

The Alewife region was formerly known as the Great Swamp, and rightly so. The region lies at the bottom of a large watershed and naturally accumulates rainfall. Alewife lies in a recessional moraine carved by the last ice sheets 12 to 15 thousand years ago. Runoff from the Belmont and Arlington hills was then blocked from reaching the Charles river by the ridge containing Reservoir, Observatory, and Avon hills (Cook, 2002). Much of Alewife lies in a floodplain. FEMA recently initiated a restudy of the region and preliminary results indicate that what was previously thought of as the 100-year floodplain is actually the 50-year floodplain (Greenblatt, 2003).¹ Evidence indicates that development throughout the watershed has contributed, at least in part, to this apparent rise in flooding as levels have increased 6 inches every 20 years (Kaiser, 2003).

Ideally one does not develop in a floodplain; there is persistent, known probability for extensive property damage. Furthermore, floodplains are often environmentally sensitive regions, as well as being some of the most fertile lands available. However, “no build” is not considered a viable option for the land-starved City of Cambridge which encompasses a mere 6 square miles of developable land. Although Cambridge is in desperate need of affordable housing it has largely been removed from the list of acceptable uses of Alewife.² Indeed the development of most forms of housing in the region are discouraged by several recent master plans, even if this is not heeded in practice. The primary focus of the city and developers has been on corporate development to furnish jobs and property tax revenue.

Conventional development exacerbates flooding, and denies the natural heritage of the region. Traditional landscaping tends to ignore the environment, geography and climate; save for considering the viability of plant specimens such as is indicated by the USDA hardiness zones. Leveling parcels and grading towards the street, which is not intended as a sluice, increases runoff by draining precipitation which would have soaked into the soil. Gutters should serve to drain the streets, not all adjacent properties. Another common element of landscaping, lawns, contributes to the problem of runoff. Among hydrologists grass is commonly referred to as “green asphalt”. This refers to the quality of the runoff; often contaminated with fertilizer, pesticides, and pet waste; as well as the quantity, which is exacerbated by irrigation during the growing season.

Natural landscaping is the attempt to use plants in a manner which approaches nature's own, and should be embraced as an alternative to current practice (Diekelmann & Schuster, 2002). Native flora have several advantages over imports and their use should be encouraged. Indigenous plant life is adapted to the local climate. They typically not only require less fertilizing and irrigation, but are better equipped to handle local extremes of drought and flooding. Many species also excel at soil and water retention, as well as water filtration. Use of indigenous plants with swells, depressions and hillocks in private and municipal landscaping to create micro-wetlands as water sinks would be beneficial to many while paying homage to the tradition of the Emerald Necklace. The existing open spaces would be better integrated with their surroundings and the basis of network would be established. Results could rival the aesthetics of the current environs by creating a more park-like atmosphere, while restoring the natural capacities of the land and instilling a greater respect for the natural environment amongst residents and visitors.

Local municipalities should determine the legality of applying mitigation requirements as conditions for development under current zoning laws. These might include storm-water storage tanks or landscaping requirements ranging from a conservative black list of forbidden species to a white list of allowable species (see Appendix 1 for a sample selection). A black list would contain invasive species such as Japanese knotweed *Fallopia japonica*, purple loosestrife *Lythrum salicaria* and the common reed *Phragmites australis* which already have a strong foothold in the Alewife Reservation.² At a minimum, a list of recommended practices, including justification and benefits, should be applied as an amendment to local by-laws, and adhered to for all future municipal projects. The drafting process of remediation recommendations/requirements could serve as an entree to a, sorely needed, coordinated rezoning effort amongst Arlington, Belmont, and Cambridge.

While municipal and commercial landscaping can improve the visual environment and give a greater sense of the natural space public education must be undertaken as well. Many current residents of Alewife do not recognize or openly acknowledge the relevance of the fact that they live in reclaimed wetlands (citizens, 2003). Public education could bridge this gap as well as supplement the previously recommended command and

control systems which are notoriously inadequate in swaying public opinion and behavior. Education “empowers,” encourages civic participation, and gives a sense of ownership of problems and their solutions. It is more effective to convince people “why” they care about something than the fact that they “should.” For instance, presenting cost benefit analyses of recommendations can lead to adoption through enlightened self-interest. Rain is free and rain barrels or cisterns are relatively low-cost durable goods. Combine this information with the fact that water prices in the Greater Boston area are some of the highest in the country, and storing rainwater for irrigation and houseplants begins to look more attractive than letting it run down the drain.

Finally, these recommendations should not be thought of as site specific. They are not applicable solely to Alewife, or even only to floodplains. Implementing these concepts in North Cambridge could greatly increase the quality of and reduce the quantity of effluent which is projected to be dumped at the Alewife Reservation by the controversial stormwater retention project. The project intends to protect Fresh Pond (the Cambridge public water supply), as well as to comply with the CSO (common sewer outlet) separation brought about by the federal court order to clean up Boston Harbor.

1. 100-year floodplain is the elevation which will statistically flood once every 100 years, or has a 1 percent chance of flooding in any given year. The 50-year floodplain is likely to flood once every 50 years, or has a 2 percent chance of flooding each year.

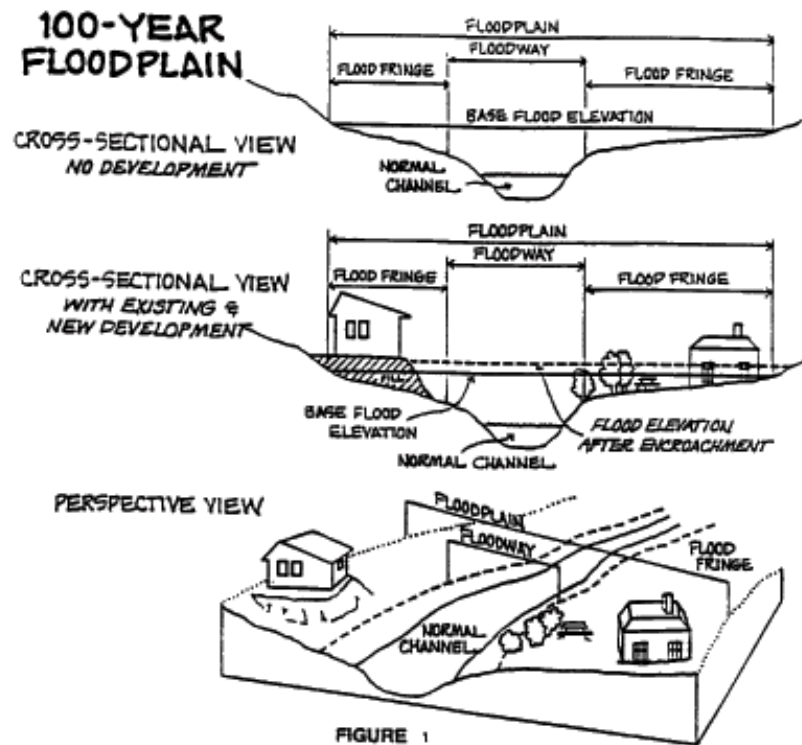


FIGURE 1

Note. From "100 Year Flood Plain Defined" by NFIP.

2. The author uses "affordable housing" to represent housing that is accessible to real lower income levels and not the definition given by statute. The difference between these two differences is akin to that between "living wage" and "minimum wage."
3. Some would argue that "(i)nvasives are currently better adapted to, and are taking over the ecological niches of natives. (this) contradicts ... arguments on the superiority of natives." (A. Hollman, personal communication, May 12, 2003). If one accepts that speciation occurs as the result of adaptation to the local environment, this goes a long way in refuting the claim that invasives proliferate because they are better suited to a location. "Many exotics have disastrous effects on native flora and fauna. They often leave behind the factors that have evolved with them and that control their population and spread. In their new habitat there may be fewer predators or diseases, so their populations grow out of control. They are then called invasive exotics" (Bryant, 2002). Furthermore, there are many examples of invasives which are arguably not superior to indigenous species. Instead the invasives lack biological controls in their new surroundings; a distinguishing characteristic between mere exotics, aliens, or introduced species and actual invasives. Australia's problems with hares and wild rabbits is one instance of this. Another, lesser known problem is that of *Caulerpa taxifolia aquaria*. *C. taxifolia aquaria* is a tropical seaweed used as ornamental foliage in aquariums which has adapted to temperate waters. This adaptation is not enough to explain the rapid spread of the plant throughout the Mediterranean, Californian and Australian waters. The *aquaria* variety has been shown to be toxic to marine life that might otherwise keep it in check.

Appendix 1

Table 1: Native flora

	Water tolerant	Water loving
Grasses & Groundcover	<ul style="list-style-type: none"> • Butterfly weed <i>Asclepias tuberosa</i> • New England Aster <i>Aster novae-angliae</i> 	<ul style="list-style-type: none"> • Cardinal flower <i>Lobelia cardinalis</i> • Lady's earrings <i>Impatiens capensis</i> • Marsh fern <i>Thelypteris palustris</i> • Marsh marigold <i>Caltha palustris</i> • New York fern <i>Thelypteris noveboracensis</i> • Salt reed grass <i>Spartina cynosuroides</i>
Bushes	<ul style="list-style-type: none"> • Common spicebush <i>Lindera benzoin</i> • Pink azalea <i>Rhododendron periclymenoides</i> 	<ul style="list-style-type: none"> • Fetterbush <i>Leucothoe racemosa</i> • Marsh hibiscus <i>Hibiscus moscheutos</i> • Sea myrtle <i>Baccharis halmifolia</i> • Swamp azalea <i>Rhododendron viscosum</i> • Sweet pepperbush <i>Clethra alnifolia</i>
Trees	<ul style="list-style-type: none"> • American beech <i>Fagus grandifolia</i> • Eastern Cottonwood <i>Populus deltoides</i> • River birch <i>Betula nigra</i> • Red maple <i>Acer rubrum</i> • Swamp white oak <i>Quercus bicolor</i> • Sycamore <i>Platanus occidentalis</i> • Yellow Polar <i>Liriodendron tulipifera</i> 	<ul style="list-style-type: none"> • American Larch <i>Larix laricina</i> • Ash-leaved maple <i>Acer negundo</i> • Atlantic white cedar <i>Chamaecyparis thyoides</i> • Musclewood <i>Carpinus carolinia</i>

(Diekelmann & Schuster, 2002; Thunhorst, 1993)

Appendix 2

Massachusetts nurseries that specialize in native and wetlands flora (Thunhorst, 1993)

Bigelow Nurseries
455 West Main Street
Northborough, MA 01532
(508) 845-2143

Garden in the Woods
180 Hemenway Road
Framingham, MA 01701
(508) 877-7630
<http://www.newfs.org/nursery.htm>

Sylvan Nursery
1028 Horseneck Road
South Westport, MA 02790
(508) 636-4573

Weston Nurseries
93 East Main Street
Hopkinton, MA 01748
(508) 435-3414
<http://www.westonnurseries.com/>

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