Weeds of California and Other Western States. By JOSEPH M. DITOMASO and EVELYN A. HEALY. 2007. University of California Agriculture and Natural Resources Publication 3488, 6701 San Pablo Avenue, Oakland, CA 94608-1239. Two volumes, 1808 pp. plus CD with photographs Softcover. $100.00. ISBN 1-879906-69-4.

In California, this may be the most important book since the publication of *The Jepson Manual* in 1993. There are three compelling reasons for this. First, unlike several local floras that have been published in the meantime, this treatment covers the whole state of California. Second, because California is one of the three U.S. states with the highest number of naturalized plant species, and because a substantial proportion of weeds are naturalized species, this component of the flora deserves a special attention. Third, the last comprehensive book on weeds of California was published 56 yr ago (Robbins et al. 1951; actually, 66 yr ago, because the 1951 edition was only minor modification of the first edition from 1941).

Weeds of California (Robbins et al. 1951) covered 693 species, 437 (63%) non-native and 256 (37%) native. Based on my counting, the main text of the DiTomaso and Healy's volumes deals with 677 (83%) non-native and ca. 140 (17%) native weedy species. Moreover, 714 additional, rarely naturalized or casual non-native species are listed in the Appendix. Out of ca. 817 species treated in the main text, 737 are illustrated by at least one color photograph, most of them by several photos of mature plants, seeds, and seedlings. There is probably no other country in the world with a so well illustrated weed manual. Plant identification is facilitated by tables summarizing important characters of species within genera or groups of closely related genera (e.g., ice plants and relatives, *Amaranthus*, *Bidens*, *Brassica* + *Hirschfeldia* + *Sinapis*, *Centaurea*, *Euphorbia*, etc.). Thirteen shortcut identification tables for groups that share similar, unusual, or relatively uncommon characters (plants with prickles, spines, or thorns, plants with palmately compound leaves, plants with square stems, etc.) are also quite helpful. Moreover, two grass identification keys are provided: a key based on all characters and a key based on vegetative characters only. The main body of the volumes contains weed descriptions that are presented in alphabetic order according to family, genus, and species. The text includes not only detailed morphological descriptions of the taxa, but also information on distribution, habitat, reproduction, phenology, and management options. All morphological terms used in the text are explained in an illustrated glossary.

Regarding the main text and illustrations, I have only a very few comments. Among over 2000 photographs, I found only one mistake: the photograph of *Trifolium angustifolium* on p. 811 is definitely not a picture of this species, but of a different clover. *Polycarpum* (pp. 573–575) should be spelled *Polycarpon*. A new non-native *Amaranthus* – *A. viridis* L. was recognized in California recently (Daniel 2005). Besides *Hedera helix* L. and *H. canariensis* Willd., plants derived from *H. hibernica* (Kircher) Bean seem to be quite common (Clarke et al. 2006). The correct name for spotted knapweed seems to be *Centaurea stoebe* L. subsp. *micranthos* (S.G. Gmelin ex Gugler) Hayek. Authors' note that Californian spotted knapweeds may be primarily classified as C. vallesiaca (DC.) Jord., species known from France, Italy and Switzerland, would deserve some elaboration. The fact that most of the *Raphanus* plants in California are hybrids (Panetsos and Baker 1967) is not mentioned. Good photos or drawings of lemma tips would help to make a distinction between *Avena barbata* and *A. fatua*. There are 31 species in the main text that were not included in *The Jepson Manual* (23 of them were recently reported by Hrusa et al. 2002). This is not always clearly indicated. Four species included in the main text are not present in California (*Brassica elongata*, *Hieracium caespitosum*, *Salsola collina*, and *Vinca minor*). This can be justified because some of them could be found in California in the foreseeable future. Including more pictures of species that are common and difficult in other mediterranean areas and are still rare or absent in California would make a weed manual even more helpful in early detection of potentially pestiferous invaders. Examples include *Atriplex numularia* Lindl., *Galega officinalis* L., *Leptospermum laevigatum* (Gaertn.) F. Muell., *Melia azedarach* L., *Paraserianthes* (*Albizia*) *lophantha* (Willd.) Nielsen, *Rosa moschata* J. Herrm (Henderson 2001; Mathei 1995). While the number of native weeds was definitely somewhat inflated in Robbins et al. (1951), several important native weeds are missing here. This is particularly true for weeds in forest plantations (see e.g., Tab. 2–3 in Walstad and Kuch 1987).

There are 722 non-native taxa listed in the Appendix. After excluding subspecific taxa and two species that were already treated in the main text, we are left with 714 alien species. Two of them are here by a mistake and should be deleted (*Acer saccharum* and *Genista aetnensis*). Most of the species (435) were already in *The Jepson Manual* (Hickman 1993). Among remaining 277 species (most of them are marked by asterisk), 261 were presented in Hrusa et al. (2002). Unfortunately, this was not acknowledged and neither was the origin of the information for the remaining 16 species. Nevertheless, one would expect that adding 673 non-native species from the main text to 712 non-native species from the

Appendix, the total of 1385 should equal the number naturalized and casual plant species in California. However, there are three problems here. First, some non-native species that were included in DiTomaso and Healy's (2003) previous book on wetland weeds appeared in the main text or in the Appendix, but some did not (e.g., *Aeschynomene rudis*, *Heteranthera limosa*, *Limnobium laevigatum*, *Najas graminea*, *Potamogeton crispus*, *Rotala indica*). Second, some established non-native species that are in *The Jepson Manual* are not in this Appendix (e.g., *Cnicus benedictus*, *Chenopodium strictum*, *Lathyrus sphaericus*, *Mollugo cerviana*, *Plantago virginica*, *Rumex orbiculatus*). Third, several species that were reported in Hrusa et al. (2002) are also missing in the Appendix (including *Asclepias fruticosa*, *Chrysanthemum balsamita*, *Silene pseudatocion*, *Ipomea quamoclit*, *Ephedra distachya*, *Cinnamonum camphora*, *Papaver capreolata*, *Passiflora mixta*). Therefore, we may conclude that we have ca. 1400 more or less established non-native plant species in California. Nobody will ever get the definite number. Some species probably do not grow in California any more (e.g., *Agrostema githago*) and some were probably eradicated (e.g., *Carthamus leucocaulos*, *Cuscuta reflexa*, *Grindelia papposa*, *Peganum harmala*, *Salvia virgata*, *Solanum cardiophyllum*, *Tagetes minuta*). Some species should not be counted because they are only persisting (e.g., *Jugnans regia*) or grow only in greenhouses (e.g., *Muntingia calabura*). On the other hand, new species are arriving (Jepson Flora Project 2007), and some "native" species – *Phalaris arundinacea*, *Spirodela* (*Landoltia*) *punctata* - are being recognized as exotics (Jacono 2002; Lavergne and Molofsky 2007).

The weakest part of this manual is the Bibliography (pp. 1680–1740). It is only slightly better than the one that was in DiTomaso and Healy's (2003) previous book that I reviewed for Madroño in 2003. First, General References: There are several obscure references here, but relevant basic publications on Californian weeds or invasive plants in general are missing (e.g., Baker 1962, 1974, 1986, 1995; Inerjit 2005; Myers and Bazely 2003; Pyšek et al. 2004; Randall et al. 1998; Rejmánek and Pitcairn 2002; Walstad and Kuch 1987; Weber 2003). Second, as for individual genera, references are far from balanced: e.g., 12 references to *Kyllinga* and 29 to *Taeniatherum*, but none to *Amsinckia*, *Bidens*, *Foeniculum*, *Hypericum*, *Raphanus*, *Viscum*, *Xanthium*, etc. References to *Anthemis cotula* are under *Cotula*. Gerlach's excellent studies of *Centaurea solstitialis* in California are missing (Gerlach and Rice 2003; Gerlach 2004). Ten, mostly Australian, references are under *Chondrilla*, but the most important reference to its biocontrol in California (Supkoff et al. 1988) is not listed. Again, many bizarre references (e.g., "Wild Flowers of Mount Olympus") are here, but essential references to such Californian weeds like *Carpobrotus chilensis*, *Mesembryanthemum crystallinum*, *Prosopis*, *Salsola*, or *Toxicodendron diversilobum* (Bicknell and Mackey 1998; Vivrette and Muller 1977; Holland 1987; Gaskina et al. 2006; Ryan and Ayers 2000; Gartner 1991a, b) are missing. A reference to the bibliography of European biological floras (Poschod et al. 1996) would be helpful.

Obviously, while the main body of this treatment is undoubtedly a great achievement, the value of the Appendix and Bibliography is rather questionable. My recommendation for the potential next edition of this manual would be to make it more economical (e.g., some redundant photographs could be deleted, pictures of seeds for all species in each genus could be combined into one), delete the Appendix and Bibliography (more professional version could be available online), and publish everything in one user-friendly volume. Recently published Flora of the Santa Ana River (Clarke et al. 2007) can serve as an example of how this could be done.

In spite of my criticism, this is a monumental piece of work. Even with digital cameras you have to find the plants first. The authors found almost all of them!

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American Perceptions of Immigrant and Invasive Species: Strangers on the Land. By PETER COATES. 2007. University of California Press, Berkeley, CA. 266 pp. Hardcover. $39.95. ISBN 13: 978-0-520-24930-1.

One of the defining characteristics of humans is their tendency to want to manage nature so that it meets their perceptions of "how things should be." Ecologically, this has been translated in numerous ways, from wildlife management practices that once promoted intense predator control to notions of restoring landscapes to "pre-European conditions." Of course, these perceptions are not universally accepted at any given point in time, and perhaps more important the prevailing opinion (i.e., conventional wisdom) often shifts over time. Hence, we now see the reintroduction of predators into areas they were once extirpated from, and the gradual realization by restoration practitioners that trying to convert an ecosystem to an arbitrary point in time (and then keeping it there) is fraught with both conceptual and practical problems. In *American Perceptions of Immigrant and Invasive Species*, Peter Coates, an environmental historian at the University of Bristol, uses historical and contemporary case studies to analyze views on non-native species in the United States over the last