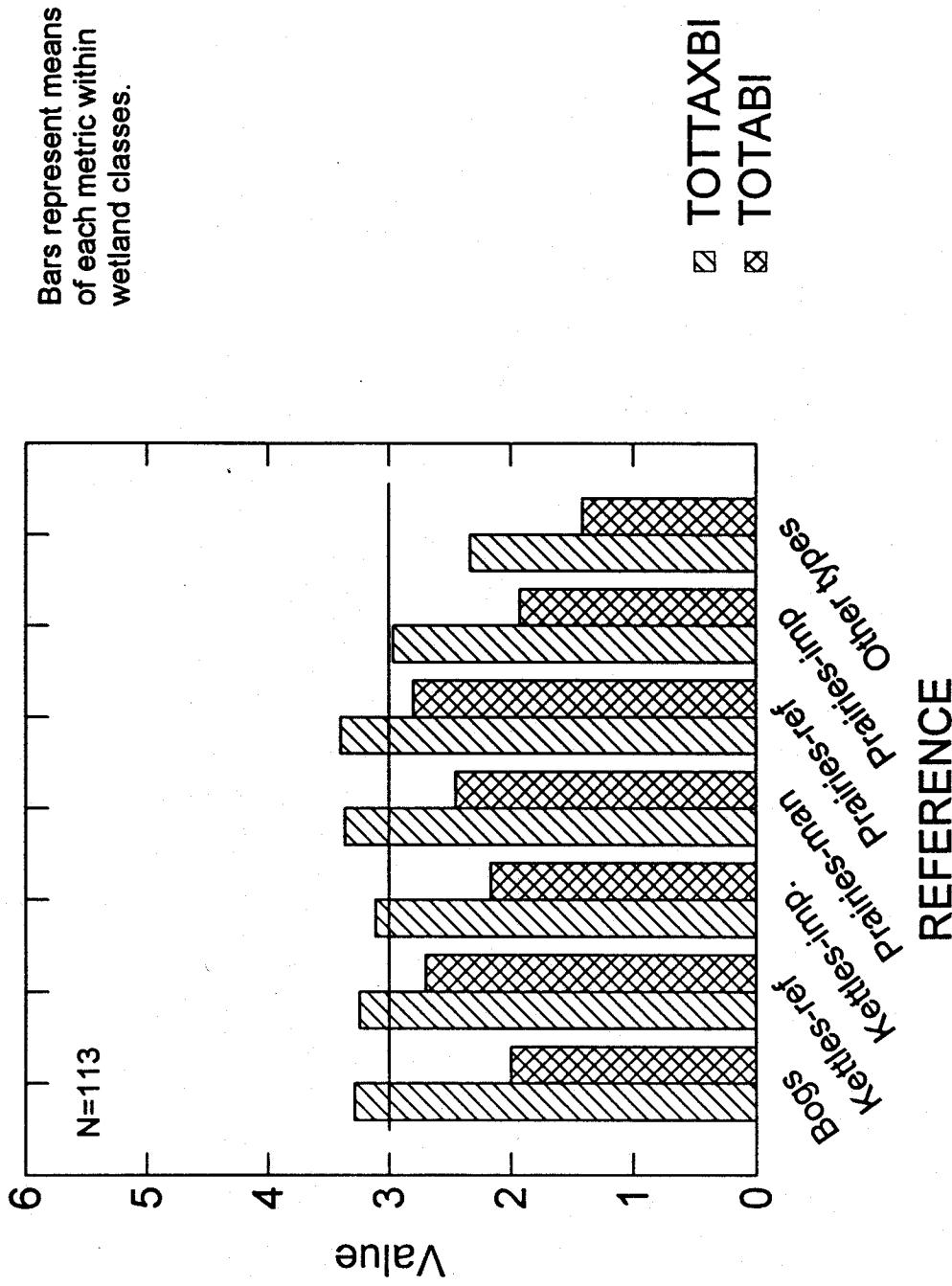


FIG. 35

Response of Total Taxa metric (TOTTAXBI) and Total Abundance metric (TOTABI) by wetland class.



Response of Wisconsin Wetland Biotic Index by wetland class

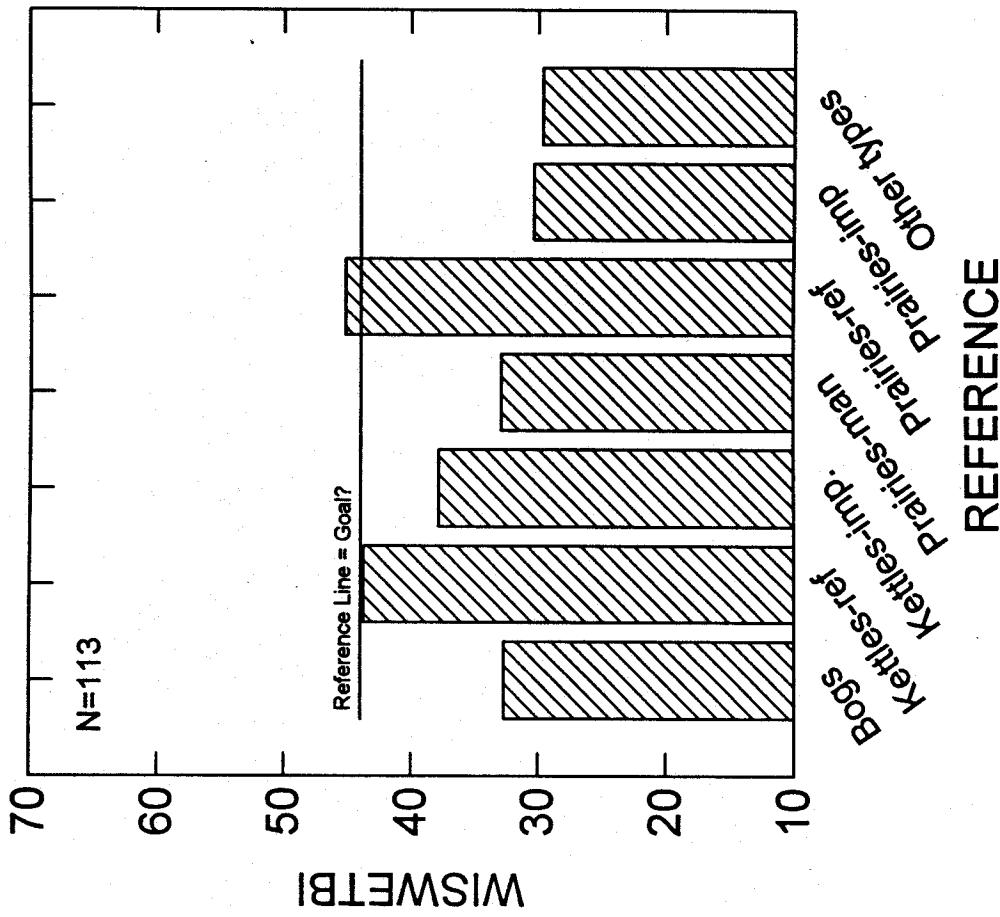
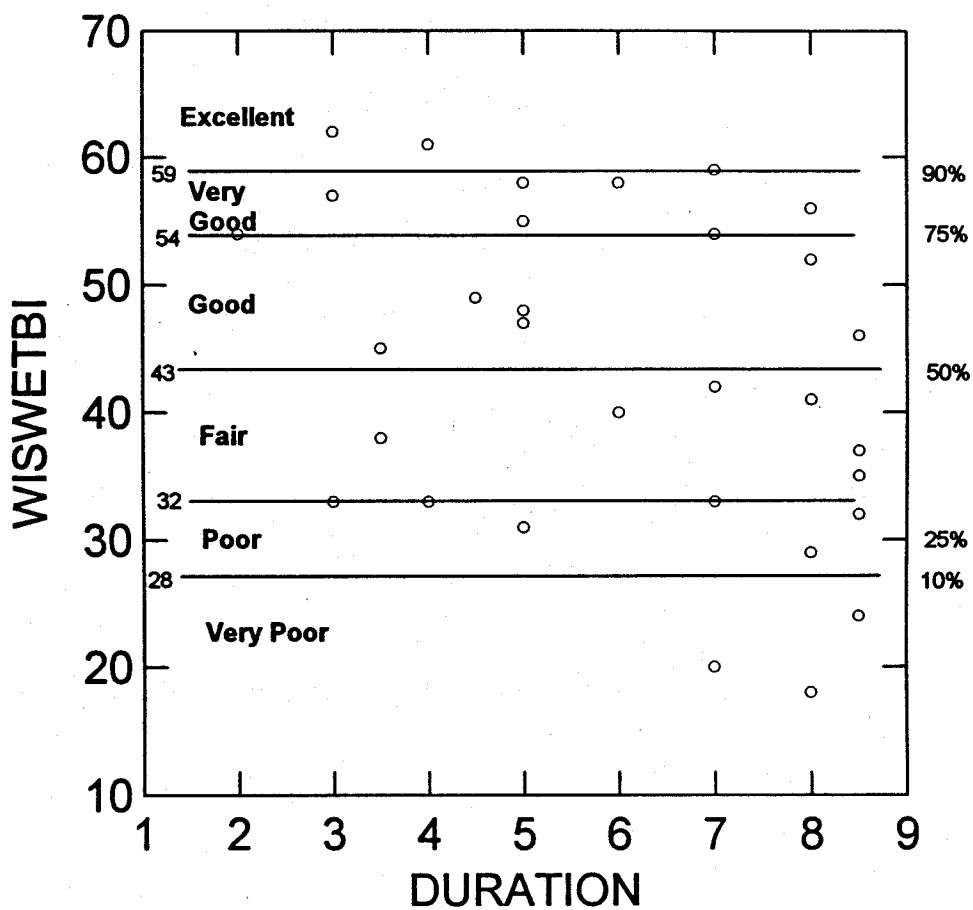
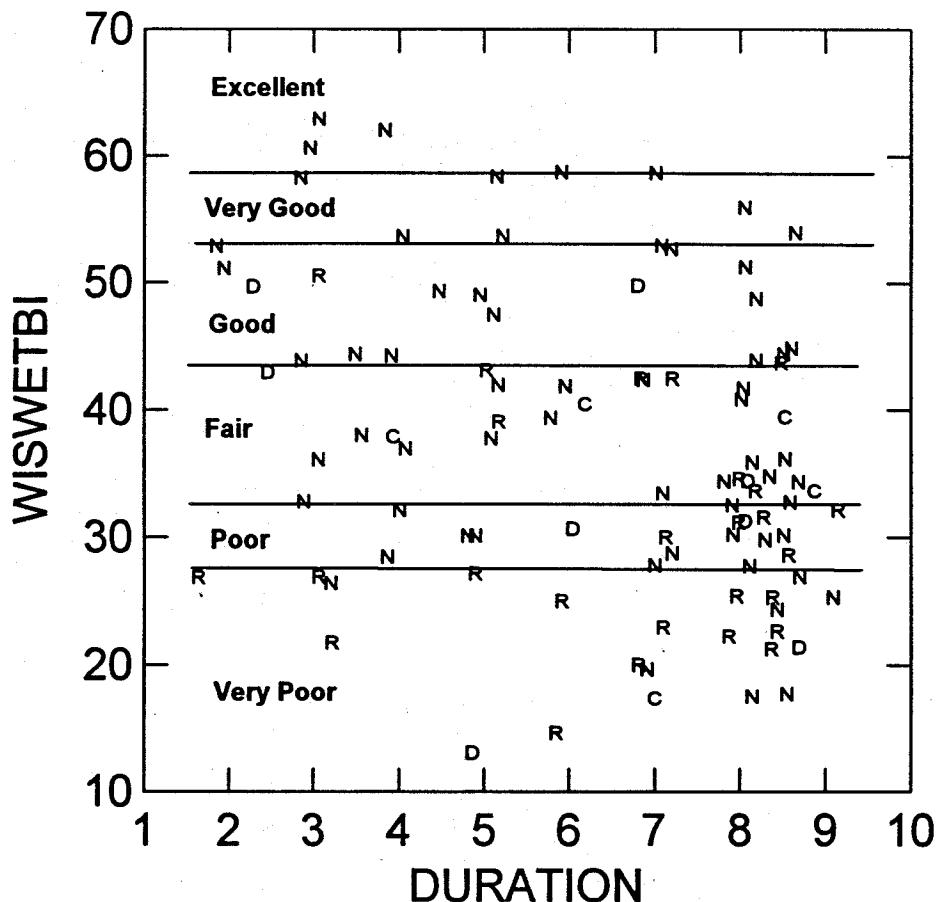


FIG. 37

**Wisconsin Wetland Macroinvertebrate Biotic Index Rating System
(Based on reference kettle data only)**



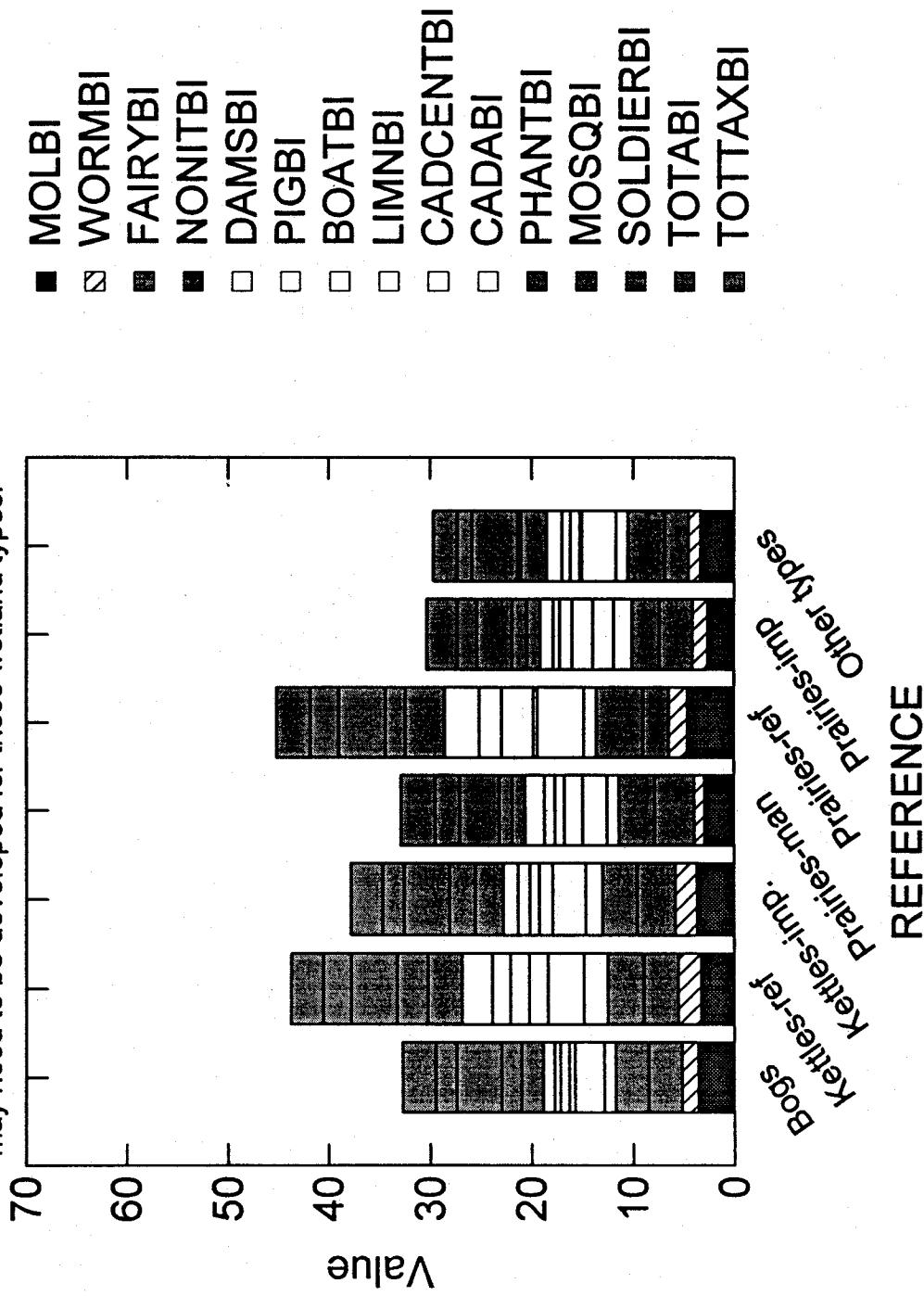
WWMBI scores for all kettle and prairie wetlands combined
By wetland history classification



N=natural, D=disturbed, C=created, and R=restored

FIG. 39

The WBI is the sum of the individual 15 metrics. Bogs and "Others" should not be compared with kettles and prairie wetlands. A different set of metrics may need to be developed for these wetland types.

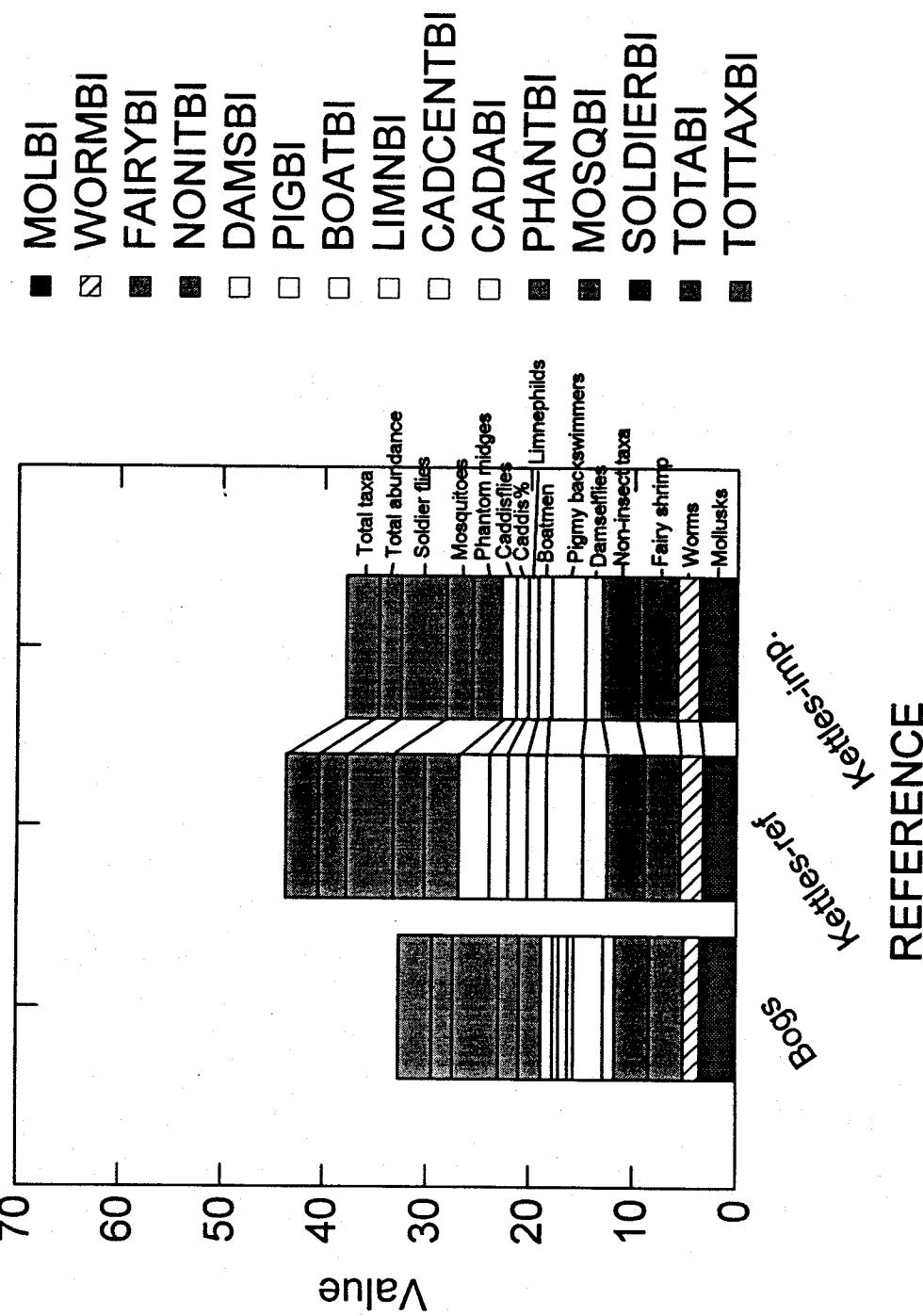


Bogs
Kettles-prairies-mix
Prairies-prairies
Others
Prairie
Prairie

REFERENCE

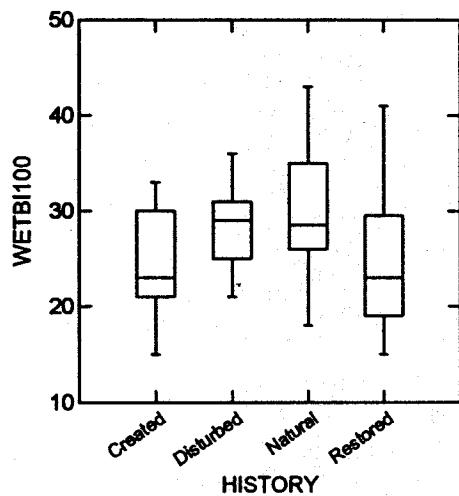
FIG. 40

Comparison between reference kettles and kettles suspected(?) to be impacted. Major differences occur among caddisflies, damselflies, and perhaps boatmen?

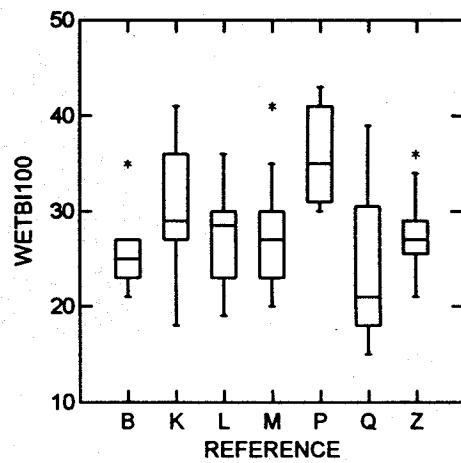


REFERENCE

**WISCONSIN WETLAND MACROINVERTEBRATE
100 COUNT BIOTIC INDEX COMPARISONS**



The above plot includes bogs and other wetland types which may have reduced the average BI in "Natural" systems.



B=bogs

K=reference kettles

L=impacted? kettles

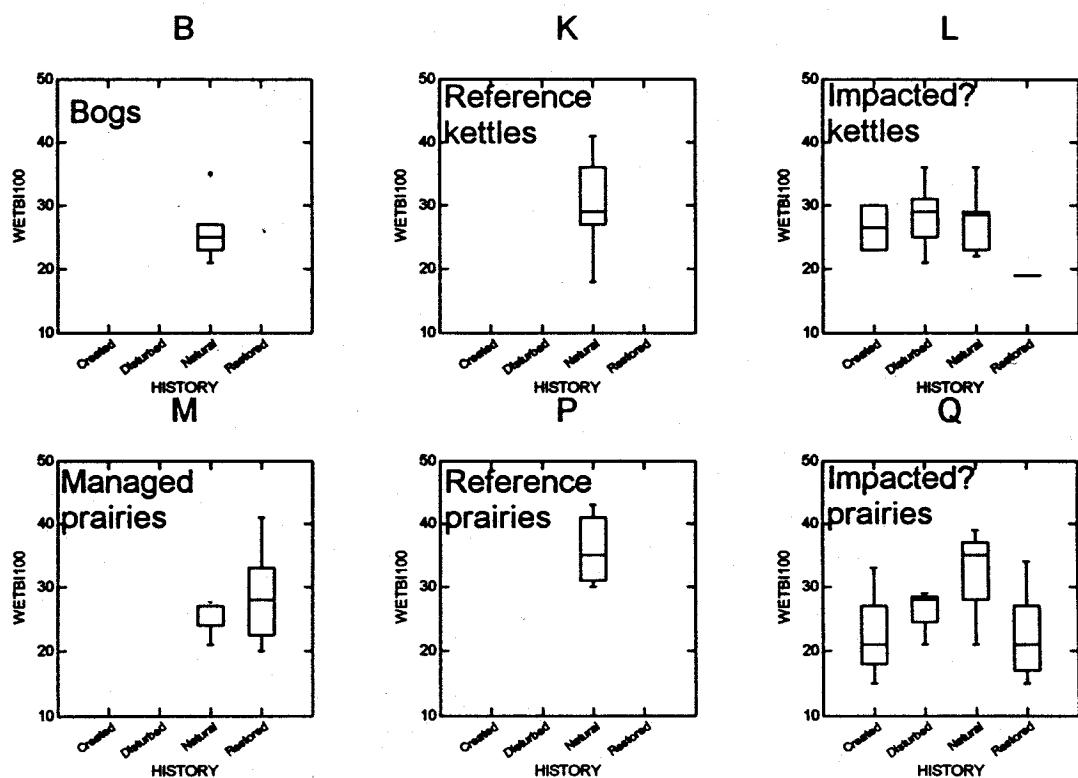
M=managed prairie wetlands

P=reference prairies

Q=impacted? prairies

Z=other wetland types

**WISCONSIN WETLAND MACROINVERTEBRATE BIOTIC INDEX
100-COUNT METHOD**



Among "Impacted" Prairie wetlands, current agricultural impacts and roads appear to have greatest influence on BI.
Note one pastured wetland has low BI.

Q

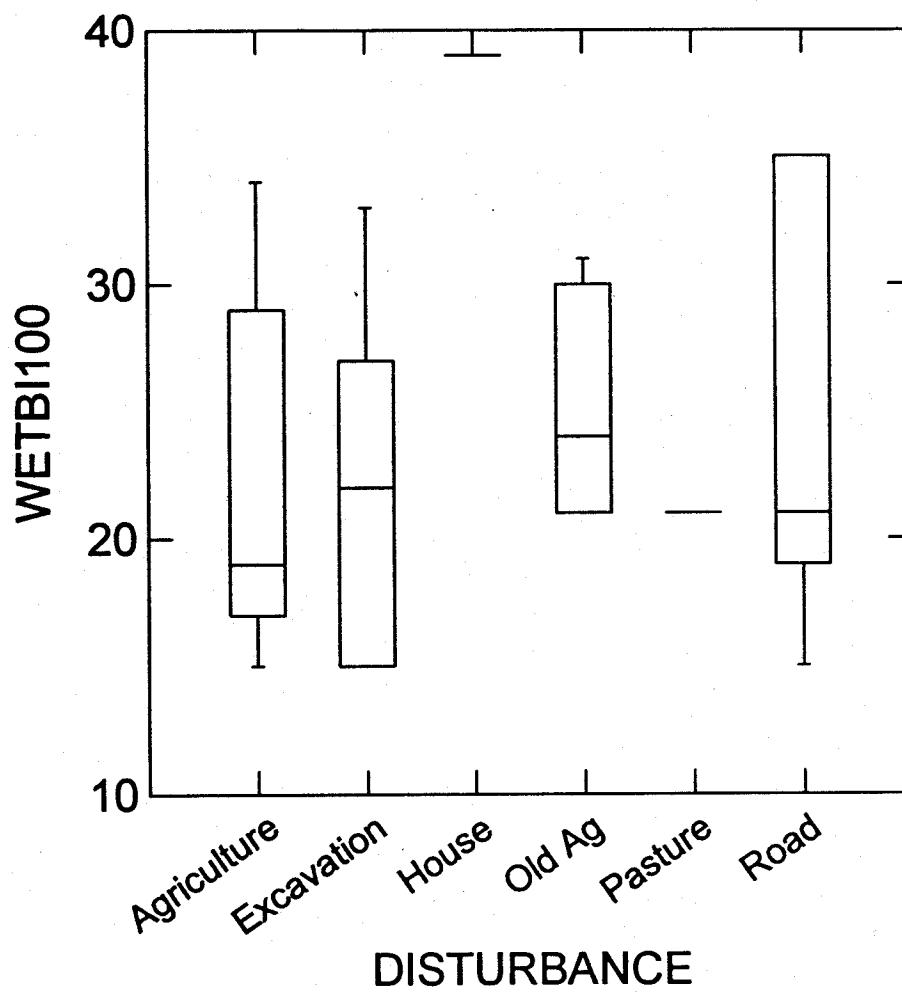
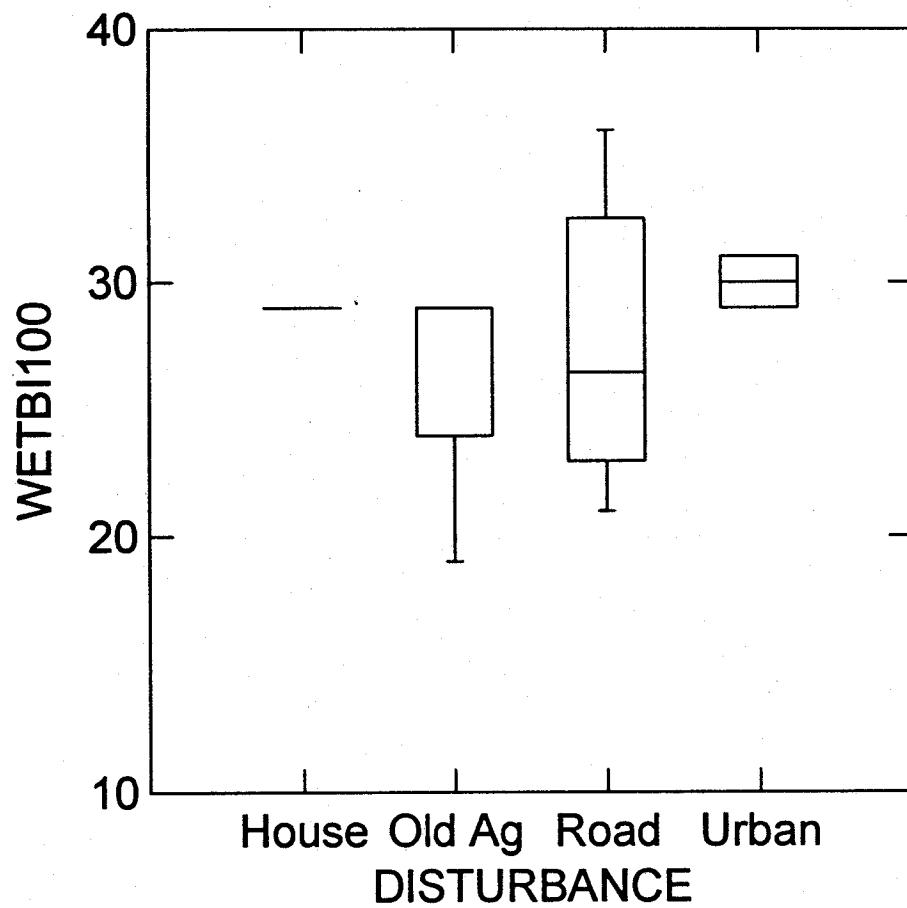
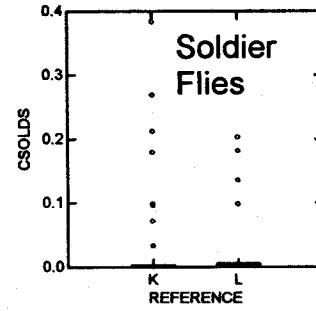
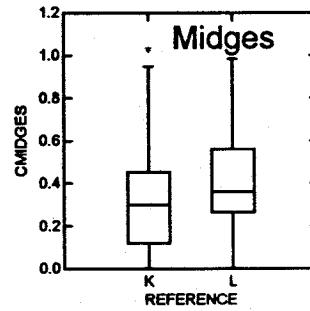
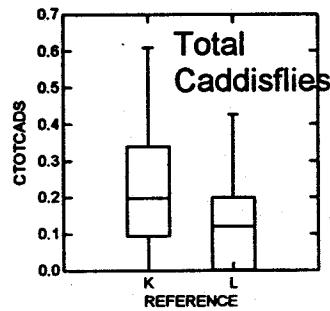
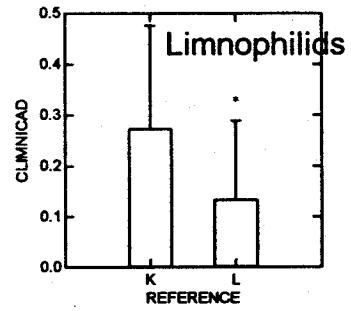
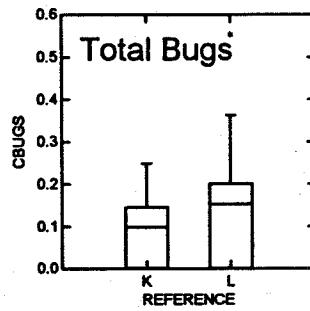
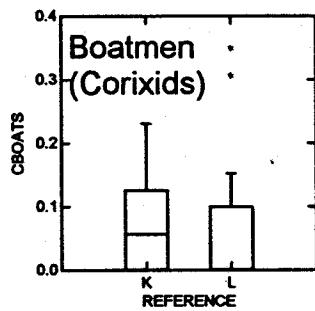
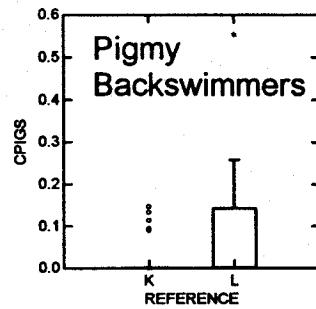
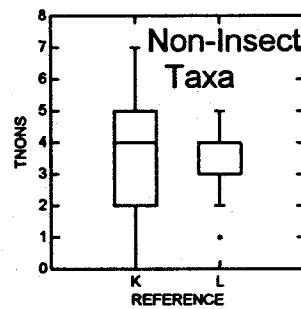
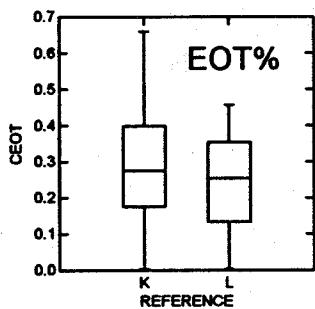


FIG. 44

Within "Impacted" kettles, roads appear to have greatest impact on biotic index. Note, however, that there are only two "urban" -impacted kettles.



KETTLES: K=reference, least-disturbed; L=impacted?



PRAIRIE WETLANDS: M=managed, P=least-impacted?, Q=impacted?

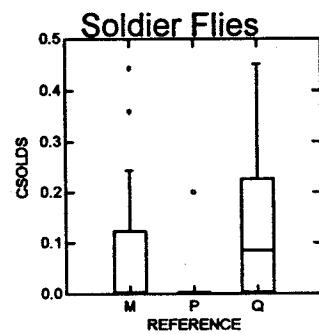
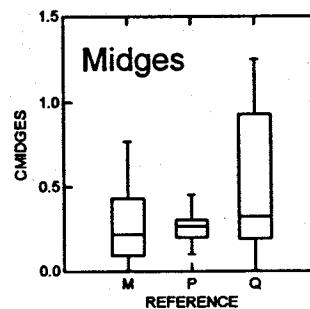
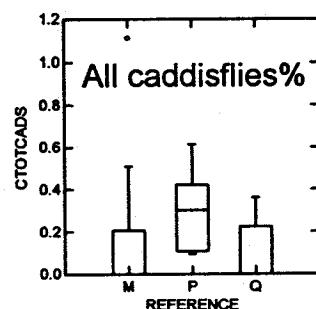
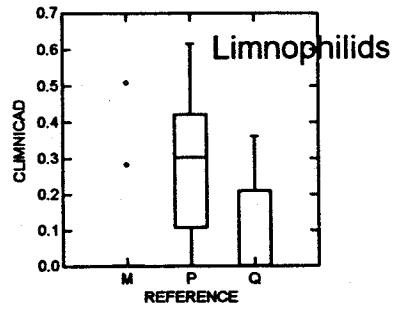
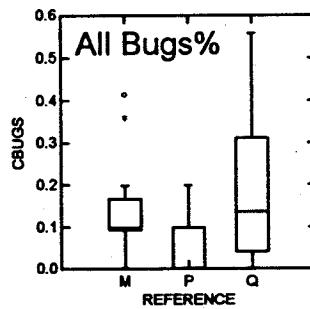
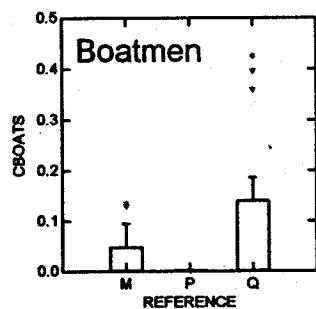
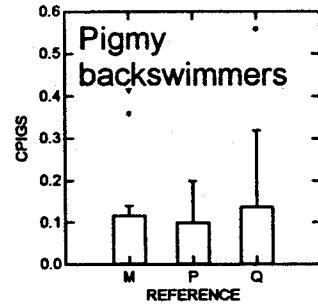
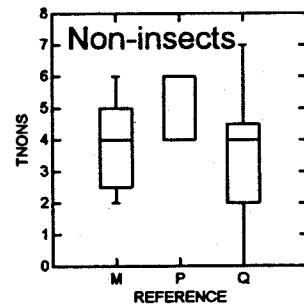
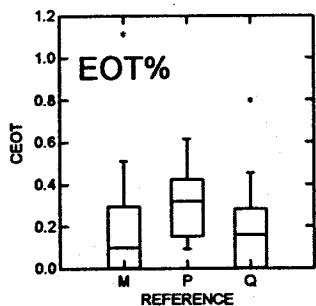


FIG. 47

Wisconsin 100-Count Macroinvertebrate Biotic Index
Rating Scores based on reference kettles (N=33)

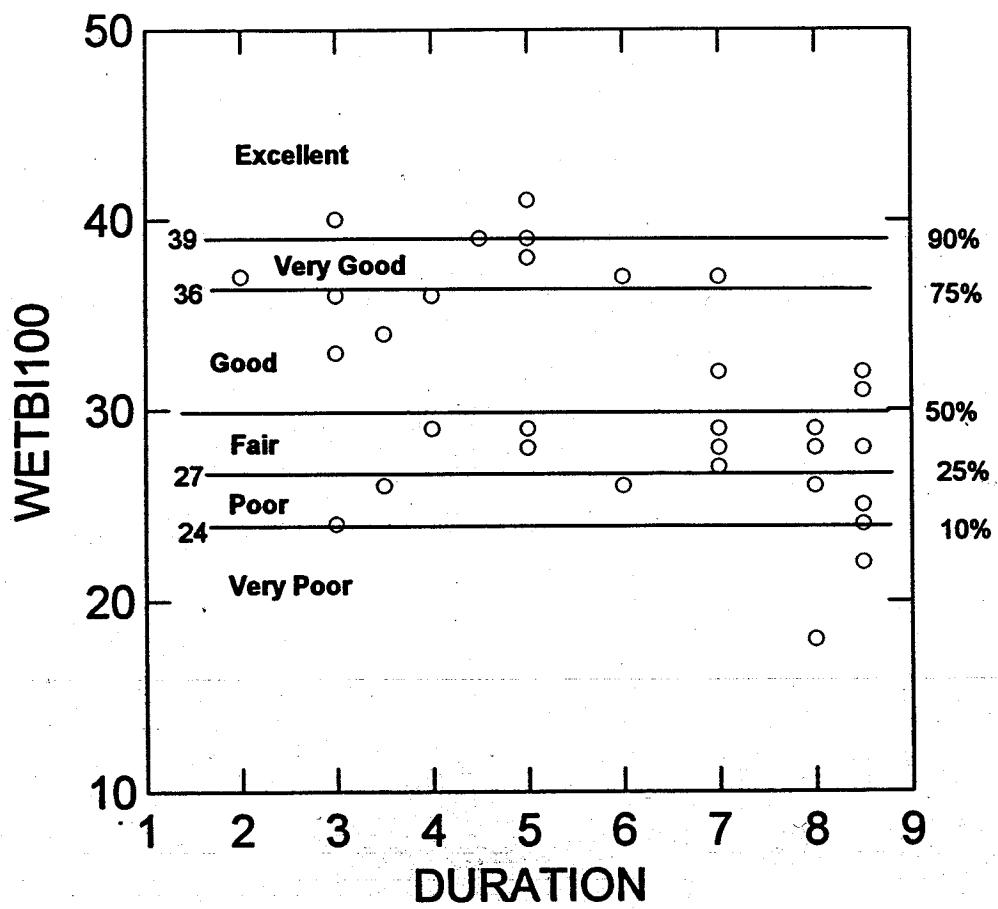
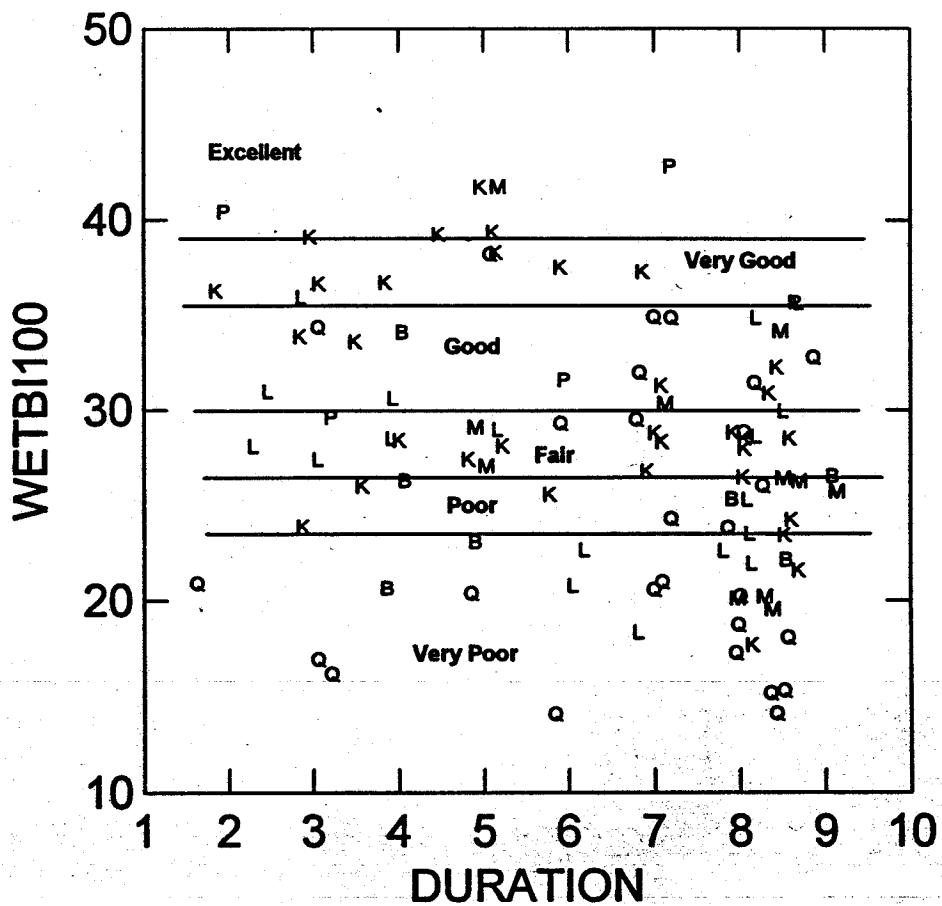


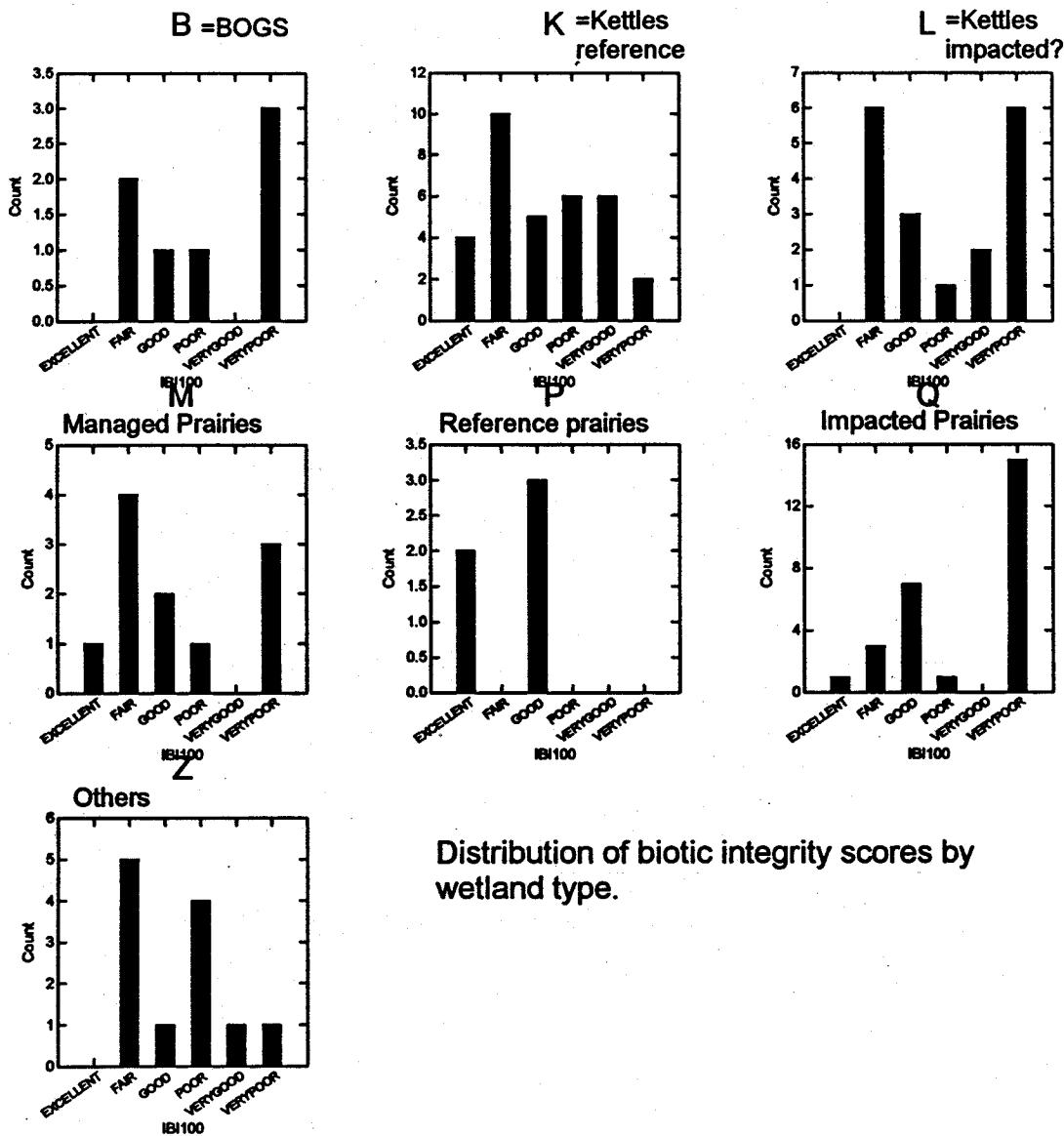
FIG. 48

Wisconsin Wetland 100-Count Macroinvertebrate Index
Scores for all wetlands except others



Where K=kettle-ref., L=kettle-imp., M=prairie-man., P=prairie-ref., Q=prairie-imp.
and B=bog

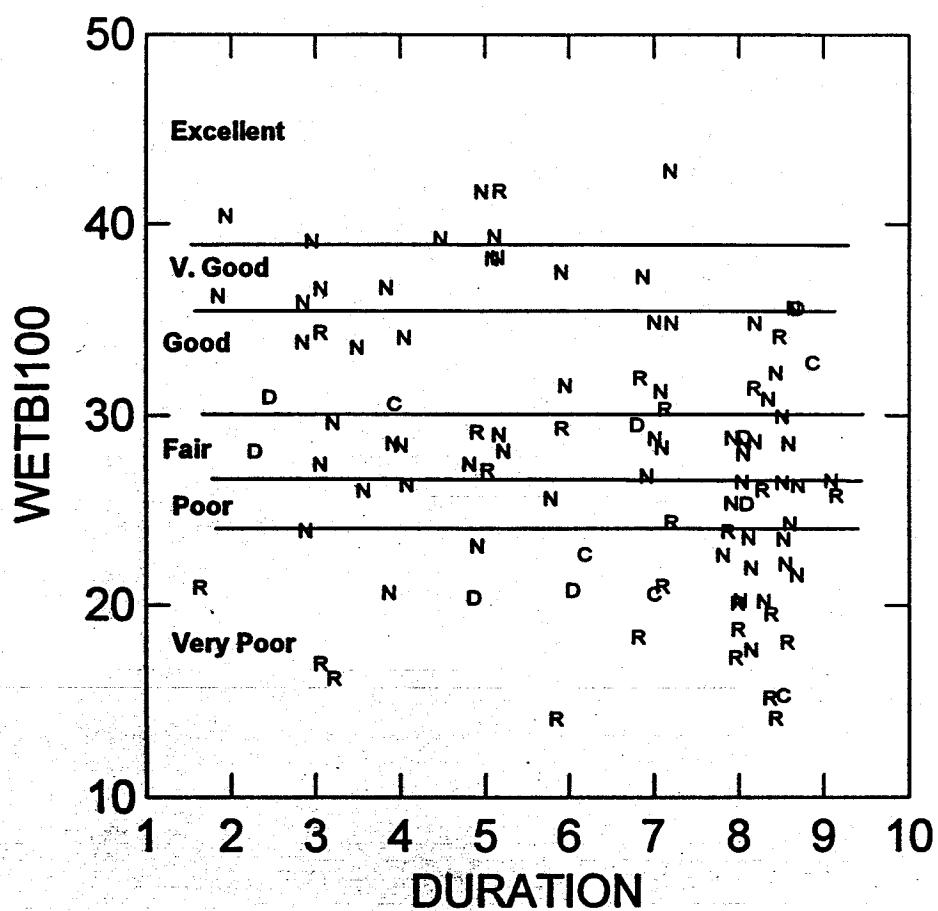
FIG. 49



Distribution of biotic integrity scores by wetland type.

FIG. 50

Wisconsin Wetland 100-Count Macroinvertebrate Index Scores by history type.

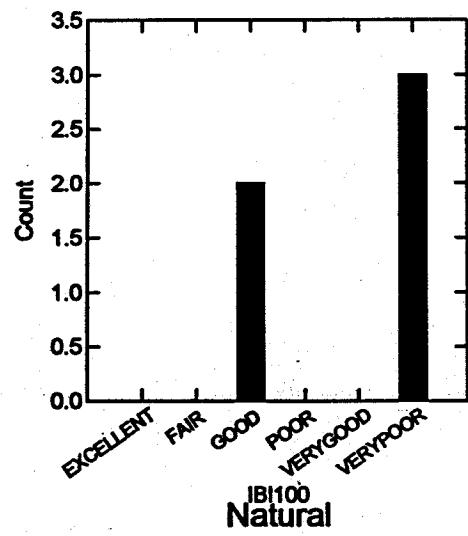


Where N=natural, C=created, D=disturbed, and R=restored

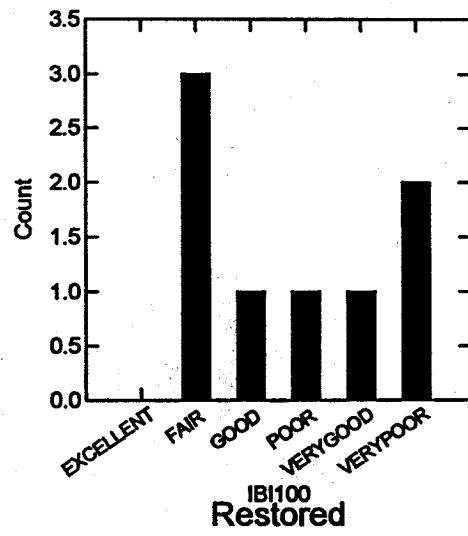
FIG. 51

Distribution of Biotic Integrity Ratings by History Classification

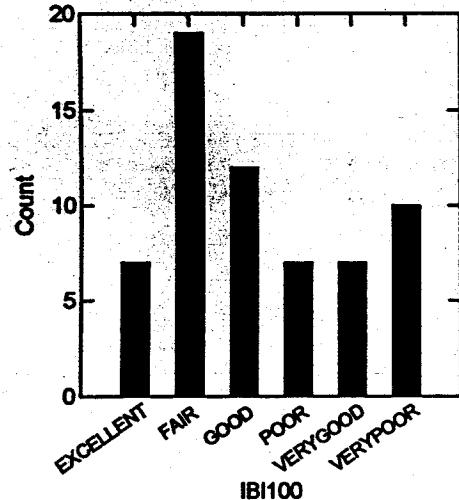
Created



Disturbed



Natural



Restored

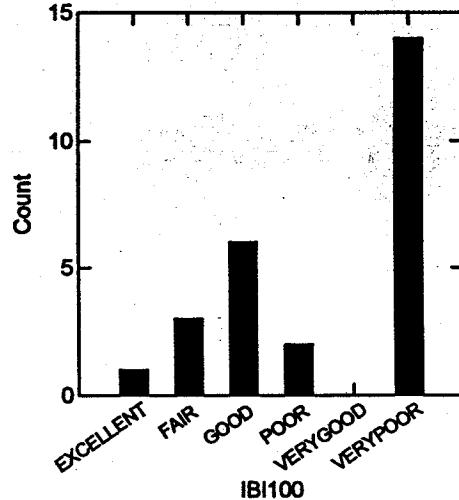


FIG. 52

**Correspondence between 100-Count MBI and subjective
Habitat Index**

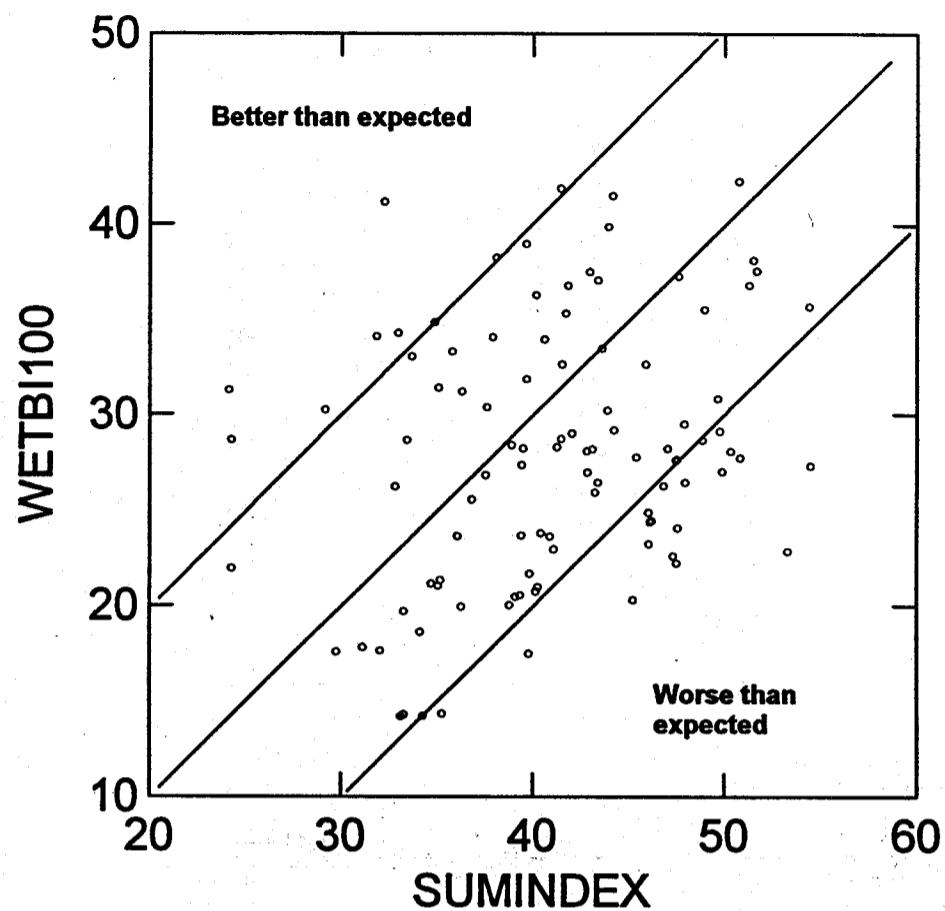
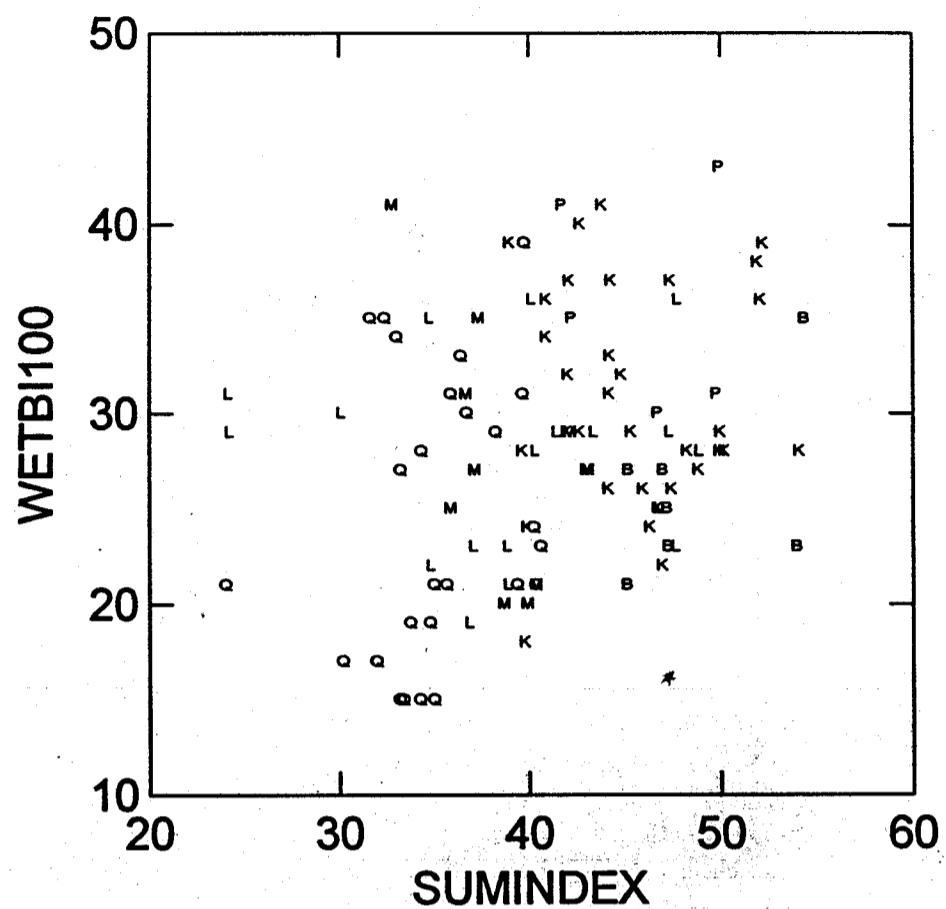


FIG. 53

Wisconsin Wetland Macroinvertebrate Biotic Index (100-Count)
versus subject multimetric Habitat Index



B=bogs
K=reference kettles
L=impacted? kettles

M=managed prairie wetlands
P=reference prairie wetlands
Q=impacted? prairie wetlands

FIG. 54

Figure __. Comparison between 100-Count MBI and the WWMBI for all samples.

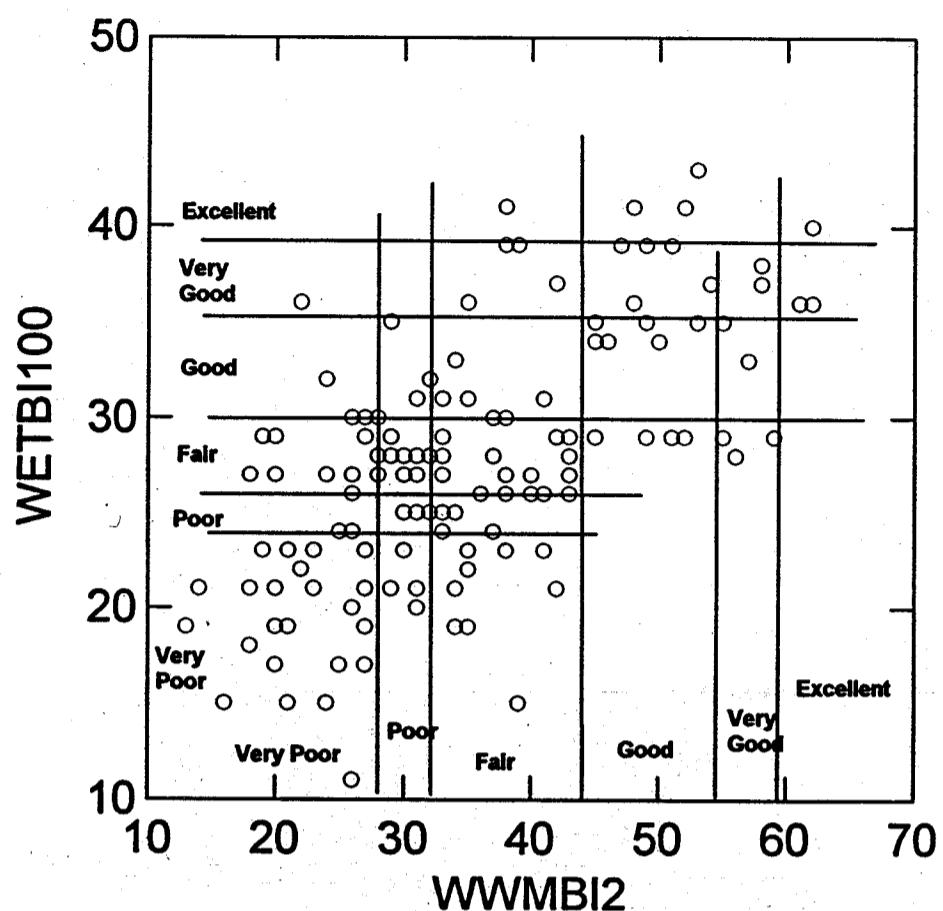


FIG. 55

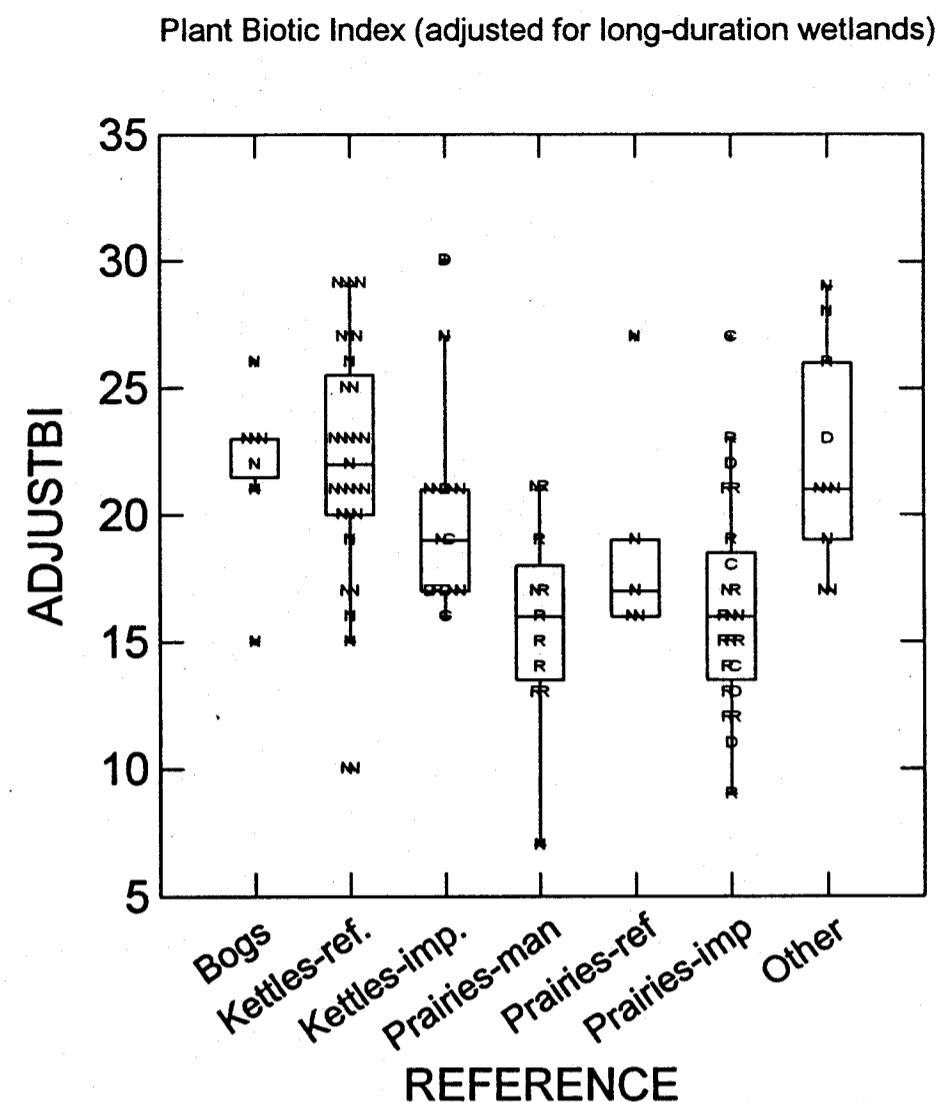


FIG. 56

Plant metric performance among "kettle" wetlands.

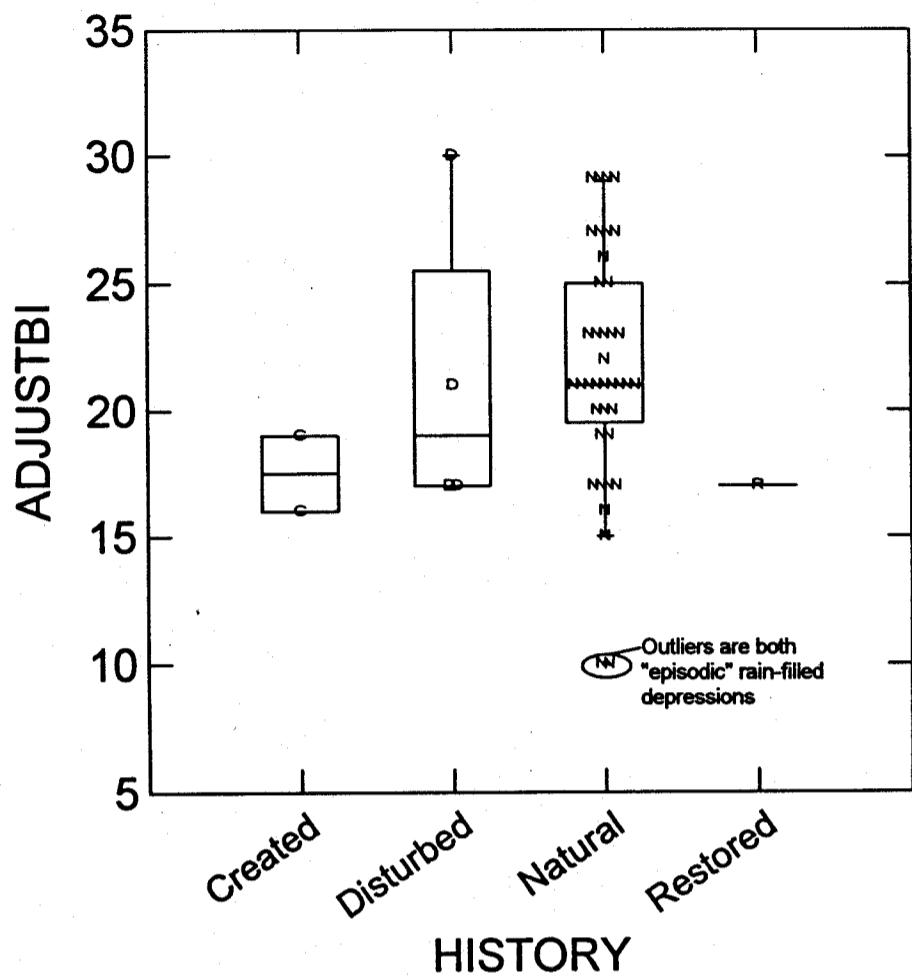


FIG. 57

Plant metric performance among all "Prairie" wetlands

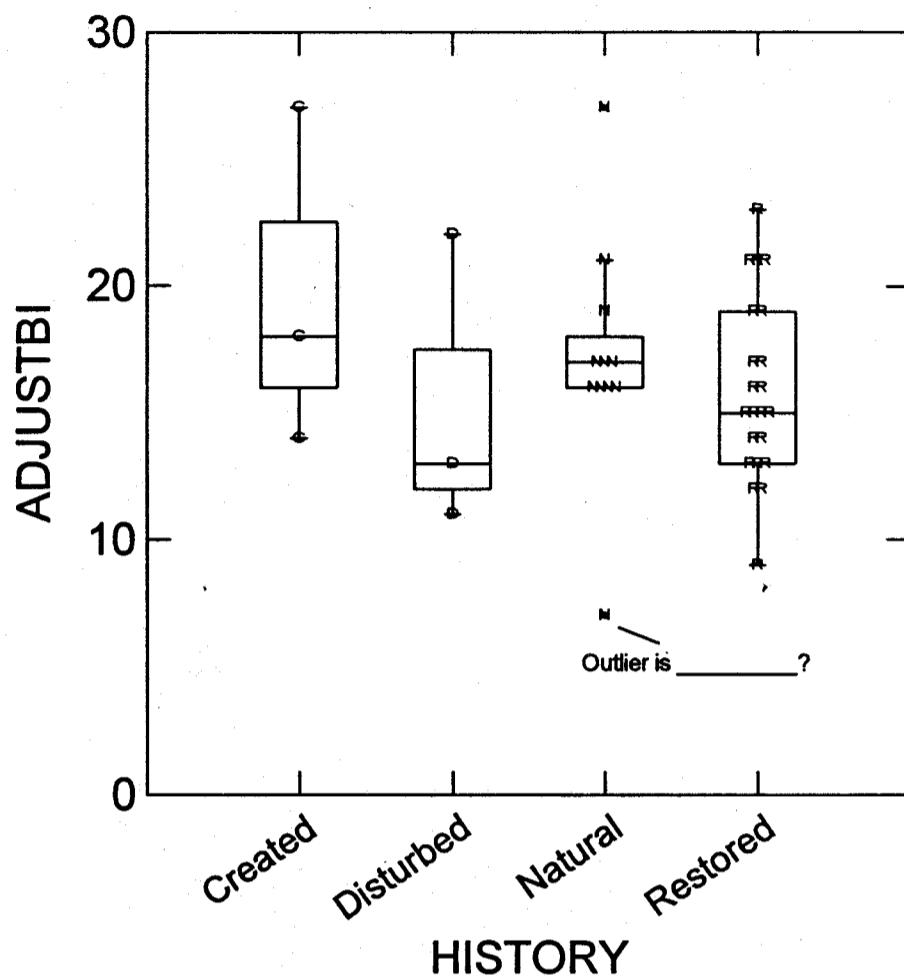
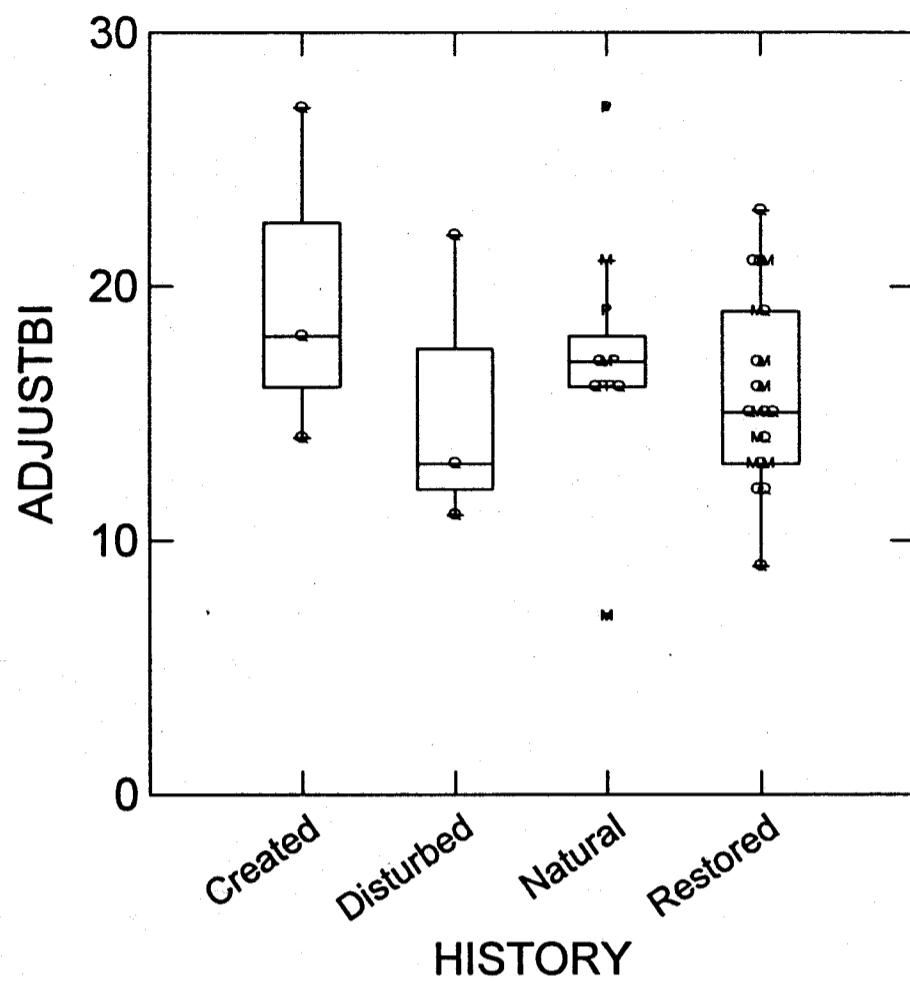
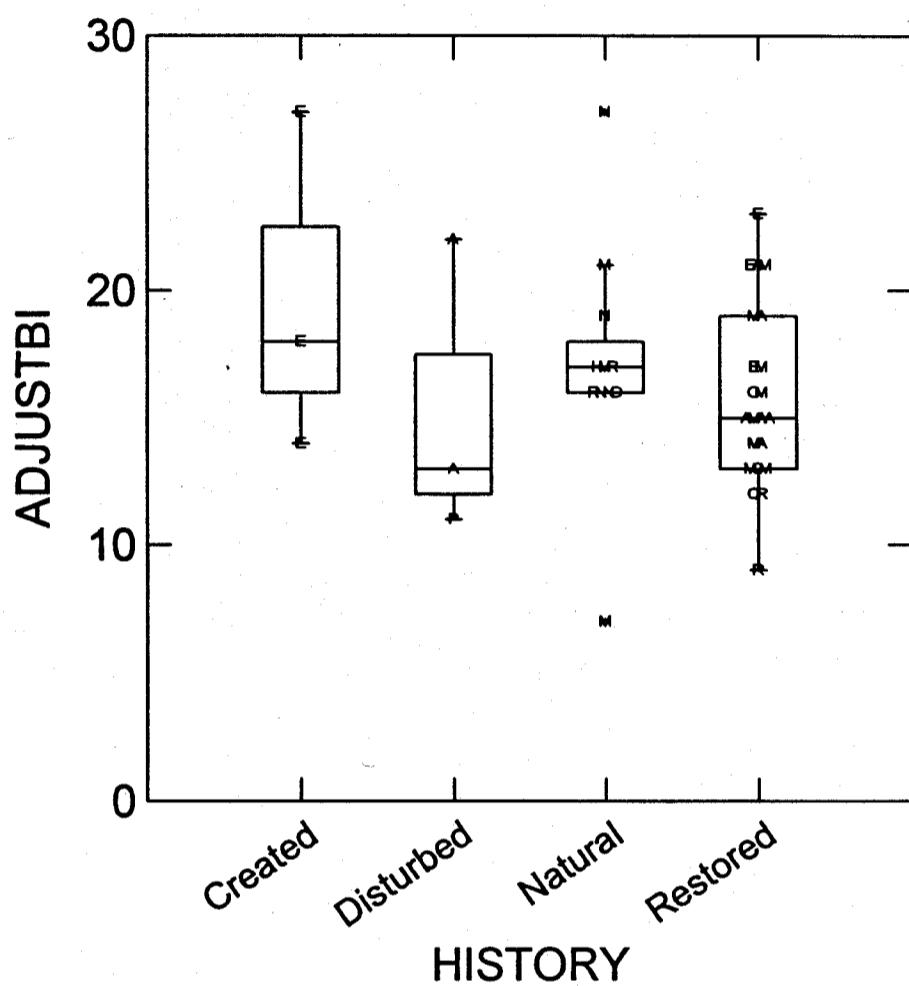


FIG. 58

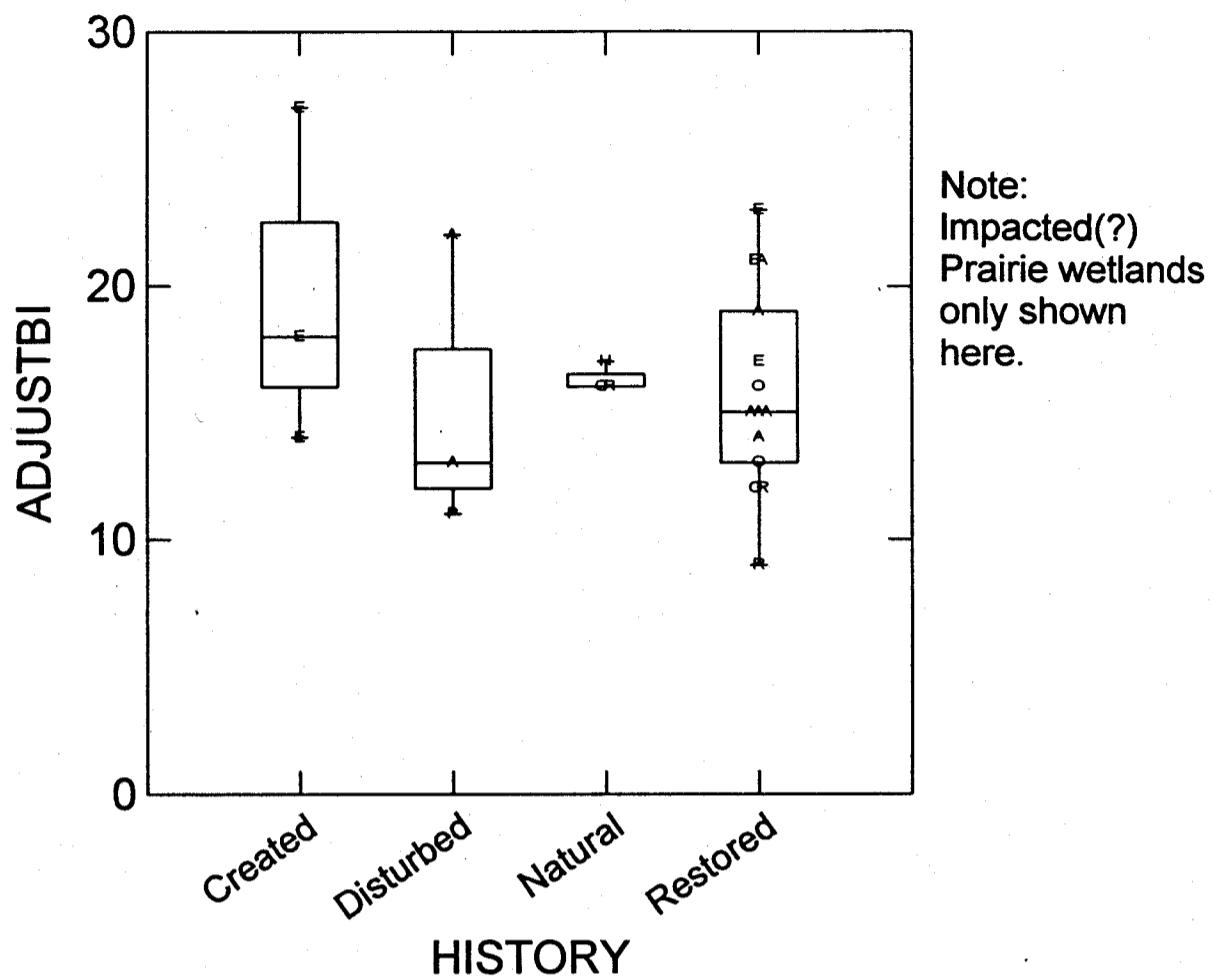
Plant biotic index as influenced by wetland history and management type (Prairies only)



Plant biotic index as influenced by wetland history
and disturbance classification (All Prairies included)



Plant biotic index as influenced by history and disturbance type.



Plant Biotic Index as influenced by wetland history
and disturbance factors

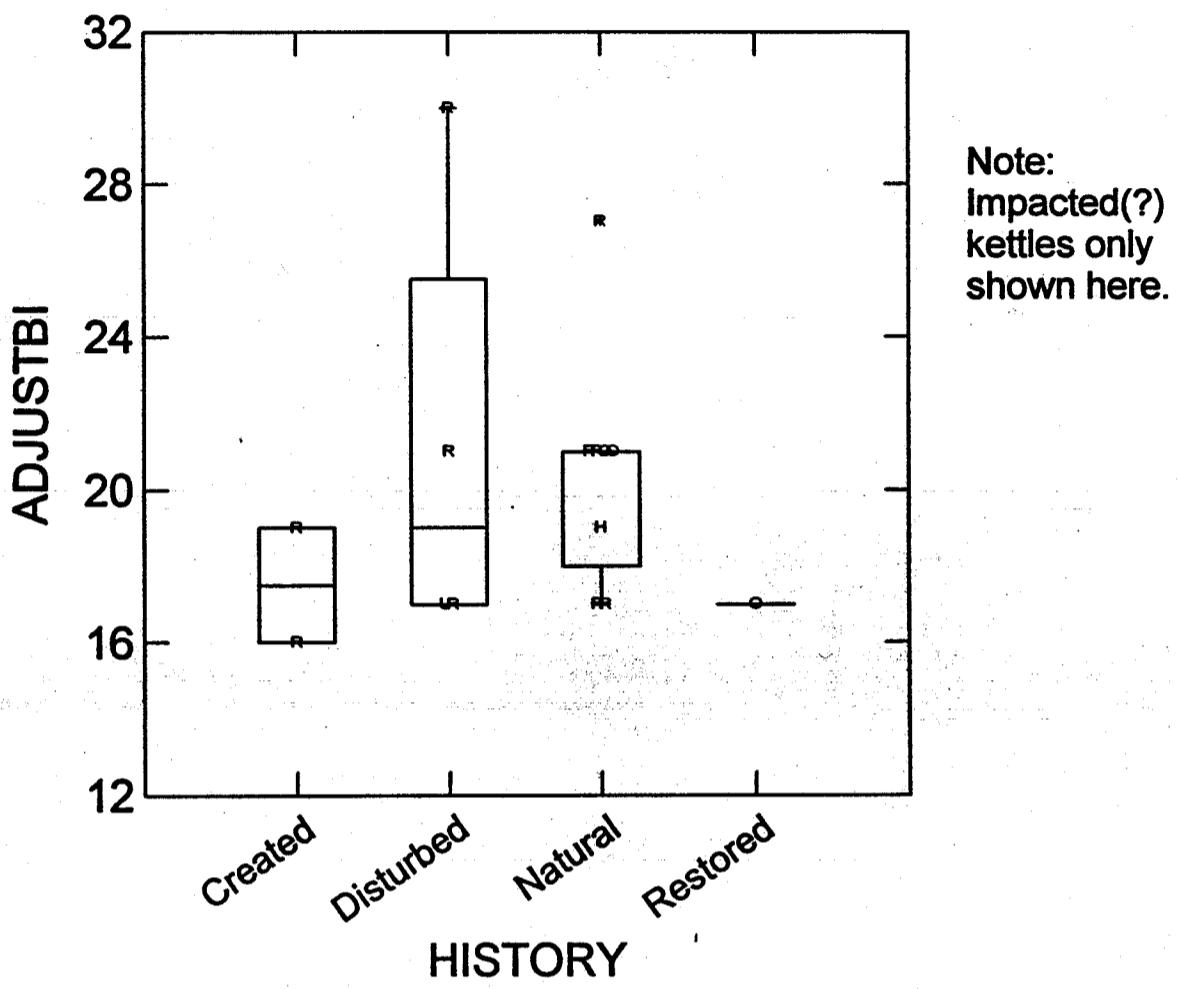


FIG. 62

**Classification of wetlands based on Wisconsin Wetland Plant
Biotic Integrity Index scores (Reference kettles only, N=29)**

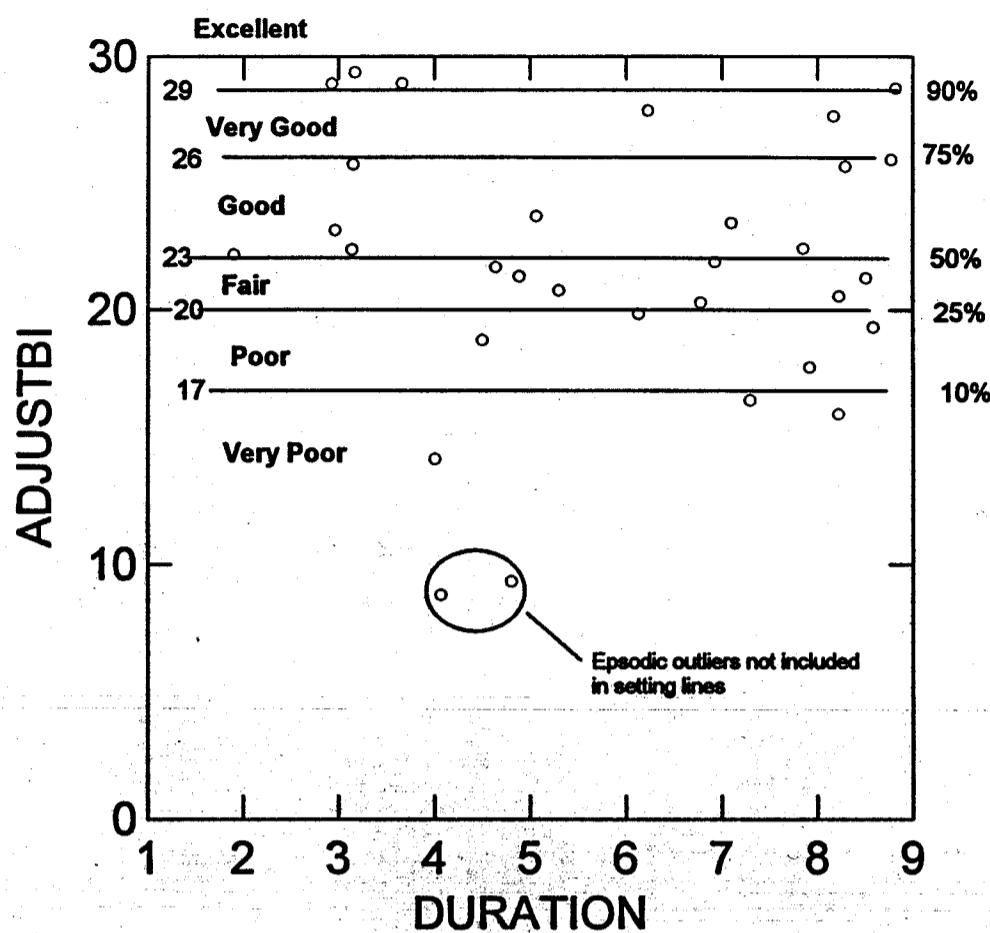


FIG. 63

**Classification of "Impacted" kettle wetlands using the Wisconsin
Wetland Plant Biotic Index system**

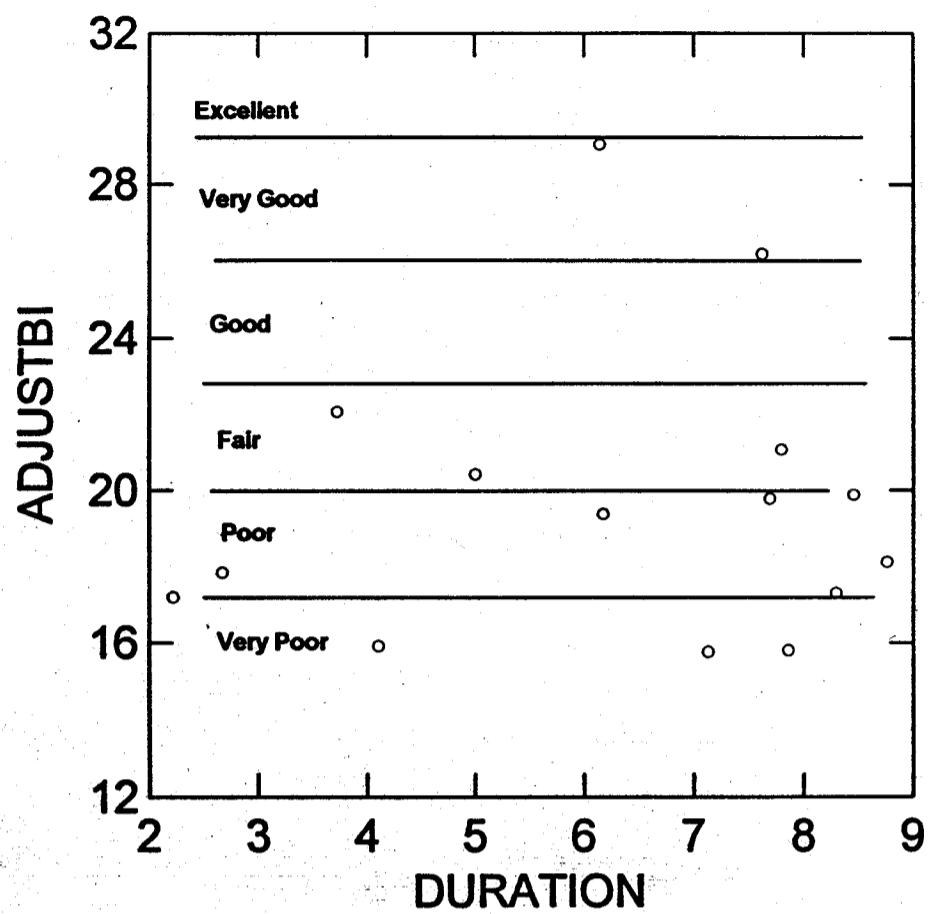


FIG. 64

Classification of Prairie wetlands using the Wisconsin
Wetland Plant Biotic Integrity Index (includes all prairie
wetlands: P=reference, M=managed, and Q=impacted)

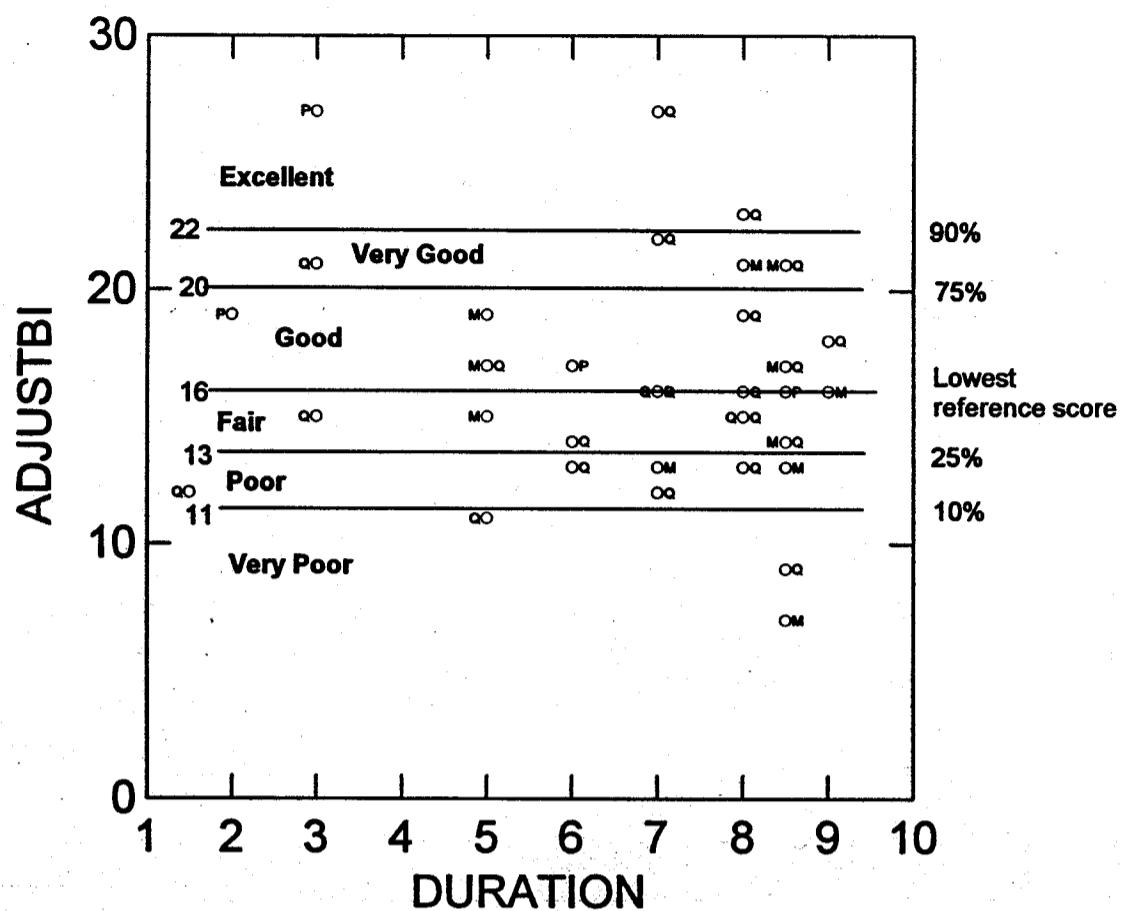


FIG. 65

Figure ____. Temporal changes in the WWMBI in four southeastern Wisconsin wetlands. Field replicates numbered 1- 3.

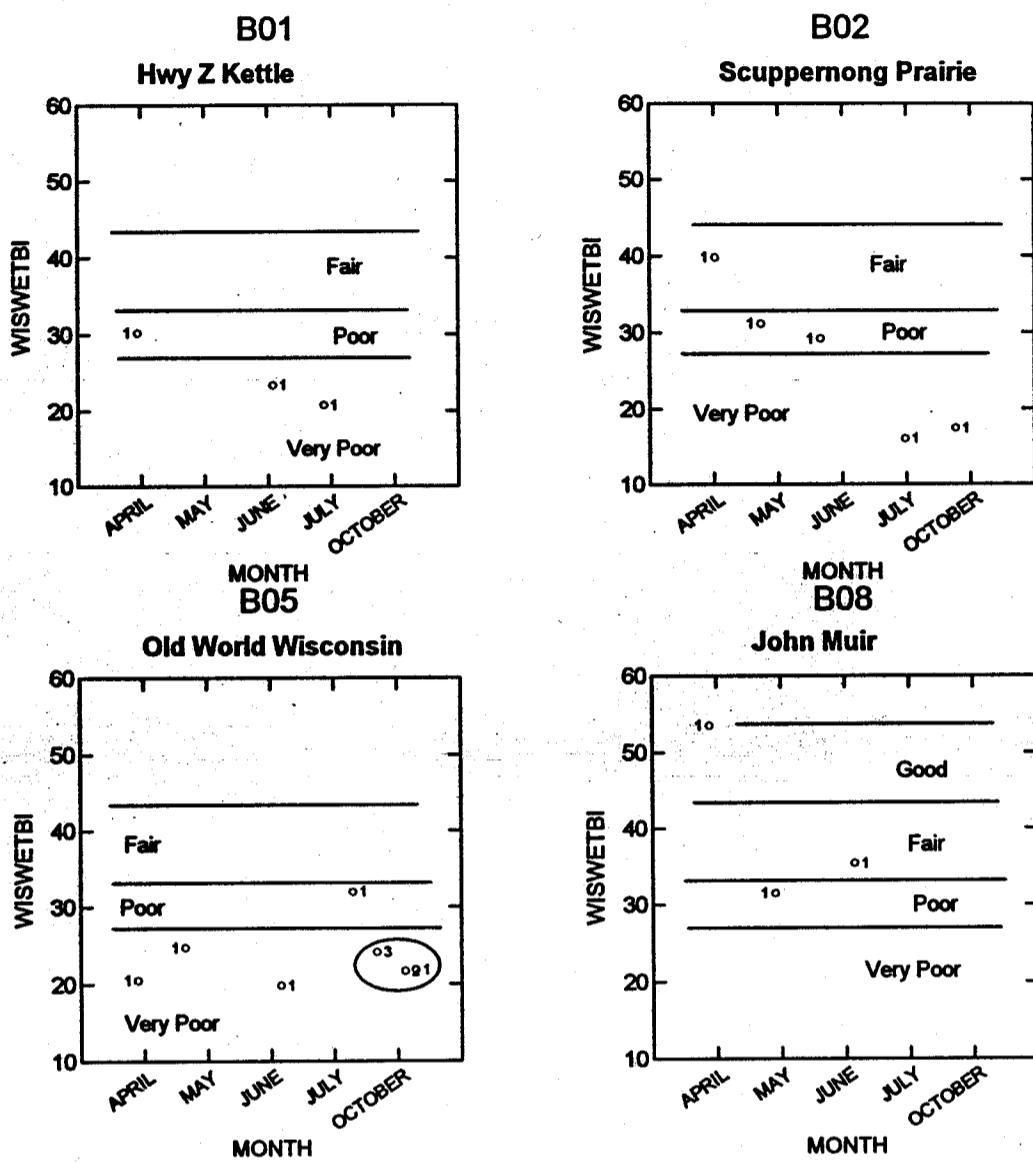


Figure _____. Temporal change in the WWMBI in four south central Wisconsin wetlands. Field replicates numbered 1-3; screened samples designated as "SC".

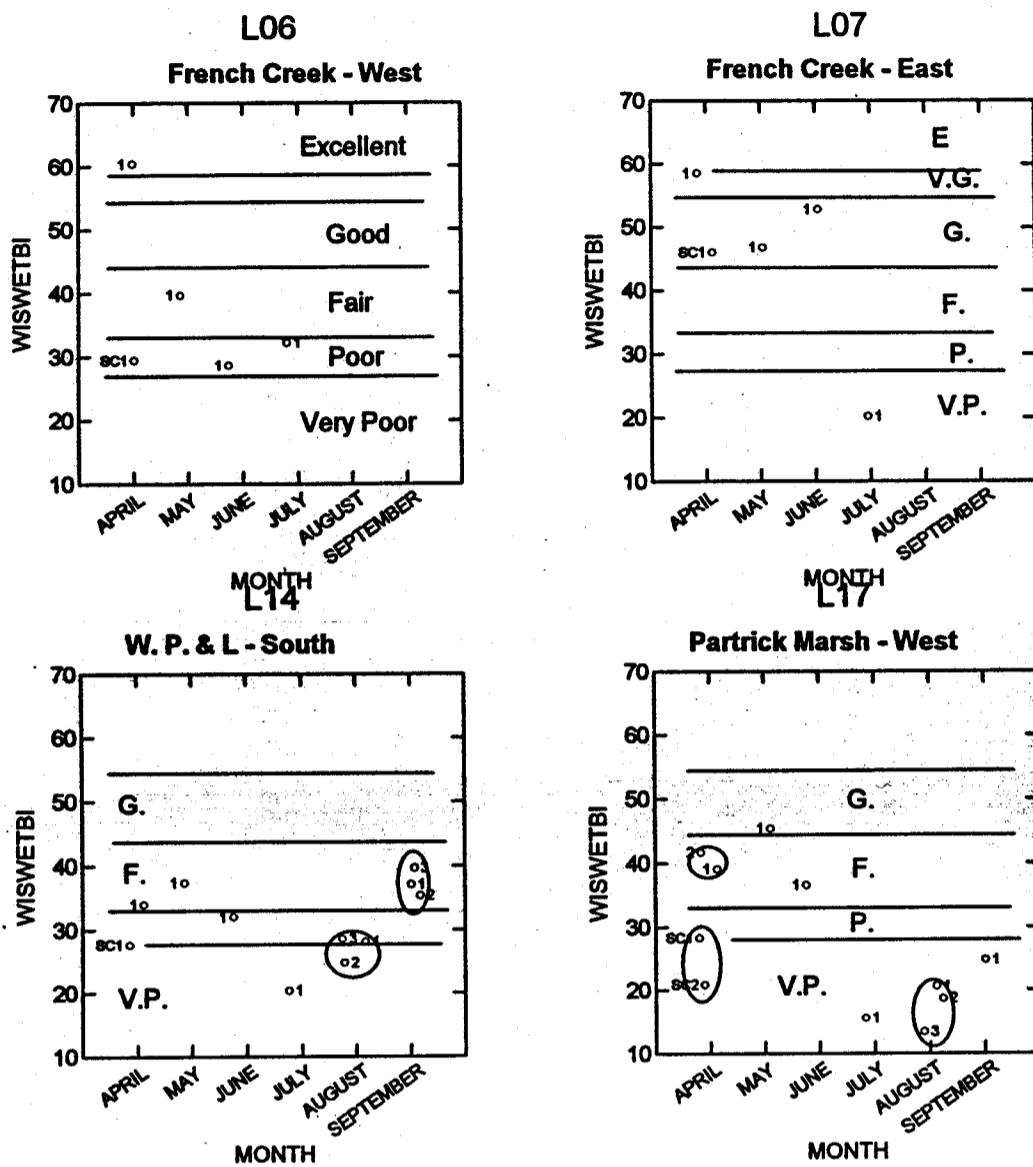
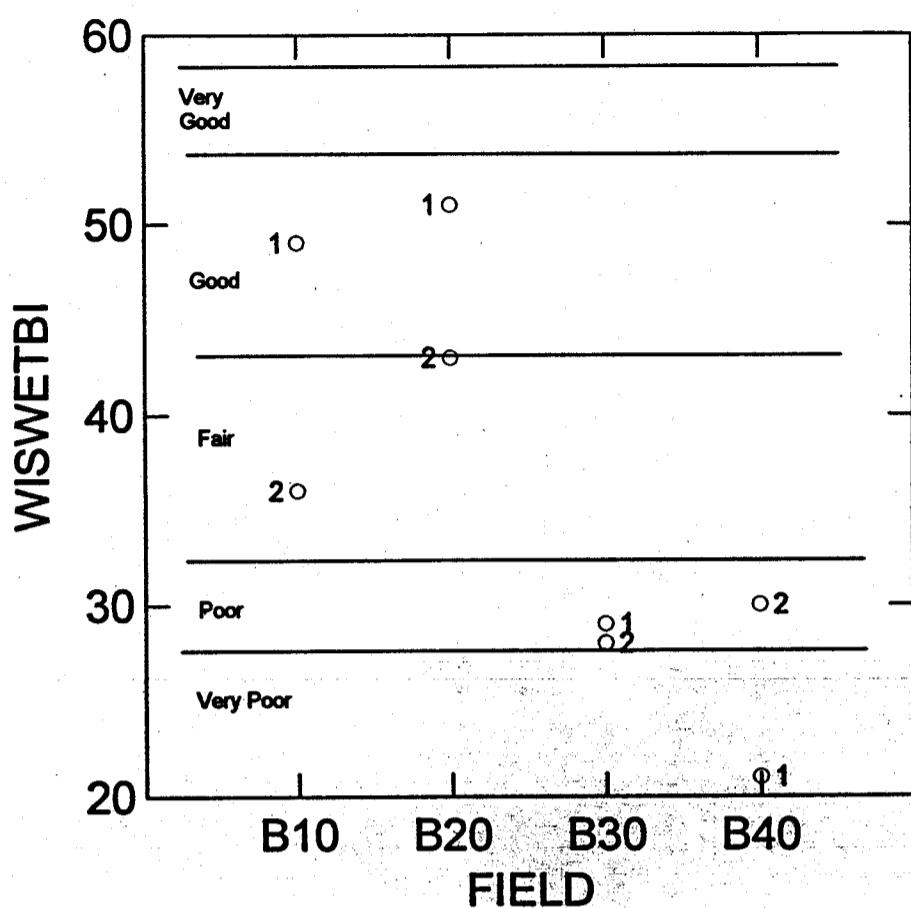


FIG. 67

Figure ___. Variation in WWMBI scores between field replicates in four southeastern Wisconsin wetlands. April 1998 samples.



[B10=Lone Tree Trail, B20=Whitnall Park, B30=Schulenberg, B40=Betry-2]

FIG. 68

Figure ___. Variation in WWMBI scores between field replicates in four northern Wisconsin wetlands. April data only.

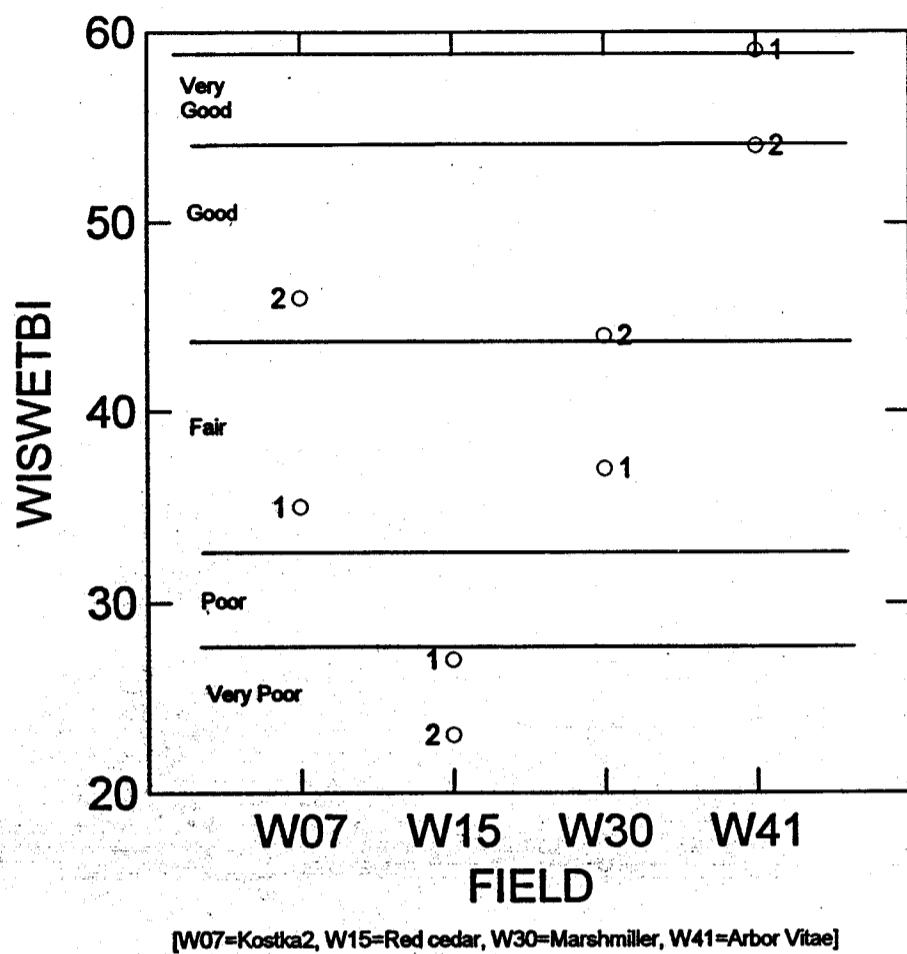


Figure __. Comparison of WWMBI scores between screen samples (=SC1) and composited kick-net samples (=1 + 2) in 15 south central Wisconsin wetlands during April 1998.

