NOAC 2024

CU Boulder

SEEK NEW HEIGHTS

Permacultures and Food Forests

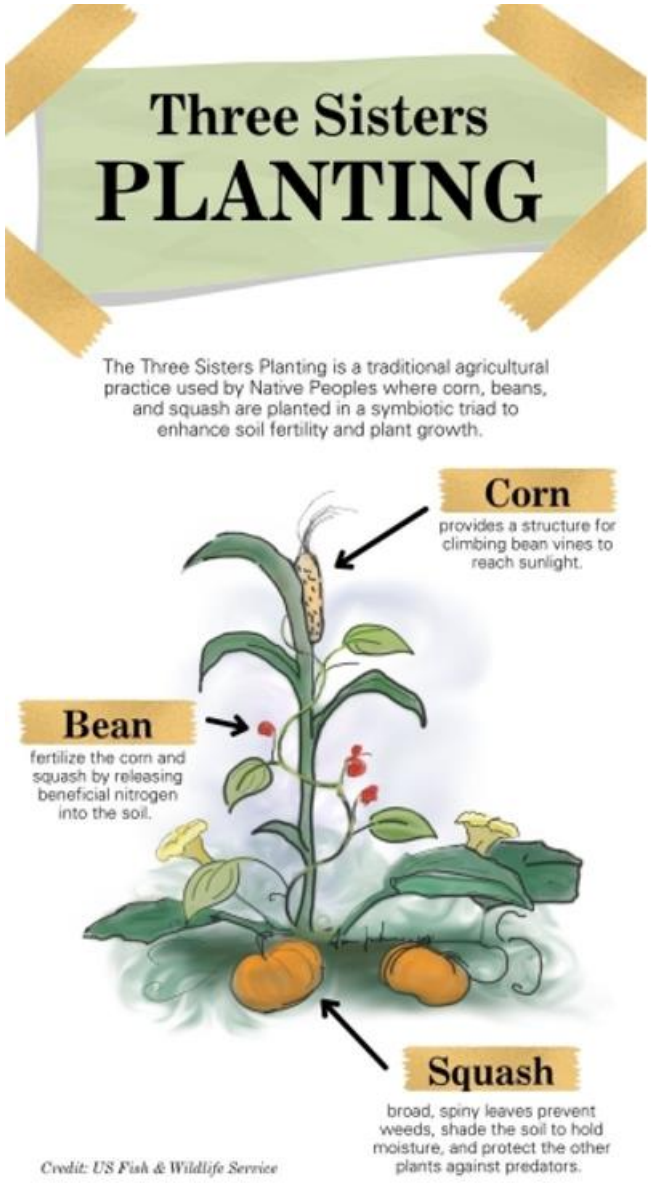
Learning Objectives

- Refresh on ICS Planning Components
- Define & examine three areas of sustainability:
  - Permaculture
  - Controlling Invasives
  - Creating a Pollinator Garden
- Practice what you have learned through an Interactive Conservation Project Planning Session

1.
Let’s define some terms

What is Permaculture?

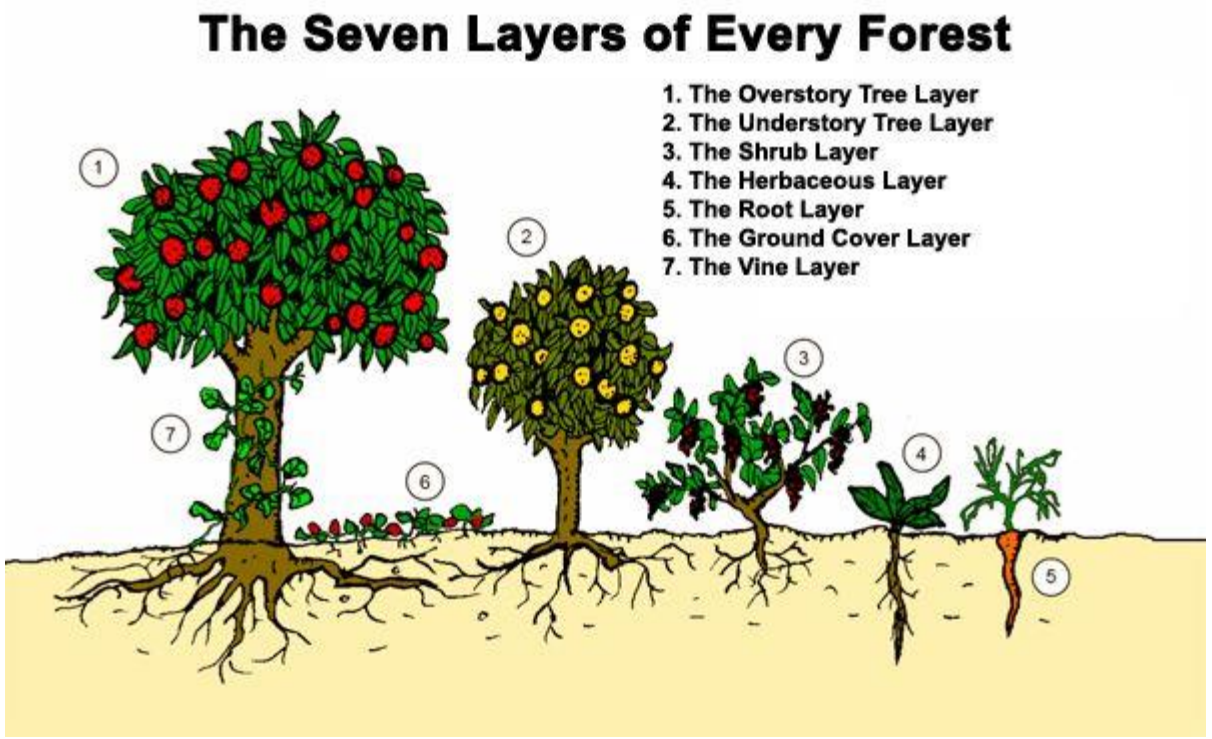
- Form of closed loop farming
- Places symbiosis at the forefront.
- Everything thing existing in it helps sustain others in the system
- Any new additions are worked into the grand scheme



What are Food Forests?

- Planting structure related to permaculture
- Designed to grow in three "dimensions"
  - up, down & out
- Goal is to get bigger produce or greater yields

Vegetable maxing



2. Why is this important?

Why use them?

(me making fun of your crop rotation idea and thereby holding our people back another 5000 years) jeff thinks the beans have to take turns lmao

- Every element of it is thought out
- Zero waste
- Doesn't require much human interaction in the form of built space or supports (ex: Seven Sisters planting method)
- If introduce animals into system, it would remove the need for pesticides.
- Prevent soil degradation with periodic rotation of crops (planting & then removing certain crop families every few seasons) it

Why are you telling me this? I'm not a farmer

- We all should care about the environment & sustainable farming
- A closed loop garden requires less human interaction
- Ideal for Eagle Scout projects or other service work

Not you

Game Break

Design your own food forest.

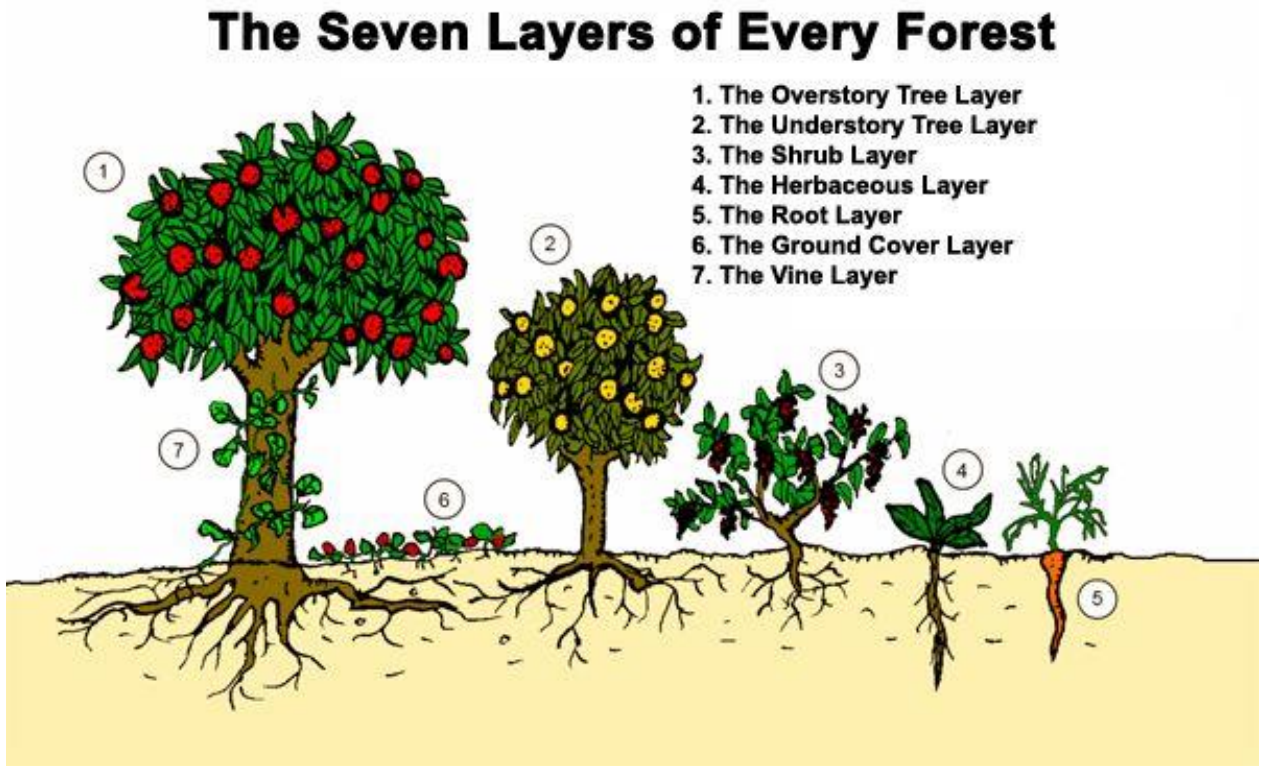
Rules:

-Every part need to serve a purpose besides food

-At least 1 plant of every layer

-Name the plants you use

-Bonus points for animal incorporation



Each layer more in-depth

1 **Canopy**: Large fruit and nut trees or timber trees.
2 **Understory**: Trees that tolerate partial shade like pear or apple.
3 **Shrub layer**: Bush growing food like berries or currants.
4 **Herbaceous Layer**: Perennials like flowers or food crop like rhubarb.
5 **Ground cover**: Living mulch, usually edible plants like mint or strawberries.
6 **Root layer**: Any root crops like carrots or parsnips.
7 **Vine layer**: Shade-tolerant plants like grapes or kiwis.

3.
Now what?

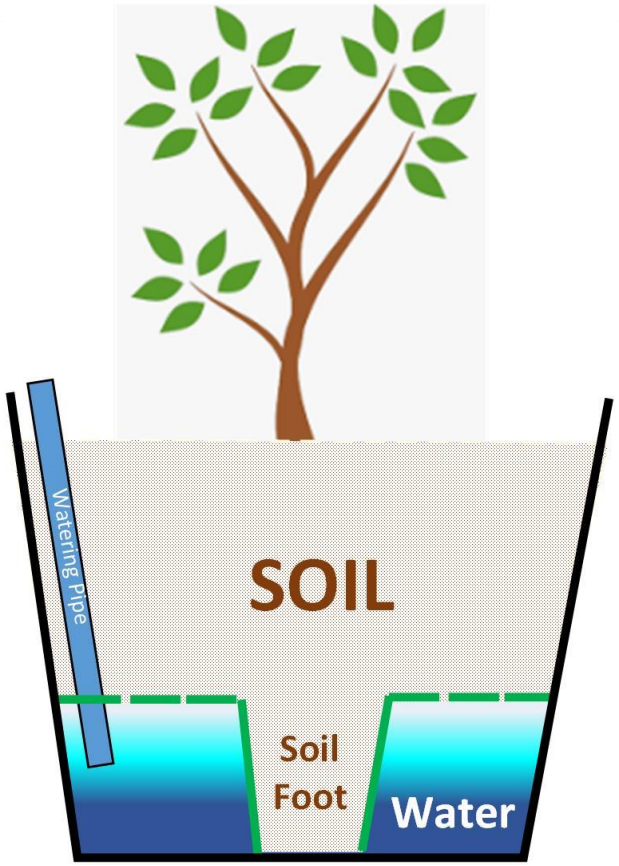
Put it into action!

Developing a community garden

- Great way to get more involved with your local community
- Provides fresh produce to people who may not always have access to healthy food.
- Ongoing upkeep could be constant source of service hours for your troop.

Smaller scale

- If space is an issue
- If don’t want a large commitment just yet:
- Create a self-watering garden in a plastic container.
- Tutorials online at varying levels of skill and effort required.
- Find one that serves your needs and skill level!



Takeaway Challenge

Grow something!

Conservation Projects with the Focus on Outdoor Ecosystems – *Controlling Invasives*

Outdoor Ecosystems

- **Sustainability** is a core to the values of the Order of the Arrow as indicated in our organization's purpose.

- Promoting camping, responsible outdoor adventure, and **ENVIRONMENT STEWARDSHIP** as essential components of every Scouts experience, in the unit, year-round, & in summer camp.

Definition of an Ecosystem

- Includes all plants, insects & wildlife that interact with all physical non-living things such as soil, water, air & sunlight -- together create the environment that humans are totally dependent upon.
- An environment out of balance or under attack is an ecosystem in danger.

Areas of Focus Under Outdoor Ecosystems

- *Human Impact*
- *Species Support*
- *Habitat Advancement*

Human Impact

What are some ways human impact outdoor ecosystems?

- Deforestation
- Desertification
- Global Warming & Climate Change
- Overpopulation
- Invasive species
- Destruction of Wildlife Habitat
- Plastic Production
- Emission of Carbon Dioxide & Other Greenhouse Gases
- Destruction of the Reefs
- Draining Streams/Rivers & Destruction of Critical Freshwater Aquifer Recharge Areas (Water Pollution)

Human Impact – Scouts Can:

- To continue to enjoy the outdoors we must think sustainably
- Use the principles of Leave No Trace
- Live the Outdoor Code
- Educate our fellow Scouts and the public through our actions and words
- Lead by example

Species Support

What are invasive species?

https://oceanservice.noaa.gov/facts/invasive.html

- *Can be any kind of living organism - an amphibian plant, insect, fish, fungus, bacteria, or even an organism's seeds or eggs - that is not native to an ecosystem and causes harm.*
- *Can harm environment, economy, or even human health.*
- *Species that grow & reproduce quickly, & spread aggressively, with the potential to cause harm, are given the label "**invasive**."*

Species Support – Scouts Can:

- *Take part in invasive species removal*
- *Reintroduce threatened or endangered species to an area*
- *Support plantings that increase the populations of native species, both plants and animals*

Habitat Advancement

- **Major Causes**
  - Wildlands conversion for agriculture
  - Logging
  - Extraction of oil & gas
  - Urbanization & urban sprawl
  - Trawling
  - Natural & man-made disasters

Habitat Advancement – Scouts Can:

- Identify endangered flora & fauna & seek ways to support their growth
- Develop conservation projects that protect habitat
- Educate fellow Scouts & public about danger of habitat destruction

An environment out of balance or under attack

- Example: when invasive plant or animal competes with natives for limited resources.
- What do plants need to live and prosper?
- What do animals need to live and prosper?

Non-native Invasive Plants

- Invasive plant species spread quickly & can displace native plants, prevent native plant growth, & create monocultures.
- A healthy plant community has a variety of herbs, shrubs & trees.
- Invasive plants cause biological pollution by reducing plant species diversity.

Colorado Invasive Plants

How Pervasive is the Problem?

- This is a list of invasive plants in Colorado
  - https://cwma.org/weed-information/weed-list/
  - According to the Colorado Weed Management Association, there are 78 invasive plants in the state.

- You can search for your own state's list of invasive plants.
  - According to California Invasive Plants Council, there are 298 identified invasive plants

- Why do you think there are so many more invasive species plants in California than in Colorado?

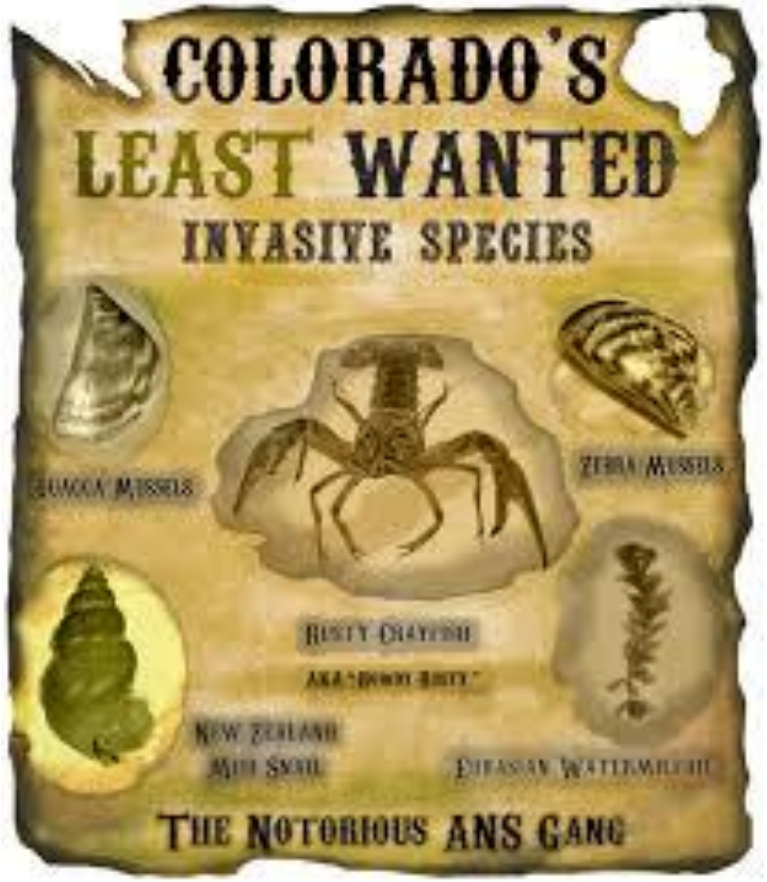
What are the Methods of Removing Invasive Plants? *Plan of Attack!*

- **Mechanical Control Methods**
  - Pulling & Digging
  - Suffocation
  - Cutting & Mowing

- **Chemical Control Methods**
  - Foliar application
  - Cut stem treatment
  - Biological controls

Non-native Invasive Animals

- Introduced accidentally or intentionally outside their native range.
- No natural competitors or predators.
- Without these checks & balances, the invaders can reproduce rapidly & out-compete native species.



Non-native Invasive Animals – cont'd

- **Why does it matter?** The introduction of invasive animals:
  - Damages land & water
  - Hurts economy
  - Ruins recreation opportunities
  - Threatens public health
  - Damages or impairs infrastructure
- **What is the impact on us?**
  - Many invasive species consume enormous amounts of water & reduce water supply for livestock, wildlife, native vegetation & humans.
  - In the United States, ecological damage & control of invasive species cost $200 billion per year.

POLLINATOR GARDENS – WHAT ARE THEY AND WHY ARE THEY IMPORTANT?

What is Pollination?

- Insects, birds, mammals or even wind takes pollen from male part of a flower to female part, fertilizing the plant.
- Necessary for crops that sustain all human & animal life.
- Living pollinators are responsible for 75% of our food supply.
- Habitat destruction is hurting & destroying pollinators.
- ***We can help by planting pollinator gardens.***

What Is a Pollinator Garden?

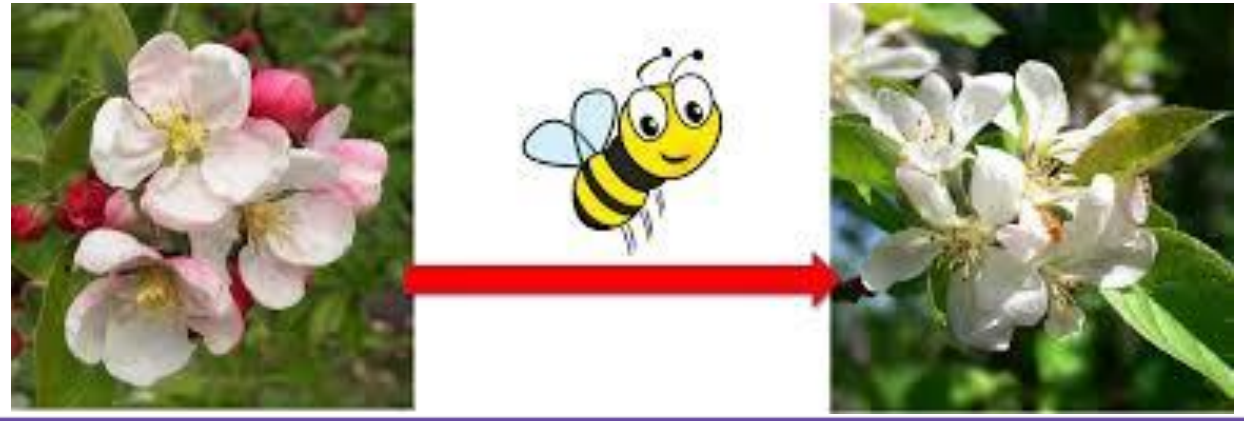
- Includes plants that attract & support pollinators such as bees, butterflies & hummingbirds.

- Plants include annuals, which only live for one season before dying, & perennials which come back every year.

- Shrubs and bushes can also act as pollinator plants.

Pollinator Gardens, cont'd

- Many plants require cross-pollination & need pollen from different plants to bloom & produce.
  - Apples are one example of cross-pollinators.
  - For example, a Honeycrisp tree may pollinate a Pink Lady tree but not another Honeycrisp tree.
- Benefit entire ecosystem, including humans, wild animals & insects.



***Bonus** – you'll attract beautiful creatures to your yard!*

Steps to Create a Pollinator Garden

1. **Research Local Pollinators**
   a) Every area has its unique pollinators
   b) Blue Orchard Bees & various wild bumblebees are native to North America
   c) Managed bee colonies are kept by beekeepers for honey, beeswax & pollination services
2. **Choose an Appropriate Garden Site**
   a) Find an area that has right amount of sunshine
   b) Most plants need sunshine to flower, others can tolerate some shade
   c) Plant during the right time of year

Steps to Create a Pollinator Garden, cont'd

3. Select Native Plants

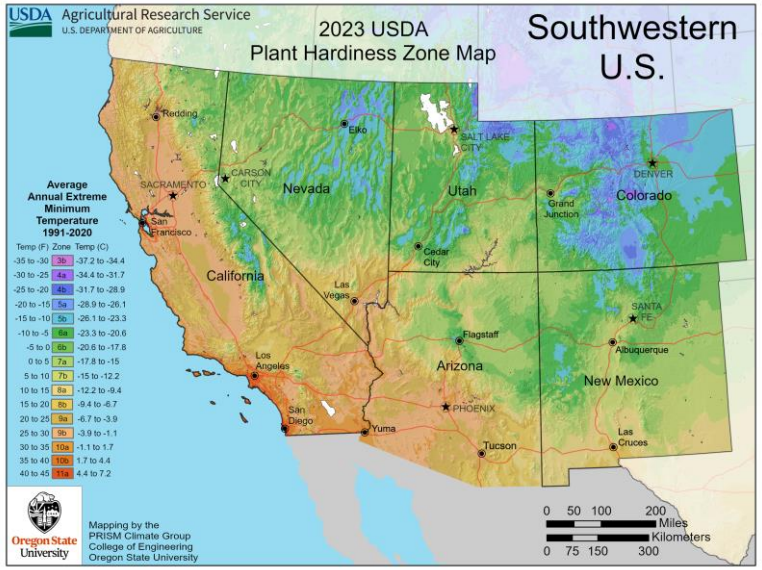
a) Use "*native*" plants from your area

b) Choose plants for your area's *"hardiness zone"* – check USDA Plant Hardiness Zone Map based on your climate

c) Ex: California natives are drought tolerant & come back after a fire.

d) Choose variety to bloom at different times of year

e) Start with either grown plants or seeds



4. Prepare the soil

a) Get your soil tested for its type and pH

b) Determine nutrient & water absorption needs of plants

c) If using raised beds, purchase specific soil for this purpose

Steps to Create a Pollinator Garden, cont'd

5. **Watering**
   a) Plants need water -- especially true when plant getting established
   b) Many plants are water intolerant -- only water when plants are dry
   b) Do not plant without a water source
6. **Maintain and Monitor the Garden**
   a) Pull invasives (weeds)
   b) Weeds compete with your plants for sunshine, water & nutrients
   c) Avoid using pesticides (See Invasives presentation for methods) -- negatively affects pollinator populations, groundwater & more!

Steps to Create a Pollinator Garden - continued

7. **It's not foolproof.**
   a. Planting a pollinator garden is easier than planting an English or rose garden but it is not foolproof
   b. Don't be discouraged if not all your plants survive – learn from it – water/sun/fertilizer, etc.
   c. Create a garden map showing names & locations of your plants so you know which plants thrived OR for replacement of dead plants

6 Types of Pollinators & Their Importance

1. Bats

a) Unlike bees & butterflies, bats not attracted to colors

b) Prefer flowers of agave, banana, eucalyptus, guava & mango plants

2. Bees

a) Top of mind when think of pollinator gardens

b) Many types act as pollinators, including bumble bees, honeybees, squash bees & sweat bees

6 Types of Pollinators and Their Importance

3. Butterflies

a) Less efficient at moving pollen than bees

b) BUT….can reach deep pollen levels in flowers that other pollinators cannot

c) Butterflies are especially helpful in fertilizing cotton plants

4. Hummingbirds

a) Hummingbirds can visit thousands of flowers a day, making them one of the most prolific pollinators

b) Fun visitor to watch in your garden

c) Anyone have a hummingbird feeder in their yard?

6 Types of Pollinators and Their Importance

5. Insects

a) Important for pollination

b) Some flies also act as pollinators, although others are destructive to crops and plants

6. Moths

a) Nocturnal butterflies -- pollinate flowering plants at night

b) Often attracted to white plants that reflect moonlight such as morning glories

Benefits of Adding a Pollinator Garden to Your Home

1. **Aesthetic Appeal**
   a) By planting pollinators, your garden will turn heads & provide a relaxing oasis to enjoy
   b) Because there are so many different pollinator plants, choose plants that best fit your aesthetic taste
   c) Attracts beautiful pollinators such as butterflies & hummingbirds to your yard

Benefits of Adding a Pollinator Garden to Your Home

2. **Easy to Maintain**
   a) Natives are easier to maintain than ornamentals
   b) Are specific to your part of country & made for your area and climate
   c) Native plants have a higher survival rate & need less care
3. **Price**
   a) Native plants often cost less than ornamentals
   b) Easy to collect native plant seeds that are free

Organizations That Support Pollinators

Organization	Website	Description
Monarch Watch	https://www.monarchwatch.org/waystations/	Monarch Watch encourages gardeners to plant species that Monarchs love to help them survive and thrive.
National Audubon Society	https://www.audubon.org/native-plants	It has a native plants database you can use to find the best plants for your area.
National Forest Service	https://www.fs.usda.gov/managing-land/wildflowers/pollinators	The service has a thorough website that explains how pollinators work, why pollination is important, and tips on creating your own pollinator-friendly garden.
National Park Service	https://www.nps.gov/aboutus/index.htm	The service actively supports pollination efforts in their parks.
National Pollinator Garden Network	http://pollinators.wpengine.com/resources/	The network has a list of resources to help you confidently build your pollinator garden.

Organizations That Support Pollinators – cont'd

Organization	Website	Description
National Wildlife Federation	https://www.nwf.org/garden-for-wildlife/about/national-initiatives/plant-for-pollinators	Without successful pollination, deer, bears, and other animals will have fewer food sources.
The Nature Conservancy	https://www.nature.org/content/dam/tnc/nature/en/documents/Wisconsin_TurfGrassConversionToNativePlantsTutorial_FINAL.pdf	The Conservancy offers educational videos and PDFs explaining how to begin a pollinator garden from scratch, even if your backyard currently looks like a pile of dirt.
U.S. Department of Agriculture	https://www.usda.gov/sites/default/files/documents/native-pollinator-plants-infographic.pdf	The department offers a native pollinator map with a list of the best plants for your region.

Thank you for participating in this workshop
Happy Gardening!

Introduction to the Planning Process

The Planning Process (Key Tasks)

Identify a Meaningful Project

- Look local
  - Scout functions
  - Community groups
  - Charter organizations
  - Council properties
  - Public lands
  - Privately held conservation lands
  - Land-management agencies
- See a need, fill a need
- Identify stakeholders and obtain permission
- Identify applicable land management plan and regulations

Assemble your team

- Define your volunteer group
- Look to local and or regional resources
  - Scouting
  - Community groups
  - Local agencies / government
  - Other non-profits

Develop & Implement your plan

- Define goals & scope
- Establish measurable objectives
- Identify what tools/support your group needs
- Identify available resources
- Coordinate resources with outside groups
- Build command structure
  - Incorporate ICS
- Develop a timeline with a backward calendar.

Invasive Plant Removal Project
"A Sample Plan" Steps

Find a meaningful project

- Obtain permission
- Define boundaries
- Under land management plan
- Develop goals
- Assess threats
- Develop timeline - draft
- Develop budget - draft

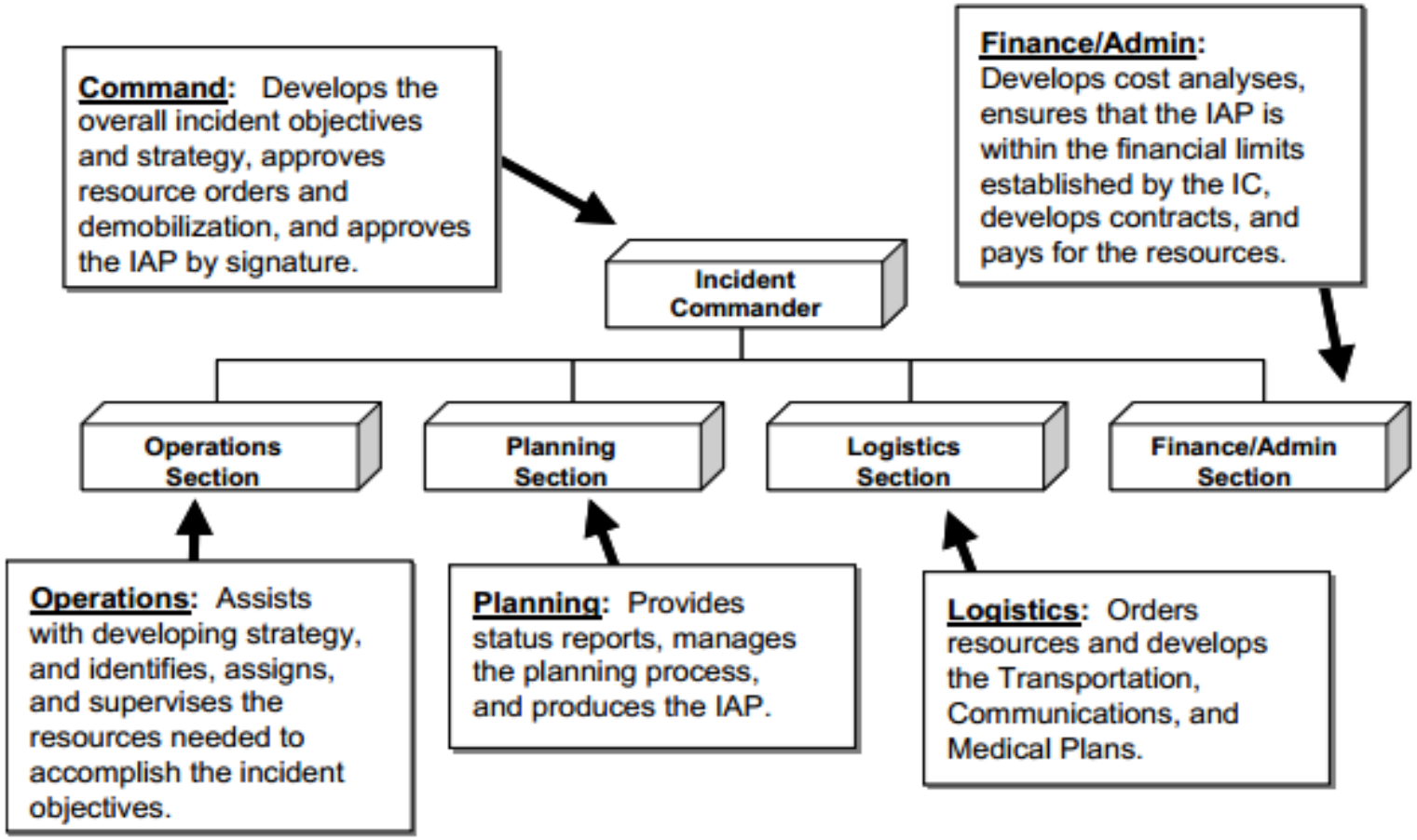
Assemble your team

- Review budget & timeline
- Assign responsibilities
- Market for volunteers
- Providing training for ICS

Develop your plan

- Plan for housing & food
- Purchase tools & supplies
- Develop safety plan
- Implement plan (ICS)
- Recognize key volunteers
- Develop press release(s)
- Create after-action report
- Use report to plan next project

The Planning Process



Incident Action Plan (IAP)

- The IAP:
  - Specifies the incident objectives.
  - States the activities to be completed.
  - Covers a specified timeframe, called an operational period.
- Every IAP must answer the following four questions:
  - **What** do we want to do?
  - **Who** is responsible for doing it?
  - How do we **communicate** with each other?
  - What is the **procedure** if someone is **injured**?

Incident Action Plan (IAP) – Continued

- The IAP is/has:
  - Several documents, not just one.
  - Used by all levels of the incident organization.
  - Updated periodically throughout the incident.
  - Measurable strategic objectives.
  - The primary means of communicating schedules, tasks, and assignments.
- The IAP is not:
  - Just a planning tool.
  - Documentation for documentation's sake.
  - Superseded by any other documents.

Incident Command System (ICS)-OA Integrating Features

- Planning
  - Ensures documentation & planning in sync with each agency – one IAP!
  - Prepare to store all documentation on BSA/OA document storage system & provide copies to agencies.
  - Daily updates sent to key BSA & OA personnel.
  - Creation/collection of ‘lessons learned’ materials.
- Logistics
  - Management of OA/BSA, agency & event-purchased tools is critical.
  - Manage base camp facilities including layout, water, sanitation, power, lighting, etc.
  - Manage safety & medical requirements at base camp & work sites.

ICS-OA Integrating Features – Continued

- Operations
  - Operations planning, transportation & tool drops require close coordination.
  - Crew assignments must consider medical history & age.
  - Training for tools & assignments is needed – most people have never done some of these activities.
  - Integration of I-Corps as task experts & crew leaders.
  - In the blended organization, need to determine who is the final authority.

ICS-OA Integrating Features – cont'd

- **Finance/Administration**
  - Works with appropriate Scout office for registration & fee collection.
  - Arrival/departure transportation coordinated within registration process.
  - Responsible for on-site check-in, materials handouts, check-in games/activities & orientation.
  - Integration of trading post activities.
- **Safety**
  - Guides safety discussion content during orientation, recreation & crew briefings.
  - Additional planning required for recreation events.

ICS-OA Integrating Features – cont'd

- **Public Information Office**
  - Important area for publicizing event, its benefits, & recognizing sponsors / partner agencies.
  - Publicizing locally as well as within the BSA & OA.
  - Coordinates VIP guests with other sections.
- **Recreation**
  - Daily/nightly planning.
  - End of project event.
- **Program**
  - Overall theme/program highlighted before event & carried throughout event.
  - Daily program integrated into work activities.
  - Wrap-up/reflection during nightly or weekly shows.

ICS-OA Integrating Features – cont'd

- Key additions to IAP:
  - What tools/support does your group need?
  - What is needed from other groups?
  - Define "group": OA Chapter, Lodge, Section, District, or Council.

Your Task is to Begin the Process of Planning a Conservation Project

- Your lodge has been given the task of removing a large growth of invasive plants from a section of your Scout camp and replacing these invasives with a pollinator garden using native plants. Scout Executive wants this done before summer camp opens June 10, 2025.
  - What is the objective?
  - What is the deadline?
- Positions on the team include *Incident Commander, Finance/Administrator, Planning, Logistics, Safety, Public Information, Recreation, and Program*.
- With your position in mind, what questions do you need answered?
- What tasks must you get done before, during & after the project?

The Planning Process

- Your task for the next _____ minutes is to answer these questions:
  - With your position in mind, what questions do you need answered?
  - What tasks do you have to get done before, during & after the project?
  - Using the list above, what month do each of these tasks need to be done?
  - Using this information, create a backward planning map.

The Planning Process - continued

Public Information/ Marketing Officer

What is the next step?

Months	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb	March	April	May	June
Task 1	X										
Task 2		X									
Task 3			X								
Task 4		X									
Task 5					X						
Task 6						X					
Task 7											
Task 8							X				
Task 9											X