BRISCOE IVESTER & BAZEL LLP
155 SANSOME STREET
SEVENTH FLOOR
SAN FRANCISCO, CALIFORNIA 94104
(415) 402-2700
FAX (415) 398-5630

David M. Ivester
(415) 402-2702
divester@briscoelaw.net

May 25, 2007

VIA CERTIFIED MAIL
U.S. Army Corps of Engineers
USACE Information Quality Act
Attn: Corporate Information, CECI-A
441 G Street, NW
Washington, D.C., 20314-1000

Re: Requests for Correction of Information; National List of Plant Species that Occur in Wetlands

Dear Sir or Madam:

Introduction

On behalf of the Home Builders Association of Northern California ("HBANC") and the Bay Planning Coalition ("BPC"), I hereby submit this three-part Request for Correction of Information pursuant to the Office of Management and Budget *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies* ("OMB Guidelines")[1] and Section 3.3.4 of Attachment 1 of the Deputy Secretary of Defense's Memorandum dated February 10, 2003.[2] HBANC and BPC respectfully request that the Corps correct certain information in the publication entitled National List of Plant Species that Occur in Wetlands: 1988 National Summary[3] ("1988 Plant List"), where *Lolium perenne* (perennial ryegrass) and *Picris echioides* (bristly oxtongue) are questionably

[1] The Department of the Interior adopted the OMB Guidelines published on February 22, 2002, and in a May 24, 2002 *Federal Register* notice instructed bureaus to prepare separate Guidelines.
[2] "Ensuring the Quality of Information Disseminated to the Public by the Department of Defense," Policy and Procedural Guidance ("DOD Guidance"), February 10, 2003.
[3] National List of Plant Species That Occur in Wetlands: National Summary, Porter B. Reed, Jr.; for National Wetlands Inventory and U.S. Fish and Wildlife Service in cooperation with the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Soil Conservation Service (1988).

listed in the wetland indicator category FAC* and *Lolium perenne* is not distinguished from *Lolium multiflorum* (Italian ryegrass), which is questionably omitted from the list. HBANC and BPC also respectfully request that the Corps correct certain information in its publication entitled National List of Plant Species that Occur in Wetlands: 1996 National Summary ("1996 Plant List"), where *Lolium perenne* (perennial ryegrass) and *Picris echioides* (bristly oxtongue) are questionably listed in the wetland indicator category FAC* and FAC, respectively, and *Lolium perenne* is not distinguished from *Lolium multiflorum* (Italian ryegrass), which is questionably omitted from the list. While saying that the 1996 Plant List is a "draft revision" of the 1988 Plant List, the FWS continued to publish the 1996 Plant List for more than a decade knowing that it has been and will be routinely used by the Environmental Protection Agency ("EPA"), other agencies, and private persons to delineate wetlands subject to regulation under the Clean Water Act ("CWA"). Indeed, the FWS has confirmed that that is an intended purpose of the 1996 Plant List: "The 1996 National List also was developed to aid in determining the presence of hydrophytic vegetation in the Clean Water Act Section 404 wetland regulatory program and in the implementation of the swampbuster provisions of the Food Security Act."[4]

In December 2006, the responsibility to maintain and update the Plant List was transferred from the U.S. Fish and Wildlife Service to the U.S. Army Corps of Engineers.[5] In the Memorandum of Agreement announcing this change, it states that "[S]cientists at the Corps Engineering Laboratory in Hanover, New Hampshire, will maintain the List, in coordination with the ERDC Environmental Lab in Vicksburg, Mississippi, and share the data with all of the agencies and interested parties. National and Regional Interagency Review Panels, made up of representatives from the Corps, EPA, FWS, and NRCS, will prepare updated National and Regional Lists."[6] Because FWS composed and maintained these Lists for almost two decades and will work with the Corps to update the Lists, HBANC and the BPC will simultaneously submit these Requests for Correction to the FWS as well.

In 1987, the indicator status of *Lolium perenne* and *Picris echioides* was changed from facultative upland and upland respectively, to facultative*, and remained as such in the 1988

[4] National List of Vascular Plant Species That Occur in Wetlands: 1996 National Summary, Introduction.
[5] Memorandum of Agreement among the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service for the Purpose of Transferring Responsibility for Updating and Maintaining the National List of Vascular Plant Species that Occur in Wetlands, last signed December 12, 2006.
[6] *Id.*

Plant List. In the 1996 Plant List, *Lolium perenne* remained facultative* while *Picris echioides* dropped the asterisk, and became facultative. Soon after this change, the Bay Planning Coalition hired Harvey and Stanley Associates, Inc., to prepare a report[7] detailing the appropriate methodology for quantitatively assessing the indicator status of species. The report applied that methodology to *Lolium perenne* and *Picris echioides*, and concluded that both should be designated as FACU species.[8] In over twenty years, FWS has not provided one piece of scientific evidence indicating the basis for designating *Lolium* and *Picris* as such and has provided no explanation for excluding *Lolium multiflorum* from these Plant Lists.

Founded in 1983, the Bay Planning Coalition ("BPC") is a non-profit, membership-based organization representing the maritime industry and related shoreline business, ports, local governments, landowners, recreational users, environmental and business organizations, and professional service firms in engineering, construction, law, planning, and environmental sciences. The Bay Planning Coalition advocates for the balanced use and regulation of San Francisco Bay-Delta resources to ensure the economic prosperity and environmental protection of the region.[9]

The Home Builders Association of Northern California is a professional, non-profit association committed to promoting housing for people of all income levels and the production of quality homes. HBANC represents about 1,000 homebuilders, trade contractors, suppliers, and industry professionals in fourteen Northern California counties from Mendocino and Lake in the north to Monterey and San Benito in the south. Every member of HBANC also joins the California Building Industry Association and the National Association of Home Builders in a three-in-one membership structure for local, state, and national home building industry affiliations.

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[7] "A Study of the Habitat Occurrence of *Lolium perenne* and *Picris echioides*," by Harvey and Stanley Associates, Inc., July 18, 1987, File No. 330-02.

[8] *Id.*

[9] In the San Francisco Bay Area, a geographic region of relatively high rainfall, extensive fog cover and/or low evaporation potential, *Lolium perenne* is able to germinate and grow in settings that are clearly devoid of wetland hydrology and hydric soil features. Thus, the BPC is uniquely suited to promote the argument that the FAC* wetland indicator status for Lolium is unreliable.

Discussion

I. Summary of Requests for Correction of Information

HBANC and BPC submit that the Corps is currently disseminating unproven and misleading information regarding the designation of *Lolium perenne* and *Picris echioides* with wetland indicator statuses of FAC* and FAC in Region 0. The Corps has not provided any scientific evidence indicating the basis for these designations. Furthermore, by not distinguishing *Lolium perenne* from *Lolium multiflorum*, which is conspicuously absent from the 1988 and 1996 Plant Lists, EPA, private persons, and others are misled and, consequently, commonly treat *Lolium multiflorum* as *Lolium perenne* in the field. As discussed further below, the 1988 and 1996 Plant Lists include "information" disseminated by the Corps on its District's websites[10] to the regulated community (including HBANC and BPC members). This information is unproven, misleading, and fails to conform to the standards of quality, objectivity, utility, and integrity applicable to the dissemination of information by the Corps as required by the Information Quality Act[11] ("IQA") and the OMB and Department of the Army Guidelines implementing the IQA.[12]

As a result of the dissemination of the 1988 and 1996 Plant Lists, questionable information regarding the necessity to obtain permits under section 404 of the Clean Water Act to fill purported wetlands has been and is being presented to HBANC and BPC members. Members of these groups have contacted and will contact staff for compliance advice as a result of the unproven and misleading information, will foreseeably rely on the information to obtain permits when they are not legally obligated to do so, and/or will invest further resources in ascertaining their actual obligations for Clean Water Act permit coverage. As affected persons, HBANC, BPC, and its members are entitled to seek correction of the information in the 1988 and 1996 Plant Lists through the procedures for administrative review authorized in the OMB

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[10] For example, the US Army Corps of Engineers Charleston District website includes a link to the Plant List (http://www.sac.usace.army.mil/?action=permits.forms).

[11] Public Law 106-554, § 1(a)(3) [Title V § 515], Stat. 2763 (2000), *reprinted* at 44 U.S.C. § 3516, note (hereinafter "IQA, § 515").

[12] The IQA required the OMB to prepare guidelines implementing the IQA's requirements, namely, to ensure and maximize the quality, objectivity, utility, and integrity of information disseminated by federal agencies. *Id.* at § 515(a). The OMB Guidelines require each federal agency to issue its own guidelines implementing the IQA and conforming to the OMB Guidelines. OMB Guidelines, § II.1, 67 Fed. Reg. at 8458.

Guidelines and prescribed in the Department of Army Guidelines. Correcting the questionable information in the Plant Lists, along with an acknowledgment by the Corps that its previous dissemination was inaccurate and misleading, will benefit HBANC, BPC, and its members by clarifying the circumstances under which individuals are legally required to obtain CWA permits for certain construction activity. That clarity will enable builders and other members of the public to know what the CWA demands of them so they may better conform to the law and plan their construction of housing with greater certainty.

We ask that the Corps respond to these Requests within 60 days, as prescribed by its Guidance.[13]

II. Federal Guidelines Authorize these Requests for Correction

Under the IQA and the DOD's implementing Guidance, HBANC and BPC are authorized to seek correction of the wetland indicator status of *Lolium perenne* in Region 0 from FAC* to FACU or NI[14], of *Picris echioides* from FAC to FACU or NI, and to add *Lolium multiflorum* to the Region 0 Plant List with a wetland indicator status of FACU or NI. These wetland indicator statuses constitute information that has been disseminated by the Corps within the meaning of the IQA, and must be corrected through the administrative process established by the Agency pursuant to the IQA, OMB Guidelines and the DOD Guidance. Moreover, HBANC and the BPC and its members have been and will be adversely affected by the dissemination of this information and therefore are entitled to seek correction of the information.

The DOD Guidance applies to all information disseminated by the Corps to the public, including information initiated or "sponsored" by the Corps. "Sponsored information" is information the Corps initiates or sponsors for distribution to the public. While the FWS prepared the 1988 and 1996 Plant Lists and distributed the information to the public, as stated above, in December 2006, the responsibility to maintain and update the 1988 Plant List was transferred to the Corps. To the best of my knowledge, the Corps has not changed the 1988 Plant List since assuming responsibility to maintain and update it.

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[13] DOD Guidance, § 3.3.4.

[14] "Unreviewed species were assigned as NI (non indicator) assignment if the Review Panel had little or no information on which to base an Indicator status." National List of Plant Species That Occur in Wetlands: National Summary, Porter B. Reed, Jr. (1988), p. 5.

The designations of wetland indicator status in the 1988 and 1996 Plant Lists certainly qualify as "information disseminated by the Corps." The OMB Guidelines define "information" as any communication or representation of knowledge such as facts or data, in any medium or form.[15] Indeed, the Plant Lists set forth as "knowledge" or "fact" the wetland indicator status of *Lolium perenne* and *Picris echioides*. The Plant Lists plainly are "disseminated to the public" in the form of "publication (electronic or written) to a community or audience" within the meaning of the OMB Guidelines.[16]

Stricter quality standards are applicable to influential scientific information.[17] "Influential" means scientific, financial, or statistical information with a clear and substantial impact on important public policies or important private sector decisions."[18] OMB maximizes the quality of "influential" information by ensuring that this information, such as analytic results, "ha[s] a high degree of transparency regarding the source of the information, assumptions employed, analytical methods applied, and statistical procedures employed."[19]

Here, the 1988 and 1996 Plant Lists designations constitute influential scientific information that clearly and substantially affects important public policies and important private sector decisions. The Corps has failed to provide any scientific sources for the information. As discussed below, the specified wetland indicator designations in the Plant Lists do not meet this standard.

Finally, HBANC and BPC are among those entitled to seek correction of the information in the Plant Lists. The OMB Guidelines create administrative mechanisms by which any affected person may seek correction of information. The questionable information in the Plant Lists adversely affects HBANC and BPC and its members because the information will foreseeably lead members to seek and perhaps obtain permits to fill purported wetlands when they would not be legally obligated to do so, thereby costing such members substantial amounts of time and money. Thus, HBANC and the BPC and its members would benefit by the correction of the questionable information. As a result, these groups are entitled to submit these Requests for Correction of Information on behalf of their members.

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[15] 67 Fed. Reg. at 8460.
[16] *Id.*
[17] *Id.* at 8455.
[18] *Id.*
[19] *Id.*

III. The 1988 Plant List Questionably Designates *Lolium perenne* and *Picris echioides* as FAC*; the 1996 Plant List Questionably Designates *Lolium perenne* as FAC* and *Picris echioides* as FAC; and by Omitting *Lolium multiflorum*, Effectively and Questionably Treat it as *Lolium perenne*

Under the manual issued by the Corps for the purpose of wetland delineation, hydrophytic vegetation includes those plant species ("hydrophytes") that possess physiological features or reproductive adaptations that allow them to persist in soils subject to prolonged inundation and anaerobic soil conditions. Plant species that at least sometimes occur in wetlands are classified as wetland indicators by their probability of being associated with wetlands or uplands. The spectrum ranges from obligate to facultative upland. Obligate ("OBL") species almost always (greater than 99 percent of the time) occur in wetlands. Facultative Wetland ("FACW") species occur in wetlands 67 to 99 percent of the time. Facultative ("FAC") species have an equal probability (34 to 66 percent) to occur in wetlands and uplands. Facultative Upland ("FACU") species occur in wetlands one to 33 percent, and Upland ("UPL") species occur in wetlands less than one percent of the time. A No Indicator ("NI") designation is used if little or no information existed on which to base an indicator status. The practical ramification of these indicator designations is that in delineating wetlands under the Corps manual, OBL, FACW, and FAC plants "count" toward identifying an area as a wetland, and UPL, FACU, or FAC- plants do not. Therefore, the proper indicator designation is critical to proper delineation of wetlands subject to regulation under the Clean Water Act. A questionable indicator designation for a plant could lead to questionable identification of an area occupied by that plant as a wetland—or vice versa.

Prior to 1987, the FWS designated *Lolium perenne* as FACU and *Picris echioides* as UPL in its wetland plant list for California. In 1987, the FWS changed the wetland indicator status of both species to FAC in its list. In response to this change, the BPC requested documents pertaining to these changes from the FWS under the Freedom of Information Act. The FWS produced two documents of no consequence. The BPC commissioned a study by Harvey and Stanley Associates, Inc., an ecological consulting firm, of the frequency of occurrence of these species in wetlands and submitted a report of this study to the FWS (a copy of which is enclosed) with a request to change their wetland indicators statuses to FACU. The report presented the results of the study indicating that of the area covered by *Lolium perenne*, only 7% was wetland, and of the area covered by *Picris echioides*, only 7% was wetland. The report concluded that both species should be designated as FACU. This evidence seems to have been disregarded.

A. *Lolium perenne* and *Lolium multiflorum*

The 1988 and 1996 Plant Lists designate *Lolium perenne* as FAC*. According to Reed (1988), the asterisk (*) indicates that status was a tentative assignment derived from "limited ecological information" and "made with less confidence than the other indicator assignments."[20] The publication further provides that "[u]sually no review was received from regional ecologists for these asterisked species."[21] The Introduction of the 1996 Plant List affirms that "[a]n asterisk (*) following a regional indicator identifies tentative assignments based on limited information or conflicting review."

Given the "tentative" nature of the FWS's designation of *Lolium perenne* as FAC* in Region 0 and acknowledgment that that designation is made with less confidence because it is based on limited or no information or perhaps conflicting review, we trust that the Corps anticipates that review of the designation may reveal the need for correction.

In its 1988 and 1996 Plant Lists, the FWS has identified eleven regions in the continental United States and Alaska and has indicated that *Lolium perenne* exists in all eleven regions. In its 1988 Plant list, the FWS has designated *Lolium perenne* as FACU or FACU- in all regions but one. In Region 0 (California), as discussed above, the FWS switched the designation of *Lolium perenne* from FACU to FAC*. In its 1996 Plant List, the FWS has listed *Lolium perenne* as FAC* in Region 0 (California) and Region 9 (Northwest) and has maintained its designation as FACU or FACU- in all other regions.

In its 1988 and 1996 Plant Lists, the FWS inexplicably omits *Lolium multiflorum*, an exceedingly common species in most of California's grasslands, and thus fails to distinguish it from *Lolium perenne*, with the result that, in practice, those using the Plant Lists commonly treat *Lolium multiflorum* as *Lolium perenne*. The U.S. Department of Agriculture and the federal integrated Taxonomic Information System recognize these two plants as separate subspecies. In California, the editors of the Jepson Manual, the authoritative treatise of vascular plants throughout the state, classify them as separate species.[22] The scientific literature reveals that these two plants differ genetically, anatomically, physiologically, and ecologically. By its failure to treat them as such, the FWS, and now the Corps, has effectively conflated them. This lack of

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[20]National List of Plant Species That Occur in Wetlands: National Summary, Porter B. Reed, Jr. (1988), p. 5.

[21] *Id.*

[22] *The Jepson Manual: Higher Plants of California*, James C. Hickman, 1993.

a clear recognition regarding the taxonomy of *Lolium multiflorum* and lack of a published wetland indicator status has led to substantial confusion and the common treatment of *Lolium multiflorum* as FAC* *Lolium perenne* without scientific basis.

B. *Picris echioides*

The 1988 Plant List designates *Picris echioides* as FAC* in California and UPL, UPL*, FAC, and NI respectively in the other four regions said to be occupied by the plant. "NI" denotes "no indicator" and means that insufficient information was available to determine an indicator status. It is curious that both the designation NI and the asterisk are used, as both denote an insufficiency of information.[23]

The 1996 Plant List shifts *Picris echioides* to FAC in California, dropping the asterisk. It designates the plant as UPL or UPL* in the other three regions said to be occupied by the plant, removing the earlier FAC designation for one region. In this list, the FWS shifted the plant out of FAC in one region and recognized it as an upland species in all regions, except California. With respect to California, the FWS removed the asterisk seemingly becoming more convinced that the plant is FAC in this one region.

C. Lack of Scientific Evidence

The Corps has failed to set forth any scientific evidence indicating the basis for these designations and the lack thereof for *Lolium multiflorum*. In 1987, Harvey and Stanley Associates, Inc. prepared a report[24] for the FWS detailing the reasons *Lolium* and *Picris* had been questionably characterized as FAC species at that time and calling for a redesignation of both as FACU species. FWS failed to adequately respond and has not since changed these designations. HBANC and BPC and its members respectfully inquire:

What scientific and other evidence supports these designations?

How are these designations made?

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[23] There is an important distinction between the two in the case of the FAC* designation in wetland delineation practice, because plants listed as FAC* are counted as hydrophytes, whereas those listed NI are treated as upland species.

[24] "A Study of the Habitat Occurrence of *Lolium perenne* and *Picris echioides*," by Harvey and Stanley Associates, Inc., July 18, 1987, File No. 330-02.

Did the Regional Interagency Review Panel review the 1987 Harvey and Stanley report prior to republishing the 1988 list?

In 1997, more than eight years following the publication of the first "official" wetland plant list, the FWS circulated a draft list of revisions to the 1988 Official Plant List for general review. In the draft revision, *Lolium multiflorum* had not been added and the indicator status for *Lolium* had not been changed in Region 0, again indicating that there was no scientific information about these species' affinities to wetlands in California. Ten years later, in 2007, the draft revision remains unadopted. Thus, almost twenty years after the Plant List was published, the FAC* designation for *Lolium* remains tenuous, as does the FAC designation for *Picris*, as no evidence has been set forth to support a scientifically defensible listing for these species.

IV. These Designations Fail to Satisfy OMB's Standard for Pre-dissemination Review and Information "Quality"

The inclusion of these questionable designations and the failure to designate *Lolium multiflorum* are contrary to the standards established by OMB concerning the quality of information disseminated by an agency. The OMB Guidelines require agencies to "take appropriate steps to incorporate information quality criteria into agency information dissemination practices."[25] "Quality" is defined as a term encompassing "utility," "objectivity," and "integrity."[26] These designations lack both objectivity and utility and therefore violate the information quality standards adopted by OMB.

First, misleading people with these unproven designations violates OMB guidelines concerning the "objectivity" standard. In order to meet the standards for "objectivity," information that is being disseminated must be presented in "an accurate, clear, complete, and unbiased manner."[27] "Objectivity" also requires information to be presented "within the proper context."[28] In addition, information disseminated must, as a matter of substance, be accurate, reliable, and unbiased.[29] In a scientific context, "the original and supporting data shall be generated, and the analytic results shall be developed, using sound statistical research

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[25] 67 Fed. Reg. at 8458.
[26] *Id.* at 8459.
[27] *Id.*
[28] *Id.*
[29] *Id.*

methods."[30] OMB's Guidelines pledge to "identify the sources of the disseminated information (to the extent possible, consistent with confidentiality provisions) and include it in a specific financial or statistical context so that the public can assess for itself whether there may be some reason to question the objectivity of the sources."[31] This is simply not happening here.

These unproven designations fail to satisfy the OMB Guidelines' objectivity requirements in several respects. The information is not substantively objective because it is unsupported by scientific evidence, as demonstrated above. In addition, the classifications lack substantive objectivity because they display strong bias to the extent they convey as "fact" a position that is scientifically indefensible that ultimately requires the seeking of a 404(b) permit even where individuals may not be legally obligated to do so. And while the Corps identifies the source of the Plant List, it fails to identify the source(s) of information relied upon by the author in making his conclusions.

These statements also lack utility. The term "utility" refers to the usefulness of the information to its intended users, including the public, and more important, requires an agency to consider the uses of information from the perspective of the public.[32] The Corps' dissemination of this information fails to consider the usefulness of the information regarding legal obligations for permit coverage as required by the CWA. As a result, the Corps' dissemination leads HBANC and BPC members to believe that they must obtain 404(b) permits when they may have no legal obligation to do so and impedes the function of HBANC/BPC staff in providing accurate and reliable compliance advice to its members. Information with such consequences could hardly be deemed to have utility for its intended users. Correction of the questionable information would bring the necessary "utility" to the information, and allow individuals to properly evaluate whether a 404(b) permit might be required for their construction activities.

In addition, the OMB Guidelines require that information disseminated by federal agencies after October 1, 2002, must undergo internal, pre-dissemination quality review before presentation to the public.[33] Pre-dissemination review ensures that agencies treat information quality "as integral to every step of an agency's development of information. . ."[34] Finally, through the dissemination of this information, the Corps has not informed the public of the

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[30] *Id.*
[31] *Id.*
[32] *Id.*
[33] *Id.*
[34] *Id.*

economic impacts of its regulatory position. Requiring individuals to obtain 404(b) permits where they have no such obligation is resulting in unnecessary expenses and added construction delays for HBANC members.

V. Scientifically Unsupported Information Justifies Corrective Action

The Corps' dissemination of information in these Plant Lists does not adhere to the basic standards of quality for the dissemination of information by federal agencies as set forth in the OMB Guidelines. Where, as here, an agency disseminates information that does not comply with the applicable guidelines, affected persons may seek and obtain timely correction of the information. HBANC and BPC members and staff are being misinformed because this questionable information is supported and published or based in fact. Accordingly, HBANC and BPC are entitled to seek immediate correction of this questionable and misleading information.

Conclusion

HBANC and BPC respectfully request that the Corps, together with the FWS, take the following corrective actions:

1. The Corps must work with the FWS to issue an acknowledgment and public correction of these three errors in the Plant List;

2. The Corps and FWS must change *Lolium perenne* from FAC* to FACU or NI and *Picris echioides* from FAC to FACU or NI in Region 0 or provide incontrovertible scientific evidence to support their existing designations;

3. The Corps and FWS must add *Lolium multiflorum* to the Plant Lists and designate it as FACU or NI in Region 0; and

4. The Corps and FWS must perform a large-scale, full review of each species on the Plant List and take steps to ensure that all present and future designations are based on supporting scientific data. Should similarly questionable information be discovered, HBANC and BPC request that the Corps and FWS remove or revise such information accordingly and issue an acknowledgment and public correction of such change(s).

These corrections will benefit HBANC, BPC, their members, and the public in general. HBANC and BPC look forward to discussions with the Corps and FWS regarding the corrective action requested herein. If you have any questions or would like to discuss these Requests, please contact me directly at (415) 402-2702.

Sincerely yours,

BRISCOE IVESTER & BAZEL LLP

David M. Ivester

Enclosures

HARVEY AND STANLEY ASSOCIATES, INC.

ECOLOGICAL CONSULTANTS • ENVIRONMENTAL PLANNERS • RESOURCE MANAGERS

A STUDY OF THE HABITAT OCCURRENCE OF *LOLIUM PERENNE* AND *PICRIS ECHIOIDES*

Prepared by:

HARVEY AND STANLEY ASSOCIATES, INC.

H. Thomas Harvey
David J. Hartesveldt
Santha A. Kaufman
Robert C. Klinger
Susan G. Thrasher

Prepared for:

THE BAY PLANNING COALITION

July 18, 1987

File No. 330-02

906 Elizabeth Street • P.O. Drawer E • Alviso, California 95002 • (408) 263-1814

INTRODUCTION

This study was undertaken to determine the frequency of occurrence of two plant species, namely perennial ryegrass (Lolium perenne) and bristly oxtongue (Picris echioides), in vegetated wetlands of the San Francisco Bay Area. The indicator status of these two species has recently (1987) been changed from facultative upland and upland respectively, to facultative in the USF&W Services "Wetland Plants of the State of California" (Reed 1987). This study represents an effort to develop an appropriate methodology for quantitatively assessing a species indicator status, and applying that methodology to the two species in question.

The indicator status of a species is a measure of its fidelity to a specific habitat. In the case of wetlands some species have been observed to grow exclusively in soils that are periodically or permanently saturated. The fidelity of such species to wetlands makes them good indicators of wetland habitats. Similarly, the fidelity of species observed exclusively in uplands makes them good indicators of upland habitats. Many species, however, exhibit a tolerance for a range of soil moisture conditions. Some species may exhibit little or no fidelity to one habitat or the other, in which case they have no utility as habitat indicators by themselves. Other species may exhibit some adaptability to a variety of moisture regimes, but, by the frequency of their occurrence in them, appear to flourish best in one habitat or the other. Such species have some utility as habitat indicators.

While it is not altogether clear how the wetland indicator status of any species is best assigned, frequency of occurrence of a species in wetlands is currently used by the USF&W Service (Reed pers. comm. 1987). Frequency of occurrence refers to the percent of samples in which a species occurs that are in wetlands. For example, if a species occurs in 100 sample quadrats and 75 of the quadrats were in wetland communities, the species would be assigned a facultative wetland indicator status. Plant species may be placed in one of five indicator groups based on their

presumed frequency of occurrence in wetlands. Listed below are the five indicator groups and the frequency of occurrence in wetlands in percent, of species within them:

Frequency (%)	Indicator Group	Abbr.
>99	Obligate	OBL
67-99	Facultative Wetland	FACW
34-66	Facultative	FAC
1-33	Facultative Upland	FACU
<1	Upland	UPL

To date the placement of a species in a indicator group has been done on a basis of the professional judgement of reviewers who have expertise in the field of wetland ecology. The original USF&W Service list of wetland indicator plants was compiled from national and regional plant manuals and was supplemented by the ecological literature and the professional experience of the reviewers. Individual recommendations and review panels meeting annually permit periodic revisions to the list. Professional judgement will probably continue to be the method of choice in determining the status of most species, however, it is hoped that this study will serve as a first step in developing a protocol for those species of special interest.

Perennial ryegrass and bristly oxtongue are two such species of special interest. Such is the case because wetland indicator plants are one of the three parameters used in the delineation of wetlands subject to regulation by the U.S. Army Corps of Engineers (COE) and the Environmental Protection Agency (EPA). The indicator status of the dominant species of a possible wetland is used to determine whether wetland (hydrophytic) vegetation is present. According to the 1987 COE wetland delineation manual:

> "When more than 50 percent of the dominant species in a plant community have an indicator status of OBL, FACW, and/or FAC, hydrophytic vegetation is present."

Thus, a change in indicator status of common species such as

perennial ryegrass and bristly oxtongue from FACU to FAC may have considerable influence on subsequent wetland delineations.

METHODS

Ten wetland and seventy upland habitats were sampled in June and July, 1987 for Lolium perenne and Picris echioides in ten San Francisco Bay Area counties (Figure 1). A map of the natural potential vegetation of California (Kuchler, 1977) was used to determine that the ratio of vegetated upland habitat to vegetated wetland habitat in the ten county area is about eight to one. The original objective of sampling ten wetland and eighty upland habitats, in order to ensure proportional sampling, was not achieved due to lack of time, but the results from the first eighty habitats sampled suggest that the over-sampling of the wetlands was not significantly biasing the results of the study.

Wetland habitats sampled included one freshwater marsh, seven salt marshes (some diked, some tidal), and one riparian area. A tensiometer was used to measure soil moisture conditions of the wetland habitats sampled.

Upland habitats sampled included the following communities: grasslands (23), woodlands (13), chaparral (3), coastal prairie (1), redwood forest (3), chaparral/grassland (7), closed-cone pine/grassland (1), closed-cone pine/chaparral (1), woodland/grassland (10), and woodland/chaparral (1). A tensiometer was used to measure soil moisture conditions of the upland habitats sampled.

In order to avoid sampling areas modified greatly by man, a list of 145 natural sites (parks and nature reserves) in the San Francisco Bay Area was compiled, from which sampling locations were randomly chosen (Appendix A). Randomly picked were ten park areas with known wetlands and thirty park areas with known uplands.

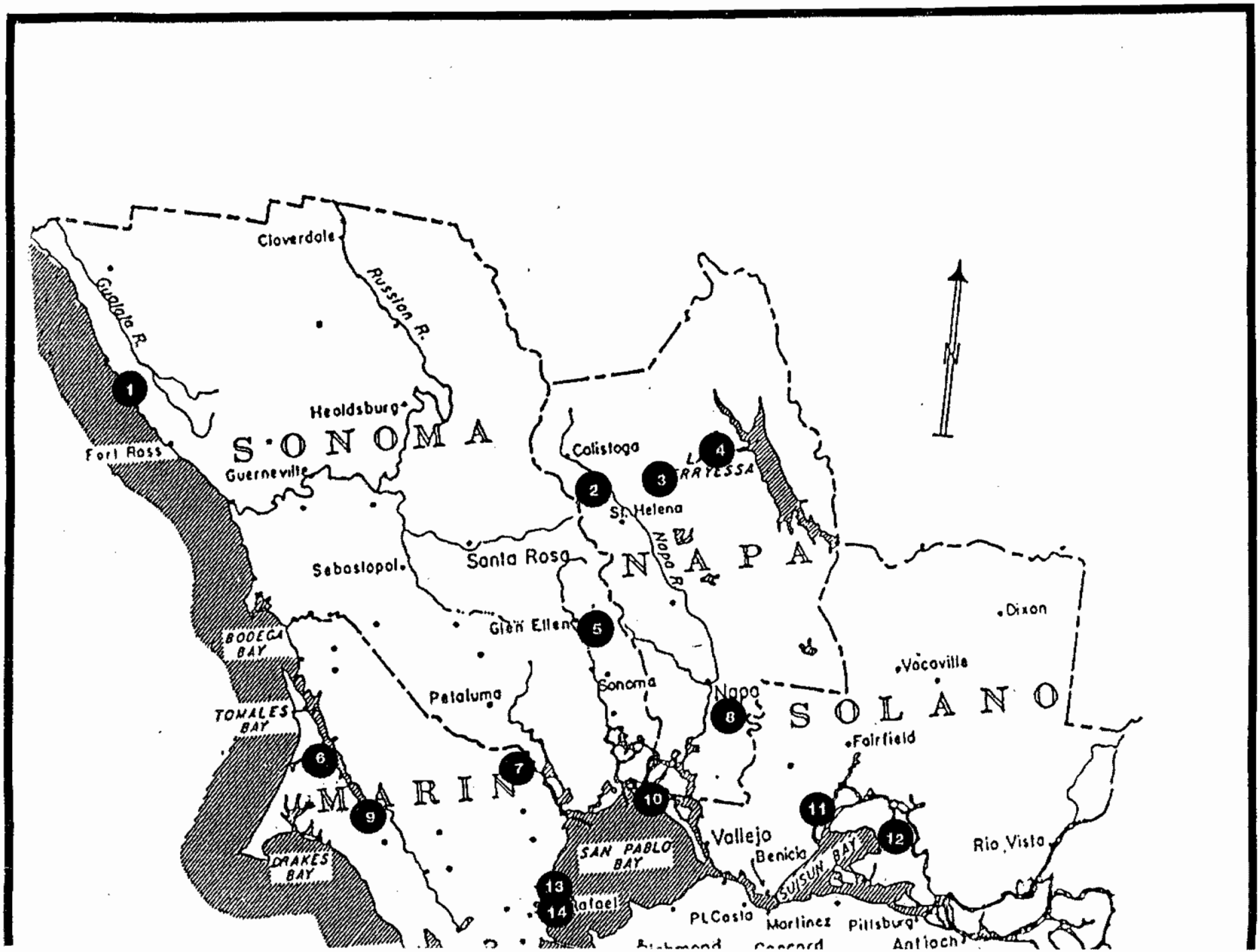
Sampling locations within each park area were randomly selected using the Universal Transverse Mercator (UTM) grid coordinate system. This system can be used to identify locations to within 100 meters or within a 1 hectare (2.5 acre) site on a 7.5 minute USGS quad map. The random selection of coordinates for each park

generated a point that served as the starting point for each 200 meter long transect. Each starting point was plotted on a 7.5 minute USGS quadrangle. If a starting point was found to be inaccessible during the course of the field work, another starting point was randomly generated in the field. A compass bearing for each transect was randomly selected. Ten quadrats were sampled at random distances along each transect and at right angles to it at randomly selected distances (up to 20 meters) to the right or left, also selected randomly. Thus, the selection of each quadrat along the transect was independent of the other nine. A total of 800 randomly selected quadrats were sampled, 100 quadrats being located in wetlands and 700 quadrats being located in uplands.

For the purposes of this study presence absence data for perennial ryegrass and bristly oxtongue from each quadrat were of singular importance. Frequency of occurrence of each species can be calculated from such data.

Other data were collected as well. Two to three tensiometer readings were collected along each transect. Relative cover data for all species were recorded in those quadrats containing one or both of the two species of interest. When present in a quadrat, the height of the two species of interest was recorded. The community or communities sampled along each transect were noted.

Where possible, the soil series at each sampling location was determined from regional soils maps (USDA) and checked against a list of hydric soils for the state of California.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Sebastopol
Santa Rosa
Glen Ellen
Dixon
Vacaville
BODEGA BAY
Petaluma
Sonoma
Napa
SOLANO
TOMALES BAY
Fairfield
MARIN
DRAKES BAY
SAN PABLO BAY
Vallejo
Benicia
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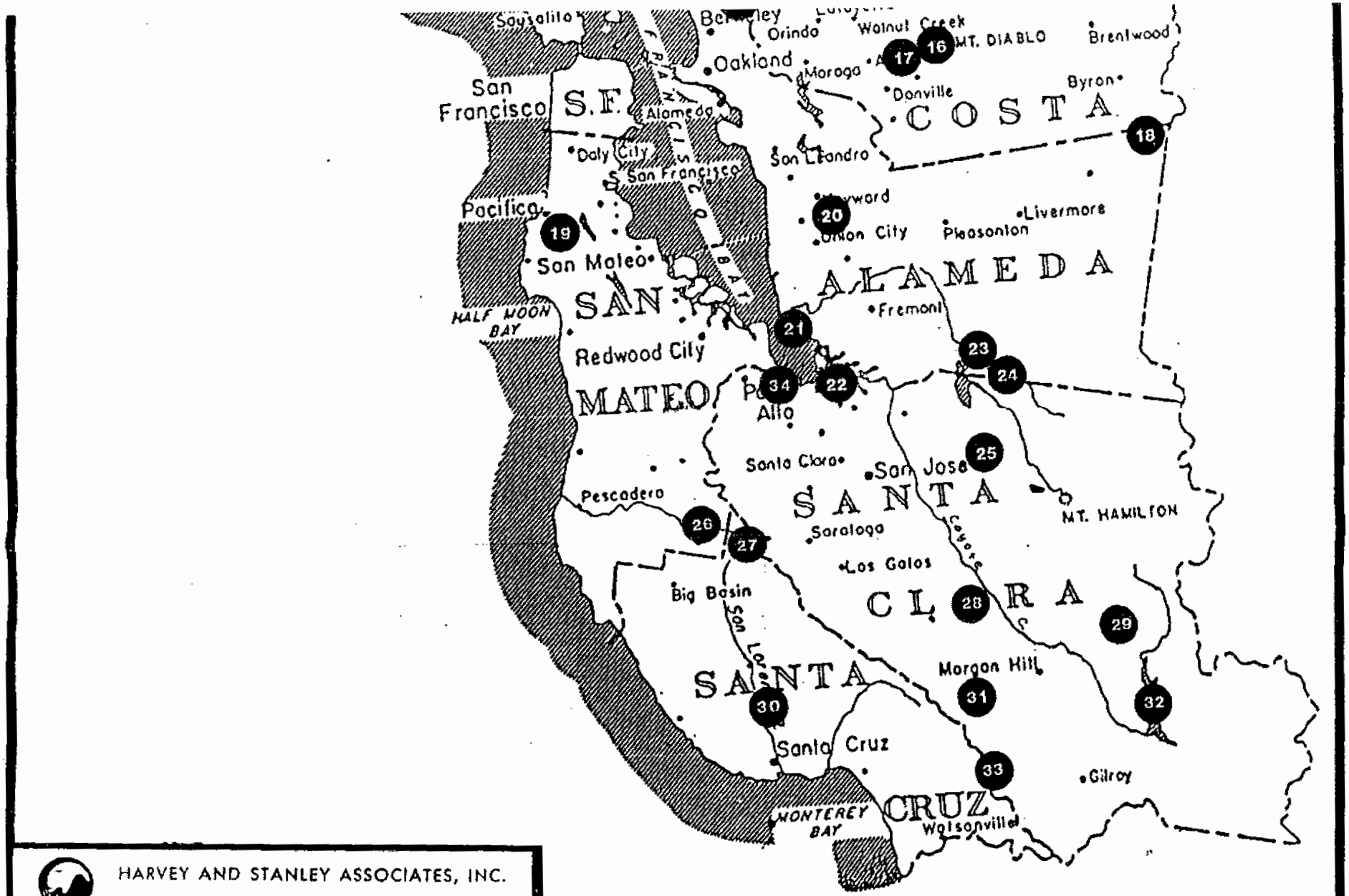

HARVEY AND STANLEY ASSOCIATES, INC.

ECOLOGICAL CONSULTANTS • ENVIRONMENTAL PLANNERS • RESOURCE MANAGERS

STUDY AREAS

File No. 330-02	Date 07/21/87	Figure 1

RESULTS

Lolium perenne was encountered along transects in two salt marshes, fifteen grasslands, one mixed chaparral/grassland community, and eight mixed woodland/grassland communities.

Picris echioides was encountered along transects in one salt marsh and six grassland communities.

Of the 800 quadrats sampled along 80 transects, Lolium perenne occurred in 132 quadrats along 29 transects. Picris echioides occurred in 15 quadrats along 7 transects. The occurrence of both species in wetland and upland quadrats is summarized in Tables 1 and 2.

Table 1. The occurrence of Lolium perenne and Picris echioides in wetland quadrats.

		Number of Quadrats	
Transect #	Community	L. perenne	P. echioides
5	Salt Marsh	4	1
44	Salt Marsh	1	-
Total occurrences in wetland quadrats		5	1

Table 2. The occurrence of *Lolium perenne* and *Picris echioides* in upland quadrats.

		Number of Quadrats	
Transect #	Community	*L. perenne*	*P. echioides*
2	Grassland	8	1
3	Chaparral/Grassland	2	-
4	Woodland	1	-
20	Grassland	4	4
22	Grassland	1	4
23	Woodland/Grassland	6	-
24	Woodland	9	-
25	Grassland	10	-
27	Woodland/Grassland	7	-
28	Woodland/Grassland	6	-
29	Grassland	6	-
30	Woodland/Grassland	2	-
31	Woodland/Grassland	5	-
33	Grassland	8	-
38	Grassland	7	-
39	Grassland	4	-
47	Grassland	3	-
48	Grassland	10	-
49	Grassland	10	-
50	Grassland	3	-
53	Woodland/Grassland	1	2
55	Grassland	5	-
56	Woodland/Grassland	1	2
57	Grassland	3	-
66	Grassland	1	-
69	Grassland	3	1
70	Woodland/Grassland	1	-
Total occurrences in upland quadrats		127	14

As indicated in Tables 1 and 2 L. perenne occurred in 5 wetland quadrats and 127 upland quadrats. The frequency of occurrence of this species in sample wetland and upland habitats was calculatd to be 4% and 96% respectively.

P. echioides occurred in 1 wetland quadrat and 14 upland quadrats. The frequency of occurrence of this species in sample wetland and upland habitats was calculated to be 8% and 92% respectively.

L. perenne was found in 132 quadrats. Individuals of L. perenne covered 36.70 square meters of the 132 quadrats. Of the 36.70 square meters occupied by L. perenne, 2.6 square meters were found in wetlands and 34.10 square meters were found in uplands. Of the total area covered by L. perenne, 7% was found in wetlands and 93% was found in uplands.

P. echioides was found in 15 quadrats. Individuals of P. echioides covered 2.75 square meters of the 15 quadrats. Of the 2.75 square meters occupied by P. echioides, 0.20 square meters were found in wetlands and 2.55 square meters were found in uplands. Of the total area covered by P. echioides, 7% was found in wetlands and 93% was found in uplands.

Soil tensiometer readings ranged from 0 centibars of suction in the wetlands (along all 10 wetland transects) to 80 centibars of suction in the uplands. Although one reading of 10 centibars of suction was recorded along an upland transect, all other readings along upland transects were greater than 30 centibars of suction. The mean value of all 134 tensiometer readings along upland transects was 70 centibars of suction. The mean value of all upland transects with L. perenne was 71 centibars of suction.

The soils of the two wetland habitats in which L. perenne were found were hydric (USDA 1985) (Appendix B). The soils of the one wetland habitat in which P. echioides was found were hydric. The soils of 21 upland habitats sampled in which one or both species occurred are known to be non-hydric. The classification of the soils in six habitats where L. perenne occurred is unknown.

Grasses were the most frequent associates of L. perenne in both wetland and upland quadrats (Table 3). Of 11 occurrences of associated species in wetland quadrats with L. perenne in them, 6 occurences were of 5 species of grasses. Of 388 occurrences of associated species in upland quadrats with L. perenne in them, 241 occurrences were of 15 species of grasses.

Table 3. Frequency of joint occurrence of associated species in quadrats containing Lolium perenne.

Associates	Frequency (%) in upland quadrats (127)	Frequency (%) in wetland quadrats (5)
Avena sp.	55	20
Bromus mollis	50	-
Bromus rigidus	28	40
Hordeum geniculatum	20	20
Centaurea solstitialis	14	-
Carduus pychnocephalus	14	-
Polypogon sp.	13	-
Festuca megalura	12	20
Brassica sp.	9	-
Plantago lanceolata	9	-
Bromus rubens	8	-
Epilobium sp.	8	20
Hordeum sp.	6	-
Chlorogalum pomeridianum	5	-
Aira sp.	4	-
Convolvulus sp.	4	-
Sisyrinchium bellum	4	-
Gallium sp.	4	-
Vicia sp.	4	-
Baccharis pilularis		

var. consanguinea	3	-
Brodiaea sp.	3	-
Iris sp.	3	-
Phalaris sp.	3	-
Ribes sp.	3	-
Rumex sp.	3	-
Erodium sp.	3	-
Toxicodendron diversiloba	3	-
Briza minor	3	-
Briza major	2	-
Cynosuarus echinatus	2	-
Cyperus sp.	2	-
Festuca sp.	2	-
Achillea sp.	2	-
Dactylis glomerata	2	-
Distichlis spicata	2	20
Lepidium latifolium	2	40
Lupinus sp.	2	-
Aesculus californica	1	-
Raphanus sativus	1	-
Clarkia sp.	1	-
Conium maculatum	1	-
Foeniculum vulgare	1	-
Juncus bufonius	1	-
Medicago sp.	1	-
Mimulus sp.	1	-
Orthocarpus sp.	1	-
Quercus agrifolia	1	-
Spergularia marina	1	-
Scirpus sp.	-	20
Spergularia marina	-	20

Grasses were the most frequent associates of P. echioides (Table 4). Of 39 occurrences of associated species in upland quadrats with P. echioides in them, 22 occurrences were of 6 species of grasses.

Table 4. Frequency of joint occurrence of associates in quadrats containing *Picris echioides*.

Associates	Frequency (%) in upland quadrats (14)	Frequency (%) in wetland quadrats (1)
Avena sp.	24	-
Bromus mollis	14	-
Bromus rigidus	14	100
Brassica sp.	14	-
Baccharis pilularis var. *consanguinea*	5	-
Conium maculatum	5	-
Bromus sp.	3	-
Centaurea solsitialis	3	-
Convolvulus sp.	3	-
Epilobium sp.	3	100
Erodium sp.	3	-
Festuca megalura	3	-
Foeniculum vulgare	3	-
Hordeum sp.	3	-
Lotus sp.	3	-
Vicia sp.	3	-
Spergularia marina	-	100

DISCUSSION

The data support a facultative upland designation for Lolium perenne and Picris echioides.

L. perenne was most commonly found in grasslands. This species was identified within 132 quadrats, of which, 86 were located in grassland habitats, and an additional 29 were located in woodland habitats interspersed with significant grasslands. Associated species included fifteen species of grasses making up 62% of all joint occurrences in quadrats with L. perenne.

Lolium perenne occurred in 132 quadrats, of which 127 were located in uplands. An upland designation is reasonable for each of the 127 quadrats because: 1) they were located in areas mapped as such by Kuchler; 2) soil tensiometer readings along the transects associated with these quadrats suggest that none of the soils were saturated; 3) each of the 127 transects were located on non-hydric soils 4) in the 127 upland quadrats, 292 of the 388 occurrences (75%) of associated species have been designated FACU or UPL (USF&W Service). The frequency of occurrence of L. perenne in upland habitats was 96%. Of the total area covered by L. perenne, 93% of the area was determined to be in uplands habitats. In our judgement the San Francisco Bay Area is sufficiently representative of the habitat occurrence of L. perenne to permit the inference from the data collected, that L. perenne should be designated a FACU indicator species in the state of California.

Like L. perenne, P. echioides was most commonly found in grasslands. P. echioides was found in 7 habitats, 6 of which were grasslands. Associated species included 6 species of grass making up 56% of all joint occurrences in quadrats with Picris echioides.

P. echioides occurred in 15 quadrats, of which 14 were located in uplands. An upland designation is reasonable for each of the 14 quadrats because: 1) they were located in areas mapped as such by Kuchler; 2) soil tensiometer readings along the transects

associated with these quadrats suggest that none of the soils were saturated; 3) each of the 14 quadrats were located on non-hydric soils; 4) in the 14 upland quadrats 32 of the 39 occurrences (82%) of associated species have been designated FACU or UPL (USF&W Service). The frequency of occurrence of P. echioides in upland habitats was 93%. Of the total area covered by P. echioides, 93% of the area was determined to be in upland habitats. In our judgement the San Francisco Bay Area is sufficiently representative of the habitat occurrence of Picris echioides to permit the inference from the data collected, that P. echioides should be designated a FACU indicator species in the state of California.

REFERENCES

United State Department of Agriculture. 1985. Hydric Soils of the State of California, 1985.

Reed, Porter B. 1987. 1987 Wetland Plant List. California. U.S. Fish and Wildlife Service.

APPENDIX A

SAMPLING LOCATIONS BY COUNTY

COUNTY	NAME OF PARK AND NUMBERED LOCATION ON FIGURE 1	TRANSECT NUMBER
ALAMEDA	Bethany Reservoir (18)	60 - 61
	Dumbarton Point (wetland) (21)	26
	Garin/Dry Creek Pioneer Regional Park (20)	55 - 57
	Sunol Regional Wilderness (23)	68 - 70
CONTRA COSTA	Diablo Foothills Regional Park (17)	48 - 50
	Mt. Diablo State Park (16)	51 - 53
	Tilden Regional Park (15)	20 - 22
MARIN	China Camp State Park (13)	1
	China Camp State Park (14)	2 - 4
	Pt. Reyes National Seashore (6)	41
	Pt. Reyes National Seashore (9)	38 - 40
NAPA	Bothe-Napa State Park (2)	11 - 13
	Pope Creek (4)	7
	Los Posadas State Park (3)	8 - 10
	Skyline Park (8)	27 - 29
SANTA CLARA	Alum Rock Park (25)	17 - 19
	Coyote Lake County Park (32)	33
	Mt. Madonna County Park (31)	62 - 64
	New Chicago Marsh (22)	42
	Palo Alto Baylands (34)	67
	Santa Theresa County Park (28)	23 - 25

SANTA CLARA (cont.)	Saratoga Gap Open Space Preserve (27)	34 - 35
	Uvas Reservoir County Park (31)	65 - 66
SANTA CRUZ	Henry Cowell Redwoods State Park (30)	54,58-59
SAN MATEO	Portola State Park (26)	36 - 37
	San Pedro Valley County Park (19)	45 - 47
SOLANO	Joice Island (11)	44
	Grizzly Island (12)	43
	San Pablo Bay (10	6
SONOMA	Schollenberger Boat Launch (7)	5
	Salt Point State Park (1)	14 - 16
	Sonoma Valley Regional Park (5)	30 - 32

APPENDIX B

SOILS ASSOCIATED WITH

LOLIUM PERENNE AND PICRIS ECHIOIDES

TRANSECT NUMBER	NAME OF SOIL SERIES
2	Saurin-Bonnydoon Urban Land Complex
3	Tocaloma-McMullin Complex
4	Tocaloma-McMullin Complex
5	*Reyes Silty Loam
20	Gilroy Clay Loam
22	Gilroy Clay Loam
23	Los Gatos-Gaviota-Vallecitos Loam
24	Los Gatos-Gaviota-Vallecitos Loam
25	Los Gatos-Gaviota-Vallecitos Loam
27	Hambright
28	Sobrante Loam/Hambright
29	Guenoc
30	Red Hill Clay Loam
33	Los Gatos-Gaviota-Vallecitos
38	Tomales Fine Sandy Loam
39	Pablo Bayview Complex/Rodeo Clay Loam
44	*Tamba Mucky Clay/Joice Muck
47	No Information Available
48	Alo Clay
49	Millsholm Loam/Los Osos Clay Loam
50	Millsholm Loam
53	Dibble Silty Clay Loam
55	Los Osos Silty Clay Loam
56	Diablo Clay
57	Los Osos Silty Clay Loam
66	No Information Available
68	Millsholm Silty Loam
70	Pleasanton Gravelly Loam

*Hydric soils