

Colorado State University Extension
NATIVE PLANT MASTER® COURSE CURRICULUM

Welcome to the Native Plant Master (NPM) Course Curriculum. We appreciate your commitment to this program and value your feedback. As you prepare for teaching your course, please review the curriculum which is designed as a checklist for your convenience.

_____ **Teach to the NPM Mission** - *The mission of the Native Plant Master Program is to educate the public about native plants in order to foster stewardship of native plants, sustainable landscaping and management of weeds that threaten native ecosystems.* The program mission is exemplified by Session 1 focus on stewardship, Session 2 theme on weeds and Session 3 theme on sustainable landscaping. The Session 1 focus on plant identification/taxonomy gives participants the foundation to learn and remember characteristics of the plants taught in the rest of the course. By staying focused on the theme for each session, you will enhance learning through repetition but avoid boredom!

SESSION 1 – PLANT FAMILIES AND IDENTIFICATION

Learning Objectives – Participants in Session 1 will:

1. *learn how to identify plants and their families by using key characteristics and technical terms;*
2. *learn about stewardship behaviors which promote natural resource conservation and social harmony on the trail;*
3. *learn about relationships between plants through their families and scientific names;*
4. *learn how to use a scientific plant key;*
5. *develop learning resources for future reference;*
6. *provide feedback to improve this course.*

A. In the Parking Lot – Introduce each other and the program.

- _____ Try to get on the trail as quickly as possible! Evaluations always point to how participants like to get on the trail and start learning plants.
- _____ Nametags – Be sure to wear your Extension nametag. Before the session begins, ask a participant to coordinate other participants filling out their own nametag if they are not wearing one.
- _____ Welcome participants and review mission of the Native Plant Master Program - *to educate the public about native plants in order to foster stewardship of native plants, sustainable landscaping and management of weeds that threaten native ecosystems.*
- _____ Introduce yourself – Introduce yourself giving your agency (Colorado State University Extension), job title or volunteer status, and how long you have been with us. Also, if you like, give your current job title outside of Extension, if applicable, and provide some background about your botanical experience (advanced degree held, Native Plant Master, etc.).
- _____ Have participants introduce themselves giving their name and job title or volunteer status. This is an important way of empowering your participants. They will feel more comfortable asking questions if they've been introduced.
- _____ Distribute NPM Manuals and show the research-based information in the manual on stewardship behaviors, alien invasive weeds, integrated pest management, plant families, taxonomy and references. The manual also has individual pages with information from the Colorado Plant Database; if you have generic manuals, these will have plant pages with blanks for plant names and participants' notes and sketches.
- _____ Refer to the Colorado Plant Database (CPD) as a research-based resource. CPD is the primary source for information taught in NPM. Recommend that participants go to the CPD to review the plants taught each week. The CPD contains information on over 1,000 Colorado Plants. Access

CPD at the web address on the front of the Manual (<http://coloradoplants.jeffco.us>). Encourage reporting of any errors in CPD to Extension staff.

_____ Distribute Course Plant List. Hand out the Course Plant List. Have participants add any new plants you identified in the field during your pre-course field visit(s). Update the list each session as you add more “new bloomers” that are not already on the list. Email to office when course is complete with new plants indicated.

_____ State course goal and session themes: cover between 40 and 50 different species by the end of the 3rd session with 9 to 15 keyed out (3 to 5 keyed per session). Session themes:

a) First Session - Identification including scientific names, families, key botanical characteristics.

b) Second Session – Non-native weeds and other ecological relationships.

c) Third Session – Sustainable landscaping and other human uses.

_____ Please do not teach more than 50 species total for all 3 sessions to assist in maintaining a focus on the session theme and also avoid duplication with other courses. Think quality over quantity:

more information about plants covered is more important than covering a large number of plants.

_____ Remind participants to take their Manual and textbook with them on the trail. Point out that the text by Weber is a “snapshot in time” of the evolving science of botany; other authors may use different nomenclature, but all can be tied back to one plant through the scientific literature.

_____ Tell participants you will have two breaks: one break during the middle of the session and another towards the end. Consider having one or both be “sit down” breaks depending on weather. If you specify a time for the break, ask participants to remind you when it’s time and to let you know if they need more breaks due to weather, need for water or snacks.

_____ Ask if anyone has any questions or needs to visit the restroom before heading out on the trail. Be sure to wait for restroom visitors to return before leaving.

B. First Stop on the Trail – Learn stewardship behaviors and today’s theme.

_____ Have participants turn to the Stewardship Guidelines in the Manual - Mention reasons for staying on trail and the few exceptions when trainer may invite off trail where impact will be low, such as on grassy areas (only in parks where the managing agency permits off trail use).

_____ Discuss why collecting, including edibles, is prohibited on public lands including the impact of urban populations on open space and rarity caused by collecting.

_____ Explain that we have obtained permission to use teaching specimens for NPM courses but that we will limit our specimens to non-natives or non-reproductive, above-ground parts of common natives to further minimize impact.

_____ Ask that first or last participant on trail call out “hiker/biker” so all can step off trail to the right (as they face in the direction of travel) to let them pass. Remind them to look before they step for hazards such as poison ivy, rattlesnakes, drop-offs, spiny plants etc.

_____ Introduce family portrait theme: “Let’s take a walk through nature’s gallery of family portraits.” Introduce plants by pointing out their family characteristics using the “family portrait” theme.

_____ Hand out prizes for correct answers at stops along the trail; there is a prize for each participant; take one for yourself - you are a winning trainer! Ask easy questions in Session 1 that participants may already know to build confidence. Even if someone gives the wrong answer, find the kernel of truth e.g. “I see what you mean; that plant really does look like it’s in the mint family, but it’s really an imposter! Does anyone else have a guess as to what family it’s in? What is a key characteristic of the mint family?”

C. On the Trail - Learn how to identify plants and families using key characteristics, scientific names, technical terms and a scientific plant key.

_____ For each plant identified:

_____ Select plants in bloom or trees and shrubs that may not be in bloom.

- _____ Teach scientific names by using both the common and scientific name whenever referring to a plant. Show participants how to find the plant in the text and manual by using the family and scientific name.
- _____ Have the group repeat your pronunciation of the plant and family scientific names when the plant is introduced in this as well as subsequent sessions. Point out that there is no “right” way to pronounce Latin names as even botanists pronounce them differently, but a general guideline is to pronounce each syllable.
- _____ Point out key characteristics for both the family and the species using information from the manual and/or CO Plant Database.
- _____ Create a memory aid - Ask participants to note in their textbook (Weber) the date/location plants were seen during the session or as homework after each session. We want them to create a reference for themselves so they know where and when they saw a plant to help them remember it.
- _____ Teach from the specific to the general by using samples to illustrate key characteristics. Collect one sample for every two to three participants so all can see the character being described. Use non-natives for samples wherever possible or non-reproductive, above-ground parts of natives. Follow NPM Stewardship Guidelines if you use natives; be sure a native plant is commonly found both in Colorado and this locale before using.
- _____ Check to be sure everyone sees the characteristic being described and ask those at a distance to step forward if needed.
- _____ Identify two plants in the same family that have unrelated common names and point out their morphological similarities. Make the point that scientific names show the closeness of their relationship while common names do not.
- _____ Take a brief mid-session break for water, snacks etc. and consider having this be a “sit-down” break if needed.
- _____ Key out three to five plants per session (9 – 15 per course) using the text, *Colorado Flora Eastern Slope*, 4th Edition, (or *Western Slope*), Weber and Wittmann. Note that our goal is to introduce students to keying, not to develop advanced competency in this skill. Please key out no more than three to five species per session and follow these guidelines:
 - a) Before the session, pre-select three to five plants that are **very brief and easy to key out** using the text, *Colorado Flora Eastern Slope*, 4th Edition, (or *Western Slope*), Weber and Wittmann.
 - b) Use non-native species, if possible, or non-reproductive above-ground parts of common native species.
 - c) Key at least one easy-to-key plant starting at page 1 of the family key in Weber.
 - d) Beware of choosing plants that have many key choices as this will take up too much class time.
 - e) For at least one species, ask a participant to read key choices out loud, referring to glossary to define any technical terms. If needed, save time by asking participants to follow in the text as you summarize the couplets and guide the choices.
 - f) Distribute plant samples to at least every third participant and ask them to share.
 - g) Trainers may keep the entire group together for the keying exercise or have the participants break up into smaller groups. If the smaller group option is preferred, trainers should circulate to answer any questions from each of the groups. Reconvene the groups as a whole to discuss their findings.

D. Break at Turnaround Point on the Trail - Develop learning resources for future reference and provide feedback to improve future courses.

- _____ Inform participants that Session Evaluations will be emailed to them shortly after the first session

and emphasize the importance of providing feedback by the deadline so you can use it before the next session. Remind them that the results are provided to you anonymously.

_____ Have a brief snack/water break.

_____ After break, review plants covered as you return to the trail head by quizzing participants on common names and then having them repeat the scientific name out loud. Award any remaining prizes.

E. VERY IMPORTANT -Within three business days after the session, turn in to the office:

_____ Names of any registered participants who did not attend

_____ Names of unregistered participants who attended, if any.

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SESSION 2 – NON-NATIVE WEEDS AND OTHER ECOLOGICAL RELATIONSHIPS

Learning Objectives – Participants in Session 2 will:

1. *Learn about Extension and what to expect for the remainder of the course;*
2. *Learn the difference between a native plant and a noxious weed, how non-native weeds affect native ecosystems and how weeds can be managed through integrated pest management.*
3. *Learn ecological values and/or detriments of plants through interrelationships with other plants, animals and the environment;*
4. *Learn more about how to use a scientific plant key;*
5. *Develop learning resources for future reference.*

A. In the Parking Lot - Learn about us and what to expect for the remainder of the course.

- _____ Don't forget to get on the trail as quickly as possible!
- _____ Handout Colorado State University Extension (CSUE) brochures provided in your trainer box and introduce CSUE as the sponsor for the Native Plant Master Program and. Review CSUE mission to *provide information and education, and encourage the application of research-based knowledge in response to local, state, and national issues affecting individuals, youth, families, agricultural enterprises, and communities of Colorado.* Mention the Master Gardener program and any other local Extension programs of that focus on the natural environment (e.g. in Jefferson County, the Plant Diagnostic Clinic and Eagle's Nest/Owl's Roost day camp).
- _____ Hand out Colorado Native Plant Society (CONPS) brochures. Discuss CONPS as a primary statewide partner with NPM and what CONPS offers: discounted membership for new members from NPM courses or classes, field trips, workshops, monthly membership meetings, annual meeting, rare plant symposium.
- _____ Discuss NPM partners for your county and hand out partner information, if any. Metro to Mountain NPM partners: Jefferson County Open Space, Lookout Mountain Nature Center).
- _____ Hand out list of plants that may be covered on Certification Exam using updated Course Plant List.
- _____ Review Certification Exam Guidelines:
 - _____ Exam is optional for those not wishing to receive credit towards the three course requirement for Native Plant Master certificate or Colorado Flora certificate.
 - _____ Announce that plants on the Exam will be those from Sessions 1 and 2 but will not include any new plants from Session 3. Note that plants that you may have discussed along the trail, but that are not on the plant list, will not be on the Certification Exam.
 - _____ Exam will be given at the beginning of Session 3 and will take about an hour.
 - _____ The total number of species covered will be a minimum of 12 and maximum of 14 species with additional questions on families, noxious weeds and sustainable landscaping.
 - _____ The textbook, Colorado Flora Eastern Slope, 4th Edition, (or Western Slope), Weber and Wittmann is the only reference to be consulted during the exam. We want participants to know how to use Weber to look up a plant they know, so they may not include any loose notes or items pasted or taped into the book including tabs, plant lists, notes on separate pieces of paper etc. Encourage participants to write as many notes on pages in the text as they wish but especially important is the date and location they first learned the species.
 - _____ For those using an electronic version of the text, they may not view images, websites or other electronic information during the exam.
 - _____ Remind participants they can look up technical terms in the glossary of their text. A half point will be deducted for any technical term that is misspelled.

_____ Credit will be given only for information given in class or from class materials rather than information participants may have obtained from other sources.

_____ Tell participants you will have two breaks: one break during the middle of the session and another towards the end. Consider having one or both be “sit down” breaks. If you specify a time for the break, ask participants to remind you when it’s time and to let you know if they need more breaks due to weather, need for water or snacks.

B. First Stop at or Near the Trail Head - Introduce session theme and review material from last time.

_____ Introduce session theme: non-native weeds threaten native ecosystems – “Weeds wander, natives nurture.”

_____ Hand out your Course Plant List that you have updated for new bloomers. The course objective by the end of the 3rd session is 40 to a maximum of 50 plants.

_____ Discuss the availability of researched-based information on the CSU Extension website including fact sheets on alien invasive weeds.

_____ Hand out any informational materials in your trainer box related to weeds.

_____ Conduct a very brief review of material covered last time, awarding all weed-related prizes either at the first trail stop, stops along the trail or as you review today’s plants on your return to the trail head. Keep one prize - you are a winning trainer!

C. On the Trail – Learn: 1) the difference between a native plant and a noxious weed, 2) how weeds affect native ecosystems, 3) other interrelationships between plants, animals and the environment and 3) learn how to use a scientific key.

_____ Identify new blooming plants and their families, using samples to illustrate key characteristics. Collect one sample for every two to three participants. Use non-natives for samples wherever possible or non-reproductive above-ground parts of natives. Follow stewardship guidelines if you use natives; be sure a native plant is commonly found both in Colorado and this locale before using; use only the part of the plant needed to illustrate the characteristic.

_____ Have participants repeat scientific names out loud for all new species/families.

_____ Check to be sure everyone sees the characteristic being described and ask those at a distance to step forward if needed.

_____ Discuss "what is a weed?" and why aliens are often invasive due to a lack of natural predators and adaptation to disturbance.

_____ Discuss how controlling alien invasive weeds can save money resulting from improved grazing, crop output, ornamental landscapes, wildlife habitat, tourism etc.

_____ For every species discussed and those covered in the first session, note whether it is native to Colorado or alien (non-native). If alien, discuss its origin, why/how it was brought to Colorado, whether it is considered a weed.

_____ Discuss how non-native plants can be detrimental to native plant and animal communities. Native plants are better adapted for survival because of the relationships between plants, animals and the environment that have evolved over millennia.

_____ Discuss the Colorado Noxious Weed Law which defines statewide noxious weeds, requires governments to establish a weed management plan and allows them to define local noxious weeds according to three control priorities. See weed management section of manual for details.

_____ Discuss how noxious weeds can be managed through integrated pest management, an environmentally sensitive approach to weed control that relies on a combination of common-sense practices including: 1) weed identification, research and monitoring, 2) setting action thresholds such as prioritized listing in the Colorado Noxious Weed Program, 3) biological controls

using natural enemies such as insects and selective grazing by domestic animals such as sheep or goats, 4) cultural controls including mowing and targeted use of chemical pesticides.

_____ Discuss other ecological relationships such as wildlife and insect interactions, as time allows.

_____ Take a brief mid-session break for water, snacks etc. and consider having this be a “sit-down” break if needed.

_____ Key out three to five plants per session (9 – 15 per course) using the text, *Colorado Flora Eastern Slope*, 4th Edition, (or *Western Slope*, as applicable), Weber and Wittmann. Remember, the course is an introduction to keying and not meant to provide advanced competency in this skill.

_____ Before the session, pre-select plants that are **brief and easy to key out** but that are slightly more difficult to key than those in the first session. Use non-native species, if possible, or common natives. Use at least one shrub, tree or vine that is easy to key and start at page 1 of the family key in Weber. Beware of selecting plants that have a lengthy list of key choices as this can take too much time away from other learning objectives.

_____ Distribute plant samples per guidelines above.

_____ For at least one species, ask a participant to read key choices out loud, referring to glossary to define any technical terms, if needed. If needed, save time by summarizing the key couplets and guiding choices.

_____ Trainers may keep the entire group together for the keying exercise or have the participants break up into smaller groups. If the smaller group option is preferred, trainers should circulate to answer any questions from each of the groups. Reconvene the groups as a whole to discuss their findings.

D. Break at Turnaround Point on the Trail - Develop learning resources for future reference.

_____ Have a brief snack/water break.

_____ Remind participants to note in their textbook the date/location plants were seen as homework after each session so they have a valuable future reference and an annotated text for the Certification Exam.

_____ Review Course Plant List and note which *may* be covered on Certification Exam with participants; cross out any on list that were not covered in Sessions 1 or 2.

_____ After break, review plants covered as you return to the trail head by quizzing participants on common names and then having them repeat the scientific name out loud. Award any remaining weed-related prizes.

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SESSION 3 – SUSTAINABLE LANDSCAPING AND OTHER HUMAN USES

Learning Objectives – Participants in Session 3 will:

1. *demonstrate the knowledge, skills and awareness they have gained from the course in a certification exam;*
2. *learn that native plants are valuable for sustainable landscaping;*
3. *learn other human uses of native plants including new blooming plants;*
4. *learn to use a scientific plant key;*
5. *develop learning resources for future reference;*
6. *tell us what they have learned and plan to do with their new knowledge.*

A. In the Parking Lot and Along the Beginning of the Trail – Certification Exam

- _____ Tell participants you will have two breaks: one break during the middle of the session and another towards the end to complete the session evaluation. Consider having one or both be “sit down” breaks. If you specify a time for the break, ask participants to remind you when it’s time and to let you know if they need more breaks due to weather, need for water or snacks.
- _____ Begin exam on time if possible, but wait until all have arrived to: 1) review instructions for Certification Exam and to 2) hand out the Exam forms.
 - _____ Exam is optional for those not wishing to receive credit towards the three course requirement for Native Plant Master certificate or Colorado Flora certificate.
 - _____ Plants on the Exam will be those from Sessions 1 and 2 but will not include any new plants from Session 3. Plants that you may have discussed along the trail, but that were not on the plant list, will not be on the Certification Exam.
 - _____ Exam will be given at the beginning of Session 3 and will take about an hour. For the plant identification section of the exam, before moving on to the next species, ask if anyone needs more time and give it if needed.
 - _____ The total number of species covered will be a minimum of 12 and maximum of 14 species with additional questions on families, noxious weeds and sustainable landscaping.
 - _____ The textbook, Colorado Flora Eastern Slope, 4th Edition, (or Western Slope), Weber and Wittmann is the only reference to be consulted during the exam. We want participants to know how to use Weber to look up a plant they know, so they may not include any loose notes or items pasted or taped into the book including tabs, plant lists, notes on separate pieces of paper etc.
 - _____ For those using an electronic version of the text, they may not view images, websites or other electronic information during the exam.
 - _____ Remind participants they can look up technical terms in the glossary of their text. A half point will be deducted for any technical term that is misspelled.
 - _____ Credit will be given only for information given in class or from class materials rather than information participants may have obtained from other sources.
- _____ Administer Certification Exam and collect in envelope provided as participants finish. Create answer key by completing a blank exam with the correct answers as participants take the exam. Protect your key from being viewed during the exam.
- _____ Ask if anyone will need to leave before the end of today's session when the course survey will be administered. If so, have them complete the survey and return to you before they leave.

B. First Stop along the Trail After Exam - Introduce session theme and review material from last time.

- _____ Introduce today's session theme: sustainable landscaping: - "Let's talk a walk along the trailside native plant garden."
- _____ Hand out your Course Plant List that you have updated for new bloomers. At this point you should have 40 to a maximum of 50 plants on your list that you have or will cover by the end of this session which is the course objective by the end of the 3rd session.
- _____ Discuss the availability of researched-based information on landscaping on the CSU Extension website. Hand out native plant landscaping fact sheets (from the website) and any other landscaping-related informational materials.
- _____ Conduct a very brief review of material covered last time, awarding all prizes either at the first trail stop, stops along the trail or during the review of today's plants as you return to the trail head. Keep one prize - you are a winning trainer!
- _____ Remember to get out on the trail as soon as possible.

C. On the Trail – Learn about native plants that are valuable for landscaping, other human uses and how to use a scientific plant key.

- _____ Identify new blooming plants and their families, using samples to illustrate key characteristics. Collect one sample for every two to three participants. Use non-natives for samples wherever possible, or non-reproductive above-ground parts of natives. Follow stewardship guidelines if you use natives; be sure a native plant is commonly found both in Colorado and this locale before using; use only the part of the plant needed to illustrate the characteristic.
- _____ Have participants repeat scientific names out loud for all new species/families.
- _____ Check to be sure everyone sees the characteristic being described and ask those at a distance to step forward if needed.
- _____ Emphasize native plants with landscaping uses i.e. perennials, annuals and woody plants for your garden or commercial landscape and how they would be used; you may also discuss other human uses as time allows.
- _____ Discuss adaptations of native plants to the semi-arid Colorado climate and advantages of using native plants for *sustainable* landscaping including minimal supplemental irrigation if sited in their native habitat.
- _____ Discuss how using natives in a sustainable landscape can save money resulting from reduced landscape inputs such as watering, pruning, pest control, etc. if sited in their native habitat.
- _____ Note that the scientific name is especially important when using natives to landscape as "native" is not a regulated word and may be applied to plants native to other parts of the U.S. or world which are sold in "native" seed packets and as "native" nursery stock.
- _____ For one plant, discuss the large number of common names that refer to the same plant compared to the one or few scientific names e.g. mullein. See how many common names participants can give for the plant.
- _____ Take a brief mid-session break for water, snacks etc. and consider having this be a "sit-down" break if needed.
- _____ Key out three to five plants using the text, *Colorado Flora Eastern Slope*, 3rd Edition, (or *Western Slope*), Weber and Wittmann.
- _____ Before the session, pre-select plants that are **brief and easy to key out** but that are slightly more difficult to key than those in the second session. Use non-native species, if possible, or common natives. Use at least one shrub, tree or vine that is easy to key and start at page 1 of the family key in Weber. Beware of selecting plants that have a lengthy list of key choices as this can take too much time away from other learning objectives.
- _____ Distribute plant samples per guidelines above.
- _____ For at least one plant, ask a participant to read key choices out loud, referring to glossary to

define any technical terms, if needed. If needed, summarize couplets yourself and guide choices to save time.

_____ Trainers may keep the entire group together for the keying exercise or have the participants break up into smaller groups. If the smaller group option is preferred, trainers should circulate to answer any questions from each of the groups. The groups will reconvene as a whole to discuss their findings.

D. Break at Turnaround Point on the Trail - Tell us what you have learned and plan to do with your new knowledge.

_____ Administer Course Surveys and have a class member collect in envelope to maintain privacy.

_____ Have a brief snack/water break while Course Surveys are completed.

_____ Ask for a volunteer to collect them in the envelope provided to ensure privacy.

_____ After break, review plants covered as you return to the trail head by quizzing participants on common names and then having them repeat the scientific name out loud. Award any remaining prizes.

E. VERY IMPORTANT -Within three business days after the last session:

_____ Grade your exams with point totals as noted on the exam. For plant identification questions, deduct one point for every item missed (each plant has 3 items). Deduct a full point for any incorrect answer, including scientific names not in the current edition of the text. Deduct a half point for any misspelled technical term. Subtract points missed from total points to get the percentage correct. This percentage is the exam score; convert score to A, B, C, D or F grade e.g. 90 – 100% = A, etc. See Trainer Guidelines for sample graded exam.

_____ Read your Course Surveys to see what impact your course has had on participants.

_____ Email your Course Plant List to us and include all plants covered from all three sessions, not just those that could be on the Certification Exam that you handed out at Session Two. Highlight any new plants that you would like included in the plant list or in the Colorado Plant Database next year.

_____ Within 3 business days of your last session, mail or deliver completed Course Surveys, Graded Certification Exams and Answer Key in envelope provided. Your participants will be eager to receive their graded exams from the office!

F. VERY IMPORTANT - Within 2 weeks after the last session:

_____ Drop off any unused items – please drop off any extra course materials including extra forms, handouts, prizes, etc. Doing so will help us stretch a limited budget.